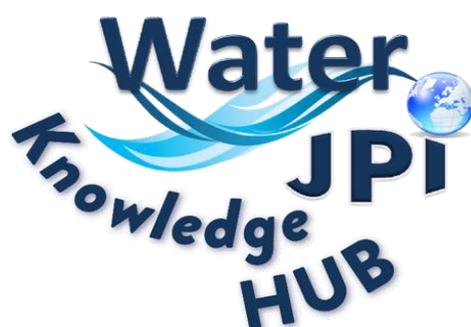




**Water Works 2015-2020 in Support of the Water JPI
ERA-NET Cofund Action**



**WATER-3-2015: Stepping up EU research and innovation
cooperation in the water area**

2019 Water JPI Knowledge Hub Workshop #4

with Seed Group Report

(WP7, Task 7.1)

October 2019



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List of Abbreviations

AMR: Antimicrobial Resistance

ANR: Agence Nationale de la Recherche (France)

CEC: Contaminants of Emerging Concern

EPA: Environment Protection Agency of Ireland

FORMAS: Swedish Research Council Formas (Sweden)

JPI: Joint Programming Initiative

KH: Knowledge Hub

KHCEC: Knowledge Hub on Contaminants of Emerging Concern

KT: Knowledge Transfer

SRIA: Strategic Research and Innovation Agenda

UWWTD: Urban Waste Water Treatment Directive

Water JPI: Joint Programming Initiative

WFD: Water Framework Directive

WWTP: Waste Water Treatment Plant

Executive Summary

This report contains the proceedings of the Water Joint Programming Initiative (Water JPI) **fourth Workshop for the Knowledge Hub on Contaminants of Emerging Concern (KHCEC)**. The establishment of a Knowledge Hub (KH) is part of one of the additional activities of the ERA-NET Cofund program WaterWorks2015.

The aim of the Water JPI Knowledge Hub is to build a network for **selected research groups and which is targeted at stakeholders**. The network will, **within a specific research area**, establish a critical mass of research and technological excellence, integration and sharing of knowledge, infrastructures, data and modelling tools, training and capacity building, in addition to improving communication and networking with stakeholders and the scientific community.

The Workshop took place in Dublin on 24 October 2019 with 22 attendees (**Annex 1**), mainly made up of the existing KHCEC seed group, and some members of the steering committee and funding partners of the Water JPI.

The fourth KH workshop began by providing an update on progress in the last period (March to October 2019) and setting the scene with respect to the scientific exercise that took place. This led into group exercises where participants were facilitated in brainstorming and co-creating elements of suitable knowledge transfer strategies for different target stakeholders. Stakeholders were profiled and key messages, channels, tools etc. were identified. This exercise was useful in helping participants better understand the components required for successful knowledge transfer.

In the afternoon, participants were introduced to good practice with regards to developing specific communication products for different channels and then took part in a highly interactive session working to co-create communication assets for different audiences. The co-creation was extremely beneficial and highlighted the need for a mixed expertise (science + communication experts) to be able to develop fit for purpose products for different target stakeholders.

The exercises demonstrated for participants the level of strategy required for customised knowledge transfer, but the discussions also regularly highlighted the challenges in relation to effective knowledge transfer – resourcing, timeliness and roles. In particular, Seed Group members mentioned that they are extremely busy already and knowledge transfer is not always of high priority within their own institutions/career pathway and they do not always have the skills.

The workshop concluded with an update on actions in the remaining period and legacy planning for the next period.

Overall, the 4th workshop marked an evolution in the activities in the KHCEC, moving from necessary stages of set up and structuring of the platform into an operational phase where the participants were co-developing outputs and defining the KHCEC's potential future role in transferring knowledge from science to stakeholders.



