Research & Innovation Projects relevant to

Water research

CALLS 2014 - 2019

HORIZON 2020

Directorate-General for Research and Innovation
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PREFACE

The European Union, through successive framework programmes for research and innovation, is supporting collaborative R&I projects in the area of water. Projects span from fundamental research to innovation actions including pilots and demonstration cases as well as training and capacity building activities.

The current Framework Programme for Research and Innovation Horizon 2020 (2014-2020)[1] adopted a decentralised approach addressing three priorities: excellent science, industrial leadership and societal challenges, in which water research is present at different levels and scales.

The present document aims to provide a quick overview of relevant projects[2] co-funded by the European Union in different areas of Horizon 2020 for the period covering 6 years of implementation, from 2014 till 2019. Without pretending to be exhaustive, the current publication includes the description of 255 water relevant projects that will mobilise a total budget close to EUR 1,235 million, of which EUR 1,008 million as EU funding.

This presentation is structured around eight main thematic areas: freshwater and aquatic ecosystems, global water cycle, water management, water and people, water and agriculture, water and industry, water and energy and water governance. Projects are assigned to different areas in accordance to their main objectives, grouped per topic and then sorted in descending order per project number. However, due consideration should be given to complex and integrated projects with multiple objectives connecting different thematic areas. Clear examples of crosscutting actions could be seen in projects addressing the nexus water-food-energy-climate or synergies between industry and the urban water sector.

To search specific information on a project or topic, either you use a thematic search following the mentioned structure or a free text search across the entire document using the 'Find' command and introducing free text keywords (e.g. wetland, advanced oxidation, struvite, …).

This document is a living piece of information subject to changes and updates. We strongly recommend to only use the electronic version of this document (more portable, editable and searchable) and only print it if when really needed and justified.

More about research and innovation in the area:
http://ec.europa.eu/programmes/horizon2020/en/h2020-section/climate-action-environment-resourceefficiency-and-raw-materials

Funding opportunities are published in the Funding and Tenders Portal:
https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/h2020

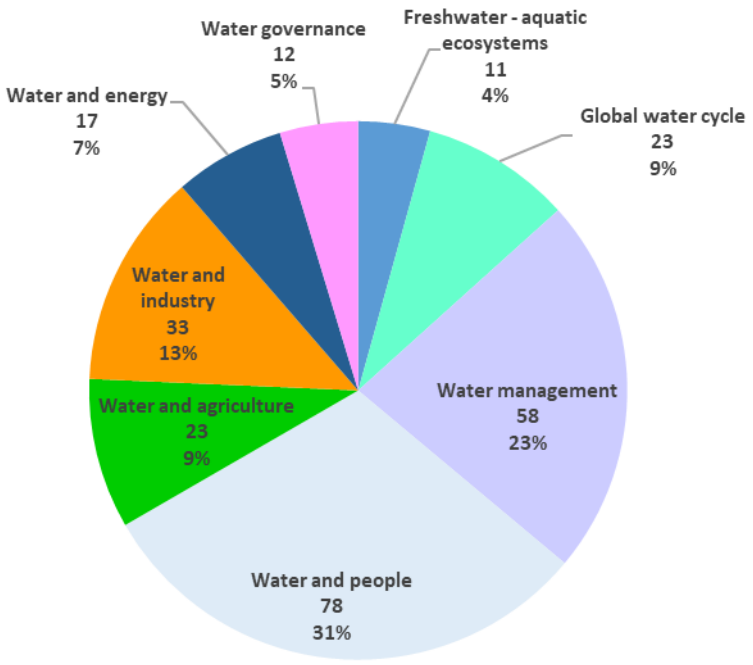
More details about the EU funded projects are available in CORDIS:
https://cordis.europa.eu/projects/en

[1] Regulation (EU) No 1291/2013 of the European Parliament and of the Council of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)
[2] For practical reasons, projects below EUR 1 million of total costs are not included.

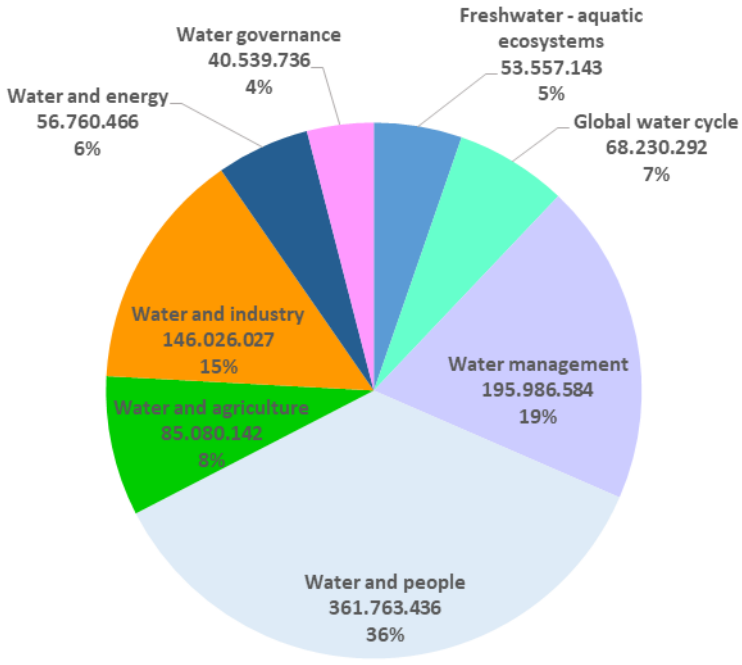
THEMATIC CLASSIFICATION

Theme		Description
1		**Freshwater - aquatic ecosystems**
	11	functioning
	12	quality
	13	services
2		**Global water cycle**
	21	earth system
	22	hydrology, hydro-morphology
	23	extreme events
	24	groundwater
	25	soil, sediments
3		**Water management**
	31	demand, allocation
	32	scenarios, modelling, DSS
	33	EO, data, IT
	34	sensors, monitoring
4		**Water and people**
	41	water treatment
	42	waste water treatment
	43	water reuse, efficiency
	44	sewage sludge
	45	resource recovery
	46	infrastructure, networks
	47	contaminants of concern
5		**Water and agriculture**
	51	efficient use
	52	irrigation
	53	diffuse pollution
6		**Water and industry**
	61	process water treatment
	62	waste water treatment
	63	water reuse, efficiency
	64	resource recovery
7		**Water and energy**
	71	hydropower
	72	renewables
	73	efficiency
8		**Water governance**
	81	policies
	82	innovation, economic, financing
	83	engagement, capacity building

NUMBER OF PROJECTS AND EU CONTRIBUTION PER THEMATIC GROUP

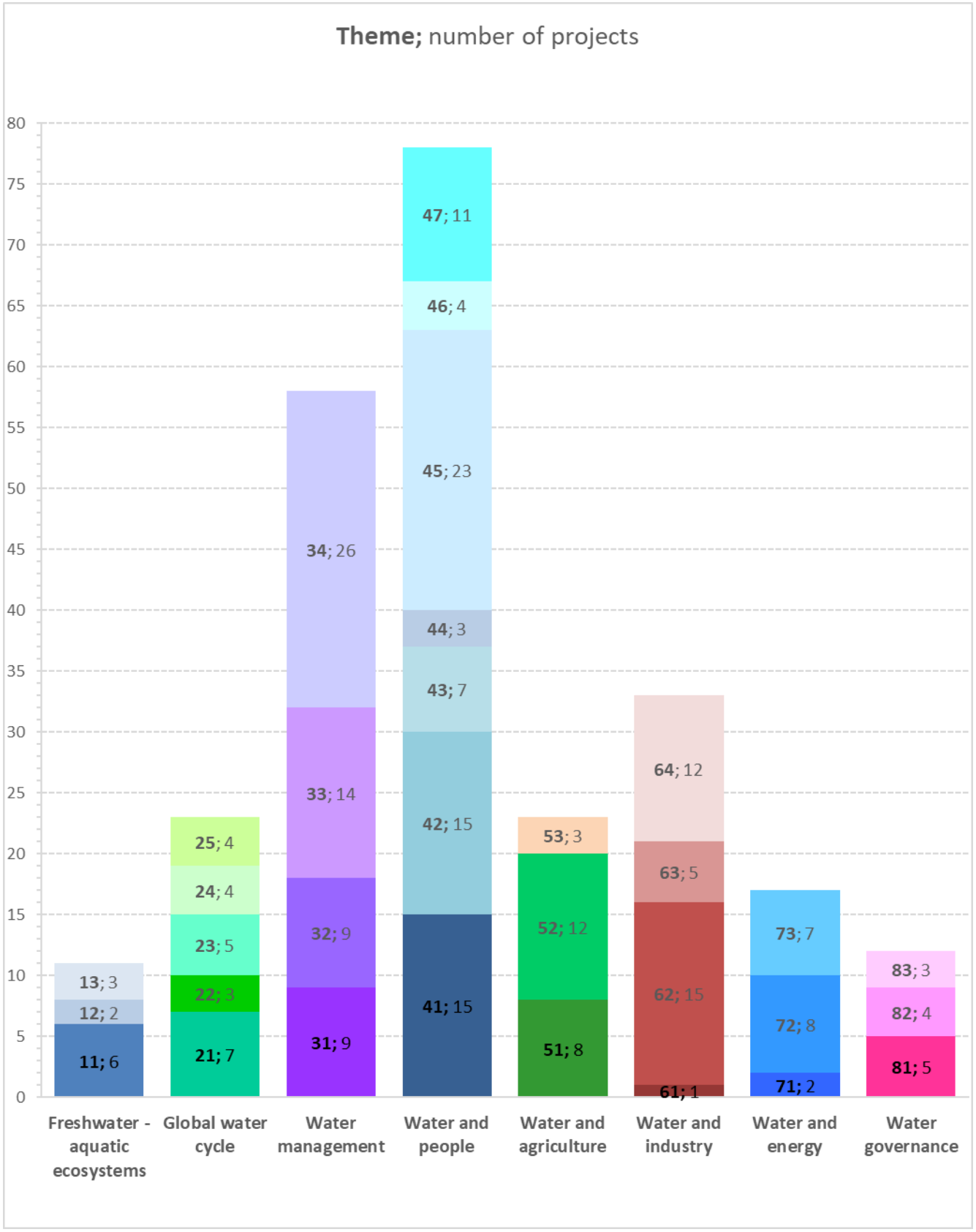


Projects distribution

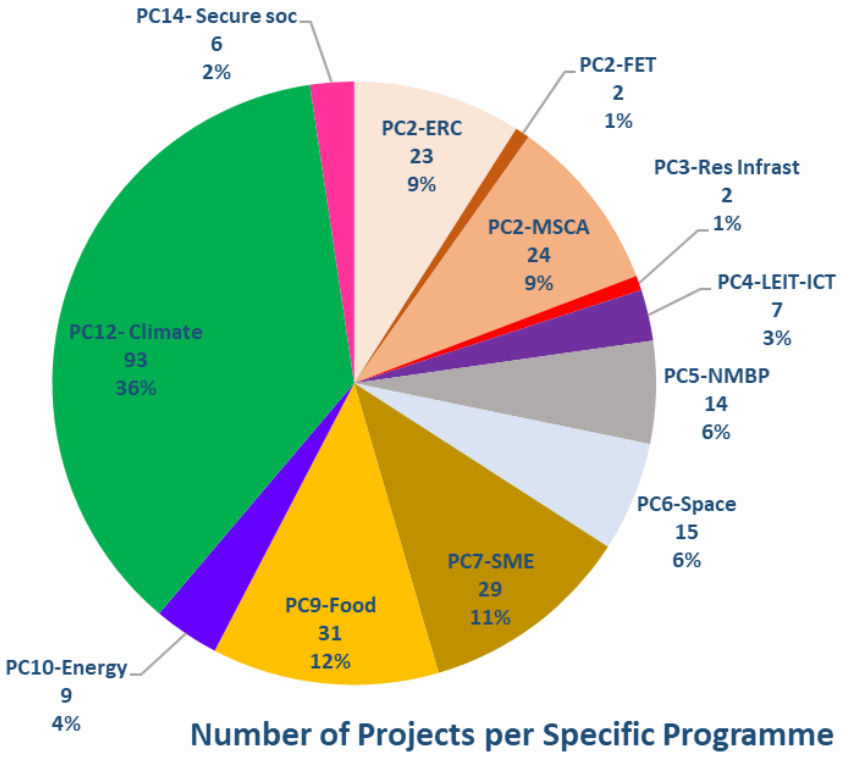


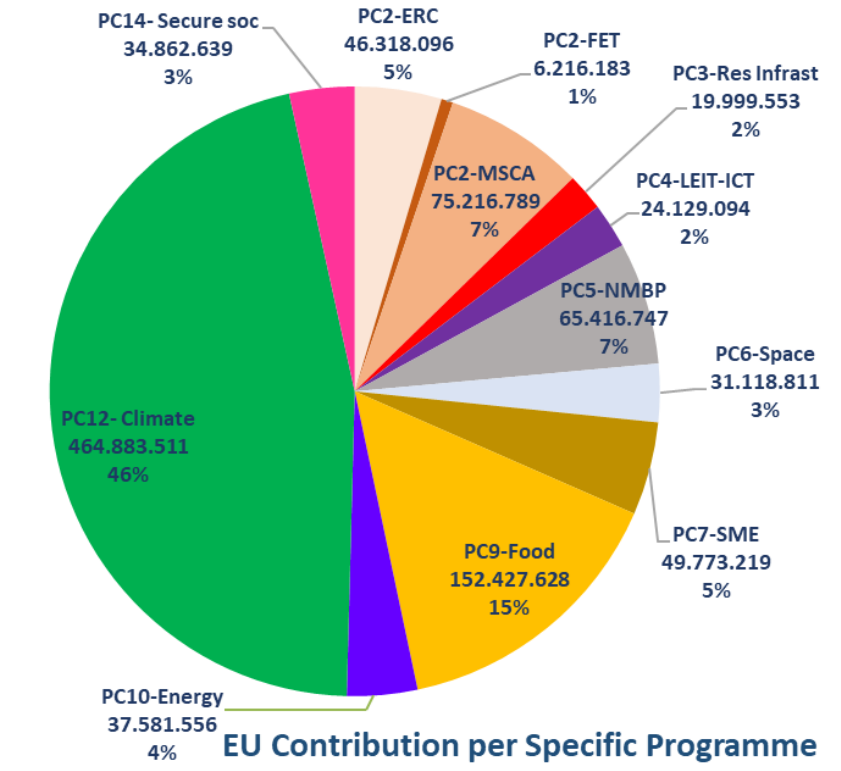
EU Contribution

NUMBER OF PROJECTS PER THEMATIC GROUP



NUMBER OF PROJECTS AND EU CONTRIBUTION PER HORIZON 2020 SPECIFIC PROGRAMME
PC (Programme Committee configuration) as defined in ANNEX V of the Horizon 2020 Specific Programme[3]





[3] Council decision of 3 December 2013 establishing the specific programme implementing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)

SUMMARY NUMBER OF PROJECTS AND EU CONTRIBUTION PER THEME AND TYPE OF ACTION

		Theme	Tt Nb Pj	Total RIA (incl BBI)		Total IA (incl. BBI)		Total SME		CSA		ERA-NET-Cofund		Total ERC		Total MSCA		PCP		TOTAL
				Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib	Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib (€)	Nb Pj	EU Contrib	EU Contrib (€)
1	Freshwater - aquatic ecosystems	11-functioning	6	3	26.702.912									2	3.499.169	1	3.090.952			33.293.033
		12-quality	2			1	1.040.484									1	3.976.834			5.017.318
		13-services	3	2	11.322.803											1	3.923.989			15.246.792
2	Global water cycle	21-earth system	7											7	19.107.739					19.107.739
		22-hydrology, hydro-morphology	3	1	6.020.173									2	3.847.304					9.867.477
		23-extreme events	5	2	9.748.898	1	2.548.396							2	3.300.361					15.597.655
		24-groundwater	4	1	2.923.503	1	2.734.223			1	1.108.669					1	2.992.494			9.758.889
		25-soil, sediments	4	2	9.959.224	1	2.599.245	1	1.340.063											13.898.532
3	Water management	31-demand, allocation	9	1	6.999.509			3	4.505.051			3	18.070.421	1	2.500.000			1	3.989.644	36.064.625
		32-scenarios, modelling, DSS	9	3	19.126.740	3	19.617.339			1	1.411.163			1	1.222.500	1	1.242.000			42.619.742
		33-EO, data, IT	14	6	19.835.390	8	27.908.270													47.743.661
		34-sensors, monitoring	26	7	27.107.739	5	21.325.359	13	17.064.515							1	4.060.944			69.558.557
4	Water and people	41-water treatment	15	4	12.180.499	4	24.901.386	6	8.321.052					1	1.500.000					46.902.937
		42-waste water treatment	15	3	8.300.849	7	49.786.006	2	3.503.489					1	1.500.000	2	4.689.609			67.779.953
		43-water reuse, efficiency	7	2	5.718.012	4	33.189.121			1	1.999.926									40.907.059
		44-sewage sludge	3			1	1.979.584	2	2.884.350											4.863.934
		45-resource recovery	23	3	11.201.946	12	105.609.243	2	3.853.042					3	4.944.278	3	7.836.089			133.444.598
		46-infrastructure, networks	4			3	18.079.344	1	996.834											19.076.178
		47-contaminants of concern	11	2	10.481.552	2	10.647.652	1	2.073.750			1	5.999.999			5	19.585.823			48.788.776
5	Water and agriculture	51-efficient use	8	6	39.850.829			1	1.427.512			1	6.267.995							47.546.336
		52-irrigation	12	2	3.176.826	2	7.764.331	6	8.240.724	1	2.999.273					1	1.518.000			23.699.154
		53-diffuse pollution	3	2	9.996.872											1	3.837.780			13.834.652
6	Water and industry	61-process water treatment	1					1	1.299.183											1.299.183
		62-waste water treatment	15	2	10.466.712	3	16.316.823	8	12.275.600					2	3.398.299					42.457.434
		63-water reuse, efficiency	5	1	2.997.710	3	25.768.873	1	1.421.443											30.188.026
		64-resource recovery	12	2	9.724.609	7	52.867.241	1	1.905.380							2	7.584.154			72.081.384
7	Water and energy	71-hydropower	2			1	1.994.370	1	1.534.488											3.528.858
		72-renewables	8	3	15.530.058	2	13.812.504	2	3.905.975							1	1.329.400			34.577.937
		73-efficiency	7	1	2.999.628	2	7.995.187			3	5.484.808					1	2.174.048			18.653.671
8	Water governance	81-policies	5	2	14.103.425					1	1.999.379			1	1.498.446	1	4.039.273			21.640.523
		82-innovation, economic, financing	4			1	4.158.735			3	5.368.140									9.526.875
		83-engagement, capacity building	3	1	3.747.938					1	2.289.000					1	3.335.400			9.372.338
		Total	255	64	300.224.355	74	452.643.718	52	76.552.451	12	22.660.358	5	30.338.415	23	46.318.096	24	75.216.789	1	3.989.644	1.007.943.826

NUMBER OF PROJECTS, EU CONTRIBUTION AND TOTAL COSTS PER YEAR AND TYPE OF ACTION

Year	Nr of Projects	EU grant (€)	Total costs (€)
2014	39	127.038.722	157.947.660
2015	49	191.213.830	232.771.157
2016	38	164.168.256	204.926.220
2017	40	148.651.844	184.670.174
2018	46	158.552.260	201.160.151
2019	43	218.318.914	253.822.566
Total	**255**	**1.007.943.826**	**1.235.297.928**

Type of Action	Nr of Projects	EU grant (€)	Total costs (€)
CSA	12	22.660.358	22.843.777
ERA-NET-Cofund	6	33.673.815	103.733.975
ERC	23	46.318.096	46.318.096
IA	74	452.643.718	548.898.386
MSCA	23	71.881.389	71.881.389
PCP	1	3.989.644	4.437.937
RIA	64	300.224.355	326.531.188
SME	52	76.552.451	110.653.180
Total	**255**	**1.007.943.826**	**1.235.297.928**

TYPE OF ACTIONS

CSA: Coordination and support action

ERA-NET–Cofund: Actions supporting public-public partnerships

ERC: European Research Council grant

IA: Innovation Action

MSCA: Marie Skłodowska Curie action

PCP: Pre-commercial procurement

RIA: Research and innovation action

SME: SME instrument – phase 2

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List of projects Horizon 2020 (period 2014-2019) relevant to Water research					
Project Number	**Project Acronym**	**Type of Action**	**Project Title**	**Theme**	**Page nr**
804673	sEElngDOM	ERC-STG	Ecological and Evolutionary Importance of Molecular Diversity in Dissolved Organic Matter	11	21
647570	ESTUARIES	ERC-COG	Estuaries shaped by biomorphodynamics, inherited landscape conditions and human interference	11	22
871128	eLTER PLUS	RIA	European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS	11	23
871081	AQUACOSM-plus	RIA	Network of Leading Ecosystem Scale Experimental AQUAtic MesoCOSM Facilities Connecting Rivers, Lakes, Estuaries and Oceans in Europe and beyond	11	24
869226	DRYvER	RIA	Securing biodiversity, functional integrity and ecosystem services in DRYing rivER networks	11	25
641939	HypoTRAIN	MSCA-ITN-ETN	Hyporheic Zone Processes – A training network for enhancing the understanding of complex physical, chemical and biological process interactions	11	26
730141	CyanoAlert	IA	Space Based Cyanobacteria Information & Services	12	27
722493	NaToxAq	MSCA-ITN-ETN	Natural Toxins and Drinking Water Quality - From Source to Tap	12	28
765553	EUROFLOW	MSCA-ITN-ETN	A EUROpean training and research network for environmental FLOW management in river basins	13	29
642317	AQUACROSS	RIA	Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies	13	30
642088	SWOS	RIA	Satellite-based Wetland Observation Service	13	31
787203	REALM	ERC-ADG	Re-inventing Ecosystem And Land-surface Models	21	32
773245	ISLAS	ERC-COG	Isotopic links to atmopheric water's sources	21	33
852115	EnTER	ERC-STG	Enhanced Mass Transport in Electrochemical Systems for Renewable Fuels and Clean Water	21	34
854088	MARIX	ERC-SyG	Methane and Ammonium Removal In redoX transition zones	21	35
648609	TWORAINS	ERC-COG	Winter Rain, Summer Rain: Adaptation, Climate Change, Resilience and the Indus Civilisation	21	36
647204	QUINCY	ERC-COG	Quantifying the effects of interacting nutrient cycles on terrestrial biosphere dynamics and their climate feedbacks	21	37
676819	CAT	ERC-STG	Climbing the Asian Water Tower	21	38
770999	DyNET	ERC-COG	Dynamical river NETworks: climatic controls and biogeochemical function	22	39
647035	STEEPclim	ERC-COG	Spatiotemporal evolution of the hydrological cycle throughout the European continent during past abrupt climate changes	22	40
689682	AMBER	RIA	Adaptive Management of Barriers in European Rivers	22	41
637010	EGSIEM	RIA	European Gravity Service for Improved Emergency Management	23	42
715254	DRY-2-DRY	ERC-STG	Do droughts self-propagate and self-intensify?	23	43
771678	HydroSocialExtremes	ERC-COG	Uncovering the Mutual Shaping of Hydrological Extremes and Society	23	44
641931	CENTAUR	IA	Cost Effective Neural Technique for Alleviation of Urban Flood Risk	23	45
641811	IMPREX	RIA	IMproving PRedictions and management of hydrological EXtremes	23	46
870353	G3P	RIA	Global Gravity-based Groundwater Product	24	47
814066	MARSoluT	MSCA-ITN-ETN	Managed Aquifer Recharge Solutions Training Network	24	48

641768	REGROUND	IA	Colloidal Iron Oxide Nanoparticles for the REclamation of Toxic Metal Contaminated GROUNDwater Aquifers, Drinking Water Wells, and River Bank Filtrations	24	49
642047	KINDRA	CSA	Knowledge Inventory for hydrogeology research	24	50
826312	GREENER	RIA	InteGRated systems for Effective ENvironmEntal Remediation	25	51
826244	ELECTRA	RIA	Electricity driven Low Energy and Chemical input Technology foR Accelerated bioremediation	25	52
641606	MISTRALE	IA	Monitoring of Soll moiSture and wateR-flooded Areas for agricuLture and Environment	25	53
783989	WATER4AGRI	SME-2	Securing water for food and safety with the world's most advanced soil moisture information derived from satellites	25	54
848537	WATERSIGN	SME-2	WATERSIGN: Smart Water Monitoring & Leakage Detection	31	55
834716	EARTH@LTERNATIVES	ERC-ADG	Sustainability, efficiency, equity and resilience of land and water use for global food and energy security: synergies and fundamental trade-offs	31	56
731996	SMART.MET	PCP	PCP for Water Smart Metering	31	57
862357	MIXED	RIA	Multi-actor and transdisciplinary development of efficient and resilient MIXED farming and agroforestry-systems	31	58
776692	WaterWorks2017	ERA-NET-Cofund	Water Works 2018-2022 in Support of the Water JPI (WaterWorks2017) and of the EC Call SC5-33-2017: Closing the water cycle gap	31	59
730254	EN-SUGI	ERA-NET-Cofund	Eranet Sustainable Urbanisation Global Initiative	31	60
806502	AccuWater	SME-2	High accuracy water leakage and apparent loss detection	31	61
778742	Propelair	SME-2	The refinement, miniaturisation and demonstration of an ultra low flush toilet capable of saving 2.8 billion litres of clean, potable water being unnecessarily wasted in Europe every day.	31	62
641715	WaterWorks2014	ERA-NET-Cofund	Water Works 2014-2019 in Support of the Water JPI	31	63
776816	Project O	IA	Project Ô: demonstration of planning and technology tools for a circular, integrated and symbiotic use of water	32	64
700174	RESCCUE	IA	RESCCUE - RESilience to cope with Climate Change in Urban arEas - a multisectorial approach focusing on water	32	65
647473	CWASI	ERC-COG	Coping with water scarcity in a globalized world	32	66
734409	Water4Cities	MSCA-RISE	Holistic Surface Water and Groundwater Management for Sustainable Cities	32	67
730482	CLARA	IA	Climate forecast enabled knowledge services	32	68
641739	BINGO	RIA	Bringing INnovation to onGOing water management – A better future under climate change	32	69
689150	SIM4NEXUS	RIA	Sustainable Integrated Management FOR the NEXUS of water-land-food-energy-climate for a resource-efficient Europe	32	70
642224	FREEWAT	CSA	FREE and open source software tools for WATer resource management	32	71
690268	DAFNE	RIA	DAFNE: Use of a Decision-Analytic Framework to explore the water-energy-food NExus in complex and trans-boundary water resources systems of fast growing developing countries.	32	72
870497	PrimeWater	RIA	Delivering Advanced Predictive Tools form Medium to Seasonal Range for Water Dependent Industries Exploiting the Cross-Cutting Potential of EO and Hydro-Ecological Modeling	33	73
870344	WaterSENSE	RIA	Making SENSE of the Water value chain with Copernicus Earth Observation, models and in-situ data	33	74
730109	DIANA	IA	Detection and Integrated Assessment of Non-authorised water Abstractions using EO	33	75
730066	EOMORES	IA	Earth Observation based services for Monitoring and Reporting of Ecological Status	33	76

730005	SPACE-O	IA	Space Assisted Water Quality Forecasting Platform for Optimized Decision Making in Water Supply Services	33	77
776348	CoastObs	IA	Commercial service platform for user-relevant coastal water monitoring services based on Earth observation	33	78
687289	Co-ReSyF	RIA	Coastal Waters Research Synergy Framework	33	79
870349	CERTO	RIA	Copernicus Evolution – Research for Transitional-water Observation	33	80
821036	Fiware4Water	IA	FIWARE for the Next Generation Internet Services for the WATER sector	33	81
820985	NAIADES	IA	A holistic water ecosystem for digitisation of urban water sector	33	82
820954	DWC	IA	DIGITAL-WATER.city - Leading urban water management to its digital future	33	83
820751	SCOREwater	IA	Smart City Observatories implement REsilient Water Management	33	84
776691	TWIGA	RIA	Transforming Weather Water data into value-added Information services for sustainable Growth in Africa	33	85
776480	MONOCLE	RIA	Multiscale Observation Networks for Optical monitoring of Coastal waters, Lakes and Estuaries	33	86
666490	AquaSHIELD	SME-2	Protecting citizens against intentional drinking water contamination with a water quality firewall	34	87
950822	Bio-LP-1	IA	A novel rapid environmental test for the human pathogen Legionella	34	88
820501	CoPs	IA	Continuous hazardous water Pollutants sensing in the environment	34	89
881495	ToxMate	SME-2	Continuous real-time monitoring of water toxicity	34	90
880886	H2OMon	SME-2	In-situ Total Nutrient Analyser System for Natural Waters	34	91
879757	CENSE	SME-2	Enabling the continuous monitoring of drinking water with an all-in-one sensor	34	92
859114	ColiSense Online	SME-2	Online and automated E. coli monitoring for 100% safe drinking water	34	93
849704	H2S Analyzer	SME-2	Market launch of an autonomous and online based hydrogen sulfide (H2S) Analyzer for the implementation of IIoT - digitalization of the sewer system	34	94
823552	CellCount	SME-2	CellCount – a revolutionary testing platform to solve current problems with microbiological contamination in water and food industries	34	95
822927	pHenom	SME-2	A cost effective, self-calibrating, low maintenance pH sensor for an integrated approach to monitoring sea and drinking water, facilitating improvements in ocean, animal and human health	34	96
822134	iMEC	SME-2	Real-time assessment of toxic sulphide in wastewater – market maturation of an Industrial Micro Electrochemical Cell	34	97
644852	PROTEUS	RIA	AdaPtive micROfluidic- and nano-enabled smart systems for waTEr qUality Sensing	34	98
825325	SARMENTI	RIA	Smart multisensor embedded and secure system for soil nutrient and gaseous emission monitoring	34	99
731778	WaterSpy	RIA	High sensitivity, portable photonic device for pervasive water quality analysis	34	100
731465	AQUARIUS	RIA	BROADBAND TUNABLE QCL BASED SENSOR FOR ONLINE AND INLINE DETECTION OF CONTAMINANTS IN WATER	34	101
813680	AQUASENSE	MSCA-ITN-ETN	Innovative Network for Training in wAter and Food QUality monitoring using Autonomous SENSors and IntelligEnt Data Gathering and Analysis	34	102
820881	LOTUS	RIA	LOw-cost innovative Technology for water quality monitoring and water resources management for Urban and rural water Systems in India	34	103
776825	MELOA	RIA	Multi-purpose/Multi-sensor Extra Light Oceanography Apparatus	34	104
775983	HYPERNETS	RIA	A new hyperspectral radiometer integrated in automated networks of water and land bidirectional reflectance measurements for satellite validation	34	105

787128	SYSTEM	IA	SYnergy of integrated Sensors and Technologies for urban sEcured environMent	34	106
726499	ULISENS	SME-2	Ultra Legionella Inmunoanalysis System for Early Sensing	34	107
766742	NanoScreen	SME-2	Disruptive portable device for pre-screening of Persistent Organic Pollutants –POPs- in food products and water	34	108
765262	MobiLab	SME-2	Development of a mobile device for the quick on-site measurement of soil nutrients	34	109
731695	SHEPHERD	SME-2	Energy-Efficient Activated Sludge Monitoring for Wastewater Treatment Plants	34	110
642356	CYTO-WATER	IA	Integrated and portable image cytometer for rapid response to Legionella and Escherichia coli in industrial and environmental waters	34	111
689341	INTCATCH	IA	Development and application of Novel, Integrated Tools for monitoring and managing Catchments	34	112
879961	STRATUS	SME-2	Replicating the rain process to provide a sustainable drinking water supply where most needed	41	113
873854	W2W - Water to Water	SME-2	The first off-grid water desalination system 100% powered by renewable energies	41	114
830150	TAPP X	SME-2	The world's first Sensor-Based Water Filter to Purify and Analyse Tap Water	41	115
714744	SAMBA	ERC-STG	Sustainable and Advanced Membranes By Aqueous Phase Separation	41	116
685793	MIDES	IA	Microbial Desalination for Low Energy Drinking Water	41	117
685579	REvivED water	IA	Low energy solution for drinking water production by a REvival of ElectroDialysis systems	41	118
720851	PROTECT	IA	Pre-commercial lines for production of surface nanostructured antimicrobial and anti-biofilm textiles, medical devices and water treatment membranes	41	119
821423	SPRING	RIA	STRATEGIC PLANNING FOR WATER RESOURCES AND IMPLEMENTATION OF NOVEL BIOTECHNICAL TREATMENT SOLUTIONS AND GOOD PRACTICES	41	120
711501	WATIFY	SME-2	Up-scaling, demonstration and first market application of Hydrokemos' patented technology as the most eco-efficient and cost-effective solution for nitrate polluted water treatment	41	121
783848	AMBROSIA	SME-2	Aquaporin-Inside™ Membranes for Brackish water Reverse Osmosis Application	41	122
739468	SunAqua18	SME-2	Sustainable Desalination System	41	123
642228	SUBSOL	IA	bringing coastal SUBsurface water SOLutions to the market	41	124
690378	FLOWERED	RIA	de-FLuoridation technologies for imprOving quality of WatEr and agRo-animal products along the East African Rift Valley in the context of aDaptation to climate change.	41	125
689925	SafeWaterAfrica	RIA	Self-Sustaining Cleaning Technology for Safe Water Supply and Management in Rural African Areas	41	126
688928	WATERSPOUTT	RIA	Water - Sustainable Point-Of-Use Treatment Technologies	41	127
869496	REWAISE	IA	REsilient WAter Innovation for Smart Economy	42	128
640422	GREENT	ERC-STG	Greenhouse Gas Mitigation through Advanced Nitrogen Removal Technology	42	129
686585	LIAR	RIA	Living Architecture	42	130
642904	TreatRec	MSCA-ITN-EID	Interdisciplinary concepts for municipal wastewater treatment and resource recovery. Tackling future challenges	42	131
812880	NOWELTIES	MSCA-ITN-EJD	Joint PhD Laboratory for New Materials and Inventive Water Treatment Technologies. Harnessing resources effectively through innovation	42	132
821427	Saraswati 2.0	RIA	Identifying best available technologies for decentralized wastewater treatment and resource recovery for India	42	133

821051	PAVITRA GANGA	RIA	Unlocking wastewater treatment, water re-use and resource recovery opportunities for urban and peri-urban areas in India	42	134
730283	GROW GREEN	IA	Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments	42	135
733718	INDALG	SME-2	Development of an innovative algae based tertiary wastewater treatment and value recovery system	42	136
767333	ALGAMATER	SME-2	Using microalgae bioreactor technology to deliver the world's most cost-effective, energy-efficient and adaptable system for the treatment of toxic industrial and landfill wastewater	42	137
642190	iMETland	IA	iMETland: A new generation of Microbial Electrochemical Wetland for effective decentralized wastewater treatment	42	138
641998	REMEB	IA	ECO-FRIENDLY CERAMIC MEMBRANE BIOREACTOR (MBR) BASED ON RECYCLED AGRICULTURAL AND INDUSTRIAL WASTES FOR WASTE WATER REUSE	42	139
641702	Eco-UV	IA	Low carbon footprint and eco-innovative UV water disinfection	42	140
689817	INNOQUA	IA	Innovative Ecological on-site Sanitation System for Water and Resource Savings	42	141
689450	AquaNES	IA	Demonstrating synergies in combined natural and engineered processes for water treatment systems	42	142
869283	WIDER UPTAKE	IA	Achieving wider uptake of water-smart solutions	43	143
776643	HYDROUSA	IA	Demonstration of water loops with innovative regenerative business models for the Mediterranean region	43	144
776541	NextGen	IA	Towards a next generation of water systems and services for the circular economy.	43	145
691402	RichWater	IA	First application and market introduction of combined wastewater treatment and reuse technology for agricultural purposes	43	146
818088	SuWaNu Europe	CSA	Network for effective knowledge transfer on safe and economic wastewater reuse in agriculture in Europe	43	147
821410	PAVITR	RIA	Potential and Validation of Sustainable Natural & Advance Technologies for Water & Wastewater Treatment, Monitoring and Safe Water Reuse in India	43	148
688320	MADFORWATER	RIA	DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries	43	149
823124	HTCycle	SME-2	Sewage sludge reuse with Phosphate recovery and heavy metal absorption with an innovative HTC technology.	44	150
760277	SSOP	IA	Sewage Sludge to Oil Process	44	151
711540	InnoPellet	SME-2	Self-supporting biofuel sludge pellet producing system for small and medium sized sewage plants	44	152
792021	SUSFERT	BBI-IA-DEMO	Sustainable multifunctional fertilizer – combining bio-coatings, probiotics and struvite for phosphorus and iron supply	45	153
837998	DEEP PURPLE	BBI-IA-DEMO	CONVERSION OF DILUTED MIXED URBAN BIO-WASTES INTO SUSTAINABLE MATERIALS AND PRODUCTS IN FLEXIBLE PURPLE PHOTOBIOREFINERIES	45	154
837583	B-FERST	BBI-IA-DEMO	Bio-based FERtilising products as the best practice for agricultural management SusTainability	45	155
668128	NewFert	BBI-RIA	Nutrient recovery from biobased Waste for Fertilizer production	45	156
727874	SABANA	IA	Sustainable Algae Biorefinery for Agriculture aNd Aquaculture	45	157
869474	WATER-MINING	IA	Next generation water-smart management systems: large scale demonstrations for a circular economy and society	45	158
869171	B-WaterSmart	IA	Accelerating Water Smartness in Coastal Europe	45	159
818308	WaysTUP!	IA	Value chains for disruptive transformation of urban biowaste into biobased products in the city context	45	160

817788	SCALIBUR	IA	SCALABLE TECHNOLOGIES FOR BIO-URBAN WASTE RECOVERY	45	161
863000	NOMAD	IA	Novel Organic recovery using Mobile ADvanced technology	45	162
730285	RUN4LIFE	IA	RECOVERY AND UTILIZATION OF NUTRIENTS 4 LOW IMPACT FERTILIZER	45	163
730349	RES URBIS	RIA	REsources from URban BIo-waSte	45	164
714080	SCARCE	ERC-STG	Sustainable Chemical Alternatives for Re-use in the Circular Economy	45	165
849841	REBOOT	ERC-STG	Resource efficient bio-chemical production and waste treatment	45	166
682444	E-motion	ERC-COG	Electro-motion for the sustainable recovery of high-value nutrients from waste water	45	167
676070	SuPER-W	MSCA-ITN-EJD	Sustainable Product, Energy and Resource Recovery from Wastewater	45	168
813438	P-TRAP	MSCA-ITN-ETN	Diffuse phosphorus input to surface waters - new concepts in removal, recycling and management (P-TRAP)	45	169
872053	RECYCLES	MSCA-RISE	Recovering carbon from contaminated matrices by exploiting the nitrogen and sulphur cycles	45	170
869703	SEA4VALUE	RIA	Development of radical innovations to recover minerals and metals from seawater desalination brines	45	171
684143	HTC4WASTE	SME-2	Up-scaling, demonstration and first market application of Loritus' patented hydrothermal carbonisation as an eco-efficient and cost-effective organic waste processing technology	45	172
783638	reNEW	SME-2	Sustainable cleaning agent and organic fertilizer recovery from sewage sludge	45	173
690323	SMART-Plant	IA	Scale-up of low-carbon footprint material recovery techniques in existing wastewater treatment plants	45	174
689242	INCOVER	IA	Innovative Eco-Technologies for Resource Recovery from Wastewater	45	175
740610	STOP-IT	IA	Strategic, Tactical, Operational Protection of water Infrastructure against cyber-physical Threats	46	176
756698	FITTOM	SME-2	PVC-O Fittings based on MOLECOR's Molecular Orientation TOM® technology	46	177
832876	aqua3S	IA	Enhancing Standardisation strategies to integrate innovative technologies for Safety and Security in existing water networks	46	178
689239	WADI	IA	WADI: Innovative Airborne Water Leak Detection Surveillance	46	179
774586	CLAIM	IA	Cleaning Litter by developing and Applying Innovative Methods in european seas	47	180
653626	microMole	IA	SEWAGE MONITORING SYSTEM FOR TRACKING SYNTHETIC DRUG LABORATORIES	47	181
675530	ANSWER	MSCA-ITN-ETN	ANtibioticS and mobile resistance elements in WastEwater Reuse applications: risks and innovative solutions	47	182
765860	AQUAlity	MSCA-ITN-ETN	Interdisciplinar cross-sectoral approach to effectively address the removal of contaminants of emerging concern from water	47	183
861369	InnovEOX	MSCA-ITN-ETN	Training of a new generation of researchers in Innovative Electrochemical OXidation processes for the removal and analysis of micro-pollutants in water streams	47	184
860775	MONPLAS	MSCA-ITN-ETN	The training of early stage researchers for the development of technologies to monitor concentrations of micro and nanoplastics in water for their presence, uptake and threat to animal and human life.	47	185
860720	LimnoPlast	MSCA-ITN-ETN	Microplastics in Europe's freshwater ecosystems: From sources to solutions	47	186
820718	PANI WATER	RIA	Photo-irradiation and Adsorption based Novel Innovations for Water-treatment	47	187
869178	AquaticPollutants	ERA-NET-Cofund	Risks posed to human health and the environment by pollutants and pathogens present in water ressources	47	188

804453	PFS	SME-2	A cost- energy-efficient treatment technology to remove pharmaceutical pollutants from water	47	189
883484	PathoCERT	RIA	Pathogen Contamination Emergency Response Technologies	47	190
873723	AQUA4D	SME-2	AQUA4D, for an efficient use of irrigation water	51	191
727247	SolACE	RIA	Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use	51	192
633945	FATIMA	RIA	FArming Tools for external nutrient Inputs and water MAnagement	51	193
862756	OPTAIN	RIA	OPtimal strategies to retAIN and re-use water and nutrients in small agricultural catchments across different soil-climatic regions in Europe	51	194
858375	WATERAGRI	RIA	WATER RETENTION AND NUTRIENT RECYCLING IN SOILS AND STREAMS FOR IMPROVED AGRICULTURAL PRODUCTION	51	195
773649	Circular Agronomics	RIA	CIRCULAR AGRONOMICS - Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System and related up- and down-stream processes to mitigate emissions	51	196
773903	SHui	RIA	Soil Hydrology research platform underpinning innovation to manage water scarcity in European and Chinese cropping systems	51	197
689271	WaterWorks2015	ERA-NET-Cofund	Water Works 2016-2020 in Support of the Water JPI (WaterWorks2015) - Sustainable water use in agriculture, to increase water use efficiency and reduce soil and water pollution	51	198
870518	COALA	RIA	COpernicus Applications and services for Low impact agriculture in Australia	52	199
873862	Plan2fix	SME-2	Nitrogen-enriched plasma activated water, an unparalleled plant feeding system	52	200
850054	RAINOLVE	SME-2	Accurate irrigation controller with multi-sensoring and interactive cloud-based platform to evaluate real plant needs and save up to 80% of water	52	201
848361	StemSense	SME-2	A precise irrigation monitoring system to provide an accurate measurement of water status in crops	52	202
777112	SWAMP	RIA	Smart Water Management Platform	52	203
823965	ACCWA	MSCA-RISE	Accounting for Climate Change in Water and Agriculture management	52	204
793325	Green-DROP	SME-2	Precise subarea specific irrigation and fertilization system	52	205
784689	HyPump	SME-2	Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals	52	206
767568	HPGen	SME-2	On-site Hydrogen Peroxide Generator for effective, safe and sustainable irrigation water treatment	52	207
642258	MOSES	IA	Managing crOp water Saving with Enterprise Services	52	208
640771	MASLOWATEN	IA	MArket uptake of an innovative irrigation Solution based on LOW WATer-ENergy consumption	52	209
689687	FERTINNOWA	CSA	Transfer of INNOvative techniques for sustainable WAter use in FERtigated crops	52	210
675120	INSPIRATION	MSCA-ITN-ETN	Managing soil and groundwater impacts from agriculture for sustainable intensification	53	211
727984	FAirWAY	RIA	Farm systems that produce good Water quality for drinking water supplies	53	212
727450	WATERPROTECT	RIA	Innovative tools enabling drinking WATER PROTECTion in rural and urban environments	53	213
811908	ULTRAWAT	SME-2	Ultrapure Water Technology - nanoparticle free water for the advanced nanoelectronics industry enabling further miniaturization of electronic devices	61	214
698374	H2AD-aFDPI	SME-2	H2AD - Innovative and scalable biotechnology using Microbial Fuel Cell and Anaerobic Digestion for the treatment of micro-scale industrial and agriculture effluents to recover energy from waste	62	215
945638	RIBATI	SME-2b	Radically innovative bacterial treatment for recalcitrant industrial wastewater	62	216

858805	ANAERGY	SME-2	Advanced Multistage Sequential Wastewater Treatment Technology	62	217
714177	ELECTRON4WATER	ERC-STG	Three-dimensional nanoelectrochemical systems based on low-cost reduced graphene oxide: the next generation of water treatment systems	62	218
771567	CABUM	ERC-COG	An investigation of the mechanisms at the interaction between cavitation bubbles and contaminants	62	219
820906	INDIA-H2O	RIA	bIo-mimetic and phyto-techNologies DesIgned for low-cost purficAtion and recycling of water	62	220
730480	ITERAMS	RIA	Integrated mineral technologies for more sustainable raw material supply	62	221
672550	iPURXL	SME-2	iPURXL: Scale-Up of Liquid Nano-reactor for the Destruction of Contaminants in Turbid Fluids	62	222
719201	CleanOil	SME-2	Global business challenge: Breaking the oilgas water dependency with a cost-effective no-waste nanomembrane technology for water reuse	62	223
718212	Lt-AD	SME-2	Low-temperature Anaerobic Digestion treatment of low-strength wastewaters	62	224
805997	CGM	SME-2	A next generation nano media tailored to capture and recycle hazardous micropollutants in contaminated industrial wastewater.	62	225
756288	IV-BWTS	SME-2	In-Voyage Ballast Water Treatment System	62	226
642494	ECWRTI	IA	ECOLORO: Reuse of Waste Water from the Textile Industry	62	227
689785	SALTGAE	IA	Demonstration project to prove the techno-economic feasibility of using algae to treat saline wastewater from the food industry.	62	228
688989	INTEGROIL	IA	Demonstration of a Decision Support System for a Novel Integrated Solution aimed at Water Reuse in the Oil & Gas Industry	62	229
869318	ULTIMATE	IA	ULTIMATE: indUstry water-utiLiTy symbIosis for a sMarter wATer society	63	230
698494	ELOXIRAS	SME-2	Electrochemical Oxidation in the Recirculating Aquaculture Systems Industry	63	231
723702	INSPIREWater	IA	Innovative Solutions in the Process Industry for next generation Resource Efficient Water management	63	232
723577	SPOTVIEW	IA	Sustainable Processes and Optimized Technologies for Industrially Efficient Water Usage	63	233
689427	VicInAqua	RIA	Integrated aquaculture based on sustainable water recirculating system for the Victoria Lake Basin	63	234
838120	INGREEN	BBI-IA-DEMO	Production of functional innovative ingredients from paper and agro-food side-streams through sustainable and efficient tailor-made biotechnological processes for food, feed, pharma and cosmetics	64	235
745737	AFTERLIFE	BBI-RIA	Advanced Filtration TEchnologies for the Recovery and Later conversIon of relevant Fractions from wastEwater	64	236
862849	FERTIMANURE	IA	Innovative nutrient recovery from secondary sources – Production of high-added value FERTIlisers from animal MANURE	64	237
730400	SYSTEMIC	IA	Systemic large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe	64	238
730390	ZERO BRINE	IA	Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries	64	239
730398	Water2REturn	IA	REcovery and REcycling of nutrients TURNing wasteWATER into added-value products for a circular economy in agriculture	64	240
858378	EPSETECH	SME-2	From Hazardous Waste to Reusable Raw Materials	64	241
814258	REFLOW	MSCA-ITN-ETN	Phosphorus REcovery for FertiLisers frOm dairy processing Waste	64	242
860127	FertiCycle	MSCA-ITN-ETN	New bio-based fertilisers from organic waste upcycling	64	243

869467	SEArcularMINE	RIA	Circular Processing of Seawater Brines from Saltworks for Recovery of Valuable Raw Materials	64	244
723729	ReWaCEM	IA	Ressource recovery from industrial waste water by cutting edge membrane technologies	64	245
637077	PRODIAS	IA	PROcessing Diluted Aqueous Systems	64	246
870504	HYPOS	IA	HYdro-POwer-Suite	71	247
879255	HyKinetics	SME-2	An innovative axial turbine for conversion of hydro-kinetics energy to electricity in rivers and canals	71	248
723930	LOWUP	RIA	LOW valued energy sources UPgrading for buildings and industry uses	72	249
831041	W2EW	IA	New combined solution to harness wave energy full renewable potential for sustainable electricity and fresh water production	72	250
850275	HORIZON	SME-2	Redefining solar technology with RETRACTABLE SOLAR POWER FOLDING ROOFS. Unlocking photovoltaics for waste water treatment plants towards self-sufficient plants.	72	251
654479	WASCOP	RIA	Water Saving for Solar Concentrated Power	72	252
654443	MinWaterCSP	RIA	MinWaterCSP - Minimized water consumption in CSP plants	72	253
792103	SOLWARIS	IA	Solving Water Issues for CSP Plants	72	254
823948	REMIND	MSCA-RISE	Renewable Energies for Water Treatment and REuse in Mining Industries	72	255
698688	WATLY	SME-2	An autonomous and mobile water treatment plant powered by solar energy	72	256
767429	ReUseHeat	IA	Recovery of Urban Excess Heat	73	257
649819	ENERWATER	CSA	Standard method and online tool for assessing and improving the energy efficiency of wastewater treatment plants	73	258
696112	EnergyWater	CSA	Improving energy efficiency in industrial water processes through benchmarking and benchlearning tools in Europe manufacturing industry.	73	259
695820	WaterWatt	CSA	Improvement of energy efficiency in industrial water circuits using gamification for online self-assessment, benchmarking and economic decision support	73	260
801229	HARMoNIC	RIA	HierARchical Multiscale NanoInterfaces for enhanced Condensation processes	73	261
812574	REWATERGY	MSCA-ITN-EID	Sustainable Reactor Engineering for Applications on the Water-Energy Nexus	73	262
641661	POWERSTEP	IA	Full scale demonstration of energy positive sewage treatment plant concepts towards market penetration	73	263
804003	RIVERS	ERC-STG	Water/human rights beyond the human? Indigenous water ontologies, plurilegal encounters and interlegal translation	81	264
869550	DOWN2EARTH	RIA	DOWN2EARTH: Translation of climate information into multilevel decision support for social adaptation, policy development, and resilience to water scarcity in the Horn of Africa Drylands	81	265
861509	NEWAVE	MSCA-ITN-ETN	Next Water Governance	81	266
724060	4PRIMA	CSA	Partnership for Research and Innovation in the Mediterranean Area	81	267
689669	MAGIC	RIA	Moving Towards Adaptive Governance in Complexity: Informing Nexus Security	81	268
691554	NEPTUNE	IA	New cross sEctorial value chains creation across EuroPe faciliTated by clUsters for SMEs's INnovation in BluE Growth	82	269
642423	WIDEST	CSA	Water Innovation through Dissemination Exploitation of Smart Technologies	82	270
642433	PIANO	CSA	Policies, Innovation And Networks for enhancing Opportunities for China Europe Water Cooperation	82	271
689162	AfriAlliance	CSA	Africa-EU Innovation Alliance for Water and Climate	82	272

687809	POWER	RIA	Political and sOcial awareness on Water EnviRonmental challenges	83	273
665874	WaterSEED	MSCA-COFUND-DP	Social, entrepreneurial and excelling doctors for water technology	83	274
730264	IC4WATER	CSA	Tackling Water Challenges in the International Context	83	275

sEEIngDOM		804673
Title: Ecological and Evolutionary Importance of Molecular Diversity in Dissolved Organic Matter		
Call Id: ERC-2018-STG	Topic: **ERC-2018-STG**	Type of Action: **ERC-STG**
Project start date: 2/1/2019	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.499.169	EU requested grant: **€1.499.169**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords: *lakes, limnology, biodiversity, ecosystem functioning, geochemistry, species interactions, environmental biology, carbon cycling, organic matter, biogeography, metabolomics, metagenomics*

Abstract:

Dissolved organic matter (DOM) is central to the functioning of freshwater ecosystems that support life on Earth. For example, DOM has a major role in global carbon (C) cycling by helping to bury four times more C in the bottom of lakes and rivers than across all of the world's oceans. DOM also majorly influences the growth of aquatic organisms and impedes drinking water treatment for millions of people, such as by increasing microbial growth. Yet, despite its importance, DOM remains poorly understood because it has been measured with little resolution for nearly 200 years. Recent technological advances have now shown that a handful of lake water can contain thousands of different molecules of varying origin and composition. But the role of all these different molecules in aquatic ecosystems largely remains a mystery.

This project will discover the importance of the tremendous diversity of molecules – termed chemodiversity – found in DOM for lake functioning and human wellbeing. It will do so by combining cutting-edge techniques in analytical chemistry, genomics, and statistical modelling with careful lab-based studies, proven field experiments, and large-scale observational surveys. By thinking about species of molecules as we would species of organisms, this project will draw upon rich theory and methods developed for the study of biodiversity. The work will allow us to learn how variation in chemodiversity across lakes is driven by associations with different microbes and how these microbes reciprocally adapt and evolve to different DOM. In the process, we will improve predictions of how important functions and services provided by lakes, such as C cycling and drinking water, vary with chemodiversity. An exciting application of this work is to improve emerging technologies for water purification by identifying microbial consortia that can consume chemodiversity and make water clearer.

ESTUARIES		647570
Title: Estuaries shaped by biomorphodynamics, inherited landscape conditions and human interference		
Call Id: ERC-2014-CoG	Topic: **ERC-CoG-2014**	Type of Action: **ERC-COG**
Project start date: 12/1/2015	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €2.000.000	EU requested grant: **€2.000.000**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords: *estuaries, tidal bars, shoals, freshwater tidal marshes, riparian vegetation, Holocene, sea level rise, scale experiments, analogue modelling, numerical modelling, paleogeographical reconstruction*

Abstract:

ESTUARIES are shallow coastal water bodies with river inflow shaped by biomorphological processes, with patterns of channels and shoals, sand/mud flats, tidal marshes, vegetated banks and peat. Development was influenced by early Holocene landscape that drowned under sealevel rise, and by human interference.

Estuaries harbour highly productive natural habitats and are of pivotal economic importance for food production, access to harbours and urban safety. Accelerating sealevel rise, changing river discharge and interference threaten these functions, but we lack fundamental understanding and models to predict combined effects of biomorphological interactions, inherited landscape and changing drivers.

We do not understand to what extent present estuary planform shape and shoal patterns resulted from biomorphological processes interacting with inherited conditions and interference. Ecology suggests dominant effects of flow-resisting and sediment de/stabilising eco-engineering species. Yet abiotic physics-based models reproduce channel-shoal patterns surprisingly well, but must assume a fixed planform estuary shape. Holocene reconstructions emphasise inherited landscape- and agricultural effects on this planform shape, yet fossil shells and peat also imply eco-engineering effects.

My aims are to develop models for large-scale planform shape and size of sandy estuaries and predict past and future, large-scale effects of biomorphological interactions and inherited conditions.

We will significantly advance our understanding by our state-of-the-art eco-morphological model, my unique analogue landscape models with eco-engineers and a new, automated paleogeographic reconstruction of 10 data-rich Holocene estuaries on the south-east North Sea coast. We will systematically compare these to modelled scenarios with biomorphological processes, historic interference and inherited valley geometry and substrate. Outcomes will benefit ecology, archeology, oceanography and engineering

eLTER PLUS		871128
Title: European long-term ecosystem, critical zone and socio-ecological systems research infrastructure PLUS		
Call Id: H2020-INFRAIA-2019-1	Topic: **INFRAIA-01-2018-2019**	Type of Action: **RIA**
Project start date: 2/1/2020	Duration: **60 months**	Unit: **RTD/G/03**
Total costs: €10.065.009	EU requested grant: **€9.999.990**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords:

Abstract:

Progress in understanding, managing and securing current and future ecosystem functions and services is challenged by fragmented and dispersed ecosystem research, operated using narrow disciplinary perspectives that prevent a holistic understanding of complex eco- and socio-ecological systems. The emerging European Long-Term Ecosystem, critical zone and socio-ecological systems Research Infrastructure (eLTER RI) was evaluated by the European Strategy Forum on Research Infrastructures (ESFRI) as having high potential for closing this gap in the European RI landscape.

The primary objective of eLTER PLUS is to open and expand the research capacities and impact of eLTER by engaging current and new users and developing the operations of cross- and transdisciplinary research, exemplified in eLTER Site and Platform design and the RI's Standard Observation framework. eLTER PLUS will execute a performance test of the emerging RI and assess and strengthen its operations in real time. It will further advance community building and provisioning of services as pursued by the H2020-funded eLTER INFRAIA Starting Community project and related projects. Its focus is on making intensive use of 35 selected sites and platforms in terrestrial, freshwater and coastal ecosystems, combined with observational data from an additional 50 sites, for studying ecosystem and socio-ecological responses to globally-relevant environmental challenges in terms of ecosystem integrity and ecosystem services. Its Whole-Systems approach will derive meaningful scientific and policy-relevant information via co-designed, transdisciplinary research in collaboration with diverse stakeholders at local, regional and EU-scales. Concerted actions also focus on collaboration with peer RIs to maximize synergies, increase efficiencies and catalyze holistic understanding of ecosystem function, and on development of virtual laboratories where in-situ site data are linked with other data sources, e.g. Copernicus.

AQUACOSM-plus		871081
Title: Network of Leading Ecosystem Scale Experimental AQUAtic MesoCOSM Facilities Connecting Rivers, Lakes, Estuaries and Oceans in Europe and beyond		
Call Id: H2020-INFRAIA-2019-1	Topic: **INFRAIA-01-2018-2019**	Type of Action: **RIA**
Project start date: 4/1/2020	Duration: **48 months**	Unit: **RTD/G/03**
Total costs: €9.999.565	EU requested grant: **€9.999.563**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords:

Abstract:

AQUACOSM-plus advances European mesocosm-based aquatic RI by integrating the leading mesocosm infrastructures into a coherent, interdisciplinary, and interoperable network covering all ecoregions of Europe. AQUACOSM-plus widens the user base by extending TA provision (> 13000 person-days), and strengthening the offered services, with 10 new partners, including a NGO and doubling of SMEs. We initiate actions to increase competence in mesocosm science in new EU member states (Hungary and Romania), and emphasize training of young scientists through summer schools covering various disciplines including effective science communication. AQUACOSM-plus develops near-real-time Open Data flows and improved metadata, thus promoting Open Mesocosm Science in collaboration with leading EU-supported initiatives in the EOSC and fosters wider sharing of information, knowledge, and technologies across fields and between academia, industry, and policy makers/advisers.

AQUACOSM-plus develops new technological capabilities for mesocosm research, to effectively execute scenario-testing for Climate Change -related pressures on aquatic systems from upstream fresh waters to the sea. These developments include mobile large-scale mesocosm approaches, leading-edge imaging technologies, and affordable methods to obtain high-frequency data on community change and greenhouse gas fluxes in mesocosm settings.

AQUACOSM-plus will progress beyond current achievements by actively pursuing RI-RI collaboration with European environmental RIs (LTER, ICOS, DANUBIUS, JERICO) at all project activity levels (NA, JRA, TA). Multidisciplinary joint research, combining observational data and modelling approaches with targeted mesocosm experiments, is a key step towards successfully tackling current and future Grand Challenges. This involves shared capacity building via symposia, expert summits, and open workshops, with the aim of co-designing future aquatic research actions and their RI demands.

DRYvER		869226
Title: Securing biodiversity, functional integrity and ecosystem services in DRYing rivER networks		
Call Id: H2020-LC-CLA-2019-2	Topic: **LC-CLA-06-2019**	Type of Action: **RIA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €6.732.609	EU requested grant: **€6.703.359**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords: *Biodiversity; Climate Change; Ecosystem Functions and Services; Drying River Networks; Metaecosystems; Adaptive Management; Conservation biology; natural capital;socio-ecological systems*

Abstract:

River networks are among Earth's most threatened hot-spots of biodiversity and provide key ecosystem services (e.g. supply drinking water and food, climate regulation) essential to sustaining human well-being. Climate change and increased human water use are causing more rivers and streams to dry, with devastating impacts on biodiversity and ecosystem services. Currently, over half the global river network consist of drying channels and these are expanding dramatically. However, drying river networks (DRNs) have received little attention from scientists and policy makers, and the public is unaware of their importance. Consequently, there is no effective integrated biodiversity conservation or ecosystem management strategy of DRNs facing climate change.

A multidisciplinary team of 25 experts from 11 countries in Europe, South America, China and the USA will build on EU efforts to investigate how climate change, through changes in flow regimes and water use, has cascading impacts on biodiversity, ecosystem functions and ecosystem services of DRNs. DRYvER (DRYing riVER networks) will gather and upscale empirical and modelling data from nine focal DRNs (case studies) in the EU and CELAC to develop a meta-system framework applicable to Europe and worldwide. It will also generate crucial knowledge-based strategies, tools and guidelines for cost-effective adaptive management of DRNs. Working closely with stakeholders and end-users, DRYvER will co-develop strategies to mitigate and adapt to climate change effects in DRNs, integrating hydrological, ecological (including nature-based solutions), socio-economic and policy perspectives. The end results of DRYvER will contribute to reaching the objectives of the Paris Agreement and place Europe at the forefront of research on climate change.

HypoTRAIN		641939
Title: Hyporheic Zone Processes – A training network for enhancing the understanding of complex physical, chemical and biological process interactions		
Call Id: H2020-MSCA-ITN-2014	Topic: **MSCA-ITN-2014-ETN**	Type of Action: **MSCA-ITN-ETN**
Project start date: 1/1/2015	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.090.952	EU requested grant: **€3.090.952**	
Main thematic area: 11 - Freshwater - aquatic ecosystems / functioning		

Free keywords: *hyporheic zone, rivers, groundwater-surface water interaction, emerging pollutants, resilience, ecohydrology, biogeochemical processes, stream productivity, river restoration,river management*

Abstract:

Hyporheic zones (HZs) are key compartments for the functioning of aquatic ecosystems. As dynamic and complex transition regions between rivers and aquifers, they are characterized by the simultaneous occurrence of multiple physical, biological and chemical processes. Turnover and degradation of nutrients and pollutants figure among the prominent ecological services the HZ provides. We are facing a significant knowledge gap in the understanding of how hyporheic processes are linked and how they impact on each other. This can be attributed to a lack of truly supra-disciplinary research and harmonized and innovative investigation methods.

The concept of HypoTRAIN has been tailored to fill this gap. Collaborative research with state-of-the art technologies from multiple disciplines (hydrology, ecology, microbiology, engineering, environmental physics, contaminant science, modelling) will generate new mechanistic insights into the functioning of HZs. A group of ESRs will be educated using the multi-faceted nature of HZs as the central theme of the training programme. The supra-disciplinary expertise within the network and the high-level training program will generate scientific knowledge that will set the ground for a more holistic design of river management plans and restoration measures. Research excellence as well as scientific and technological innovation is ensured as all partners have world-leading reputations and work at the forefront of their respective discipline areas.

Participating in HypoTRAIN will make ESRs highly attractive for employers and open up doors for their successful careers in research, regulation, consulting, and industry. They will be experts for the better assessment of the ecological and chemical status of surface waters and for providing successful river restoration and management strategies. The strong involvement of the non-academic sector will provide the ESRs with a holistic perspective on career opportunities.

CyanoAlert		730141
Title: Space Based Cyanobacteria Information & Services		
Call Id: H2020-EO-2016	Topic: **EO-1-2016**	Type of Action: **IA**
Project start date: 11/1/2016	Duration: **40 months**	Unit: **REA/B/01**
Total costs: €1.630.021	EU requested grant: **€1.040.484**	
Main thematic area: 12 - Freshwater - aquatic ecosystems / quality		

Free keywords: *cyanobacteria; water quality; eutrophication; information services*

Abstract:

CyanoAlert will be a global service for the environmental authorities and commercial sector, concerned by health risks and quality of water resources. The proposed project will deliver a fully automated application for assessing toxin producing cyanobacteria blooms in water resources globally, using ground-breaking Copernicus Earth Observation technology. The service foresees a dual dissemination system that provides user-specific information for monitoring and reporting purposes to customers, and a free and open information service for the public based on mobile telecommunication. South African and European SMEs will partner with users in the environmental authority and commercial sector, in order to establish a sustainable supply chain, based on a sound business model, to bring this innovative service to market.

