

<b>JPI Partner, EU Member State</b>	<b>The Netherlands</b>	<b>NL</b>
Total declared Water RDI Funding: 100 M€/yr		

**Netherlands Enterprise Agency (RVO.nl)** encourages entrepreneurs in sustainable, agrarian, innovative and international business. It helps with grants, finding business partners, know-how and compliance with laws and regulations. The aim is to improve opportunities for entrepreneurs and strengthen their position. The Agency works at the instigation of ministries and the European Union. Netherlands Enterprise Agency is part of the Ministry of Economic Affairs. The organisation has been in existence since 2014 and is the result of a merger between NL Agency and the Dienst Regelingen. Some activities of the Commodities Boards are also included. Netherlands Enterprise Agency focuses on providing services to entrepreneurs. It aims to make it easier to do business using smart organisation and digital communication. The Agency works in The Netherlands and abroad with governments, knowledge centres, international organisations and countless other partners

The current main R&D programme is the **Topsector Water**. Topsector Water is a collective programme of the Dutch government, private sector and public research institutes to promote and support innovation and export in the private sector. Topsector Water has set an ambitious and firm goal: Double the added value between 2010 and 2020. It represents three pillars: Maritime, Delta- and Watertechnology. Besides the Topsector Water different national and regional programmes exist with a focus on public tasks. For the JPI Water only the delta and watertechnology sector are of importance.

The Water Technology sector provides top-quality water and top quality waste water treatment, while keeping the pressure on the environment as low as possible. Dutch knowledge and technology, developed to produce drinking and industrial water of the highest level, is applied and sold worldwide. This also applies to our knowledge and technology regarding the treatment and reuse of wastewater and water infrastructure.

The international market for water technology is large and mainly offers opportunities for local and integrated solutions for the supply of water and for technology for the use and reuse of freshwater. Four innovation themes have been formulated:

- Water for All
- More Crop per Drop
- Water & Energy
- Water & IT

#### Water for All

Water for All comprises the production of drinking and industrial water, and the purification of wastewater at a minimum cost. The scope of this market is estimated globally at €50-60 billion per year. The strong growth of this market is in line with the rising global need for freshwater as a source of drinking and industrial water. New wastewater purification technology is needed to be able to provide a sustainable, good quality supply of water without burdening the environment. The demand for this technology is in part driven by more stringent legislation and higher quality standards.

#### More Crop per Drop

More Crop per Drop focuses on a high quality freshwater supply for food production. There is much to be gained by using innovative and sustainable solutions for closing water cycles and by reusing water in the agriculture and horticulture sectors. As an extension of the agriculture and horticulture sectors, the food industry is facing the challenge of dealing efficiently with scarce raw materials and making processes more sustainable as a condition for a license to produce.

### Water & Energy

Water & Energy focuses on making the processes for the energy production industry more sustainable and on new forms of clean energy based on water technology. The use of water in the energy sector is continuing to rise. With the growth of the world's population and the growing demand for energy, this trend must be reversed. The expectation is that alternative forms of energy generation based on water technology will contribute to the transition from fossil fuels to clean energy.

### Water & IT

Water & IT focuses on expanding the efficiency of water technology by checking water quality using automatic sensing & monitoring, and on optimal control of the water chain (process control). This offers opportunities to significantly improve the processes of water treatment plants as well as opportunities for a decentralised fit-for-use water treatment.

The Delta technology (open water management) enables us to live and work in low-lying Delta regions like the Netherlands. The Netherlands has a strong international reputation in the field of delta technology. The building of the Sand Motor and Maasvlakte II are wonderful projects that showcase our innovative strength for the rest of the world. And, other countries call on Dutch technology, for example in making New Orleans 'waterproof', building a storm surge barrier in St Petersburg or obtaining advice after Hurricane Sandy struck New York.

Society requires integrated and sustainable water-system management solutions to problems involving the quantity and quality of our surface water and protection against high water. The delta technology sector has chosen to cluster knowledge development and innovations in four themes:

- Water Safety
- Water management
- Eco-engineering
- Asset management

### Water Safety

This topic deals with understanding morphological and hydrologic changes in water systems; water risk management, real time monitoring of the condition of dykes and early warning systems, multifunctional use of dykes (energy & water nexus) and the concept of multi-layer water safety (prevention, spatial adaptation and risk management).

### Water management and water security

This topic includes smart management of water on the national, regional and local level and research into regional self-sufficiency and water use efficiency. Major question is how to introduce a fair water supply system to satisfy the needs of regions and water-users. A major topic is also to combat salt intrusion due to sea level rise or to adapt to more saline conditions.