1. Introduction

1.1. Water Joint Programming Initiative

The Water Joint Programming Initiative, Water JPI (www.waterjpi.eu), entitled “*Water Challenges for a Changing World*”, was launched in 2010 and was later formally approved by the European Council in December 2011. As of March 2019, the Water JPI membership included a total of 23 member countries and three observer countries, which collectively represent 88% of European public research, development and innovation investment in water resources. The Water JPI is dedicated to tackling the ambitious grand challenge of achieving “*sustainable water systems for a sustainable economy in Europe and abroad*”.

As a result of coordination activities, Water JPI member countries have approved as of June 2016, a second version of the common Strategic Research and Innovation Agenda ([SRIA](#)) that lays down RDI priorities for the following 5 scientific themes:

1. Maintaining Ecosystem Sustainability;
2. Developing Safe Water Systems for the Citizens;
3. Promoting Competitiveness in the Water Industry;
4. Implementing a Water-Wise Bio-Based Economy; and,
5. Closing the Water Cycle Gap.

1.2. ERA-NET Cofund WaterWorks2015

Within the ERA-NET Cofund programme [WaterWorks2015](#), Work Package 7 is focusing on Water JPI alignment activities. Alignment should enable the optimal use of national research funds.

Water JPI partners have identified several actions to attain alignment activities. Some of these actions are finalised or ongoing (e.g. joint foresight, mapping of European RDI actors in the field of water, the approval of a common SRIA, the writing-up and update of an implementation plan, the launch of stakeholder consultations, cooperation between JPIs, and set-up of a Knowledge Hub) whereas others are planned in the near future (e.g. training of researchers, and the shared use of RDI infrastructure).

A “knowledge hub” is understood to be a “network consisting of selected research groups within a defined area of research. The added value of the Knowledge Hub includes the establishment of a critical mass of research and technological excellence, the integration and sharing of knowledge, infrastructure, data and modelling tools, training and capacity building, as well as improved communication and networking with stakeholders and the scientific community” (WaterWorks2015, Work Package 7, Task 7.1).

WaterWorks2015 has had four Knowledge Hub workshops (with Seed Group) to date and a number of meetings/networking events in 2018 (Helsinki Water JPI Conference, June and a side event at XENOWACII conference, Cyprus, in October); a preliminary workshop was held on 22 March 2017 in Dublin (Ireland) with the objective of defining the vision and operational/ managerial aspects of the Knowledge Hub, by setting the conditions for the launch of this first Water JPI Knowledge Hub. The first workshop’s main objective was to launch the Knowledge Hub on Emerging Pollutants (March



2018, Stockholm). The overall aim of this workshop was to discuss how the efficiency and effectiveness of the Water JPI Community activities could be improved based on the question: Can we do more with what we have? The seed group experts and the Knowledge Hub Steering Committee met in Helsinki on 5 June 2018 for a second workshop with the objective of identifying possible areas for Policy Briefs. A third workshop was held on 26 March 2019 in Madrid to start planning the development of a robust business plan to sustain the KHCEC post February 2020, to exchange knowledge of best practice communication activities and to realise the implementation plan by gaining a consensus on terms and topics and agreement on a communication approach.

1.3. Aims of this Report

This report contains the Proceedings of the 2019 “Scientific Outputs, Knowledge Transfer and Legacy” Workshop of the Water JPI Knowledge Hub on Contaminants of Emerging Concern held on 24 October 2019 in Dublin, Ireland. This **report** and the **master presentations** are available on a webpage dedicated to the [Water JPI Knowledge Hub](#).

This report is organised as follows:

- **Section 1:** Introduction and background to the Water JPI and Knowledge Hubs;
- **Section 2:** Overview of the workshop methodology;
- **Section 3:** Update of the Knowledge Hub activities and outputs;
- **Section 4:** Results of the scientific pilot exercise;
- **Section 5:** Results of the knowledge transfer sessions; and
- **Section 6:** Information on the next steps of the network.