NaToxAq		722493
Title: Natural Toxins and Drinking Water Quality - From Source to Tap		
Call Id: H2020-MSCA-ITN-2016	Topic: **MSCA-ITN-2016**	Type of Action: **MSCA-ITN-ETN**
Project start date: 1/1/2017	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.976.834	EU requested grant: **€3.976.834**	
Main thematic area: 12 - Freshwater - aquatic ecosystems / quality		

Free keywords: *Natural toxins, Drinking Water, Water Supply, Water treatment, Emerging Contaminants, Hydrological Modelling, Exposure Modelling, Environmental Fate studies, Risk Assessment*

Abstract:

Clean drinking water is crucial to human health and wellbeing. The ambition of the NaToxAq ETN network is to expand the research basis for EU's leading role in securing high quality drinking waters for its citizens. Focus is on natural toxins – a large group of emerging contaminants with unknown impact on drinking water resources. Both known toxins, like cyanotoxins, cyanogenic glucosides and terpenes and not yet explored toxins will be investigated. Twenty leading universities, research institutions, and water enterprises will pioneer the field through joint training of 15 ESRs investigating natural toxin emission via water reservoirs to water works and consumers. The natural toxin challenge is addressed by the concerted work of the ESRs within 4 scientific work packages comprising origin, distribution, fate and remediation. Priority toxins are selected using in silico approaches accompanied by novel non-targeted and targeted analyses to map natural toxins along vegetation and climatic gradients in Europe. Invasion of alien species, toxin emission, leaching and dissipation will be under strong influence of climate change. Data collected for toxin emission, properties and fate will be used to model effects of climate, land use, and design of remediation actions. Special attention will be paid to toxin removal at water works including development of new technologies tailored to remove natural toxins. The results will contribute to strengthening of European policies and regulation of drinking water, while new business opportunities within the fields of water supply and treatment, chemical monitoring and sensing, and the consulting sector will arise from academia-indstry collaborations. The urgency of the challenge, its eminent knowledge gaps, its multifaceted and multidisciplinary nature, and the need for scientific and public awareness to be communicated by ESRs in a balanced way makes the topic ideal for a European mobility and training network.

EUROFLOW		**765553**
Title: A EUROpean training and research network for environmental FLOW management in river basins		
Call Id: H2020-MSCA-ITN-2017	Topic: **MSCA-ITN-2017**	Type of Action: **MSCA-ITN-ETN**
Project start date: 9/1/2017	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.923.989	EU requested grant: **€3.923.989**	
Main thematic area: 13 - Freshwater - aquatic ecosystems / services		

Free keywords: *Reservoir, flood, low flow, river, abstraction, water quality, freshwater biology*

Abstract:

A EUROpean training and research network for environmental FLOW management in river basins.

The regulation of river flows is one of the biggest stressors affecting river ecosystems across the world. In many westernised countries, major legislative efforts are therefore underpinning the development of new approaches to mitigate the impacts of river flow regulation (e.g. EU WFD, US Clean Water Act, South Africa National Water Act, Australian Water Resources Act). These approaches are based on optimising the management of river flows to maintain services to humans (e.g. water supply, hydropower) whilst protecting and/or rejuvenating the aquatic environment with water of adequate quantity and quality in space and time (i.e. environmental flows, aka e-flows). In this context, a field of applied aquatic science has developed to generate the evidence base for identifying the best ways to manage the quantity, quality and patterns of e-flows to sustain river ecosystems. EUROFLOW will train a new cohort of researchers to be future leaders in this field.

AQUACROSS		642317
Title: Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies		
Call Id: H2020-SC5-2014-two-stage	Topic: **SC5-06-2014**	Type of Action: **RIA**
Project start date: 6/1/2015	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €6.913.116	EU requested grant: **€6.343.614**	
Main thematic area: 13 - Freshwater - aquatic ecosystems / services		

Free keywords: *Freshwater, Coastal, Marine, Ecosystems; Resilience; Social-ecological modelling; EU 2020 Biodiversity Strategy; Innovation; Social learning; Stakeholder engagement*

Abstract:

AQUACROSS aims to support EU efforts to enhance the resilience and stop the loss of biodiversity of aquatic ecosystems as well as to ensure the ongoing and future provision of aquatic ecosystem services. It focuses on advancing the knowledge base and application of the ecosystem-based management concept for aquatic ecosystems by developing cost effective measures and integrated management practices. AQUACROSS considers the EU policy framework (i.e. goals, concepts, time frames) for aquatic ecosystems and builds on knowledge stemming from different sources (i.e. WISE, BISE, Member State reporting, modelling) to develop innovative management tools, concepts, and business models (i.e. indicators, maps, ecosystem assessments, participatory approaches, mechanisms for promoting the delivery of ecosystem services) for aquatic ecosystems at various scales. It thereby provides an unprecedented effort to unify policy concepts, knowledge, and management concepts of freshwater, coastal, and marine ecosystems to support the cost-effective achievement of the targets set out by the EU 2020 Biodiversity Strategy.

SWOS		642088
Title: Satellite-based Wetland Observation Service		
Call Id: H2020-SC5-2014-two-stage	Topic: **SC5-16-2014**	Type of Action: **RIA**
Project start date: 6/1/2015	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €4.979.189	EU requested grant: **€4.979.189**	
Main thematic area: 13 - Freshwater - aquatic ecosystems / services		

Free keywords: *Wetlands, ecosystem service, biodiversity, MAES, policy implementation, GEOSS, users are partners, multi-scale monitoring, indicators, Sentinel satellite data, Service Portal, SW toolbox*

Abstract:

The objective of the project SWOS is to develop a monitoring and information service focussing on wetland ecosystems.

Globally wetlands are the ecosystems with the highest rate of loss. This is alarming, considering their significance as biodiversity hotspots and ecosystems with a central role in the water cycle, including improving water quality and reducing water scarcity, in climate regulation and the economic benefit gained from using their services.

A key limitation to their more effective conservation, sustainable management and restoration is the missing knowledge underpinning the application of European policy by Member States. Under the Biodiversity Strategy, Member States have recently committed to the mapping and assessment of ecosystem services (MAES); this provides a key instrument for an improved integration of wetlands in policy.

SWOS will take full advantage of the Sentinel satellites and integrate results from the ESA Globwetland projects. Status maps and indicators, as well as near real-time observations will allow the assessment of biodiversity and the monitoring of dynamic changes in an unmatched temporal and spatial resolution.

The Service Portal will allow the integration and web-based analysis of new maps and in-situ measurements and provide a unique entry point to locate, access and connect existing information and databases. It follows a GEOSS compatible data-broker approach and adopts international standards.

SWOS contributes to establishing a Global Wetland Observing System, as requested by Ramsar, it will facilitate local and EU monitoring tasks and input into international reporting obligations. SWOS will position Europe in a leading role for wetland activities within the GEO ecosystem, biodiversity, water, land cover tasks. The direct involvement of users working at different scales and support of key user organizations ensures the usability and acceptance of the service, the harmonization with related activities and a long-term impact.

REALM		787203
Title: Re-inventing Ecosystem And Land-surface Models		
Call Id: ERC-2017-ADG	Topic: **ERC-2017-ADG**	Type of Action: **ERC-ADG**
Project start date: 10/1/2018	Duration: **60 months**	Unit: **ERCEA/C/03**
Total costs: €2.499.615	EU requested grant: **€2.499.615**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords: *Dynamic global vegetation model,Earth system model,Plant functional traits,Optimality,Carbon cycle,Acclimation,Ecohydrology,Land surface model,Primary production,Biome distributions,Carbon allocation*

Abstract:

Terrestrial ecosystems respond to changes in climate and the atmospheric environment, which they in turn help to regulate. As global change has become an international concern, high expectations have been laid on Earth system models with embedded ecosystem and biophysical land-surface components to deliver reliable, quantitative predictions of large-scale changes in ecosystems and their feedbacks to the climate system. But the lack of established quantitative theory for many fundamental processes – such as the long-term effects of temperature on primary production and carbon allocation, the sustainability and nutrient requirements of CO2 'fertilization', and the regulation of green vegetation cover and its water use – has made such expectations impossible to fulfil. As a result, numerical models of land ecosystem processes continue stubbornly to disagree both with one another, and with benchmark data sets.

This impasse can be overcome, but not without re-thinking modelling practice. Theory must be re-instated as the required link between observations and models. Multidisciplinary data resources now available should be used far more extensively and creatively. Observational and experimental results should be integral to model development, not merely used for 'end-of-pipe' testing of complex, poorly constrained models. I propose to develop a comprehensive, next-generation vegetation model using eco-evolutionary optimality hypotheses to generate testable predictions, and multiple data sources to provide tests. Initial results have demonstrated the remarkable power of this 'strong inference' approach to explain patterns seen in nature. The project will transform the practice of global vegetation and land-surface modelling and in doing so, establish the foundations of a more robust, quantitative understanding of the role of terrestrial ecosystems in Earth System dynamics.

ISLAS		773245
Title: Isotopic links to atmopheric water's sources		
Call Id: ERC-2017-COG	Topic: **ERC-2017-COG**	Type of Action: **ERC-COG**
Project start date: 8/1/2018	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.999.054	EU requested grant: **€1.999.054**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords: *Atmospheric water cycle*

Abstract:

The hydrological cycle, with its feedbacks related to water vapour and clouds, is the largest source of uncertainty in weather prediction and climate models. Particularly processes that occur on scales smaller than the model grid lead to errors, which can compensate one another, making them difficult to detect and correct for. Undetectable compensating errors critically limit the understanding of hydrological extremes, the response of the water cycle to a changing climate, and the interpretation of paleoclimate records. Stable water isotopes have a unique potential to serve as the needed constraints, as they provide measures of moisture origin and of the phase change history. We have recently spearheaded a revised view of the atmospheric water cycle, which highlights the importance of connections on a regional scale. This implies that in some areas, all relevant processes can be studied on a regional scale. The Nordic Seas are an ideal case of such a natural laboratory, with distinct evaporation events, shallow transport processes, and swift precipitation formation. Together with recent technological advances in isotope measurements and in-situ sample collection, this will allow us to acquire a new kind of observational data set that will follow the history of water vapour from source to sink. The high-resolution, high-precision isotope data will provide a combined view of established and novel natural isotopic source tracers and set new benchmarks for climate models. A unique palette of sophisticated model tools will allow us to decipher, synthesize and exploit these observations, and to identify compensating errors between water cycle processes in models. In ISLAS, my team and I will thus make unprecedented use of stable isotopes to provide the sought-after constraints for an improved understanding of the hydrological cycle in nature and in climate models, leading towards improved predictions of future climate.

EnTER		852115
Title: Enhanced Mass Transport in Electrochemical Systems for Renewable Fuels and Clean Water		
Call Id: ERC-2019-STG	Topic: **ERC-2019-STG**	Type of Action: **ERC-STG**
Project start date: 2/1/2020	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.500.000	EU requested grant: **€1.500.000**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords:

Abstract:

To meet the growing demand for green energy carriers and clean water for the next decades, we can use the increasing supply of harvested solar and wind energy to synthesize fuels (hydrogen, syngas, ammonia, etc.) and clean water via electrochemical methods. Electrochemical methods have the advantage of single-step, energy-efficient and low-temperature conversion of chemicals. However, despite developments in electrocatalysts and system design in the past decade, none of the electrochemical methods has grown to a market-leading technology in the energy or water sector because of limitations in process intensification. A boost in electrical current density, without sacrificing energy efficiency, is required to allow large-scale deployment.

This process intensification needs breaking three limitations in mass transport, at three different scales: 1) the diffusion boundary layer (microscale), 2) gas bubble interference (mm-scale) and 3) concentration gradients in the flow compartments bulk. This ERC project will use a multiscale approach to address these three mass transport limitations, and has the objective to understand and enhance mass transport using novel concepts. Diffusion limitations will be addressed via studying suspension electrodes, gas bubbles will be controlled while synergistically disturbing the diffusion boundary layer via pressure swing control, and reactor engineering concepts that are new to the field of electrochemistry are used to mitigate macro-scale concentration gradients. Water electrolysis, CO2 electrolysis and electrodialysis will be used as tool to evaluate these strategies, using fluorescence lifetime imaging (FLIM) and micro particle image velocimetry (µPIV) to observe the local environment at microscale within large-scale systems. This multiscale approach with in-situ measurements of local flow and concentrations will target the fundamental understanding and control of mass transport limitations for universal electrochemical conversion.

MARIX		854088
Title: Methane and Ammonium Removal In redoX transition zones		
Call Id: ERC-2019-SyG	Topic: **ERC-2019-SyG**	Type of Action: **ERC-SyG**
Project start date: 3/1/2020	Duration: **72 months**	Unit: **ERCEA/C/03**
Total costs: €7.610.000	EU requested grant: **€7.610.000**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords: *eutrophication, deoxygenation, geochemistry, redox reactions, discovery, methane, anammox, nitrogen cycle, nitrification, geochemistry, ocean, sediment, climate change, field studies, fuel cell, nitrogen removal, wastewater, ammonium, earth science, new*

Abstract:

Earth's geochemical evolution was shaped by an enormous microbial metabolic diversity. One of the urgent scientific grand challenges is to decipher the key geochemical pathways involved in those 4 Gy of evolution, with the ultimate aim to obtain a truly predictive understanding of the response of the Earth System to global change. Rapid advances in geochemistry and microbiology have revealed the unique and critical role of sharp redox transitions in marine environments as prime sites for the removal of toxic ammonium and the greenhouse gas methane. Yet, the redox reactions, microbial players, and key controls remain largely unexplored. Our ERC synergy project MARIX will unite the complementary expertise required to gain a fundamental and mechanistic understanding of the geochemistry of these redox zones and the complex in-situ microbial interactions that together strongly impact our environment. By combining highly innovative fieldwork, cutting-edge laboratory experiments and state-of-the-art modeling for a range of carefully selected and representative coastal ecosystems we will: 1. Unravel the geochemistry and novel microbial pathways that remove methane and ammonium through oxidation with metal-oxides. 2. Determine the impact of the novel microbial pathways of methane and ammonium oxidation on the dynamics of nutrients, oxygen and other key elements. 3. Develop innovative gene-centric biogeochemical models for coastal sediments and overlying waters, to improve projections of the impacts of eutrophication and climate change. MARIX will bring together two outstanding and complementary groups located within easy travel distance, allowing excellent synergistic coupling of infrastructure, personnel and resources on a daily basis. Our project will lead to major breakthroughs in the understanding of the key role that microorganisms play in modulating Earth's biogeochemistry with far-reaching implications for a wide range of research fields.

TWORAINS		648609
Title: Winter Rain, Summer Rain: Adaptation, Climate Change, Resilience and the Indus Civilisation		
Call Id: ERC-2014-CoG	Topic: **ERC-CoG-2014**	Type of Action: **ERC-COG**
Project start date: 9/1/2015	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.999.439	EU requested grant: **€1.999.439**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords: *Archaeological science, Bioarchaeology, Isotope analysis, Residue analysis,*

Agent-based modelling

Abstract:

Rainfall systems are complex and inherently variable, yet they are of fundamental importance due to their impact on food security. Given that human populations can adapt their behaviour to a wide range of climatic and environmental conditions, it is essential that we understand the degree to which human choices in the past, present and future are resilient and sustainable in the face of variable weather conditions, and when confronted with abrupt events of climate change.

TWORAINS will investigate the resilience and sustainability of South Asia's first complex society, the Indus Civilisation (c.2500-1900 BC), which developed across a range of distinctive environmental contexts where westerly winter rainfall overlapped with the summer rainfall of the Indian Summer Monsoon (ISM). It is now clear that there was an abrupt weakening of the ISM that directly impacted NW India c.2100 BC, and coincided with the start of the decline of Indus cities, but the degree of connection between the two is elusive.

Archaeologists have a unique role to play in understanding the ways that societies respond to climate change as they can investigate past instances of success or failure, and the Indus Civilisation provides an ideal laboratory in which to explore how societies can respond to variable and changing rain systems. TWORAINS will combine cutting edge approaches from Archaeology, Earth Sciences and Geography to reconstruct climate, model rain patterns, and explore societal adaptations and responses to change by combining data on settlement distribution, food production and consumption, and water stress. The data will then be integrated and assessed using agent-based modelling. By adopting an integrated interdisciplinary approach, it will be possible to ask "Does climate change really cause collapse?", elucidate how particular communities perceived weather and landscape changes, hypothesise why they made the decisions they did, and explore the consequences of those decisions.

QUINCY		647204
Title: Quantifying the effects of interacting nutrient cycles on terrestrial biosphere dynamics and their climate feedbacks		
Call Id: ERC-2014-CoG	Topic: **ERC-CoG-2014**	Type of Action: **ERC-COG**
Project start date: 9/1/2015	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €2.000.000	EU requested grant: **€2.000.000**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords: *nutrient cycles, soil-vegetation interaction*

Abstract:

Nutrient availability plays a pivotal role in the response of terrestrial ecosystems to increasing atmospheric CO2 and climate change. The global role of nutrients is only poorly understood quantitatively, limiting the predictive understanding of terrestrial biosphere - climate feedbacks. The first generation of global nutrient-carbon cycle models shows strongly diverging estimates of the nutrient effect, resulting from lacking integration of ecosystem observations and fundamental uncertainties in the representation of governing processes. The objective of QUINCY is to clarify the role of the interacting terrestrial nitrogen and phosphorus cycles and their effects on terrestrial C allocation and residence times as well as terrestrial water fluxes. QUINCY will create a novel, predictive framework founded on the principle of resource optimisation, shifting the paradigm of terrestrial biosphere modelling towards an active biological control of matter flows. QUINCY's main themes are (i) the effects of nutrient availability on plant photosynthesis and respiration, explicitly taking the energy requirement of nutrient acquisition into account, and (ii) the effects of vegetation-soil interactions, namely rhizosphere processes, on plant nutrient availability and soil C turnover. To corroborate these theoretical concepts, QUINCY will synthesise existing and ongoing ecosystem monitoring and manipulation studies. To specifically test emerging hypotheses on the effects of rhizosphere priming on soil C storage and plant nutrition - and to provide currently lacking data for soil-vegetation models - QUINCY will establish a tree mesocosm, elevated CO2 experiment. The novel model concepts will be consistently integrated to form a new general terrestrial biosphere model. For the first time, QUINCY will be able to address the multiway interactions of carbon, nitrogen, phosphorus and water cycles globally in a theoretically well-founded way commensurate with ecosystem observations.

CAT		676819
Title: Climbing the Asian Water Tower		
Call Id: ERC-2015-STG	Topic: **ERC-StG-2015**	Type of Action: **ERC-STG**
Project start date: 2/1/2016	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.499.631	EU requested grant: **€1.499.631**	
Main thematic area: 21 - Global water cycle / earth system		

Free keywords:

Abstract:

The water cycle in the Himalaya is poorly understood because of its extreme topography that results in complex interactions between climate and water stored in snow and glaciers. Hydrological extremes in the greater Himalayas regularly cause great damage, e.g. the Pakistan floods in 2010, while the Himalayas also supply water to over 25% of the global population. So, the stakes are high and an accurate understanding of the Himalayan water cycle is imperative. The discovery of the monumental error on the future of the Himalayan glaciers in the fourth assessment report of the IPCC is exemplary for the scientific misconceptions which are associated to the Himalayan glaciers and its water supplying function. The underlying reason is the huge scale gap that exists between studies for individual glaciers that are not representative of the entire region and hydrological modelling studies that represent the variability in Himalayan climates. In CAT, I will bridge this knowledge gap and explain spatial differences in Himalayan glacio-hydrology at an unprecedented level of detail by combining high-altitude observations, the latest remote sensing technology and state-of-the-art atmospheric and hydrological models. I will generate a high-altitude meteorological observations and will employ drones to monitor glacier dynamics. The data will be used to parameterize key processes in hydro-meteorological models such as cloud resolving mechanisms, glacier dynamics and the ice and snow energy balance. The results will be integrated into atmospheric and glacio-hyrological models for two representative, but contrasting catchments using in combination with the systematic inclusion of the newly developed algorithms. CAT will unambiguously reveal spatial differences in Himalayan glacio-hydrology necessary to project future changes in water availability and extreme events. As such, CAT may provide the scientific base for climate change adaptation policies in this vulnerable region.

DyNET		770999
Title: Dynamical river NETworks: climatic controls and biogeochemical function		
Call Id: ERC-2017-COG	Topic: **ERC-2017-COG**	Type of Action: **ERC-COG**
Project start date: 5/1/2018	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.999.758	EU requested grant: **€1.999.758**	
Main thematic area: 22 - Global water cycle / hydrology, hydro-morphology		

Free keywords: *River networks, Catchments, Transport processes, Modeling*

Abstract:

Despite the ubiquity of expansion and retraction dynamics of flowing streams, the large majority of biogeochemical and hydrological studies conceive river networks as static elements of the landscape, and a coherent framework to quantify nature and extent of drainage network dynamics is lacking. The implications of this phenomenon extend far beyond hydrology and involve key ecological and biogeochemical function of riparian corridors. The proposed research project will move beyond the traditional paradigm of static river networks by unravelling, for the first time, physical causes and biogeochemical consequences of stream dynamics. In particular, the project will undertake the following overarching scientific questions: 1) what are the climatic and geomorphic controls on the expansion/contraction of river networks? 2) what is the length of temporary streams and what is their impact on catchment-scale biogeochemical processes and stream water quality across scales? These challenging issues will be addressed by developing a novel theoretical framework complemented by extensive field observations within four representative sites along a climatic gradient in the EU. Field measurements will include long-term weekly mapping of the active drainage network and daily hydro-chemical data across scales. The experimental dataset will be used to develop and inform a set of innovative modelling tools, including an analytical framework for the description of spatially explicit hydrologic dynamics driven by stochastic rainfall and a modular hydro-chemical model based on the concept of water age, able to account for the variable connectivity among soil, groundwater and channels as induced by stream network dynamics. The project will open new avenues to quantify freshwater carbon emissions - crucially dependent on the extent of ephemeral streams - and it will provide a robust basis to identify temporary rivers and maintain their biogeochemical function in times of global change.

STEEPclim		647035
Title: Spatiotemporal evolution of the hydrological cycle throughout the European continent during past abrupt climate changes		
Call Id: ERC-2014-CoG	Topic: **ERC-CoG-2014**	Type of Action: **ERC-COG**
Project start date: 8/1/2015	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.847.546	EU requested grant: **€1.847.546**	
Main thematic area: 22 - Global water cycle / hydrology, hydro-morphology		

Free keywords:

Abstract:

With global temperatures on the rise due to anthropogenic greenhouse gas emissions, one of the largest short-term threats to societies comes from a changing water cycle: changing ocean currents and atmospheric circulation patterns, increased periods of drought or extreme precipitation events directly affect the socio-economic foundation of communities. However, one of the great unknowns in state-of-the art climate models predicting future changes is the spatial distribution of changing precipitation patterns. This lack of knowledge severely limits implementation of mitigation and adaptation options to divert the most severe consequences of climate change.

I propose a fundamentally new approach to understand spatial patterns and mechanisms of hydrological changes on the European continent by reconstructing such changes during past abrupt temperature and ocean circulation changes. We will develop an innovative research program integrating ideas and methods from diverse disciplines: organic geochemistry, plant physiology, event stratigraphy and geostatistical data analysis. We will generate quantitative paleohydrological data by developing a dual biomarker approach as a novel and direct proxy for fluxes in the hydrological cycle from 10 of the most precisely dated terrestrial climate records encompassing the European continent.

STEEPclim will enter uncharted territory and establish master records of continental climate change, comparable in resolution and quality to the polar ice cores. We will identify continental-scale feedback mechanisms and particularly vulnerable regions in European hydroclimate relevant for the evaluation of the consequences of ongoing climate change. These mechanistic insights will be essential to validate future generations of climate models, ensuring more accurate predictions of regional effects of anthropogenic climate changes and as such enable a targeted mitigation and adaptation policy.

AMBER		689682
Title: Adaptive Management of Barriers in European Rivers		
Call Id: H2020-SC5-2015-two-stage	Topic: **SC5-07-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **52 months**	Unit: **EASME/B/02**
Total costs: €6.238.104	EU requested grant: **€6.020.173**	
Main thematic area: 22 - Global water cycle / hydrology, hydro-morphology		

Free keywords: *Water Framework Directive, Habitats Directive, Floods Directive, Hydropower, River fragmentation, connectivity, barriers, Adaptive Management, Stream Ecology, Mitigation,*

Abstract:

Rivers rank among some of the most threatened ecosystems in the world, and are the focus of costly restoration programmes that cost billions to taxpayers. Much of Europe depends on water from rivers for drinking, food production, and the generation of hydropower, which is essential for meeting the EU renewable energy target. Yet only half the EU surface waters have met the WFD's 2015 target of good ecological status, due in part to the fragmentation of habitats caused by tens of thousands of dams and weirs which also pose a flood hazard. Some barriers are old and out of use, but may have historical value, while the life span of others will soon come to an end and may need to be removed. But barriers also provide energy, water, fishing and leisure opportunities, and may also help to prevent the spread of aquatic invasive species. Improving stream connectivity has been flagged as one of the priorities for more efficient stream restoration but effective rehabilitation of ecosystem functioning in European rivers needs to take the complexity and trade-offs imposed by barriers into account.

AMBER will deliver innovative solutions to river fragmentation in Europe by developing more efficient methods of restoring stream connectivity through adaptive barrier management. The project seeks to address the complex challenge of river fragmentation through a comprehensive barrier adaptive management process, based on the integration of programme design, management, and monitoring to systematically test assumptions about barrier mitigation, adapt and learn.

EGSIEM		637010
Title: European Gravity Service for Improved Emergency Management		
Call Id: H2020-EO-2014	Topic: **EO-1-2014**	Type of Action: **RIA**
Project start date: 1/1/2015	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.499.550	EU requested grant: **€1.752.050**	
Main thematic area: 23 - Global water cycle / extreme events		

Free keywords: *Earth observation, Gravity Data, Mass Redistribution, Water Balance, Hydrological Extremes, Environmental challenges, Flood Forecasting, Drought monitoring, Near Real-Time Service, Scientific Service*

Abstract:

Earth observation (EO) satellites yield a wealth of data for scientific, operational and commercial exploitation. However, the redistribution of environmental mass is not yet part of the EO data products to date. These observations, derived from the Gravity Recovery and Climate Experiment (GRACE) mission and in future by GRACE-FO (Follow-on), deliver fundamental insights into the global water cycle. Changes in continental water storage control the regional water budget and can, in extreme cases, result in floods and droughts that often claim a high toll on infrastructure, economy and human lives. The aim of this proposal is to demonstrate that mass redistribution products open the door for innovative approaches to flood and drought monitoring and forecast.

The timeliness and reliability of information is the primary concern for any early-warning system. We aim to increase the temporal resolution from one month, typical for GRACE products, to one day and to provide gravity field information within 5 days (near real-time). Early warning indications derived from these products are expected to improve the timely awareness of potentially evolving hydrological extremes and to help in the scheduling of high-resolution follow-up observations. We will provide adequate data products and indicators for tentative integration into the work of the Center for Satellite Based Crisis Information (ZKI, operated by the German Aerospace Center) and its future use within international initiatives such as the Copernicus Emergency Management Service and the International Charter “Space and Major Disasters”. The performance of our products will be assessed with complementary data and post-processed mass products derived from the combined knowledge of the entire European GRACE community unified in our consortium.

Our efforts thus culminate in three dedicated services: 1) a scientific combination service, 2) a near real-time service and 3) a hydrological/early warning service.

DRY-2-DRY		715254
Title: Do droughts self-propagate and self-intensify?		
Call Id: ERC-2016-STG	Topic: **ERC-2016-STG**	Type of Action: **ERC-STG**
Project start date: 2/1/2017	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.465.000	EU requested grant: **€1.465.000**	
Main thematic area: 23 - Global water cycle / extreme events		

Free keywords:

Abstract:

Droughts cause agricultural loss, forest mortality and drinking water scarcity. Their predicted increase in recurrence and intensity poses serious threats to future global food security. Several historically unprecedented droughts have already occurred over the last decade in Europe, Australia and the USA. The cost of the ongoing Californian drought is estimated to be about US$3 billion. Still today, the knowledge of how droughts start and evolve remains limited, and so does the understanding of how climate change may affect them.

Positive feedbacks from land have been suggested as critical for the occurrence of recent droughts: as rainfall deficits dry out soil and vegetation, the evaporation of land water is reduced, then the local air becomes too dry to yield rainfall, which further enhances drought conditions. Importantly, this is not just a 'local' feedback, as remote regions may rely on evaporated water transported by winds from the drought-affected region. Following this rationale, droughts self-propagate and self-intensify.

However, a global capacity to observe these processes is lacking. Furthermore, climate and forecast models are immature when it comes to representing the influences of land on rainfall. Do climate models underestimate this land feedback? If so, future drought aggravation will be greater than currently expected. At the moment, this remains largely speculative, given the limited number of studies of these processes.

I propose to use novel in situ and satellite records of soil moisture, evaporation and precipitation, in combination with new mechanistic models that can map water vapour trajectories and explore multi-dimensional feedbacks. DRY-2-DRY will not only advance our fundamental knowledge of the mechanisms triggering droughts, it will also provide independent evidence of the extent to which managing land cover can help 'dampen' drought events, and enable progress towards more accurate short-term and long-term drought forecasts.

HydroSocialExtremes		771678
Title: Uncovering the Mutual Shaping of Hydrological Extremes and Society		
Call Id: ERC-2017-COG	Topic: **ERC-2017-COG**	Type of Action: **ERC-COG**
Project start date: 4/1/2018	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.835.361	EU requested grant: **€1.835.361**	
Main thematic area: 23 - Global water cycle / extreme events		

Free keywords:

Abstract:

More than 100 million people per year are affected by hydrological extremes, i.e. floods and droughts. Hydrological studies have investigated human impacts on droughts and floods, while conversely social studies have explored human responses to hydrological extremes. Yet, the dynamics resulting from their interplay, i.e. both impacts and responses, have remained poorly understood. Thus, current risk assessment methods do not explicitly account for these dynamics. As a result, while risk reduction strategies built on these methods can work in the short-term, they often lead to unintended consequences in the long-term.

As such, this project aims to unravel the mutual shaping of society and hydrological extremes. A combined theoretical and empirical approach will be developed to uncover how the occurrence of hydrological extremes influences society's wealth, institutions and population distribution, while, at the same time, society in turn alters the frequency, magnitude and spatial distribution of hydrological extremes via structural measures of water management and disaster risk reduction.

To explore the causal mechanisms underlying this mutual shaping, this project will propose explanatory models as competing hypotheses about the way in which humans drive and respond to droughts and floods. These alternative explanations will be developed and tested through: i) empirical analysis of case studies, and ii) global investigation of numerous sites, taking advantage of the current unprecedented proliferation of worldwide datasets. By combining these different methods, this project is expected to address the gap of fundamental knowledge about the dynamics of risk emerging from the interplay of hydrological extremes and society.

CENTAUR		**641931**
Title: Cost Effective Neural Technique for Alleviation of Urban Flood Risk		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €3.532.121	EU requested grant: **€2.548.396**	
Main thematic area: 23 - Global water cycle / extreme events		

Free keywords: *Urban Water Management, autonomous systems, real time control, sensors, urban flood risk, climate change adaptation*

Abstract:

The project will develop a radically new market ready approach to RTC of sewer networks with the aim of reducing local flood risk in urban areas. Existing RTC pilot projects (e.g. Vienna, Dresden, Aarhus) are characterised by complex sensor networks, linked to centralised control systems governed by calibrated hydrodynamic modelling tools and fed by radar rainfall technology. Such systems are expensive and complex to install and operate, requiring a high investment in new infrastructure, communication equipment and control systems. In contrast, this proposal will develop a novel low cost de-centralised, autonomous RTC system. It will be installed, tested and demonstrated in a number of pilot study catchments. This RTC system will utilise data driven distributed intelligence combined with local, low cost monitoring systems installed at key points within existing sewer infrastructure. The system will utilise mechanically simple, robust devices to control flow in order to reduce flood risk at vulnerable sites. This system will be informed and governed directly by sensors distributed within the local network, without the need for an expensive hydrodynamic model or real time rainfall measurements. This system will deliver many of the benefits of RTC systems, whilst avoiding the high costs and complex nature of extensive sensor networks, centralised control systems, communications systems and infrastructure modifications. It is anticipated that such a system will be of significant benefit to operators of small to medium sized sewer networks.

IMPREX		641811
Title: IMproving PRedictions and management of hydrological EXtremes		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-2a-2014**	Type of Action: **RIA**
Project start date: 10/1/2015	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €7.996.848	EU requested grant: **€7.996.848**	
Main thematic area: 23 - Global water cycle / extreme events		

Free keywords: *Climate Change impacts, risk outlooks, risk management, adaptation strategy*

Abstract:

For a better anticipation on future high impact hydrological extremes disrupting safety of citizens, agricultural production, transportation, energy production and urban water supply, and overall economic productivity, prediction and foresighting capabilities and their intake in these strategic sectors need to be improved. IMPREX will improve forecast skill of meteorological and hydrological extremes in Europe and their impacts, by applying dynamic model ensembles, process studies, new data assimilation techniques and high resolution modeling. Novel climate change impact assessment concepts will focus at increasing the realism of relevant events by specific high resolution regional downscaling, explore compounding trans-sectoral and trans-regional risks, and design new risk management paradigms. These developments are demonstrated in impact surveys for strategic economic sectors in a set of case studies in which local stakeholders, public organizations and SMEs are involved. A pan-European assessment of risk management and adaptation strategies is applied, minimizing risk transfer from one sector or region to another. As a key outreach product, a periodic hydrological risk outlook for Europe is produced, incorporating the dynamic evolution of hydro-climatic and socio-economic processes. The project outreach maximizes the legacy impact of the surveys, aimed at European public stakeholder and business networks, including user-friendly assessment summaries, and training material.

The project responds to the call by targeting the quality of short-to-medium hydro-meteorological predictions, enhancing the reliability of future climate projections, apply this information to strategic sectoral and pan-European surveys at different scales, and evaluate and adapt current risk management strategies. With its integrative approach, IMPREX will link current management decisions and actions with an emergent future.

G3P		870353
Title: Global Gravity-based Groundwater Product		
Call Id: H2020-SPACE-2019	Topic: **LC-SPACE-04-EO-2019**	Type of Action: **RIA**
Project start date: 1/1/2020	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.923.503	EU requested grant: **€2.923.503**	
Main thematic area: 24 - Global water cycle / groundwater		

Free keywords: *Groundwater, Water storage, Gravity field, Satellite gravimetry, Water cycle, Earth Observation*

Abstract:

Groundwater is one of the most important freshwater resources for mankind and for ecosystems. Assessing groundwater resources and developing sustainable water management plans based on this resource is a major field of activity for science, water authorities and consultancies worldwide. Due to its fundamental role in the Earth's water and energy cycles, groundwater has been declared as an Essential Climate Variable (ECV) by GCOS, the Global Climate Observing System. The Copernicus Services, however, do not yet deliver data on this fundamental resource, nor is there any other data source worldwide that operationally provides information on changing groundwater resources in a consistent way, observation-based, and with global coverage. This gap will be closed by G3P, the Global Gravity-based Groundwater Product.

The G3P consortium combines key expertise from science and industry across Europe that optimally allows to (1) capitalize from the unique capability of GRACE and GRACE-FO satellite gravimetry as the only remote sensing technology to monitor subsurface mass variations and thus groundwater storage change for large areas, (2) incorporate and advance a wealth of products on storage compartments of the water cycle that are part of the Copernicus portfolio, and (3) disseminate unprecedented information on changing groundwater storage to the global and European user communities, including a European use case as a demonstrator for industry potential in the water sector. In combination, the G3P development is a novel and cross-cutting extension of the Copernicus portfolio towards essential information on the changing state of water resources at European and global scales. G3P is timely given the recent launch of GRACE-FO that opens up the chance for gravity-based time series with sufficient length to monitor climate-induced and human-induced processes over more than 20 years, and to boost European space technology on board these satellites.

MARSoluT		814066
Title: Managed Aquifer Recharge Solutions Training Network		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-ETN**
Project start date: 3/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €2.992.494	EU requested grant: **€2.992.494**	
Main thematic area: 24 - Global water cycle / groundwater		

Free keywords: *Water scarcity, drought, climate change, mediterranean, aquifer, recharge, soil-aquifer treatment*

Abstract:

Managed Aquifer Recharge (MAR) – storing water in aquifers during times of excess – is a key strategy to enrich groundwater resources in water scarce regions by providing intermediate storage, addressing the typical mismatch between water demand and availability. It can help to mitigate the effects of climate change, and to support water-related environmental services. MAR is, however, characterized by complex interaction of physical, biological and hydrochemical processes influencing water quality and the sustainability of infiltration rates. Individual processes are in principal known, but there is a significant knowledge gap on how they are linked and affect each other. An in-depth understanding of their interplay can lead to MAR systems tailored for best performance in terms of water storage, water polishing goals, infiltration rates, economic viability, and adaptation to climatic change.

MARSoluT addresses this knowledge gap by a collaborative effort in a multi-disciplinary team. Activities are organized around the existing field sites of previous EU FP7 project MARSOL that are already highly characterised and instrumented to allow further in-depth studies and experimental approaches. This will lead to new insights into the complex and coupled processes at MAR sites and will help to optimize MAR design and operation, and thereby minimizing risk of MAR failure. Excellence in research and technological innovation are ensured by involving partners from renown research organizations as well as SMEs and industry partners with a strong background in the water sector.

MARSoluT ESRs will get hands-on experience at various MAR sites while tackling specific MAR-related research topics in an interdisciplinary team. MARSoluT ESRs will become experts on the tailored planning of MAR systems making them attractive for employers from research, industry, and regulatory agencies which are eager to implement MAR into sound and safe Integrated Water Resources Management concepts.

REGROUND		641768
Title: Colloidal Iron Oxide Nanoparticles for the REclamation of Toxic Metal Contaminated GROUNDwater Aquifers, Drinking Water Wells, and River Bank Filtrations		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **40 months**	Unit: **EASME/B/02**
Total costs: €2.868.094	EU requested grant: **€2.734.223**	
Main thematic area: 24 - Global water cycle / groundwater		

Free keywords: *groundwater remediation, heavy metal immobilization, drinking water well protection*

Abstract:

The main objective of the presented innovation action is the first application and near-market replication of a novel water nanogeotechnology for the immobilization of toxic metals in groundwater aquifers, drinking water wells, and river bank filtration sites. The basic concept of our technology is the creation of an adsorptive in situ barrier for the immobilization of toxic metal contaminations. This barrier is made of iron oxide nanoparticles, which are injected into sediments as colloidal suspension, forming stable deposits there. Over the last 6 years, we have developed a novel technology for the injection of iron oxide nanoparticles (NPs) into groundwater contaminant plumes. The feasibility of this approach has been successfully tested in lab experiments and a scientific field application. Specifically, our approach addresses arsenic, barium, cadmium, chromium, copper, lead, mercury, and zinc, all of which are known major groundwater contaminants. Now, we want to bring this novel, green and near-market water eco-innovation into the European markets, and beyond. The very core of this effort is the performance of two industrial-scale applications of our technology at two different types of contaminated sites. This first application of our technological approach under field conditions is the major objective of REGROUND. By developing our technology into a market-ready application, REGROUND will globally transform the efforts to mitigate the risks posed by toxic metal contaminations to humans and ecosystems. The REGROUND technology, due to its low costs and wide applicability, will be made highly available. The near-market replication of our technology and subsequent commercialization efforts are an integral part of REGROUND. This will enable immobilization of toxic metal contaminations at sites which were left untreated so far due to technical or economic reasons.

KINDRA		642047
Title: Knowledge Inventory for hydrogeology research		
Call Id: H2020-WATER-2014-one-stage	Topic: **WATER-4a-2014**	Type of Action: **CSA**
Project start date: 1/1/2015	Duration: **39 months**	Unit: **EASME/B/02**
Total costs: €1.119.338	EU requested grant: **€1.108.669**	
Main thematic area: 24 - Global water cycle / groundwater		

Free keywords: *hydrogeology, GWD, WFD, groundwater*

Abstract:

Practical and scientific knowledge related to hydrogeology research and innovation are scattered amongst various actors in Europe. The overall objective of KINDRA is to create an inventory of this knowledge-base and then use the inventory to identify critical research challenges in line with the implementation of the WFD and new innovation areas within integrated water resources management based on the latest research.

Project objectives:

1. Create a uniform EU-harmonised categorisation approach / terminology for reporting groundwater research (a Hydrogeological Research Classification System – HRC-SYS). Since such uniform classification does not exist at the moment, ongoing research activities, national/European hydrogeological research activities, agendas and strategies are difficult to report and even more difficult to compare.

2. Carry out EU-wide assessment of existing practical and scientific knowledge (using the developed HRC-SYS) focusing on EU, national, regional, international and EU-third party scientific activities. This assessment will be implemented with the help of the national members of EFG.

3. Create a European Inventory of Groundwater Research and Innovation (EIGR). This register will be supported by a web-service that will be searchable by selected key-words and will support users with query functions for statistics, diagrams, and others concise data elaboration.

4. Use the data in the register and the developed analytical tools (qualitative/quantitative) to assess the performance of key ongoing EU, national, regional, international and EU-third party hydrogeological scientific and innovation activities and results.

5. Compare the results with existing recommendations and position papers on groundwater related research requirements.

6. Define research gaps and corresponding suggestions for research agendas in line with WFD, and WssTP recommendations.

GREENER		826312
Title: InteGRated systems for Effective ENvironmEntal Remediation		
Call Id: H2020-NMBP-BIO-CN-2018	Topic: **CE-BIOTEC-04-2018**	Type of Action: **RIA**
Project start date: 3/1/2019	Duration: **48 months**	Unit: **RTD/F/03**
Total costs: €5.527.032	EU requested grant: **€4.964.168**	
Main thematic area: 25 - Global water cycle / soil, sediments		

Free keywords: *bioremediation, water, soil, bio-electrochemical systems, mixed cultures, biopile, ecopile, phytoremediation, hybrid systems, hydrocarbons, heavy metals, emerging contaminants, validation, scale-up*

Abstract:

Increasing chemical pollution seriously compromises the health of ecosystems and humans worldwide. Hazardous compounds, such as polycyclic aromatic hydrocarbons, heavy metals and emerging pollutants contaminate soils/sediments, ground and surface waters. To prevent/minimise the risks associated with the accumulations of these chemicals in the environment it is key to establish low-cost/green methodologies for the treatment and redevelopment of contaminated areas. Several physico-chemical methods have been explored to remove pollutants in the environment, but these are complex, energy consuming or expensive. The exploitation of the capability of bacteria, fungi and phototrophs to transform toxic contaminants into harmless end-products, can lead instead to cheap and sustainable bioremediation alternatives.

GREENER proposes the development of innovative, efficient and low-cost hybrid solutions that integrate bioremediation technologies with bio-electrochemical systems (BES). BES, such as microbial fuel cells, break down organic contaminants through the action of electroactive bacteria while generating electrical current. We will investigate the synergetic effect of different bioremediation strategies and demonstrate effective pollutants removal in water and soil/sediments, while generating side products of interest, such as bioelectricity. The type and entity of contamination, along with the specific physico-chemical/microbial characteristics of the environment to be depolluted, will feed into a decision-making toolbox. The latter will allow the establishment of ad hoc integrated solutions, which will take into account effectiveness of biodegradation, costs, environmental risks and social aspects. Fundamental research will be performed at lab-scale, while pilot-tests will be used to proof the scaling-up feasibility for field applications. Environmental benefits and risks, compared to standard remediation approaches, including energy efficiency, will be investigated.

ELECTRA		826244
Title: Electricity driven Low Energy and Chemical input Technology foR Accelerated bioremediation		
Call Id: H2020-NMBP-BIO-CN-2018	Topic: **CE-BIOTEC-04-2018**	Type of Action: **RIA**
Project start date: 1/1/2019	Duration: **48 months**	Unit: **RTD/F/03**
Total costs: €7.635.281	EU requested grant: **€4.995.056**	
Main thematic area: 25 - Global water cycle / soil, sediments		

Free keywords: *Bio-electro chemical systems, 3-D printed biofilms, nanoparticles, microbial consortia, China, field experiments*

Abstract:

The ELECTRA project is a EU-China RTD joint initiative that will deliver 2 innovative sets of novel electromicrobiology based environmental biotechnologies, facilitating/improving electron transfer during microbial degradation processes. Our approach will accelerate the elimination of several classes of pollutants and mixtures thereof in contaminated wastewater, groundwater, sediment and soil. The first set of biotechnologies employs bioelectrochemical systems requiring low energy input and no chemical addition. The second set comprises biotechnologies, which necessitate no energy input and minimal chemical amendment using electromicrobial concepts. ELECTRA biotechnologies will build on recent groundbreaking advances in biotechnology to develop them for environmental bioremediation applications and test the 4 most advanced technologies during field trials under various environmentally relevant conditions in both Europe (4 sites with contaminated wastewater, groundwater, soil, and sediment) and China (4 sites: mirroring tests concept) to prove their efficiency and robustness. The ELECTRA project deliberately addresses the accelerated elimination of compounds representative of hydrocarbons and derivatives, emerging pollutants, metals and nutrients and mixtures thereof in environmentally relevant concentration as a wise and careful approach taking into account the real problem of contaminations by organic and inorganic pollutants as well as nutrients. ELECTRA is a consortium of European and Chinese partners for a 4-year project. The EC-funded consortium gathers 17 partners from 6 EU countries,1 Associated Country. 1 large Chinese company is part of the EC consortium without claiming any funding from the EC since NSFC finances only fundamental research and does not allow for the inclusion of companies as partners in NSFC projects. This company has a key/essential role in replicating field test experiments from European sites to Chinese sites. The NSFC-funded consortium is constituted by five research institutions acting as international partners.

MISTRALE		641606
Title: Monitoring of SoIl moiSture and wateR-flooded Areas for agricuLture and Environment		
Call Id: H2020-Galileo-2014-1	Topic: **GALILEO-1-2014**	Type of Action: **IA**
Project start date: 1/1/2015	Duration: **42 months**	Unit: **GSA/MARKET**
Total costs: €3.337.858	EU requested grant: **€2.599.245**	
Main thematic area: 25 - Global water cycle / soil, sediments		

Free keywords: *Soil, moisture measurements, wetland monitoring, GNSS-R, RPAS, irrigation management*

Abstract:

The MISTRALE project proposes to address soils moisture management in agriculture as well as wetlands or flooded areas monitoring by using Global Navigation Satellite Systems reflected signals (GNSS-R) as a powerful technology for humidity or flooded mapping. The detection by GNSS-R is known to be much more reliable than visible/NIR imagery, and will be usable even under a cloud cover, during the night and even under vegetation (bushes, grass, trees) when passive remote sensing is not applicable.

The main objective is to demonstrate a service chain in different use cases : pilot projects will be carried out in soil humidity mapping for agriculture (optimizing the water resource management), wetlands and flooded areas (risk management, flood-prone areas, damages evaluation).

In order to meet the objectives, a GNSS-R receiver embedded into a small RPAS (Remotely Piloted Aircraft System) will be developed and implemented into an operational chain to provide the service. GNSS-R technology aims at measuring the GNSS signals reflected on the ground, and, compared to the direct signals, permits a measurement of the soil humidity (from 0 to 100%) as well as flooded extend. The use of GALILEO signals will significantly improve the precision of mapping. The operational system will integrate three main axes of development: adapting the GNSS-R technology for the requirements, making a compact GNSS-R receiver and optimizing an existing RPAS.

Using EGNOS and GALILEO in the project will also improve navigation capabilities of small RPAS (<4Kg) and contribute to the development of regulations for their integration in airspace.

We assembled a consortium that addresses all aspects of the project : four SME specialized in GNSS receivers, GNSS-R technology, operational applications and dissemination, two labs for RPAS and GNSS-R technology. An advisory board composed of agronomy and environment specialists as well as end users will complete the skills of the consortium.

WATER4AGRI		783989
Title: Securing water for food and safety with the world's most advanced soil moisture information derived from satellites		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-04-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2017	Duration: **18 months**	Unit: **EASME/A/02**
Total costs: €1.914.375	EU requested grant: **€1.340.063**	
Main thematic area: 25 - Global water cycle / soil, sediments		

Free keywords: *Global soil moisture data, Satellite remote sensing, ESA Sentinel constellation, Near real time, High spatio-temporal resolution, Precision agriculture*

Abstract:

European agriculture is facing important challenges in the coming decades linked to our changing climate. Periods of droughts and floods will further increase which threaten production and require a smart usage of our vulnerable water resources. Climate change also stimulates crop disease, which causes farmers to use more pesticides and in turn endangers water quality and impacts people's health and the environment. Satellite Remote Sensing has a crucial role to play in tackling these challenges. At VanderSat we have developed a method to provide accurate high-resolution images of soil moisture, at any place on Earth 24/7 a year. Soil moisture is a key indicator for the physical status of a plant, and has a strong predictive value with respect to crop yield and weather conditions including flooding and droughts. By combining microwave data obtained from different satellites – including the ones in the Copernicus Sentinel constellation – we are revealing a revolutionary data set that can be used to retrieve key information about the water availability for crops at field level. This data is crucial for improving the accuracy of Agricultural (Ag.) models that are the backbone of modern agribusiness. Through the WATER4AGRI project we want to lift the technology to TRL9 by: (1) scaling VanderSat soil moisture for implementation in Ag. models and, (2) demonstrating the effectiveness of VanderSat in the two most widespread Ag. models. With VanderSat our customers will be able to accurately predict crop yield, pesticide requirements, droughts and flooding and, most important, reduce climate related risks for their businesses. VanderSat is creating business opportunities that were unimaginable before, like reducing crop risks through smart re-insurance strategies and integrated pest management. In doing this VanderSat impacts agribusiness in the most important dimension: improving yield and the overall profit or loss of the operation.

WATERSIGN		848537
Title: WATERSIGN: Smart Water Monitoring & Leakage Detection		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 6/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.013.616	EU requested grant: **€2.109.531**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *water conservation, water monitoring, sensors, flow fluctuation, leak detection*

Abstract:

To enable a more efficient use of water and limit wasteful usage, real time monitoring and alerts in case of burst, blockage or leakage is needed to empower consumers to take corrective action as quickly as possible. Tavlit's Watersign System's disruptive patented technology reduces water wastage and maximizes the efficient use of water, thereby preserving scarce resources, by enabling real time monitoring of water supply lines and irrigation systems. The system is simple and economical, making it an ideal solution for water management. Using the water itself as the medium to transfer the data, the system detects leakages, bursts, blockages, water theft and unauthorized connections, identifying the specific point/location of the disturbance, and alerts the user immediately so that corrective action can be taken. The system analyses water consumption patterns and sends alerts in the case of irregular behaviour, as well as immediately sending an alert when non-potable water enters a potable water system.

The system is comprised of just one sensor located at the inlet of the water system being monitored, while each individual water outlet is equipped with a Watersign-marker, a mechanical device operated by the water flow, creating small flow/pressure fluctuations in the water, generating a unique signature at every outlet, identifying each user by small fluctuations in the water flow/pressure. The water itself is used as the medium to transmit information from all markers simultaneously to the sensor located at the inlet of the system. A smart algorithm separates between signals and identifies each user, sending an immediate alert in case of irregular behaviour.

The project's objective is to bring the Watersign System to full commercialisation using Tavlit's global market presence and reputation. Throughout the project, pilot sites will be operational, including agricultural, landscape & turf and golf course sites, as well as rural village and water utility pilots.

EARTH@LTERNATIVES		834716
Title: Sustainability, efficiency, equity and resilience of land and water use for global food and energy security: synergies and fundamental trade-offs		
Call Id: ERC-2018-ADG	Topic: **ERC-2018-ADG**	Type of Action: **ERC-ADG**
Project start date: 9/1/2019	Duration: **60 months**	Unit: **ERCEA/C/03**
Total costs: €2.500.000	EU requested grant: **€2.500.000**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *sustainability, resource use efficiency, equity, resilience, water-land-food-energy nexus*

Abstract:

Humanity faces major challenges: stay below local and global ecological thresholds; increase natural resources use efficiency; share resources fairly; and increase societal resilience. Most research focusses on one or two of these challenges at a time; there is a major scientific gap in understanding synergies and inevitable trade-offs between the development principles of environmental sustainability, equitability, efficiency and resilience. This project aims to analyse synergies and trade-offs between environmental sustainability, resource efficiency, social equity and social-ecological resilience in the context of land and water use for food and energy supply. We consider production, consumption and trade patterns globally, at high spatial resolution, analyse past developments, and develop alternative future pathways, based on coherent sets of assumptions regarding demographic and economic developments, technological innovation, changes in local diets and energy mixes, and climate change. The project team will pioneer in integrating methods and computational tools from the fields of Environmental Footprint Assessment, Life Cycle Assessment and Input-Output Analysis, applied at unrivalled high level of granularity. Coherent perspectives on handling uncertainty and risk from cultural theory will be used in a unique approach to develop alternative futures. Finally, an original framework will be developed to analyse synergies and traded-offs between competing development principles. The project will revolutionize our understanding of different pathways to food and energy security given limited land and water resources, and particularly how each pathway will make trade-offs between environmental sustainability, fair sharing, efficient resources use and resiliency. This knowledge is key in understanding how to achieve UN's Sustainable Development Goals with limited land and water resources and reveal synergies and trade-offs embedded in specific strategies.

SMART.MET		731996
Title: PCP for Water Smart Metering		
Call Id: H2020-ICT-2016-1	Topic: **ICT-34-2016**	Type of Action: **PCP**
Project start date: 1/1/2017	Duration: **54 months**	Unit: **CNECT/H/05**
Total costs: €4.437.937	EU requested grant: **€3.989.644**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Smart water metering, public water utilities*

Abstract:

European Water utilities environment is embedded in a context dealing with global issues such as water scarcity and technical-economic issues such as infrastructure aging. Management of drinking water supply is facing key challenges partly related to traditional water meter, such as managing capital and operational costs; water loss (also known as non-revenue water) due to leaks and other system failures; and water scarcity/conservation.

The core of the solution lies in the renewed access and use of accurate data that Smart Water Metering can provide to decrease operating costs, identify performance issues, improve customer service and better prioritize infrastructure investments.

SMART.MET strongly paves the way to a more efficient management providing for example automatic reading of the household meters and billing, real time assessment of water balance for leak detection, identification of abnormal behaviors and awareness-raising, ability to identify user-meters defaults.

However, the lack of common European standards and lack of “open technological platforms” combined to the high transaction cost on the demand side create a lock-in situation in the market and determine a situation of long-term dependency of water operators on technology providers. This determines high average operating costs for water operators and users, as well as collective inefficiency related to the multiplication of different proprietary solutions on the offer side.

The objective of the proposal is thus to drive the development of new technologies to manage smart metering data collection and management, driven by a group of 7 water utilities through a joint Pre Commercial Procurement (PCP).

They are supported by 6 expert organizations for assessing the technologies, implement the new procurement procedures and disseminate the outcomes of the project to other utilities and solutions suppliers.

The duration of the project is 48 months.

MIXED		862357
Title: Multi-actor and transdisciplinary development of efficient and resilient MIXED farming and agroforestry-systems		
Call Id: H2020-SFS-2019-2	Topic: **LC-SFS-19-2018-2019**	Type of Action: **RIA**
Project start date: 10/1/2020	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €6.999.509	EU requested grant: **€6.999.509**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Participatory action research, Mixed Farming, improved performance, decision-support tools, efficiency and resilience synergies, dialogue and dissemination, user acceptability, policy development*

Abstract:

MIXED is a multi-actor project to drive the development of European Mixed Farming and Agroforestry Systems (MiFAS) that optimize efficiency and resource use, reduce GHG emissions, and show greater resilience to climate change by considering agronomic, technical, environmental, economic and social advantages and constraints. The project will, through a participatory and transdisciplinary process, develop, improve and implement efficient and resilient MiFAS in collaboration between organic and conventional networks of farmers, advisors, researchers and other stakeholders. Assessment of potential impacts on environment and mitigation and adaptation to climate change will be made at the farm, landscape and value chain level. The development of new and improved MiFAS will include combined effects on crop and livestock production, livestock health and welfare, soil structure and fertility. Methods for landscape resilience assessments will be developed and life cycle assessment methodologies adapted to selected value chains and MiFAS including modelling of carbon sequestration and biodiversity. Indicators (economic factors, nutrients, GHG, etc.) and socio-economic factors important for farmers' decision-making for transition to or improving efficiency and resilience of MiFAS will be integrated in farm-level decision support tools. Assessment of trade-offs and synergies between efficiency and resilience of MiFAS at multiple levels will inform discussions between policy makers and the agricultural sector for the support of strategies for larger-scale implementation of MiFAS. The project will facilitate dialogue and dissemination of MiFAS to farmers as well as to decision makers at regional and EU level to ensure the highest levels of implementation of MiFAS at farm and landscape scale for efficient and resilient production and performance in terms of climate change and eco-systems services.

WaterWorks2017		776692
Title: Water Works 2018-2022 in Support of the Water JPI (WaterWorks2017) and of the EC Call SC5-33-2017: Closing the water cycle gap		
Call Id: H2020-SC5-2017-OneStageB	Topic: **SC5-33-2017**	Type of Action: **ERA-NET-Cofund**
Project start date: 1/1/2018	Duration: **60 months**	Unit: **RTD/C/01**
Total costs: €22.283.676	EU requested grant: **€7.320.613**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Resource efficiency; socio-economic approach; Water reuse*

Abstract:

The WaterWorks2017 project is pooling resources from the 23 participating research programme owners / managers of 19 countries to implement a joint call for proposals, with EU co-funding in the area of closing the water cycle gap. It will support delivery of priorities identified in the Water Joint Programming Initiative (Water JPI) Strategic Research and Innovation Agenda (SRIA) in order to reconcile water supply and demand, both in terms of quantity and quality, and also in terms of space and time. It covers the following sub-themes: • Enabling Sustainable Management of Water Resources; • Strengthening Socio-economic Approaches to Water Management.

WaterWorks2017 includes 8 organisations from associated and third countries in an effort to reinforce international cooperation. Additional Activities will also be carried out to further support the implementation and strategy of the Water JPI. The overall aims include:

• Supporting the implementation and development of the Water JPI on priorities identified in its SRIA;

• Pooling financial resources from participating national and regional research programmes and implementing a co-funded transnational and multi-disciplinary call for research and innovation proposals;

• Pooling additional financial resources to implement a joint call for proposals resulting in grants to third parties without EU co-funding (through a Thematic Annual Programming action - TAP);

• Overcoming the fragmentation of European water related research, development and innovation (RDI) activities while avoiding overlaps with ongoing actions co-funded by the European Commission and/or the Member States;

• Improving the implementation of research and innovation programmes in these fields through exchange of good practices;

• Contributing to the implementation of EU Water policies, the UN Sustainable Development Goals (SDGs), in particular SDG 6 and SDG 13, as well as the conclusions of the COP21 Agreement; and

• Seeking synergies with international research programmes beyond Europe.

EN-SUGI		730254
Title: Eranet Sustainable Urbanisation Global Initiative		
Call Id: H2020-SCC-NBS-1stage-2016	Topic: **SCC-04-2016**	Type of Action: **ERA-NET-Cofund**
Project start date: 12/1/2016	Duration: **60 months**	Unit: **RTD/D/02**
Total costs: €18.649.260	EU requested grant: **€5.000.053**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Food energy water (FEW NEXUS Approach), Sustainable urbanisation, global initiative, urban development*

Abstract:

Cities around the globe are struggling to meet the needs of their citizens with respect to food, energy and water. These three sectors are inextricably linked and actions in one sector more often have impacts in one or both of the others; these interacting sectors can therefore be seen as a Food-Energy-Water Nexus (FEW Nexus) of systems.

The ERANET Sustainable Urbanisation Global Initiative (EN-SUGI) will bring together the fragmented research and innovation expertise across Europe and beyond to find innovative new solutions to this FEW Nexus challenge. Furthermore, by linking the activity of the Joint Programming Initiative (JPI) Urban Europe and the Belmont Forum (BF), EN-SUGI develops more resilient, applied urban solutions that bring research and innovation together from across the globe.

EN-SUGI is a project that foresees the participation of 19 Funding Agencies eligible for the EU top up, 18 from JPI Urban Europe and 1 from Argentina, and 6 FAs non eligible for EU top up, under the umbrella of the Belmont forum , collaborating on a volunteer base.

EN-SUGI Main objectives and impacts are:

To support development of practical innovations and new collaborative research that will allow urban areas to understand and address the challenges of the Food-Energy-Water systems. (Impact = 12-14 projects funded, and 15 cities/local authorities engaged)

To provide a framework for aligning R&I agendas of JPI Urban Europe and the BF,. The alignment will help foster transdisciplinary collaboration and co-creation in research and innovation, and facilitate the use of global expertise and knowledge (Impact = 24 funding organisations involved)

EN-SUGI will foster development of international relationships between the different parts of the research and innovation community – to enable them to contribute to addressing those challenges and goals, while aligning them to wider, strategic initiatives, including the SRIA agenda, Future Earth and UN –Habitat.

AccuWater		806502
Title: High accuracy water leakage and apparent loss detection		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 2/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.150.386	EU requested grant: **€1.505.270**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Water leakage, water loss, water pipes, water, monitoring, digital network, smart water network*

Abstract:

Bunt Planet is pioneering the development of intelligent Big Data Analytics solutions to reduce Water Losses, or Non-Revenue Water (NRW) and for related applications. NRW in potable water distribution networks poses a major global economic challenge, costing 14 billion € annually (according to the World Bank) and contributes to water stress, with associated climate change risks.

Comprising two modules, BuntPlanets' patented BuntBrain technology uniquely addresses both types of NRW, Physical Losses (Leakage) and Apparent Losses (losses due to unauthorised consumption, customer meter inaccuracies or data transmission and handling errors). BuntBrain is highly cost effective and offers a rapid payback on investment for water utilities – with significant benefits in terms of performance compared to alternative technologies. BuntBrain LeakFinder detects 33% smaller (early stage) leaks and can size and position leaks more accurately than other approaches. BuntBrain Water Meters is the only solution available which is customised to the water industry and which learns from user feedback.

BuntBrain has already attracted strong interest, including sales contracts, but it remains a challenge to gain market acceptance without further testing and in the absence of reference sites relevant to the diverse range of characteristics of water utilities. Initially, Bunt Planet plans to focus on water utility customers in Europe and Latin America.

The goals of the ACCUWATER Phase II project are to develop the algorithm to address the full range of conditions in the initial target markets and to create reference sites to facilitate commercial roll-out. BuntPlanet is targeting revenues of 18 million €, with 50 new employees by the fifth year after completion of the project. The technology can contribute to the evolution of new markets to analyse the large volumes of data available through smart meters and sensors within water distribution networks and has the potential to create man

Propelair		778742
Title: The refinement, miniaturisation and demonstration of an ultra low flush toilet capable of saving 2.8 billion litres of clean, potable water being unnecessarily wasted in Europe every day.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2017	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €1.271.787	EU requested grant: **€890.250**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Toilet, WC, water saving, Propelair, waste water, ultra, low, flush,*

Abstract:

As reported by the European Environment Agency, 70million people in Europe are living in water stressed areas. In the Mediterranean region that figure rises to 53%. Water shortages affect almost every country in Europe and the problem is getting worse. Water consumption per person is increasing significantly; by 55% in the last 25 years.

European flushing toilets (WCs) waste valuable, potable water on an unprecedented scale. The 392m installed base of toilets across the EU currently 'flush' away 102bn litres of clean water every day. That is enough to drain Lake Geneva every 20 hours.

There is clearly a pressing need for a novel technology to reduce the volume of water used in flushing toilets.

Existing toilets including the latest ultra low, dual flush units, do not offer the level of water reduction required. Since water volume is integral to their operational mode, they are compromised and all require significant flush volumes to clean effectively.

This project will demonstrate and bring to market readiness a 1.5L ultralow flush toilet that will reduce average toilet water consumption by 75% and directly save 2.8bn litres of water being unnecessarily wasted per day.

Propelair also provides attractive economic benefits and rapid payback to customers. It reduces water bills on average by 60%, (typically €344 per unit p.a.) delivering a payback within just 1.2 years.

This Dedicated SME Instrument project is essential for us to refine, miniaturise, demonstrate and cost reduce our prototype to overcome current barriers to market, including purchase price and lack of a proven long term demonstration.

A successful project delivery will allow us to achieve cumulative sales of €80.7m and an EBITDA of €31.5m by 2023. At a modest 0.5% market penetration, we will our save customers 2.8bn litres of water day or 1.04bn m3 p.a. worth over €1.98bn.

This proposal builds upon a previous proposal 755830 which scored 13.66 and received a Seal of Excellence.

WaterWorks2014		641715
Title: Water Works 2014-2019 in Support of the Water JPI		
Call Id: H2020-WATER-2014-one-stage	Topic: **WATER-3-2014**	Type of Action: **ERA-NET-Cofund**
Project start date: 2/1/2015	Duration: **60 months**	Unit: **RTD/C/01**
Total costs: €17.423.501	EU requested grant: **€5.749.755**	
Main thematic area: 31 - Water management / demand, allocation		

Free keywords: *Water Distribution Treatment Desalination Floods Droughts JPI Strategy Implementation*

Abstract:

Water is a critical resource for the European society. Beside its main life function, freshwater also provides many other functions essential to our economy. Water challenges cannot be successfully tackled through the isolated effort of individual national research and innovation programmes. This ERA-NET cofund proposal is submitted in the name of the Joint Programming Initiative “Water Challenges for a Changing World”, and aims at contributing to tackle European water challenges through the development of transnational and trans-disciplinary research and innovation actions. WaterWorks2014 addresses the specific challenge of integrating the efforts and Strategic Agendas of many European Water Research and Innovation funding organizations. This ERA-NET cofund will implement a Call for proposals on “research and innovation developing technological solutions and services to support the implementation of EU water policy, in particular for water distribution and measurement, waste water treatment and reuse, desalination, floods and droughts etc.” This Call for proposals will be funded by 18 organizations from 16 countries, and will have a total budget of 15.2 million Euro. This total budget includes a cofund from the European Commission amounting to 5.0 million Euro. WaterWorks2014 will also perform additional activities contributing to Water JPI Strategy and Implementation. Activities contributing to strategy include the development of new versions of the Water JPI Strategic Agenda and the Implementation Plan. Activities contributing to implementation include sharing good practices on Water research and innovation funding and management, exploratory workshops, alignment of on-going projects and the monitoring and final evaluation of Calls without cofunding. WaterWorks2014 will benefit researchers, policy-makers, water authorities, utility operators, industry, farmers, and citizens by developing new solutions to water challenges.