### Asset management (design, planning, building, management and financing of infrastructure)

Asset management and spatial planning play an important role in keeping the Delta livable. Main questions involve the life-cycle approach of assets, the integration of different investments, spatial planning with respect to climate change and soil subsidence. Main topics are:

- Sustainable delta cities (climate resilient cities), including mapping and monitoring delta cities, designing and planning resilient delta cities, and climate adaptive construction and (re)development, but also
- Replacement of aging sluices, locks and storm flood barriers.

### Innovate with Nature

Innovate with Nature contributes to achieving economic goals as well as goals involving nature and our living environment. Over the past five years, we have been successfully developing this concept within the Building with Nature innovation programme. The concept is already enabling the hydraulic engineering sector to remain competitive on the international market. The ambition is to see the ‘eco-dynamic design concept for spatial development’ become globally accepted, applied and developed further.

Water Safety stands for integrated, sensible and risk-based protection against high water, or ‘multi-layered safety’. Prevention, sustainable spatial planning and sound disaster management together ensure optimal safety at the lowest possible cost.

Other relevant Research, Development and Innovation research programmes in the Netherlands include:

- The National Knowledge and Innovation Programme **Water and Climate**. It focusses on water safety, water security, aquatic ecosystems and spatial adaptation. It is mainly a public driven programme in order to implement national and European water and climate policy.
- Regional programmes, include programmes initiated by water companies (e.g. funding KWR) and water boards (partly via STOWA).
- [STW Perspective Programme](#). It focuses on solving technological problems by developing new technologies in a multidisciplinary approach, through cooperation with end users, through co-financing by private parties and by setting up special activities like valorization and entrepreneurship.

[NWO](#) “Water and Climate” and “Sustainable Earth Research” Programmes. The Water and climate programme contributes to innovative insights into the fundamental principles underlying climate extremes, flood security, fresh water supply (for example as drinking water and in agriculture), changing ecosystems and the boundaries of the intrinsic predictability of fluctuations and trends in the climate. The theme will also contribute to knowledge development that benefits the manageability and controllability of water systems. The “Sustainable Earth Research” Programme is being developed under the auspices of the National Partnership for Sustainable Earth research (NPDA), whose members include NWO, Knowledge for Climate Foundation, Energy research programmes, and several larger and smaller institutes that steer research in the field of sustainability and the Earth.

**Table on major RDI Funding Institutions**

Funder Name	programme	Water Programme name (if any)	Target: Research / Innovation	Bottom-up / Top-down	Annual RDI Water Funding (M€)
<b>Min EZ</b>	Basic Funding Applied research	Applied research	Innovation	Bottom-up	10
<b>MIN EZ</b>	Top-up TKI	TS Water	Innovation	Bottom-up	5
<b>Min EZ</b>	DLO: KB/BO	Public Tasks	R&I	Both	Pm
<b>Min IenM</b>	KPP (BOA + LT)	Public Tasks	R&I	Top-down	> 40
<b>Min IenM</b>	Partners for Water	International	R&I	Both	
<b>Min IenM</b>	KNMI/PBL/RIVM	Public Tasks	Research	Both	
<b>MIN BuZA</b>	Different programmes	International	R&I	Both	
<b>MIN OCW</b>	Basic funding Scientific Research	Scientific research	Research	Bottom-up	
<b>MIN OCW</b>	NIOO-KNAW			Bottom-up	
<b>NWO/STW</b>	Scientific Research calls	Water and Climate	R&I	Bottom-up	> 10
<b>EU</b>	H2020 /ESIF		R&I	Bottom-up	>10
<b>Water boards</b>		Public Tasks	R&I	Top-down	> 7
<b>Water companies</b>		Public Tasks	R&I	Top-down	> 8
<b>Provinces</b>		Public Tasks	R&I	Top-down	> 4
<b>Municipals</b>		Public Tasks	R&I	Top-down	