2. Methodology

The 2019 Water JPI Knowledge Hub Workshop was organised by Intrigo (Knowledge Hub Facilitator) in consultation with Norbert Kreuzinger (Scientific Coordinator) and with the support of EPA (Ireland), the WaterWorks2015 partners, and the Water JPI Secretariat. The following sets out the aims and objectives of the workshop, the attendees invited, and the outline of the programme.

2.1. Workshop Aims and Objectives

The objectives of this fourth workshop, “Scientific Outputs, Knowledge Transfer and Legacy”, were to discuss the progress including the scientific activities and outputs, planned knowledge transfer of scientific outputs, future role and legacy plans.

2.2. Workshop Attendees

The workshop brought together 22 attendees in total, made up of the existing KHCEC seed-group, some members of the KHCEC steering committee (funding partners) and additional Water JPI members. The full list of participants is provided in **Annex 1**. Nine members of the Seed Group from 8 countries participated. Intrigo provided 5 staff on the day to help facilitate the workshops interactive sessions (David Murphy, Georgia Bayliss-Brown, Keegan Porter, Avril Hanbridge, John Joyce).

2.3. Workshop Programme

The programme was designed to stimulate open discussions and co-creation of outputs by the participants. The workshop included an introductory session to set the scene, followed by a scientific pilot exercise session chaired by Norbert Kreuzinger, KHCEC Scientific Coordinator (TU Wien, Vienna) and a knowledge transfer session chaired by David Murphy, KHCEC Facilitator (Intrigo, Dublin). The final session on the next steps was led by Kristina Laurell, KHCEC Steering Chair (Formas, Stockholm), before the meeting close by Dominique Darmendrail, Water JPI Coordinator (ANR, France). The detailed programme is provided in **Annex 2**.

2.3.1. Session I: Knowledge Hub Activities Update

Kristina Laurell provided a welcome address while David Murphy updated the participants on activities since the last workshop in March 2019. Participants were also asked to reflect on the preceding Water JPI SRIA expert workshop (22-23 October 2019). Lisa Sheils (EPA Ireland) also provided a presentation on latest policy processes of relevance to KHCEC.

2.3.2. Session II: Scientific Pilot Exercise

Norbert Kreuzinger set the scene, looking back at the process undertaken to produce the latest version of the scientific documents. The latest designed draft was reviewed, with feedback provided from the Seed Group present. An open discussion was facilitated in order to agree on key messages, and on the final technical level and communication mediums of the document.

David Murphy then introduced the Intrigo knowledge transfer methodology. Three smaller groups (Table 1) applied this process for transferring ideas from the seed group for scientific activities going forward using the exercise to identify target stakeholder end users for the KHCEC in member states, with a focus on science to policy, science to industry, and science to the public.

Table 1. Breakout groups during the workshop sessions

Group	Members	Facilitator
1	Dominique DARMENDRAIL, Kristof DEMEESTERE, Laura FORSSTRÖM, Corinne LE GAL LA SALLE, Lisa SHEILS, Henning SØRUM	David MURPHY Lisa Sheils
2	Aimie CRANCH, Harri HAUTALA, Kristina LAURELL, Foon Yin LAI, Elzbieta PLAZA, Timo TARVAINEN	Georgia BAYLISS BROWN Avril HANBIDGE
3	Enda CUMMINS, Kevin JEWELL, John JOYCE, Zakhar MALETSKYI, Fiona WALSH	Keegan PORTER
	Norbert KREUZINGER	Attended all tables

2.3.3. Session III: Knowledge Transfer

Following the initial identification of target users, David Murphy facilitated the session on producing working outputs, starting with a setting the scene presentation. Kristina Laurell presented examples of a national strategy for disseminating KHCEC outputs from Sweden for the absent Karin Wiberg. A presentation of science to policy followed, focusing on the reform of the Water Framework Directive (WFD), the Urban Waste Water Treatment Directive (UWWTD) etc. The team from Intrigo presented ways to effectively use words and visuals to communicate messages, after which three carousel stations were set up. Each table (same participants as in Session II – see Table 1) discussed the previously identified messages and ways to convey them appropriately to a selected audience. Facilitators presented the cumulative results per station in order to reach an agreement on a post-meeting action plan. The aim was to get commitment from the Seed Group to try at least one knowledge transfer activity in their own country and report back.