Project O		776816
Title: Project Ô: demonstration of planning and technology tools for a circular, integrated and symbiotic use of water		
Call Id: H2020-CIRC-2017TwoStage	Topic: **CIRC-02-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2018	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €10.692.938	EU requested grant: **€9.261.272**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Water Footprint; Advanced Oxidation Processes; Nanoadsorption; Modularisation; Demosntration activities; Industrial Symbiosis; Textile finishing; Food processing; Agriculture; Aquaculture*

Abstract:

Project Ô intends to demonstrate approaches and technologies to drive an integrated and symbiotic use of water within a specific area, putting together the needs of different users and waste water producers, involving regulators, service providers, civil society, industry and agriculture. The project seeks to apply the pillars of integrated water management (IWM) as a model for "water planning" (akin to spatial planning) and to demonstrate low cost, modular technologies that can be easily retrofitted into any water management infrastructure at district/plant level, hence enabling even small communities and SMEs to implement virtuous practices. Technologies and planning instruments complement each other as the first make possible the second and the latter can provide as example or even prescribe the former (and similar technologies allowing virtuous water use practices). Indeed the technologies support the regulators in implementing policy instruments, as foreseen by IWM, for convincing stakeholders (like developers and industry) to implement water efficiency strategies and could include instruments for e.g. rewarding virtuous behaviours (for example: advantageous water tariffs), planning regulations that award planning consent more swiftly or even prescribe the use of water from alternative sources (including recycling). Project Ô has in summary the overall objective of providing stakeholders (everybody using or regulating the use of water in an area) with a toolkit that enables them to plan the use of and utilise the resource water whatever its history and provenance, obtaining significant energy savings in terms of avoided treatment of water and waste water and release of pressure (quantity abstracted and pollution released) over green water sources. This overall objective will be demonstrated in up to four sites each in different Countries of Europe and in Israel, involving industries, aquaculture and agriculture as well as local authorities of different sizes.

RESCCUE		700174
Title: RESCCUE - RESilience to cope with Climate Change in Urban arEas - a multisectorial approach focusing on water		
Call Id: H2020-DRS-2015	Topic: **DRS-09-2015**	Type of Action: **IA**
Project start date: 5/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €8.084.616	EU requested grant: **€6.896.992**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Urban resilience, climate change, multisectorial approach, urban services, adaptation strategies, cost-benefit analysis, urban resilience platform*

Abstract:

RESCCUE aims to deliver a framework enabling city resilience assessment, planning and management by integrating into software tools new knowledge related to the detailed water-centred modelling of strategic urban services performance into a comprehensive resilience platform. These tools will assess urban resilience from a multisectorial approach, for current and future climate change scenarios and including multiple hazards. The project will review and integrate in the general framework existing options to assess climate change impacts and urban systems vulnerabilities allowing to assess multisectorial dependencies under multiple climate change scenarios. An adaptation strategies portfolio, including climate services, ecosystem-based approaches and resource efficiency measures will be incorporated as key components of the deployment strategy. The possible approaches will be ranked by their cost-efficiency in terms of CAPEX and OPEX to evaluate their benefits potential. This will enable city managers and urban system operators deciding the optimal investments to cope with future situations. The validation platform is formed by 3 EU cities (Barcelona, Lisboa and Bristol) that will allow testing the innovative tools developed in the project and disseminating their results among other cities belonging to major international networks. In terms of market potential, RESCCUE will generate large potential benefits, in terms of avoided costs during and after emergencies, that will contribute to their large-scale deployment. The structure of the consortium will guarantee the market uptake of the results, as the complete value chain needed is already represented. The project is coordinated by Aquatec, a large consultancy firm part of a multinational company focused on securing and recovering resources, and includes partners from the research domain, operation of critical urban systems, city managers and international organisations devoted to urban resilience.

CWASI		647473
Title: Coping with water scarcity in a globalized world		
Call Id:	Topic: **ERC-CoG-2014**	Type of Action: **ERC-COG**
Project start date: 7/1/2015	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.222.500	EU requested grant: **€1.222.500**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords:

Abstract:

We intend to set up a new globalized perspective to tackle water and food security in the 21st century. This issue is intrinsically global as the international trade of massive amounts of food makes societies less reliant on locally available water, and entails large-scale transfers of virtual water (defined as the water needed to produce a given amount of a food commodity). The network of virtual water trade connects a large portion of the global population, with 2800 km3 of virtual water moved around the globe in a year. We provide here definitive indications on the effects of the globalization of (virtual) water on the vulnerability to a water crisis of the global water system. More specifically, we formulate the following research hypotheses:

1) The globalization of (virtual) water resources is a short-term solution to malnourishment, famine, and conflicts, but it also has relevant negative implications for human societies.

2) The virtual water dynamics provide the suitable framework in order to quantitatively relate water-crises occurrence to environmental and socio-economic factors.

3) The risk of catastrophic, global-scale, water crises will increase in the next decades.

To test these hypotheses, we will capitalize on the tremendous amount of information embedded in nearly 50 years of available food and virtual water trade data. We will adopt an innovative research approach based on the use of: advanced statistical tools for data verification and uncertainty modeling; methods borrowed from the complex network theory, aimed at analyzing the propagation of failures through the network; multivariate nonlinear analyses, to reproduce the dependence of virtual water on time and on external drivers; multi-state stochastic modeling, to study the effect on the global water system of random fluctuations of the external drivers; and scenario analysis, to predict the future probability of occurrence of water crises.

Water4Cities		**734409**
Title: Holistic Surface Water and Groundwater Management for Sustainable Cities		
Call Id: H2020-MSCA-RISE-2016	Topic: **MSCA-RISE-2016**	Type of Action: **MSCA-RISE**
Project start date: 3/1/2017	Duration: **48 months**	Unit: **REA/A/03**
Total costs: €1.242.000	EU requested grant: **€1.242.000**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *groundwater; surface water; data analytics; data visualization; water monitoring; urban planning; water lifecycle*

Abstract:

Urban water management becomes progressively more challenging in the view of population growth and increasing complexity of water management infrastructure. In this line, there is an ever increase demand from the water providers' and public authorities' perspective to critically evaluate the existing water ecosystems at city level in respect to the water supply, waste water treatment, reuse potential and the effect the growing population has on the water ecosystem and endangered species. To enable effective decision making at the entire city level, both surface water and groundwater should be viewed as part of the overall urban water ecosystem with its spatio-temporal availability, quantity and quality and competing uses being taken into account.

The Water4Cities project will rely on sensor technologies, data and visual analytics to enable localization, visualization and analysis of urban water (both surface water and groundwater) at a holistic urban setting providing services to multiple water stakeholders. More specifically, the Water4Cities project aims to develop the necessary models and associated platform that will enable water providers and relevant stakeholders to a) monitor in real-time the urban water resources; b) support their decisions for optimal urban water management causing minimal environmental impact and c) involve policy makers, corporations and the public to provide the support for sound and balanced decision-making. Beyond the scientific results, Water4Cities will target the exchange of knowledge among project partners. The Water4Cities project requires the collaboration of researchers in different research areas, i.e., water management, urban infrastructure management, sensor networks, data mining, data visualization, system integration, urban planning. Due to the multi-disciplinary nature of the project, staff exchanges will allow partners working closely together to deliver high quality results.

CLARA		730482
Title: Climate forecast enabled knowledge services		
Call Id: H2020-SC5-2016-TwoStage	Topic: **SC5-01-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €3.821.700	EU requested grant: **€3.459.075**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Copernicus Climate change services, climate seasonal and decadal forecasts, disaster risk reduction, agriculture, air pollution, water availability*

Abstract:

Climate variability and change (CVC) embody sizeable economic, social and environmental risks in Europe and globally . Climate services (CSs) (Brasseur and Gallardo, 2016; Brooks, 2013; Lourenco et al., 2015) are essential for catalysing economic and societal transformations that not only reduce these risks and/or improve societal resilience, but also unlock Europe's innovation potential, competitiveness and economic growth. As a part of European efforts to catalyse the potential of climate services for more efficient natural resource management and improved disaster risk management and resilience, the CLARA project will boost innovation and uptake of climate services based on front line seasonal and decadal forecasts and climate projections. Building upon the advancements in climate modelling and science in the context of the Copernicus Climate Change Service (C3S), the CLARA project will illustrate genuine benefits and economic value of CSs in the face of climate variability and short-term climate change. A portfolio of user co-designed and co-developed climate services will help to improve policy and decision makings in the five priority areas GFCS: disaster risk reduction, water resource management, agriculture and food (security), renewable energy sources, and public health. Carefully designed business and marketing strategies will promote their uptake, help to energise the European market with climate services, and foster the European innovation potential.

BINGO		641739
Title: Bringing INnovation to onGOing water management – A better future under climate change		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-2a-2014**	Type of Action: **RIA**
Project start date: 7/1/2015	Duration: **51 months**	Unit: **EASME/B/02**
Total costs: €7.822.423	EU requested grant: **€7.822.423**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Flood risk management, water quality*

Abstract:

The water sector needs improved climate prediction and downscaling based on consistent grounds (IPCC 5th Assessment Report, 2013). There is also a need for near future weather scenarios and anticipation of their impacts in the water cycle together with risk management strategies. BINGO will provide demand-driven solutions for a number of specific climate-related challenges in particular for highly vulnerable water resources of strategic importance. Water managers and other stakeholders will then be provided with information on specific climate scenarios at the space/time resolution fitting their needs, enabling them to act at various geographical levels (local, regional and European). BINGO aims at reducing the uncertainty of climate predictions and developing response strategies to help society manage that uncertainty. An innovative approach consists of enrolling end-users from the start, identifying specific vulnerabilities, needs and concerns about future climate. BINGO is built around 7 research sites in Northern and Southern Europe, covering a representative range of climatic conditions as well as combinations of water systems and water pressures. They illustrate a variety of water cycles at local/regional scales in Europe over various timescales, as well as common problems, including floods and droughts; water quality pressured by CSO, agriculture and competing demands for water (urban/tourism; agriculture/food security; hydropower). To guarantee sound management strategies for future weather challenges, BINGO will develop and validate all solutions built by strong dynamic interaction of researchers with end-users and decision makers throughout the project. By creating such knowledge alliances, water managers and other stakeholders can share awareness of climate challenges, thus increasing the possibilities of collaboration in order to manage and better cope with future climate challenges.

SIM4NEXUS		689150
Title: Sustainable Integrated Management FOR the NEXUS of water-land-food-energy-climate for a resource-efficient Europe		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-2b-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €7.895.658	EU requested grant: **€7.895.658**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *nexus, water, land, food, energy, climate change*

Abstract:

Land, food, energy, water and climate are interconnected, comprising a coherent system (the 'Nexus'), dominated by complexity and feedback. The integrated management of the Nexus is critical to secure the efficient and sustainable use of resources. Barriers to a resource efficient Europe are policy inconsistencies and incoherence, knowledge gaps, especially regarding integration methodologies and tools for the Nexus, and knowledge and technology lock-ins. SIM4NEXUS will develop innovative methodologies to address these barriers, by building on well-known and scientifically established existing "thematic" models, simulating different components/"themes" of the Nexus and by developing: (a) novel complexity science methodologies and approaches for integrating the outputs of the thematic models; (b) a Geoplatform for seamless integration of public domain data and metadata for decision and policy making; (c) a Knowledge Elicitation Engine for integrating strategies at different spatial and temporal scales with top down and bottom up learning process, discovering new and emergent knowledge, in the form of unknown relations between the Nexus components and policies/strategies; (d) a web-based Serious Game for multiple users, as an enhanced interactive visualisation tool, providing an immersive experience to decision- and policy-makers. The Serious Game will assist the users (as players) in better understanding and visualising policies at various geo-/spatial scales and from a holistic point of view, towards a better scientific understanding of the Nexus. The Serious Game will be validated (applied, tested, verified and used) via ten Case Studies ranging from regional to national level. Two further Strategic Serious Games at European and Global levels will also be developed for demonstration, education and further exploitation purposes, accompanied by a robust business plan and IPR framework, for taking advantage of the post-project situation and business potential.

FREEWAT		642224
Title: FREE and open source software tools for WATer resource management		
Call Id: H2020-WATER-2014-one-stage	Topic: **WATER-4a-2014**	Type of Action: **CSA**
Project start date: 4/1/2015	Duration: **30 months**	Unit: **EASME/B/02**
Total costs: €1.583.913	EU requested grant: **€1.411.163**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Implementation of EU water related policies, Participatory approach, Open source and public domain software, GIS integrated water management modelling*

Abstract:

FREEWAT aims at promoting water management and planning by simplifying the application of the Water Framework Directive and other EU water related Directives. FREEWAT will be an open source and public domain GIS integrated modelling environment for the simulation of water quantity and quality in surface water and groundwater with an integrated water management and planning module.

Specific objectives of the FREEWAT project are:

- to coordinate previous EU and national funded research to integrate existing software modules for water management in a single environment into the GIS based FREEWAT;

- to support the FREEWAT application in an innovative participatory approach gathering technical staff and relevant stakeholders (in primis policy and decision makers) in designing scenarios for the proper application of water policies.

FREEWAT will initiate a process aimed at filling the gap between EU and US on widespread-standardised ICT tools and models for management of water quantity and quality and will set a well recognisable and flagship initiative. The open source characteristics of the platform allow to consider this an initiative "ad includendum" (looking for inclusion of other entities), as further research institutions, private developers etc. may contribute to the platform development.

Through creating a common environment among water research/professionals, policy makers and implementers, FREEWAT main impact will be on enhancing science- and participatory approach and evidence-based decision making in water resource management, hence producing relevant and appropriate outcomes for policy implementation.

The Consortium is constituted by partners from various water sectors from 11 EU countries, plus Switzerland, Turkey and Ukraine. Synergies with the UNESCO HOPE initiative on free and open source software in water management greatly boost the value of the project. Large stakeholders involvement guarantees results dissemination and exploitation.

DAFNE		690268
Title: DAFNE: Use of a Decision-Analytic Framework to explore the water-energy-food NExus in complex and trans-boundary water resources systems of fast growing developing countries.		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 9/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.420.223	EU requested grant: **€3.408.659**	
Main thematic area: 32 - Water management / scenarios, modelling, DSS		

Free keywords: *Trans-boundary basins, developing countries, integrated water resources management, decision-analytic framework, sustainable development, interdisciplinary, Participatory and Integrated Planning.*

Abstract:

Global trends in population growth and rising economic prosperity will increase the demand for energy, food and water, with more severe impact in fast-growing economies, such as in several African countries. The constraints on water, energy, and food could well hamper economic development, lead to social and geopolitical tensions, and cause lasting environmental damage. DAFNE advocates an integrated and adaptive water resources planning and management approach that explicitly addresses the water-energy-food (WEF) nexus from a novel participatory and multidisciplinary perspective. This includes social, economic, and ecologic dimensions, involves both public and private actors and is socially inclusive, enhances resource efficiency and prevents the loss of ecosystem services in regions where large infrastructures exist or are being built and intensive agriculture is expanding. A decision-analytic-framework (DAF) will be developed to quantitatively assess the social, economic, and environmental impact of expanding energy and food production in complex physical and political contexts, where natural and social processes are strongly interconnected and the institutional setting involves multiple stakeholders and decision-makers. The DAFNE approach will be demonstrated by analysing two cross-boundary case studies, the Zambezi and the Omo river basins. The WEF nexus will be quantified and analysed as the trade-off between conflicting objectives such as hydropower production vs irrigation, land exploitation vs conservation, etc. The nexus will be translated in economic values and impact on growth, ecosystems and ecosystem services. DAFNE will allow a better understanding of the WEF nexus, and generate and explore alternative planning and management solutions based on the cooperation of public and private stakeholders, which foster the profitable but equitable use of resources without transgressing environmental limits or creating societal and/or stakeholder conflicts.

PrimeWater		870497
Title: Delivering Advanced Predictive Tools form Medium to Seasonal Range for Water Dependent Industries Exploiting the Cross-Cutting Potential of EO and Hydro-Ecological Modeling		
Call Id: H2020-SPACE-2019	Topic: **DT-SPACE-06-EO-2019**	Type of Action: **RIA**
Project start date: 12/1/2019	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.077.680	EU requested grant: **€2.013.828**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords:

Abstract:

PrimeWater aims to maximize the potential of the Earth Observation (EO) technologies for the water sector by enhancing and expanding the information base for inland water quality attributes, through advanced physics-based algorithms that integrate multi- and hyper-spectral imagery from satellite, airborne and ground-based sensors, increasing the situational intelligence of water regulators, emergency planners, water-related industry professionals and local communities.

PrimeWater aspires to further add value to EO data and other Copernicus sectoral services through cross-cutting research with Data Assimilation (DA) and Machine Learning (ML) techniques aiming at improving the skill of hydro-ecological forecasts and their related impact at different spatial scales and time horizons, and hence improve preparedness against water hazards and enhance the capacity of decision-making through uncertainty information.

PrimeWater will establish a complete value chain linking science with the water business sector, ensuring the co-development of products and services through continuous and efficient interaction and communication with water professionals across the globe and in-depth analysis of the intrinsic barriers for the wide market uptake of EO-enabled services in the water sector. As a result PrimeWater will deliver water intelligent services that capitalize on advanced EO data products and intersections with other data sources, will build on cause-effect analyses through diagnostic modelling tools, and will utilize predictive and prescriptive calculations by integrating forecasting capabilities with planning and scenario analysis.

WaterSENSE		870344
Title: Making SENSE of the Water value chain with Copernicus Earth Observation, models and in-situ data		
Call Id: H2020-SPACE-2019	Topic: **DT-SPACE-06-EO-2019**	Type of Action: **RIA**
Project start date: 1/1/2020	Duration: **48 months**	Unit: **REA/B/01**
Total costs: €1.999.175	EU requested grant: **€1.999.175**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords:

Abstract:

Shortages of freshwater will be one of the most pressing problems in feeding the world this century. To optimize use of available water it is important to distribute it wisely over the various competing interests, in particular agriculture, which is responsible for 70% of all freshwater use. Irrigation is currently often unsustainable, while groundwater reserves are becoming depleted and many places in the world are suffering water shortages. Action is therefore required now to use space and in-situ monitoring systems, to create a better sense of water availability and optimise use across the planet. WaterSENSE will provide water-availability and mapping services for any place in the world at different time and space resolutions, based on integrated Copernicus data, hydrological models and local data. The results of these services will be open access so as to further develop value-adding services. WaterSENSE itself will deliver the essential value-added service of monitoring compliance of local water use against water rights and regulations ('water auditing'). The first application will be in the multi-climate Murray-Darling Basin in Australia, followed by validation in South Africa and the Netherlands. Consortium partners already provide water-availability and water-auditing services in the latter two countries. Novel research in the project will develop scalable information services, based on advanced big-data processing algorithms, to determine variables such as evapotranspiration, irrigation water use, rainfall and soil moisture, as well as machine learning to allow automatic data processing and reduce uncertainty in the hydrological variables determined. DIAS services for data provision, as well as cloud hosting and processing of computational services, will be developed and implemented. Existing successful partnership models will be refined to ensure service providers in the water value chain achieve healthy business development.

DIANA		730109
Title: Detection and Integrated Assessment of Non-authorised water Abstractions using EO		
Call Id: H2020-EO-2016	Topic: **EO-1-2016**	Type of Action: **IA**
Project start date: 1/1/2017	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.478.969	EU requested grant: **€1.937.891**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *non-authorized water abstraction, Earth Observation, Copernicus programme, Irrigation, water management, commercial service platform, Earth observation applications*

Abstract:

DIANA is aimed at co-designing and openly demonstrating a commercial service platform that will empower water managers and authorities to optimise the identification and inspection of non-authorised water abstractions for irrigation as well as improve their water management policies and practices, especially in extreme conditions such as drought. DIANA will leverage EO data provided by Copernicus and other data sources as well as state-of-the-art models for the identification of (illegally) irrigated areas and the estimation of abstracted water volumes in order to offer a value added suite of data products and services, that will be affordable and cost-effective. The value propositions of DIANA will be co-created and defined along with users and stakeholders so as to be shaped according to their needs and requirements. Three pilots will be deployed in order to put them to the test in real operational environments of Spain, Italy and Romania. All pilots will be integrated with the work flows of the users and their results will be co-evaluated and validated with them through a multi-layer methodology, fostering the acceptance of DIANA as a marketable solution. In order to ensure the demand-driven design of the DIANA service platform as well as set the stage for its market launch and uptake following the end of the project, a customer-driven business modelling process will be followed during the project, validating its business case and producing an effective business plan to serve as the roadmap for its post-project commercialization. Finally, DIANA is implemented by a transnational and well-balanced consortium, consisting of innovative SMEs and pioneering authorities, all of which possess the complementary expertise as well as the motivation and commitment required to ensure not only the creation of meaningful project outcomes but also their successful commercial exploitation and sustainability.

EOMORES		730066
Title: Earth Observation based services for Monitoring and Reporting of Ecological Status		
Call Id: H2020-EO-2016	Topic: **EO-1-2016**	Type of Action: **IA**
Project start date: 12/1/2016	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.219.318	EU requested grant: **€2.005.862**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *water quality, WFD, reporting, monitoring, operational services, ecological indicators, spatial analysis, in situ, ecological forecasting*

Abstract:

EOMORES (Earth Observation-based Services for Monitoring and Reporting of Ecological Status) aims to develop new highly efficient commercial services for operational inland and coastal ecological water quality monitoring.

Inland and coastal water bodies constitute essential components of ecology and biodiversity, they buffer climate change and influence many aspects of economy (recreation, fisheries) and human welfare (e.g. drinking water supply). Knowledge about the state of these waters is therefore of great importance. This is recognized by the Water Framework Directive (WFD) requiring the EU member states to monitor and improve the status of these water bodies.

EOMORES will develop fully-automated commercial, reliable and sustainable services based on the integration of Earth observation (Sentinel 1, 2 and 3), in situ monitoring using optical in situ sensors with integrated GNSS positioning, and ecological modeling. The validated data from these components will be flexibly combined into higher-level products to fit the users' information needs. Three service concepts are envisaged: 1) operational water quality monitoring and forecasting for operational water management, 2) implementation of validated EO-based water quality indicators for WFD and other reporting and 3) historic compilation of data for specific ecological analysis.

The target users of EOMORES are international, national and regional authorities responsible for monitoring and management of water quality and for WFD reporting. Additional targeted users are private entities dealing with water quality. Thirteen users from six countries have committed to collaborate with the consortium to define and evaluate the EOMORES services. The services are expected to result in lower operational costs, more reliable and more timely water quality datasets for water managers. By introducing these services into the worldwide market, an increase in annual turnover of €3.000.000 by 2020 is expected.

SPACE-O		730005
Title: Space Assisted Water Quality Forecasting Platform for Optimized Decision Making in Water Supply Services		
Call Id: H2020-EO-2016	Topic: **EO-1-2016**	Type of Action: **IA**
Project start date: 11/1/2016	Duration: **26 months**	Unit: **REA/B/01**
Total costs: €2.469.949	EU requested grant: **€2.002.088**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *EO, Hydrological modelling, Water quality, Data assimilation, Water Utilities, Performance Indicators, Decision Support System, Copernicus*

Abstract:

Satellite remote sensing has been evolved into a powerful tool for global monitoring of surface waters. Earth Observations (EO) and remote sensing are widely used for quantifying the physical parameters of reservoirs as well as for retrieving selected water constituents concentrations.

Space-O aims at the integration of state of the art (EO) and in situ monitoring with advanced hydrological, water quality models and ICT tools into a powerful decision support system (DSS) for generating real time, short to medium term forecasting water flows and quality data in reservoirs which will be used for the optimization of water treatment plants (WTPs) operations, establishing a complete service line from EO to water business sector.

An operational service platform will be designed to facilitate increased interoperability among EO and modeled services. Data acquisition and integration of almost real time EO data in the hydrological and water quality models will be implemented in order to provide improved real-time, short to medium term water quantity and quality forecasting in reservoirs.

A risk-based DSS will be developed in order to enable cost-effective and environmental sustainable Water Treatment Plants (WTPs) operation, based on the water quality parameters forecasts at the reservoir, the in situ monitoring data and the data collected through supervisory control and data acquisition (SCADA) systems used in WTPs for operation control.

Additionally, developing Copernicus Services (C3S) will be jointly assessed with site-specific data sets generated through the satellite, modeling, in situ and citizens monitoring services, to produce continuous monitored indicators for enabling water quality Risk Assessment analysis on a catchment level.

CoastObs		776348
Title: Commercial service platform for user-relevant coastal water monitoring services based on Earth observation		
Call Id: H2020-EO-2017	Topic: **EO-1-2017**	Type of Action: **IA**
Project start date: 11/1/2017	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.306.911	EU requested grant: **€1.968.614**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Water quality, coastal areas, coastal zone management, aquaculture, environmental monitorin and reporting, marine engineering, ecological indicators, operational services*

Abstract:

Coastal zones are very productive areas, offering many valuable habitats and ecosystems services and attracting human settlements and activities. The intensive concentration of population and excessive exploitation of natural resources puts high pressure on coastal ecosystems leading to biodiversity loss, habitat destruction, pollution as well as conflicts between potential uses and space competition. Several European directives aim at sustainable management of coastal waters, retaining or restoring a high ecological status and safeguarding ecosystem services. Increasing pressure and stricter regulations increase the need for efficient monitoring solutions. Where traditional in situ sampling is insufficient to characterise the highly dynamic coastal environments, Earth Observation (EO) provides a synoptic view and frequent coverage. With the launch of the Copernicus Sentinel satellites, operational water quality services become a business opportunity.

CoastObs will develop a service platform for coastal water monitoring with validated products derived from EO. In dialogue with users from various sectors, CoastObs will develop innovative EO-based products: monitoring of seagrass and macro-algae, phytoplankton size classes, primary production, and harmful algae as well as higher level products such as indicators and integration with predictive models. CoastObs will establish sustainable supply chains that can be directly integrated into the users' systems. The CoastObs consortium has the knowledge and ambition to develop services that are commercially viable, grow in capacity and thus create new jobs. The business case is to define user groups with common requirements, so tailored products can be developed at highly reduced costs per user. Setup of efficient data structures (array database) for smart (re)processing of data is part of this ambition. The commitment of 13 users to CoastObs demonstrates the need for such user-friendly and affordable coastal water services

Co-ReSyF		687289
Title: Coastal Waters Research Synergy Framework		
Call Id: H2020-EO-2015	Topic: **EO-2-2015**	Type of Action: **RIA**
Project start date: 1/1/2016	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.999.901	EU requested grant: **€2.999.901**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Cloud computing; Big data; Earth Observation; Services; Coastal Waters Research.*

Abstract:

The Co-ReSyF project will implement a dedicated data access and processing infrastructure, with automated tools, methods and standards to support research applications using Earth Observation (EO) data for monitoring of Coastal Waters, leveraging on the components deployed SenSyF. The main objective is to facilitate the access to Earth Observation data and pre-processing tools to the research community, towards the future provision of future Coastal Waters services based on EO data.

Through Co-ReSyF's collaborative front end, even young and/or inexperienced researchers in EO will be able to upload their applications to the system to compose and configure processing chains for easy deployment on the cloud infrastructure. They will be able to accelerate the development of high-performing applications taking full advantage of the scalability of resources available in the cloud framework. The included facilities and tools, optimized for distributed processing, include EO data access catalogue, discovery and retrieval tools, as well as a number of pre-processing and toolboxes for manipulating EO data. Advanced users will also be able to go further and take full control of the processing chains and algorithms by having access to the cloud back-end and to further optimize their applications for fast deployment for big data access and processing.

The Co-ReSyF capabilities will be supported and initially demonstrated by a series of early adopters that will develop new research applications on the coastal domain, will guide the definition of requirements and serve as system beta testers. A competitive call will be issued within the project to further demonstrate and promote the usage of the Co-ReSyF release. These pioneering researchers in will be given access not only to the platform itself, but also to extensive training material on the system and also on Coastal Waters research themes, as well as to the project's events, including the Summer School and Final Workshop.

CERTO		870349
Title: Copernicus Evolution – Research for Transitional-water Observation		
Call Id: H2020-SPACE-2019	Topic: **LC-SPACE-04-EO-2019**	Type of Action: **RIA**
Project start date: 1/1/2020	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €2.843.000	EU requested grant: **€2.843.000**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Water quality*

Abstract:

Water quality is a key worldwide issue relevant to food production, industry, nature and recreation. Recognising its importance, Copernicus has satellite data and services to provide water quality data and information to end-users in industry, policy, monitoring agencies and science. However, water quality data production is split across three services, Copernicus Marine, Climate Change, and Land, with different methods used, while transitional waters are not supported by any service.

CERTO will address these issues by undertaking R&D necessary to produce harmonised water quality data from each Copernicus service and extend support to the large communities operating in transitional waters. CERTO will focus on: methods to classify waters, using satellite observations, together with existing and new in situ data; improvements to remove the atmospheric signal, particularly problematic in near-coastal and transitional waters; and evaluating cross-cutting optical water quality Indicators, that may be used across coasts, transitional and inland waters (monitored through WFD and MSFD). The project will contribute to DANUBIUS the developing European research infrastructure in River-Sea Systems, GEO AquaWatch and Blue Planet, the Lagoons for Life initiative as well as supporting the United National Sustainable Development Goals.

The main output of the project will be a prototype that can be “plugged into” the existing services, or the Copernicus DIAS, and widely used open-source software (SNAP). CERTO will also produce the evidence needed by the “entrusted entities” that run Copernicus services as to the improvements, potential to increase the user community, possible downstream services and wider impact of the prototype.

CERTO will achieve it objectives by bringing uniquely together the leaders of the water quality data elements in the three Copernicus Services, 5 SMEs Climate-KIC, 4 research intensive institutes/and leaders of end-user relevant communities.

Fiware4Water		821036
Title: FIWARE for the Next Generation Internet Services for the WATER sector		
Call Id: H2020-SC5-2018-2	Topic: **SC5-11-2018**	Type of Action: **IA**
Project start date: 6/1/2019	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €5.700.245	EU requested grant: **€4.997.945**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *water utilities, NGI,*

Abstract:

FIWARE is a smart solution platform, funded by the EC (2011-16) as a major flagship PPP, to support SMEs and developers in creating the next generation of internet services, as the main ecosystem for Smart City initiatives for cross-domain data exchange/cooperation and for the NGI initiative. So far little progress has been made on developing specific water-related applications using FIWARE, due to fragmentation of the water sector, restrained by licensed platforms and lagging behind other sectors (e.g. telecommunications) regarding interoperability, standardisation, cross-domain cooperation and data exchange.

Fiware4Water intends to link the water sector to FIWARE by demonstrating its capabilities and the potential of its interoperable and standardised interfaces for both water sector end-users (cities, water utilities, water authorities, citizens and consumers), and solution providers (private utilities, SMEs, developers).

Specifically we will demonstrate it is non-intrusive and integrates well with legacy systems. In addition to building modular applications using FIWARE and open API architecture for the real time management of water systems, Fiware4Water also builds upon distributed intelligence and low level analytics (smart meters, advanced water quality sensors) to increase the economic (improved performance) and societal (interaction with the users, con-consensus) efficiency of water systems and social acceptability of digital water, by adopting a 2-Tier approach: (a) building and demonstrating four Demo Cases as complementary and exemplary paradigms across the water value chain (Tier#1); (b) promoting an EU and global network of followers, for digital water and FIWARE (cities, municipalities, water authorities, citizens, SMEs, developers) with three complementary Demo Networks (Tier#2). The scope is to create the Fiware4Water ecosystem, demonstrating its technical, social and business innovative potential at a global level, boosting innovation for water.

NAIADES		820985
Title: A holistic water ecosystem for digitisation of urban water sector		
Call Id: H2020-SC5-2018-2	Topic: **SC5-11-2018**	Type of Action: **IA**
Project start date: 6/1/2019	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €5.729.754	EU requested grant: **€4.999.980**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Artificial Intelligence, Deep Learning Models, Machine Learning, Consumer Behavior Monitoring, IoT*

Abstract:

NAIADES Ecosystem envisions transforming water sector through automated and smarter water resource management and environmental monitoring, achieving a high level of water services in both residential or commercial consumers, exploiting the efficient use of physical and digital components of water ecosystem. NAIADES will apply in various situations on diverse big data in terms of sources, data types, and entities represented that is collected by such water monitoring and control systems in Europe, including (i) the water consumption in both retail and corporation efficiency, (ii) the confidence of water consumers (including special groups as ageing, disabled persons and children), by measuring the water quality in residential buildings, offices and public infrastructures (mall, hospital), (iii) the safety and reliability through the detection of warning signs from equipment failures and maintenance report, and (iv) personalized persuasive feedback and recommendation services provided to the NAIADES App Users aiming to enhance public awareness on water consumption and usage savings, and promote user engagement in water conservation activities. NAIADES AI elements, aim to provide multidimensional intelligence on the water ecosystem by introducing: Situational Intelligence - by collecting real-time data from the buildings as they are in operation and analysing it in three different dimensions; Spatial, Temporal and Nodal; Operational intelligence - by using the power of data and its capability to extract the right information at the right time to provide insight into water infrastructure operation and improve the effectiveness of maintenance activities; Asset intelligence: the continuous data streams produced from various sub-systems in buildings will help OEMs build digital twins that represent physical systems in real-time. NAIADES ecosystem will be validated and demostrated in three heterogeneous pilot sites.

DWC		820954
Title: DIGITAL-WATER.city - Leading urban water management to its digital future		
Call Id: H2020-SC5-2018-2	Topic: **SC5-11-2018**	Type of Action: **IA**
Project start date: 6/1/2019	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €5.878.015	EU requested grant: **€4.997.162**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Urban Water Systems*

Abstract:

digital-water.city's (DWC) main goal is to boost the integrated management of waters systems in five major European urban and peri-urban areas, Berlin, Milan, Copenhagen, Paris and Sofia, by leveraging the potential of data and smart digital technologies. DWC will create linkages between the digital and the physical worlds by developing and demonstrating 18 advanced digital solutions to address current and future water-related challenges; namely the protection of human health, the increase of performance and return on investment of water infrastructures and the involvement of citizens in urban water management. Areas of application of DWC digital solutions range from groundwater management, sewer maintenance and operation, wastewater treatment and reuse to urban bathing water management. DWC combines cutting-edge digital technologies such as augmented reality, open source software, cloud computing, real-time sensors, artificial intelligence, predictive analytics and decision support systems. DWC integrates the development of digital solutions in a dedicated guiding protocol to cover the existing gaps regarding ICT governance, interoperability, ontology and cybersecurity. Ultimately, DWC will provide an interoperable free flow of information among stakeholders and across the water value chain. DWC will generate the necessary conditions for co-creation and open innovation by the establishment of Community of Practices aiming at integrating stakeholder knowledge, ensuring the transferability of the digital solutions in other European or international contexts, supporting knowledge transfer beyond DWC and creating durable binding between European cities. The large scale assessment and communication of the benefits provided by the digital solutions in five major cities will serve as lighthouse, raising the awareness of European cities for a necessary digital transformation, and opening new market opportunities for DWC partners and European providers of digital solutions.

SCOREwater		820751
Title: Smart City Observatories implement REsilient Water Management		
Call Id: H2020-SC5-2018-2	Topic: **SC5-11-2018**	Type of Action: **IA**
Project start date: 5/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.787.788	EU requested grant: **€4.998.728**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Resilience, urban drainage, organisational science, open platform, sewer sociology, water-safe construction projects, flooding resilience, data market*

Abstract:

SCOREwater focuses on enhancing the resilience of cities against climate change and urbanization by enabling a water smart society that fulfils SDGs 3, 6, 11, 12 and 13 and secures future ecosystem services. We introduce digital services to improve management of wastewater, stormwater and flooding events. These services are provided by an adaptive digital platform, developed and verified by relevant stakeholders (communities, municipalities, businesses, and civil society) in iterative collaboration with developers, thus tailoring to stakeholders' needs. Existing technical platforms and services (e.g. FIWARE, CKAN) are extended to the water domain by integrating relevant standards, ontologies and vocabularies, and provide an interoperable open-source platform for smart water management. Emerging digital technologies such as IoT, Artificial Intelligence, and Big Data are used to provide accurate real-time predictions and refined information. We implement three large-scale, cross-cutting innovation demonstrators and enable transfer and upscale by providing harmonized data and services. We initiate a new domain "sewage sociology" mining biomarkers of community-wide lifestyle habits from sewage. We develop new water monitoring techniques and data-adaptive storm water treatment and apply to water resource protection and legal compliance for construction projects. We enhance resilience against flooding by sensing and hydrological modelling coupled to urban water engineering. We will identify best practices for developing and using the digital services, thus addressing water stakeholders beyond the project partners. The project will also develop technologies to increase public engagement in water management. Moreover, SCOREwater will deliver an innovation ecosystem driven by the financial savings in both maintenance and operation of water systems that are offered using the SCOREwater digital services, providing new business opportunities for water and ICT SMEs.

TWIGA		776691
Title: Transforming Weather Water data into value-added Information services for sustainable Growth in Africa		
Call Id: H2020-SC5-2017-OneStageB	Topic: **SC5-18-2017**	Type of Action: **RIA**
Project start date: 2/1/2018	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.006.824	EU requested grant: **€4.979.623**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *Data assimilation*

Abstract:

Objectives: Provide currently unavailable geo-information on weather, water and climate for sub-Saharan Africa by enhancing satellite-based geo-data with innovative in situ sensors and developing related information services that answer needs of African stakeholders and the GEOSS community.

Concept: A systematic feedback loop to reciprocally validate in situ measurements and satellite data in one integrated model. Over 500 in situ measurement stations using citizen science.

State of the art advancement & Innovation potential: Building on and pushing further recent advances in sensor and communication technology to provide cheaper and more robust in situ measurements covering a wider area at a higher resolution in sub-Saharan Africa. Working with tech-hubs in Europe and Africa to feed creation and growth of European and African start-ups that develop sensors and geo-services, delivering complete value chains from sensor to customer-ready information delivery.

Impact on call expectations:

-Integration of in situ components into models based on GEOSS and Copernicus data

-OGC compliant science-grade geo-data (atmosphere, hydrosphere, biosphere) delivered to GEOSS, incl. near-real time statistically characterized soil moisture data from Africa that can be used operationally (not currently available) and radar derived soil moisture measurements also available under cloudy conditions, or vegetation overgrowth

-at least 20 new products for use in food, water, energy security, climate change and resilience to natural hazards validated and ready for large-scale implementation by consortium partners and external stakeholders

-based on at least 10 innovative, cost efficient, robust, sensors, including fast neutron coun-ter, track¬ing of convective storms with consumer lightning sensors and accelerometer for tree-crown weighing

-(Bio-degradable) sensors reduced to one tenth to one hundredth of their current price, extremely low-maintenance, use of Unmanned Aerial Vehicles.

MONOCLE		776480
Title: Multiscale Observation Networks for Optical monitoring of Coastal waters, Lakes and Estuaries		
Call Id: H2020-SC5-2017-OneStageB	Topic: **SC5-18-2017**	Type of Action: **RIA**
Project start date: 2/1/2018	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.999.863	EU requested grant: **€4.999.863**	
Main thematic area: 33 - Water management / EO, data, IT		

Free keywords: *earth observation, water quality, sensor development, platform innovation, citizen science, UAV, ships, buoys, market analysis, capacity building, sensor data innovation*

Abstract:

MONOCLE innovates and develops sensor, platform, and data handling technologies to increase coverage and lower the cost of in situ sensors in inland and coastal water bodies. These ecosystems are particularly vulnerable to direct anthropogenic impacts but of high economic importance and crucial to sustainable food, energy, and clean water supply. At the same time, these water bodies represent areas of the weakest performance in present EO capability to date.

The MONOCLE system will reduce uncertainties in Earth Observation (EO) by characterising atmospheric and water optical properties. MONOCLE will deploy new and improved sensors on autonomous platforms (buoys, ships, drones), and further fill information gaps by developing low-cost complementary solutions for citizen scientists. This will provide essential reference observations needed to further improve and grow EO-based water quality services.

MONOCLE will be requirement-driven and implemented by sensor and platform developers, sensor-data infrastructure experts, and EO scientists. A service-oriented data storage, processing, and visualisation infrastructure based on open data standards will integrate MONOCLE seamlessly with existing platforms. This also allows MONOCLE to build sensor performance traceability into its core to support synergistic sensor use and data inspection to identify sensor drift and episodic events.

MONOCLE will demonstrate the added value of EO and water quality oriented sensor network to Copernicus EO services, GEOSS data brokering and GEO capacity building initiatives through a number of validation campaigns and use cases, including data-poor regions where no similar infrastructure yet exists. It is expected that the evolution of system standards, new sensors and innovative use of observation platforms of MONOCLE will foster innovation and commercial opportunities for the EO commercial sector and its downstream users in domains ranging from public health to energy and food security.

AquaSHIELD		666490
Title: Protecting citizens against intentional drinking water contamination with a water quality firewall		
Call Id: H2020-SMEINST-2-2014	Topic: **DRS-17-2014**	Type of Action: **SME-2**
Project start date: 1/1/2015	Duration: **29 months**	Unit: **EASME/A/02**
Total costs: €1.123.136	EU requested grant: **€786.195**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Online Water Quality Monitoring, Real-Time, Firewall,Optical Sensors, Contaminant Identification, Biosensoring, Early Warning System, Drinking Water Distribution System, Optisense*

Abstract:

Critical water infrastructures and high profile (soft) targets are vulnerable to intentional drinking water contamination. Physical access is difficult to control and traditional water quality monitoring solutions are largely inadequate to protect the water distribution process and its consumers. In light of increasing security threats there is a strong need amongst water suppliers and authorities, in Europe and globally, for a contaminant warning system that can be deployed in the distribution network and that provides real-time water quality information and event classification to support rapid decision making and protect the health of citizens AquaSHIELD is based on an innovative and awarded optical sensor technology developed by Dutch optical sensor company Optisense, and is unique in combining 24/7 online event detection and high spec analytical capabilities for multiple substances in an affordable platform suitable for deployment in the field and for operation by non-specialist personne.

The AquaSHIELD solution integrates two sub-components that have already been tested and validated by leading water companies in the Netherlands and Singapore, and will consist of a generic sensor for online real-time detection of contamination events, online monitoring of chlorine residual as indicator for micro-biological contaminations, and rapid screening capability for a set of high priority threat substances. Support letters from drinking water companies in the Netherlands, France and Israel confirm how AquaSHIELD will fulfil a market requirement that is currently not met.

Globally water utilities spend over USD 180 billion annually on the production and distribution of drinking water, of which 3 billion is spent on water quality analysis. Water security is an increasingly important niche in this large global market. The dual-use capability of the individual AquaSHIELD sub-components further adds to the commercial potential (smart grids) of the project and Optisense.

Bio-LP-1		950822
Title: A novel rapid environmental test for the human pathogen Legionella		
Call Id: H2020-EIC-FTI-2018-2020	Topic: **EIC-FTI-2018-2020**	Type of Action: **IA**
Project start date:	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.826.040	EU requested grant: **€1.978.228**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *human pathogen Legionella environmental testing*

Abstract:

Traditional microbiological culture for Legionella bacteria takes up to 14 days to provide a result. While some rapid methodologies have been developed they require 2-3 tests to be completed meaning it can take 3 days for a result and they also require capital investments in costly specialised equipment.

Bio-LP-1 is a novel rapid test which has the capacity to transform the environmental global testing landscape for the human pathogen Legionella.

Bio-LP-1's unique selling point is that it provides a complete identification of Legionella to the serogroup level in a single test using molecular technologies.

This is a diagnostic breakthrough, as all existing competitors can only offer 2 or 3 stage molecular tests to generate the equivalent result. The single test Bio-LP-1 product format is 5 x FASTER than the nearest competitor, Offers €319,200 pa savings for large test laboratories conducting at least 50,000 tests per year. Bio-LP-1 – offers a faster time to result; yields more robust information; requires less hands on time; requires no specialised equipment and ultimately has the potential for significant cost savings.

Current estimates predict that the global legionella testing market will reach $352.6 million by 2025 and that the water testing market is the fastest growing sector.

We have a best in class consortium:

BPD - European experts in development and commercialisation of rapid microbial diagnostic solutions.

myPOLs - leader in molecular biology reagent manufacturing.

Genaxxon - European leader in sales of innovative molecular IVD products)

Control Microbiológico - ENAC accredited large environmental testing laboratory.)

BPD and myPOLS have previously collaborated in the development of Bio-Lp-1, over past 12 months to bring Bio-LP-1 to TRL 6

CoPs		820501
Title: Continuous hazardous water Pollutants sensing in the environment		
Call Id: H2020-EIC-FTI-2018-2020	Topic: **EIC-FTI-2018-2020**	Type of Action: **IA**
Project start date: 9/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.791.430	EU requested grant: **€1.954.000**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *pesticides, nitrate, water quality, pollutants monitoring, realtime, in situ, continuous, early warning, agricultural chemicals runoff, clean water supply, geo-monitoring, miniaturized electronics*

Abstract:

CoPs combines the expertise of the 3 industry partners – ground-breaking electrochemical sensors developed by IPM, miniaturised electronics customised by PAL and CAU's geo-monitoring hardware and software – and is expected to bring economic, social and environmental impacts, including towards achieving UN SDGs and EU policy.

Pesticide and nitrate pollution in fresh waters pose a significant risk to public health and the environment. Exposure to pesticides can lead to several cancer types or Parkinson's disease, while nitrate can result in "Blue Baby Syndrome" and cause eutrophication. According to latest estimates, getting sick from drinking tap water in Europe had a societal cost of €220 million. Meanwhile, inefficient water monitoring based on sampling and lab analyses does not provide early alerts. Water suppliers need to meet EU monitoring requirements and react instantly with contamination treatment protocols, protect water supplies and avoid economic losses through shutdowns.

Our innovative solution rapidly detects specific water pollutants and transmit real-time data on contaminant levels and movements in natural water systems before they could reach water infrastructures and consumers. It saves both time and costs (by at least 40%), it vastly improves data quality and quantity, and it provides a data analysis and hazardous pollutants alert service to monitoring agencies.

Our goal is to mature, scale-up and demonstrate the production of the CoPs sensor platform for continuous in-situ water monitoring, targeting water suppliers as initial clients, and with the potential to create new markets within the agriculture and private well owner segments.

A successful CoPs project will allow us to create measurable impacts on our companies, quantified as accumulated revenue of €217m in five years (2021-2025), equal to accumulated operating profit of €86.05m, creating 101 full time employments in our value chain, and generating €21.83m in reduced costs for our end-users

ToxMate		881495
Title: Continuous real-time monitoring of water toxicity		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 1/1/2020	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.763.594	EU requested grant: **€1.234.516**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *real time monitoring, water toxicity, automated*

Abstract:

Urban centres, industries and agriculture produce large volumes of wastewater; in addition, the current population growth, accelerated urbanization and economic development are increasing the quantity and pollution of wastewater globally. Being a by-product of human activities, wastewater contains chemical, biological and physical pollutants, so it must be treated to remove all contaminants before it is released in the environment. Releasing untreated or inadequately treated wastewater is dangerous and has harmful effects on human health, the environment, and economic activities.

Water quality after wastewater purification varies over time, even and especially during one single day, but managers do not have the necessary tools to monitor these variations. Currently available methods based on bioassays or physical and chemical parameters require sampling, conservation and transport, and are based on spot-sampling (1-2 times/year). These methods are not able to provide information on temporal variability and have low efficiency, durability, and specificity; they are also slow in providing results (at least 72 hours) and can't allow real time monitoring. To overcome these limitations, ViewPoint has developed ToxMate: a tool for the automated real-time, on-site and on-line monitoring of wastewater toxicity. It is based on the simultaneous analysis of the locomotor behaviour of 3 different species of aquatic invertebrates and it uses infrared light and powerful and precise cameras to record continuously the activity of the animals. The system is composed of 3 panels, each containing 16 animals, so 48 animals can be analysed at the same time and for up to 30 days. ToxMate is fast: it can provide a result on water toxicity in just one hour, so it allows public authorities and water managers to measure the variation in wastewater and identify abnormal episodes, thus allowing quick interventions to optimize water purification and control treatment plants more efficiently.

H2OMon		880886
Title: In-situ Total Nutrient Analyser System for Natural Waters		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 11/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.447.813	EU requested grant: **€1.013.468**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Nutrient pollution sensors, Affordability, Nitrates, Phosphates, Ammonia, Saltwater, Freshwater*

Abstract:

The H20Mon project will address the findings of an in-house feasibility study conducted by Tellab and enable rapid commercialisation of our low-cost in-situ multi-parameter nutrient water pollutant monitoring system.

The most commonly used method for measuring pollutants is the physical collection of a sample that is then analysed in a laboratory. This has a number of disadvantages, including cost, the results often become available only after several days and that it only shows a snapshot of the situation at the instant of sampling.

The complexity, short deployment endurance and high cost of current in-situ monitoring systems make them unaffordable and impractical for many users to put into practice - especially true for small operations. Also, many current systems themselves create pollution due to the emission of chemical reagents used in the analysis.

The H20Mon integrated nitrate/phosphorous/ammonia all natural water monitoring system, is rooted in the clear market-pull caused by the industrial and domestic need to comply with increasingly tightly policed water nutrient pollution regulations, infringements of which carry heavy fines.

Our solution is a multi-parameter autonomous microfluidic device with in-situ calibration and high -frequency measurements over long deployment periods. Its in-built communication system and process control add-on enable the user to remotely monitor water quality in lakes, rivers, estuaries and coastal zones; alerting them via immediate warning on the detection of a pollutant and enabling immediate action to be taken to limit environmental damage.

H20Mon can reduce operating costs by 5%, saving users up to €125,000 p.a. The solution addresses the large and growing in-situ water monitoring market, which is projected to increase from €875m to over €1bn in 2021. Through the H20Mon project, we expect to create accumulated revenue of €27.3m and profit of €18.6m over 5 years creating 22 FTEs in our firm and c.150 in our supply chain.

CENSE		879757
Title: Enabling the continuous monitoring of drinking water with an all-in-one sensor		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 11/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.035.250	EU requested grant: **€1.424.675**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *water quality, chlorine, monitoring, sensor*

Abstract:

The CENSE Integral probe combines 5 water quality monitoring sensors in one: temperature, turbidity, pressure, conductivity and chlorine. The chlorine sensor developed by the CENSE team is a brand-new technology based on a microfluidic lab-on-chip. This new technology is far more affordable than the more standard colorimetric and amperometric methods; it is also much less hazardous to handle and can withstand high pressures and challenging conditions. Installation costs are low and the time taken to replace an amperometric sensor with the Integral probe is minimal. EFS listened to and answered the needs of its customers – there has been a lot of demand for a high-performance low-cost chlorine sensor within the drinking water sector. The feasibility studies have shown that uptake of the new probe will be large, and its release is much anticipated. EFS have already gained trust within the drinking water sector, thanks to the success of their previous water probes. Sales will be made via direct sales and indirect sales, through EFS' extensive distributor network. The team working on CENSE are experienced and have brought multiple water probes and water sensing technologies from lab to market already. The new technology will be rolled out initially in France, Germany, Italy Spain and the UK. France was chosen to be the kick-off point for several reasons: first of all EFS is based in France and has a strong network there, and secondly France is home to several global market leaders in drinking water provision: VEOLIA, AQUALTER and SUEZ, to name a few. From year 3 the product will be launched in the rest of the EU with a global launch beginning year 5.

ColiSense Online		859114
Title: Online and automated E. coli monitoring for 100% safe drinking water		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 7/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.413.375	EU requested grant: **€1.689.363**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *water safety, water monitoring, E. Coli, drinking water, microbiological analysis*

Abstract:

Drinking water is the most essential resource for life. Access to safe drinking water can prevent disease outbreaks, and lower diarrheal and other disease burdens. According to the World Health Organisation around 330,000 cases of water-related disease such as E. coli are reported yearly in Europe. Just in 2016, 6,378 confirmed cases of Shiga toxin-producing Escherichia coli infections were reported in the EU. Symptoms include diarrhoea, vomiting, stomach pains, nausea, headache, and fever. With the current technologies it can take two or more days to identify infectious risks in drinking water and by then the affected water is likely to have been consumed.

ColiSense will bring to industrial production stage a quick (60 min), inexpensive (€1 per analysis) and accurate analyzer capable of detecting and quantifying E. coli cells in drinking water below the regulation threshold limits (1 cell per /100ml). ColiSense can be applied in a wide variety of industries, including the ones with the highest quality water demands in Europe (e.g. waterworks, food and beverage, pharma, cosmetic, etc.), and reach very high levels of efficiency. Our solution makes monitoring low-cost and easy to use with an enabled cloud dashboard (for remote monitoring) and analytic tools. The ultimate goal of ColiSense is to eliminate the large problem of E. coli contaminated drinking water distribution in EU (preventing people becoming sick by preventing them from drinking contaminated water).

bNovate Technologies AG (bNovate) is a company that offers solutions to waterworks and food and beverage industries for automated monitoring of microbiological parameters and fast detection of bacterial contaminations in water. The bNovate staff is composed of experts and professionals who have extensive knowledge in a wide variety of subjects related to water science, microbiology and flow cytometry.

H2S Analyzer		849704
Title: Market launch of an autonomous and online based hydrogen sulfide (H2S) Analyzer for the implementation of IIoT - digitalization of the sewer system		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 3/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.497.500	EU requested grant: **€1.748.250**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *water-analytical device, H2S Analyzer, hydrogen sulphide, groundwater protection, sulphuric acid corrosion, waste water industry, waste water infrastructure, IIoT, digitalization waste water*

Abstract:

There is a huge environmental problem in our sewers: hydrogen sulphide (H2S). H2S causes massive ecological problems and economic damage, which arise to more than €250 bn per year in Europe. Currently, high levels of chemicals such as Nutriox are used in the sewer to eliminate H2S. However, the use of chemicals could be drastically reduced if measures are taken at the point of origin, the waste water collection point. This requires an autonomous measuring method that can detect even the smallest H2S concentrations on site and online. We as ECH have developed such an Analyzer. The H2S Analyzer (TRL 7) is based on a new, patented measurement method - gas extraction with coupled detection. A higher-level control system connects several H2S Analyzer with each other and always determines the required quantities of waste water chemicals precisely on the basis of the measurement results. We make the waste water industry digital with this technology and enable a complete real-time monitoring of the whole system. Target customers are municipal and private companies in the wastewater industry, but also contract laboratories (market volume Europe: €1.5 bn). Our advantages are:

1.Automate online measurements

- H2S can be measured autonomously at various points in the wastewater pipe without personnel.

- real-time Monitoring and targeted influencing

2.Exact and reproducible measuring method

-Measurement of H2S occurrences from 0.01 ppm

3.Environmentally friendly

- Proven significant reduction of at least 40-50% in the use of chemicals to treat H2S

- Increased service life wastewater system to 100 years (currently 10-60)

4.Economic viability

- Decreasing costs for replacement investments in wastewater infrastructure

- Cost savings of >40%

The H2S analyzer is seen as a key factor in ECH and leads to significant increase of sales and employees and, in the long term, a reduction in the use of chemicals in the wastewater industry. H2S Analyzer - Good for you and the Environment.

CellCount		823552
Title: CellCount – a revolutionary testing platform to solve current problems with microbiological contamination in water and food industries		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.136.383	EU requested grant: **€2.195.468**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords:

Abstract:

Food- and water-borne illnesses are common and preventable public health issues. Hundreds of millions of samples are tested each year to detect harmful bacteria in drinking and environmental water, food and beverages. Pathogens such as Legionella, Pseudomonas, Giardia/Cryptosporidium, Salmonella, Campylobacter and E. coli (O157:H7), cause disease and lead to enormous economic damage.

Events such as, the 2013 Legionella outbreak in Warstein, Germany, with over 185 cases of disease, or the Danish Listeria outbreak of summer 2014, with 12 reported deaths and the shutting down of the meat producing company, painfully demonstrated the limitations of current testing methodologies. Long testing times, and insufficient analytical quality in results lead to unsuccessful countermeasures, spread of the disease, and waste of energy and biocides, and financial loss for the organisations involved.

CellCount is a novel testing technology that delivers fully quantitative test results at an unmatched speed. CellCount revolutionizes the pathogen detection market by combining various new technologies, already well-established in the academic environment, and applying them to industrial applications. Due to its novel sample preparation and pathogen detection technology, CellCount provides a quantitative pathogen detection result within one hour, compared to days and weeks for other methods.

pHenom		822927
Title: A cost effective, self-calibrating, low maintenance pH sensor for an integrated approach to monitoring sea and drinking water, facilitating improvements in ocean, animal and human health		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 8/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.124.210	EU requested grant: **€786.947**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *pH Sensors, self-calibrating, energy efficient, low maintenance, smart*

Abstract:

ANB Sensors (ANB) is a company set up to develop the next generation of pH Sensors for oceanographic, source water and aquifer monitoring and water resource management applications. In a short period of time, ANB has won innovation awards and grant funding and registered intellectual property (IP) (3 patents pending with a further 5 patents in the filing stage) covering new, fundamental pH sensor technology.

The key failing of existing pH sensors is the short life and high maintenance costs of the sensors, which is a result of reference electrode drift giving unreliable measurements. The impact of reference drift is that most current ISE sensors cannot be used for long duration monitoring, cannot be used autonomously in smart sensor networks and require frequent, labour intensive calibrations. The only solution to reference drift currently available is expensive manual calibration.

ANB's innovative pH sensor, the pHenom, is based on a voltammetric electrochemical technique, which utilises a pH responding molecule bound within a solid-state matrix. This is combined with a novel means of verifying the performance of the pHenom's reference electrode through an additional in-situ electrochemical measurement.

For the first time, the pHenom sensor provides a pH sensor that is capable of smart, networked sensing allowing companies and government funded agencies to use their scarce monitoring management resources more efficiently.

ANB's overall objective for this project, therefore, is to develop the pHenom technology to the point where it can be placed on the market as-soon-as-possible, through technology licensing and sales. To meet this objective, in this project ANB will develop and produce four commercial prototype sensor systems specifically tailored for the biggest pH sensor market, the water monitoring and management industry. These commercial prototypes will be used to demonstrate the operational advantages of the pHenom technology to gain market acceptance.

iMEC		822134
Title: Real-time assessment of toxic sulphide in wastewater – market maturation of an Industrial Micro Electrochemical Cell		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 10/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.181.250	EU requested grant: **€1.526.875**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *H2S electrochemical sensor, H2S management, Sewer corrossion, Wastewater management, Asset management, toxic gas*

Abstract:

The number one cause influencing the lifetime of wastewater (WW) industry assets and hampering the pervasive implementation of a High Performing Asset Management (HPAM) strategy is the hydrogen sulphide (H2S) occurrence and the lack of tools to manage it.

The H2S prevalence is highly problematic, because it is highly toxic, entails odour nuisances and it leads to corrosion and collapse of sewer systems, pumps and other equipment. The annual worldwide cost of asset corrosion in WW industry exceed €1.4 trillion and billions are overspent to handle H2S consequences. This industry spends 88.4% of its budget in asset management.

Existing solutions measure H2S in the gas phase, however, these sensors underestimate the H2S levels leading to its inefficient management. The alternative is to add neutralization agents in excess, which entails an unsustainable economic burden and does not solve the problem regarding the lack of data to implement a HPAM strategy.

To target this market need, Unisense A/S developed and patented a disruptive, auto-calibrated industrial Micro Electrochemical Cell sensor (iMEC) for measuring dissolved H2S that can save up to €150,000 in chemical expenses per WW utility, while the savings resulting from enabling a HPAM strategy can lead to €0.5M – €1.3M savings in an average WW utility

In an initial phase, we expect that most of iMEC sold will be used as feedback for dosing pumps or as tool to diagnose H2S problems. As the market confidence increases, iMEC will be increasingly purchased to monitoring the overall state of the network enabling a HPAM approach.

Besides giving to Unisense a technological leap with the consequent competitive advantage and export potential, the iMEC project will assist Europe in achieving objectives for environmental and quality of life policy. Overall, this opens an important economic opportunity for Unisense (expecting €18M in cumulative profits, 5 years' post-project) and leads to a more sustainable WW industry.

PROTEUS		644852
Title: AdaPtive micROfluidic- and nano-enabled smart systems for waTEr qUality Sensing		
Call Id: H2020-ICT-2014-1	Topic: **ICT-02-2014**	Type of Action: **RIA**
Project start date: 2/1/2015	Duration: **36 months**	Unit: **CNECT/A/03**
Total costs: €3.993.520	EU requested grant: **€3.993.520**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *multi-parametric sensing, water monitoring, cognitive, reconfigurable, MEMS, micro-fluidic CNT Array, energy autonomy*

Abstract:

Water management requires massive, low-cost monitoring means coping with differentiated and evolving requirements. However, the majority of multifunctional water sensors only supports predefined goals hindering interoperability, with a high cost, impeding large scale deployments.

Addressing this, PROTEUS aims at offering x10 reduction in both size and unit function cost compared to state of the art. To this end, an increased number of functions will be integrated at a reduced cost and PROTEUS will deliver a reconfigurable microfluidic-and nano-enabled sensor platform for cognitive water quality monitoring. Innovative embedded software will provide reconfigurability of the sensing board to support several differentiated applicative goals while cognitive capabilities will manage evolving requirements during exploitation. Energy autonomy will be made by harvesting water flow energy. In addition, low cost of additional sensing components will enable redundancy increasing life span of the systems.

The main challenge relates to the heterogeneous integration into a monolithic, microfluidic sensing chip of carbon-nanotubes-based resistive chemical sensors, of MEMS physical and rheological resistive sensors and of a multifunctional adaptive deep-submicron CMOS system on chip.

Upstream, high level system design addressing industrial use cases, manufacturability and cost-effectiveness, packaging, energy budget and interfaces between building blocks, will enable consistency and efficiency of the whole approach.

Downstream, system validation will be carried out at different levels: benchmarking, reliability assessment to guarantee service time, model deployments and field testing.

The consortium brings together renowned actors along the whole value chain, including system integration and end users. This will contribute to post-project exploitation prepared by ensuring appropriate inclusion of business requirements within the system design.

SARMENTI		825325
Title: Smart multisensor embedded and secure system for soil nutrient and gaseous emission monitoring		
Call Id: H2020-ICT-2018-2	Topic: **ICT-07-2018**	Type of Action: **RIA**
Project start date: 1/1/2019	Duration: **36 months**	Unit: **CNECT/A/03**
Total costs: €3.979.431	EU requested grant: **€3.979.431**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *electrochemical sensors, hygroscopic material, packaging, security for IoT node*

Abstract:

SARMENTI develops a multisensor, low power IoT secure node to provide decision support to farmers by monitoring in real-time and in situ soil nutrients and gaseous emission. From this data measured on a daily basis over crop lifecycles, the farmer will timely perform appropriate actions regarding fertilisation, with direct impact on crop growth, soil & water quality and farmer income.

The SARMENTI system will embed electrochemical sensors to measure e.g. NOx, POx, NH4, K, urea, pH, moisture, temperature. They will stay ideally during the crop lifecycle in the soil with packaging issues to protect them from their environment. A hygroscopic membrane will attract water from the soil, avoiding integration of a power hungry active pump usually used to exact water from a soil sample. SARMENTI will also monitor N2O (may appear in the nitrate cycle) and CH4 (generated by decomposition of manure under anaerobic conditions) just above the ground. These gases are greenhouse ones with higher warming potential than CO2.

SARMENTI is part of the IoT (e.g. LoRa, BLE connexion). Data integrity is guaranteed by developing a secure node via combination of attack detection and automatic countermeasures application.

Partners bring SoA prototypes of electrochemical and gas sensors and communication submodules, know-how in security for IoT nodes, and expertise in Agriculture. SARMENTI will further improve the prototypes (power, usage duration, hygroscopic membrane, packaging, sensitivity, selectivity) and integrate them with advanced processing in a connected secured device. Cloud Decisions support will allow evaluate the overall solution, SARMENTI demonstrator being tested in real fields.

SARMENTI directly addresses ICT-7 challenge: “develop and validate new generation of cost-effective ESS ...”, RIA aim: “demonstrate ESS bringing intelligence ... integration of sensor systems, processors, computing and networking elements..." and “verification", "exploitation... clearly identified".

WaterSpy		**731778**
Title: High sensitivity, portable photonic device for pervasive water quality analysis		
Call Id: H2020-ICT-2016-1	Topic: **ICT-29-2016**	Type of Action: **RIA**
Project start date: 11/1/2016	Duration: **40 months**	Unit: **CNECT/A/04**
Total costs: €4.133.301	EU requested grant: **€3.049.207**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Bacteria measurement in water, Portable water analytical device, Photonics for water quality, Tunable quantum cascade lasers, HOT photodetectors, ATR spectroscopy*

Abstract:

Pervasive and on-line water quality monitoring data is critical for detecting environmental pollution. However, it's not easy to gather such data, at least not for all contaminants. Currently, water utilities rely heavily on frequent sampling and laboratory analysis in order to acquire this information.