**Table with publications and patents data**

Indicator <sup>1</sup>	SRIA theme	Publications		Patents	
		The Netherlands	Europe <sup>2</sup>	The Netherlands	Europe
Raw data	Q1	2652	33531	2	59
	Q2	2309	37391	36	855
	Q3	7928	134254	37	759
	Q4	1254	15957	11	184
	Q5	2030	22514	16	329
	ALL	8861	142901	98	2256
Increasing rate <sup>3</sup>		2.2	2.1	1.1	1.3
Patens per 1,000 publications		NL: 11.06 ; Europe: 15.78			
Standardized by population <sup>4</sup> (10 <sup>6</sup> Inhabitants)	Q1	157.3	53.7	0.0	0.0
	Q2	137.0	59.9	2.1	1.4
	Q3	470.4	215.0	2.2	1.2
	Q4	74.4	25.5	0.7	0.3
	Q5	120.4	36.0	0.9	0.5
	ALL	525.7	228.8	5.8	3.6
Standardized by GDP <sup>5</sup> (100 x 10 <sup>3</sup> M EUR)	Q1	449.0	229.3	0.3	0.4
	Q2	391.0	255.7	6.0	5.8
	Q3	1342.4	918.1	6.3	5.2
	Q4	212.3	109.1	1.9	1.3
	Q5	343.7	154.0	2.7	2.2
	ALL	1500.4	977.2	16.6	15.4

<sup>1</sup> All data correspond to the period 1999 - 2013.

<sup>2</sup> Considered as the 28 EU Member States plus the 12 Associated Countries.

<sup>3</sup> Increasing Rate is the number of publications or patens in 2009-2013 divided by the number in 1999-2003 (considering ALL water topics).

<sup>4</sup> Population obtained from [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_population](http://en.wikipedia.org/wiki/List_of_countries_by_population).

<sup>5</sup> Gross Domestic Product (GDP), nominal, obtained from [http://en.wikipedia.org/wiki/List\\_of\\_countries\\_by\\_GDP\\_%28nominal%29](http://en.wikipedia.org/wiki/List_of_countries_by_GDP_%28nominal%29)

**Tables on Funders and Performers obtained from publications analyses**

SRIA theme	Funding Institutions	Acronym	Intensity of citations
<b>Q1</b>	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		100
	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH	NWO	17
	WAGENINGEN UNIVERSITY		10
<b>Q2</b>	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		100
	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH	NWO	61
	CITY OF LEEUWARDEN		39
	PROVINCE OF FRIESLAND		39
<b>Q3</b>	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH	NWO	100
	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		40
	DUTCH TECHNOLOGY FOUNDATION	STW	19
	CITY OF LEEUWARDEN		18
<b>Q4</b>	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		100
	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH		75
	NETHERLANDS DIRECTORATE GENERAL FOR INTERNATIONAL COOPERATION	DGIS	40
	NETHERLANDS FOUNDATION FOR THE ADVANCEMENT OF TROPICAL RESEARCH	WOTRO	35
<b>Q5</b>	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH	NWO	100
	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		84
	UTRECHT UNIVERSITY	UU	25
	WAGENINGEN UNIVERSITY		20
<b>ALL</b>	NETHERLANDS ORGANIZATION FOR SCIENTIFIC RESEARCH	NWO	100
	MINISTRY OF ECONOMIC AFFAIRS OF THE NETHERLANDS		63
	DUTCH TECHNOLOGY FOUNDATION	STW	18
	CITY OF LEEUWARDEN		16

SRIA theme	Performing Institutions	Intensity of citations
<b>Q1</b>	WAGENINGEN UNIVERSITY RESEARCH CENTER	100
	UNIVERSITY OF UTRECHT	47
	VU UNIVERSITY AMSTERDAM	39
	DELFT UNIVERSITY OF TECHNOLOGY	38
<b>Q2</b>	DELFT UNIVERSITY OF TECHNOLOGY	100
	WAGENINGEN UNIVERSITY RESEARCH CENTER	74
	UNIVERSITY OF UTRECHT	39
	VU UNIVERSITY AMSTERDAM	32
<b>Q3</b>	WAGENINGEN UNIVERSITY RESEARCH CENTER	100
	DELFT UNIVERSITY OF TECHNOLOGY	80
	UNIVERSITY OF UTRECHT	57
	VU UNIVERSITY AMSTERDAM	39
<b>Q4</b>	WAGENINGEN UNIVERSITY RESEARCH CENTER	100
	DELFT UNIVERSITY OF TECHNOLOGY	26
	VU UNIVERSITY AMSTERDAM	15
	UNIVERSITY OF TWENTE	13
<b>Q5</b>	WAGENINGEN UNIVERSITY RESEARCH CENTER	100
	DELFT UNIVERSITY OF TECHNOLOGY	65
	UNIVERSITY OF UTRECHT	36
	VU UNIVERSITY AMSTERDAM	27
<b>ALL</b>	WAGENINGEN UNIVERSITY RESEARCH CENTER	100
	DELFT UNIVERSITY OF TECHNOLOGY	66
	UNIVERSITY OF UTRECHT	44
	VU UNIVERSITY AMSTERDAM	35