2.3.4. Session IV: Next Steps for Current Phase & Legacy Planning

Steering Committee chair Kristina Laurell led the final session on the next steps for the remaining period of the current KHCEC phase (until February 2020). It is hoped that each Seed Group member will carry out at least one Knowledge transfer pilot exercise before the end of the current phase using/adapting assets developed centrally by the facilitator. Furthermore, Kristina will be in contact to capture feedback into the assessment of the current phase. There are currently discussions taking place on the terms of reference of the next phase and Kristina will update Seed Group members in due course.

2.3.5. Close of meeting

Dominique Darmendrail, Water JPI Coordinator, closed the meeting reflecting on her positive experience of the meeting and recognising the importance of Knowledge Transfer. She informed participants that a decision is still pending on the future of the knowledge hub and that in the last period it was important to close out the work in order to show the national funding agencies the benefits of funding such a hub. She thanked the Scientific Coordinator, Facilitator, SC chair, EPA Ireland and Seed Group for their efforts to date.

3. Session 1: Knowledge Hub Activities Update

3.1. Welcome Address and Round Table Introductions

Chaired by David Murphy.

Kristina Laurell opened the workshop and welcomed all attendees followed by round table introductions by all participants.

3.2. Update on Activities

KHCEC Facilitator David Murphy updated participants on the activities undertaken between March and October 2019;

- Proceedings of Madrid 3rd KHCEC workshop written up and approved (30/4/19)
- Draft Business Plan developed by Facilitator and Scientific Coordinator (5/4/19)
- Package of KHCEC Documents Updated and submitted to Steering Committee (5/4/19)
 - Business Plan (v1 30/4/19)
 - Implementation Plan (v2 30/4/19)
- Brainstorming with Scientific Coordinator on Scientific Work
- Steering Committee have had several conference calls on activity and legacy



Figure 1: Picture of the workshop participants in Dublin

David also reminded the seed group of the achievements/outputs to date; Workshops, 2 policy briefs, a Who is Who document, Implementation Plan, Business plan and the draft of the scientific document.

3.3. Reflections from KHCEC experts who attended SRIA expert workshop

Workshop participants who attended the Water JPI SRIA expert workshop meetings (22-23 October 2019) were given the opportunity to share key reflections (observations on process, relevant Information for Knowledge Hub, opportunities arising), the responses included;

- Knowledge transfer was highlighted as being very important.
- It is not clear whose role it is to carry out the knowledge transfer, understanding that scientists are already very busy and usually not experienced.
- Indicators for successful projects are needed; how can impact/success be measured?
- CEC's were not mentioned much during the workshop.
- There's a gap between science and society. Where to start communicating such complex issues, and how to help society absorb it.
- Often focus is on the importance of applications either for the environment or for citizens but water is important for everyone and should benefit the whole of society and the environment.

- We can engage by addressing water value and usage, communicating how to value water for society and how to reduce the pressure chemicals are causing to the environment.
- The SRIA is too complex and the Water JPI already need to consider how to design and communicate it better.

3.4. Science to Policy Scene Setting

There was a slight change to the agenda. Lisa Sheils provided a presentation on Science to Policy during Session I, which was previously scheduled for Session III. The presentation highlighted key policy processes currently underway where the KHCEC could potentially influence and interact with (see presentation).