For this situation to be improved, portable and high-performance devices for pervasive water quality monitoring are required. Towards this end, there has been growing interest in expanding spectroscopic methods beyond the 2µm range of the infrared spectrum. That region of the spectrum is home to many vibrational & rotational absorptions of compounds related to water quality. Unfortunately, water itself is a strong absorber of infrared light. Thus, such methods were restricted to laboratory settings until now.

WaterSpy addresses this challenge by developing water quality detection photonics technology suitable for inline, field measurements, operating in the 6-10 µm region. The solution is based on the combined use of advanced, tuneable Quantum Cascade Lasers and fibre-coupled, fast & sensitive Higher Operation Temperature photodetectors. Together with these new components, optimized laser driving and detector electronics as well as laser modulation concepts will be developed. Attenuated total reflectance spectroscopy will be used to give rise to the biochemical profile of the surface chemistry of the sample. Targeted analytes will be specific heterotrophic bacterial cells. Several novel techniques are employed in order to increase the SNR, including antibodies capable of binding the targeted analytes and a novel pre-concentration method. WaterSpy technology will be integrated, for validation purposes, to a commercially successful water quality monitoring platform, in the form of a portable device add-on. WaterSpy will be used in the field for the analysis of critical points of water distribution networks. This will be demonstrated in two different demo sites in Italy

AQUARIUS		731465
Title: BROADBAND TUNABLE QCL BASED SENSOR FOR ONLINE AND INLINE DETECTION OF CONTAMINANTS IN WATER		
Call Id: H2020-ICT-2016-1	Topic: **ICT-29-2016**	Type of Action: **RIA**
Project start date: 1/1/2017	Duration: **36 months**	Unit: **CNECT/A/04**
Total costs: €3.891.264	EU requested grant: **€3.891.264**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *quantum cascade laser, external cavity, µEC-QCL, MOEMS, waveguide, infrared spectroscopy, hydrocarbon monitoring, water sensing, waste water, drinking water, online, inline, Microoptics, Photonics*

Abstract:

AQUARIUS proposes disruptive improvements in laser based water sensing employing MIR quantum cascade lasers (QCLs). It is motivated by

i) the EC Water Framework Directive (2000/60/EC) where hydrocarbons are identified as priority hazardous substances,

ii) the industrial and regulatory need for fast and continuous detection of contaminants and

iii) the current state-of-the-art of measuring these substances using QCLs as defined by project partner QuantaRed Technologies and described in ASTM D7678.

AQUARIUS will improve this offline method by developing pervasive online and inline sensing strategies based on advanced photonic structures. For improved specificity a broadly (200 cm-1) tunable MOEMS based µEC-QCL source will be developed into a core spectrometer. High power, mode-hop free operation and unprecedentedly fast data acquisition (1000 spectra/s) will assure high S/N-ratios and thus high sensitivity. The system for online sensing (LOD: 1ppm) is based on automated liquid-liquid extraction and will be validated by project partner OMV for process and waste water monitoring. It will also be tested for identifying different sources of contaminations by project partner KWR in their water treatment and purification facilities. The system for inline sensing will be based on integrated optical circuits (IOC) including waveguides for evanescent wave sensing. Switching between individual waveguides of the IOC will enable quasi-simultaneous sample and background measurement and thus assure excellent long-term stability. By enrichment of analytes in polymer layers LODs as required for drinking (0.5ppb) and groundwater (50ppb) will be reached.

AQUARIUS covers the supply chain from research institutes to system integrator and end users. It will push the online system from TRL 3 to 7 and the inline system from TRL 2 to 4 and thus reinforce the industrial leadership of the project partners regarding QCL based liquid sensing and photonic components (source, detector and IOCs).

AQUASENSE		813680
Title: Innovative Network for Training in wAter and Food QUality monitoring using Autonomous SENSors and IntelligEnt Data Gathering and Analysis		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-ETN**
Project start date: 10/1/2018	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €4.060.944	EU requested grant: **€4.060.944**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *electrochemical sensors, flexible/printed electronics, robotics, UAVs*

Abstract:

The deterioration of water quality, caused by climatic/seasonal changes, or industrial waste etc. is a major global concern. Over the last decade, water quality observing technology has risen to the challenge of scientists to identify and mitigate poor water quality by providing them with cost-effective tools that can take measurements of essential biogeochemical variables autonomously. Yet, despite these options becoming more readily available, there is a gap between the technology and the end-user (including the investigators and technicians that deploy these technologies) due to a collective lack of training, in-depth knowledge, and skilled workers who can meet new and emerging challenges. There is also a disconnect between data quality, data gathering by autonomous sensors and data analysis, which is a major obstacle, as the sensors are already being deployed (e.g. through buoys, boats etc.). AQUASENSE will address these challenges through 15 early stage researchers (ESRs), who will receive 540 person-month of unparalleled multidisciplinary training in the field of water quality monitoring. Each ESR will be mentored by carefully selected experts from academia and industry in 9 European countries (UK, Germany, Ireland, Serbia, Sweden, Italy, Poland, Austria, Estonia) and will have access to state-of-the-art equipment to develop autonomous sensors for improved data quality. The autonomous underwater robots and drones will be used to improve the data gathering and AI methods will be used to improve the data analysis. Hands-on project training will be supplemented with formal training courses in relevant fields such as new materials, sensors fabrication, wireless communication, system integration, and robotics, and a variety of complementary courses such as IPR, grant writing and exploiting the scientific results. Mobility within the network will ensure exposure to complementary academic and industrial research environments.

LOTUS		820881
Title: LOw-cost innovative Technology for water quality monitoring and water resources management for Urban and rural water Systems in India		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 2/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.480.478	EU requested grant: **€2.500.238**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Monitoring, water quality, sensor, decision support system, water distribution system, irrigation systems, groundwater, river, waste water treatment.*

Abstract:

LOTUS will: (a) Co-design and co-produce, with the cooperation of EU and Indian partners, an innovative water quality chemical sensor, as an advanced solution for water quality monitoring in India, using advanced technologies (carbon nano-tubes), capable of concurrently monitoring at real time multiple contaminants, expandable and suitable for multiple and diverse Use Cases in India, which will reduce the cost of sensors by a factor of at least 10; (b) Develop a suite of software tools (off- and online), organised and combined in a platform with cloud-based implementation, implementing sensor measurements (quality and quantity), the specific needs of diverse Use Cases (e.g. intermittent supply, tanker distribution) and advanced technologies in the ICT domain to improve water management; (c) Demonstrate and showcase the LOTUS solution in a wide variety of use cases, across the whole value chain of water (urban and rural areas, drinking and irrigation systems, river and groundwater monitoring, treated wastewater quality), taking into account the existing infrastructure, the capabilities of the sensor and the specific water challenges in India (socio-economic and technical); (d) Investigate, co-design and plan the business model and market uptake of the LOTUS solution, with industrial production and further development and production of the sensor in India, ensuring an advanced but affordable, low cost product and solution for monitoring water quality, after the end of the project; (e) promote social innovation, by introducing co-creation, co-design and co-development with multiple local stakeholders, as a paradigm of successful EU-India Cooperation in the water sector, with lasting social, technological and business impacts for water quality in India, leading to viable, affordable and (socially) acceptable products and solutions, capacity development, job creation, contribution to wider issues and initiatives and wide outreach activities.

MELOA		776825
Title: Multi-purpose/Multi-sensor Extra Light Oceanography Apparatus		
Call Id: H2020-SC5-2017-OneStageB	Topic: **SC5-18-2017**	Type of Action: **RIA**
Project start date: 12/1/2017	Duration: **39 months**	Unit: **EASME/B/02**
Total costs: €4.694.845	EU requested grant: **€4.694.845**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Novel measurements; Cost reduction*

Abstract:

The MELOA project proposes to develop a low-cost, easy-to-handle, wave resilient, multi-purpose, multi-sensor, extra light surface drifter for use in all water environments, ranging from deep-sea to inland waters, including coastal areas, river plumes and surf zones. The device will be developed as an upgrade to the WAVY drifter conceived by the Faculty of Engineering of the University of Porto, which was used to measure the surface circulation forced by wave breaking, including detailed structure of rifts and the littoral drift current (Jorge da Silva et al, 2016).

The philosophy of the WAVY drifter will essentially be respected:

a small-size sphere with just enough room to accommodate power source, GPS-receiver, communications modules, antennae, sensors and data processor;

optimised buoyancy to prevent the drifter trajectory responding to the wind instead of the current, while providing just enough exposure of the antennae to ensure acquisition of the GPS signal at the required rate and reliable near real-time communications.

Given the low influence of wind upon the drifters' displacements, MELOA will provide a cheap effective way to monitor surface currents and surface dynamic features anywhere in the World Ocean. Through equipping the drifters with thermistors at two different levels, the possibility is open for monitoring "near-skin temperature" and near-surface vertical temperature gradients, which will be invaluable for calibration/validation of satellite derived SST fields.

HYPERNETS		775983
Title: A new hyperspectral radiometer integrated in automated networks of water and land bidirectional reflectance measurements for satellite validation		
Call Id: H2020-SC5-2017-OneStageB	Topic: **SC5-18-2017**	Type of Action: **RIA**
Project start date: 2/1/2018	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.999.234	EU requested grant: **€4.999.234**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Copernicus validation, networks, optical remote sensing, hyperspectral, land and water, surface reflectance*

Abstract:

Networking of automated instruments on unmanned platforms, e.g. AERONET-OC and RADCALNET, has proved to be the most effective way to provide validation data for Copernicus optical missions. The re-use of data from each site for many optical missions (S2, S3, PROBA-V, MODIS, VIIRS, L8, Pléiades, ENMAP, PRISMA, SABIAMAR,etc.) gives a huge economy of scale. The existing AERONET-OC and RADCALNET networks are based on multispectral instruments, which are expensive to acquire and require modelling associated uncertainties to cover all spectral bands of all sensors. Recent advances in opto-electronics facilitate the use of miniaturized hyperspectral spectrometers, with reduced price. Industrial production of video surveillance cameras greatly reduces the price of pointing systems for scientific instruments. Improved LEDs can provide a stable light source for relative calibration and continuous autonomous monitoring of radiometers. Webcams (for remote inspection of instruments and maintenance support) and data transmission have become cheaper allowing reducing the running costs and improving the reliability of autonomous instrument systems. The objective of the HYPERNETS project is to develop a new lower cost hyperspectral radiometer and associated pointing system and embedded calibration device for automated measurement of water and land bidirectional reflectance. The instrument will be tested in a prototype network covering a wide range of water and land types and operating conditions. Quality controlled data with associated uncertainty estimates will be provided automatically for the validation of all optical satellite missions. Preparations will be made a) for the new instrument design (and associated calibration service) to be commercialized with an expected lifetime of at least 10 years and b) for the networks to be further expanded to become the main source of surface reflectance validation data for all spectral bands of all optical missions for at least the next 10 years.

SYSTEM		787128
Title: SYnergy of integrated Sensors and Technologies for urban sEcured environMent		
Call Id: H2020-SEC-2016-2017-2	Topic: **SEC-10-FCT-2017**	Type of Action: **IA**
Project start date: 9/1/2018	Duration: **36 months**	Unit: **REA/B/04**
Total costs: €9.159.532	EU requested grant: **€7.926.171**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *data fusion*

Abstract:

The SYSTEM project will design and demonstrate a data fusion system for the continuous monitoring of threats associated to the manufacturing of explosives and to the production and handling of synthetic drugs. Data fused from different mature sensor networks will provide Law Enforcement Agencies with enriched information to assess the potential occurrence of a criminal activity (e.g. to localize the production of improvised explosive devices and/or clandestine synthetic drugs laboratories) in an identified area. Forerunners and basis of SYSTEM are two H2020 IA projects, NOSY and microMole, funded under the call FCT-05-2014.

SYSTEM devices will support the detection of home-made explosives and synthetic drugs manufacturing by detecting intermediates and impurities of the production process and precursors used for their synthesis, identifying abnormal use of chemicals transported/provided within the covered urban areas. Additionally, the prevalence of new psychoactive substances including metabolites in the sewage system will be assessed. Deploying a network of sensing systems, working in different and complementary utilities and environments, SYSTEM will acquire and process data from the sewage wastewater and solid waste networks as well as air emissions from target areas in real-time. Such network will consist of different sensing systems, working in different and complementary utilities and environments, Metal-Oxides (MOXs) sensors, Molecular Imprinted Polymers (MIPs), Liquid Chromatography with Mass Spectrometry and autonomous sampling (online LC/MS), fast Gas-Chromatography with Photoionization Detection (GC-PID) and commercial pH and conductivity sensors combined with passive sampling devices and integrated into SYSTEM through a centralised monitoring centre. The consortium will test and demonstrate functionality of SYSTEM in seven different European cities during three years of activities

ULISENS		726499
Title: Ultra Legionella Inmunoanalysis System for Early Sensing		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-03-2016-2017**	Type of Action: **SME-2**
Project start date: 6/1/2016	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.098.470	EU requested grant: **€768.929**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Legionella; early sensing; biotechnology; water; cooling towers; business plan; commercialization;exploitation; health;*

Abstract:

The general objective of ULISENS project is focused on the development and further commercialization of an automatic early warning system able to detect and quantify Legionella species in water. The system integrates an innovative fast detection biotechnology with an automatic module able to carry out “in situ” analysis in real-time to minimise time to results. ULISENS reduces the legionellosis lethality from 12% to 2% because of TIMELY AND COST-EFFECTIVE INFORMATION to risk owners to take appropriate effective preventive measures as soon as possible. Therefore, it prevents shutdown times and costs, penalties of fines and discredit in face to their customers and the society. The benefit from each early detection using ULISENS (around 120,000€ per case) far exceeds the initial investment (20,000-60,000€).

ULISENS technical specifications:

- Faster response time, reducing time to result up to 99% compared to laboratory tests

- ICT Early warning system to prevent users from infection risks in real time.

- Lower cost, with reductions of up to 80% compared with standard laboratory tests

- Direct sampling from user’s network in real-time, no technical staff needed.

- Sustainable detection biotechnology without maintenance or biological waste generation.

- Great reduction of penalties and the discredit of the mark by human infections.

BIOTICA is a Spanish company specialized in the development of fast techniques for the microbiological detection and quantification based on the combination of recognition biomolecules, like antibodies, with advanced nanomaterials like paramagnetic particles. Up to now, they have focused on the research and development of the ULISENS system, by means of two R&D regional and national projects aimed at developing the prototype of the system and to validate in industrial facilities its performance and functionalities. The system is ready to go a step further in the development towards the future exploitation and commercialization.

NanoScreen		766742
Title: Disruptive portable device for pre-screening of Persistent Organic Pollutants –POPs- in food products and water		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-07-2016-2017**	Type of Action: **SME-2**
Project start date: 6/1/2017	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €1.745.335	EU requested grant: **€1.221.735**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Persistent organic pollutants, pesticides, analytic method, optical, pre-screening, food analysis, POP.*

Abstract:

Persistent organic pollutants (POPs) are organic compounds produced by human action resistant to environmental degradation and whose bioaccumulative capacity and toxicity can cause harmful health effects e.g. cancer. Hence, they have become global threats for human and environment. The most extended analytic methods used nowadays for detecting POPs are gas chromatography and/or mass spectroscopy to separate and identify them. These methods are expensive -€1,000/sample-, time-consuming -24h-, require a laborious sample preparation and a well-equipped laboratory. Consequently, there is a great demand to increase the number of water and food quality tests if available for a lower price and shorter time.

SAFTRA PHOTONICS will bring to market NanoScreen - a portable nano-optical sensing chip for pre-screening purpose that detects food or water contamination by POPs. We will offer a rapid method (10 minutes) to detect the most important POPs (ppb) present in food products and water, carrying out an in-situ analysis for less than 100€ per sample. By putting NanoScreen solution into the the European, Japanese and USA market, in 2023 we expect to sale 55,000 chips with revenue of €4,800,000 (27% Y/Y growth) and ROI 3.25. This ensures sustainability of 37 new full time job positions at company.

The project resubmission (13.61) reflects couple of great achievements of 2016: FS has elaborated in detail the NanoScreen business plan, the company has signed two investment agreements, three business partners and two distribution partners. Moreover, we have identified another two major replication opportunities of future joint ventures that can form a new business-industrial ecosystem for online nano-screening. The vision is to reach a unique one-box-system tailored for specific applications, e.g. security, agriculture and sport.

The Phase 2 funding will help us to close the gap from design validation to industrial production and significantly shorten the market entry period.

MobiLab		765262
Title: Development of a mobile device for the quick on-site measurement of soil nutrients		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-07-2016-2017**	Type of Action: **SME-2**
Project start date: 6/1/2017	Duration: **33 months**	Unit: **EASME/A/02**
Total costs: €1.302.813	EU requested grant: **€911.969**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *fertilisation, precision farming, lab-on-a-chip*

Abstract:

Today the application of fertilisers to agricultural crops is mainly based on calculations, estimations and recommendations and not on analyses of the actual demand of soil and plants. The resulting over-fertilisation has substantial disadvantages: Farmers suffer from reduced yields and unnecessary expenses for fertilisers, groundwater is polluted, surface water bodies are eutrophicated, greenhouse gas is emitted from soils and finite natural fertiliser resources are depleted. It is estimated that up to 35 % of the applied fertiliser could be saved if a method for the quick and simple determination of the fertiliser demand existed.

Pessl GmbH, an Austrian SME specialised in the development of innovative products in the field of agricultural monitoring and precision farming, has developed MobiLab, a lab-on-a-chip sensor for the quick on-site determination of the concentrations of the most important plant nutrients (ammonia, nitrate, phosphate and potassium) in the soil, based on the outcomes of the award-winning EU project OPTIFERT. MobiLab will enable farmers to determine the fertiliser requirements of their fields within just a few minutes and without the need for any special knowledge. The proper functioning and the great potentials of the technology have been proven, but further technological developments as well as the finalisation of a commercialisation concept are necessary to achieve the market breakthrough. Based on the outcomes of phase 1 of the project, all necessary steps for a successful market introduction of the MobiLab system will be taken.

The MobiLab nutrient sensor will help European farmers to save up to 35 % of their applied fertiliser, leading to total potential annual savings of up to 6 billion € on the EU level. At the same time, Pessl Instruments GmbH will be able to significantly grow in terms of turnover, profit and employees and to further expand its leading position on the world market for precision farming products.

SHEPHERD		731695
Title: Energy-Efficient Activated Sludge Monitoring for Wastewater Treatment Plants		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-09-2016-2017**	Type of Action: **SME-2**
Project start date: 8/1/2016	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.508.750	EU requested grant: **€1.756.125**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *activated sludge, closed-loop monitoring, wastewater, microbial respirometer*

Abstract:

The aeration of activated sludge accounts for 60% of the running cost of wastewater treatment plants, a staggering 2% of all electricity generated at country-level. The project will improve upon an existing prototype of on-line microbial respirometer with near real-time capability for monitoring the activity of the microbial population (biomass) in activated sludge, and suitable for industrial and municipal wastewater applications, with the following environmental and financial benefits:

• 20% reduction of greenhouse gas emission related to the aeration process (lower energy consumption)

• 5% reduction of nitrous oxide emission related to the denitrification process (better process parameters)

• 25 % reduction of energy costs and maintenance costs (better online monitoring of the process)

The solution reduces the costs and improves the reliability of the measurements, allowing small and midsize WWTPs to monitor the biological activity of the process. The integration with existing hardware sensors and SCADA systems, allows the system to control the plant automatically within design operating parameters and reacting in real-time to variable (diurnal and seasonal) loading or toxic events. The cloud-based implementation creates a central data repository accessible for operational purposes (remote access, alerts) and management purposes (benchmarking, continuous improvement, and design of new installations). The original prototype (TRL6) was tested in Anglian Water's Milton (Cambridge) wastewater treatment plant and gave operators information about the status of the active component (biomass) so that manual interventions could be made to improve efficiency. The project aims to take the technology forward, automate the process to a higher degree and demonstrate the solution in a large-scale pilot with four wastewater utilities over 10 plants across Europe and the USA (TRL 8). The project duration is 24 months and the requested EC funding 1.75M Euros.

CYTO-WATER		642356
Title: Integrated and portable image cytometer for rapid response to Legionella and Escherichia coli in industrial and environmental waters		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 6/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €2.368.299	EU requested grant: **€1.896.625**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *Lens-free technology, in-situ system, cost-effective, E. coli, Legionella,*

Abstract:

The proposed project will deploy for the first time a new imaging cytometer platform capable of detecting minute quantity of micro-organisms in industrial and environmental waters. The platform is based on the integration of proprietary technologies available to the consortium partners: an automatic water concentration cartridge combined with a microfluidic cell will provide an adequate sample to a newly designed fluorescence image cytometer whose readings will be recorded and processed using a proper software interface. It will be validated for quantifying Legionella and Escherichia coli (E. coli) population within 120 minutes from obtaining the sample, overcoming in this way the main disadvantage of traditional methods used in laboratories, i.e. long time-to results which can currently last up to 12 days in the case of Legionella and 1 day for E. coli. The targeted detection limit will be 10-100 cells/L and 5-20 cells/100 mL for Legionella and E.coli, respectively. Also, the new imaging cytometer will have a portable form, a size similar to a smart-phone, which will increase its versatility and widen the possibilities of onsite applications. The relevance of the project is clear when one thinks about the high risk of legionellosis in some specific industrial environments, such as cooling waters, evaporative condensers and air conditioning systems and the fact that E. coli is one of the faecal pollution index commonly analyzed for monitoring the presence of waterborne pathogens and hence the quality of bathing waters. From a market perspective, more than 7 million of Legionella analyses are performed annually in Europe while E. coli level is included in all bathing water regulations in different EU countries. CYTO-WATER clearly falls into HORIZON 2020 topic WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication and addresses Water Framework Directive (2000/60/EC) and in the Bathing Water Directive (2006/7/EC).

INTCATCH		689341
Title: Development and application of Novel, Integrated Tools for monitoring and managing Catchments		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **44 months**	Unit: **EASME/B/02**
Total costs: €8.770.935	EU requested grant: **€7.570.335**	
Main thematic area: 34 - Water management / sensors, monitoring		

Free keywords: *robotic boat runoff treatment*

Abstract:

INTCATCH will instigate a paradigm shift in the monitoring and management of surface water quality that is fit for global waters in the period 2020-2050. INTCATCH will do this by developing efficient, user-friendly water monitoring strategies and systems based on innovative technologies that will provide real time data for important parameters, moving towards SMART Rivers. The business model will transform water governance by facilitating sustainable water quality management by community groups and NGOs using a clouds data linked to a decision support system and eco-innovative technologies.

The INTCATCH project will use demonstration activities to showcase eco-innovative autonomous and radio controlled boats, sensors, DNA test kits and run-off treatment technologies. Actions which develop and evaluate these in a range of catchments will address the important innovation barriers to uptake, notably, a lack of knowledge of new technologies and their capabilities, identified by the European Innovation Plan (EIP) on water. By conceptually moving the laboratory to the 'field', the monitoring techniques that will be developed aim to supersede the inefficient, time dependent, costly and labour-intensive routine sampling and analysis procedures currently deployed to understand the quality of receiving waters. It will compliment routine monitoring that is required for baseline datasets, but also enable cost-effective impact and management investigations.

INTCATCH will incentivise stakeholder innovation in monitoring and will facilitate new financing for innovation through its innovative franchise business model and empowerment of community groups and NGOs. The market ambition is that the INTCATCH business will facilitate an eco-innovative approach to deliver good quality water bodies across Europe and beyond. This will support green growth, increase resilience to climate change and capture greater market-share for Europe's innovative industries.

STRATUS		879961
Title: Replicating the rain process to provide a sustainable drinking water supply where most needed		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 11/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.521.295	EU requested grant: **€1.064.907**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Atmospheric Water Generator, AWG, humidity harvesting, water generation, plastic bottled water, water scarcity, energy savings.*

Abstract:

GENAQ is a Spanish SME focused on the development and commercialisation of disruptive Atmospheric Water Generators (AWGs). With a consolidated team of 6 engineers, developers and market experts our aim is to become the global standard in AWG technology.

Bottled water is the most popular solution to supply drinking water to areas where water is scarce or lacks sufficient quality. However, it is expensive, generates large amounts of plastic waste and results in multiple impacts associated to its production and transportation. Current alternatives to bottled water such as water filters and water tanks also face several limitations (need of a water source, insufficient water quality). AWGs generate drinking water by condensing ambient humidity, avoiding the generation of residues or transportation impacts. Nevertheless, available AWGs are expensive, have low efficiency and are poorly suited for their installation in residential or commercial premises. The global AWGs market is expected to grow at a booming 30% CAGR, reaching over €7 bn by 2025, creating a unique opportunity for the introduction of affordable, efficient and functional AWGs.

STRATUS is the next AWG series in GENAQ's pipeline. Targeting residential, commercial and public premises, STRATUS models (with 20, 50 and 200l/day capacity) produce top quality drinking water, achieving 50% higher water production and 150% reduced energy consumption compared to available AWGs while offering a 1-year payback period and a user-friendly interface. Moreover, STRATUS contributes to maintain optimum ambient humidity and generates hot water without consuming additional energy.

STRATUS has reached TRL7 through the successful implementation of larger models for remote locations and emergency response purposes (NIMBUS and CUMULUS) and the development and testing of STRATUS prototypes. The last development steps will be achieved through STRATUS project by further developing, validating and bringing it into the market.

W2W - Water to Water		873854
Title: The first off-grid water desalination system 100% powered by renewable energies		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.350.678	EU requested grant: **€2.345.475**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *water desalination, water sanitation, water scarcity, sustainable tourism, decentralized desalination, wastewater recycling, off-grid, membrane distillation, water management, humanitarian aid, NGO*

Abstract:

Water scarcity is probably one of the biggest challenges of the 21st century. According to the United Nations, it affects more than 40 percent of the global population, and by 2050 more than 5 bn people could suffer water shortages. Europe is not an exemption, as one third of European countries have relatively low availability of water. In Mediterranean area there is both a severe lack and great demand for water. However, climate change and growing water demand is projected to increase water shortages in other EU regions.

The ocean is seen as a promising source for providing drinking water to the more than 40% of EU population living in coastal areas. However, traditional technologies for water desalination are highly energy demanding and the capital and operation costs are not affordable for small to medium-sized applications. W2W-Water to Water is a state-of-the-art desalination system that tackles these two challenges. It has been originally conceived to be used with renewable energies (intermittent power) and to provide clean water from seawater or brackish groundwater. It is easily scalable, mobile and rapidly deployable even in remote areas. It is highly versatile, and it adapts to be used in multiple applications such as: drinking water delivery in low-income and developing countries, humanitarian aid and disaster relief operations or to support the water distribution in intense touristic areas during the dry season.

We are Rainmaker, a Dutch SME focused on developing sustainable and decentralized water purification technologies to produce clean water. We have planned the activities required to build, install and validate the first W2W industrial unit, providing around 80 m3 of clean water daily. The market deployment of W2W will start in 2021 and by 2025, we expect having installed 200 units worldwide. This will make Rainmaker grow up (18 new jobs) and will place Rainmaker at the forefront of sustainable water supply.

TAPP X		830150
Title: The world's first Sensor-Based Water Filter to Purify and Analyse Tap Water		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.771.350	EU requested grant: **€1.239.945**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Water filter; Single use Plastic reduction; Internet of Things; Big Data; Water Quality;*

Abstract:

Magnus Jern and Alex Schwartz founded TAPP Water in 2014 and since then have tested over 50 different filters and technologies, while conducting blind tests among test panels and installation tests and analysis by water institutes. Based on our findings, we developed a new filter system that provides the cleanest and best tasting tap water in the world: TAPP, combining the best of Scandinavian design, German engineering and Spanish water filtration expertise.

For now, our short term goal is to lower the environmental impact of clean drinking water and replace at least 1 Billion bottles by 2020 by empowering people to easily get clean and healthy water from tap. To achieve this goal, we have already sold two tap filters (TAPP 1 and 1S) in 5 countries, while TAPP 2 is being prepared for launch in June 2018.

TAPP X is the world's first household water filter that contains sensors to analyse tap water quality in real time. With TAPP X we intend to alter consumers' behaviour once and for all by taking away prejudices about (filtered) tap water in the form of an evidence-based approach. In addition, we will use this data to inform water providers and municipalities about tap water quality in their area. TAPP X is the next step in providing affordable, clean drinking water to all, while creating awareness about water consumption and battling harmful plastic waste.

With an estimated 1 Billion households worldwide having access to tap water, we initially target about 62 Million households in Europe and North America with TAPP X. Successful implementation and of TAPP X in our current portfolio of water filters by 2021 will boost our company not only financially, but also create new positions, further enhance tap water quality and reduce plastic bottle waste with 2 Billion bottles per year.

SAMBA		714744
Title: Sustainable and Advanced Membranes By Aqueous Phase Separation		
Call Id: ERC-2016-STG	Topic: **ERC-2016-STG**	Type of Action: **ERC-STG**
Project start date: 1/1/2017	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.500.000	EU requested grant: **€1.500.000**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Membranes, Membrane production, Responsive Polymers, Polyelectrolyte Complexation, Non-Solvent induced Phase Separation (NIPS), Blending.*

Abstract:

Membranes play a critical role in the production of safe drinking water and in the treatment of human waste streams. However, membranes themselves are nearly always produced using costly, harmful and environmentally unfriendly aprotic solvents such as N-methyl-pyrrolidone (NMP), dimethylformamide (DMF), or dimethylacetamide (DMAC). This proposal describes a highly novel approach allowing the production of the next generation of advanced membranes without the need to use any organic solvents. Here we make use of so-called responsive polymers that can switch under aqueous conditions from a hydrophilic to a hydrophobic state by a simple change of, for example, pH. In the hydrophilic state, water dissolves the polymers and the so obtained solution can be cast as a thin film. Sudden immersion in a bath at a pH where the polymer becomes hydrophobic, leads to very sudden phase separation whereby the polymer coagulates into a porous film, a membrane. Control over the kinetics of this aqueous phase separation process allows for the fabrication of a large variety of porous structures. Furthermore, this process also works for two oppositely charged polymers, where polyelectrolyte complexation is used to induce phase separation. Crosslinking will be a natural way to guarantee membrane stability but can also be used to further modify/improve membranes. The very nature of this aqueous phase separation process is such that membrane additives that are typically associated with advanced membranes (responsive polymers, enzymes, polyzwitterions, metallic nanoparticles) can readily be incorporated. As such, aqueous phase separation not only allows solvent free membrane production, it also provides a very simple and versatile route for the production of membranes with advanced properties. Finally, the porous structures and novel materials developed within this project could be directly useful for other applications, ranging from adsorption processes and coatings to biomedical materials.

MIDES		685793
Title: Microbial Desalination for Low Energy Drinking Water		
Call Id: H2020-NMP-2015-two-stage	Topic: **NMP-24-2015**	Type of Action: **IA**
Project start date: 4/1/2016	Duration: **48 months**	Unit: **RTD/F/04**
Total costs: €8.019.583	EU requested grant: **€6.328.164**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Microbial Desalination Cells*

Abstract:

Shortage of fresh water has become one of the major challenges for societies all over the world. Water desalination offers an opportunity to significantly increase the freshwater supply for drinking, industrial use and irrigation. All current desalination technologies require significant electrical or thermal energy, with today's Reverse Osmosis (RO) desalination units consuming electric energy of at least 3 kWh/m3 – in extensive tests about ten years ago, the Affordable Desalination Collaboration (ADC) in California measured 1.6 kWh/m3 for RO power consumption on the best commercially available membranes, and total plant energy about twice as high.

To overcome thermodynamical limitations of RO, which point to 1.09 kwh/m3 for seawater at 50 % recovery, Microbial Desalination Cells (MDC) concurrently treat wastewater and generate energy to achieve desalination. MDCs can produce around 1.8 kWh of bioelectricity from the handling of 1 m3 of wastewater. Such energy can be directly used to i) totally remove the salt content in seawater without external energy input, or ii) partially reduce the salinity to lower substantially the amount of energy for a subsequent desalination treatment.

MIDES aims to develop the World's largest demonstrator of an innovative and low-energy technology for drinking water production, using MDC technology either as stand-alone or as pre-treatment step for RO.

The project will focus on overcoming the current limitations of MDC technology such as low desalination rate, high manufacturing cost, biofouling and scaling problems on membranes, optimization of the microbial-electrochemical process, system scaling up and economic feasibility of the technology. This will be achieved via innovation in nanostructured electrodes, antifouling membranes (using nanoparticles with biocide activity), electrochemical reactor design and optimization, microbial electrochemistry and physiology expertise, and process engineering and control.

REvivED water		685579
Title: Low energy solution for drinking water production by a REvival of ElectroDialysis systems		
Call Id: H2020-NMP-2015-two-stage	Topic: **NMP-24-2015**	Type of Action: **IA**
Project start date: 5/1/2016	Duration: **48 months**	Unit: **RTD/F/04**
Total costs: €9.781.826	EU requested grant: **€7.633.672**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *ElectroDialysis, ED, Reverse ElectroDialysis, RED, desalination, low energy*

Abstract:

The REvivED water project will establish electrodialysis (ED) as the new standard providing a source of safe, affordable, and cost-competitive drinking water, using less than half the energy required by state-of-the-art Reverse Osmosis (RO) plants.

The innovations of the project constitute a technology platform with a very wide field of potential applications. All components and systems have reached at least TRL4 and will be further developed reaching at least TRL7. The main focus of the project will be on the following applications:

1. A simplified ED system that can be used for brackish water desalination (8 pilots in developing countries) or for tap-water softening (2 pilots in Germany and the Netherlands).

2. A multistage ED system for industrial-scale seawater desalination, which will be demonstrated to reach energy consumption as low as 1.5 kWh/m3 (1 pilot in the Netherlands)

3. Combinations of the multistage ED system with the latest salinity gradient power systems (Reverse ElectroDialysis - RED), which can further reduce energy consumption for seawater desalination to the region of 1 kWh/m3 (1 pilot in the Netherlands)

4. The versatile nature of the developed innovations will be demonstrated by testing their combinations with Reverse Osmosis (RO) systems (1 pilot in Spain). This will allow initial market introduction, without the need to replace the extensive RO infrastructure.

The pilot systems in developing countries will be located in critical areas where the project partner PHAESUN has local offices in Africa (Eritrea, Ivory Coast, Somalia, Djibouti and Ethiopia), Asia (Dubai, and India) and Latin America (Panama).

The consortium brings together leading partners covering the whole value chain and ensuring exploitation of the results. It is clearly industry driven, and it gives European industry the chance to take the lead of the ED revival and face the competition from the US that is also actively pursuing this important growth market.

PROTECT		720851
Title: Pre-commercial lines for production of surface nanostructured antimicrobial and anti-biofilm textiles, medical devices and water treatment membranes		
Call Id: H2020-NMBP-PILOTS-2016	Topic: **PILOTS-02-2016**	Type of Action: **IA**
Project start date: 1/1/2017	Duration: **48 months**	Unit: **RTD/F/04**
Total costs: €9.441.863	EU requested grant: **€7.478.985**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *antibacterial textiles, anti biofilmmedical devices, multifunction polymers*

Abstract:

PROTECT aims to introduce to the market One step antimicrobial finish processes for polymeric materials used in i) specialty textiles for public areas and hospitals, ii) water treatment membranes, and iii) implantable medical devices. Compared to main existing manufacturing routes, the proposed one-step coating technologies are simple, fast, and reproducible. For this, PROTECT uses as a starting point four existing pilot lines emanated from high successful FP7 projects SONO, NOVO and BioElectricSurface. PROTECT will upgrade the nanocoating One step process platform comprising: two roll to roll (R2R) pilots (sonochemical and spray coating) for functional textiles production, a R2R thermo-embedding pilot for antibacterial/biofilm preventing water treatment membranes, and a batch sonochemical pilot for antibacterial/antibiofilm/biocompatible medical devices. This platform will cover a wide range of applications due to their specific characteristics by the following objectives:

a) Incorporating 'antibacterial antibiofilm biocompatible novel nanoparticles'(NPs) of the following categories: inorganic (CuxZn1-xO ,5 Ga@C-dots, Si/TiO2 composite) polymer (polypyrrole, PPy)) and biologicals (antibacterial enzymes, functionalized lipids (FSLs), hybrid antibacterials) to obtain 'biocompatible nanostructured surfaces with antimicrobial and anti-adhesive' properties.

b) Implementing real time characterization methods for monitoring at the nanoscale to characterise relevant materials, process properties and product features for 'real-time nanoscale characterization' to ensure 'reproducibility' and 'quality' of the nano-coated products

c) Improving 'coating efficiency, production capacity, reproducibility, robustness, cost-effectiveness, safety and sustainability' of the processes in relation to the targeted applications.

d) Introducing a Labs Network (PLN) that will include also lab scale processes of the proposed technologies for 'training and knowledge dissemination.

SPRING		821423
Title: STRATEGIC PLANNING FOR WATER RESOURCES AND IMPLEMENTATION OF NOVEL BIOTECHNICAL TREATMENT SOLUTIONS AND GOOD PRACTICES		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 8/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €3.116.949	EU requested grant: **€3.116.949**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *microbial sensors, real-time monitoring, remote sensing.*

Abstract:

The overall aim of the SPRING project is to present an integrated water resource management for reliable water supply for all needs that involve; developing innovative simple to operate bio oxidation systems for treatment of polluted water bodies (stagnant and flowing), cost effective real time monitoring tools and finally by implementing good practices in water planning for treatment, supply and usage. SPRING aims at improving and developing technologies for the elimination of pollutants from water using a bioremediation approach.

In particular, SPRING aims at improving and developing bioremediation technologies for the removal of organic micro-pollutants present in groundwater and surface water at low concentrations, and which are currently treated using expensive physicochemical technology. Innovation also revolves around provision of simplified water quality monitoring methods and developing novel microbial technology to monitor pollutants in water. The Project will also develop real time detection systems to highlight different pollutants risks and flooding/water insufficiency scenarios.

Field trials of the developed prototype in urban and rural settings will be carried out with the help of Municipality and an NGO.

In addition, an inclusive decision-making process will contribute to democracy and will lend the decision legitimacy. Acceptance of remediation schemes during implementation will be enhanced by involving stakeholders and the public in the decision-making stage and thus, stakeholders decision making and management framework in the form of an NGO and a local Governing Body (Municipality) will be formed. Successful implementation and demonstration of the developed systems involving all stakeholders will help to achieve wide public acceptance towards reuse and recycling of wastewater through the developed bioremediation technology

WATIFY		711501
Title: Up-scaling, demonstration and first market application of Hydrokemos' patented technology as the most eco-efficient and cost-effective solution for nitrate polluted water treatment		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 12/1/2015	Duration: **26 months**	Unit: **EASME/A/02**
Total costs: €1.318.660	EU requested grant: **€923.062**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *nitrates pollution, water purification, wastewater remediation, fully clean technology, eco-efficient,*

Abstract:

Hydrokemos, a high tech Spanish SME, aims to demonstrate and commercialise the first fully clean equipment to purify nitrate polluted water.

In the EU +20% of groundwater is contaminated by nitrates due to the use of fertilizers that have been and still are extensively applied in agriculture. On the other hand, demand for freshwater is increasing by 64 billion cubic meters every year. Groundwater is essential for meeting this increasing demand and existing solutions to purify it are highly inefficient and/or produce dangerous residues.

Electrodenitrification (technology developed and patented by Hydrokemos) is the first fully clean technology that destroys nitrates dissolved in water transforming them into air (no waste is produced) and generates energy that is re-inserted into the system making it extremely energy-efficient.

The objective of this project is to demonstrate – at full scale and in real market applications – the technical and commercial excellence of Hydrokemos' unique technology. During the project, Hydrokemos will up-scale the existing prototypes building 4 full-scale prototypes to demonstrate its economic and technological performance across a range of typical industrial applications. These applications are:

- Freshwater supply to food or metal industries;

- Water purification for re-injection to public network;

- Remediation of high nitrate waste-waters (metal industry and similar);

- Prevent eutrophication;

Hydrokemos will then operate these full-scale prototypes in real operational conditions demonstrating that electrodenitrification achieves much better performance than any other available solution (at least -50% reduction in investment and +20% in performance).

Finally, business success means €38m incomes in year 5 with IRR 93% and NPV 7.523.711 € for Hydrokemos and generating also a very profitable business for its commercial stakeholders (NPV 16.415.453 € in 2022 for commercial distributors).

AMBROSIA		783848
Title: Aquaporin-Inside™ Membranes for Brackish water Reverse Osmosis Application		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2017	Duration: **33 months**	Unit: **EASME/A/02**
Total costs: €2.095.726	EU requested grant: **€1.423.310**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Water, brackish water, desalination, Reverse Osmosis, membrane, biomimetic membrane, RO membrane, aquaporin, aquaporinbased membrane, flat sheet, spiral wound module, low fouling, membrane longevi*

Abstract:

More than a billion people currently live in water-scarce regions, and as many as 3.5 billion could experience water scarcity by 2025. Forecasts estimate that water demand in 2040 will exceed supply by 50%. Seawater amounts to 97% of all water contained on Earth and can, fortunately, be converted into fresh water by desalination. Desalination processes are still expensive, energy intensive and commonly pose great negative impacts on ecosystems. Presently, no current state-of-the-art solutions suggest sustainable technologies to the Earth's ecosystem. The Reverse Osmosis (RO) membrane segment, which is the largest of the membrane market, was valuated at €1.1 billion in 2015 and is projected to grow by 43% over the 8-year period from 2014 to 2021, reaching a €2.5 billion revenue by 2021. Part of the RO market is dominated by brackish water reverse osmosis membranes (BWRO). Brackish water is water that has higher salinity than fresh water (more than 0.05%) and lower than seawater (less than 3%). Aquaporin A/S has acknowledged this huge business opportunity and has developed a ground-breaking biomimetic technology to separate and purify water from other compounds based on nature's own principles: Aquaporin water channel proteins. This technology will potentially disrupt the current RO technology, making it more energy and water efficient as well as more sustainable and cost-effective. Since we have a commercial Aquaporin Inside™ RO membrane already tested and validated at low pressure conditions (house hold, 7 bar), our main goal within this project will be to optimise and up-scale this to work at brackish water conditions (15 bar) in both flat sheet and spiral wound module formats. Aquaporin Inside™ Brackish Water RO membranes will boost our growth and consolidate a worldwide reference for us, thereby drastically differentiate us from competitors, and will open the possibility to also get into the seawater desalination market in the near future.

SunAqua18		739468
Title: Sustainable Desalination System		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2016	Duration: **36 months**	Unit: **EASME/A/02**
Total costs: €1.891.933	EU requested grant: **€1.324.353**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Desalination, small-scale desalination, salt market, brine disposal, efficiency, eco-innovation in arid areas, vapour-compression, seawater spray-drying.*

Abstract:

Our Earth is drying-up. Water is an over-used vital resource worldwide and more than 1billion people still live in water-scarce regions and around 3,5 billion could experience water scarcity by 2025. Fortunately, 97% of all water contained on the Earth is in liquid phase & just few steps from the coast: Seawater. Within this scenario, global desalination capacity in 2015 reached 95 million m3 water per day, distributed among 18,700 plants worldwide. These incredible figures are translated into a global water desalination market already representing over €12 billion/year and CAGR of total cumulative contracted capacity over 9.5% per year.

AQUA.abib S.L was founded in Barcelona (Spain) 2 years ago as a spin-off of BarcelonaTech after having completed the feasibility assessment of the invention. The introduction of SunAqua into the market will have a positive impact on: i) the economy of our customers, by allowing them to desalinate saline water at lower costs ii) the environment, and iii) AQUA.Abib's economic growth. SunAqua18 consists of a pyramid-shaped structure with an octagonal base, measuring 18m in height (15m of column + 3m of human-beings), covering an area of 2.500m2. The structure is covered by an outer transparent plastic layer and an inner dark-coloured layer which is considered to efficiently harvest sunlight from sun.

The system was validated by the end of 2013 with a SunAqua pilot-scale, which was running during 4 months. Moved by real market demand and several expressions of interest, we are committed to quickly moving towards our final commercial product, with overall dimensions assuring the best cost/efficiency ratio: SunAqua18. Thanks to the promising performance of the fully-operational prototype we estimate yearly revenues up to 19M€ by the end of the 5th year and cumulated benefits reaching 16.6€. These figures would allow us to assure a Payback period of our project lower than 3 years.

SUBSOL		642228
Title: bringing coastal SUBsurface water SOLutions to the market		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €4.170.008	EU requested grant: **€3.460.565**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *freshwater management, coastal areas, salinization, innovation, ecosystem services, technology assessment, commercialisation, salt water intrusion, public private partnerships, capacity building*

Abstract:

Coastal areas are the most productive and economically dominant regions of the world. The high water demand in these regions, however, puts tremendous pressure on their freshwater resources and ecosystems. This leads to problems like seasonal water shortage, saltwater intrusion, and disappearance of wetlands.

Building on national, regional and European research and innovation programs, in the past five years, a set of innovative, practical concepts have been developed for protection, enlargement and utilization of freshwater resources in coastal areas. These subsurface water solutions (SWS) combine innovations in water well design and configuration, allowing for advanced groundwater management, and maximum control over freshwater resources. SWS have been successfully piloted by public-private partnerships. These full-scale pilots have demonstrated SWS capacity to support sustainable freshwater supply in coastal areas, energy reduction, food production, and financial savings.

SUBSOL targets a market breakthrough of SWS as robust answers to freshwater resources challenges in coastal areas, by demonstration, market replication, standardization and commercialisation. The route to market includes business cases, market scans and capacity building in selected regions in Europe (Mediterranean, Northwestern Europe) and worldwide (USA, Brazil, China, Vietnam). SUBSOL will share experiences and outcomes with stakeholder groups through an online platform, that will be linked to existing networks, including EIP on Water.

The SUBSOL consortium combines knowledge providers, technology SMEs, consultants, and end-users from across Europe. Our ambition is to introduce a new way of thinking in terms of water resources management, promoting the sustainable development of coastal areas worldwide. This will stimulate economic growth and will create market opportunities and jobs for the European industry and SMEs.

FLOWERED		690378
Title: de-FLuoridation technologies for imprOving quality of WatEr and agRo-animal products along the East African Rift Valley in the context of aDaptation to climate change.		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €2.989.201	EU requested grant: **€2.989.201**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Defloridation; East African Rift Valley; Water quality; Health; Food Security*

Abstract:

FLOWERED objective is to contribute to the development of a sustainable water management system in areas affected by fluoride (F) contamination in water, soils and food in the African Rift Valley countries (Ethiopia, Kenya, Tanzania), thus to improve living standards (environmental, health and food security) of its population. FLOWERED aims to study, test and implement innovative defluoridation technologies for drinking and irrigation water that will mainly operate at small village scale and to develop an integrated, sustainable and participative water and agriculture management at a cross-boundary catchment scale.

On the basis of the complexity of the issue of water de-fluoridation, the proposed scientific approach in FLOWERED is based on a detailed knowledge of the geological and hydrogeological setting that controls contamination of water that constitute the prerequisite for the implementation of a sustainable water management and for the proposal of sustainable and suitable strategies for water sanitation and agricultural system. Innovative agricultural practices will be assessed, aiming to mitigate the impacts of F contamination of water and soil on productivity of selected food and forage crops and dairy cattle health and production. The development of an innovative and shared Geo-data system will support the integrated, sustainable and participative management system.

FLOWERED, focusing on innovative technologies and practices and taking into account local experiences, will implement an integrated water and agriculture management system and will enable local communities to manage water resources, starting from using efficient defluoridation techniques and applying sustainable agricultural practices. The integrated approaches improve knowledge for EU partners, local researchers, farmers and decision makers. The Project through the involvement of SMEs will strengthen the development co-innovative demonstration processes as well as new market opportunities.

SafeWaterAfrica		689925
Title: Self-Sustaining Cleaning Technology for Safe Water Supply and Management in Rural African Areas		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €2.989.998	EU requested grant: **€2.989.998**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *water purification; autonomous supply systems, electrochemical oxidation,*

Abstract:

This project focuses on a major challenge in African countries: In the 15 sub-Saharan African countries 108 million people have limited or even no access to clean water. The SafeWaterAfrica project will research and develop an autonomous and decentralized water treatment system for rural and peri-urban areas which is highly efficient in the degradation of harmful pollutants and at the same time very effective in killing microbiological contaminants. The system will be designed to provide 300 people in rural areas. With a market penetration of 3000 systems the project has the potential to supply 900,000 people within app. four years after the end of the project. The project includes capacity building and business development so that system ownership and responsibility are in the hands of the local rural communities.

The joint European-African development will result in a low-cost solution easy to handle and operate. It will take into account the specific cultural aspects of the region and will be designed for operation with local staff and in the responsibility of local communities or local water service providers, respectively. These “Made in Africa” systems will therefore have a high level of acceptance in the rural areas which promotes the implementation of the technology.

Ten transdisciplinary partners from Europe and Africa, assisted by eight enterprises and organisations in the Advisory Board, will work jointly over a project duration of 42 months to adapt a specific European water treatment technology into an African water treatment system solution. Besides, SafeWaterAfrica will generate the technological basis for innovative business models related to the development of water treatment products, which are produced, installed, operated and maintained in Africa. The resulting creation of new jobs will contribute to the social well-being and will promote economic growth in the rural and peri-urban areas of the southern African countries.

WATERSPOUTT		688928
Title: Water - Sustainable Point-Of-Use Treatment Technologies		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €3.571.946	EU requested grant: **€3.084.351**	
Main thematic area: 41 - Water and people / water treatment		

Free keywords: *Solar Disinfection Ethiopia South Africa Malawi Uganda*

Abstract:

The WHO estimates that in 2015 in Africa ~156 million people relied on untreated sources for their drinking water. WATERSPOUTT will design, develop, pilot and field-test a range of, sustainable point-of-use solar disinfection (SODIS) technologies that will provide affordable access to safe water to remote and vulnerable communities in Africa and elsewhere. These novel large-volume water treatment SODIS technologies will be developed in collaboration and consultation with the end-users, and include:

1. HARVESTED RAINWATER SODIS SYSTEMS for domestic and community use. (South Africa, Uganda).

2. TRANSPARENT 20L SODIS JERRYCANS. (Ethiopia)

3. COMBINED 20L SODIS/CERAMIC POT FILTRATION SYSTEMS. (Malawi)

These are novel technologies that will create employment and economic benefits for citizens in both the EU and resource-poor nations. WATERSPOUTT will use social science strategies to:

a. Build integrated understanding of the social, political & economic context of water use & needs of specific communities.

b. Examine the effect of gender relations on uptake of SODIS technologies.

c. Explore the relevant governance practices and decision-making capacity at local, national and international level that impact upon the use of integrated solar technologies for point-of-use drinking water treatment.

d. Determine the feasibility & challenges faced at household, community, regional and national level for the adoption of integrated solar technologies for point-of-use drinking water treatment.

WATERSPOUTT will transform access to safe drinking water through integrated social sciences, education & solar technologies, thus improving health, survival, societal well-being & economic growth in African developing countries. These goals will be achieved by completing health impact studies of these technologies among end-user communities in Africa. Many of the consortium team have worked for more than 15 years on SODIS research in collaboration with African partners.

REWAISE		869496
Title: REsilient WAter Innovation for Smart Economy		
Call Id: H2020-SC5-2019-2	Topic: **CE-SC5-04-2019**	Type of Action: **IA**
Project start date:	Duration: **60 months**	Unit: **EASME/B/02**
Total costs: €18.943.183	EU requested grant: **€14.984.649**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *smart water economy, governance, climate change, resilience, energy recovery, sustainability*

Abstract:

REWAISE will create a new "smart water ecosystem", mobilising all relevant stakeholders to make society embrace the true value of water, reducing freshwater and energy use, resulting in a carbon free, sustainable hydrological cycle, to transition into a resilient circular economy.

A network of nine living labs, involving 5 major water utilities, demonstrates real-life, large-scale operational environments for technological innovations and new governance methods to secure a resource-efficient water supply for the EU. New business niches will be created, incentivizing water-related investments, and accelerating SME growth, by linking users with specific water needs, incorporating life cycle and cost assessments, and collective action in new governance frameworks for smart value creation and high social returns.

By incorporating paradigm shifts from a linear Roman heritage to a new circular, water-smart economy, REWAISE reveals the full Value of Water for Europe, considering 3 key components of the economic and societal value generated by integral water cycles:

• Value in Water: is accomplished by extracting and putting to beneficial use dissolved substances such as nutrients, minerals, chemicals and metals, as well as organic matter and energy, embedded in raw and used water streams.

• Value from Water: encompasses the economic activities inherent to the water cycle, related products and services that generate benefits and jobs, directly or in other sectors that depend on water, such as energy and transportation,

• Value through Water: the societal, health and well-being functions of water, which will be enhanced by inter-linking users, regulators, water operators and other stakeholders in electricity and chemicals markets through a digital platform that optimizes decision making and business opportunities through socio-economics-based coordination between them, while minimizing emissions , risks and vulnerability.

GREENT		640422
Title: Greenhouse Gas Mitigation through Advanced Nitrogen Removal Technology		
Call Id: ERC-2014-STG	Topic: **ERC-StG-2014**	Type of Action: **ERC-STG**
Project start date: 9/1/2015	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.500.000	EU requested grant: **€1.500.000**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *nitrogen removal, anaerobic ammonium oxidation, nitrogen cycle*

Abstract:

Human activities have severe impacts on the biological carbon and nitrogen cycles. The most important consequences of these are global warming and water pollution. Wastewater treatment technology, in particular nitrogen removal systems, improved considerably in the last decade. The application of anaerobic ammonium oxidizing (anammox) bacteria in oxygen-limited granules has the potential to turn wastewater treatment plants into energy-efficient systems with minimal greenhouse gas emissions of carbon dioxide, nitrous oxide and methane. Recently, microorganisms that couple the anaerobic oxidation of methane to denitrification were discovered. An innovative integration of these microorganisms into partial nitritation-anammox systems for wastewater treatment offers an elegant and efficient solution to combat greenhouse gas emissions from wastewater treatment plants. The aim of the GREENT project is to determine nitrous oxide emissions from partial nitritation-anammox bioreactors and the parameters that govern these emissions, and to investigate the responsible pathways in molecular detail. Furthermore, I will explore the feasibility of an innovative bioreactor, which will remove ammonium and methane simultaneously through anammox and anaerobic methane-oxidizing microorganisms. This approach will turn the otherwise harmful methane into a resource for efficient nitrogen removal. These fundamental insights and technological advances will be achieved by a complimentary array of state-of-the-art methodology such as continuous culturing, stable isotope tracing and a combination of -omics methods together with physiological experiments and detailed measurements at full-scale installations. The results of this proposal will be of paramount importance for the wastewater treatment sector, but also indispensable for mathematical modelling, life cycle assessment and understanding the ecophysiology of the involved microorganisms.

LIAR		686585
Title: Living Architecture		
Call Id: H2020-FETOPEN-2014-2015-RIA	Topic: **FETOPEN-RIA-2014-2015**	Type of Action: **RIA**
Project start date: 4/1/2016	Duration: **39 months**	Unit: **REA/A/05**
Total costs: €3.216.555	EU requested grant: **€3.216.555**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *Living Architecture*

Abstract:

Living Architecture (LIAR) is a modular bioreactor-wall, which is based on the operational principles of microbial fuel cell technology and synthetic 'consortia' of microbes. LIAR is conceived as a next-generation selectively-programmable bioreactor and integral component of human dwelling, capable of extracting valuable resources from waste water and air, generation of oxygen and production of proteins and fiber by manipulating consortia performance. Its operational principles are grounded in distributed sensing, decentralised autonomous information processing, high-degree of fault-tolerance and distributed actuation and reconfiguration. Applications within urban systems are examined as a form of customizable micro-agriculture for installation in domestic, public (schools, hospitals) and office environments. Such a system has far reaching impacts on the building performance (resilience, resource recycling) manufacturing and design with ecosystems.

The project establishes:

• Foundational concepts through which 'designed' metabolisms can computationally process, recycle, remediate and synthesise valuable compounds from waste water.

• Transferable principles by which synthetic ecosystems can shape the environmental performance of our living spaces to increase our health, productivity and ecosystems impact.

• New standards for synthetic 'ecosystems' through consortia design, engineering and optimization.

TreatRec		642904
Title: Interdisciplinary concepts for municipal wastewater treatment and resource recovery. Tackling future challenges		
Call Id: H2020-MSCA-ITN-2014	Topic: **MSCA-ITN-2014-EID**	Type of Action: **MSCA-ITN-EID**
Project start date: 1/1/2015	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €1.267.467	EU requested grant: **€1.267.467**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *wastewater treatment; upgrading; microcontaminants removal; resource recovery; global change; stress conditions; decision support system*

Abstract:

Wastewater treatment and management in Europe has a large potential for growth; however needs to be supported by education of a new generation of interdisciplinarily trained wastewater professionals able to face future challenges and implement wastewater-related directives in practice. TreatRec, with the participationof two academic partners (ICRA-Catalan Institute for Water Research and University of Girona) and two non-academic (ATKINS and AQUAFIN) identifies several pertinent technological gaps and knowledge needs around which we have built a research programme. TreatRec involves equally academia and industry with a clear aim of producing a group of young researchers capable of conducting high quality research, but also able to address industrial and societal needs and implement wastewater-related directives in practice. The five researchers will conduct their scientific projects in an environment that combines industrial excellence in the development, design, construction and management of wastewater treatment systems, with complementary academic excellence in a) hypothesis-driven research involving the improvement/upgrading of state-of-the art technologies and the deepening the understanding of fate and removal of emerging contaminants in wastewater treatment systems and in b) applied research involving the development of decision support systems which allow for the encapsulation of knowledge for further use in decision-making processes. As a general goal, academic and non-academic partners of TreatRec, including WWTP operators, engineers responsible for the design and a water authority which has experience in water policy implementation, a set of recommendations will be generated to provide guidance for decision-makers on upgrading wastewater treatment plants for future challenges such as microcontaminants removal and nutrient recovery from a sustainable perspective.

NOWELTIES		812880
Title: Joint PhD Laboratory for New Materials and Inventive Water Treatment Technologies. Harnessing resources effectively through innovation		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-EJD**
Project start date: 2/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.422.142	EU requested grant: **€3.422.142**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *wastewater treatment, water reuse, organic micropollutants, advanced biological treatment, advanced oxidation processes, hybrid systems, nanomaterials, nanocatalysts,*

Abstract:

Future challenges, including climate change and the resulting unpredictability of precipitation patterns and temporal or permanent water scarcity, generate a high diversity of demands on water treatment technologies obliging them to be able to cater towards a variety of source and target water qualities across multiple scales, depending on application. It is evident that this will generate a market pull towards the development of new water treatment technologies, employing new materials or improving the integration of existing technologies. However, the integration of research and innovation within the water sector needs to be supported by education of a new generation of interdisciplinary trained wastewater professionals able to face future challenges and implement wastewater-related directives in practice. The primary objective of NOWELTIES is to organize a platform (European Joint Doctorate) that will provide cutting edge training opportunities for the education of tomorrow`s water treatment experts. The core activity is the research programme (composed of 14 individual research projects) aimed at development of inventive water treatment technologies (advanced biological treatments, inovative oxidation processes, hybrid systems) that allow catering for the varied treatment demands for a plethora of interconnected streams arising from recycling loops. These technologies will be able to control contamination by organic micropollutants (OMPs) and improve recovery of water across a diversity of scales enabling a smart combination of decentralized and centralised approaches. Besides a holistic training in the field of wastewater treatment dealing with state-of-the-art technologies, experimental techniques and knowledge management methodologies, NOWELTIES will provide a unique training approach to learning complex complementary skills leading to independent and critical thinking which seeks for originality and innovation.

Saraswati 2.0		821427
Title: Identifying best available technologies for decentralized wastewater treatment and resource recovery for India		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 8/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.103.173	EU requested grant: **€2.009.473**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *affordability, economic and institutional aspects, planning, policies, regulations, social acceptance*

Abstract:

The aim of SARASWATI 2.0 is to identify best available and affordable technologies for decentralized wastewater treatment with scope of resource/energy recovery and reuse in urban and rural areas. Further, it addresses the challenge of real time monitoring and automation. The previous SARASWATI project has shown that a number of decentralized wastewater treatment plants in India do not perform properly and that there are few plants that would meet the more stringent standards as those proposed by the Indian Government in 2015. Thus, in many cases not even CATNAP (the cheapest available technology narrowly avoiding prosecution) has been applied, leading to high pollution levels. The SARASWATI project therefore proposed to adopt the principle of BAT (best available technologies) in a more flexible way, adapting the definition of BAT to the local context, based on complementing the treatment efficiency with the costs of the treatment technology and affordability, and local context in the location of application. This will allow to identify BATs with more stringent standards if required and suitable for the location. Thereby, ten pilot technologies in 7 Indian States demonstrating enhanced removal of organic pollution (BOD, TSS), nutrients (particularly Nitrogen), organic micro-pollutants and pathogens have been proposed (WP1). Further, all pilots allow for resource recovery contributing to the principles of a circular economy and will undergo a comprehensive performance assessment (WP2) complemented by an extended sustainability assessment informed by recent ISO standards (WP4). This will allow identification of BATs for the Indian context. In addition, suitable automation and control strategies will be tested and recommended, taking into account the presence of operators and their level of knowledge and expertise (WP3). Finally, WP5 is dedicated to dissemination and exploitation of results. The consortium is comprised of a well-balanced EU-Indian team of 17 partners.

PAVITRA GANGA		821051
Title: Unlocking wastewater treatment, water re-use and resource recovery opportunities for urban and peri-urban areas in India		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 2/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.731.648	EU requested grant: **€3.074.821**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords:

Abstract:

India's water resources are under severe stress resulting from overexploitation and pollution. The Indian government has started the Namami Gange programme in line with the sustainable development goals (SDG), including the improvement of wastewater treatment. PAVITRA GANGA links directly to these programmes and builds on existing cooperation between EU/India, supported by national governments. The objective is to fulfil SDG6 by unlocking the environmental and economic potential of municipal wastewater treatment and reuse solutions for urban and peri-urban areas in India. By focussing on three pillars we ensure maximum impact:

- People: we create social awareness through a participatory monitoring approach. We target social vulnerable groups by providing treatment solutions for open drains. We create a community of practitioners by the establishment of open innovation test sites and a training & learning network.

- Planet: we focus on rejuvenation of the river by removing organic pollution, heavy metals and emerging compounds that have the biggest impact on Indian streams. We provide technology innovations to upgrade existing wastewater infrastructure and to add treatment systems to open drains, resulting in improved quality of receiving rivers.

- Profit: we apply the principles of the Circular Economy and exploit the economic opportunities of waste-to-energy, water reuse and resource recovery. Solutions are cost efficient and require limited investments making them particularly suited for the Indian market.

In collaboration with local stakeholders and supported by industrial partners we will set-up two pilot sites at the Barapullah Drain (New Delhi) and the Jajmau plant (Kanpur). The dynamics of a business and technology platform combined with a learning network will form strong Indian water professionals, in line with Skill India, while also training EU experts in understanding Indian challenges. This will accelerate the transition to an EU-India level playing field.

GROW GREEN		730283
Title: Green Cities for Climate and Water Resilience, Sustainable Economic Growth, Healthy Citizens and Environments		
Call Id: H2020-SCC-NBS-2stage-2016	Topic: **SCC-02-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **60 months**	Unit: **EASME/B/02**
Total costs: €11.519.300	EU requested grant: **€11.224.058**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *climate resilience, water resilience, sustainable economic growth, healthy citizens, urban policy, green and blue infrastructure, stakeholder engagement*

Abstract:

The frontrunner cities of Manchester (UK), Valencia (Spain), Wroclaw (Poland) and Wuhan (China) and the follower cities Brest(France), Zadar (Croatia) and Modena (Italy) are currently inhabited by 12.7 million people and sit at the heart of wider metropolitan areas which are home to 17.8 million people. All cities already experience flooding and heat stress, with projections for these issues to increase due to climate change and ongoing development. Working in complex, resource-constrained urban environments, the municipalities for each city have committed to delivering joined-up, cost-effective, smart solutions to address these and other urban challenges. They recognise that the cities of the future will need to achieve more with less resources and deliver genuine sustainable development that realises a broad range of social, economic and environmental objectives. Each city believes that nature-based solutions (NBS) are a critical part of this approach.

GROW GREEN brings the partner cities together on the basis of these similarities but also their differences. Across the 6 European and 1 Chinese City they represent the range of different cities that are found across the world, and the different climate risks that they face. The cities will demonstrate a replicable approach for the development and implementation of city NBS strategies.

The outcome will be more than simply demonstrating a methodology that works in the partner cities. GROW GREEN will provide the platform for a step change in the way that NBS are embedded in the long-term planning, development, operation and management of cities around the world. The project outputs will be promoted directly to 4-5 follower+ cities in Latin America, Africa and India to encourage them to develop and implement NBS strategies and to 146 Chinese 'Sponge Cities'. These channels have been designed to create global demand for NBS and to promote European NBS products and services to meet this demand.

INDALG		733718
Title: Development of an innovative algae based tertiary wastewater treatment and value recovery system		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-03-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2016	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €2.098.984	EU requested grant: **€1.469.289**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *Sustainable; Wastewater treatment; Material recovery; Algae; Biotechnology; Water; Chemical free*

Abstract:

Industrial Phycology (IPHYC) has developed a wastewater treatment (WWT) process to meet tightening discharge consents for the concentration of nitrogen (N), phosphorus (P) and other materials in wastewater (WW) effluents. These nutrients & materials are linked to adverse environmental events e.g. eutrophication. WWT operators require a sustainable treatment process to remove / recover these materials to meet legislation.

IPHYC's novel patented WWT process uses microalgae (MA) to remove nutrients from WW) effluents. MA reproduce rapidly when sufficient nutrients, light & C02 are supplied. The MA consume nutrients in the WW until depleted cleaning the effluent to the legislated discharge consent concentrations, allowing the operator to meet its statutory commitments & not risk financial penalties. The biomass is retained for reactor seeding or harvested for valorisation e.g. use for anaerobic digestion, animal feed, feedstock for bio-based industries.

The process has been validated by I-PHYC in a recent field trial at Wessex Water's Avonmouth WWT plant & a supporting feasibility study carried out though SME instrument phase 1 support. Through the phase 1 project, IPHYC engaged with the UK water industry to understand the market & end-user needs. From this IPHYC has worked with industry partners to identify the work required to prove its technology & develop its process to commercial readiness. IPHYC is applying for funding to enable it to achieve this by; building a commercial demonstrator of its process for the treatment of municipal wastewaters; optimising its process for the treatment of industrial effluents (e.g. mines); develop methods of recovering value from the algal biomass; further engage with key industry companies, decision makers and potential future customers; develop its commercial strategy for the delivering the technology to market. This outcomes of the project will enable IPHYC to enter the market with a credible and proven disruptive technology.

ALGAMATER		767333
Title: Using microalgae bioreactor technology to deliver the world's most cost-effective, energy-efficient and adaptable system for the treatment of toxic industrial and landfill wastewater		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 6/1/2017	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €2.906.000	EU requested grant: **€2.034.200**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *Wastewater treatment plant; microalgae, biological treatment processes*

Abstract:

Bluemater CEO Nuno Gomes conceived this project inspired by the words of the inventor and author Buckminster Fuller: "Nature has no pollution. This is a word coined in human ignorance regarding the presence of the right chemicals being released in the wrong places…" While high concentrations of compounds such as ammonium, phosphates and sulphates can be deadly for aquatic ecosystems and their inhabitants, they are nutrients for algae and plants. This project harnesses components found in highly concentrated wastewaters to feed microalgae, which grow especially quickly by transforming ammonium and phosphates into proteins and other organic matter.

Since 2008 we have been developing this challenging concept into a viable commercial system for wastewater treatment at landfills and in industry. Following extensive testing at diverse wastewater treatment plants (WWTPs), and guided by feedback from target clients, our breakthrough microalgae technology – the first of its kind - was integrated with Bluemater's next-generation wastewater management systems in its current configuration. In these pilot tests, Algamater demonstrated decreased energy costs in wastewater treatment by more than 60% and lowered operational costs by more than 40% compared to traditional wastewater treatment plants. We are proud to introduce the Algamater Wastewater Treatment Plant: the world's most robust, flexible, cost-effective, and eco-friendly wastewater treatment system. Algamater is currently at a prototype stage (TRL7). In this project we will upgrade, scale up and integrate the Algamater components into a full-scale wastewater treatment plant capable of demonstrating our game-changing technology at an industrial level.

With the commercialization of Algamater we forecast strong, consistent growth for Bluemater, notable employment creation both inside our company and out, and significantly reduced environmental hazards in the wastewater treatment sector.

iMETland		642190
Title: iMETland: A new generation of Microbial Electrochemical Wetland for effective decentralized wastewater treatment		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **40 months**	Unit: **EASME/B/02**
Total costs: €3.461.623	EU requested grant: **€2.924.810**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *Microbial Electrochemical Technologies, Wetlands, Electrogenic bacteria, ICT*

Abstract:

iMETland project aims to construct and validate a full-scale application of a eco-friendly device to treat urban wastewater from small communities at zero-energy operation cost. Our concept comes from the integration of Microbial Electrochemical Technologies (MET) with the biofilters used in constructed wetlands. iMETland outperforms classical biofilters from constructed wetlands by using electroactive bacteria in combination with a innovative electroconductive material to achive depuration rates that are 10-fold higher than classical techniques. On top of that, the low biomass yield generated under electrogenic conditions avoids any bed colmatation. Wastewater will be also converted into pathogen-free water suitable for irrigation by using an electro-oxidative methodology. Furthermore, the unique conversion of sewage treatment into electric current by electricity-producing bacteria makes such a process an internal reporter of the biological depuration process. So thus, it can be used as output signal to control the process and can easily inform the operator through ICT tools, converting the depuration in an interactive process between device and a smart-phone in end-user´s hands.

iMETland try to fill the gap that was sharply identified by the programme topic: WATER-1-2014/2015: Bridging the gap: from innovative water solutions to market replication. Our solution has already passed both research and pilot scale and is ready to try a full-scale demonstration to accelerate the market uptake. The multidisciplinary nature of iMETland makes it to fit well with the “water and wastewater treatment “priority of the EIP-water. Moreover, the coordinator of iMETland consortium is also the Technical Manager of a recent ACTION GROUP at EIP-WATER called “ MEET-ME4WATER, Meeting Microbial Electrochemistry for Water”. This AG focuses on overcoming the barriers to scaling up and demonstrate microbial electrochemical technologies (METs) and bring them faster to the market.

REMEB		641998
Title: ECO-FRIENDLY CERAMIC MEMBRANE BIOREACTOR (MBR) BASED ON RECYCLED AGRICULTURAL AND INDUSTRIAL WASTES FOR WASTE WATER REUSE		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €2.361.623	EU requested grant: **€1.869.854**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *agro-industrial wastes, low cost ceramic membrane, waste water treatment, MBR, water reuse, water scarcity, market replication and impact*

Abstract:

The main objectives of the REMEB project are the implementation and validation of a low-cost ceramic membrane bioreactor (MBR) in a Waste Water Treatment Plant (WWTP), the study of the impact and replication of the technology for the reuse of the water in regions with water scarcity and the industrial sector, and finally, the definition of a proper business plan to start the commercialization of the technology, once the project will be finished.

The low cost recycled ceramic membranes of the project are based on residues obtained in agricultural and industrial processes (sub-products), such as olive oil solid wastes, marble working wastes and chamotte from fired scrap, in addition to the typical raw materials used in the ceramic tile industry. The project aims to achieve several specific objectives: valorization of wastes from different agricultural or industrial processes, manufacturing of an innovative product using recycled materials, validation of a new MBR with a lower initial and running costs by using low cost ceramic membranes and comparison between REMEB MBR and the MBR in operation in the WWTP selected for the validation.

Replication of both, manufacturing and validation tasks, is assured by repeating the processes in the facilities of some participants. Manufacturing membrane replicability will be performed in Turkey and Italy. The replication study of the MBR implementation in the urban and industrial wastewater sector will be performed in Colombia and nearby countries, Cyprus and nearby countries and Europe. Furthermore, evaluation of the environmental impact of product and process will be carried out by the method of LCA. Finally, a marketing and dissemination plan of the technology will be done by the entire consortium.

It is expected that this technology would be implemented massively, principally due to the low cost of REMEB MBR (3.5 times lower than a MBR of organic membranes and 2.5 times lower than a ceramic MBR).

Eco-UV		641702
Title: Low carbon footprint and eco-innovative UV water disinfection		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 6/1/2015	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €4.494.949	EU requested grant: **€3.949.129**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *UV; water treatment; disinfection; ultra high efficiency; mercury-free; low life cycle costs; demonstration sides, evaluation*

Abstract:

The central objective for Eco-UV is the demonstration and characterisation of an innovative UV lamp and driving electronics technology for chemical-free water treatment and disinfection. The newly implemented technology is a ground-breaking innovation providing up to four times increased lifetime with greatly increased efficiency, the energy consumption reduced by 80%. Thus, this technology provides a lower carbon footprint, much improved energy use and hence greatly reduced lifetime costs. Additionally, the innovative technology will be introduced with a mercury-free configuration, removing the need to handle with this hazardous substance in manufacture and disposal, hence providing a sustainable and eco-innovative technology. The project will prove the lamp technology by demonstration in real applications with full characterisation in terms of long-term stability, ageing effects and dose-response-relationship. Furthermore, the UV lamps are integrated in reactors and the performance of the whole UV system is evaluated at a test centre for drinking water. A new testing protocol for different end-users applications will furthermore be derived, which will be the basis for a future standardised validation of industrial UV applications. The technology will be installed at three demonstration sites for an extended running period. At each, the treatment performance of the UV systems will be evaluated according to the inactivation of micro organisms and the reduction of application specific chemicals, e. g. antibiotics and pesticides. A full Life Cycle evaluation of cost and environmental benefits will be disseminated via EU ETV forums to ensure active uptake of the technology offering by comparing it to traditional UV technology in terms of energy, infrastructure and lifetime costs. The proposed UV technology is addressing the thematic priority areas as outlined in the EIP on Water, especially water reuse, water treatment, water governance and the water-energy nexus.

INNOQUA		689817
Title: Innovative Ecological on-site Sanitation System for Water and Resource Savings		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €8.073.725	EU requested grant: **€6.996.214**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *ecological natural process - no sludge production - modular system - earthworms - daphnia - bio-solar purification -UV disinfection - EU and overseas markets - carbon emissions reduction*

Abstract:

INNOQUA will accelerate the path to market of a modular set of innovative, patent protected, award winning and scalable fully ecological sanitation solutions that address wide market needs in rural communities, for agricultural industries, for sustainable home-builders or collective housing owners and for developing countries worldwide. The modular system is based on the purification capacity of biological organisms (worms, zooplankton and microorganism) and sorption materials bringing ecological, safe and affordable sanitation capacity where it is needed most while fully addressing the thematic and cross cutting priorities of the EIP on Water.

We will perform demonstration scale deployment and resulting exploitation of the system to include commercial development, technology integration, eco-design, controlled environment pilots (in NUI Galway facilities in Ireland and UDG facilities in Spain), real use demo sites and market uptake preparation in several EU and non-EU countries (France, Italy, Ireland, Romania, UK, Ecuador, Peru, India and Tanzania), and further preparation for post project uptake.

Such an integrated solution is innovative and has not been employed in the past. This integrated but modular solution for the final reuse of wastewater is particularly attractive for small to medium remote water stressed European communities with high water demand for either agriculture and/or the conservation of natural freshwater ecosystems. The system is aimed at being a sustainable solution for 'zero' wastewater production with the complete reuse of wastewater. The system is ideal for small to medium scale situations where an integrated solution for the treatment of wastewater is required to reduce the waste directed to surface freshwaters for the attainment of good quality water, as stated by the Water Framework Directive. The robust but efficient technologies are also ideal for deployment in markets where resources are limited and skilled staff unavailable.

AquaNES		689450
Title: Demonstrating synergies in combined natural and engineered processes for water treatment systems		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €10.720.718	EU requested grant: **€7.837.292**	
Main thematic area: 42 - Water and people / waste water treatment		

Free keywords: *natural and engineered water treatment systems, constructed wetlands, managed aquifer recharge, bank filtration, ecosystem services, drinking water, wastewater treatment, water reuse, LCA*

Abstract:

The AquaNES project will catalyse innovations in water and wastewater treatment processes and management through improved combinations of natural and engineered components. Among the demonstrated solutions are natural treatment processes such as bank filtration (BF), managed aquifer recharge (MAR) and constructed wetlands (CW) plus engineered pre- and post-treatment options.

The project focuses on 13 demonstration sites in Europe, India and Israel covering a repre-sentative range of regional, climatic, and hydrogeological conditions in which different combined natural-engineered treatment systems (cNES) will be demonstrated through active collaboration of knowledge and technology providers, water utilities and end-users. Our specific objectives are:

• to demonstrate the benefits of post-treatment options such as membranes, activated carbon and ozonation after bank filtration for the production of safe drinking water

• to validate the treatment and storage capacity of soil-aquifer systems in combination with oxidative pre-treatments

• to demonstrate the combination of constructed wetlands with different technical post- or pre-treatment options (ozone or bioreactor systems) as a wastewater treatment option

• to evidence reductions in operating costs and energy consumption

• to test a robust risk assessment framework for cNES

• to deliver design guidance for cNES informed by industrial or near-industrial scale expe-riences

• to identify and profile new market opportunities in Europe and overseas for cNES

The AquaNES project will demonstrate combined natural-engineered treatment systems as sus-tainable adaptations to issues such as water scarcity, excess water in cities and micro-pollutants in the water cycle. It will thus have impact across the EIP Water's thematic priorities and cross-cutting issues, particularly on 'Water reuse & recycling', 'Water and wastewater treatment', 'Water-energy nexus', 'Ecosystem services', 'Water governance', and 'DSS & monitoring'.

WIDER UPTAKE		869283
Title: Achieving wider uptake of water-smart solutions		
Call Id: H2020-SC5-2019-2	Topic: **CE-SC5-04-2019**	Type of Action: **IA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €12.085.616	EU requested grant: **€11.606.480**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *Resource recovery, value chain optimisation*

Abstract:

The overall objective of WIDER UPTAKE is to co-develop a roadmap for widespread implementation of water smart symbiotic solutions for wastewater reuse and resource recovery, based on the principles of circular economy.

WIDER UPTAKE will demonstrate innovative solutions that optimize water reuse, resource recovery and energy utilisation where market utilisation of the recovered resource(s) is achieved through a symbiosis between the utility and industry. The cases will provide applied knowledge on operationalization of the solutions, shared and further co-developed in a community of practice. The demonstrations are:

- Reuse of wastewater for urban agriculture, Ghana.

- Fertiliser and soil improver by wastewater resource recovery, Norway.

- Reuse of wastewater for greening of urban areas, Czech Republic.

- Reuse of wastewater for irrigation in agricultural industry, Italy.

- Production of new bio-composite material by water resource recovery, Netherlands.

WIDER UPTAKE's hypothesis is that the barriers for wider uptake of water-smart solutions are not only technological but also of organizational, regulatory, social and economic character. WIDER UPTAKE will identify and demonstrate common measures for wider uptake through activities on 'Monitoring and control of health and quality risks', 'Circular-economy and efficiency potential', 'Governance and business models for industrial symbiosis' and 'Measuring water smartness and progress towards SDG'.

WIDER UPTAKE includes demonstrations of wastewater reuse for agriculture and urban greening, which also reduces the impact of warming from climate change. WIDER UPTAKE also comprises cases with phosphorus recycling, biogas and biochar utilisation, and production of bio-composites for manufacturing materials with resources recovered from the whole water cycle, which demonstrates the upcycling of the resources from wastewater to marketable products.

HYDROUSA		776643
Title: Demonstration of water loops with innovative regenerative business models for the Mediterranean region		
Call Id: H2020-CIRC-2017TwoStage	Topic: **CIRC-02-2016-2017**	Type of Action: **IA**
Project start date: 7/1/2018	Duration: **54 months**	Unit: **EASME/B/02**
Total costs: €12.015.449	EU requested grant: **€9.958.707**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *Closing water loops*

Abstract:

HYDROUSA will provide innovative, regenerative and circular solutions for (1) nature-based water management of Mediterranean coastal areas, closing water loops; (2) nutrient management, boosting the agricultural and energy profile; and (3) local economies, based on circular value chains. The services provided lead to a win-win-win situation for the economy, environment and community within the water-energy-food-employment nexus.

HYDROUSA water loops will include water from non-conventional sources including wastewater, rainwater, seawater, groundwater and vapour water, all resulting in recovered and marketable products. HYDROUSA will demonstrate at large scale the feasibility and sustainability of innovative, low-cost water treatment technologies to recover freshwater, nutrients and energy from wastewater, salt and freshwater from seawater, and freshwater from atmospheric water vapour. Water conservation solutions including aquifer storage and sustainable agricultural practices including fertigation will be applied. The solutions will be demonstrated on 3 major touristic islands in Greece. Detailed technical and financial deployment plans will be established for replication in additional 25 locations worldwide. Through the on-site water loops of HYDROUSA, complex supply chains for resource recovery are not required, as producers are directly involved as consumers of derived products. HYDROUSA will combine traditional skilled workmanship with modern ICT integration in beautiful and smart automation systems. HYDROUSA will revolutionise water value chains in Mediterranean areas and beyond, from water abstraction to sewage treatment and reuse. The proposed HYDROUSA solutions show massive potential to change the way humans interact with water, food and energy.

NextGen		776541
Title: Towards a next generation of water systems and services for the circular economy.		
Call Id: H2020-CIRC-2017TwoStage	Topic: **CIRC-02-2016-2017**	Type of Action: **IA**
Project start date: 7/1/2018	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €11.397.544	EU requested grant: **€9.965.231**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *Circular water systems; Water reuse; energy recovery; materials recycling; large scale demonstration; business models; Energy recovery;Knowledge co-creation; Marketplace;Evidence Base*

Abstract:

The NextGen initiative will evaluate and champion innovative and transformational circular economy solutions and systems that challenge embedded thinking and practices around resource use in the water sector. We will produce new understandings to underpin the exploitation of techniques and technologies that enhance our ability to recover, refine, reuse, repurpose, capture value from, and extend the use-life of, an ever-increasing range of resources and products, thereby projecting the European water and allied sectors as global circular economy pioneers. NextGen will demonstrate innovative technological, business and governance solutions for water in the circular economy in ten high-profile, large-scale, demonstration cases across Europe, and we will develop the necessary approaches, tools and partnerships, to transfer and upscale.

The circular economy transition to be driven by NextGen encompasses a wide range of water-embedded resources: water itself (reuse at multiple scales supported by nature-based storage, optimal management strategies, advanced treatment technologies, engineered ecosystems and compact/mobile/scalable systems); energy (combined water-energy management, treatment plants as energy factories, water-enabled heat transfer, storage and recovery for allied industries and commercial sectors) and materials (nutrient mining and reuse, manufacturing new products from waste streams, regenerating and repurposing membranes to reduce water reuse costs, and producing activated carbon from sludge to minimise costs of micro-pollutant removal).

The project mobilises a strong partnership of water companies, industry, specialised SMEs, applied research institutes, technology platforms, city and regional authorities and builds on an impressive portfolio of past research and innovation projects, leveraging multiple European and global networks guaranteeing real impact.

RichWater		691402
Title: First application and market introduction of combined wastewater treatment and reuse technology for agricultural purposes		
Call Id: H2020-FTIPilot-2015-1	Topic: **FTIPilot-1-2015**	Type of Action: **IA**
Project start date: 2/1/2016	Duration: **33 months**	Unit: **EASME/A/02**
Total costs: €2.083.866	EU requested grant: **€1.658.703**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *Water reuse, reclaimed water, sustainable agriculture, water management, smart irrigation*

Abstract:

In recent years, a growing concern has been expressed throughout the EU regarding water scarcity problems and the significant impacts on freshwater resources by agricultural activities. The concept presented in this project is an advancement of the TREAT&USE system, a successful EU research project (FP7) approaching the safe reuse of wastewater in agriculture production with excellent technical and scientific results. The upscale of TREAT&USE prototype will permit to overcome main barriers to reach the market and adapt the technology to intensive agriculture production. The result will be a commercial system thoroughly demonstrated and tested in its operational environment.

RichWater system is composed of a low-cost and energy-efficient MBR (to produce pathogen-free and nutrient rich irrigation water), a mixing module (for tailor-made mixing with freshwater and additional fertilizers), the fertigation unit and a monitoring / control module including soil sensors to guarantee demand-driven and case sensitive fertigation. By combining these developed modules a complete and turn-key system for safe wastewater reuse in agriculture is available covering all topics relevant to farmers and the market. In TREAT&USE, a prototype system has already been tested and implemented in a small-scale tomato plantation in Southern Spain. It is RichWater project ambition to develop an up-scaled commercial prototype (min. 100 m^3 treatment capacity/day) and pursue the goal of implementing it in a real scale food producer in Southern Spain to reuse local community wastewater for irrigation purposes. The aim is to create a win-win situation between two sectors (the wastewater treatment and the agricultural sector) by turning public wastewater into a valuable end-product. A detailed life cycle assessment and business plan will help to precisely assess the ecologic, technological and economic benefits enabling an effective market strategy.

SuWaNu Europe		818088
Title: Network for effective knowledge transfer on safe and economic wastewater reuse in agriculture in Europe		
Call Id: H2020-RUR-2018-1	Topic: **RUR-15-2018-2019-2020**	Type of Action: **CSA**
Project start date: 1/1/2019	Duration: **30 months**	Unit: **REA/B/02**
Total costs: €1.999.926	EU requested grant: **€1.999.926**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *water resue agriculture, circular economy, rural developement, sustainable water management, practicioners, multi-actor approach, networking,*

Abstract:

Reclaimed water has a strong potential for complementing conventional water resources. According to the European Commission communication “Closing the loop - An EU action plan for the Circular Economy” (COM(2015)0614): “in addition to water-efficiency measures, the reuse of treated wastewater in safe and cost-effective conditions is a valuable but under-used means of increasing water supply and alleviating pressure on over-exploited water resources in the EU”. Water reuse is especially relevant in agriculture as this is one of the main water consumers, having additional benefits for farmers: lower cost compared to other solutions (e.g. desalination), reliability of supply regardless of season, climatic conditions and associated water restrictions, and nutrients contribution of the treated wastewater that can supplement or replace conventional fertilizers. Based on the results of a previous EU project called SuWaNu (contract number 319998) whose main result was to set research driven clusters in the field of water reuse in 5 target countries: Malta, Spain, Germany, Greece and Bulgaria, SuWaNu Europe is intended to bridge the current innovation gaps and achieve an effective implementation of reuse solutions in agriculture. SuWaNu Europe will extend the geographical coverage of its predecessor and will summarize, share and present existing and upcoming knowledge and skills in the field of water reuse in agriculture to the relevant stakeholders such as farmers and farming advisory groups. SuWaNu Europe will also create regional working groups for the development of action plans. These action plans will set strategies at regional level with the objective of boosting innovation in the agricultural and water sectors, improving best practice development and identifying the most appropriate channels to reach stakeholders. In addition to this, dissemination and training will create the capacity and competencies needed to implement these results.

PAVITR		821410
Title: Potential and Validation of Sustainable Natural & Advance Technologies for Water & Wastewater Treatment, Monitoring and Safe Water Reuse in India		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 2/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.446.073	EU requested grant: **€2.807.143**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *High Resolution Management*

Abstract:

The increased demand for drinking water from habited zones combined with continued pollution of freshwater sources due to inadequate collection and treatment of wastewater, is a statement of challenge and also a window of opportunity common to India and Europe. Unlike in Europe, the water and sanitation scenario in developing countries like in India is a matter of serious concern and more challenging. The main aim of this project is to validate, deploy or develop cost-effective & sustainable solutions to tackle water challenges and ensure the provision of safe water reuse, rejuvenate water quality of rivers, and restore ecosystems in India. This will be achieved by deploying & developing water / wastewater technologies, and use of sensors for emerging and traditional contaminants. Further, it also aims to develop new management & planning strategies and enable better monitoring of pollution levels in real-time modes. This will not only contribute to the development of sustainable technologies to cope with water shortages in rural and urbanised areas in India, but also in Europe, where climate change is expected to induce a changing and uncertain precipitation pattern and an enhancement in temperature. It will assess and enhance the potential of natural and technical water treatment systems to suit the local hydro-geological conditions. Moreover, the projects will assess and validate different wastewater and water management plans. Besides the technical aspects, research will also cover financial, environmental and institutional sustainability of those systems in order to develop and bring to the market a cost-efficient multi-barrier water management approach by building capacity.

MADFORWATER		688320
Title: DevelopMent AnD application of integrated technological and management solutions FOR wasteWATER treatment and efficient reuse in agriculture tailored to the needs of Mediterranean African Countries		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.039.419	EU requested grant: **€2.910.869**	
Main thematic area: 43 - Water and people / water reuse, efficiency		

Free keywords: *Water stress mapping; Wastewater treatment and reuse in agriculture; Water efficiency in agriculture; Technology adaptation and validation; Water management; Food security; Water polici*

Abstract:

Climate change and population growth are expected to exacerbate the water crisis of Mediterranean African Countries (MACs), where agriculture accounts for 80-85% of freshwater consumption. The aim of MADFORWATER is to develop a set of integrated technological and management solutions to enhance wastewater treatment, reuse for irrigation and water efficiency in agriculture in three MACs (Tunisia, Morocco and Egypt). MADFORWATER will develop and adapt to three main hydrological basins in the selected MACs technologies for the production of irrigation-quality water from drainage canals, municipal, agro-industrial and industrial wastewaters, and technologies for water efficiency and reuse in agriculture, initially validated at laboratory scale. Selected technologies will be further adapted and validated in four field pilot plants of integrated wastewater treatment/reuse. Integrated strategies for wastewater treatment and reuse targeted to the selected basins will be developed, and guidelines for the development of integrated water management strategies in other basins of the three target MACs will be produced, considering climate change, population increase and economic growth scenarios. The social and technical suitability of the developed technologies and non-technological instruments in relation to the local context will be evaluated with the participation of MAC stakeholders and partners. Guidelines on economic instruments and policies for the effective implementation of the proposed water management solutions in the target MACs will be developed. The project will lead to a relevant long-term impact in Egypt, Morocco and Tunisia in terms of increased wastewater treatment, wastewater reuse, food production and income in the agricultural and water treatment sectors, and decreased groundwater exploitation, water pollution and food contamination. The MADFORWATER consortium consists of 18 partners, 5 of which from the 3 MACs and 1 from China.

HTCycle		823124
Title: Sewage sludge reuse with Phosphate recovery and heavy metal absorption with an innovative HTC technology.		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.962.000	EU requested grant: **€1.373.400**	
Main thematic area: 44 - Water and people / sewage sludge		

Free keywords: *Sewage sludge treatment and reuse, hydrothermal carbonization, heavy metal removal, phosphate recovery, resource efficiency, eco-innovation*

Abstract:

Efficient municipal waste-water treatment, such as the systems currently in place in most European municipalities, produces vast amounts of sewage sludge. The latest data collected show a yearly production of 9.637 thousands of tons in the EU28 countries. Sludge treatment issues are often neglected in comparison with water-related parameters which results in serious technical difficulties and highly expensive disposal methods. As a result, an energy efficient, environmentally sound and economically viable process for sludge disposal and reuse of valuable resources e.g. phosphorus hardly exists.

The most common disposal methods for sludge are spreading on agricultural soil, composting and incineration. Land-filling has been long banned, the use as fertilizer, although very moderate in costs, is being banned in many regions due to concerns about contamination of soils with heavy metals and endocrine disruptive compounds. Composting raises the same concerns, and it is a labour-intensive and unsafe process, which leaves incineration as the most used option, albeit an expensive and not effective one. Incineration entails the highest costs (80-110 € /ton), but is also considered the safest disposal method and is fast growing and widely adopted. It presents also technical difficulties, such as the low overall efficiency of the process, the huge logistic efforts required to transport the sludge to the incineration plants, or the disposal of the ashes after the sludge has been incinerated.

In this situation, our company, AVA has the objective to demonstrate and commercialize our proprietary technology for hydrothermal carbonization (HTC) of sewage sludge, showing clearly technical and economic ad-vantages against the current sludge incineration method. We aim to increase the amount of sludge converted into high value products such as fuel, activated carbons for water treatment, recovered phosphorus, soil remediation material, carbon sequestration schemes and other applications. The HTCycle process turns the present sewage sludge disposal (incineration) from a costly process into an income-generating activity.

SSOP		760277
Title: Sewage Sludge to Oil Process		
Call Id: H2020-FTIPilot-2016-1	Topic: **FTIPilot-01-2016**	Type of Action: **IA**
Project start date: 5/1/2017	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €2.827.978	EU requested grant: **€1.979.584**	
Main thematic area: 44 - Water and people / sewage sludge		

Free keywords: *sewage sludge treatment, bio-crude; bio-oil, wastewater treatment plant, valorization of wastes*

Abstract:

SSOP is a profitable green technology that transforms 95% of the solids of sewage sludge into fuel (oil + gas + char) and reduces the disposed sludge volume down to 5%. SSOP minimizes the environmental impact and disposal costs of the sludge and valorises this residue transforming it into a fully renewable source of energy (bio-crude). The users of SSOP (municipal WWTPs) will reduce their sludge treatment costs 75% (current annual operation expenses for SSOP are € 1 million for a 15,000 population equivalent/year plant whilst they are around € 4 million for conventional sludge disposal methods). Furthermore, the energy obtained will plenty cover the energy requirements of the plant (10%-30% of operation costs), leading to a global 50 % increase in profit thanks to savings. Our technology will also open a new business line for increasing profit: selling bio-crude.

InnoPellet		**711540**
Title: Self-supporting biofuel sludge pellet producing system for small and medium sized sewage plants		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 3/1/2016	Duration: **36 months**	Unit: **EASME/A/02**
Total costs: €2.158.500	EU requested grant: **€1.510.950**	
Main thematic area: 44 - Water and people / sewage sludge		

Free keywords: *Sewage sludge biofuel pelleting, Eco-friendly wastewater treatment, Self-supporting system, Low wastewater treatment cost*

Abstract:

There is a huge number of small and medium sized sewage plants in and out of the European Union that cannot pass over urban sewage sludge for agricultural use in sufficient proportion (less than 50% in the EU), therefore the management of these sewage plants usually ask and receive permissions from environmental authorities for disposing the communal sludge in disused mines or dumps. Instead of disposal/landfilling – that regularly causes pollution of natural water resources – it would be more beneficial to produce sludge pellets. Such experiences drove us to create the InnoPellet technology, a self-supporting biofuel pellet producing system for treating communal sewage sludge that is economical in case of small scale production too.

Five years of research and development led to the successful completion of a prototype machine that received regulatory approval and third-party testing/validation. After finalising the InnoPellet technology, our primary goal is to commercialise the units and relating pelleting services to wastewater companies primarily in Europe and later on the world market as well.

The InnoPellet system offers an economical solution of sewage sludge treatment for wastewater companies. Our technology is a self-supporting machinery for drying and pelleting sewage sludge without external need of fossil fuel or any other additional material. Our technology fits into the ‘energy from waste’ policy of the European Union. It will enables wastewater plants to meet the strict EU environmental regulations and at the same time, reduce their sewage sludge treatment costs with 50-75%.

SUSFERT		792021
Title: Sustainable multifunctional fertilizer – combining bio-coatings, probiotics and struvite for phosphorus and iron supply		
Call Id: H2020-BBI-JTI-2017	Topic: **BBI.2017.D4**	Type of Action: **BBI-IA-DEMO**
Project start date: 5/1/2018	Duration: **60 months**	Unit:
Total costs: €9.364.590	EU requested grant: **€6.554.979**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Probiotics, iron fertilizer, phosphorus fertilizer, struvite, lignin coatings, sustainable*

Abstract:

SUSFERT addresses the massive usage of mineral fertilisers in EU agriculture, which are largely based on non-renewable resources, but are required in intensive crop production for meeting demands for food and feed. SUSFERT will develop multifunctional fertilisers for phosphorus (P) and iron (Fe) supply, which will fit into existing production processes and common EU agricultural practice.

The SUSFERT innovation combines bio-based and biodegradable coatings, probiotics, and the renewable P-source struvite in at least four novel sustainable P and Fe fertiliser products, which may partly or fully replace unsustainable and resource-intense conventional ones. SUSFERT will test novel organic formulations, microgranules, granules, and liquid fertilizer products in field trials, evaluate them regarding economic potential and environmental sustainability, ensure regulatory compliance and establish industry-scale production processes (TRL 7-8). Technological concepts include 1) probiotics based on P and Fe solubilizing Bacilli and Actinobacteria; 2) microbial siderophore (Fe chelator) produced in a demonstration plant; 3) enzymatic modification of the by-product lignin for cost effective, biodegradable controlled release coatings and product stabilization and 4) demonstration of struvite, a renewable P-source from wastewater, as a partial substitute of mineral P. Five industrial, three SME and three academic partners will contribute expertise along the whole value chain in biotechnology, microbiology, large-scale fermentation, fertilizer production and sales. We will fit the SUSFERT products into the regulatory and policy context for conventional and organic agriculture in various pedo-climatic conditions in Europe and prepare rapid market entry post-project.

DEEP PURPLE		837998
Title: CONVERSION OF DILUTED MIXED URBAN BIO-WASTES INTO SUSTAINABLE MATERIALS AND PRODUCTS IN FLEXIBLE PURPLE PHOTOBIOREFINERIES		
Call Id: H2020-BBI-JTI-2018	Topic: **BBI.2018.SO1.D2**	Type of Action: **BBI-IA-DEMO**
Project start date: 5/1/2019	Duration: **48 months**	Unit:
Total costs: €9.527.581	EU requested grant: **€6.983.050**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Photobiorefinery, biopolymer, cellulose, chemical precursor, fertilizer, municipal solid waste, organic fraction, phosphorous, sewage, wastewater*

Abstract:

DEEP PURPLE creates a holistic consortium to transform diluted urban bio-wastes, including mixed waste streams, organicfraction of municipal solid waste (OFMSW), wastewater (WW) and sewage sludge (SS), into feedstock for bio-industry toobtain sustainable bio-products. This revolutionary concept will be implemented in a novel Single-Site Multi-Platform Concept (Biomass, Cellulose and Biogas) to replace current polluting destructive practices with new value added concepts.

The beneficial use of bio-waste is obtained by an innovative combination of optimized recovery technologies and novel solutions: the Purple Phototrophic Bacteria (PPB) PhotoBiorefinery. The use of PPB -the most versatile metabolismreported- ensures the adaption to fluctuating and diluted waste streams to support a stable and profitable production chain. Thefirst PPB PhotoBiorefinery in the EU (the biggest worldwide) will be validated in different environmental, economic, logisticand social scenarios.

The concept will be implemented by end-users from four municipalities, namely Madrid (ES), Toledo (ES), and the Moravia-Silesia Region(CZ) to transform bio-wastes (OFMSW: 422 t/y, mixed waste: 438,000 m3/y) into high-added value bioproducts:fine chemicals (bio-cosmetics), fertilizers, bio-packaging and self-repairing construction materials. The marketuptake of DEEP PURPLE is facilitated by optimal logistics of bio-wastes conversion (reduction of landfilled OFMSW: 60%,WWTP, solids recovery: 71%), and bio-products quality to favor their commercialization (440 t/y). The integration of valuechains is boosted by relevant stakeholder's participation and innovative business models, minimizing waste and maximizingbenefits (85 M€ benefits, GHG emissions savings: 11,300 tCO2eq/y in 2025). Key communities (social engagementstrategies) will participate in the new value creation, calibrating the returns of the project like social innovation promotion and creation of new opportunities along the urban value cycle.

B-FERST		837583
Title: Bio-based FERtilising products as the best practice for agricultural management SusTainability		
Call Id: H2020-BBI-JTI-2018	Topic: **BBI.2018.SO3.D4**	Type of Action: **BBI-IA-DEMO**
Project start date: 5/1/2019	Duration: **60 months**	Unit:
Total costs: €10.016.296	EU requested grant: **€6.787.076**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Bio-based fertilisers; Biostimulant; nutrients; soil conditioning; industrial upscaling; bio-based value chain; Sustainability; logistics; business plan*

Abstract:

B-FERST's main objective is to integrate the valorisation of bio-wastes in agriculture management plans creating anew circular and bio-based value chains considering a bilateral interaction between farming and fertiliser sectors focused on a paradigm shift in the fertiliser value chain with 8 specialised fertilisers. Specialised nutrient mixes are required to achieve a more sustainable management of resources by tailor-made nutrient dosing adapted to farmer systems. The SUSTAINABILITY of B-FERST is based on the reuse of bio-waste to replace non-renewable, non-domestic and energy intensive raw materials:

1) Bio-based solid fertilisers including renewable sources of macronutrients (N,P,K) obtained from 3 by-products streams: i) ashes, as source of P & K from: Waste Water Treatment Plants (WWTP) (sewage sludges), & agri-food such as: slaughterhouse waste, olive & livestock wastes; ii) struvite as source of P & N from WWTP & agro waste (pig slurries), and; iii) compost as source of organic carbon compound, N, P & K from Organic Fraction of Municipal Solid Waste) OFMSW, WWTP & agro waste (manure -livestock-).

2) Biostimulants for soil nutrient improvement from two approaches: selected microbiological strains as Microbial Plant Biostimulant (MPB) or Non-Microbial Plant Biostimulant (NMPB) from cardoon oil meal processing (agricultural by-products) and compost extracts. Bio-degradable coatings based on biopolymers will be used when MPB is added to the fertiliser products to protect the beneficial microorganisms and guaranty their performance.

The VIABILITY is based on previous R&D from other RIA projects. The manufacturing process will be demonstrated at a demonstrative industrial scale. Then specialised fertilisers will be performed and validated in 5 crops tests (Spain, Italy, France, Poland and Ukraine) comparing their functionality to that of traditional fertilisers in terms of: sustainable sourcing, logistics, soil and growing conditions, reaching a TRL6

NewFert		668128
Title: Nutrient recovery from biobased Waste for Fertilizer production		
Call Id: H2020-BBI-PPP-2014-1	Topic: **BBI.VC4.R10**	Type of Action: **BBI-RIA**
Project start date: 7/1/2015	Duration: **42 months**	Unit:
Total costs: €2.419.740	EU requested grant: **€1.209.521**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Recovery, Biowaste streams, Food value chain, Nutrient valorisation, Fertiliser, Recycling, Biomass production, new Biorefining technologies*

Abstract:

Biowaste valorisation is an attractive approach in the framework of the EU Waste Management policies and the development of a circular economy. Waste from biostreams and different biobased sources are being under-utilised as potential resource of valuable compounds. Fertilisers play an important role as suppliers of nutrients relying on their production heavily on fossil mineral resources. European Fertiliser industry is besides very dependent on imports of these raw materials, being vulnerable to supply and pricing policies.

Main objective of the proposal is to build up a breakthrough concept of Fertiliser Industry, strengthening European competitiveness and boosting the biobased economy potential, through the development of a new value chain, which will achieve turning solid and liquid residues, specifically ashes of different origins and livestock effluents, into high quality valuable products, a new generation of fertilisers. NEWFERT will focus on a viable and cost-effective industrial nutrient recycling scheme, developing new biorefining technologies aimed at increasing nutrient recovery ratios and mitigating environmental and socio-economical impact of the current fertilisers by replacing non renewable and fossil nutrients with biobased materials in their composition. Projected benefits also include substantial energy savings and CO2 emissions reduction. NEWFERT aims to decrease raw material dependency, prevent resource depletion and reduce the environmental impact increasing significantly the Fertiliser industry sustainability. The work organisation has been designed to link and pursue a successful industrial integration supported by a solid life-cycle cost analysis. The strategy of the work plan is based on 8 workpackages. NEWFERT consortium is lead by FERTIBERIA and composed by a balanced set of 6 partners from 4 European Union member countries: biobased industries, SMEs, RTOs and academic institutions covering nutrients recovery from biobased waste field.

SABANA		727874
Title: Sustainable Algae Biorefinery for Agriculture aNd Aquaculture		
Call Id: H2020-BG-2016-1	Topic: **BG-01-2016**	Type of Action: **IA**
Project start date: 12/1/2016	Duration: **54 months**	Unit: **REA/B/02**
Total costs: €10.646.705	EU requested grant: **€8.848.524**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Biorefinery, Microalgae, Marine water, Large Scale, Biopesticides, Biostimulants, Aquafeed, Wastewaters*

Abstract:

SABANA aims at developing a large-scale integrated microalgae-based biorefinery for the production of biostimulants, biopesticides and feed additives, in addition to biofertilizers and aquafeed, using only marine water and nutrients from wastewaters (sewage, centrate and pig manure). The objective is to achieve a zero-waste process at a demonstration scales up to 5 ha sustainable both environmentally and economically. A Demonstration Centre of this biorefinery will be operated to demonstrate the technology, assess the operating characteristics of the system, evaluate environment impacts and collaborate with potential customers for use.

The key advantages of SABANA project are: the sustainability of the process, using marine water and recovering nutrients from wastewaters while minimizing the energy consumption, and the socioeconomic benefits, due to the relevance of the target bioproducts for two major pillars in food production as agriculture and aquaculture. Bioproducts capable of increasing the yield of crops and fish production are highly demanded, whereas recovery of nutrients is a priority issue in the EU. Instead of considering wastewater as an inevitably useless and problematic residue of our society, SABANA acknowledges its potential as an opportunity for economically relevant sectors.

SABANA project includes (i) the utilization of microalgae-bacteria consortia and in co-culture with other algae to control grazing species, (ii) the implementation of efficient thin-layer cascade and raceway, (iii) the scale-up of reactors to ensure stable operation, (iv) to use marine water to increase the sustainability of the process; (v) to recover nutrients from wastewaters, (vi) to develop harvesting processes taking into account the remaining water, (vii) to establish processes for mild/energy efficient extraction of bioproducts, (viii) to process residual biomass to produce biofertilizers and aquafeed in zero-waste schemes, (ix) using robust and sustainable technology

WATER-MINING		869474
Title: Next generation water-smart management systems: large scale demonstrations for a circular economy and society		
Call Id: H2020-SC5-2019-2	Topic: **CE-SC5-04-2019**	Type of Action: **IA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €19.174.544	EU requested grant: **€16.876.960**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Circular Economy, Resource recovery, Urban wastewater, Desalination, Brine management, service-based business models, bio-polymers, critical raw materials, phosphorus recovery, salts, energy recovery*

Abstract:

This project aims to provide for real-world implementations of Water Framework Directive and the Circular Economy packages by showcasing and validating innovative next generation water resource solutions at pre-commercial demonstration scale. These solutions combine WATER management services with the recovery of value added renewable resources extracted/MINED from alternative water resources ("WATER-MINING"). The project will integrate selected innovative technologies that have reached proof of concept levels under previous EU projects. The value-added end-products (water, platform chemicals, energy, nutrients, minerals) are expected to provide regional resource supplies to fuel economic developments within a growing demand for resource security. Different layouts for urban wastewater treatment and seawater desalination are proposed, to demonstrate the wider practical potential to replicate the philosophy of approach in widening circles of water and resource management schemes. Innovative service-based business models (such as chemical leasing) will be introduced to stimulate progressive forms of collaboration between public and private actors and access to private investments, as well as policy measures to make the proposed water solutions relevant and accessible for rolling out commercial projects in the future. The goal is to enable costs for the recovery of the resources to become distributed across the whole value chain in a fair way, promoting business incentives for investments from both suppliers and end-users along the value chain. The demonstration case studies are to be first implemented in five EU countries (NL, ES, CY, PT, IT) where prior successful technical and social steps have already been accomplished. The broader project consortium representation will be an enabler to transferring trans-disciplinary project know-how to the partner countries while motivating and inspiring relevant innovations throughout Europe.

B-WaterSmart		869171
Title: Accelerating Water Smartness in Coastal Europe		
Call Id: H2020-SC5-2019-2	Topic: **CE-SC5-04-2019**	Type of Action: **IA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €17.306.026	EU requested grant: **€14.975.184**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *water smartness, smart data solutions, smart technologies, community of practice, water governance, living labs, water reuse, resource recovery, circular economy, business models, holistic assessment*

Abstract:

B-WaterSmart will accelerate the transformation to water-smart economies and societies in coastal Europe and beyond. We will apply a large-scale systemic innovation approach to select, connect and demonstrate a tailored suite of technology, management and smart data solutions for multiple users and sectors, and create new business models based on circular economy and water-smartness. We bring together six cities and regions as living labs with high ambitions to address water-related challenges and opportunities – Alicante (ES), Bodø (NO), Flanders (BE), Lisbon (PT), East Frisia (DE), Venice (IT) – selected for complementarity of scale, users, sectors and challenges, and for opportunities of mutual learning, replication & upscaling through a network of followers already mobilised. We built each case around the actual problem-owner (water utility, municipality), a research partner, innovative solution providers and market-uptake partners (6 are SMEs), complemented by partners with specific crosscutting expertise (social sciences & humanities, IT, business development, water sector outreach). We will apply a participatory approach for co-creation & implementation of solutions through local Communities of Practice and a joint innovation alliance of problem owners, and develop recommendations for suitable governance models, regulation & policy instruments. We will deliver a novel framework to assess gains in water-smartness and sustainability at different scales. Our cases will demonstrate in real systems, at multiple scales, a range of promising technologies for water reuse/nutrient recovery, and smart data applications for more efficient, safe allocation & use of resources (water, energy, nutrients). For the apps, we build on FIWARE technology to enable interoperability and exchange across sectors, which is key for systemic change. All cases have defined criteria and target values to achieve by the project end and by 2040, and can build on synergies with other funding.

WaysTUP!		818308
Title: Value chains for disruptive transformation of urban biowaste into biobased products in the city context		
Call Id: H2020-SFS-2018-1	Topic: **CE-SFS-25-2018**	Type of Action: **IA**
Project start date: 9/1/2019	Duration: **42 months**	Unit: **REA/B/02**
Total costs: €11.663.084	EU requested grant: **€9.348.929**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *urban biowaste; biowaste utilisation;*

Abstract:

WaysTUP! aims to demonstrate the establishment of new value chains for urban biowaste utilisation to produce higher value purpose products (i.e. biobased products, including food and feed ingredients), through a multi-stakeholder approach in line with circular economy. The project will showcase a portfolio of new 'urban biowaste to biobased products' processes starting from different feedstocks i.e. fish and meat waste, spent coffee grounds, household source separated biowaste, used cooking oils, cellulosic waste derived from municipal wastewater and waste treatment plants and sewage sludge. Pilot demonstration will take place in several European cities i.e. Valencia (Spain), London (UK), Alicante (Spain), Prague (Czech Republic), Athens (Greece), L'Alcúdia (Spain), Terni (Italy) and Crete (Greece). The processes will result in the production of food and feed additives, flavours, insect protein, coffee oil, bioethanol, biosolvents, polyxydroxyalkanoates, ethyl lactate, long chain dicarboxylic acid, bioplastics and biochar. End-product characterisation and safety assessment will be implemented. Life Cycle Assessment of the value chains will be conducted to assess their environmental impact. WaysTUP! will develop and implement a behavioural change approach with citizens and local communities by improving the current perception of citizens and local communities on urban biowaste as a local resource; enhancing the active participation of citizens in the separate collection of urban biowaste; and improving customer acceptance of urban bio-waste derived products. New profitable business models will be developed preparing market entry of the technology solutions demonstrated as well as of the end-products resulting from them. Finally, the project will provide guidance for city managers on adopting new organisational models supporting the valorisation of urban biowaste, as well as evidence-based EU level policy recommendations for decision makers.

SCALIBUR		817788
Title: SCALABLE TECHNOLOGIES FOR BIO-URBAN WASTE RECOVERY		
Call Id: H2020-SFS-2018-1	Topic: **CE-SFS-25-2018**	Type of Action: **IA**
Project start date: 11/1/2018	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €12.005.923	EU requested grant: **€9.999.391**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *waste collection, organic fraction, bioplastics, proteins, energy, business models, circle economy*

Abstract:

SCALIBUR creates a holistic consortium to cut urban biowaste and replace it with a new production chain of biomaterials, forming a partnership of end users to recover and transform biowaste from three municipalities, namely Madrid (ES), Albano (IT) and Kozani (EL), into value added products. During SCALIBUR a complete study of the quality, logistics and management schemes for municipal solid waste (MSW) and urban sewage sludge (USS) will be performed, to integrate innovative systems and technologies and obtain high-value biobased products. In SCALIBUR, HORECA waste will be transformed to proteins, lipids and chitin from insect rearing, while the organic fraction of MSW will generate biopesticides and bioplastics by high-solid enzymatic hydrolysis followed by fermentation. The resulting biogas from MSW and USS will be upgraded by bioelectrochemical treatment to produce commodity chemicals and bioplastics, such as PHBV. By cutting traditional linear waste management, new business models are created for the resulting circular value chains, applying a sustainable approach to generate new activities and benefits. These new profit sources will be created from a baseline analysis of existing waste management data and business models for each municipality, generating social innovation and favouring the adaptation and uptake of new opportunities along the entire urban value cycle. Continuous tests and development along SCALIBUR will create and fine tune new business models based on innovative processes, and feedback will be obtained from all stakeholders, in order to improve the definition, performance and integration of value, to minimize waste and maximize its benefit. With social engagement strategies, key communities will participate in all aspects of the new value creation, calibrating the returns of the project both for the generation of jobs and improved urban welfare, such as reducing the dependence from outside materials and the environmental impacts.

NOMAD		863000
Title: Novel Organic recovery using Mobile ADvanced technology		
Call Id: H2020-SFS-2019-1	Topic: **CE-SFS-39-2019**	Type of Action: **IA**
Project start date: 10/1/2019	Duration: **36 months**	Unit: **REA/B/02**
Total costs: €5.499.857	EU requested grant: **€4.250.477**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords:

Abstract:

NOMAD gathers partners from China, Greece, the UK, Italy, Romania, Malta and the Netherlands to develop an innovative, small-scale tech solution designed to recover fibre and specific nutrients from digestate for formulation into high performance bio-fertiliser products. It addresses key digestate issues including environmental and health risks, handling, variable composition and the increasing volume being produced. Currently, turning digestate into bio-fertiliser products is not feasible for most small plants due to lack of available, cost-effective equipment, and the expense of achieving end of waste standard PAS110.

Building on partners' previous work, the proposed technology will utilise heat from combustion of waste timber and recovered energy from a collection vehicle to improve energy efficiency while simultaneously addressing regulatory compliance. Specific nutrients will be extracted from the liquid fraction and water recovered for reuse. The remaining sludge will be blended & composted with ash (derived from waste timber combustion) and biochar to produce optimised, nutrient-balanced soil conditioners. The model rests on the solution's mobility and modularity as one unit could serve multiple plants, tackling digestate from a range of feedstocks with shared costs making it more viable than installing systems at individual plants.

Other project activities include stakeholder engagement; field trials across contrasting regions; policy recommendations; a comprehensive impact assessment of the business model; and dissemination of key outputs. The project aims to replace non-renewable mineral fertilisers with low-carbon, organic equivalents; minimise environmental and health risks associated with digestate; create a new, disruptive business model for rural decentralised AD; and achieve a more favourable climate for circular economy development through successful stakeholder engagement.

RUN4LIFE		730285
Title: RECOVERY AND UTILIZATION OF NUTRIENTS 4 LOW IMPACT FERTILIZER		
Call Id: H2020-CIRC-2016TwoStage	Topic: **CIRC-02-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €7.720.901	EU requested grant: **€6.239.341**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Nutrient recovery, Water reuse, social acceptance, Source separation*

Abstract:

Domestic wastewater (WW) is an important carrier of nutrients usually wasted away by current decentralised WW treatments (WWT). Run4Life proposes an alternative strategy for improving nutrient recovery rates and material qualities, based on a decentralised treatment of segregated black water (BW), kitchen waste and grey water combining existing WWT with innovative ultra-low water flushing vacuum toilets for concentrating BW, hyper-thermophilic anaerobic digestion as one-step process for fertilisers production and bio-electrochemical systems for nitrogen recovery. It is foreseen up to 100% nutrient (NPK) recovery (2 and >15 times current P and N recovery rates) and >90% water reuse.

Obtained products will be >90% reused thanks to prospective end-users in the consortium and a new Business model based on a cooperative financial scheme. Run4Life impacts will be evaluated on safety and security (Risk Assessment), from an environmental point of view (Life Cycle Assessment and Environmental Technical Verification), on the economy (Benefit Cost Analysis) and considering Social Risk Perception. Active measures will be developed with the support of a Stakeholders and Exploitation Panel for achieving institutional, legal and social acceptance. Different parts of Run4Life will be large scale demonstrated at 4 demo-sites in Belgium, Spain, Netherlands and Sweden, adapting the concept to different scenarios (market, society, legislation). Performance tests will be carried out with obtained products (compared to commercial fertilisers) with close collaboration with fertiliser companies. Process will be optimised by on-line monitoring key performance indicators (nutrient concentration, pathogens, micropollutants). The information obtained in the 4 demo-sites will be used for process simulation to conceive a unified Run4Life model which will be applied in a fifth demo-site in Czech Republic, allowing new business opportunities and providing data for critical raw material policies.

RES URBIS		730349
Title: REsources from URban BIo-waSte		
Call Id: H2020-CIRC-2016OneStage	Topic: **CIRC-05-2016**	Type of Action: **RIA**
Project start date: 1/1/2017	Duration: **36 months**	Unit: **REA/B/02**
Total costs: €3.377.915	EU requested grant: **€2.996.689**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *urban bio-waste, biodegradable fraction, municipal solid waste, sewage sludge, wastewater, biorefinery, bio-based products, bioplastics, polyhydroxyalkanoate, PHA, biosolvent, biocomposite*

Abstract:

RES URBIS aims at making it possible to convert several types of urban bio-waste into valuable bio-based products, in an integrated single biowaste biorefinery and by using one main technology chain. This goal will be pursued through:

- collection and analysis of data on urban bio-waste production and present management systems in four territorial clusters that have been selected in different countries and have different characteristics.

- well-targeted experimental activity to solve a number of open technical issues (both process- and product-related), by using the appropriate combination of innovative and catalogue-proven technologies.

- market analysis whitin several economic scenarios and business models for full exploitation of bio-based products (including a path forward to fill regulatory gaps).

Urban bio-waste include the organic fraction of municipal solid waste (from households, restaurants, caterers and retail premises), excess sludge from urban wastewater treatment, garden and parks waste, selected waste from food-processing (if better recycling options in the food chain are not available), other selected waste streams, i.e. baby nappies. Bio-based products include polyhydroxyalkanoate (PHA) and related PHA-based bioplastics as well as ancillary productions: biosolvents (to be used in PHA extraction) and fibers (to be used for PHA biocomposites). Territorial and economic analyses will be done either considering the ex-novo implementation of the biowaste biorefinery or its integration into existing wastewater treatment or anaerobic digestion plants, with reference to clusters and for different production size. The economic analysis will be based on a portfolio of PHA-based bioplastics, which will be produced at pilot scale and tested for applications: Biodegradable commodity film; Packaging interlayer film; Speciality durables (such as electronics); and Premium slow C-release material for ground water remediation.

SCARCE		714080
Title: Sustainable Chemical Alternatives for Re-use in the Circular Economy		
Call Id: ERC-2016-STG	Topic: **ERC-2016-STG**	Type of Action: **ERC-STG**
Project start date: 4/1/2017	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.499.656	EU requested grant: **€1.499.656**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords:

Abstract:

This proposal seeks to develop a novel non-invasive, real-time direct observation methodology to provide new knowledge on the mechanisms underpinning crystal growth and harvesting within membrane crystallisation reactor technology. Crystallisation represents one of the most important separation processes in the chemical industry and will play a critical role in the circular economy through enabling the recovery of resources from wastewater to yield an array of sustainable low cost chemicals for use in European industries. Existing crystallisation reactor designs suffer from imperfect mixing and inhomogeneous solvent removal which makes control of crystal quality and consistency problematic and can limit application of the final product.

Membrane crystallisation reactor technology is a disruptive innovation that combines process intensification with the capability to achieve significant control over the crystallisation process at a fraction of the scale thus ameliorating many of the problems associated with existing crystallisers. However, before this disruptive membrane based technology can be realised at full scale, there is a critical need to understand the role of shear forces in mediating the growth and harvesting of crystals at the solvent-membrane boundary which has to date received little attention. With no reliable and accurate description of the shear force behaviour within the boundary layer, there is considerable risk incurred in the scaling up of membrane crystallisation reactor design which could lead to inconsistent and inefficient performance. Development of the novel non-invasive, real-time direct observation methodology will enable direct measurement of these discrete forces. The arising new knowledge will be challenged at various process sizes to evolve the science underlying process scale-up of membrane crystallisers and in doing so will deliver internationally competitive research, placing the applicant at the forefront of his academic field.

REBOOT		849841
Title: Resource efficient bio-chemical production and waste treatment		
Call Id: ERC-2019-STG	Topic: **ERC-2019-STG**	Type of Action: **ERC-STG**
Project start date: 1/1/2020	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.494.622	EU requested grant: **€1.494.622**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *phosphorous, hydrothermal, liquefaction, sludge, manure, biofuel, jet fuel, circular economy*

Abstract:

The REBOOT project will create a disruptive wet waste valorisation technology where valuable resources are re-used rather than disposed of while tackling two urgent environmental challenges: nutrient circularity and climate change. Wastewater treatment sludge and manure treatment technologies are currently not satisfactory and there is no solution to efficiently re-use the resources it contains: phosphorous and carbon.

The aim of REBOOT is to completely recover phosphorous from wastes while generating carbon neutral transportation fuels and a carbon sink in the form of carbon materials. The project will employ a frontier technology called hydrothermal liquefaction (HTL) which uses high temperature and pressure to produce a liquid product similar to petroleum termed bio-crude. This will be used for a range of innovative applications such as renewable aviation fuel, functionalized carbon materials and bio-bitumen.

The possibility of complete phosphorous recovery in HTL is a completely new concept, previously thought impossible as only continuous HTL reactors can theoretically achieve this. The complex hydrothermal chemistry of salts can only be exploited on such advanced reactors that are currently beyond state-of-the-art. The specific objectives of REBOOT are: (1) mechanistic understanding of salt behaviour in multi-phase hydrothermal systems with the aim of full recovery. (2) Develop tailored strategies for in-situ jet fuel synthesis. (3) Establish microbial electrolysis cells for in-situ hydrogen production and nutrient recovery.

REBOOT will be carried out on pilot continuous reactors, where the challenging physical conditions can be explored, exploited and new engineering solutions developed. If REBOOT is successful it will enable society to tackle existing waste problems while recovering nutrients and producing renewable materials, replacing fossil derived ones; representing a revolutionary solution to wet waste management in the emerging circular bio-economy.

E-motion		682444
Title: Electro-motion for the sustainable recovery of high-value nutrients from waste water		
Call Id: ERC-2015-CoG	Topic: **ERC-CoG-2015**	Type of Action: **ERC-COG**
Project start date: 11/1/2016	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.950.000	EU requested grant: **€1.950.000**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *physical chemistry, process engineering, separation processes, water treatment, sustainability, polyelectrolytes, ion-selectivity, ion recovery*

Abstract:

Current water treatment technologies are mainly aimed to improve the quality of water. High-value nutrients, like nitrate and phosphate ions, often remain present in waste streams. Electro-driven separation processes offer a sustainable way to recover these nutrients. Ion-selective polymer membranes are a strong candidate to achieve selectivity in such processes.

The aim of E-motion is to chemically modify porous electrodes with membranes to introduce selectivity in electro-driven separation processes. New, ultrathin ion-selective films will be designed, synthesized and characterized. The films will be made by successively adsorbing polycations and polyanions onto the electrodes. Selectivity will be introduced by the incorporation of ion-selective receptors. The adsorbed multilayer films will be studied in detail regarding their stability, selectivity and transport properties under varying experimental conditions of salinity, pH and applied electrical field, both under adsorption and desorption conditions.

The first main challenge is to optimize and to understand the film architecture in terms of 1) stability towards an electrical field, 2) ability to facilitate ion transport. Also the influence of ion charge and ion size on the transport dynamics will be addressed. The focus of E-motion is set on phosphate ions, which is rather complex due to their large size, pH-dependent speciation and the development of phosphate-selective materials. Theoretical modelling of the solubility equilibria and electrical double layers will be pursued to frame the details of the electrosorption of phosphate.

E-motion represents a major step forward in the selective recovery of nutrients from water in a cost-effective, chemical-free way at high removal efficiency. The proposed surface modification strategies and the increased understanding of ion transport and ionic interactions in membrane media offer also applications in the areas of batteries, fuel cells and solar fuel devices.

SuPER-W		676070
Title: Sustainable Product, Energy and Resource Recovery from Wastewater		
Call Id: H2020-MSCA-ITN-2015	Topic: **MSCA-ITN-2015-EJD**	Type of Action: **MSCA-ITN-EJD**
Project start date: 3/1/2016	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.715.183	EU requested grant: **€3.715.183**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *wastewater, resources, nutrients, nitrogen, phosphorus, organic products, metals, energy, water reuse*

Abstract:

In many cases energy, water and resources contained in wastewater may have significant value if recovered. Therefore, the EU is currently confronted with a paradigm shift from wastewater treatment to resource recovery. To facilitate this shift, the SuPER-W European Joint Doctorate programme trains early-stage researchers (ESRs) in developing technologies for water, energy, nutrient and metal reuse, and bioproduction from (waste)water. The ESRs obtain knowledge and skills needed to turn environmental problems into economic opportunities. SuPER-W focuses not only on technology development through research, but the ESRs are also trained in translating research into policy, creative problem-solving, identification of bottlenecks for effective implementation of resource recovery technologies, development of business cases and urban/industrial ecosystems, and assessment of sustainability and the role of public perception and policy in innovation. Furthermore, they acquire a set of commercial, entrepreneurial and managerial skills that prepare them as future leaders. All ESRs are supervised by at least 2 promoters from 2 universities and co-supervised by a researcher from a non-academic partner organisation. Moreover, they conduct an internship in the non-academic sector in the first and last project year, contributing to more effective dissemination and exploitation of their research results. To organise the training, SuPER-W brings together leading researchers from 5 renowned universities and 12 associated non-academic partner organisations, including industrial partners involved in technology development, SMEs focused on consultancy/engineering, a service provider, a government agency, and professional network organisations. ESRs who successfully defend the PhD thesis and finish the doctoral training programme receive a double or joint PhD degree, jointly awarded by the universities of his/her promoters, as well as a joint doctoral training certificate of SuPER-W.

P-TRAP		813438
Title: Diffuse phosphorus input to surface waters - new concepts in removal, recycling and management (P-TRAP)		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-ETN**
Project start date: 3/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €2.911.106	EU requested grant: **€2.911.106**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *phosphorus, iron, phosphorus removal, nutrient recycling, fertilizers, agriculture, soils, groundwater, lakes, sediments, eutrophication, water quality, element cycles, drainage systems*

Abstract:

Flux of phosphate (P) from agricultural areas to surface waters is wasting a resource which is becoming scarce and is in conflict with the principles of a circular economy. Enhanced loading of surface water with P is the main cause for eutrophication and presents a key challenge in meeting the objectives of the EU Water Framework Directive. P-TRAP targets both problems and develops new methods and approaches to trap P in drained agricultural areas and in the sediments of eutrophic lakes. Trapping of P involves the application of iron(Fe)-containing by-products from drinking water treatment. P-TRAP aspires the ideas of a circular economy and aims at recovering the retained P in agricultural systems. Novel microbial technologies will be developed to convert P-loaded Fe-minerals into marketable fertilizers whose suitability will be evaluated. The new P-TRAP technologies have in common that they rely on the naturally strong connection between P and Fe and the innovative P-TRAP strategies will be underpinned by process-orientated investigations on the behavior of P during the transformation of Fe minerals. The latter are key in trapping and recycling of P in agricultural systems and lakes. P-TRAP establishes a framework of partners from multiple science and engineering disciplines. Integration of non-academic partners from various stakeholder groups into the P-TRAP consortium paves the way for direct implementation of the acquired knowledge. P-TRAP provides Early Stage Researchers (ESRs) an environment for conducting innovative scientific research by using state-of-the-art methodology. Training through P-TRAP increases the ESRs' mobility between sectors, cultures, and nations and strengthens their responsibility to exploiting scientific results for societal and economical benefit. P-TRAP will offer ESRs an excellent starting point for a career of leadership in a number of environmental and sustainable business sectors, academia, and public administration.

RECYCLES		872053
Title: Recovering carbon from contaminated matrices by exploiting the nitrogen and sulphur cycles		
Call Id: H2020-MSCA-RISE-2019	Topic: **MSCA-RISE-2019**	Type of Action: **MSCA-RISE**
Project start date: 1/1/2020	Duration: **48 months**	Unit: **REA/A/03**
Total costs: €1.209.800	EU requested grant: **€1.209.800**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Resource recovery, bioreactors, C/N/S cycles, integration, immobilized biocatalysts, bioprocesses engineering, wastewater treatment, waste gas treatment, innovative treatment trains*

Abstract:

The objective of the project is to exploit the integration of the carbon, nitrogen and suflur cycles in bioreactors to design optimal treatment trains to recover added-value products out of liquid and gaseous effluents. The strategy will be to combine interdisciplinary approaches to:

- investigate innovative unit processes based on partial nitrification for nitrogen recycle, autotrophic denitrification for biosulfur recovery and multienzyme-based bioreactors for CO2 valorization;

- apply technologies that are novel in this field such as moving bed bioreactors, membrane biofilm reactors and enzimatic reactors

- combine biological processes in to innovative treatment trains for wastewater treatment and biogas upgrading.

The topic will be addressed from the point of view of circular economy by exploring the potential synergies of carbon, nitrogen and sulfur cycles in wastewater and biogas treatment trains to reduce treament costs and to te increase production of added-value products. From a methodological point of view, the project targets the improvement of existing knowledge of innovative technologies based on immobilized biocatalysts as well as the demonstration of the viability of innovative treatment trains at in-silico, lab- and pilot-scale levels.

The project is interdisciplinary and intersectorial; in fact, the research teams involved include environmental and chemical engineers, biologists and bioinformatics and mathematical modellers, while the companies are complementary being specialised in reactors design and construction and in bioprocess design and control. Finally, the involvement of the industry will allow to receive feedbacks on the solutions needed from pilot case studies using real effluents and to effectively translate novel scientific outcomes into suitable technologies.