Figure 1: Overview of water related policy processes (Source: EC)

4. Session 2: Scientific Pilot Exercise

4.1. Reminder of Process

In Phase III of the KHCEC Implementation plan, the objective was to bring science to the fore. Norbert Kreuzinger introduced the latest Scientific Document report and the drafting processes undertaken:

- Scientific Coordinator selected sub-topics for focus of Scientific Exercise (June)
- A template generated by Facilitator and request sent out to Seed Group members (July)
- Scientific Coordinator and Facilitator drafted a scientific document based on Seed Group inputs (8 responses) and own research over summer.
- A draft Scientific document (v1) was sent out to Seed group members (8/10/19)
- Seed Group provided feedback/input to the document by (17/10/19)
 - *By Google Docs, track changes in word, email correspondence*

- Feedback was incorporated to generate a new draft - Scientific document (v2) & Citation List was updated
- New version was distributed to the Seed Group to review in advance of workshop (22/10/19)

4.2. Review of the latest version of the Scientific Documents

Norbert Kreuzinger reminded participants that the Scientific Document 2019 is not a scientific review of the CEC topic but more a compilation of key messages that could be important to transmit to different target audiences. Currently the document is not seen as a standalone published product but rather it could be used as a starting point to generate customised messages and products for different audiences.

Norbert shared a recent experience when talking to a local mayor in Austria. The mayor understood the issues and was keen to make changes. However, the mayor encountered a challenge in securing funding to upgrade the local wastewater treatment plant (WWTP) to higher standards as there was no legal requirement. Norbert felt that there is a need to convince the general public as to why an upgrade is needed without the technical jargon and to consider strong messages. Norbert highlighted the issue of microplastics in the aquatic environment that has raised major attention in the public domain. Perhaps “water” needs a similar surrogate (such the impact of endocrine disruptors) to begin a conversation and engage the public.

Due to time constraints, the usefulness of the Scientific documents was addressed in the next session (see 4.3).

4.3. Development of a Knowledge Transfer Strategy per stakeholder type

The aim of this session was to brainstorm in order to develop a knowledge transfer strategy per stakeholder type. Participants were divided amongst three themed tables categorised by broad type of stakeholder (policy, industry, society). Each table had facilitators who chaired the discussion, helped the group brainstorm on components of a knowledge transfer strategy and captured the inputs. A handout on developing a knowledge transfer strategy (**Annex 3**) was provided.

Questions posed to the participants included;

Identify;

- Specific target Stakeholder(s)?
- Identify the Key Message(s) you want to transmit
- What is a Successful Transfer Outcome?

Participants were asked to try and profile the identified stakeholders in terms of;

- Technical level
- Role/responsibility
- Current mandate
- Preferred sources of information/knowledge
- Key influencers

Participants were also asked to consider what communication channels could be used.

Finally, they were asked to consider timing: Are there any milestones (e.g. policy process deadline) or events (e.g. consultation) that are opportunities for knowledge transfer?

At the end of an allocated time (25-10 min per station), participants rotated to another table where they were updated on the previous groups discussions and then provided their inputs. By the end of the session, all participants had spent time on every table. Inputs were captured on flipcharts and the facilitators reporting on the main outcomes at the end of the session.

4.3.1. Science to Policy

There are a lot of policies and policy actors related to water that makes science to policy particularly challenging. This table had a productive brainstorming session, but it was recognised more time was needed to be comprehensive.

Table 1. Key messages to be communicated to policymakers

1. The issues around CEC's need to be clearly communicated, possibly by relating them to daily life.
2. Practical solutions should be presented/recommended including risk assessment, cost and management options.
3. Short-term actions and long-term perspectives vary and should be split out when communicating.
4. Legislation needs to be fit-for-purpose. <ul style="list-style-type: none"> - We should prioritise trying to influence changes to the WFD watch list and current limits/EQS chemical and monitoring methods. - Focus on the most high-risk issues
5. Engage in topics where evidence exists (e.g. AMR) and make clear recommendations
6. Standardised monitoring (inter-calibration).

During the session, the participants were able to identify key stakeholders but there was no time to discuss key messages per stakeholder nor expected outcomes.