SEA4VALUE		869703
Title: Development of radical innovations to recover minerals and metals from seawater desalination brines		
Call Id: H2020-SC5-2019-2	Topic: **SC5-09-2018-2019**	Type of Action: **RIA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €6.995.736	EU requested grant: **€6.995.736**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *brines, dessalination plants, processing industry, value-chain, EU dependency, Raw Materials, separation technologies, concenration and crystalisation, trace metals recovery, multi-modular process*

Abstract:

SEA4VALUE wants to deliver a Multi-mineral Modular Brine Mining Process (MMBMP) for the recovery of valuable metals and minerals from brines produced in sea-water desalination plants. The project will proof the feasibility of the next generation technologies (including advanced concentration and crystallization processes and highly selective separation processes) for recovery of Mg, B, Sc, In, V, Ga, Li, Rb, Mo and set the basis for their future assimilation in already existing SWDP and those yet to come.

The EC and national public officials are well aware of the economic importance and supply risk of CRM and non-CRM, and are promoting new solutions for the recycling, exploration and mining of raw materials needs. SEA4VALUE puts together an industrially and user-driven consortium of 15 members that represent the whole value chain (from Water Infraestructure Operator to Processing Industry) who will extensively work during four years to proof that the measures presented are competitive, technically feasible, contribute towards circular economy strategies and sustainability goals.

SEA4VALUE will upscale 10 technologies by developing novel selective membranes; producing new 3D printed selective adsorbents; applying advanced metallurgical solutions including solvometallurgy, ionic liquids and supported liquid membranes; improving membrane crystallization; and, developing thermally-conductive polymer composite materials for the heat exchangers to be used in multi-effect distillation while building confidence for the market uptake of the recovered elements, and therefore considerably reducing the arrival into the market and its uptake of brine as new source of raw materials.

HTC4WASTE		684143
Title: Up-scaling, demonstration and first market application of Loritus' patented hydrothermal carbonisation as an eco-efficient and cost-effective organic waste processing technology		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 11/1/2015	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.523.733	EU requested grant: **€2.466.613**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Continuous Hydrothermal Carbonisation; organic waste; full-scale demonstration; first market introduction; biocoal; biochar; carbon consumer products;*

Abstract:

The objective of HTC4WASTE is to demonstrate – at full scale and in a real market application – the technical and commercial excellence of Loritus' unique, patented Hydrothermal Carbonisation (HTC) technology as a flexible organic waste recovery technology, suitable for converting organic waste streams into carbon neutral biocoal, carbon sequestering biochar, fertility products, water, and local thermal energy.

During the project, Loritus will build a full-scale HTC installation to demonstrate its economic and technological performance across a range of commonly occurring waste streams sharing characteristics that make them costly to treat with established technologies. The demonstration will target at least three market applications (sewage sludge, food waste and animal by-products, and spent mushroom compost) on a commercial scale (10.000 tonnes/year).

Loritus will then operate the full-scale HTC system on a specific organic waste stream, spent mushroom compost, at a mushroom farm in Ireland to finalise the business case for HTC in a real life, industrial scale application. Such a success will induce a multiplication effect across the associated multi-national farming cooperative, and provide evidence that clients in other market segments can gain the same HTC cost and environmental advantages. Loritus will prioritise and pursue these segments aggressively.

Ultimately, Loritus will jumpstart its operational capabilities, and build a dominant reputation in the HTC field with this project as the catalyst. Loritus will crystallise its targeted markets and demonstrate where HTC can outperform established technologies with a no subsidies business case. Potential clients will be invited to see the full-scale plant in operation, and the project data used to identify economic criteria and boundaries for other clients across multiple sectors.

Business success means €4,5m EBITDA in year 2, being worth over €100m in 3 years, and building more than 200 systems by year 5.

reNEW		783638
Title: Sustainable cleaning agent and organic fertilizer recovery from sewage sludge		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 11/1/2017	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.980.614	EU requested grant: **€1.386.429**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Waste Water Treatment (WWT), compound recovery, sustainable WWTP operation*

Abstract:

UTB Envirotec Zrt, is one of the Central European market leaders in engineering services for wastewater and organic waste treatment. In the past few years, we have developed a technology for sustainable valorisation of sewage sludge. The treatment of this sludge represents one of the biggest problems for small and medium sized wastewater treatment plants (WWTP) in Europe. In our process, called reNEW, the sewage sludge is biologically transformed into volatile fatty acids (VFA) and valuable nutrients (NPK), which are recovered. These products represent important market value: VFA as raw material for eco labelled cleaning agents, and NPK as fertilizer. With the aim of exploitation of the reNEW technology, we formed a spin-off company, Renew Technologies Ltd (RNT) in the UK. Our final aim is to roll-out the technology and widely implement it all over Europe, enabling the growth of our companies. We aim to realise the reNEW project in cooperation of the two companies: RNT being the technology owner and responsible for commercial exploitation, while UTB being the technology provider (design, building and implementation of plants). This initiative has received funding in the Horizon 2020 SME Instrument Phase 1, project number: 728932, duration: 01/07/2016-31/12/2016. We have successfully completed the feasibility study. We verified the technological feasibility as well as the economic viability of the project and further improved our business concept. We demonstrated the efficiency and economic value of the two products, VFA and NPK, respectively and made a scale-up design of our pilot operating currently at our premises (TRL=6). We have improved the proposal and discussed it with our clients, technical partners, and the Enterprise Europe Network (EEN). These discussions and the results of the feasibility assessment have reassured us regarding its merit.

SMART-Plant		690323
Title: Scale-up of low-carbon footprint material recovery techniques in existing wastewater treatment plants		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €9.768.806	EU requested grant: **€7.536.300**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Bioresource recovery; Phosphorus recovery; Bioplastics recovery; Cellulose recovery; Revamping of wastewater treatment plants by innovation;*

Abstract:

SMART-Plant will scale-up in real environment eco-innovative and energy-efficient solutions to renovate existing wastewater treatment plants and close the circular value chain by applying low-carbon techniques to recover materials that are otherwise lost. 7+2 pilot systems will be optimized fore > 2 years in real environment in 5 municipal water treatment plants, inclunding also 2 post-processing facilities. The systems will be authomatised with the aim of optimizing wastewater treatment, resource recovery, energy-efficiency and reduction of greenhouse emissions. A comprehensive SMART portfolio comprising biopolymers, cellulose, fertilizers and intermediates will be recovered and processed up to the final commercializable end-products. The integration of resource recovery assets to system-wide asset management programs will be evaluated in each site following the resource recovery paradigm for the wastewater treatment plant of the future, enabled through SMART-Plant solutions. The project will prove the feasibility of circular management of urban wastewater and environmental sustainability of the systems, to be demonstrated through Life Cycle Assessment and Life Cycle Costing approaches to prove the global benefit of the scaled-up water solutions. Dynamic modeling and superstructure framework for decision support will be developed and validated to identify the optimum SMART-Plant system integration options for recovered resources and technologies. Global market deployment will be achieved as right fit solution for water utilities and relevant industrial stakeholders, considering the strategic implications of the resource recovery paradigm in case of both public and private water management. New public-private partnership models will be explored connecting the water sector to the chemical industry and its downstream segments such as the contruction and agricultural sector, thus generating new opportunities for funding, as well as potential public-private competition.

INCOVER		689242
Title: Innovative Eco-Technologies for Resource Recovery from Wastewater		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **38 months**	Unit: **EASME/B/02**
Total costs: €8.432.456	EU requested grant: **€7.209.032**	
Main thematic area: 45 - Water and people / resource recovery		

Free keywords: *Wastewater added-value plant, DSS, optical sensing and control, PHA and organic acids from wastewater, anaerobic co-digestion, near-zero-energy plant, irrigation water*

Abstract:

Taking into account the current global water scarcity and the expensive operation and maintenance cost of wastewater treatment, INCOVER concept has been designed to move wastewater treatment from being primarily a sanitation technology towards a bio-product recovery industry and a recycled water supplier. A wastewater specific Decision Support System methodology will be tailored to the INCOVER technologies and provide data and selection criteria for a holistic wastewater management approach

Three added-value plants treating wastewater from three case-studies (municipalities, farms and food and beverage industries) will be implemented, assessed and optimised concurrently. INCOVER plants will be implemented at demonstration scale in order to achieve Technology Readiness Level(TRL) of 7-8 to ensure straightforward up scaling to 100,000 population equivalents (PE). INCOVER added-value plants will generate benefits from wastewater offering three recovery solutions: 1) Chemical recovery (bio-plastic and organic acids) via algae/bacteria and yeast biotechnology; 2) Near-zero-energy plant providing upgraded bio-methane via pre-treatment and anaerobic co-digestion systems; 3) Bio-production and reclaimed water via adsorption, biotechnology based on wetlands systems and hydrothermal carbonisation. To improve added-value production efficiency, INCOVER solutions will include monitoring and control via optical sensing and soft-sensors

INCOVER solutions will reduce at least a 50% overall operation and maintenance cost of wastewater treatment through the use of wastewater as a source for energy demand and added-value production to follow UE circular economy strategy. In addition, strategies to facilitate the market uptake of INCOVER innovations will be carried out in order to close the gap between demonstration and end-users

An estimated turnover of 188 million€ for INCOVER lead-users is expected after the initial exploitation strategy of 5 years implementing 27 INCOVER solutions

STOP-IT		740610
Title: Strategic, Tactical, Operational Protection of water Infrastructure against cyber-physical Threats		
Call Id: CIP-2016-2017-1	Topic: **CIP-01-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **48 months**	Unit: **REA/B/04**
Total costs: €9.616.525	EU requested grant: **€8.255.320**	
Main thematic area: 46 - Water and people / infrastructure, networks		

Free keywords: *Protection of networks, cybersecurity, physical threat, integrated risk management, water critical infrastructure, safety, resilience, community of practice, detection, preparedness, mitigation*

Abstract:

Water critical infrastructures (CIs) are essential for human society, life and health and they can be endangered by physical/cyber threats with severe societal consequences. To address this, STOP-IT assembles a team of major Water Utilities, industrial technology developers, high tech SMEs and top EU R&D providers. It organizes communities of practice for water systems protection to identify current and future risk landscapes and to co-develop an all-hazards risk management framework for the physical and cyber protection of water CIs. Prevention, Detection, Response and Mitigation of relevant risks at strategic, tactical and operational levels of planning will be taken into account to generate modular solutions (technologies, tools and guidelines) and an integrated software platform. STOP-IT solutions are based on: a) mature technologies improved via their combination and embedment (incl. public warning systems, smart locks) and b) novel technologies whose TRL will be increased (incl. cyber threat incident services, secure wireless sensor communications modules, context-aware anomaly detection technologies; fault-tolerant control strategies for SCADA integrated sensors, high-volume real-time sensor data protection via blockchain schemes; authorization engines; irregular human detection using new computer vision methods and WiFi and efficient water contamination detection algorithms). STOP-IT solutions are demonstrated through a front-runner/follower approach where 4 advanced utilities, Aigües de Barcelona (ES), Berliner Wasserbetriebe (DE), MEKOROT (IL) and Oslo VAV (NO) are twinned with 4 less advanced, but ambitious ones, to stimulate mutual learning, transfer and uptake. Building on this solid basis STOP-IT delivers high impact through the creation of hands-on training, best practice guidelines, support for certification and standardization as well as by fostering market opportunities, also leveraging the EU water technology platform's multi-stakeholder network.

FITTOM		756698
Title: PVC-O Fittings based on MOLECOR's Molecular Orientation TOM® technology		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-02-2016-2017**	Type of Action: **SME-2**
Project start date: 2/1/2017	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.424.049	EU requested grant: **€996.834**	
Main thematic area: 46 - Water and people / infrastructure, networks		

Free keywords: *Environment, Industrialization, PVC-O, fittings*

Abstract:

The main objective of FITTOM is the development of a new technological industrial process able to produce innovative fittings commercially competitive for water transport.

Fittings are indispensable in pipe systems to connect straight pipes, fit them to different sizes or shapes and for other purposes such as regulating fluid flow.

Currently, most piping systems for high pressure water transport use ductile iron fittings or injection-based plastic-fittings. The former ones are heavy and oxidises relatively easily; the latter require very expensive moulds and large amounts of raw material.

MOLECOR has developed a revolutionary technology that provides reliable and user friendly systems that widen possibilities for the global pipe business. This technology demonstrated to be the highest performance, the most eco-friendly and cost-effective solution among the alternatives.

The Global water market is an attractive high-volume market, which is currently estimated at about $591 billion and it is expected to reach $1 trillion by 2025. After evaluating the market trends and existing demand, we validated that FITTOM will be a promising business opportunity for MOLECOR.

MOLECOR is a pioneer company specialized in the development of the latest technology applying molecular orientation to PVC pipeline solutions. MOLECOR's proven expertise in the pipes business together with the ambition of the Boards of Directors and its outstanding staff, makes FITTOM's success a reachable goal.

Starting from an existing TRL6 prototype, and after analysing the Feasibility of the project, the current Phase 2 Project will skilfully combine technology advances with marketing and pre-sales activities to ensure a seamless transition from technology implementation to business operation.

FITTOM is an excellent chance for MOLECOR to grow and expand in addition to revolutionizing the pipeline sector offering the best mechanical performance and best cost-effectiveness over the current solutions.

aqua3S		832876
Title: Enhancing Standardisation strategies to integrate innovative technologies for Safety and Security in existing water networks		
Call Id: H2020-SU-SEC-2018	Topic: **SU-DRS03-2018-2019-2020**	Type of Action: **IA**
Project start date: 9/1/2019	Duration: **36 months**	Unit: **REA/B/04**
Total costs: €6.853.609	EU requested grant: **€5.997.068**	
Main thematic area: 46 - Water and people / infrastructure, networks		

Free keywords: *standardisation, detection technologies, water supply networks, sensor network integration, social interaction, citizen feedback, early warning, contingency plan, network recovery*

Abstract:

Exposure of citizens to potential disasters has led to vulnerable societies that require risk reduction measures. Drinking water is one main source of risk when its safety and security is not ensured. aqua3S combines novel technologies in water safety and security, aiming to standardise existing sensor technologies complemented by state-of-the-art detection mechanisms. On the one hand sensor networks are deployed in water supply networks and sources, supported by complex sensors for enhanced detection; on the other hand sensor measurements are supported by videos from Unmanned Aerial Vehicles (UAVs), satellite images and social media observations from the citizens that report low-quality water in their area (e.g. by colorisation), creating also social awareness and an interactive knowledge transfer. Semantic representation and data fusion provides intelligent DSS alerts and messages to the public through first responders' mediums. The proposed technical solution is designed to offer a very effective detection system, taking into account the cost of the aqua3S platform and targets at very high return over investment ratio. A strategy for the insertion of aqua3S solution into the market is designed towards the standardisation of the proposed technologies and the aqua3S secure platform.

WADI		689239
Title: WADI: Innovative Airborne Water Leak Detection Surveillance		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 10/1/2016	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €4.724.144	EU requested grant: **€3.826.956**	
Main thematic area: 46 - Water and people / infrastructure, networks		

Free keywords: *Water transmission, leak detection, multi-spectral and IR imaging, remote sensing, airborne optical sensors, surveillance, service, innovative optical sensors, market up-take, ecosystem service*

Abstract:

The overall objective of WADI project is to contribute to the reduction of losses in water transmission systems and decrease the related energy consumption required for the process.

WADI aims to develop an airborne water leak detection surveillance service to provide water utilities with adequate information on leaks in water infrastructure outside urban areas, thus enabling the utility to promptly repair them.

The project idea relies on innovative concept of coupling optical remote sensing and their application on two complementary aerial platforms, i.e. manned and unmanned, typically used for distinctive purposes in infrastructure performance observation. The former is being used in long-distance monitoring whereas the latter in 'particular' areas observation, i.e. those with a limited/difficult physical access or requiring closer monitoring upon earlier detection of some anomalies in aircraft missions. Following the determination of cameras' optimized wavelengths (suitable particularly for water leaks detection), the WADI technology will be applied in an operational environment represented by two pilot sites, i.e. in France (Provence region, case of water supply mains) and Portugal (Alqueva, case of multi-purpose mains serving irrigation, water supply, and hydro power).

The WADI proposal addresses the challenge of building a water (and energy) efficient and climate change resilient society by integrating the concept of ecosystem services through the recovery of up to 50% of the water lost at a cost which is lower by an order of magnitude than the cost of terrestrial techniques – e.g. 50-200 EUR/km for airborne technology vs. 1,000-5,000 EUR/km for ground techniques.

The project includes legal aspects assessment (related to data protection and regulatory standards for use of UAV), market analysis and strategy along with the corresponding business plan and a dissemination plan that addresses key stakeholders.

CLAIM		774586
Title: Cleaning Litter by developing and Applying Innovative Methods in european seas		
Call Id: H2020-BG-2017-1	Topic: **BG-07-2017**	Type of Action: **IA**
Project start date: 11/1/2017	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €6.185.613	EU requested grant: **€5.654.786**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Integrated approach, Visible and invisible coastal pollution, Innovative green technologies, Forecasting tools, Microlitter, Macrolitter*

Abstract:

CLAIM focuses on the development of innovative cleaning technologies and approaches, targeting the prevention and in situ management of visible and invisible marine litter in the Mediterranean and Baltic Sea.

Two innovative technological methods will be developed, a photocatalytic nanocoating device for cleaning microplastics in wastewater treatment plants and a small-scale thermal treatment device for energy recovery from collected litter on board ships and ports. An innovative floating boom for collecting visible litter and a method to measure microlitter on board ships (Ferrybox) will be developed. The proposed cleaning technologies and approaches prevent litter from entering the sea at two main source points, i.e. wastewater treatment plants and river mouths. Effectiveness of developed devices and methods will be demonstrated under real conditions.

Additionally, CLAIM will develop innovative modeling tools to assess the marine visible and invisible plastic pollution at basin and regional scales (Saronikos Gulf, Gulf of Lyon, Ligurian Sea and Belt Sea).

An ecosystems approach will be followed to evaluate the potential benefit from proposed litter cleaning methods to ecosystem services. New business models will be developed to enhance the economic feasibility for upscaling the innovative cleaning technologies, taking into account the existing legal and policy frameworks in the CLAIM countries, as well as acceptance of the new technologies by their end-users and relevant stakeholders.

The data and information produced will be made available to policymakers, stakeholders and end-users in a user-friendly format,both meaningful and tailored to each stakeholder group. CLAIM aims at the same time to raise public awareness with respect to having healthy oceans and seas, clean of litter and pollutants, and hence the importance of reducing marine (macro, micro and nano) pollution in European seas and beyond towards restoring marine ecosystems based on a circular economy.

microMole		653626
Title: SEWAGE MONITORING SYSTEM FOR TRACKING SYNTHETIC DRUG LABORATORIES		
Call Id: H2020-FCT-2014	Topic: **FCT-05-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **42 months**	Unit: **REA/B/04**
Total costs: €5.423.799	EU requested grant: **€4.992.866**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords:

Abstract:

The threat of synthetic drugs is one of the most significant current drug problems worldwide. Amphetamine-Type Stimulants (ATS) are the second most widely used drugs. Since 1990, ATS manufacturing has been reported from more than 70 countries worldwide and the figure keeps rising. In 2008, 80 % of the amphetamine production facilities dismantled worldwide were located in Europe (UNODC, 2010) (EMCCDA, 2011). Organised Crime Groups are involved in ATS large-scale production (Europol, 2007) (EMCDDA, 2009). Since 2011, the wide availability of pre-precursors (like APAAN) significantly lowered the price of the controlled precursor BMK and caused severe environmental problems, taking the problem to a greater dimension.

The aim of this project is to design, develop and test a prototype of a system for legal recording, retrieving and monitoring operations of ATS and ATS precursor laboratories in urban areas. The sensor system will be installed within the sewage system and will track waste associated to ATS production. Criminal investigators and forensic specialists will use the system in case of:

1. initial general suspicion of ATS production in a certain area, for locating laboratories by monitoring the sewage system for long time periods;

2. strong suspicions that in a well confined area ATS is being produced, for collecting material for forensic analysis and potential use in court, and for aiding in the planning of LEA raid operations.

The µMole prototype will contain the following features: a) miniaturized system for 200mm sewage pipes, b) robust housing taking into account sewage system environment, c) minimized power consumption, d) enhanced operation time supported by energy harvesting, e) high-specificity electro-chemical sensors, f) integrated micro-tanks for sample storage, and g) secure GSM and radio communications for remote monitoring. Analysis of privacy law, data protection and social acceptance will be carried on at different stages.

ANSWER		675530
Title: ANtibioticS and mobile resistance elements in WastEwater Reuse applications: risks and innovative solutions		
Call Id: H2020-MSCA-ITN-2015	Topic: **MSCA-ITN-2015-ETN**	Type of Action: **MSCA-ITN-ETN**
Project start date: 10/1/2015	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.708.690	EU requested grant: **€3.708.690**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Wastewater treatment and reuse, Irrigation by treated wastewater, Antibiotics, Antibiotic resistance, Uptake of microcontaminants by crops*

Abstract:

In response to the increasing problem of water shortage, the reuse of treated urban wastewater is considered the most suitable and reliable alternative for sustainable water management and agricultural development. In spite of the benefits associated with this practice, major concerns currently exist, related to the adverse effects regarding chemical and biological contaminants of emerging concern such as antibiotics and mobile antibiotic resistance elements such as antibiotic resistant bacteria and resistance genes. These are now considered as a serious public health problem by various international organizations and the European Commission, because of their spread in the environment, the food chain, drinking water, etc. To tackle these problems, scientists with an interdisciplinary research/training background are urgently needed. This ETN will train a new generation of ESRs to address the risks associated with such contaminants and wastewater reuse. Innovative chemical, microbiological, toxicological and modelling tools, and novel process engineering will form the scientific and training core of their innovative research projects and training. The project will contribute to understanding the fate and transmission of antibiotics and resistance from wastewater to the environment and humans, through soil, ground/surface water and crops. Relevant ELVs will be determined, essential for the development and implementation of regulatory frameworks. This project directly tackles these aspects, by bringing together a multidisciplinary research team, with the private sector, and policy makers and through communication activities towards stakeholders and the wider public.

AQUAlity		765860
Title: Interdisciplinar cross-sectoral approach to effectively address the removal of contaminants of emerging concern from water		
Call Id: H2020-MSCA-ITN-2017	Topic: **MSCA-ITN-2017**	Type of Action: **MSCA-ITN-ETN**
Project start date: 10/1/2017	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.897.678	EU requested grant: **€3.897.678**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Contaminants of emerging concern, nanofiltration, hybrid materials, sun driven processes, HR-MS, DOM, iron, contaminants prioritization*

Abstract:

AQUAlity is a multidisciplinary and cross-sectoral European Training Network, that consist in eighteen participants (7 universities, 3 research institutes and 8 companies) and aims to generate and promote highly skilled scientists with the potential to face the present and future challenges concerning the protection of water resources from contaminants of emerging concern (CECs). AQUAlity will enroll fifteen early-stage researchers (ESRs) to conduct cutting-edge research on multidisciplinary aspects of novel hybrid technologies for the removal of CECs from aqueous systems. Moreover, ESRs will be trained to develop their creativity, critical and autonomous thinking, and entrepreneurial skills, thus boosting their scientific skills and innovation capacity in the field of water treatment technologies. This goal will be attained via a structured training-through-research programme, consisting of original individual research projects (performed both at the beneficiary organization and through intersectoral secondments) and education on technical and transferable skills (performed both at local level and with network-wide events). The overall research goal of AQUAlity is to develop highly innovative hybrid green technologies for CECs removal from aqueous systems by unconventional solar advanced oxidation processes (AOP) in combination with high flux ceramic nanofiltration membranes. Hence, ESRs will conduct frontier research in the field of AOP (organic photocatalysis, sensitized photocatalysts, photo-Fenton), materials development, nanofiltration technology, and will develop innovative hybrid photochemical/membranes systems to be tested on different waters to prove their potential for the production of high-quality water. Advanced analytical tools for the determination of CECs, their degradation products and water safeness will be developed. Thanks to the presence of industrial participants, AQUAlity aims for the commercial exploitation of part of the research results.

InnovEOX		861369
Title: Training of a new generation of researchers in Innovative Electrochemical OXidation processes for the removal and analysis of micro-pollutants in water streams		
Call Id: H2020-MSCA-ITN-2019	Topic: **MSCA-ITN-2019**	Type of Action: **MSCA-ITN-ETN**
Project start date: 10/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.992.303	EU requested grant: **€3.992.303**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *wastewater treatment, priority pollutants degradation, electrochemistry, chromatography*

Abstract:

Although the European freshwater system is monitored closely by different European frameworks, it has been demonstrated that organic chemical pollutants are still putting half of it at risk. The InnovEOX R&D training network was built to address and provide a solution for this considerable challenge: to boost innovative electrochemical wastewater treatment techniques to effectively degrade highly hazardous organic micro-pollutants, reducing environmental pollution and improving the European quality of life and health. By setting up a training frame to educate the next generation of highly-qualified ESRs in one of the most promising fields in micro-pollutant degradation, this will enable to generate important innovations, necessary to create a new level of EU excellence and reinforce EU R&D capacity in the field. The overall InnovEOX aim is to train 15 creative, entrepreneurial & innovative ESRs with high employability and career perspectives, capable of promoting new technologies in the industry and academic sector. The main InnovEOX R&D objectives are: 1) the exploration of alternative electrochemical oxidation pathways via generation of different oxidative radicals, 2) the development of combined photocatalytic/electrochemical oxidation techniques, 3) the development of novel analytical approaches for the separation and identification of these micro-pollutants and their degradation products, and 4) an assessment of the effects of the developed treatments on the aquatic toxicity, biological wastewater treatment and the environment as a whole via a life cycle assessment. These objectives combined will ensure a high-quality training with a high-societal impact for the reliable, economic and complete removal of priority pollutants from wastewater. Pushed by an interdisciplinary & intersectoral consortium of 10 leading beneficiaries and 7 partner organisations, the proposal will offer innovative training based on an optimal balance between research and formal training.

MONPLAS		860775
Title: The training of early stage researchers for the development of technologies to monitor concentrations of micro and nanoplastics in water for their presence, uptake and threat to animal and human life.		
Call Id: H2020-MSCA-ITN-2019	Topic: **MSCA-ITN-2019**	Type of Action: **MSCA-ITN-ETN**
Project start date: 1/1/2020	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.908.325	EU requested grant: **€3.908.325**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *microplastics nanoplastics microfluidics photonics optics toxicology instrumentation*

Abstract:

Micro and nanoplastics have recently been found in our soil, tap water, bottled water, beer and even in the air we breathe, with a growing concern about the potential health risks they pose to us. Whether that is through ingesting the harmful bacteria they pick up when coming from wastewater plants, or just through injury and death of cells through contact, possibly through absorbtion of nanoplastics by cells, we really don't know. Which is why there is an urgent need for more research on their toxicity and also why a new EC drinking water directive is to be published in 2019 stating that water companies will need to measure concentrations of microplastics from within two years for positive release and inspection. However, even though a standard measurement method will be published in 2019 for water, its necessary use of exisiting and expensive scientific laboratory equipment, such as microscopy and FTIR or Raman spectroscopy, will make it prohibitively expensive for in line use for many companies across Europe especially considering its need for highly trained personnel. There is therefore a need to develop suitable technologies for a robust, easy to use and low cost industrial instrument, whose measurements will correspond directly to the aforementiond standard, as well as train engineers for method development and operation. Given these multiple technical and analytical challenges, and that global production of plastic, that can take hundreds of years to biodegrade, is expected to triple by 2050; we propose a timely four year Initial Training Network to train multiple Early State Researchers throughout various scientific areas. Consisting of some of Europes greatest experts in their fields it will provide tomorrows talent with the skills and knowledge to tackle possibly one of mankinds greatest threats to its existence whilst they jointly develop the technologies for the industrial instrument in collaboration with end-users and equipment manufacturers.

LimnoPlast		860720
Title: Microplastics in Europe's freshwater ecosystems: From sources to solutions		
Call Id: H2020-MSCA-ITN-2019	Topic: **MSCA-ITN-2019**	Type of Action: **MSCA-ITN-ETN**
Project start date: 11/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €4.078.827	EU requested grant: **€4.078.827**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Microplastic, freshwater ecosystems, aquatic ecology, public health, harmonisation of methods, biopolymers, risk communication, environmental policy, environmental law*

Abstract:

Microscopic plastic debris, so-called microplastics (MP), pose a global challenge. As most plastic is produced and used inland, the considerable lack of knowledge on their sources and impacts in freshwater ecosystems inhibits effective mitigation measures. To meet this challenge, LimnoPlast will for the first time bring together environmental, technical, and social sciences with the vision to transform a new understanding of freshwater MP to innovative solutions. LimnoPlast will:

- Train a new type of scientists able to tackle the complex plastics issue holistically and contribute to Europe's innovation and Circular Economy capacity. Working at the interface of three usually very distant disciplines, they will promote a step change in how we deal with this and future environmental challenges.

- Provide the first comprehensive assessment of the sources and impacts of freshwater MP based on the analysis of three major urban areas as hotspots of plastic pollution.

- Innovate technological solutions to the plastics issue, including novel processes to remove MP from municipal and industrial wastewater as well as bio-degradable, environmentally sound polymers.

- Promote societal change by understanding the economic, legislative and social context of freshwater MP.

- Transform science into a set of specific solutions, including (I) the prioritization of actions based on the sources and impacts of MP, development of (II) better processes and polymers, (III) risk communication strategies and societal interventions, (IV) effective policy and legislative interventions.

- Transfer the LimnoPlast outcomes to European decision makers, stakeholders and the public to enable and promote action on freshwater MP using an innovative communication and dissemination strategy.

PANI WATER		820718
Title: Photo-irradiation and Adsorption based Novel Innovations for Water-treatment		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 2/1/2019	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.969.749	EU requested grant: **€3.576.533**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Rural peri-urban communities*

Abstract:

About 2.1 Billion people live without access to safe water sources. Contaminants of Emerging Concerns (CECs) such as pharmaceuticals, personal care products, pesticides and nanoparticles are increasingly being detected in wastewater and in drinking water around the world, in addition to geogenic pollutants, pathogens, antibiotic resistant bacteria and antibiotic resistance genes. Water treatment systems that remove CECs and common contaminants from wastewater and drinking water are therefore urgently needed.

PANI WATER will develop, deploy and validate in the field six prototypes for the removal of contaminants, including CECs, from wastewater and drinking water. The prototypes for wastewater treatment will consist of (i) a 20,000 L/day multifunctional oxidation reactor, (ii) a 10 L/day photoelectrochemical system, and (iii) a 100 L/day solar photolytic plant. The prototypes for drinking water treatment will consist of (iv) a 300 L/hour filtration, adsorption, and UVC LED system (v) a 20 L transparent jerrycan for solar water disinfection, and (vi) a 2,000 L/day electrocoagulation, oxidation, and disinfection t system. These prototypes will be deployed in peri-urban and rural areas in India. The consortium will work closely with the communities at the fieldsites, and carry out water quality analyses, health and social impact assessments, and advocate for safe reuse of treated wastewater for irrigation, and preservation of drinking water sources. PANI technologies can find promising application among the agricultural sector, water-demanding businesses (e.g. textile, pharmaceutical), and the Indian water utilities.

AquaticPollutants		869178
Title: Risks posed to human health and the environment by pollutants and pathogens present in water ressources		
Call Id: H2020-SC5-2019-1	Topic: **SC5-21-2019-2020**	Type of Action: **ERA-NET-Cofund**
Project start date: 1/1/2020	Duration: **60 months**	Unit: **RTD/C/01**
Total costs: €18.181.814	EU requested grant: **€5.999.999**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Risk Management, Freshwater Ecosystems, Marine Ecosystems, Human Health, Emerging Pollutants, Pathogens, Antimocrobial Resistance, Aquatic Ecosystems*

Abstract:

The AquaticPollutants proposal responds to the Horizon 2020 (H2020) Societal Challenge 5 SC 5 21-2019-2020: Risks posed to human health and the environment by pollutants and pathogens present in water resources. AquaticPollutants aims at pooling resources from the 32 participating national and regional research programme owners / managers of 26 countries to implement a joint call for proposals (with EU co-funding).

One of the most serious risks for freshwater and marine ecosystems and consequently human health derives from the occurrence of emerging pollutants and pathogens, especially antimicrobial resistant bacteria, in the environment. To face this challenge in a comprehensive way and to provide multidisciplinary solutions for a safe and clean aquatic ecosystems (freshwater, groundwater, marine) this ERA-NET Cofund is carried out as a collaboration between three Joint Programming Initiatives (JPIs): Water JPI “Water Challenges for a Changing World”, JPI Oceans “Healthy and Productive Seas and Oceans” and JPI AMR “On Antimicrobial Resistance”. The topic of the ERA-NET Cofund aims to deliver on priorities identified in the Research Agendas of the three JPIs. The overall objective is to strengthen the European Research Area (ERA) in the field of clean and healthy aquatic ecosystems and to leverage untapped potential in the collaboration between the freshwater, marine and health research areas. Moreover, AquaticPollutants includes 9 organizations from associated and third countries in an effort to reinforce and expand international cooperation. With new instruments in the Additional Activities the implementation of the co-funded call will be further supported and the cooperation of Water JPI, JPI Oceans and JPI AMR will be strengthened. It is envisaged to generate an increased visibility of the topic at European and international level and a stronger alignment of the three JPIs.

PFS		804453
Title: A cost- energy-efficient treatment technology to remove pharmaceutical pollutants from water		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-11-2016-2017**	Type of Action: **SME-2**
Project start date: 3/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.962.500	EU requested grant: **€2.073.750**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *wastewater, water treatment, WWTP, pharmaceuticals*

Abstract:

Widely used pharmaceuticals (synthetic or natural chemicals found in prescription medicines, over-the-counter therapeutic drugs & veterinary drugs) are finding their way into the drinking water supply via wastewater treatment facilities, posing serious threats to public health globally. The problem is that modern wastewater treatment facilities are not designed for effective removal of pharmaceuticals or similar organic compounds. Upcoming EU legislation will make such removal mandatory.

Pharem Biotech brings to market PFS—the first patented enzyme-carrying filtration system capable of removing a large range of organic pollutants (pharmaceuticals and other biological active compounds such as bisphenol A, antibiotics, hormone disruptors, etc.). PFS is a filtration solution that can be easily installed at most of wastewater treatment facilities. Its compact size makes it particularly useful for urban wastewater treatment plants.

PFS is based on modified enzymes which are 200 times more effective than native enzymes, resistant to low temperature, resistant to low pH and with high levels of stability and activity. Compared to alternative purification methods, PFS is very cost-efficient, and requires no energy to run.

As the total EU yearly investments in its wastewater treatment facilities and related infrastructure are expected to reach €25bn per year in 2015-2020, Pharem Biotech is addressing the market of 70,000 facilities in EU processing 100bn litres of water per day in total.

During a successful Phase 1 project, Pharem Biotech validated the market and commercial feasibility of PFS, and selected the trial cases to validate the technology as well as key target markets to approach.

In this Phase 2 project Pharem Biotech will industrialize PFS, validate it in trial cases and prepare for commercial roll out with the objective is to deploy 50 PFS systems before 2020 and reach revenue of €34m.

The requested EC contribution is €2.07m.

PathoCERT		883484
Title: Pathogen Contamination Emergency Response Technologies		
Call Id: H2020-SU-SEC-2019	Topic: **SU-DRS02-2018-2019-2020**	Type of Action: **RIA**
Project start date:	Duration: **36 months**	Unit: **REA/B/04**
Total costs: €7.158.394	EU requested grant: **€6.905.019**	
Main thematic area: 47 - Water and people / contaminants of concern		

Free keywords: *Water, pathogens, modelling, contamination, event diagnosis, fault diagnosis, systems engineering, control systems, risk assessment, first responders, emergency response, public health*

Abstract:

Pathogens are a determining factor in emergency response due to their life-threatening nature, both for the public as well as for the safety of first responders. In many cases, pathogen contaminations are difficult to detect, and require specialized technologies, tools and procedures to handle them. Pathogens can easily spread via water, and may cause contaminations of large areas far from their origin. Waterborne pathogen contamination events can occur anywhere, and may be caused by various natural events or they can be the result of human activity, either accidental or malicious. During these emergencies, first responders may need to operate within a certain pre-defined incident area, and are likely to be exposed to contaminated water originating from various sources, such as surface water, wastewater or drinking water. This can pose a significant risk of illness, disease or even death, through skin contact, ingestion or inhalation.

The overall objective of the PathoCERT project is to strengthen the coordination capability of the first responders in handling waterborne pathogen contamination events. This will increase the first responders' capabilities, allowing the rapid and accurate detection of pathogens, improving their situational awareness, and improving their ability to control and mitigate emergency situations involving waterborne pathogens. To achieve this objective, the project will research and demonstrate Pathogen Contamination Emergency Response Technologies (PathoCERT), a collection of novel, cost-effective and easy-to-use technologies, tools and guidelines, which will be field-validated by the first responders.

AQUA4D		873723
Title: AQUA4D, for an efficient use of irrigation water		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.039.303	EU requested grant: **€1.427.512**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Electromagnetic water treatment, irrigation, large crops, cereals, pivot irrigation systems*

Abstract:

Population growth, climate change and limitations of natural resources mean that agriculture must become more productive, efficient and environmentally sound. Within this need for improved agricultural production, irrigation plays a crucial role. However, there is a clear need for AgTEch solutions applied to irrigation systems in order to achieve sustainable agricultural practices, specially for large crops (cereals, oilseeds and pulses) which dominates the crops market.

AQUA4D-HR is an innovative electromagnetic water treatment that allows an accurate modification of the irrigation water structure to optimize the irrigation process and achieve key benefits for water use, crops yield and soil quality. AQUA4D-HR is designed as a simple, cost-effective and environmentally friendly system suitable for large crops irrigation (cereals, oilseeds and pulses) in pivot irrigation systems (high water flow rates).

AQUA4D-HR will achieve key benefits for large crops farmers: up to 25% water savings, up to 30% in fertilizer savings; up to 20% increased crop production and reduction of soil salinity and mineral crystallization in the rhizosfere, thus allowing a sustainable cultivation. Moreover, AQUA4D-HR will be affordable for end-users, with ROI < 3 years .

SolACE		727247
Title: Solutions for improving Agroecosystem and Crop Efficiency for water and nutrient use		
Call Id: H2020-SFS-2016-2	Topic: **SFS-01-2016**	Type of Action: **RIA**
Project start date: 5/1/2017	Duration: **60 months**	Unit: **REA/B/02**
Total costs: €7.192.149	EU requested grant: **€6.000.000**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Below-ground trait, crop simulation model, genomic selection, genotype, hybrid, microbiome, nitrogen, nutrient, participatory research, phosphorus, rhizosphere, root, use efficiency, water*

Abstract:

SolACE's overarching goal is to help European agriculture facing the challenge to deal with more frequent combined limitations of water and nutrients in the coming decades, through the design of novel crop genotypes and agroecosystem management innovations to improve water and nutrient (i.e. N and P) use efficiency. To achieve this goal, SolACE will focus its activities on three major European crops - potato, bread and durum wheat - and will identify the (i) optimum combinations of above- and below-ground traits for improving resource use efficiency, (ii) best-performing genotypes under combined water and N or P stresses and (iii) novel practices that make better use of plant-plant and plant-microbe interactions to access water, N and P resources in conventional, organic and conservation agriculture. SolACE will implement a double interactive innovation loop, based on agroecosystem management and breeding strategies, and will imply the engagement of diverse end-users, across the production chain, from farmers and farm advisors to NGOs, SMEs and larger industries in the agri-business sector, through the SolACE consortium and a range of stakeholders' events. The tested innovations will include crop genotype mixtures, legume-based crop rotations and cover crops, microbial inoculants, as well as improved decision support systems and hybrids or products from genomic selection and participatory evolutionary breeding schemes. SolACE will implement complementary approaches, from data mining, modelling, phenotyping in high throughput platforms and field conditions, to experiments in research stations and farmers' networks in contrasted pedo-climatic zones. Through the co-design and co-assessment with the end-users of the selected novel breeding and management strategies to increase the overall system resource use efficiency, the findings of SolACE will be deemed acceptable and readily available for dissemination to a broad spectrum of stakeholders, including policy-makers.

FATIMA		633945
Title: FArming Tools for external nutrient Inputs and water MAnagement		
Call Id: H2020-SFS-2014-2	Topic: **SFS-02a-2014**	Type of Action: **RIA**
Project start date: 3/1/2015	Duration: **36 months**	Unit: **REA/B/02**
Total costs: €7.966.697	EU requested grant: **€7.966.697**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Farm advisory services, nutrient efficiency, irrigation management, agri-environmental indicators, water & energy footprint, participatory multi-actor*

Abstract:

FATIMA addresses effective and efficient monitoring and management of agricultural resources to achieve optimum crop yield and quality in a sustainable environment. It covers both ends of the scale relevant for food production, viz., precision farming and the perspective of a sustainable agriculture in the context of integrated agri-environment management. It aims at developing innovative and new farm capacities that help the intensive farm sector optimize their external input (nutrients, water) management and use, with the vision of bridging sustainable crop production with fair economic competitiveness.

Our comprehensive strategy covers five interconnected levels: a modular technology package (based on the integration of Earth observation and wireless sensor networks into a webGIS), a field work package (exploring options of improving soil and input management), a toolset for multi-actor participatory processes, an integrated multi-scale economic analysis framework, and an umbrella policy analysis set based on indicator-, accounting- and footprint approach.

FATIMA addresses and works with user communities (farmers, managers, decision makers in the farm and agribusiness sector) at scales ranging from farm, over irrigation scheme or aquifer, to river-basins. It will provide them with maps of fertilizer and water requirements (to feed into precision farming machinery), crop water consumption and a range of further products for sustainable cropping management supported with innovative water-energy footprint frameworks. All information will be integrated in leading-edge participatory spatial online decision-support systems. The innovative FATIMA service concept considers the economic, environmental, technical, social, and political dimensions in an integrated way.

FATIMA will be implemented and demonstrated in 8 pilot areas representative of key European intensive crop production systems in Spain, Italy, Greece, Netherlands, Czech Republic, Austria, France, Turkey.

OPTAIN		862756
Title: OPtimal strategies to retAIN and re-use water and nutrients in small agricultural catchments across different soil-climatic regions in Europe		
Call Id: H2020-SFS-2019-2	Topic: **SFS-23-2019**	Type of Action: **RIA**
Project start date: 9/1/2020	Duration: **60 months**	Unit: **REA/B/02**
Total costs: €6.999.856	EU requested grant: **€6.999.856**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Natural/small water and nutrient retention; farm and catchment scale; multi-actor approach; indicators; integrated assessment; multi-objective optimization; policy analysis; learning environment*

Abstract:

Natural/Small Water Retention Measures (NSWRMs) can help mitigate the conflicts between agricultural water uses (e.g. plant production, animals) and other human and environmental demands for water, including drinking water or maintaining environmental flow. This is crucial, since these conflicts will be probably exacerbated by an increasing number of extreme events such as droughts and heavy rainfall. A more careful management of head watersheds will significantly contribute to a more resilient agriculture and society. Moreover, NSWRMs are contributing simultaneously to the achievement of different Sustainable Development Goals and environmental targets formulated in several water- and agriculture-related European Union policies. Despite a comprehensive set of techniques available to increase water retention on both catchment and farm levels, knowledge is still lacking on the effectiveness of different scale- and region-specific measures across various soil-climatic regions and agricultural systems, especially under changing climate conditions. OPTAIN aims to (i) identify efficient techniques for the retention and reuse of water and nutrients in small agricultural catchments across Continental, Pannonian and Boreal biogeographical regions of Europe, taking into account potential synergies with existing drainage-irrigation systems, and - in close cooperation with local actors - (ii) select NSWRMs at farm and catchment level and optimize their spatial allocation and combination, based on environmental and economic sustainability indicators. By building on existing knowledge and addressing these objectives, OPTAIN will improve the Technological Readiness Level of NSWRMs for the benefit of both humans and ecosystems. All gained knowledge will be translated into a learning environment allowing analysis of trade-offs and synergies between multiple values/goals in the management and design of NSWRMs.

WATERAGRI		858375
Title: WATER RETENTION AND NUTRIENT RECYCLING IN SOILS AND STREAMS FOR IMPROVED AGRICULTURAL PRODUCTION		
Call Id: H2020-SFS-2019-2	Topic: **SFS-23-2019**	Type of Action: **RIA**
Project start date:	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €6.999.986	EU requested grant: **€6.999.986**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Framework; model and assimilation; serious gaming; farm constructed wetland; remote sensing pipeline; precision irrigation system; biochar; drainage system; nutrient-collecting membrane; Microfluidics*

Abstract:

The WATERAGRI vision is to solve agricultural water management and soil fertilisation challenges in a sustainable manner to secure affordable food production in Europe for the 21st century. The WATERAGRI concept aims to introduce a new framework for the use of affordable small water retention approaches for managing excess and shortage of water as well as better recovery of nutrients from agricultural catchments applying a multi-actor approach. The objectives are to

(a) Co-develop (multi-actor approach) the links between agricultural land and soil-sediment-water management for improved management of water excess and shortage, maximizing crop production and improving water quality and nutrient uptake by crops;

(b) Undertake both technical and sustainability assessments of proposed measures considering tested and reviewed management options;

(c) Develop a cloud-based simulation and data assimilation system based on a physically-based terrestrial system model, which is able to assimilate in situ and remotely sensed observations of hydrological and plant variables and meteorological data in near-real time to analyse effects of structures such as drains and dams for improved farm-scale water management and retention;

(d) Identify, develop and test affordable and easy-to-implement long-term technical and operational farm solutions such as controlled drainage, regulated deficit irrigation, subsurface irrigation, groundwater recharge, farm constructed wetlands, soil management and nutrient recovery options;

(e) Assess the techniques for their potential regarding adaptation to climate change and their impact on ecosystem services for different biogeographic regions using case studies; and

(f) Disseminate the implemented innovations to farmers, advisory services and decision-makers as part of a multi-actor approach.

The key performance indicators are increased crop production, enhanced nutrient recovery from streams and a simulation and data assimilation system.

Circular Agronomics		773649
Title: CIRCULAR AGRONOMICS - Efficient Carbon, Nitrogen and Phosphorus cycling in the European Agri-food System and related up- and down-stream processes to mitigate emissions		
Call Id: H2020-SFS-2017-2	Topic: **SFS-30-2017**	Type of Action: **RIA**
Project start date: 9/1/2018	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €7.021.765	EU requested grant: **€6.999.796**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Agri-food chain; Greenhouse Gas Emissions; Nutrient recycling; Manure; Nitrate; Agriculture; Food waste; Climate change; Life Cycle Assessment; Bioenergy; Carbon management; Policy Briefing*

Abstract:

Circular Agronomics (CA) provides a comprehensive synthesis of practical solutions to improve the current Carbon (C), Nitrogen (N) and Phosphorus (P) cycling in European agro-ecosystems and related up- and down-stream processes within the value-chain of food production. The proposed solutions would constitute a further step towards making agriculture an integral part of a circular economy by increasing resource efficiency while simultaneously addressing associated environmental challenges such as greenhouse gas and ammonia emissions as well as eutrophication of water bodies. Along 7 work packages and 6 case-studies, representing locations with different biogeographic conditions and environmental challenges typical for the European agricultural sector, the objective of CA is to contribute to a development towards sustainable, resilient and inclusive economies that are part of circular and zero-waste societies. The involved multi-actor and international consortium aims (i) To increase the understanding of C, N, P flows and the related potential to reduce environmental impacts at farm and regional level under different bio-geographical conditions; (ii) To close loops within cropland farming, from livestock to cropland farming and to increase the reuse of waste/wastewater from food-industry to improve soil fertility and to increase nutrient use efficiency; (iii) To highlight the performance of different prototypes of agro-ecological systems and increase sustainability of food production in the EU; and (iv) To contribute to the improvement of the European Agricultural Policies by providing evidence based, farmer led and consumer relevant recommendations for the agri-food chain. Cross-cutting social, economic and environmental evaluation ensure the overall sustainability of the investigated solution.

SHui		773903
Title: Soil Hydrology research platform underpinning innovation to manage water scarcity in European and Chinese cropping systems		
Call Id: H2020-SFS-2017-2	Topic: **SFS-47-2017**	Type of Action: **RIA**
Project start date: 9/1/2018	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €5.562.745	EU requested grant: **€4.884.494**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Research platform, stakeholders, socieconomics, ecosystem services, sustainable intensification*

Abstract:

SHui is conceived as a network integrating long-term experiments of its 19 academic and SME partners across different environmental conditions and cropping systems in the EU and China. It provides a platform for research on soil-water resources management under water scarce conditions, to better understand the linkages between agricultural soil hydrology and sustainability and for a systematic assessment of adaptation and mitigation methods. It will develop and implement new strategies to increase water use efficiency and yield, based on sustainable intensification through integrated use of soil and water across different spatial scales. At farm level, this includes digital agriculture solutions integrating in situ and remote sensors and simulation models to exploit an improved understanding of the relationship between crop yield variability and soil hydraulic properties, optimizing circular approaches to re-use water and using waste water sources. These technical approaches are reliant on optimum data utilization and transdisciplinary research with multiple stakeholders. At regional scales, the aggregation of biophysical and socioeconomic variables in dynamic models will evaluate the impact of different policy strategies, to support decision makers to evaluate different scenarios of land-use dynamics, economic context and current and future climate in EU and China, including assessments of water and carbon footprint. SHui will exploit scientific, technological and social innovations by disseminating and communicating these to multiple stakeholders, and implementing novel technological packages from farm to large regional scales. It aims to make a significant contribution to the EU and China Research Agenda for Agriculture in providing food security and optimum use of scarce soil and water resources. Training a cohort of early career scientists in soil conservation and water-saving practices, SHui's legacy will extend beyond the project duration.

WaterWorks2015		689271
Title: Water Works 2016-2020 in Support of the Water JPI (WaterWorks2015) - Sustainable water use in agriculture, to increase water use efficiency and reduce soil and water pollution		
Call Id: H2020-WATER-2015-one-stage	Topic: **WATER-3-2015**	Type of Action: **ERA-NET-Cofund**
Project start date: 1/1/2016	Duration: **60 months**	Unit: **RTD/C/01**
Total costs: €20.524.924	EU requested grant: **€6.267.995**	
Main thematic area: 51 - Water and agriculture / efficient use		

Free keywords: *Resource efficiency*

Abstract:

The WaterWorks2015 proposal responds to the Horizon 2020 (H2020) Societal Challenge 5 2015 Call topic Water-3 [2015]: Stepping up EU research and innovation cooperation in the water area.

WaterWorks2015 aims at pooling resources from the 32 participating research programme owners / managers of 23 countries to implement a joint call for proposals, with EU co-funding in the area of sustainable water use in agriculture and forestry. It's a collaboration between the Joint Programming Initiatives (JPIs), Water JPI “Water Challenges for a Changing World” and FACCE JPI “Agriculture, Food Security and Climate Change”. Achieving a “sustainable water use in agriculture, to increase water use efficiency and reduce soil and water pollution” is at the intersection of the two JPIs, contributing to the implementation of their respective Strategic Research Agendas. WaterWorks2015 includes 9 organisations from associated and third countries in an effort to reinforce international cooperation. Additional Activities will also be carried out to further support the implementation and strategy of the Water JPI.

The overall aims include:

• Increasing the value of relevant national and EU R&D funding by concerted and joint planning, implementation and evaluation of national research programmes;

• Pooling financial resources from participating states towards the definition and implementation of a Co-funded transnational and multi-disciplinary Call for research and innovation proposals. The aim of the Call will be to support the implementation of initiatives and environmental policies, in particular those related to water and agriculture & forestry, as a way to increase water use efficiency and to reduce soil and water pollution;

• Overcoming the fragmentation of European water and agriculture/forestry-related research and innovation activities;

• Supporting the implementation and the development of the two Joint Programming Initiatives, seeking synergies in overlapping research issues.

COALA		870518
Title: COpernicus Applications and services for Low impact agriculture in Australia		
Call Id: H2020-SPACE-2019	Topic: **DT-SPACE-06-EO-2019**	Type of Action: **RIA**
Project start date: 1/1/2020	Duration: **36 months**	Unit: **REA/B/01**
Total costs: €1.698.736	EU requested grant: **€1.698.736**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *DIAS, AUSTRALIA, CROP WATER REQUIREMENT, NUTRIENT MANAGEMENT*

Abstract:

COALA will develop Copernicus-based information service for irrigation and nutrient management for the Australian agricultural systems, starting from the consolidated past experiences of the proposed European partnership, but based on strong collaboration with Academic Australian institutions and business players in the agricultural sector of Australia. Operational farming advisory services will be further developed on one hand to include nutrient managements on the other to provide water accounting data from the farm to the district and/or basin scale. COALA will monitor crops development, water and nutrient status, irrigated areas by means of innovative algorithms based on Sentinel Earth Observation data, which will be accessed by means of the new cloud platforms (DIAS) of Copernicus. In-situ and other source of data will be used to improve the accuracy of the products for the final users, which will be on three different levels: i) farmers, ii) irrigation infrastructure operators, iii) basin authorities. COALA will demonstrate that Copernicus data and new DIAS infrastructure can greatly improve the availability of information for management decisions on irrigation and nutrient management at all decision levels, from the Water Authority in charge of monitoring the implementation of the basin exploitation plan, to the farm level, passing through the irrigation infrastructure operators, in charge of managing irrigation distribution infrastructures. COALA tools and data will improve the decision making and policy for sustainable use of water and nutrients in multi-functional ecosystems. Through this project, it will be possible to explore new business opportunities in Australia for the European industry of Earth Observation services.

Plan2fix		873862
Title: Nitrogen-enriched plasma activated water, an unparalleled plant feeding system		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 9/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.025.605	EU requested grant: **€1.417.924**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Fertiliser, Fertilisation, Nitrogen, Nitrogen fixation, Plasma, Plasma Activated Water, Nitrate, Sustainability*

Abstract:

Horticultural producers fertilise their crops with Nitrogen (N) to ensure healthy and abundant yields that meet the needs of an increasing population. EU greenhouse farmers spend € 808 M yearly in synthetic N-fertilisers, which are energy-intensive to produce, heavily dependent on fossil fuels and very pollutant. Moreover, the supply chain of synthetic N-fertilisers entails a great amount of GHG emissions, with costs estimated at €14 B/yr. Fertilisation with synthetic fertilisers is unsustainable particularly in EU as the price of N is highly dependent on changes in the price of natural gas.

VitalFluid brings to market a sustainable and non-polluting alternative to current synthetic N-fertilisers. Our PLAsma Nitrogen FIXation technology provides an on-the-spot production of liquid N-fertiliser that makes the current supply chain of fertilisers redundant. Only with air, water and electricity from renewable sources, our innovative patented plasma activation technology extracts N directly from the air and dissolve it into Plasma Activated Water (PAW) which is nitrate-enriched water ready to be supplied to crops. PLAN2FIX will provide the agriculture sector and society with lower cultivation costs and third parties' dependency, ensured availability of fertilisers and a drastic reduction of GHG emissions.

With 500,000 Ha of greenhouses in the world and 210,000 Ha in EU, our short-term target customers are professional greenhouse horticulture growers which require more fertilisers per hectare due to intensive cultivation practice. We aim at entering leading countries in the greenhouse and advanced farming: Netherlands, Germany, Spain, France, Italy, Poland & UK in the first 5 years. We will sell directly in NL while will rely on a distribution network outside NL. From 2022 until 2026, we expect 450 units sold, €44.5 M of cumulated revenue, EBITDA of € 22M and a ROI(5Y) of 5.53. The payback of the investment is less than 2 years and we will create 22 new job positions.

RAINOLVE		850054
Title: Accurate irrigation controller with multi-sensoring and interactive cloud-based platform to evaluate real plant needs and save up to 80% of water		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 3/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.954.321	EU requested grant: **€1.368.025**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Irrigation, plant needs, water saving, irrigation technology, platform, efficiency, irrigation controller, precision irrigation*

Abstract:

Irrigation of private lawns is becoming more and more an economic burden for owners and a source of environmental concern for the society due to the high-water consumption it entails. In Europe we are using almost 380 m3 of water spending an average of 728 € per year for a garden of 500 m2 (a small garden of just 10x50 m) whose real needs would be 210 m3 for 405 €. If we consider the number of households with a garden requiring irrigation (we estimated more than 1,5 M in our target market), the water need is hugely impacting from both economic and environmental point of views. Under this context, Precision Irrigation such our irrigation controller is the only option. This growing technology which optimizes the usage of water is expected to expand its market share by 13% from 2016 to 2023. RAINOLVE is the fruit of a collaboration between RAIN, an Italian engineering and manufacture leader in irrigation products; and INOLVE, a Spanish SME specialized in software, for the development of an accurate irrigation controller. RAINOLVE is a multi-sensor coupled with intelligent cloud-based platform with vast botanical and agronomical database to calculate and check the exact plant water, fertilizer and light needs in function of each site conditions. RAINOLVE will provide a highly accurate irrigation technology with low return over investment (less than 1 year) allowing savings up to 19,000€/ha/year: water (up to 80%), fertilizer (up to 40%). RAINOLVE technology stands in a TRL7, with a real scale prototype tested in different field sites. RAINOLVE project main objective is to optimize, test and validate the technology to take it to industrial production and successful commercialization. We estimate that RAINOLVE will be able to generate an annual revenue of 9 M EUR and 36 new job positions among RAIN and INOLVE, in addition to save 340 M m3 of water in Europe, accounting for almost 400 M EUR.

StemSense		848361
Title: A precise irrigation monitoring system to provide an accurate measurement of water status in crops		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 5/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.102.350	EU requested grant: **€1.471.645**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Precision irrigation, crop water status, stem water potential, sustainable water use*

Abstract:

There is an increasing global pressure on water resources and ensuring there is a sufficient supply in the face of climate change. This is of particular prevalence within the agriculture industry where irrigation is becoming increasingly important. Farmers typically overwater plants by 20% due to insufficient knowledge of plant water status resulting in significant wastewater and lowering plant yields. Saturas have developed StemSense, a unique sensor device that measures Stem Water Potential (SWP). SWP is scientifically proven to provide the most accurate data on plant water status. Saturas' system then interprets this data, incorporating external factors such as meteorological data and provides recommended levels of irrigation to farmers. Farmers using the StemSense sensor experience up to 20% higher income, significant water savings and reduced costs. The overall objectives of the Phase 2 project are to design and engineer a miniaturised sensor that can be deployed in a wide variety of plants; to optimise the communication system and user interface; to scale-up production of StemSense with a contract manufacturer; and to demonstrate and validate the technology in in-field trials with farmers across Europe. The overall objective is to reach full commercialisation of StemSense as a reliable innovation validated by the relevant end-users, farmers.

SWAMP		777112
Title: Smart Water Management Platform		
Call Id: H2020-EUB-2017	Topic: **EUB-02-2017**	Type of Action: **RIA**
Project start date: 11/1/2017	Duration: **36 months**	Unit: **CNECT/E/04**
Total costs: €1.478.090	EU requested grant: **€1.478.090**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Internet of Things, Water Management, Autonomous devices*

Abstract:

The SWAMP project develops IoT based methods and approaches for smart water management in precision irrigation domain, and pilots them in Italy, Spain, and Brazil (2).

Water is vital for ensuring food security to the world's population, and agriculture is the biggest consumer amounting for 70% of freshwater. The water wastages are caused mainly by leakages in distribution and irrigation systems, and in the field application methods. The most common technique, surface irrigation wastes a high percentage of the water by wetting areas where no plants benefit from it. Localized irrigation can use water more efficiently and effectively, avoiding both under-irrigation and over-irrigation. However, in an attempt to avoid under-irrigation, farmers feed more water than is needed resulting not only to productivity losses, but also water is wasted. Therefore, technology should be developed and deployed for sensing the level of water needed by the plantation and for flowing the water to places where and when needed. The SWAMP project addresses these issues by use of the Internet of Things (IoT), data analytics, autonomous devices and other related technologies.

The challenges addressed by SWAMP project are following: 1) Reducing effort in software development for IoT-based smart applications. 2) Automating advanced platforms and integrating different technologies and components. 3) The integration of heterogeneous and advanced sensors, particularly flying sensors (drones) providing precision in the water supply for irrigation. 4) The use of a Software Platform together with technologies such as IoT, Big Data, Cloud/Fog and drones for the deployment of pilot applications for smart water management. 5) Proposing, testing and validating new business models for using IoT in smart water management settings. 6) Technological components must be flexible and adaptable enough in order to adapt to different contexts and to be replicable to different locations and contexts.

ACCWA		823965
Title: Accounting for Climate Change in Water and Agriculture management		
Call Id: H2020-MSCA-RISE-2018	Topic: **MSCA-RISE-2018**	Type of Action: **MSCA-RISE**
Project start date: 3/1/2019	Duration: **48 months**	Unit: **REA/A/03**
Total costs: €1.518.000	EU requested grant: **€1.518.000**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *irrigation, water use, food security, drought, yield, management tools, remote sensing*

Abstract:

The Mediterranean and Sahel regions are among the most sensitive areas to climate change as demonstrated in many studies (IPCC, 2013).

Increased rainfall variability and ET rates will compromise irrigation potential and expansion plans and increased competition and conflict over limited water resources. There are significant knowledge gaps and uncertainties about how much water will be available for a complete growing season, how much should be used for scheduling irrigation efficiently and extracted from these regions. More information regarding water use is necessary to improve agricultural planning and to manage water more efficiently at different scales: farm and catchment/irrigation district level.

Over both regions, the temperature increase will cause higher evaporation and transpiration rates, decreasing soil moisture and increasing crop water requirements. The expected impact in rainfed agriculture is a decrease in yield due to heat and water stress and an increase in the likelihood of crop failure in rainfed crops for maize, millet and sorghum (Parkes et al. 2018). Ongoing changes in the socio-economic and environmental background of rainfed farmers combined with the expected population growth make timely and reliable information on rainfed crop yield and its spatial variability essential in decision-support for improving food security and livelihoods. To this end, both understanding of the long term changes (inter-annual variability) and short-term changes (intra-annual variability) are needed.

Temperature and precipitation changing patterns will also increase hazards linked to environmental conditions such as droughts, floods or crop pests like locust swarms. ACCWA aims to develop the remote sensing based monitoring tools for agriculture and water and management that help risk guidance in a climate change context.

Green-DROP		793325
Title: Precise subarea specific irrigation and fertilization system		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-07-2016-2017**	Type of Action: **SME-2**
Project start date: 4/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.384.238	EU requested grant: **€968.966**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Automatic system, fertigation, efficient use of resources, water savings, sensors, precise farming, low-cost, waste reuse, increase productivity, state-of-the-art technologies*

Abstract:

Competitive global markets, rising fertilizer and energy costs, and growing uncertainties in water availability, due to a more and more uneven rainfall distribution, impose serious challenges on the European agricultural producers. Besides, wastes from farms with high nutrient availability as manure from animals, digestate from biogas plants and sewage sludge are becoming difficult and expensive to dispose.

In response to these challenges and in order to achieve an efficient application of resources more and more farmers are introducing approaches of “precision agriculture” technologies for farming practices, such as Green-DROP. Green-DROP uses a number of georeferenced layers with different information: crop type, topography, weather distribution, field capacity, soil type, etc. This information gives the precise and specific requirements of water and nutrients for each subarea of the holding to be fertigated. Green-DROP makes possible to meet the exact fertilizer and water demands for all types of soils and crops. Thus, Green-DROP enables the farmer to increase productivity, resource efficiency, compliance and competitiveness in the production of raw materials, while mitigating environmental impacts from water abstractions and fertilizer application. Additionally, Green-DROP project will recover nutrients from farming wastes, and will use them as input for the fertilization of the land to close the nutrient cycle (Nutrients in waste-Nutrients as fertilizers-Nutrients in plants). Green-DROP reduces water and fertilizers consumption by 20 % making the agricultural sector more independent and profitable. It is designed for farms of all sizes but it will focus on holdings and agricultural cooperatives with at least 50 ha of surface area.

HyPump		784689
Title: Enabling Sustainable Irrigation through Hydro-Powered Pumps for Canals		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-07-2016-2017**	Type of Action: **SME-2**
Project start date: 10/1/2017	Duration: **33 months**	Unit: **EASME/A/02**
Total costs: €2.545.390	EU requested grant: **€1.781.773**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Irrigation, Renewable energy, Sustainability, Hydro-power, Pumps, Drip, Sprinkler, Canal*

Abstract:

In irrigation water cannot be decoupled from energy. Raising water from rivers and canals and distribute it to the crops requires pumping of large volumes of water with a sizeable amount of pressure, which is generated by means of electric energy or by fuel-driven pumps. This turns into a substantial increase of energy consumption and capital expenditure, which has become a real concern for farmers and their communities. Besides, sharp increases in energy tariffs almost doubled the energy bills that irrigators have to pay, which accounts for up to 40% of the total irrigation costs for farmers' communities. In a context exacerbated by the ongoing climate change, European farmers are striving to reduce their water footprint by means of water saving irrigation technologies while optimising their energy costs for pumping, with the aim to ensure long-term economic and environmental sustainability. To address this global need, aQysta has designed the HyPump, an innovative spiral pump which converts the energy from the flow of existing irrigation canals to pressure for pumping water, delivering pressurized water directly to the agriculture plots without requiring any fuel nor electricity to be operated. This Phase 2 is focussed on the industrialisation and field tests of the HyPump, which will allow farmers obtaining up to 75% savings on the overall costs for modernizing infrastructures and running an irrigation system with respect to competing electric or fuel-driven solutions, and up to 37% savings with respect to solar pumps. Through the Cost Benefit Analysis run during Phase 1, annual net savings have been estimated in the range of 5k€-8k€ per hectare with respect to electric pumping. Besides, a payback time in the range of 2,5-4 years has been estimated when switching from an electric or fuel- operated system to the HyPump, obtained with zero environmental footprint with respect to fuel or energy powered pumps.

HPGen		767568
Title: On-site Hydrogen Peroxide Generator for effective, safe and sustainable irrigation water treatment		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-07-2016-2017**	Type of Action: **SME-2**
Project start date: 6/1/2017	Duration: **25 months**	Unit: **EASME/A/02**
Total costs: €1.760.559	EU requested grant: **€1.232.391**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *irrigation water treatment, hydrogen peroxide, hydrogen peroxide generator*

Abstract:

Greenhouses in Europe and Mediterranean produce 30% of the EU's fruits and vegetables. Growing irrigation water resource pressures are driving greenhouse growers to use of more efficient irrigation techniques, and of non-potable water sources. These lead to a strong need for irrigation water treatment (IWT), to eliminate water-borne plant and human pathogens, mitigate clogging by bio-foul and secure reliable and uniform irrigation, and improve water oxygenation. Our goal is to bring to market a novel irrigation water treatment (IWT) solution based on our technology breakthroughs in on-site generation of hydrogen peroxide (H2O2). Our autonomous H2O2 generation device (HPGen) enables the safe, cost-effective and sustainable on-site generation of hydrogen peroxide, with only water, air and electricity as input. Hydrogen peroxide is a potent but eco-friendly disinfection agent, yet its use in IWT is very limited due the costs, risks and complexities of its present-day supply chain. HPGen will disrupt today's H2O2 supply chain, enabling growers to reap the benefits of its use in IWT, substantially decreasing IWT and irrigation line maintenance costs, eliminating use of toxic-chemicals in IWT, improving farm safety, and increasing crop yields. HPGen will provide farmers with a positive economic impact of €4k-€5k per hectare per annum, while enhancing agriculture sustainability and reducing environmental impact. Technology breakthrough was made at the Danish Technical University 5 years ago, and a commercialization path was launched 2 years ago by HPNow ApS, a Danish SME. The company has since been highly successful in scaling up its technology, while attracting strong commercial partners, including global leaders in agriculture irrigation and in bulk hydrogen peroxide production, which are actively supporting this project. This project will initiate with pilot and customer trials of a full-scale version (TRL 6), and will end with commercial launch of HPGen (TRL 9).

MOSES		642258
Title: Managing crOp water Saving with Enterprise Services		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 7/1/2015	Duration: **40 months**	Unit: **EASME/B/02**
Total costs: €4.249.263	EU requested grant: **€3.768.013**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *GIS, crop classification, crop monitoring, seasonal weather forecasting, water balance model, remote sensing, copernicus, sentinel-1, sentinel-2*

Abstract:

The main objective of MOSES is to put in place and demonstrate at the real scale of application an information platform devoted to water procurement and management agencies (e.g. reclamation consortia, irrigation districts, etc.) to facilitate planning of irrigation water resources, with the aim of: a) saving water; b) improving services to farmers; c) reducing monetary and energy costs.

To achieve these goals, the MOSES project combines in an innovative and integrated platform a wide range of data and technological resources: EO data, probabilistic seasonal forecasting and numerical weather prediction, crop water requirement and irrigation modelling and online GIS Decision Support System. Spatial scales of services range from river basin to sub-district; users access the system depending on their expertise and needs. Main system components are:

1. early-season irrigated crop mapping

2. seasonal weather forecasting and downscaling

3. in-season monitoring of evapotranspiration and water availability

4. seasonal and medium/short term irrigation forecasting

Four Demonstration Areas will be set up in Italy, Spain, Romania and Morocco, plus an Indian organization acting as observer. Different water procurement and distribution scenarios will be considered, collecting data and user needs, interfacing with existing local services and contributing to service definition. Demonstrative and training sessions are foreseen for service exploitation in the Demonstration Areas.

The proposed system is targeting EIP on Water “thematic priorities” related to increasing agriculture water use efficiency, water resource monitoring and flood and drought risk management; it will be compliant to INSPIRE. This SME-led project address to the irrigated agriculture users an integrated and innovative water management solution.

MASLOWATEN		640771
Title: MArket uptake of an innovative irrigation Solution based on LOW WATer-ENergy consumption		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 9/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €4.875.130	EU requested grant: **€3.996.318**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords: *Reduction of water-energy consumption, Market replication, Photovoltaic irrigation*

Abstract:

The world of irrigation requires innovative solutions, less water and energy dependant. UPM developed in 2013 solutions for large power photovoltaic (PV) pumping systems at TRL5 that was successfully tested in a real Irrigators Community (IC) of Alto Vinalopó (Spain). The results showed great technical reliability (solving the problem of the variability of solar energy), matching the IC irrigation needs just with the solar electricity (thanks to sun-tracking systems) and reducing dramatically the cost of energy (60% regarding the conventional grid consumption.)

In parallel, ELAIA has integrated systems with, in one hand, automatisms and ICT solutions that reduce the water consumption (30%) detecting in real-time the actual needs of the specific crop in a certain moment, and in the other hand, low pressure systems that reduce the energy needs

. This project proposes activities to integrate both developments at a TRL9 for the first application and market replication of a new green product at TRL9 consisting of PV pumping systems for productive agriculture irrigation consuming zero conventional electricity and 30% less waer.

Main objectives:

1 To show the technical and economical viability of efficient and intermittency-free large scale PV pumping systems for irrigation allowing 100% renewable energy consumption. 2 To reduce the water consumption, using Automatisms and ICT and Precision Agriculture-based solutins.

3 Market uptake and market replication of a new green product for irrigation at TRL9 consuming 100% renewable electricity and 30% less water.

The expected impact is, first, the market penetration of this innovative solution through five real scale first market systems (in Spain, Italy, Portugal and Morocco) and other technical, economical and diseemination actions for the market uptake. And second, the generation of a real market of 6GW of large-scale systems meaning a real business of 9000M€. MASLOWATEN is the initiative of an AG of EIP Water (PVAIZEC)

FERTINNOWA		689687
Title: Transfer of INNOvative techniques for sustainable WAter use in FERtigated crops		
Call Id: H2020-WATER-2015-one-stage	Topic: **WATER-4b-2015**	Type of Action: **CSA**
Project start date: 1/1/2016	Duration: **36 months**	Unit: **REA/B/02**
Total costs: €2.999.273	EU requested grant: **€2.999.273**	
Main thematic area: 52 - Water and agriculture / irrigation		

Free keywords:

Abstract:

In European countries, the cultivation of fertigated crops experience scarcity of water, and the intensity of cultivation poses significant risks to water quality. The main objective of the FERTINNOWA thematic network is to create a meta-knowledge database on innovative technologies and practices for fertigation of horticultural crops. FERTINNOWA will also build a knowledge exchange platform to evaluate existing and novel technologies (innovation potential, synergies, gaps, barriers) for fertigated crops and ensure wide dissemination to all stakeholders involved of the most promising technologies and best practices.

A multi-actor integrated approach will be used through the FERTINNOWA platform which will involve various stakeholders (researchers, growers, policy-makers, industry, environmental groups etc.) at several levels including the socio-economic and regulatory level (national and European) with a special focus on the EU Water Framework Directive and Nitrate Directive. Information will be gathered at national level to feed a European benchmark study that will evaluate and compare existing technologies used at various horticulture sectors, including vegetables, fruit and ornamentals in different climate zones.

All tools, databases and other resources generated will be shared within the consortium and the stakeholders' group and will be made available to the broader scientific community, policy-makers, the industry and the public at large. FERTINNOWA will help the growers to implement innovative technologies in order to optimize water and nutrient use efficiency thus reducing the environmental impact.

INSPIRATION		675120
Title: Managing soil and groundwater impacts from agriculture for sustainable intensification		
Call Id: H2020-MSCA-ITN-2015	Topic: **MSCA-ITN-2015-ETN**	Type of Action: **MSCA-ITN-ETN**
Project start date: 4/1/2016	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.837.780	EU requested grant: **€3.837.780**	
Main thematic area: 53 - Water and agriculture / diffuse pollution		

Free keywords: *sustainable agriculture, groundwater pollution, water and soil protection, soil restoration, environmental management, resource conservation*

Abstract:

Agricultural production in Europe has significantly damaged soil and water resources, ecosystem biodiversity, socio-economic well-being and contributed to climate change. Expected further intensification of production to ensure food safety for population growth must be sustainable to minimise future impacts and negative externalities. This ETN addresses these challenges by training 15 early stage researchers in cutting edge research skills and innovative approaches to manage soil and groundwater impacts from agriculture for sustainable intensification. It supports EU policy goals on food security, resource conservation, renewable energy and climate change, and the aims of the H2020 Societal Challenge 5 Work Programme for sustainable management of the environment and its resources. The scientific objectives focus on developing (1) management techniques which mitigate environmental impacts of agricultural practices on soil, water and climate systems, and support sustainable intensification using new production methods; (2) "smart" environmental monitoring, biotechnology and modelling tools to predict the outcome of measures and practices in (1); (3) decision-making tools with sustainability indicators to implement sustainable agricultural production methods. This will be achieved by linking lab-scale studies of processes with field-scale evaluation of novel management concepts, analytical tools and modelling, using state-of-the-art methods. The network includes research, advisory and commercial organisations from all sectors of the agri-environmental management community, and SMEs to multinational firms. Its novel training agenda of workshops and summer schools on technical and business skills, international conferences, industry secondments and knowledge transfer activities has the specific aim of transferable skills training. This is highly relevant for scientific communication, societal impact and entrepreneurship, preparing the fellows for careers in many sectors.

FAirWAY		727984
Title: Farm systems that produce good Water quality for drinking water supplies		
Call Id: H2020-RUR-2016-2	Topic: **RUR-04-2016**	Type of Action: **RIA**
Project start date: 6/1/2017	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €4.999.865	EU requested grant: **€4.999.865**	
Main thematic area: 53 - Water and agriculture / diffuse pollution		

Free keywords: *Farm management, nitrate, pesticides, drinking water, governance models, best management practices*

Abstract:

Safe drinking water is vital for human health. Diffuse pollution of nitrogen and pesticides from agriculture is the main obstacle to meet drinking water quality targets. Policies to protect drinking water resources have not achieved a consistent effectiveness in all member states. The objective of FAIRWAY is to review policy, governance and farm water management approaches to protect drinking water resources in the EU and to identify and further develop innovative measures and governance approaches which will simultaneously increase the sustainability of agriculture. The FAIRWAY partners form a unique blend of researchers, farm advisers and consultancies and is built on 13 case studies ('living labs') in 11 different EU countries, which will form the core of a multi-actor platform, underpinning all FAIRWAY work packages. Equally important is the upscaling of successful practices from case studies to the regional, national, and EU scales, emphasising the role of effective communication and extension tools developed in FAIRWAY. The outputs will provide a blueprint for multi-actor engagement across different scales, which will allow agriculture and water policies to be addressed in a more integrated way. FAIRWAY will i) increase the scientific understanding of the relationship between agriculture and drinking water protection, ii) increase the understanding for the social, technical and economic barriers to practical implementing of measures (iii) deliver innovative measures and tools to overcome these barriers, iv) develop protocols and data-sets for monitoring of farming practices and water quality, v) develop effective governance approaches for small to large water supplies, and vi) increase awareness and involvement of farmers and other citizens in the monitoring and governance of water supplies. The FAIRWAY results will be widely disseminated to a range of targeted audiences using state-of-the-art technologies, social media and workshops.

WATERPROTECT		727450
Title: Innovative tools enabling drinking WATER PROTECTion in rural and urban environments		
Call Id: H2020-RUR-2016-2	Topic: **RUR-04-2016**	Type of Action: **RIA**
Project start date: 6/1/2017	Duration: **36 months**	Unit: **REA/B/02**
Total costs: €4.997.007	EU requested grant: **€4.997.007**	
Main thematic area: 53 - Water and agriculture / diffuse pollution		

Free keywords: *Water governance*

Abstract:

High-quality, safe, and sufficient drinking water is essential for life: we use it for drinking, food preparation and cleaning. Agriculture is the biggest source of pesticides and nitrate pollution in European fresh waters. The overarching objective of WATERPROTECT is to contribute to effective uptake and realisation of management practices and mitigation measures to protect drinking water resources. Therefore WATERPROTECT will create an integrative multi-actor participatory framework including innovative instruments that enable actors to monitor, to finance and to effectively implement management practices and measures for the protection of water sources. We propose seven case studies involving multiple actors in implementing good practices (land management, farming, product stewardship, point source pollution prevention) to ensure safe drinking water supply. The seven case studies cover different pedo-climatic conditions, different types of farming systems, different legal frameworks, larger and smaller water collection areas across the EU. In close cooperation with actors in the field in the case studies (farmers associations, local authorities, water producing companies, private water companies, consumer organisations) and other stakeholders (fertilizer and plant protection industry, environment agencies, nature conservation agencies, agricultural administrations) at local and EU level, WATERPROTECT will develop innovative water governance models investigating alternative pathways from focusing on the 'costs of water treatment' to 'rewarding water quality delivering farming systems'. Water governance structures will be built upon cost-efficiency analysis related to mitigation and cost-benefit analysis for society, and will be supported by spatially explicit GIS analyses and predictive models that account for temporal and spatial scaling issues. The outcome will be improved participatory methods and public policy instruments to protect drinking water resources.

ULTRAWAT		811908
Title: Ultrapure Water Technology - nanoparticle free water for the advanced nanoelectronics industry enabling further miniaturization of electronic devices		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 7/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.855.975	EU requested grant: **€1.299.183**	
Main thematic area: 61 - Water and industry / process water treatment		

Free keywords: *Nanoelectronics, nanoparticles, yield rate, semiconductors, IC, Integrated circuit, transistors, microchip, defects, Ultrapure water, Chips, fabs, nodes, nm, electronics, wafers, lithography, tran*

Abstract:

The ULTRAWAT project will commercialize a new advanced technology system, proven to remove sub-20 nanoparticles from ultrapure nanoelectronic process water and from industrial waste water. Type 1 Ultrapure Water (UPW) is water treated to highest levels of purity. It is used in the nanoelectronics industry for surface treatment of microchips. Sub-20 nm particles are called ”killer particles”. They are difficult to remove and can cause damage to advanced devices by causing short circuits. Removing killer particles from process water will enable further miniaturization of electronic devices.

The global consumption of UPW in nanoelectronics industry is estimated at 2000 billion litres per year. State-of-the-art UPW systems cannot remove sub-20 nanoparticles efficiently and reuse both the water and valuable minerals and chemicals. Recognizing a significant business opportunity, XZERO has developed a new Key Enabling Technology for the complete removal of “killer particles”. The technology enables Zero Liquid Discharge. ZLD saves large quantities of water, enables the extraction of valuable materials and stops dangerous contaminants from polluting the environment.

The targeted users are water system integrators (WSI) and nanoelectronics manufacturers. WSIs will get access to innovative technology that will boost the added value of their systems. Nanoelectronics manufacturers will remove the threat to profitable manufacture from nanoparticles and minimize their environmental footprint. XZERO’s crucial strategy is to capitalize on this strong industrial need. We acquired huge commercial interest.

The project is aimed at turning tested prototypes [TRL 6] into fully functional commercial systems [TRL 9] that can be easily deployed and integrated with production equipment in the nanoelectronics industry. The technology has a potential to boost the development of the nanoelectronics sector in Europe that is striving to reclaim its position among world leaders.

H2AD-aFDPI		698374
Title: H2AD - Innovative and scalable biotechnology using Microbial Fuel Cell and Anaerobic Digestion for the treatment of micro-scale industrial and agriculture effluents to recover energy from waste		
Call Id: H2020-SMEINST-2-2015	Topic: **BIOTEC-5b-2015**	Type of Action: **SME-2**
Project start date: 11/1/2015	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.054.206	EU requested grant: **€2.137.944**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Effluent disposal, microbial fuel cells, anaerobic digestion, AD, biogas, agri-food and drink industry, digestate polishing, waste water treatment*

Abstract:

Lindhurst Innovation Engineering (LIE) have developed H2AD - a novel micro-scale technology for the rapid and safe disposal of organic effluent. A hybrid of microbial fuel cells (MFC) and conventional anaerobic digestion (AD), H2AD is based on a patented bioreactor and electrode architecture. H2AD enables a 10x reduction in the time required to reduce the organic content of waste, and recover the energy via conversion to a hydrogen/methane rich biogas.

Effluent disposal has been identified by LIE as a key restriction on the productivity and profitability of the EU agri-food and drink processing industry (a-FDPI), which is the largest EU manufacturing industry but includes 271,000 micro and small enterprises (µSE). No viable micro-scale technology currently exists for disposal of effluents from µSE, or is able to recover energy from these waste volumes. However, currently at TRL6/7 through extensive testing on cattle slurry, H2AD can also directly address the challenge of waste management in the a-FDPI, recovering some of the 288TWh of potential energy lost in effluent from the EU a-FDPI annually.

The overall aim of the Phase 2 project is to undertake the experimental development and field trials required to confirm predicted H2AD performance/payback for new feedstocks, derived from the a-FDPI. LIE seek to prove commercial viability for efficient removal of organic content from key process waste streams; slurry; and post-AD liquors, with biogas utilisation strategies for optimum payback. The project seeks to develop sensing for automated/remote control of system operation and optimised biogas yields through process performance.

Strong collaboration with EU industrial and academic bodies directly open opportunities for the placement of 600 units in the a-FDPI, as well as a further 14,000 applications in primary agriculture and waste management, in line with LIE's commercial strategy for H2AD to address the €34 billion global market for waste-to-energy equipment.

RIBATI		945638
Title: Radically innovative bacterial treatment for recalcitrant industrial wastewater		
Call Id: H2020-EIC-SMEInst-2018-2020-3	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2b**
Project start date:	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.649.631	EU requested grant: **€1.154.742**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Biological treatment, Industrial wastewater, Energy efficiency, Environment, Water consumption, Contaminants, Chemical Oxygen Demand, COD*

Abstract:

Manufacturing industries are responsible for large loads of contaminants discharged in water. As each wastewater has different composition, each of them requires specific treatment in order to remove the contaminants. Treatments are expensive (€40-121,4/m3) and usually their efficiency is low – as little as 20% in some sectors.

Moreover, EU environmental regulations are becoming stricter. These facts are putting the industry at serious risk: factories may be forced to closure because of the high costs and the non-compliance with regulations, which involves heavy sanctions. Amapex has developed RIBATI, an integral industrial wastewater treatment service based on 3 key elements:

i) Active Product, composed by a blend of a specific registered bacterial strain and a selected variety of 12 oligoelements; ii) Smart Doser Unit, an exclusive automatic device that adjusts dose, time, temperature and life cycle of the active product, and iii) an integral service including a landing study, installation, maintenance, supply of active product and recurrent analysis of treated wastewaters. Our invention has been tested with more than 30 potential clients with promising results: leading up to 59% savings and allowing for water reuse in some water-intensive industries like the textile sector. Our solution is adapted to the industry's needs and it also adapts to the needs of every individual client. Our revenue model will be based on subscriptions, what we call RIBATI PAY PER FLOW.

Our target are SMEs from the textile, tanning, metals processing, chemical and car wash sectors, which represent 30% of the EU manufacturing sector (around € 1,85 bn in Europe). Our target countries are Spain, Italy, France, Belgium, Netherlands and Germany. By year 5, we expect to treat about 500.000 m3 of wastewater and to generate around €12,3M revenues, an EBITDA of €8,3M, an IRR of 80% and an NPV of €7M (discount rate of 15%). We also expect to create 15 new jobs.

ANAERGY		858805
Title: Advanced Multistage Sequential Wastewater Treatment Technology		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 6/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.748.750	EU requested grant: **€1.224.125**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Wastewater treatment; Agro-food industry; Anaerobic digester; Aerobic stage; Water cycle; Industrial effluents ; Wastewater discharges fees; Biogas production; Water purification*

Abstract:

Enhancing of wastewater treatment technologies is a key goal of the EU to achieve sustainable and circular economy. Due to the required high investment and operational costs of current technologies, many industries find more economical to pay fines for direct discharges of polluted effluents than to treat them. Particularly, the heterogeneity and seasonality of the agro-food sector produce a broad variety of wastewater streams which claim for more efficient and customizable solutions to meet with increasingly stringent wastewater regulations.

Within this context, Ingeobras and Proycon have developed ANAERGY, a modulable wastewater treatment system that integrates for the first time: anaerobic, aerobic and advanced oxidation stages. The exclusive design of the anaerobic digester, including patented PUREMUST® technology, enable to reach high pollutants elimination rates (95-99%) and production of biogas (16 m3/m3). Also, its small size and flexibility allow reducing installation and operational costs, together with a tailored response to end-user´s requirements. Following their collaboration for 12 years, Ingeobras will manage technical upgrades, assembly, commercialization and installation, while Proycon will be in charge of manufacturing the digesters.

The adoption of ANAERGY by industries lead to major economic savings by eliminating wastewater discharge fees and reducing energy costs (biogas ≈80% energy needs). The benefits that ANAERGY will bring to the market will make the proposed project profitable with a ROI of 6.6 over 4 years and a payback period by the 1st quarter of the second year. Likewise, by improving current technology, ANAERGY will decrease water pollution, increase water reusability and strengthen renewable energy share. Together, these actions generate social, environmental and economic benefits for all society, contributing to overall well-being, water and food security, and sustainable development.

ELECTRON4WATER		714177
Title: Three-dimensional nanoelectrochemical systems based on low-cost reduced graphene oxide: the next generation of water treatment systems		
Call Id: ERC-2016-STG	Topic: **ERC-2016-STG**	Type of Action: **ERC-STG**
Project start date: 5/1/2017	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.493.734	EU requested grant: **€1.493.734**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *electrochemical water treatment, reduced graphene oxide-coated electrode materials, persistent organic contaminants removal, disinfection*

Abstract:

The ever-increasing environmental input of toxic chemicals is rapidly deteriorating the health of our ecosystems and, above all, jeopardizing human health. Overcoming the challenge of water pollution requires novel water treatment technologies that are sustainable, robust and energy efficient. ELECTRON4WATER proposes a pioneering, chemical-free water purification technology: a three-dimensional (3D) nanoelectrochemical system equipped with low-cost reduced graphene oxide (RGO)-based electrodes. Existing research on graphene-based electrodes has been focused on supercapacitor applications and synthesis of defect-free, superconductive graphene. I will, on the contrary, use the defective structure of RGO to induce the production of reactive oxygen species and enhance electrocatalytic degradation of pollutants. I will investigate for the first time the electrolysis reactions at 3D electrochemically polarized RGO-coated material, which offers high catalytic activity and high surface area available for electrolysis. This breakthrough approach in electrochemical reactor design is expected to greatly enhance the current efficiency and achieve complete removal of persistent contaminants and pathogens from water without using any chemicals, just by applying the current. Also, high capacitance of RGO-based material can enable further energy savings and allow using intermittent energy sources such as photovoltaic panels. These features make 3D nanoelectrochemical systems particularly interesting for distributed, small-scale applications. This project will aim at: i) designing the optimum RGO-based material for specific treatment goals, ii) mechanistic understanding of (electro)catalysis and (electro)sorption of persistent pollutants at RGO and electrochemically polarized RGO, iii) understanding the role of inorganic and organic matrix and recognizing potential process limitations, and iv) developing tailored, adaptable solutions for the treatment of contaminated water.

CABUM		771567
Title: An investigation of the mechanisms at the interaction between cavitation bubbles and contaminants		
Call Id: ERC-2017-COG	Topic: **ERC-2017-COG**	Type of Action: **ERC-COG**
Project start date: 7/1/2018	Duration: **60 months**	Unit: **ERCEA/C/02**
Total costs: €1.904.565	EU requested grant: **€1.904.565**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Cavitation, Exploitation, Bacteria, Viruses, Water treatment*

Abstract:

A sudden decrease in pressure triggers the formation of vapour and gas bubbles inside a liquid medium (also called cavitation). This leads to many (key) engineering problems: material loss, noise and vibration of hydraulic machinery. On the other hand, cavitation is a potentially a useful phenomenon: the extreme conditions are increasingly used for a wide variety of applications such as surface cleaning, enhanced chemistry, and waste water treatment (bacteria eradication and virus inactivation).

Despite this significant progress a large gap persists between the understanding of the mechanisms that contribute to the effects of cavitation and its application. Although engineers are already commercializing devices that employ cavitation, we are still not able to answer the fundamental question: What precisely are the mechanisms how bubbles can clean, disinfect, kill bacteria and enhance chemical activity? The overall objective of the project is to understand and determine the fundamental physics of the interaction of cavitation bubbles with different contaminants. To address this issue, the CABUM project will investigate the physical background of cavitation from physical, biological and engineering perspective on three complexity scales: i) on single bubble level, ii) on organised and iii) on random bubble clusters, producing a progressive multidisciplinary synergetic effect.

The proposed synergetic approach builds on the PI's preliminary research and employs novel experimental and numerical methodologies, some of which have been developed by the PI and his research group, to explore the physics of cavitation behaviour in interaction with bacteria and viruses.

Understanding the fundamental physical background of cavitation in interaction with contaminants will have a ground-breaking implications in various scientific fields (engineering, chemistry and biology) and will, in the future, enable the exploitation of cavitation in water and soil treatment processes.

INDIA-H2O		820906
Title: bIo-mimetic and phyto-techNologies DesIgned for low-cost purficAtion and recycling of water		
Call Id: H2020-SC5-2018-1	Topic: **SC5-12-2018**	Type of Action: **RIA**
Project start date: 2/1/2019	Duration: **54 months**	Unit: **EASME/B/02**
Total costs: €4.433.356	EU requested grant: **€2.551.348**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Desalination, Forward Osmosis, Reverse Osmosis,*

Abstract:

INDIA-H20 will develop, design and demonstrate high-recovery, low-cost water treatment systems for saline groundwater and industrial wastewaters. The focus for developments will be in the arid state of Gujarat, where surface water resources are very scarce. We will develop novel batch-reverse osmosis technology for a 10-fold reduction in specific energy consumption with high fractions of water recovery (80%) reducing /m3 operating costs to below €0.35/m3 (<30 rupees/m3). Forward osmosis will be developed and piloted for use in wastewater recovery applications including hybrid arrangements with reverse osmosis for further reduction in energy consumption. These solutions will be demonstrated in small-scale rurally relevant low-cost systems for brackish groundwater treatment for use as safe drinking water, which will be extended to include phyto-technology solutions for rural domestic wastewater treatment. Systems will remove salinity and emerging pollutants (e.g. agricultural chemicals), valorise rejected brines in halophytic crop cultivation. For specific industrial wastewater in textile, desalination and dairy we will develop and demonstrate cost-effective high-efficiency hybrid technologies for water recycling with minimum liquid discharge, using advanced membrane technologies to achieve the required water quality for recycling. A centre of excellence will be established in water treatment membrane technologies, design operation and monitoring. Activities such as supply chain mapping and EU India collaboration on developing industrial scale forward osmosis membranes and batch-RO systems will support the development of business models to exploit the developed solutions to mutual EU/India economic advantage. We will analyse and produce policy briefs on economic models and governance arrangements for viable adoption of the developed systems.

ITERAMS		730480
Title: Integrated mineral technologies for more sustainable raw material supply		
Call Id: H2020-SC5-2016-OneStageB	Topic: **SC5-13-2016-2017**	Type of Action: **RIA**
Project start date: 6/1/2017	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €7.915.364	EU requested grant: **€7.915.364**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *water quality, geopolymerization*

Abstract:

The aim of ITERAMS is to develop a proof of concept for more environmentally friendly and economic mine site operations, in Europe and globally. For that, the ITERAMS project focuses on the isolation of process waters completely from the adjacent water systems. This will require development of new methods for optimising and controlling water qualities at each process step. As a bonus, this will also facilitate the recovery of additional valuable constituents.

The ITERAMS project will develop research and dimensioning protocols suitable for use at the mines processing different ores. In this context, validation of the concepts will have an essential role. In the planned project, it will be performed at selected mine sites processing sulphide ores, although the concepts will be generic and thus also suitable for other types of ores like gold, rare earth, and phosphate ores.

The closure of water cycles at each process stage will inevitably increase their thermodynamical and kinetic unstability (as is also the case with conventional tailing ponds). In addition, water temperatures will also increase, causing higher bacterial growth, especially for iron and sulphur oxidising species. This will result in a dynamic situation that has never so far been worked on. The ITERAMS project will create new academic and industrial knowledge and capabilities to tackle such questions. The tightly closed water cycles can be realised only if the tailings can be filtered and stacked dry. ITERAMS will demonstrate the use of geopolymerisation to create water and oxygen tight covers on the deposited tailings. For that, the tailings streams will be modified for their easier geopolymerisation.

The ITERAMS water and waste efficient methods will be validated at mine sites in Finland, in Portugal and additionally either in Chile or South Africa.

iPURXL		672550
Title: iPURXL: Scale-Up of Liquid Nano-reactor for the Destruction of Contaminants in Turbid Fluids		
Call Id: H2020-SMEINST-2-2014	Topic: **SC5-20-2014**	Type of Action: **SME-2**
Project start date: 7/1/2015	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.880.198	EU requested grant: **€1.316.137**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Water treatment, effluent, cold pasteurisation, COD reduction*

Abstract:

The iPURtech Nanoreactor effluent fluid treatment system recycles metal working fluids in an almost closed loop. iPURXL builds on 2 years successful sales and a growing list of enquiries to transfer the technology to other sectors, particularly for the treatment of water and other aqueous liquids. This will required scale up from our current >20-50 Litres per hour systems to those capable of processing >1000 in line with customer demand. This will enable us to sell into both single line and full site effluent treatment, ranging from small meat rendering plants up to full scale municipal waste water treatment.

The original system treats fluid in quartz tubes supplied with sufficient UV-C light to operate. A TiO2 photo-catalyst coated auger causes oscillation and scrubs tube walls clean. Conventional systems immerse single lamps in fluid; we use multiple high powered UV-C lamps around tubes to achieve higher volume kill ratios making iPURtech uniquely suitable for scale up.

TiO2 reactors are well researched yet little large scale commercial delivery has resulted. To succeed commercially this must be practical. Direct linear scale up is not possible, issues such as coating light weight auger materials over greater surface areas, UV dose, system size and weight and must be addressed. Over summer of 2014, testing was carried out with a range of meat renderers and with the input of a range of technical and commercial specialists. This has resulted in the development of a very strong research, development, supply and sales team and we are confident of our combined abilities to deliver at commercial scale immediately post this demonstration.

CleanOil		719201
Title: Global business challenge: Breaking the oilgas water dependency with a cost-effective no-waste nanomembrane technology for water reuse		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 5/1/2016	Duration: **30 months**	Unit: **EASME/A/02**
Total costs: €1.387.708	EU requested grant: **€971.395**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Produced water; Oil and gas industry; worldwide business opportunity; Water reuse; Ceramic membranes; Sustainable E&P; Onshore/offshore*

Abstract:

CleanOil consists on the introduction into the market of an innovative filtration solution to treat and reuse the produced water (PW), a highly polluted oily wastewater which is the largest volume byproduct associated to oil and gas production. The solution will allow achieving up to 80% reduction of water demand for oil extraction through the reuse of up to 99% of the PW, and will be based on a proprietary product - ceramic nanomembranes with an innovative production process - installed in a fully integrated solution with the equipment, instrumentation and advanced fouling monitoring and control tools and software. The project aims to achieve three objectives: (1) reducing the target membrane price up to 4 times, thanks to the upscaling of the nanomembrane production process, (2) launching worldwide highly competitive and cost-effective filtration solutions for the treatment and reuse of PW and (3) international consolidation through the new subsidiaries and strategic partners in high potential markets, aiming for a 3% share of the Likuid's target industrial filtration market, doubling the existing actual staff and achieving a tenfold increase in EBITDA profit by 2020. Likuid has identified two market segments targeted by its innovative solution: onshore, with 680 Mill.€ target market (USA, Canada, Colombia, Mexico) and offshore, with 490 Mill.€ target market (North Europe and LATAM). Potential customers for Likuid's solution are (a) the intermediary EPC, OEM and OFS companies and (b) oil producers, as end-users of the technology. In the project, onshore segment will be addressed with a Canadian demonstration for SAGD and tailing ponds and offshore segment is related to a demo study with Petrobras, who has already tested Likuid's membranes. Successfull demonstration will boost the market uptake of the new highly-efficient and cost-effective Likuid's solution, thus helping European cutting-edge technologies to position in the lead of sustainable O&G production.

Lt-AD		718212
Title: Low-temperature Anaerobic Digestion treatment of low-strength wastewaters		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 6/1/2016	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.418.815	EU requested grant: **€1.693.171**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Anaerobic, Digestion, low, temperature, wastewater, dairy, treatment, biogas*

Abstract:

No need for heat! NVP Energy presents the first to market, high-rate AD technology that successfully treats low strength wastewater (WW) at ambient temperatures (4 - 20°C). The low-temperature anaerobic digestion (Lt-AD) process provides a novel solution to Food and Drinks industrial sectors which produce large volumes of WW. The European milk treatment and processing sector alone generates over 367 billion litres annually which is typically treated using conventional aerobic processes. The latter treatment process is unsustainable. It results in high sludge yields, requires a large footprint on-site and is hugely reliant on fossil fuels for aeration. The Lt-AD technology produces negligible sludge volumes, presents a compact design, requires no heat input or biogas recirculation, and produces effluent of urban wastewater directive (UWWD) standard (< 125 mg/L COD) without post-aeration. Comparing Lt-AD to conventional aerobic treatment of WW from a typical dairy processing plant producing 2,000 m3 WW per day, Lt-AD can provide annual OPEX savings of €1,662,106 p.a over a payback period of 2.49 years that includes RHI revenue of €374,176. The low temperature operation of Lt-AD allows for 100% of the biogas produced being available for reuse or resale. Lt-AD also has a high impact on environmental savings through reduced greenhouse gas (GHG) emissions and lowered thermal energy and fossil fuels requirements. This Phase 2 project will allow NVP Energy install and commission a demonstrator plant and gain 8-12 months operational data. The results obtained, in conjunction with ETV assessment, will build the business case for each targeted market channel ahead of commercialisation. Other key project objectives include: commercialisation partner relationship development; promotional materials development; exploitation planned; assessment and protection of IP assets and project risk management.

CGM		805997
Title: A next generation nano media tailored to capture and recycle hazardous micropollutants in contaminated industrial wastewater.		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-02-2016-2017**	Type of Action: **SME-2**
Project start date: 4/1/2018	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €1.953.701	EU requested grant: **€1.367.591**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *micropollutants; contaminants; heavy metals; clean water*

Abstract:

Customem Ltd is a company founded with the long term vision to harness nature's capacity to make biomaterials to promote human health in alignment with sustainable development goals. A next generation nanomedia that can be tailored to capture and recycle specific micropollutants in contaminated industrial wastewater. Lack of access to clean water is predicted to affect 47% of the world's population by 2030. Contamination of water supplies by micropollutants such as metal ions, pesticides and pharmaceuticals is a major contributor to this water stress. These pollutants are released by industrial processes in the textile and manufacturing industries. Existing water treatment removes 99.96% of contaminants, but does not remove the 0.04% of micropollutants. Although the remaining contaminants seem small, they are a major problem as they are exceptionally difficult to capture but also highly toxic to humans and animals. CustoMem have developed a customisable selective nanocellulose media called CustoMem Granular Media (CGM) that is bioengineered to capture and remove all micropollutants including the 0.04% that cannot currently be removed. Customers benefit from a simple, low cost, low energy solution that is low maintenance. It allows removal of all micropollutants resulting in clean water supplies. The company is headquartered in the Imperial College Incubator UK and currently has 6 employees. The company is currently in talks with companies in the EU who have shown an active interest in the project. The Phase 2 project will allow CustoMem to finalise CGM development and accelerate its market introduction.

IV-BWTS		756288
Title: In-Voyage Ballast Water Treatment System		
Call Id: H2020-SMEINST-2-2016-2017	Topic: **SMEInst-08-2016-2017**	Type of Action: **SME-2**
Project start date: 2/1/2017	Duration: **36 months**	Unit: **EASME/A/02**
Total costs: €4.673.670	EU requested grant: **€2.410.495**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Ballast water treatment; invasive species*

Abstract:

Challenge: Ballast water is the dominant vehicle for transport of invasive species in the marine environment, threatening ecoenvironmental stability and diversity. More than 7,000 different species are transported in the 3-10 billion cubic meters of ballast water, which are let over board each year, posing threats of extensive ecological and economic damage to the local aquatic ecosystems. The financial losses caused by these transported invasive species amount to more than €50bn per year in both the EU and US.

Solution – the innovation: Bawat has developed a ballast water treatment system (BWTS) that eliminates invasive species in the ballast water tank using a new invention. The solution treats the ballast water in-voyage using excess heat from the vessel engines, thereby saving energy and costs. The treatment system runs automatically and independently of other on-board procedures and is 50% cheaper to operate for the ship owners than any competing system, and easier to fit in both existing and new vessels.

Impact: The project will have significant impact on both the operation of ships globally and the aquatic environments. The invasive species in the ballast water tank will be eliminated and never pose a threat to distant environments. Ship owners will save time and money when ships can leave the harbour right after loading/unloading, and money will be saved as excess heat from the engines is used to eliminate the biological activity in the ballast water tank.

Project: The objective is to secure a US Coast Guard type approval, as this approval is a de-facto “licence to operate” in the global market.

Customers and market: The customers are vessel owners and managing companies of vessels, with bulk carriers as well as oil and chemical tankers being the key end-users. Bawat estimates sales of 80 systems, equivalent to a € 30m turnover in 2019, growing to 400 units/€ 192m in 2020. The global market is estimated at € 35bn for the years 2017-2027.

ECWRTI		642494
Title: ECOLORO: Reuse of Waste Water from the Textile Industry		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 6/1/2015	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €4.822.850	EU requested grant: **€3.748.968**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Electro Coagulation, Innovative usage of existing technologies, Ultra filtration*

Abstract:

Constant extraction of increasingly scarce fresh water puts a vital demand on increasing water-use efficiency in all sectors. The ECWRTI project will demonstrate the EColoRO concept on full industrial scale in two locations in the European textile industry.

The EColoRO concept uses electro-coagulation (EC) combined with flotation to remove pollutants, colorants and chemicals from waste water very effectively. This unique feature enables using ultrafiltration and reverse osmosis membrane processes downstream in an optimized way. The key advantages are:

- Total reuse of waste-water in textile industry reducing fresh-water intake by at least 75%

- Low-cost and economically highly attractive

- Very flexible, containerized and modular, easy scalable, low footprint, suitable for retro-fit, brownfield or greenfield application

- Low energy use, no use of chemicals or flocculants, producing concentrated waste streams with very high re-use potential

- Enabler for optimizing use of water, allowing for advanced energy and resource efficiency in the textile manufacturing processes

EC and the EColoRO concept are currently proven at TRL 6. The ECWRTI project will run for 48 months and will deliver technological proof at TRL 8, ready for commercial uptake. It will further deliver the materials, analysis and tools needed for rapid commercial roll-out.

The consortium consists of a focused and well-balanced team. The project is SME driven with EColoRO as coordinator and 6 partners from 3 EU member states with key know-how on waste water purification (VITO, EColoRO), textile technology and production (Inotex, Utexbel, Tintoria Pavese), electro-coagulation and engineering (Morselt), process technology, open innovation and project support (ISPT) and EU wide market access in the textile sector (Euratex). An advisory board with stakeholders from textile, process industry and waste water sectors will provide guidance, critical feedback and dissemination support.

SALTGAE		689785
Title: Demonstration project to prove the techno-economic feasibility of using algae to treat saline wastewater from the food industry.		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **40 months**	Unit: **EASME/B/02**
Total costs: €9.844.741	EU requested grant: **€8.294.319**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *Wastewater; saline; algae; bacteria;*

Abstract:

The aim of the project is to implement and demonstrate at large scale the long-term technological and economic feasibility of an innovative, sustainable and efficient solution for the treatment of high salinity wastewater from the F&D industry. Conventional wastewater treatments have proven ineffective for this kind of wastewater, as the bacterial processes typically used for the elimination of organic matter and nutrients are inhibited under high salinity contents. Therefore, generally combinations of biological and physicochemical methods are used which greatly increase the costs of the treatment, making it unaffordable for SMEs, who voluntarily decide not to comply with EU directives and discharge without prior treatment, causing severe damage to the environment.

The solution of SALTGAE to this issue consists in the implementation of innovative technologies for each step of the wastewater treatment that will promote energy and resource efficiency, and reduce costs. Amongst these, the use of halotolerant algae/bacteria consortiums in HRAPs for the elimination of organic matter and nutrients stands out for its high added value: not only will it provide an effective and ecological solution for wastewater treatment, but also it will represent an innovative way of producing algal biomass, that will subsequently be valorized into different by-products, reducing the economic and environmental impact of the treatment.

Moreover, the project will also address cross-cutting barriers to innovation related to wastewater by developing a platform for the mobilization and networking of stakeholders from all the different sectors related to wastewater, and for the dissemination of results, enabling the development of a common roadmap for the alignment of legislation, regulation and pricing methodologies and promoting financial investment and paradigm shift in perception from ‘wastewater treatment’ to ‘resource valorisation’.

INTEGROIL		688989
Title: Demonstration of a Decision Support System for a Novel Integrated Solution aimed at Water Reuse in the Oil & Gas Industry		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-1b-2015**	Type of Action: **IA**
Project start date: 6/1/2016	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €5.794.443	EU requested grant: **€4.273.536**	
Main thematic area: 62 - Water and industry / waste water treatment		

Free keywords: *oil&gas industry, wastewater, produced water, decision support system, real-time control, ceramic ultrafiltration, reverse osmosis,advanced oxidation process, disolved air flotation, chemical packages*

Abstract:

The Oil&Gas (O&G) industry is one of the 8 most water-intensive industries; indeed, it could be conceived as a water industry which delivers oil as a by-product. Specifically, by 2020 it is expected that over 500 million barrels/day of produced water (PW) and about 15 million m^3/day of refinery wastewater (RW) are generated. Despite the necessity and potential beneficial impacts of reusing the water involved in extraction and refining activities, several significant barriers are hampering this opportunity. Firstly, the existent commercial water treatment technologies cannot be used directly in the O&G sector without an extensive adaptation, and they are not flexible and reliable enough to bear the complexity and variability of PW/RW composition. Moreover, there is no expertise or experience in the O&G sector in the design and operation of water treatment systems.

The INTEGROIL project aims to develop and demonstrate a robust but flexible integrated solution for treating O&G water flows with variable compositions to different water qualities depending on the final reuse objective. This new solution will be readily designed with different modules each comprising innovative water treatment technologies that will be operated and optimized in an integrated manner through a novel Decision Support System, in line with 3 priorities of the EIP Water. The INTEGROIL approach ensures minimal design and operational efforts involved from the O&G end-user side and that the energy and chemical costs are kept to an absolute minimum for a certain target water quality. Its feasibility and long-term application will be assessed through demo activities in 2 real operational conditions, that will provide critical information for the commercialisation actions to be undertaken.

The INTEGROIL consortium brings together 10 entities (6 SMEs) covering the full value chain, including technology developers, O&G end-users, a Sustainability Assessment firm and a professional association.

ULTIMATE		869318
Title: ULTIMATE: indUstry water-utiLiTy symbIosis for a sMarter wATer society		
Call Id: H2020-SC5-2019-2	Topic: **CE-SC5-04-2019**	Type of Action: **IA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €16.763.959	EU requested grant: **€13.527.633**	
Main thematic area: 63 - Water and industry / water reuse, efficiency		

Free keywords: *water-smart industrial symbiosis, circular economy*

Abstract:

ULTIMATE will act as a catalyst for "Water Smart Industrial Symbiosis" (WSIS) in which water/wastewater plays a key role both as a reusable resource but also as a vector for energy and materials to be extracted, treated, stored and reused within a dynamic socio-economic and business oriented industrial ecosystem. We adopt an evidence-based approach anchored on 9 large-scale demonstrations across Europe and SE Mediterranean relevant to the agro-food processing, beverages, heavy chemical/petrochemical and biotech industries. We recover, refine and reuse wastewater (industrial and municipal) but also extract and exploit energy (combined water-energy management, treatment processes as energy producers, water-enabled heat transfer, storage and recovery) and materials (nutrient mining and reuse, extraction and reuse of high-added-value exploitable compounds) contained in industrial wastewater. We support the cases and ensure their replicability through smart tools to optimize and control, assess costs and benefits, minimize risks and help stakeholders identify, assess and explore alternative symbiotic pathways linked to emerging business opportunities, supported by tailored contracts and investment schemes. ULTIMATE nurtures partnerships between business (incl. industrial and technological ecosystems), water service providers, regulators and policy makers and actively supports them through immersive Mixed Reality storytelling using technology and art to co-produce shared visions for a more circular, profitable, socially responsible and environmentally friendly industry, with water at its centre. The project mobilises a strong partnership of industrial complexes and symbiosis clusters, leading water companies and water service providers, specialised SMEs, research institutes and water-industry collaboration networks, and builds on an impressive portfolio of past and ongoing research and innovation, leveraging multiple European and global networks to ensure real impact.

ELOXIRAS		698494
Title: Electrochemical Oxidation in the Recirculating Aquaculture Systems Industry		
Call Id: H2020-SMEINST-2-2015	Topic: **SFS-08-2015**	Type of Action: **SME-2**
Project start date: 12/1/2015	Duration: **36 months**	Unit: **EASME/A/02**
Total costs: €2.030.633	EU requested grant: **€1.421.443**	
Main thematic area: 63 - Water and industry / water reuse, efficiency		

Free keywords:

Recirculating aquaculture systems, fish

production, aquaculture

Abstract:

Recirculating aquaculture systems (RAS) operate by filtering and removing water pollutants from the fish tanks so it can be reused. Since its introduction, RAS production has increased in volume and species with a CAGR of 14%/year, and has a worldwide market estimated in €6.4 billion. Marine RAS is expensive to purchase and operate, and requires high biomass culture density (kg/m3) that implies fast accumulation of toxic metabolized compounds in low water volume, implying significant volumes of fresh water. Thus, RAS end-users need cost-efficient technologies that can work in these conditions. Market available solutions are mainly bio-filtration and ozone treatments, and cannot work under these challenging conditions, showing efficacy fluctuations and start-up periods that increase the production stages and their costs.

That scenario has encouraged APRIA SYSTEMS, a SME with more than 9 years of experience in water treatment process, to develop ELOXIRAS. Its first prototype is based on new advanced electrochemical oxidation technology, allowing to increase production (30%), reduce fresh water consumption (20%), and increase the efficacy on removing pollutants (>90%). It can be adjusted to different RAS facilities (modular & versatile), and is easy to operate without efficacy fluctuations and start-up periods, then can be also used on logistics operations to guarantee best fish transport conditions and efficiencies. ELOXIRAS will be upgraded by APRIA supported by key technology partners as MAGNETO SPECIAL ANODES (reactor specialist) and 2 RAS end-users: RODECAN and IRTA (industrial validation tests). This approach will allow APRIA to commit on achieving a RAS EU market share of 7% for 3 marine species (seabream, seabass, turbot) primary over key RAS EU countries (Spain, France, UK, Italy, Denmark, The Netherlands). That conservative market share will permit a total ELOXIRAS sales of 1385 modules in the first 5 years of commercialisation.

INSPIREWater		723702
Title: Innovative Solutions in the Process Industry for next generation Resource Efficient Water management		
Call Id: H2020-SPIRE-2016	Topic: **SPIRE-01-2016**	Type of Action: **IA**
Project start date: 10/1/2016	Duration: **42 months**	Unit: **RTD/F/03**
Total costs: €7.614.001	EU requested grant: **€5.377.880**	
Main thematic area: 63 - Water and industry / water reuse, efficiency		

Free keywords: *water treatment, resource efficiency, holistic approach, membrane technology, catalyst, magnetic separator, innovation management,*

Abstract:

INSPIREWATER demonstrates a holistic approach for water management in the process industry using innovative technology solutions from European companies to increase water and resource efficiency in the process industry. This will put Europe as a leader on the world market for segments in industrial water treatment which will create new high skilled jobs in Europe.

With extended collaboration between technology providers including innovative SME's, world-wide active companies in the chemical and steel industries and research organizations, this project also contributes to the aims of the SPIRE SRA, the European Innovation Partnership (EIP) on 'Water' and to the aims of the Commission's Roadmap on Resource efficiency, supporting effective implementation of European directives and policies in the water management area.

INSPIREWATER addresses non-technical barriers as well as technical, as innovation needs both components and demonstrates them in the steel and chemical industry. A flexible system for water management in industries that can be integrated to existing systems is worked out and demonstrated to facilitate implementation of technical innovations. Technical innovations in the area of selected membrane technologies, strong field magnetic particle separator, and a catalyst to prevent biofouling are demonstrated, including valorisation of waste heat. This will increase process water efficiency as well as resource, water and energy savings in the process industry.

The development and demonstration work is combined with a strong emphasis on exploitation and dissemination. Specific exploitation strategies are developed for the different solutions in INSPIREWATER. Dissemination targets different target groups: Stakeholders in different process industry also beyond the involved ones, e.g. Pulp and paper, but also policy makers based on the findings of the project.

SPOTVIEW		723577
Title: Sustainable Processes and Optimized Technologies for Industrially Efficient Water Usage		
Call Id: H2020-SPIRE-2016	Topic: **SPIRE-01-2016**	Type of Action: **IA**
Project start date: 10/3/2016	Duration: **42 months**	Unit: **RTD/F/03**
Total costs: €8.498.103	EU requested grant: **€6.863.360**	
Main thematic area: 63 - Water and industry / water reuse, efficiency		

Free keywords: *separation technologies, deionization, ultrafiltration, water reuse, heat pump; valuable substances recovery, microbial control, modelling, water footprint, Life Cycle Assessment, competitiveness*

Abstract:

The objective of the SPOTVIEW project is to develop and demonstrate innovative, sustainable and efficient processes and technology components, in order to optimize the use of natural resources, especially water, in three industrial sectors (Dairy, Pulp and Paper and Steel) contributing to 44% of industrial water usage in EU. This resource optimization (including water, energy, raw materials and additives) is a key issue to maintain production competitiveness and sustainability. A total of 14 existing and new technologies will be assessed during the project, including solid/liquid separation, ultrafiltration, deionization, biological treatment, disinfection and chemical heat pump. The technology components will be assessed in simulated or operational environment for 9 new water management practices in the three industrial sectors. Up to 7 selected technologies demonstrators are planned in real industrial environment. The implemented process and technology will be evaluated in terms of environmental impacts and benefits, generated by achieving the SPOTVIEW targets (20% to 90% reduction of water usage, wastewater emissions, chemicals and energy use). The SPOTVIEW consortium covers the whole value chain, from technology development, assessment, supply and industrial applications in each targeted sector. Economic exploitation of the proposed technologies is pursued through a well described business case scenario and market penetration strategy. The market opportunities for future services and technology products beyond the SPOTVIEW project will generate up to 2800 new equipment and 7000 new jobs in Europe. The expected gains for the industrial sectors generated by the recovery of by-products and by energy, chemicals and additives savings represent annually 1.53b€ for Europe. The generated production capacity increase by companies has been estimated at 22.8b€. Dissemination and training activities are planned to maximize the impact of the project.

VicInAqua		689427
Title: Integrated aquaculture based on sustainable water recirculating system for the Victoria Lake Basin		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-5c-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €2.997.710	EU requested grant: **€2.997.710**	
Main thematic area: 63 - Water and industry / water reuse, efficiency		

Free keywords: *Sanitation, innovative water treatment, membrane bioreactor, Lake Victoria, fish ponds, closed recirculation aquaculture systems, water reuse, agriculture, renewable energy, capacity building.*

Abstract:

VicInAqua will follow an integrated approach in order to develop a sustainable combined sanitation and recirculating aquaculture system (RAS) for wastewater treatment and reuse in agriculture in the Victoria Lake Basin area. In this decentralized integrated treatment system wastewater from households and fish processing industry as well as RAS production water will radically reduce stress on the sensitive ecosystems of the Lake Victoria and will contribute to food and health security. It will be operated fully autonomous powered by renewable energies (PV, biogas). The RAS will particularly produce high quality fingerlings of the local fish species to supply the pond aquaculture of the area with stocking material. The innovative core idea of the project is to develop and test new technologies which enable the integration of sanitation with the aquaculture in a sustainable manner. The core of the project concept is to develop and test a novel self-cleaning water filters which consist of a highly efficient particle filter as well as a membrane bioreactor (MBR) as principal treatment unit within a combined treatment system where the nutrient rich effluent water will be used for agricultural irrigation. the surplus sludge from both filter systems will be co-digested with agricultural waste and local water hyacinth to produce biogas. The overall concept will promote sound approaches to water management for agriculture, taking into consideration broader socio-economic factors and also fomenting job creation and greater gender balance in decision-making. The pursued approach will be perfectly in line with the strategic guidelines of the Rio+20 and the post-2015 development framework.

INGREEN		838120
Title: Production of functional innovative ingredients from paper and agro-food side-streams through sustainable and efficient tailor-made biotechnological processes for food, feed, pharma and cosmetics		
Call Id: H2020-BBI-JTI-2018	Topic: **BBI.2018.SO3.D5**	Type of Action: **BBI-IA-DEMO**
Project start date: 6/1/2019	Duration: **42 months**	Unit:
Total costs: €8.775.679	EU requested grant: **€6.323.920**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *biobased ingredients food by-product food feed nutraceutical cosmetic prebiotics cheese bakery*

Abstract:

Agro-food and Paper mill side streams and by-products are sources of unexploited organic fractions exploitable into safe microbial biomasses, functional ingredients and intermediates, e.g. prebiotics, pre-fermented ingredients, bioplastics and chemicals. The INGREEN bio-based ingredients/materials will be used to produce innovative functional products for food, feed, packaging, pharmaceutical, nutraceutical and cosmetic sectors. The INGREEN outcomes will be obtained by validated tailor made biotechnologies based on safe microorganisms or eco-friendly approaches. Logistics and storage conditions will be optimized to favor the flow from feedstock to the bio-based prototype producers. INGREEN aims to demonstrate in industrial environments the efficiency and sustainability of the target biotechnologies to produce i) lactobionic acid (LBA), galactooligosaccharides (GOS), microbial safe biomasses from whey; ii) polyhydrohyalkanoates (PHA) enriched biomasses and purified PHA, as prebiotics and bioplastics respectively, from paper mill wastewater; iii) functional pre-fermented ingredients from rye/wheat milling fractions. Safe and characterized INGREEN ingredients will be used for innovative functional cheeses, bakery products and nutritious feeds. Functional GOS, LBA and pre-fermented bran will be used to produce prebiotic immune-stimulating gel, nutraceutical supplement and cleanser for human health. INGREEN biodegradable material will be valorised into bag in box to boost INGREEN fluid prototype sustainability. Prototype safety, shelf-life, quality and functional performances will be compared to benchmarks. Also LCA/LCC, sound business cases and plans and compliance with REACH and any relevant EU safety legislation will be applied over the whole project to assess prototype benefits compared to benchmarks. INGREEN product specifications will contribute to define/standardize the regulatory requirements for outcome innovation deals, market uptake and societal acceptance.

AFTERLIFE		745737
Title: Advanced Filtration TEchnologies for the Recovery and Later conversIon of relevant Fractions from wastEwater		
Call Id: H2020-BBI-JTI-2016	Topic: **BBI-2016-R01**	Type of Action: **BBI-RIA**
Project start date: 9/1/2017	Duration: **48 months**	Unit:
Total costs: €4.180.166	EU requested grant: **€3.890.593**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Membrane filtration, polyhydroxyalkanoates, food industry*

Abstract:

AFTERLIFE proposes a flexible, cost- and resource-efficient process framed in the zero-waste and circular economy approach for the recovery and valorisation of the relevant fractions from wastewater. The first step of such process is an initial step consisting of a cascade of membrane filtration units for the separation of the totally of solids in wastewater. Then, the concentrates recovered in each unit will be treated to obtain high-pure extracts and metabolites or, alternatively, to be converted into value-added biopolymers (polyhydroxyalkanoates). Moreover, the outflow of the process is an ultra-pure water stream that can be directly reused.

The outcomes of the project will be focused on:

- Demonstration of an integrated pilot using real wastewater from three water intensive food processing industries (fruit processing, cheese and sweets manufacturing)

- Demonstration of the applicability of the recovered compounds and the value added bioproducts in manufacturing environments

The design and optimisation of the AFTERLIFE process following a holistic approach will contribute to improve performance and reduce the costs associated to wastewater treatment by maximising the value recovery.

FERTIMANURE		862849
Title: Innovative nutrient recovery from secondary sources – Production of high-added value FERTIlisers from animal MANURE		
Call Id: H2020-RUR-2019-1	Topic: **CE-RUR-08-2018-2019-2020**	Type of Action: **IA**
Project start date: 1/1/2020	Duration: **48 months**	Unit: **REA/B/02**
Total costs: €8.419.671	EU requested grant: **€7.784.512**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Nutrient recovery, manure management, on-farm pilot, novel technologies, bio-based fertilisers, tailor-made fertilisers.*

Abstract:

Total farm livestock population in Europe excrete around 1400 Mt of manure annually. More than 90% of manure produced is returned to agricultural fields. However, this is not being done in the most efficient and least leaky way. FERTIMANURE will develop, integrate, test and validate innovative Nutrient Management Strategies to efficiently recover mineral nutrients and other products with agronomic value from manure, to finally obtain reliable and safe fertilisers that can compete in the EU fertilizers market. FERTIMANURE focuses on “How to improve the agronomic use of recycled nutrients from livestock manure” to reconnect nutrient flows between plant and livestock production.

Nutrient recycling relies not only in the technologies for producing bio-based fertilisers, but also in a better understanding and managing nutrients at the farm. The ambition of FERTIMANURE is to cover both technological approach for nutrient recovery and nutrient management. To this end, the technological approach will be covered by the implementation of 5 innovative & integrated nutrient recovery on-farm experimental pilots in the most relevant European countries in terms of livestock production (Spain, France, Germany, Belgium, The Netherlands), whereas the nutrient management will be addressed through 3 different strategies adapted to mixed and specialised farming systems: (Strategy #1) On-farm production and use of Bio-Based Fertilisers (BBF), (Strategy #2) On-farm BBF production and Centralised Tailor-Made Fertilisers (TMF) production and (Strategy #3) On-farm TMF production and use.

A total of 31 marketable end-products (11 BBF & 20 TMF) will be obtained. The agronomic & environmental performance and their potential to replace conventional fertilisers will be assessed.

Ultimately, FERTIMANURE seeks to provide an innovative circular economy model to favour rural development in agricultural sector by creating real synergies and links within farmers and other industrial activities.

SYSTEMIC		730400
Title: Systemic large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe		
Call Id: H2020-CIRC-2016TwoStage	Topic: **CIRC-01-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €9.723.586	EU requested grant: **€7.859.829**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Waste valorisation, nutrient recovery, demonstration plant, biobased industries, biochemicals, biogas, secondary raw materials*

Abstract:

SYSTEMIC will reach a break-through to re-enter recovered nutrients from organic waste into the production cycle. Consequently, this will offer solutions for pressing environmental issues and to reduce the import of P as finite irreplaceable resource in mines.

The SYSTEMIC project aims to shift the European Biomass treatment practice to the next level. Departing from existing business cases and a new ground-breaking large scale demonstration plant, the future of anaerobic digestion (AD) value chains will be investigated and demonstrated. The result will help existing and future AD-operators to maximise their performance: produce and sell more quality products, generate more energy and be independent on subsidies. By the market driven leadership, the SYSTEMIC-project will finally turn biomass waste into valuable products while reducing water pollution, greenhouse gas emission and creating quality jobs in rural areas.

The planned demonstration plant will allow innovative combinations of modules to elaborate possible optimizations for increasing the production quantity and quality of new mineral products, and the integration of these products into a circular economy. Reflecting the experiences from the demonstration plant with a set of 4 mirror cases in different members states allow systemic innovation including end-user driven (a) specific technical development and (b) the cost efficient investigation of real world circular economy business cases and (c) operational, regulatory, institutional and contextual barriers to overcome.

Using partial funding from the EC, the SYSTEMIC industry-driven consortium will validate for the first time the technical and economic viability of a fully integrated, multistep approach in an operational environment. The successful practical demonstration will put the European sector in a leading position to offer efficient mineral recovery technologies.

ZERO BRINE		730390
Title: Re-designing the value and supply chain of water and minerals: a circular economy approach for the recovery of resources from saline impaired effluent (brine) generated by process industries		
Call Id: H2020-CIRC-2016TwoStage	Topic: **CIRC-01-2016-2017**	Type of Action: **IA**
Project start date: 6/1/2017	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €11.081.973	EU requested grant: **€9.992.209**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Brine effluent, Water recovery, Minerals recovery, Salt, Magnesium recovery, Waste Heat, Industrial Symbiosis, Circular Economy, Closing-the-loop*

Abstract:

This project aims to facilitate the implementation of the Circular Economy package and the SPIRE Roadmap in various process industries by developing the necessary concepts, technological solutions and business models to re-design the value and supply chains of minerals (including magnesium) and water, while dealing with present organic compounds in a way that allows their subsequent recovery.

This is achieved by demonstrating new configurations to recover these resources from saline impaired effluents (brines) generated by process industry, while eliminating wastewater discharge and minimising environmental impact of industrial operations through brines (ZERO BRINE). The project will bring together and integrate several existing and innovative technologies aiming to recover end-products of high quality and sufficient purity with good market value. It will be carried out by large Process Industries, SMEs with disruptive technologies and a Brine Consortium of technology suppliers across EU, while world-class research centres ensure strong scientific capacity and inter-disciplinary coordination to account for social, economic and environmental considerations, including LCA.

A large scale demonstration will be developed in the Energy Port and Petrochemical cluster of Rotterdam Port, involving local large industries. Two demo plants will be able to treat part of the brine effluents generated by one process industry (EVIDES), while the waste heat will be sourced by neighbouring factories. The quality of the recovered end-products will be aimed to meet local market specifications. The involvement of representatives covering the whole supply chain will provide an excellent opportunity to showcase Circular Economy in Rotterdam Port, at large scale. Finally, three large-scale pilot plants will be developed in other process industries, providing the potential for immediate replication and uptake of the project results after its successful completion.

Water2REturn		730398
Title: REcovery and REcycling of nutrients TURNing wasteWATER into added-value products for a circular economy in agriculture		
Call Id: H2020-CIRC-2016TwoStage	Topic: **CIRC-02-2016-2017**	Type of Action: **IA**
Project start date: 7/1/2017	Duration: **42 months**	Unit: **EASME/B/02**
Total costs: €7.129.323	EU requested grant: **€5.871.896**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *water reuse, high added value products, bioestimulants, algae production, circular economy*

Abstract:

Water2REturn proposes a full-scale demonstration process for integrated nutrients recovery from wastewater from the slaughterhouse industry using biochemical and physical technologies and a positive balance in energy footprint. The project will not only produce a nitrates and phosphate concentrate available for use as organic fertiliser in agriculture, but its novelty rests on the use of an innovative fermentative process designed for sludge valorisation which results in a hydrolysed sludge (with a multiplied Biomethane Potential) and biostimultants products, with low development costs and high added value in plant nutrition and agriculture.

This process is complemented by proven technologies such as biological aeration systems, membrane technologies, anaerobic processes for bio-methane production and algal technologies, all combined in a zero-waste-emission and an integrated monitoring control tool that will improve the quality of data on nutrient flows. The project will close the loop by demonstrating the benefits associated with nutrients recycling through the implementation of different business models for each final product. This will be done with a systemic and replicable approach that considers economic, governance and social acceptance aspects through the whole chain of water and targets essentially two market demands: 1) Demand for more efficient and sustainable production methods in the meat industry; and 2) Demand for new recycled products as a nutrient source for agriculture.

As a summary, Water2REturn project adopts a Circular Economy approach where nutrients present in wastewaters from the meat industry can be recycled and injected back into the agricultural system as new raw materials. The project foster synergies between the food and sustainable agriculture industries and propose innovative business models for the resulting products that will open new market opportunities for the European industries and SMEs in two key economic sectors.

EPSETECH		858378
Title: From Hazardous Waste to Reusable Raw Materials		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 4/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.721.973	EU requested grant: **€1.905.380**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Industrial wastewater treatment, hazardous waste*

Abstract:

Hazardous wastewaters generated by chemical production, manufacturing, mining and other industrial activities can cause substantial harm to human health and to the environment.

There are several treatment technologies in use to limit these negative effects. However, these technologies do not solve the issue for good. The sludge that is left over after the treatment is still hazardous and has to be stored in costly controlled landfill deposits for indefinite period of time.

Improper hazardous waste storage or disposal frequently contaminates surface and groundwater supplies. Continuing accumulation of hazardous waste is increasing the risk of leakages that threat the wildlife as well as the safety of our drinking water.