Table 2. Policy Stakeholders Identified

Policy Stakeholders Identified		
Politicians	Lobbyists	General public/citizens
Scientific Advisers	Governmental staff tasked with formulating legislation	NGO's
Mandated Authorities (enforcement/monitoring)	European Commission (DG ENV, DG RES)	Civil Society Organisations

4.3.2. Science to Industry

It was felt that when communicating to industry about CECs and the work of the KHCEC, the information should be presented in terms of risks (the risk of ignoring the problems or only applying short-term solutions) and benefits of taking steps now for long term adherence to recommendations. These messages should not come off as overly punitive, but rather emphasise the opportunities available to industry.

Table 3. Key messages to be communicated to industry

<ol style="list-style-type: none"> 1. Proper action now should be thought of as future proofing. Any approach to industry should strive to bear in mind that industries want to know whether: <ol style="list-style-type: none"> a. Regulatory policies will continue to get more stringent. b. The list of contaminants highlighted is unlikely to significantly change (or at least not to the point of requiring entirely new technologies/methods). c. The technology/methods currently available to invest in will still be sufficient in 10-20 years. d. Actions taken today incorporate future costs. e. Investments today will be sellable in the future.
<ol style="list-style-type: none"> 2. Small changes in chemical structures and short-term changes will still wind up costing more money in the long term. Environmentally friendly solutions will need to be made and making them sooner rather than later promises better market benefits in the long term.
<ol style="list-style-type: none"> 3. There is a contaminant problem in our society and environment, and industry needs to be aware of it and their role in it. This includes being aware of potential side products and chemical reactions associated with CECs.
<ol style="list-style-type: none"> 4. Industry is part of the solution, and it can and should be involved in the solution process. There is a need to champion Corporate Social Responsibility.
<ol style="list-style-type: none"> 5. Waste Water Treatment Plants (WWTPs) and other critical actors need to expand monitoring to cover CECs, or a larger set of contaminants. Consider non chemical target analysis and bioassays for toxicology.
<ol style="list-style-type: none"> 6. The ultimate goal is to reduce the amount of contaminants released into the environment.

Based on these key messages, broad stakeholder groups were identified (Table 4). (For each of these stakeholder groups, the expected outcome of the knowledge transfer activity and also the potential channel or timing for these activities were discussed.) Some gaps remain due to time restrictions, rather than an intentional omission of a response.

Table 4. Knowledge transfer to industry

Stakeholders	Outcome	Channel	Timing
Pharmaceuticals	<p>Improve the return rate of unused packs and pills.</p> <p>Avoid discharging micropollutants or gain more control over what gets released (coordinate with regional WWTPs to ensure they can process what's released). Consider advanced treatment techniques (e.g. ozonation / nanofiltration)</p>	Lobbyists: Establish direct connections and provide them with the full information.	Related to public consultation, but often has a quick turnaround time.
Wastewater and water treatment plants	<p>Understand what's being released into water systems and working with researchers and manufacturers of those contaminants to develop better screening and treatment systems.</p>	Companies, and specifically R&D sections of companies: Hold targeted conferences, brokerage events and send them scientific documents directly.	

Agriculture	Fertilizers and pesticides: Evaluate their chemical composition and dissemination risk and choose the most environmentally friendly options.	SMEs and Trade Unions (e.g. Plastics Union): Specific thematic or sectoral conferences, newsletters or industry newspapers.	1- to 5-year sustainability reports.
Electronics/ microelectronics manufacturers and users	Science-based company decisions regarding chemical use and disposal.	Search engines (e.g. Google or Wikipedia): Control the flow of scientifically supported information through validated pages.	
Other chemical producers	Awareness of long production/ value chains and taking responsibility for the entire chain, as well as for generic versions of products (not just the named brands). Warning labels explaining proper disposal. Development of a global certificate (such as the MSC for fish). Take control of chemical waste disposal throughout the downstream value chain, and take actions based on long term scenarios. Take action to eliminate illegal dumping of their products. Conduct risk analyses for known brands and sell brand innovations in clean actions to the public.	Industry news: Ensure it's specific to local languages and contexts.	
Waste processors, food industry, textiles, aquaculture, forestry, energy	Take control and responsibility over the actions of subcontractors. View necessary changes as opportunities from a market perspective. Fundraising vs environmental reports, and gain support from fundraisers.		