Finnish SME Global EcoProcess Services Oy has developed, patented and tested a simple new technology that enables to remove metals from the wastewater completely, so that just purified water and solid metals are left after the process. Both are reusable in manufacturing as valuable raw materials.

The SMEI project focuses on speeding up our sales and piloting processes. We will develop and build portable pilot equipment for efficient on-site technology demonstrations and test the new equipment and process together with actual customers.

REFLOW		814258
Title: Phosphorus REcovery for FertiLisers frOm dairy processing Waste		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-ETN**
Project start date: 1/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €3.469.775	EU requested grant: **€3.469.775**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Dairy processing waste; phosphorous recovery and reuse; biocircular economy; new fertilisers; soil quality and crop yield; LCA; end of waste regulations*

Abstract:

REFLOW is an interdisciplinary cross-sectoral European Training Network combining world-leading scientists and key stake-holders in dairy processing, fertilizer production and phosphorous recycling with early stage researchers to address important technical and socio-economic challenges associated with the recovery of phosphorous from dairy processing waste water and its recycling into fertilizer products enabling sustainable expansion of the dairy industry in Europe. REFLOW research will (i) mitigate the environmental impact of dairy processing waste on soil and water, (ii) provide safe environmentally sustainable, cost effective closed loop solutions for crop nutrient management (iii) meet the demand for skilled professionals to support the technical, regulatory and commercial development of the market for recycled phosphorous fertilizer products in accordance with the deliverables of the Circular Economy Package. REFLOW will achieve these goals by creating an innovative and entrepreneurial training environment for the next generation of scientists. 13 ESRs will be recruited in a network of 10 beneficiaries and 14 partner organisations who bring complementary expertise and experience of delivering technical solutions, socio-economic modeling, environmental analysis, policy frameworks, high level training and commercial entrepreneurship. Graduating fellows will be equipped with a unique range of relevant interdisciplinary and cross-sectoral skills for careers as independent industrial or academic researchers, entrepreneurs, regulators or agri-environmental specialists. REFLOW will train the Fellows through an integrated and cohesive curriculum of network-wide partner training activities including industrial secondments and embedded commercially driven research projects. The outputs from REFLOW will influence land management practice, the rural bio-economy framework and EU policy goals while significantly progressing the state-of-the-art in Phosphorous recycling.

FertiCycle		860127
Title: New bio-based fertilisers from organic waste upcycling		
Call Id: H2020-MSCA-ITN-2019	Topic: **MSCA-ITN-2019**	Type of Action: **MSCA-ITN-ETN**
Project start date: 1/1/2020	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €4.114.379	EU requested grant: **€4.114.379**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *fertiliser, organic waste, recycling, circular economy*

Abstract:

The world food supply needs to increase by 70 % to feed the 9 billion global population by 2050, increasing pressure on agriculture and necessitating further intensification. Currently, EU is heavily import dependent for more than 90% of nonrenewable phosphorus and synthetic nitrogen fertilisers, at large economic cost (€15 billion/y) and with negative environmental impacts from fertiliser production and use. Furthermore, phosphate has been identified as a critical raw material for the EU. We therefore need a new European effort to address 'The Nutrient Nexus', where reduced nutrient losses and improved nutrient use efficiency across all sectors simultaneously provide the foundation for a greener and more circular economy to produce more food and energy while reducing environmental pollution. European farmers and fertiliser industry thus urgently need techniques for increasing substitution of synthetic with waste-derived nutrients formulated into high-quality, bio-based fertilisers. However, this requires research into new processing, application and assessment and more innovative and entrepreneurial scientists capable of meeting these future needs - FertiCycle aims to to fill this gap. The objective of FertiCycle is to train 15 early stage researchers (ESR) to develop new processes for production of bio-based fertilisers, recycling wasted resources and to estimate the market potential and sustainability challenges of their production and use. The training program aims to enable the ESR to generate, integrate and apply inter-disciplinary knowledge for developing new technical solutions for bio-based fertiliser production, management and marketing, and will give them competences for inter-sectoral work and international collaboration in industry and academia. FertiCycle outcomes will be 15 trained scientists; required technologies, knowhow and market concepts from which innovative new bio-based fertiliser products can develop to proof-of-concept level with industry.

SEArcularMINE		869467
Title: Circular Processing of Seawater Brines from Saltworks for Recovery of Valuable Raw Materials		
Call Id: H2020-SC5-2019-2	Topic: **SC5-09-2018-2019**	Type of Action: **RIA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €5.834.016	EU requested grant: **€5.834.016**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Circular economy; Magnesium; Lithium; alkaline and rare earths; transition metals; reactive crystallisation; electro selective membrane processes; pH Swing Adsorption;*

Abstract:

In this proposal, we build on the ancient and still widely used process of saltworks, where seawater goes through natural evaporation and fractionated crystallization in shallow basins. This process produces sea salt and a brine (bittern) free of calcium as a by-product, which is 20 to 40 times more concentrated than seawater in some crucial elements. The SEArcularMINE project uses this bittern, targeting Magnesium, Lithium and other Trace-Elements belonging to the alkaline/alkaline earths metals (e.g. Rb, Cs, Sr) or transition/post-transition metals (e.g. Co, Ga, Ge) group. Three innovative technologies will be developed and integrated within a circular approach, based on three different processes: 1) reactive crystallisation; 2) selective membrane separation; 3) selective sorption/desorption. The concept is enhanced by: i) energy-efficient concentration steps, ii) on-site generation of reactants from the available brines and iii) production of the required energy from reverse electrodialysis fed with the process outlet brine on-site and solar or wind energy. A multi-disciplinary approach will be adopted for bringing the low TRL of the three main technologies and of the overall integrated concept up to TRL4-5. There will be fundamental advances in the knowledge of the processes, leading to break-through developments of the 3 most important technologies for the recovery of minerals from brines, but also from seawater or any other kind of metals-rich solution.

Within our circular strategy, we will look also at the option of including desalination upstream from the saltworks, providing freshwater to the local communities and a concentrated stream to feed the saltworks, increasing salt productivity and bittern availability.

The adopted approach will have positive effects on the environmental and financial performance, laying the foundations for a future industrial application.

ReWaCEM		723729
Title: Ressource recovery from industrial waste water by cutting edge membrane technologies		
Call Id: H2020-SPIRE-2016	Topic: **SPIRE-01-2016**	Type of Action: **IA**
Project start date: 10/1/2016	Duration: **38 months**	Unit: **RTD/F/03**
Total costs: €5.781.631	EU requested grant: **€5.041.867**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *Recovery of process water, Recovery of valuable salts, metals and minerals, Closed loop processes, energy efficiency, Metal industry, Metal plating industry*

Abstract:

The ReWaCEM project aims at reducing water use, wastewater production, energy use, valuable metal resource recovery and water footprint by between 30-90% in the metal plating, galvanizing and printed circuit board industry. In order to achieve these goals, ReWaCem will adopt two cutting edge membrane technologies suitable for the requirements of closed material cycles approaches and recovery concepts in metal processing industry: Diffusion Dialysis (DD) and Membrane Distillation (MD) as an integrated hybrid process. This combination of existing technologies will be adapted to fit the requirements of 4 pilot demonstration sites in representative industrial applications of the metallurgical industry in order to evaluate the accomplishment of the ReWaCEM goals. Through the evaluation of the demonstration a highly attractive technological solution for low energy wastewater treatment will be available to be entered into the large and growing market of metal processing. This market will profit significantly from the technological outcome of the innovation action, with cost savings and environmental benefits as relevant rewards. In order to maximise impact, the project consortium was selected carefully to represent all relevant stakeholders in the quadrant of end users, scientific partners, associations and decision makers and SMEs. The consortium will establish a dissemination & exploitation board that will create a substantial network of interest groups from agencies, industry, research SMEs and research centres as well as universities. The successful exploitation of the results will lead to a post project up-scaling of the technology and a step by step market introduction. Part of ReWaCEM will be to mobilise all relevant stakeholders into promoting innovative membrane solutions for industrial water and resources management, leading to the effective implementation of European directives and policies while creating market opportunities for European industry and SMEs.

PRODIAS		637077
Title: PROcessing Diluted Aqueous Systems		
Call Id: H2020-SPIRE-2014	Topic: **SPIRE-03-2014**	Type of Action: **IA**
Project start date: 1/1/2015	Duration: **48 months**	Unit: **RTD/F/03**
Total costs: €13.627.823	EU requested grant: **€9.993.008**	
Main thematic area: 64 - Water and industry / resource recovery		

Free keywords: *water removal, product recovery, renewable-based products, processing of complex dilute aqueous solutions, selective separation, low-energy concentration*

Abstract:

The use of renewable resources in the process industries is socially desirable and a market pull for products has started to develop in recent years, but renewable products have to compete with identical or similar-in-application products based on fossil raw materials in terms of quality and production cost. One of the main reasons for currently higher production costs of products based on renewable resources is that the production routes involve processing complex dilute aqueous solutions from which the desired products have to be separated during downstream processing. Consequently, a major challenge the process industry is facing, is the development of cost- and energy-efficient water removal and product-recovery techniques. Today downstream processes for products based on renewable resources are often developed using methods from the petrochemical area being insufficiently adapted to the new applications. A re-thinking of downstream process development and the development of suitable methodologies for a fast-track development of tailored downstream processes as well as the optimisation of separation technologies are urgently needed in order to unlock the potential of the renewable-based product market for the European process industry. PRODIAS addresses this challenge by developing and implementing:

- a toolbox of highly innovative, cost-effective and renewable-tailored separation technologies; single technologies and/or hybrid systems

- novel, optimized apparatus and machinery to enable for and host the developed technologies

- in combination with an integrated design approach for the fast-track selection of appropriate technologies.

The main advantages of the PRODIAS toolbox and integrated design approach for processes based on renewable resources are:

- significantly decreased production cost

- increased productivity and efficiency

- faster process development and commercialization

- significantly lower energy consumption leading to less CO2 emmission

HYPOS		870504
Title: HYdro-POwer-Suite		
Call Id: H2020-SPACE-2019	Topic: **DT-SPACE-01-EO-2018-2020**	Type of Action: **IA**
Project start date: 12/1/2019	Duration: **30 months**	Unit: **REA/B/01**
Total costs: €2.397.120	EU requested grant: **€1.994.370**	
Main thematic area: 71 - Water and energy / hydropower		

Free keywords:

Abstract:

Hydropower as the world's largest source of renewable energy still has a high unused potential to be explored in times of a changing global energy policy. The economic and ecological evaluation of new hydropower developments rely on a number of environmental conditions, such as key hydrological parameters. For example, the major drivers of the reservoir storage capacity over time, reservoir life time, and also a major driver of the operations costs are directly related to the sediment regime and sediment trapping.

HYPOS is catalyzing innovation with an operational service for appropriate environmental and economic investment planning and monitoring based on Earth Observation (EO) technologies and modelling for the Hydropower industry.

The to developed online accessible Decision Support Tool will provide essential assets for hydro power managers, planners and decision makers in their work. The subscription portal brings together high-quality satellite based measurements for historic time periods, actual current monitoring, up-to-date modelled hydrological parameters, with nowcasting on various orderable levels of detail and available in-situ data for integrated baseline and environmental impact assessments.

The service significantly contributes on a trans-national as well as a global scale, with the requirement of independent, standardized and consistent information over a wide range of different water bodies and spatial scales. Substantial Blue Footprint analysis are enabled based on sophisticated and state-of-the-art algorithms and methodology featuring sustainable long-term monitoring solutions.

HyKinetics		879255
Title: An innovative axial turbine for conversion of hydro-kinetics energy to electricity in rivers and canals		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 1/1/2020	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €2.192.125	EU requested grant: **€1.534.488**	
Main thematic area: 71 - Water and energy / hydropower		

Free keywords: *Micro hydropower plant; axial hydropower turbine; in river kinetic energy exploitation, hydroelectric generator*

Abstract:

HyKinetics is an innovative and patented 3-blades axial 20 kW micro hydroelectric generator, able to competitively exploit the hydro-kinetics energy of the flowing water, specifically designed for exploitation of renewable energy on rivers and canals, not using dams or waterfalls.

HyKinetics is the first product on the market for micro hydropower sector (< 100 kW) able to achieve a Cost of Electricity of comparable with large hydro plants, solar photovoltaic, biomass and geothermal power technologies and presenting a very limited visual and environmental impact, very important for river applications, subjected to stringent environmental constraints.

To enter the market with a standardized and easily accessible market, COSBI targets to address as entry point the installation to canals downstream of dam-based hydroelectric power stations, increasing production of existing large hydro power plants of >5%, i.e 17 TWh/year if applied in all hydropower plants in EU28 (the annual electricity consumption of Slovenia).

The potential and acceptance of this market segment has been demonstrated by means of a Customer Validation methodology (discussion and agreements with big players owners of large hydropower plants). The Total Available Market of this segment in Europe amounts to 12.2 GW, able to generate a turnover of 26.8 B€. Then, after entering the market, COSBI will face the huge rural electrification sector, with a market potential of up to 40 B€.

The objectives of the project are: 1) Manufacturing of ten 20 kW HyKinetics prototypes (Minimum Viable Product); 2) Installation and validation of the prototypes in real testing sites already selected; 3) Achieve the certifications needed for commercialization and optimization of industrial production to reduce cost of production ; 4) Increase market awareness and demonstrate results to potential clients for product launch just after the project.

LOWUP		723930
Title: LOW valued energy sources UPgrading for buildings and industry uses		
Call Id: H2020-EE-2016-RIA-IA	Topic: **EE-04-2016-2017**	Type of Action: **RIA**
Project start date: 11/1/2016	Duration: **48 months**	Unit: **EASME/B/01**
Total costs: €3.727.078	EU requested grant: **€3.727.078**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Heating, cooling, residual ,renewable, waste, energy, low-exergy, building, industry, business models, PVT panels*

Abstract:

In the “secure, clean and efficient energy” initiative, it is stated that the most important milestones for such a transformation are the EU's energy and climate targets for 2030, which are: (i) at least 40% reduction in greenhouse gas emissions compared to 1990, (ii) at least 27% for the share of renewable energy consumed in the EU, and (iii) at least 27% improvement of energy efficiency and an electricity interconnection target of 10%[1].The LowUP Project has a two-fold strategy: 1) on one hand, to target goals (i) and (ii) of these climate challenge with a 42 months duration project where innovation will be the core activity, and 2), on other hand, to successfully present different technological solutions which will enable the participation of low grade thermal energy sources in the energy transition, and improve the efficiency of the Europe Low Exergy systems, not only at building level but also in industrial applications. Within the LowUP project three different heating and cooling systems will be developed and demonstrated at relevant environment: HEAT-LowUP (low exergy heating system directly fed by solar and sewage water recovered heat) COOL-LowUP (low exergy cooling systems directly fed by renewable and free energy sources) and HP-LowUP (waste heat recovery and upgrading via heat pump.) The first two systems are focused on the rational and efficient use of low valued energy sources for direct implementation in low-exergy heating & cooling systems for buildings and the third one is focused on the exploitation of low temperature residual energy, wasted with industrial processes, by upgrading them to generate useful heat to be re-introduced in the process.

The project will be implemented using the Acciona thermal lab located in Seville where will be emulated different real cases as the industrial process of a Water treatment plant, an automotive factory and a retirement house.

W2EW		831041
Title: New combined solution to harness wave energy full renewable potential for sustainable electricity and fresh water production		
Call Id: H2020-EIC-FTI-2018-2020	Topic: **EIC-FTI-2018-2020**	Type of Action: **IA**
Project start date: 1/1/2019	Duration: **32 months**	Unit: **EASME/A/02**
Total costs: €4.871.701	EU requested grant: **€3.000.000**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Wave Energy, Wave Power, Decarbonising Islands, Desalination*

Abstract:

With 96.5% of all water on Earth being on the ocean, there is a theoretical ocean wave energy potential of 2000 GW of installed capacity, which could contribute to decarbonizing the energy system, expanding the water supply through desalination and creating a new industry with export opportunities worldwide. However, this opportunity remains underexplored due to remaining technological, market, environmental and social challenges. With wave energy still in the pre-commercial development stages, the EU setting a target of 337 GW of installed wave by 2050 and a direct EU economic impact of drought events in the past 30 years estimated at a minimum of € 100BN, there is a unique opportunity for strong industrial cooperation towards the deployment of solutions to address the twin challenges of energy and fresh water shortage. Leveraging on a strong consortium vision, expertise and technologies, the W2EW project aims to deliver a world beating and first of a kind wave powered technology solution – W2EW solution – to the market. The solution relies on the innovative integration of wave energy and water desalination technologies, to produce zero-emission electricity and fresh water.

The main goal of this project is to integrate the partners technologies, demonstrate the combined solution, and build the market to pave the way for broad market roll-out. Thirty-three months after project start the consortium plans to roll out the W2EW solution on off grid small-scale energy and water production in islands and isolated coastal communities with up to 100,000 inhabitants, which corresponds to a potential market of 22Bn EUR for electricity and 6Bn EUR for freshwater. After 2025 we intend to extend the customer base of the W2EW solution to the large-scale utilities for production of renewable energy and/or water desalination, to be an alternative and/or to operate in synergy with offshore wind and solar PV.

HORIZON		850275
Title: Redefining solar technology with RETRACTABLE SOLAR POWER FOLDING ROOFS. Unlocking photovoltaics for waste water treatment plants towards self-sufficient plants.		
Call Id: H2020-SMEInst-2018-2020-2	Topic: **EIC-SMEInst-2018-2020**	Type of Action: **SME-2**
Project start date: 3/1/2019	Duration: **24 months**	Unit: **EASME/A/02**
Total costs: €3.554.464	EU requested grant: **€2.488.125**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Solar Photovoltaic, retractable, subsidies, cableway, decentralised, electromobility, dual usage, self-consumption, carport , energy selfsufficiency*

Abstract:

dhp technology is an award winning start-up in the energy sector which has developed the first and unique feasible application of photovoltaics in wastewater treatment plants (WTPs). HORIZON is a worldwide unparalleled retractable folding solar roof that can be utilised in already commercially exploited spaces such as parking lots, storage and logistics facilities, as it enables the production of solar power through dual usage. The dual usage of spaces preserves resources and allows for the production of solar power where it is needed most. The folding roof automatically avoids poor weather and retracts itself into a central garage, in a aesthetic, lightweight and economical manner. Horizon has been designed with the future in mind as it can be integrated into current and future trends such as IoT, smart mobility and smart grids. Our solution provides a solution to the increasing densification of our living spaces and eases the competition amongst industry, housing, cropland, recreational spaces and energy production. Horizon is a disruptive technology and it has no direct competing solutions which can achieve a similar dual function in the target markets. The two main applications of the folding solar roof are parking-logistics areas and wastewater treatment plants. The customers are municipalities, energy providers or land operators. High self-consumption remains at the centre for both segments, as well as additional benefits such as shade for vehicles, brand image or the compatibility with electro mobility charging stations. There is a technical potential of approximately 70MW on wastewater purification plants and 5GW on parking lots within the Swiss market. In Europe these are approximately 4GW and 300GW respectively in the same segments which corresponds to a market size of over €100 billion. Through the market entry in 7 EU markets, the HORIZON project will reach in in year 2025 revenues of €55’7M, and profit of €9’7M, generating renewable 80 MWp in 157 WTPs.

WASCOP		654479
Title: Water Saving for Solar Concentrated Power		
Call Id: H2020-LCE-2015-1-two-stage	Topic: **LCE-02-2015**	Type of Action: **RIA**
Project start date: 1/1/2016	Duration: **48 months**	Unit: **INEA/H/01**
Total costs: €5.941.608	EU requested grant: **€5.941.608**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords:

Abstract:

Concentrating Solar Power is one of the most promising and sustainable renewable energy and is positioned to play a massive role in the future global generation mix, alongside wind, hydro and solar photovoltaic technologies. Although there is definitely perspective for the technology for rapid grow, success of CSP will ultimately rely on the ability to overcome obstacles that prevent its mass adoption, especially the large financial demand and limited accessibility of water. Water saving is therefore one of the major issues to ensure a financially competitive position of CSP plants and their sustainable implementation.

To overcome such challenges, WASCOP brings together leading EU and Moroccan Institutions, Universities, and commercial SMEs and industry. They join their forces to develop a revolutionary innovation in water management of CSP plants - flexible integrated solution comprising different innovative technologies and optimized strategies for the cooling of the power-block and the cleaning of the solar field optical surfaces.

WASCOP main advantage consists in the ability to reflect and adapt to the specific conditions prevailing at individual CSP plants, unlike other competitive approaches proposing a single generic solution applicable only on some referenced cases. The WASCOP holistic solution provides an effective combination of technologies allowing a significant reduction in water consumption (up to 70% - 90%) and a significant improvement in the water management of CSP plants.

To demonstrate the benefits (whether economic or environmental), the developed system will be tested and validated in real conditions of four testing sites in France, Spain and Morocco after preliminary demonstration in laboratory environment.

MinWaterCSP		654443
Title: MinWaterCSP - Minimized water consumption in CSP plants		
Call Id: H2020-LCE-2015-1-two-stage	Topic: **LCE-02-2015**	Type of Action: **RIA**
Project start date: 1/1/2016	Duration: **36 months**	Unit: **INEA/H/01**
Total costs: €5.861.372	EU requested grant: **€5.861.372**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Increase of electrical efficiency of a CSP plant, reduction of water usage during mirror cleaning; usage of dry and hybrid dry/wet cooling systems, improved cost-benefit ratio of CSP*

Abstract:

MinWaterCSP addresses the challenge of significantly reducing the water consumption of CSP plants while maintaining their overall efficiency. Its objective is to reduce evaporation losses and mirror cleaning water usage for small- and large-scale CSP plants through a holistic combination of next generation technologies in the fields of i) hybrid dry/wet cooling systems ii) wire structure heat transfer surfaces iii) axial flow fans iv) mirror cleaning techniques and v) optimized water management. MinWaterCSP will reduce water evaporation losses by 75 to 95% compared to wet cooling systems. It aims to increase the net efficiency of the steam Rankine cycle by 2%, or alternatively reduce the capital cost of a dry-cooling system by 25%, while maintaining cycle efficiency. To complement this, mirror cleaning water consumption will be reduced by 25% through an improved mirror cleaning process for parabolic trough collectors, the development of a cleaning robot for linear Fresnel collectors and a reduced number of cleaning cycles enabled by an enhanced monitoring of the reflectance of the mirrors. Also, comprehensive water management plans for CSP plants in various locations will be developed and combined with plant performance simulations to maximize the impact of the achieved design improvements in a complete system context. Zero liquid discharge and the option of making use of solar energy or low grade waste heat for water treatment will be considered. MinWaterCSP will improve the cost-competitiveness of CSP. This will make CSP more attractive for investment purposes and drives growth in the CSP plant business as well as job creation at European companies which provide technologically advanced CSP plant components. In addition, by making CSP technology more attractive MinWaterCSP contributes to solve the global climate challenge by reducing carbon-dioxide emissions and increasing energy generation from renewable resources.

SOLWARIS		792103
Title: Solving Water Issues for CSP Plants		
Call Id: H2020-LCE-2017-RES-IA	Topic: **LCE-11-2017**	Type of Action: **IA**
Project start date: 5/1/2018	Duration: **48 months**	Unit: **INEA/H/01**
Total costs: €12.586.196	EU requested grant: **€10.812.504**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Concentrated solar power, sustainable renewable energy, water saving, cleaning, cooling, water recovery, demonstration*

Abstract:

SOLWARIS targets to significantly reduce the water used by CSP plants (by 35% for wet cooled & by 90% for dry cooled). The project proposes to demonstrate the efficiency of innovations on solar field cleaning, power-block cooling, water recycling system, and plant operation strategy. Among these are solutions to reduce solar field water cleaning needs, an operation and maintenance optimizer software including soiling forecaster, a MEE water recovery technology running on otherwise dumped heat from the solar field, and a cooling concept for the turbine condenser storing excess heat when ambient is too warm, then releasing it during cool night times.

The solutions will be implemented at two CSP operational sites, “La Africana” parabolic trough plant in Spain and “Ashalim” central receiver plant in Israel, to demonstrate significant reduction in water use while making CSP more cost effective, and achieving near-to-market status. The solutions are best applied together, but each will also bring water and cost savings on its own, thanks to their ability to fit any kind of CSP plant; dry, wet, or hybrid cooled, existing or future ones, tailored to location and policy framework. Their application will save more than 0.5 M€/year of operational cost for a 50 MW CSP plant.

Regarding competition on water resources and humanitarian issues, the social acceptance of CSP will be increased by detailed analysis of case studies and education of local population to the benefits of solar energy.

The targeted savings of water and operation costs will increase CSP’s competitiveness compared to other renewable energy and the electricity market in general, as well as its acceptance within local communities, achieving a big step forward in the SET plan goals for CSP technology by 2020. The consortium, led by TSK Electrónica y Electricidad S.A. (Spain), is made up of 13 partners from 6 European countries plus Israel, including 5 industrials partners, 2 SMEs, 5 RTOs and one University.

REMIND		823948
Title: Renewable Energies for Water Treatment and REuse in Mining Industries		
Call Id: H2020-MSCA-RISE-2018	Topic: **MSCA-RISE-2018**	Type of Action: **MSCA-RISE**
Project start date: 11/1/2018	Duration: **48 months**	Unit: **REA/A/03**
Total costs: €1.329.400	EU requested grant: **€1.329.400**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *membrane science and technology; renewable energy sources*

Abstract:

The overall aim of REMIND is to develop an innovative framework of interplay between Renewable Energy Sources (RES) and innovative Water Treatment Technologies in the logic of a sustainable growth for mining industries. The novel paradigms explored are expected to drastically reduce the environmental impact due to extensive water and energy consumption, and to release of untreated wastewater during the production cycle of copper and gold. The REMIND collaborative network among European Union, Chile and Ecuador is in line with EU policy and strategy for raw materials supply; moreover, this partnership supports the economic and research efforts of Latin American countries towards a more eco-friendly and RES-driven development.

The bi-directional knowledge transfer activities implemented in REMIND aim to: i) implement a rational use of water resources in the logic of circular economy; ii) promote a carbon-free technological approach (water-energy nexus) for reducing conventional energy resources requirements, and iii) mitigate health environmental risk in two demonstration sites (mining districts of Antofagasta – CL and Regione de l'Oro – EC), and iv) exploit the intersectorial cooperation between academia and industry by setting best practices for knowledge transfer in analogous contexts.

REMIND brings together 8 leading High Education Institutions and Large Companies from 4 Countries (Italy, Spain, Chile and Ecuador), and implements a multisectorial and transdisciplinary network that generates 64 secondments and 73 Knowledge Transfer Activities.

WATLY		698688
Title: An autonomous and mobile water treatment plant powered by solar energy		
Call Id: H2020-SMEINST-2-2015	Topic: **SC5-20-2015**	Type of Action: **SME-2**
Project start date: 10/1/2015	Duration: **25 months**	Unit: **EASME/A/02**
Total costs: €2.025.500	EU requested grant: **€1.417.850**	
Main thematic area: 72 - Water and energy / renewables		

Free keywords: *Environment, water sanitation, wastewater treatment, renewables, solar energy, off-grid electricity, internet connectivity, eco-innovative technology, place-and-play, resource efficiency.*

Abstract:

Water and energy are highly interdependent and are both crucial to human well-being and sustainable socio-economic development. 1.1 billion people worldwide do not have access to a safe source of drinking water; 1.3 billion people lack access to electricity; 5 billion people worldwide still have no access to internet.

Our innovative solution Watly addresses the increasing global demand for safe sources of drinking water and green off-grid electricity, by combining highly efficient photovoltaic panels with thermal energy production, used to desalinate and purify water in-situ. Watly also provides internet connectivity and mobile chargers in remote areas. Our customers are: Governments and public institutions, NGOs, mobile hospitals, military organizations, hotels/resorts/businesses in remote destinations, oil platforms, etc.

WATLY's success depends on the fulfilment of the following objectives:

- Scale-up Watly 2.0 to Watly 3.0 able to treat up to 4,500l of water and produce 70 kWh of electricity per day, boosting its readiness level from TRL7 to TRL9

- Certification and live Demonstration of Watly 3.0

- Succesfull final Business Innovation Plan and commercialization activities for Watly 3.0

The investment cost of Watly 3.0 could be a strong barrier for the public sector and NGOs. To overcome this barrier Watly will include additional features and 2 kinds of revenues channels for the Watly operator:

Vending Machine: It is a model created for the public sector of remote areas, with medium-low purchasing power. Watly will include specific hardware to act as a vending machine, which will give a certain amount of water/energy/connectivity in exchange of a small economic input. Lively Donors: It is a model strictly created for NGOs. Watly will integrate a web platform and a mobile App which will allow external donors, i.e. philanthropists from rich countries, to remotely donate money giving a certain amount of water/energy/connectivity to the needy person

ReUseHeat		767429
Title: Recovery of Urban Excess Heat		
Call Id: H2020-EE-2017-RIA-IA	Topic: **EE-01-2017**	Type of Action: **IA**
Project start date: 10/1/2017	Duration: **48 months**	Unit: **EASME/B/01**
Total costs: €4.883.672	EU requested grant: **€3.998.061**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *Urban waste heat recovery investments, innovative business models, demonstrators, hospital, datacenter, sewage water and metrosystem*

Abstract:

There is enough waste energy produced in the EU to heat the EU's entire building stock; however despite of this huge potential, only a restricted number of small scale examples of urban waste heat recovery are present across the EU. The objective of REUSEHEAT is to demonstrate, at TRL8 first of their kind advanced, modular and replicable systems enabling the recovery and reuse of waste heat available at the urban level.

REUSEHEAT explicitly builds on previous knowledge and EU funded projects (notably CELSIUS, Stratego and HRE4) and intends to overcome both technical and non technical barriers towards the unlocking of urban waste heat recovery investments across Europe.

Four large scale demonstrators will be deployed, monitored and evaluated during the project, showing the technical feasibility and economic viability of waste heat recovery and reuse from data centres (Brunswick), sewage collectors (Nice), cooling system of a hospital (Madrid) and underground station (Bucharest). The knowledge generated from the demonstrators and from other examples across the EU will be consolidated into a handbook which will provide future investors with new insight in terms of urban waste heat recovery potential across the EU. Innovative and efficient technologies and solutions, suitable business models and contractual arrangements, estimation of investment risk, bankability and impact of urban waste heat recovery investments, authorization procedures are examples of handbook content. The handbook will be promoted through a powerful dissemination and training strategy in order to encourage a rapid and widespread replication of the demonstrated solutions across the EU.

ENERWATER		649819
Title: Standard method and online tool for assessing and improving the energy efficiency of wastewater treatment plants		
Call Id: H2020-EE-2014-3-MarketUptake	Topic: **EE-16-2014**	Type of Action: **CSA**
Project start date: 3/1/2015	Duration: **44 months**	Unit: **EASME/B/01**
Total costs: €1.731.087	EU requested grant: **€1.731.087**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *wastewater, treatment plants, WWTP, energy, electricity, renovation, optimization, monitoring, online, tools, software, methodology, standard, regulation, norm, ESCO, authorities, utilities*

Abstract:

Waste Water Treatment Plants (WWTPs) is one of the most expensive public industries in terms of energy requirements accounting for more than 1% of consumption of electricity in Europe. EU Water Framework Directive (WFD) 91/271/CEE made obligatory waste water treatment for cities and towns. Now within the EU-27, the total number of WWTPs is estimated as 22.558, for which we can estimate a total energy consumption of 15,021 GWh/year. Although most of the objectives of the WFD in relation to water protection have been achieved, most of these aging plants show unsustainable energy consumption and must be optimized to the maximum and renovated accordingly. However, in Europe there is no legislation, norms or standards to be followed, and as consequence, a gigantic opportunity for reducing the public electric expense remains unregulated.

The main objective of ENERWATER is to develop, validate and disseminate an innovative standard methodology for continuously assessing, labelling and improving the overall energy performance of WWTPs. For that purpose a collaboration framework in the waste water treatment sector including research groups, SMEs, utilities, city councils, authorities and industry will be set up. ENERWATER will devote important efforts to ensure that the method is widely adopted. Subsequent objectives are to impulse dialogue towards the creation of a specific European legislation following the example of recently approved EU directives, to achieve EU energy reductions objectives for 2020, ensuring effluent water quality, environmental protection and compliance with the WFD.

These actions should bring European Water Industry a competitive advantage in new products development and a faster access to markets by facilitating evidence of reduction therefore fostering adoption on new technologies.

EnergyWater		696112
Title: Improving energy efficiency in industrial water processes through benchmarking and benchlearning tools in Europe manufacturing industry.		
Call Id: H2020-EE-2015-3-MarketUptake	Topic: **EE-16-2015**	Type of Action: **CSA**
Project start date: 2/1/2016	Duration: **36 months**	Unit: **EASME/B/01**
Total costs: €1.971.188	EU requested grant: **€1.971.188**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *Benchmarking, ICT tools, best practice guide, access to finance*

Abstract:

Objectives: 1. Improve the competitiveness of the EU industrial sector by reducing 20% energy costs in industrial water processes. (WP4)

A total reduction of 26 GWh/year will be achieved at the end of the project implementing energy efficiency measures in the European manufacturing companies.

2. Identify saving potentials and benchmark energy performance through an Energy Management Self-Assessment (EMSA) collaborative web-tool. (WP1 & WP2)

Manufacturing industries can anonymously introduce their data into the EMSA web-tool to know their ranking regarding other industries with the same processes.

3. Strengthen the energy saving market through the creation of an “Energy Angels” network: facilitating contacts with skilled energy managers and auditors and providing access to support for the implementation and financing of water energy efficiency projects. (WP3)

The energywater proposal will prepare the ground for investment facilitating information about potential savings and establishing a network of qualified providers (with technical and financial skill).

Furthermore the Energy Angels network will implement a training module to improve the availability of skilled energy managers and auditors in which at least 200 people will be trained.

4. Improve energy performance in industrial water processes through benchmarking activities and a best practice guide based on real experience case studies. (WP4)

Saving strategies identified in the EMSA web-tool will be implemented in manufacturing industries. The best energy saving strategies to manage industrial water processes will be compiled in a guidance document.

5. Influence energy efficiency regulation through public authorities’ involvement. (WP4)

In order to optimise energy efficiency in manufacturing industries both private and public stakeholders have to be aware of their role. We will make public authorities part of the energywater project with the objective to identify and remove regulatory and non-regulatory barriers.

WaterWatt		695820
Title: Improvement of energy efficiency in industrial water circuits using gamification for online self-assessment, benchmarking and economic decision support		
Call Id: H2020-EE-2015-3-MarketUptake	Topic: **EE-16-2015**	Type of Action: **CSA**
Project start date: 4/1/2016	Duration: **36 months**	Unit: **EASME/B/01**
Total costs: €1.782.533	EU requested grant: **€1.782.533**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *Energy consumption, energy efficiency, self-assessment, industrial water circuits, decision-making support*

Abstract:

The improvement of energy efficiency across European industry is crucial for competitiveness. So far, the measures for improvement of energy efficiency have been directed at primary production processes. In this project, we will address the improvement of energy efficiency in industrial water circuits: auxiliary electric motor driven systems with high optimisation potential. The European manufacturing industry consumes about 37 000 million m^3/y freshwater recycling it up to 10 times with the specific electrical energy consumption >0.2 kWh/m^3. By the according energy consumption of 74 000 GWh/a the potential 10% savings amount to 7 400 GWh/a. Currently, there is neither a benchmark on the energy consumption in industrial water circuits, nor tools for its systematic reduction, nor awareness of the saving potential. The WaterWatt project aims to remove market barriers for energy efficient solutions, in particular the lack of expertise and information on energy management and saving potential in industrial water circuits. The aims will be achieved through: i) case studies in relevant industries, ii) development of improvement measures for energy efficiency in industrial water circuits, iii) market studies, iv) capacity building activities and v) dissemination in workshops and by e-learning. An Energy Efficiency Evaluation Platform (E3 Platform) will be developed to disseminate knowledge/know-how on energy efficiency improvements using gaming approach. The tools of E^3 Platform will be used by SMEs and large industrial producers for self-assessment and improvement of the energy efficiency in their circuits. WaterWatt will reach more than 2000 relevant persons, organisations and policy makers triggering investments of €7-12 million resulting in primary energy saving of 100-180 GWh/a during the project life-time. The planned spin-off company will ensure further investments and savings after the project has finished.

HARMoNIC		801229
Title: HierARchical Multiscale NanoInterfaces for enhanced Condensation processes		
Call Id: H2020-FETOPEN-1-2016-2017	Topic: **FETOPEN-01-2016-2017**	Type of Action: **RIA**
Project start date: 10/1/2018	Duration: **36 months**	Unit: **REA/A/05**
Total costs: €2.999.628	EU requested grant: **€2.999.628**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *Dropwise condensation, heat transfer, condenser, water harvesting, water desalination, membranes, coatings, surface robustness, nanostructures, biphilic surfaces, nanocomposites, nanometrology*

Abstract:

This proposal focuses on key challenges facing human society: continuously increasing global demands for electricity as well as potable drinking water. Our long term vision consists of developing solutions related to water utilization for significant enhancement in i) efficiency of thermal power generation and ii) water harvesting to reduce the shortfall in global fresh water supply. The novel concepts that we propose rely on the realization of: 1) Precisely engineered, random yet hierarchical interface nanotextures, also with, controllable directionality, 2) Introducing a new norm of random biphilicity in the above interfaces at the submicron level, 3) Realization of novel superhydrophobic membranes through controlled coating of commercial hollow fiber membranes. 4) Novel methods of nanometrology to precisely and rationally describe the complex interfaces. Concept 1 is related to heat transfer exchange via dropwise condensation, where we target lifetime performance relevant to industrial surface condensers, while maximizing their heat transfer coefficient by up to an order of magnitude. By employing concept 2 we target novel material systems focusing on dew water harvesting in humid environments. Concept 3 targets new surface modification approaches for commercial membranes to achieve high efficiency in water desalination while ensuring anti-biofouling. For all the three concepts described above, a key component of our work will be to ensure economic scalability, of the precisely controlled textures, to large surface areas so that they can be converted to industrial products. For achieving optimal design, quantification and repeatable manufacturability of the aforementioned systems, we will employ novel metrology methods for hierarchical surfaces (concept 4) which will provide important theoretical feedback and understanding of the influence of critical surface structural parameters, through the entire project duration.

REWATERGY		812574
Title: Sustainable Reactor Engineering for Applications on the Water-Energy Nexus		
Call Id: H2020-MSCA-ITN-2018	Topic: **MSCA-ITN-2018**	Type of Action: **MSCA-ITN-EID**
Project start date: 4/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €2.174.048	EU requested grant: **€2.174.048**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *Reactor engineering, energy efficiency, water treatment, catalysis, hydrogen, LED, UV-C, advanced oxidation processes, disinfection, antibiotics, ENMs, microplastics, ARG*

Abstract:

The EU is currently facing the challenge of recycling materials and water of high quality to become carbon neutral by decreasing its energy consumption and CO2 emissions. The current Water Framework Directive has strict regulations on a wide range of contaminants, and most treatments continuously increase the energy demand of the water cycle. Yet, the EU is committed to ambitious targets to reduce Greenhouse Gas emissions, including the legally binding 2015 Paris agreement.

These conflicting interests have motivated REWATERGY, a partnership within the water-energy nexus. This integrated network, led by industry in partnership with world leading academic institutions, envisions the scientific and technological opportunities of such challenges with direct economic and social impacts to the EU. Three research objectives set the foundation of this ambitious programme,

i) enhance the energy recovery from waste water streams inspired by the circular economy concept,

ii) improve the energy efficiency of water disinfection and removal of contaminants of emerging concern, and

iii) increase the resilience of distributed household safe drinking water systems addressing potential health and safety challenges.

The programme is particularly designed to cultivate an entrepreneurial spirit by the collaborative design, development and manufacturing of new prototypes aligned with the three research objectives. This training concept will have a long term impact by providing a stream of highly trained innovative scientists and engineers able to communicate ideas and to develop creative solutions for the adoption of novel technologies in the market.

POWERSTEP		641661
Title: Full scale demonstration of energy positive sewage treatment plant concepts towards market penetration		
Call Id: H2020-WATER-2014-two-stage	Topic: **WATER-1a-2014**	Type of Action: **IA**
Project start date: 7/1/2015	Duration: **36 months**	Unit: **EASME/B/02**
Total costs: €5.173.855	EU requested grant: **€3.997.126**	
Main thematic area: 73 - Water and energy / efficiency		

Free keywords: *energy positive and carbon neutral wastewater treatment, integrated and innovative concepts, full-scale*

Abstract:

The municipal wastewater in Europe contains a potential chemical energy of 87,500 GWh per year in its organic fraction, which is equivalent to the output of 12 large power stations. Due to the currently applied technologies and related energy loss at each process step, wastewater treatment in Europe today consumes instead the equivalent of more than 2 power stations. Many operators are thus targeting incremental energy efficiency towards energy neutrality, but recent studies have shown that with novel process schemes using existing technologies, sewage treatment plants could actually become a new source of renewable energy, without compromising the treatment performance.

The project POWERSTEP aims at demonstrating such innovative concepts in first full scale references for each essential process step in order to design energy positive wastewater treatment plants with currently available technologies. The following processes will be demonstrated in 6 full-scale case studies located in 4 European countries: enhanced carbon extraction (pre-filtration), innovative nitrogen removal processes (advanced control, main-stream deammonification, duckweed reactor), power-to-gas (biogas upgrade) with smart grid approach, heat-to-power concepts (thermoelectric recovery in CHP unit, steam rankine cycle, heat storage concepts), and innovative process water treatment (nitritation, membrane ammonia stripping). These individual technology assessments will merge into integrative activities such as treatment scheme modelling and design, global energy and heat management, carbon footprinting, integrated design options, as well as extensive dissemination activities.

POWERSTEP will demonstrate the novel concepts and design treatment schemes of wastewater treatment plants that will be net energy producers, paving the way towards large implementation of such approaches and quick market penetration and supporting the business plans of participating technology providers.

RIVERS		804003
Title: Water/human rights beyond the human? Indigenous water ontologies, plurilegal encounters and interlegal translation		
Call Id: ERC-2018-STG	Topic: **ERC-2018-STG**	Type of Action: **ERC-STG**
Project start date: 5/1/2019	Duration: **60 months**	Unit: **ERCEA/C/01**
Total costs: €1.498.446	EU requested grant: **€1.498.446**	
Main thematic area: 81 - Water governance / policies		

Free keywords: *human rights, legal anthropology, human right to water, indigenous peoples, legal pluralism, extractivism, natural resources, ontological turn, decolonial theories*

Abstract:

RIVERS's main challenge is to produce ground-breaking knowledge, from an empirical, interdisciplinary and dialoguing perspective, about the contentions and challenges intrinsic to reconceptualising human rights with different ways of understanding and relating to water. Worldwide, indigenous peoples are mobilising against the neoliberalisation of nature, demonstrating radically different ways of knowing, being and living. At the same time, in 2010 the UN acknowledged water as a human right, while in 2017 New Zealand, India and Colombia established ground-breaking legal precedents by granting rivers human rights. RIVERS's overarching research question is: To what extent can international human rights law come to grips with plurilegal water realities? This project engages with one of the most pressing questions of this century: the relationship between humans and nature. RIVERS tackles two intertwined core objectives: 1) analysing different ways of knowing and relating to water and life among indigenous peoples and their understanding of its (potential) violation by extractive projects; 2) discussing the contributions, challenges and pitfalls of interlegal translation of differing water natures in plurilegal encounters at domestic and international levels. RIVERS will develop a multi-sited analysis and empirical case-studies in three contexts: Colombia, Nepal and the UN human rights protection system. Through the lens of legal pluralism, this will foreground competing political and legal water realities that interrogate dominant understandings of the modern world. RIVERS will address two interrelated research challenges: 1) indigenous visions/practices: beyond water as a natural resource and human right; 2) the UN human rights system: towards counter-hegemonic water knowledge production. This project will pioneer new ways of thinking about water beyond the modern divides of nature/culture, providing clues about future paths towards reconceptualising human rights.

DOWN2EARTH		869550
Title: DOWN2EARTH: Translation of climate information into multilevel decision support for social adaptation, policy development, and resilience to water scarcity in the Horn of Africa Drylands		
Call Id: H2020-LC-CLA-2019-2	Topic: **LC-CLA-05-2019**	Type of Action: **RIA**
Project start date:	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €6.645.664	EU requested grant: **€6.645.664**	
Main thematic area: 81 - Water governance / policies		

Free keywords: *agro-pastoralists, water resources, hydrology, food security, citizen science, international development, groundwater*

Abstract:

Prolonged periods of extreme water scarcity induced by drought are detrimental to regional economies through crop and livestock loss, threatening food security in rural communities, and making politically unstable regions more vulnerable to conflict, terrorism, and mass migration. The rural communities of the Horn of Africa Drylands (HAD) are extremely vulnerable to food insecurity and associated economic losses during drought conditions due to low socio-economic levels and low adaptive capacity to climatic shocks, such that frequent and more severe droughts in HAD have dramatically reduced soil moisture and affecting drinking water reserves, leading to increased food insecurity, livestock loss, and major water shortages. DOWN2EARTH is composed of a multidisciplinary project team that will deliver state-of-the-art and community relevant climate services that focus on water scarcity and its consequences at or near the Earth's surface (hence DOWN2EARTH) to increasingly vulnerable agro-pastoral populations in HAD. The project is designed to bolster existing climate services frameworks, improve decision support to governments and NGOs in the most vulnerable HAD countries (Kenya, Somalia, Ethiopia), and to improve community-centric adaptation and resilience to climate change. The project will: assess the socio-economic dimensions and human dynamics of climate change including feedbacks between climatic shocks, human behavior, and policy implementation; characterize historical trends and future projections of water scarcity, food insecurity, population, and land use; develop and enhance multi-level decision-support tools that emphasize the translation of climate information into critical land and water information required for adaptation and resilience by end users and state/regional governments; and strengthen regional climate services through capacity building, citizen science, information dissemination, expansion of data networks, and policy implementation.

NEWAVE		861509
Title: Next Water Governance		
Call Id: H2020-MSCA-ITN-2019	Topic: **MSCA-ITN-2019**	Type of Action: **MSCA-ITN-ETN**
Project start date: 11/1/2019	Duration: **48 months**	Unit: **REA/A/01**
Total costs: €4.039.273	EU requested grant: **€4.039.273**	
Main thematic area: 81 - Water governance / policies		

Free keywords: *Water Governance; policy change; sustainability challenges*

Abstract:

The NEWAVE project departs from the notion that the global debate about water governance needs a reset, and aims to point the way forward. It does so by developing research and training for a new generation of future water governance leaders, and by equipping them with the transdisciplinary skills to better tackle water challenges. The central organizing framework in NEWAVE is formed by the "three Ps" – which reflects the insight that future water governance leaders should have a deep and transdisciplinary understanding of 1) Problématiques - the nature of nowadays water challenges; 2) Paradigms – the ideational underpinnings of current approaches to water governance; and 3) Patterns – the way in which newly proposed approaches interact with existing institutions. NEWAVE proposes cutting edge research on all these aspects from a global perspective, a highly sophisticated training program to teach the required skills to analyze these issues in a reflexive way and to come up with recommendations about them, and a close collaboration with several of the most prominent players in the water governance debate. NEWAVE will not only be active in Europe, but will additionally target the water governance debate in a carefully selected number of emerging economies and developing countries, and has the right partners on board to do so. Because of its excellent design, NEWAVE will help to recognize and avoid the traps in the current debate on water governance, such as panacea thinking, the disregard of institutional contexts, and the neglect of politics or normative considerations such as justice and equity. NEWAVE thus presents an opportunity to make a step change in an salient societal debate in Europe, and far beyond, and is designed to leave a strong legacy in terms of networks, insights and skills acquired.

4PRIMA		724060
Title: Partnership for Research and Innovation in the Mediterranean Area		
Call Id: H2020-SC5-2016-OneStageA	Topic: **SC5-12-2016**	Type of Action: **CSA**
Project start date: 5/1/2016	Duration: **22 months**	Unit: **RTD/C/01**
Total costs: €1.999.379	EU requested grant: **€1.999.379**	
Main thematic area: 81 - Water governance / policies		

Free keywords: *food systems and water resources, partnership for research and innovation, Strategic Research and Innovation Agenda, implementation plan, cooperation between EU and Mediterranean Partner Countries*

Abstract:

The 4PRIMA Coordination and Support Action will create the bases and will develop a set of activities aimed at supporting the establishment of a long-term, well-structured and integrated partnership for research and innovation (R&I) on food systems and water resources, among countries from both sides of the Mediterranean Sea ("PRIMA Initiative"). In order to enable a sustainable development in this area, 4PRIMA will facilitate the establishment of favourable and stable conditions for a reinforced international cooperation on food systems and water research, based on a better coordination, collective ownership of R&I programmes and, consequently, clear and tangible mutual benefits.

4PRIMA will develop a Strategic Research and Innovation Agenda (SRIA) and an associated implementation plan, as a result of an extensive participatory process that will target a critical mass of key players at international level and all relevant stakeholders of the food and water sectors. To achieve this main objective, 4PRIMA will take advantage of a wide portfolio of results and relationship generated in previous and on-going EU projects, as well as it will seek cooperation between EU and Mediterranean Partner Countries (MPCs), in coherence with the activities of the Strategic Forum for International Cooperation.

Given the strategic relevance of an appropriate development and uptake of the SRIA to establish a long lasting partnership in the region, 4PRIMA science diplomacy actions will be essential to ensure the support to R&I policy dialogue addressing sensitive challenges between EU and MPCs. Moreover, in order to maximise its expected impact, 4PRIMA project will explore avenues for awareness raising and development of strategic alliances with key stakeholders, including EU, AC and MPCs countries that did not take part to the PRIMA joint programming process, with the goal to enlarge the participation to the "PRIMA Initiative".

MAGIC		689669
Title: Moving Towards Adaptive Governance in Complexity: Informing Nexus Security		
Call Id: H2020-WATER-2015-two-stage	Topic: **WATER-2b-2015**	Type of Action: **RIA**
Project start date: 6/1/2016	Duration: **48 months**	Unit: **EASME/B/02**
Total costs: €7.457.761	EU requested grant: **€7.457.761**	
Main thematic area: 81 - Water governance / policies		

Free keywords: *Multi-level Governance, Multi-Scale Integrated Assessment, Nexus Security, Socio-Ecosystem Metabolism, Quantitative Story Telling; biofuels, circular economy, desalination, fracking.*

Abstract:

MAGIC is a proposal coordinated by the Institute of Environmental Science and Technology (ICTA) of the Autonomous University of Barcelona (UAB) in collaboration with partners which have a proven and track record in their respective fields of competence.

Our objective is to open the path towards a new way of managing the Nexus in which researchers and decision makers work together in the search for development strategies that can contribute to the smart, sustainable and inclusive economic growth required by the EU 2020 Strategy, while maintaining a leading and informed participation in international discussions about global issues, like climate change or food security.

In order to do so, MAGIC deploys a set of novel, cutting-edge and system-oriented approaches that originates from system ecology, bio-economics and Science and Technology Studies. Their combination allows MAGIC to highlights if a certain mix of EU policies results in undesirable or unforeseen outcomes. Climate, water, land energy, and food modeling are integrated into a socio- and bio-economics framework using an iterative and participatory method. Significant care is taken to embed these ideas and approaches within the advisory and decision making functions of the European Commission.

Impacts are twofold. First, MAGIC contributes a methodological framework where the needs for advice of different DG in the design of development strategies for the EU are covered using a method that can embrace the complexity of the nexus, for a better understanding of the interactions it holds.

Second, the project provides ‘on the flight’ advice to the EC about the timeliness and soundness for the EU 2020 Strategy and the EU position in international agreements of EU policies -like the Water Framework Directive, the Common Agricultural Policy, or the Low-Carbon Economy Strategy- and targets of implementing technologies -such as fracking, desalination, biofuels and GMOs.

NEPTUNE		691554
Title: New cross sEctorial value chains creation across EuroPe faciliTated by clUsters for SMEs's INnovation in BluE Growth		
Call Id: H2020-INNOSUP-2015-1	Topic: **INNOSUP-1-2015**	Type of Action: **IA**
Project start date: 7/1/2016	Duration: **30 months**	Unit: **EASME/A/01**
Total costs: €4.199.822	EU requested grant: **€4.158.735**	
Main thematic area: 82 - Water governance / innovation, economic, financing		

Free keywords: *Blue Growth, Cross-sectoral, Water, Aerospace, ICT, Agriculture, Internationalisation, Creativity, Innovation methodology*

Abstract:

The EU faces huge challenges in food security, sustainable agriculture, marine and maritime and inland water management. Blue Growth solutions can play an important role in meeting these challenges and unlock the potential of oceans and inland water for the benefit of European competitiveness. Blue Growth is identified as a key emerging industry to be supported via inter cluster collaboration as well as a key driver for the EU economy.

NEPTUNE aims at developing new cross-sectoral and cross-border industrial value-chains, including notably SMEs, to foster the development of Blue Growth industries in Europe and beyond. This will be based on the construction or reconfiguration of value chains driven by the integration of new technologies and know-how between Water, Aerospace, ICT and Agriculture industries. NETPUNE addresses in particular three key aspects of Blue Growth that have a great potential to benefit from such collaboration and SME innovation support: (i) Water management in urban and rural environments; (ii) Fluvial and maritime transport and port logisitics; (iii) Environment and renewable marine energy.

From a methodological perspective, NEPTUNE focuses on two main concepts: the innovative Open Space Platform that refers to the collaborative space and innovation animation techniques via a project emergence methodology that helps SMEs and other stakeholders to identify market trends and opportunities and support the incubation of Blue Growth projects and innovation ideas. NEPTUNE expects to support at least 100 SMEs for the development of 40 new innovative solutions. NEPTUNE brings together 10 of Europe's leading clusters from 7 countries and 2 additional innovation, creativity and inter-cluster expert organisations to implement this ambitious project.

WIDEST		642423
Title: Water Innovation through Dissemination Exploitation of Smart Technologies		
Call Id: H2020-WATER-2014-one-stage	Topic: **WATER-4a-2014**	Type of Action: **CSA**
Project start date: 2/1/2015	Duration: **24 months**	Unit: **EASME/B/02**
Total costs: €1.022.030	EU requested grant: **€1.022.030**	
Main thematic area: 82 - Water governance / innovation, economic, financing		

Free keywords: *Water Market and observatory, ICT for water technology portfolio, Semantic interoperability and ontologies roadmap, Smart City connection roadmap, Smart Water Grids roadmap,CSA, water EIP*

Abstract:

The role of ICT in contributing to the "Smart Technologies EIP Priority" is widely recognised by the scientific community and water business professionals. Despite relevant progress and innovation achieved in this field, several barriers hinder the implementation of Smart Water Technologies such as the fragmentation of the sector, slow adoption, absence of SME development, and no holistic vision of water supply considering its whole life cycle. Moreover, at present a fully integrated Smart Water Network does not exist in Europe or globally. Hence, current lack of knowledge of EU water research and innovation results on industry, policy makers, and citizens is slowing down the widespread application of solutions that can leverage the development of the urban systems and infrastructures of tomorrow. This scenario shows that achieving water-related challenges cannot progress with the sole contribution of research. In this sense, the project has the vision of establishing and supporting a thriving, interconnected ICT for water community to promote the dissemination and exploitation of EU funded activities and results in this area. WIDEST will address its goals through a project-to-project approach and the coordination among relevant stakeholders by means of five objectives that will include, amongst others: Conducting literature reviews of relevant academic and commercial references; Establishing common frameworks such as standards, guidelines, website, video channel; Organizing events including conferences, workshops, special sessions; Producing three Topical Roadmaps and one Overall Roadmap; Producing a Portfolio of effective ICT for water management technologies including the methodology to build, update and execute it. The project is backed by a strong consortium composed by institutions with proven track record and expertise across different facets of ICT for water research, including established connections with key stakeholders.

PIANO		642433
Title: Policies, Innovation And Networks for enhancing Opportunities for China Europe Water Cooperation		
Call Id: H2020-WATER-2014-one-stage	Topic: **WATER-5a-2014**	Type of Action: **CSA**
Project start date: 3/1/2015	Duration: **39 months**	Unit: **RTD/C/01**
Total costs: €1.107.375	EU requested grant: **€1.107.375**	
Main thematic area: 82 - Water governance / innovation, economic, financing		

Free keywords: *none*

Abstract:

The overall objective of PIANO is to create a strategic cooperation partnership for water research and innovation between Europe and China, promoting the creation of networks of companies (including SMEs), entrepreneurs, not for profit organisations, policy makers, regulators and funding bodies to create business and social opportunities for China Europe Water Cooperation. PIANO will contribute to and is endorsed by the China Europe Water Platform (CEWP), and its 10 active EU Member States.

First, PIANO will strengthen the existing CEWP network to create a comprehensive China Europe water research and innovation network. Second, based on a comparative analysis of the water innovation landscape in Europe and China, PIANO will identify European technological water innovations with potential for implementation and replication in China. In addition, PIANO will identify opportunities for joint development to address water challenges, where both Europe and China lack market ready technological water innovations. Third, PIANO will identify drivers and barriers for implementation and replication of technical innovations. PIANO will also identify strategies to overcome obstacles and take advantage of drivers, to facilitate creation of business opportunities. Fourth, PIANO will promote knowledge exchange and a policy dialogue to create an enabling environment for the uptake of technological water innovations. Fifth, PIANO will develop a shared strategic research and innovation agenda between Europe and China in the water sector.

PIANO will align with current and future strategic initiatives to optimise opportunities for the EU and China across the water sector. To ensure success and achieve high impact, PIANO will be executed by a consortium of 9 leading European partners from both public and private sectors. Also, 13 leading Chinese partners are active PIANO participants, including the Ministries of Water Resources and of Environmental Protection.

AfriAlliance		689162
Title: Africa-EU Innovation Alliance for Water and Climate		
Call Id: H2020-WATER-2015-one-stage	Topic: **WATER-5b-2015**	Type of Action: **CSA**
Project start date: 3/1/2016	Duration: **60 months**	Unit: **EASME/B/02**
Total costs: €3.238.735	EU requested grant: **€3.238.735**	
Main thematic area: 82 - Water governance / innovation, economic, financing		

Free keywords: *Monitoring and forecasting*

Abstract:

The main objective of AfriAlliance is for African and European stakeholders to work together in the areas of water innovation, research, policy, and capacity development to prepare Africa for future Climate Change challenges. There are many but fragmented initiatives and networks in place, therefore we will not create new but will consolidate existing networks of scientists, decision makers, practitioners, citizens and other key stakeholders into an effective, problem-focused knowledge sharing mechanism via an overall coordination platform: the Africa-EU Innovation Alliance for Water and Climate. We will support them in identifying appropriate social innovation and technological solutions for key water and climate change challenges.

We will take Africa-EU cooperation in this field to a practical level by sharing (non)technological innovation for local challenges, thus also identifying and boosting sustainable market and investment opportunities.

Demand-driven, problem-focused Action Groups will share knowledge between the identified stakeholders and networks at all scales to effectively identify and address vulnerabilities. We will make extensive use of existing/emerging communication channels and events (EU/African platforms, conferences, social media) to streamline Climate Change issues into water-related networks to raise awareness about their impacts and propose adaptation measures.

We will re-enforce and valorise Water and Climate Change research and (social) innovation (R&I) cooperation between Africa and Europe through a mix of forward-looking and bottom-up innovation and road mapping techniques. We will identify demands, opportunities, and constraints at different levels and develop strategic advice (short term demand-driven R&I outlook and long term R&I agenda) for improving Africa-EU collaboration. This will help policy makers to create a consistent approach to bilateral cooperation between Africa and the EU in the field of innovation for water and climate

POWER		687809
Title: Political and sOcial awareness on Water EnviRonmental challenges		
Call Id: H2020-ICT-2015	Topic: **ICT-10-2015**	Type of Action: **RIA**
Project start date: 12/1/2015	Duration: **48 months**	Unit: **CNECT/H/05**
Total costs: €3.747.938	EU requested grant: **€3.747.938**	
Main thematic area: 83 - Water governance / engagement, capacity building		

Free keywords: *EIP Water Action Group, City Blueprints, environmental challenges, water issues, bottom-up, middle-out, top-down, participatory model, open-source, share best-practice*

Abstract:

POWER is a user-driven project to share knowledge and experience of water related issues in different EU local authorities to create a tool for EU water policy. It addresses 4 of the 8 EIP WATER prioritise: 1.Water reduction consumption; 2.Water quality; 3.Extreme weather events (surface water flood risk); 4.Variables related to water conservation.

It will develop a common DSP system prototype to be demonstrated in Milton Keynes, Sabadell, Leicester and Jerusalem. It will combine the experience of these Key Demonstration Cities with follower Cities. The followers are members of EIP Water Action Group City Blueprints, NetwercH2O and cities that have already produced a CITY BLUEPRINT.

The objectives are: 1. Set up a user-driven Digital Social Platform (DSP); 2. Ensure the involvement of a wide society and knowledge community; 3. Ensure social, technological, environmental and political uptake; 4. Transfer the POWER model environment to other communities; 5. Create new collaborative business models.

The POWER project will therefore:

- Increase the transnational municipal network effect by facilitating unrestricted communication and community involvement

- Influence related policy planning and decisions

- Offer an innovative and effective open source solution to excluded regions, cities and users, based on a 'link and scale up' strategic network

- Prioritise social value, scalability, transferability, society empowerment and motivation to act.

POWER responds to the call and topic c) challenges by: - harnessing the collaborative nature of ICT to create awareness; - reducing the gap between stakeholders of specific city challenges; - addressing scalability and deployment for new cases; - involving excluded stakeholders; - integrating water issues into economic and social policy; - being based on the networks: EIP Water - Action Group City Blueprints and NetwercH20; - engaging with decision makers, professionals and the general public

WaterSEED		665874
Title: Social, entrepreneurial and excelling doctors for water technology		
Call Id: H2020-MSCA-COFUND-2014	Topic: **MSCA-COFUND-2014-DP**	Type of Action: **MSCA-COFUND-DP**
Project start date: 2/1/2016	Duration: **60 months**	Unit: **REA/A/04**
Total costs: €6.670.800	EU requested grant: **€3.335.400**	
Main thematic area: 83 - Water governance / engagement, capacity building		

Free keywords: *Entrepreneurial, Interdisciplinair, Excelling Doctors, Breakthrough technology, Social relevance*

Abstract:

The objective of the WaterSEED project is to provide a doctoral program to excellent early stage researchers (ESRs) that want to develop their skills and contribute to the development of breakthrough technologies for water related challenges. Key elements in the program are the strong focus on interdisciplinary interaction, entrepreneurial skills and societal relevance.

The project will use the existing Wetsus doctoral (PhD) program as a strong base and will enable this program to become even more international and relevant for the European society. The Wetsus doctoral program has grown in the 10 years of its existence to a prime example of smart, regional specialization on water technology with a strong European connection between research institutes and industry partners. The research in the Wetsus program takes place in close collaboration with 90 companies that actively participate in the research through paying memberships to focused and high trust research themes. All Wetsus researchers have at least three contacts per year with these industry partners. The current doctoral program has a strong regional and national funding base.

Through COFUND this program will be further expanded and strengthened by attracting 45 international, excellent young researchers to the program in the period of 2015-2020. It will also strengthen the European connection of the program by increasing the number of researchers from other countries than the host organisation to over 70%. The ESRs will be selected in two calls per year through a transparent and thorough selection process, including a two day WaterSEED Recruitment Challenge at Wetsus for the best candidates.

IC4WATER		730264
Title: Tackling Water Challenges in the International Context		
Call Id: H2020-SC5-2016-OneStageB	Topic: **SC5-11-2016**	Type of Action: **CSA**
Project start date: 1/1/2017	Duration: **60 months**	Unit: **RTD/C/01**
Total costs: €2.289.000	EU requested grant: **€2.289.000**	
Main thematic area: 83 - Water governance / engagement, capacity building		

Free keywords: *international cooperation; mapping; UN SDGs; cooperation models; water challenges*

Abstract:

The Joint Programming Initiative Water Challenges for a Changing World, the Water JPI, is an intergovernmental initiative which strives to achieve sustainable water systems for a sustainable economy in Europe and abroad.

IC4WATER's objectives include supporting agencies in stepping up international cooperation: through the sharing of best practices, networking, closer coordination of existing activities, and the establishment of new relationships to facilitate multidisciplinary networking across the water challenges at a wider scale, both with respect to research and geographical areas. A mapping of the existing research cooperation models (mainly bilateral – between a Member State or the European Commission and some Beyond Europe countries) and a comparative analysis of existing cooperation models will be issued to identify barriers and challenges to transnational collaboration, and formulate successful mechanisms for working together efficiently beyond this bilateral approach.

In order to become more than a 'network of networks' and a dialogue platform for research programmes and to bring genuine added value to the current cooperation models, IC4WATER will be focusing on key topics of the Water JPI Strategic Research & Innovation Agenda. As an initial focus, the Water JPI Governing Board, which endorsed the IC4Water concept in November 2015, has agreed a plan to pilot new principles of international transnational cooperation through concrete joint programming, focusing on the theme of UN Sustainable Development Goals related to Water challenges. A shortlist of key 'UN SDG thematic' RDI areas will be scoped in more detail and will serve as recommendations for joint activities (opportunities for cooperation with funding RDI governmental institutions or for RDI support for market development, first domains of development of the Water JPI knowledge hub, joint transnational call with partners willing to commit additional national / regional funds for RDI projects).