4.3.3. Science to Society

It was felt that when communicating to society about CECs and the work of the KHCEC, the information should not come solely from the scientific document but should be more educational. In addition, it is important to explain why this is important to lay people and cover both the pros and the cons in messaging. Table 5 shows the key messages to be communicated to society.

Table 5. Key messages to be communicated to society

1. CECs can be a problem and humans and the environment are exposed to them daily (indirectly or directly), even in the water we drink.
2. There are different types of CECs and these include medicines, pharmaceuticals, cosmetics, anti-microbial resistance (AMR), personal care products, industrial chemicals, household cleaning products and pesticides.

3. The effects of exposure to humans and the environment are variable and it can be harmful, harmless or unknown. We have even less evidence to help us understand the long-term effects of exposure to complex mixtures of CECs. Even the reason to be careful and pro-active in looking for solutions: these substances should not be in our water resources.
4. Several practical solutions exist, and they can range from controlling CECs at the source to including guidelines for disposal on packaging and waste/water treatment technologies.

Based on these key messages, broad stakeholder groups were identified (Table 6). For each of these stakeholder groups, the expected outcome of the knowledge transfer activity and also the potential channel or timing for these activities were discussed. Some gaps remain due to time restrictions, rather than an intentional omission of a response.

Table 6. Knowledge transfer to society

Stakeholders	Outcome	Channel	Timing
School children from nursery to university	Ambassadors Influencing parents Future careers Changing behaviours	Via education boards School curricula Science museums Cartoons and stories Projects Social media (incl. vlogs) Open days and trips	Scientific fairs Competitions Curriculum reviews Celebratory events, e.g. World Water Week, Green Capital Week, Science Week
NGOs, e.g. WWF, Greenpeace	Influence policy, industry and public opinion	Campaign	
Intergovernmental, e.g. IPBES, UN Water			
General public	Behavioural changes Informed decisions	TV and documentaries Serious gaming Return incentives [Consider presenting best- and worst-case scenarios and empower to make a change]	To run at the same time as current topics in the media (which means being prepared to run a campaign)
Journalists	Provide a science base to respond to fake news Topic popularisation	Press releases and conferences News	EC breakfasts
Public health agencies and medical, pharmacy and veterinary professionals		Continuous education, e.g. MOOC with shared tools and content Industry magazines, e.g. BMJ	Conferences Avoid busy periods, e.g. winter illnesses
Consumer organisations		Accreditation Certification and quality marks Labelling	

Industry PR and marketing agencies		Corporate communications Ads Press releases	Trade fairs
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5. Session 3: Knowledge Transfer

5.1. Setting the scene

Several presentations were given to provide some context and additional information for the knowledge transfer session.

Kristina Laurell presented, in place of absent Karin Wiberg, examples of national strategy for disseminating KHCEC outputs. This included: new home pages about drinking water at Swedish University of Agricultural Sciences (SLU), communication of the policy brief to Swedish networks, send as a piece of news to communicators at the institute, plenty of media interest and other activities, and translation into Swedish for the Future Food Platform. Media (public radio interview), debate article, events (World Water Week, DRICKS, Swedish Water Research Cluster Venture).

At this point the issue was raised that it is difficult to define who to send the policy briefs out to. The following were identified as having worked for the previous KHCEC policy briefs:

- Interviews conducted prior to the release of the briefs.
- Raised at events, e.g. political weeks where policy makers are gathered in one place; World Water Week; or Breakfast Meetings on different topics.
- Utilising research clusters/networks e.g. DRICKS network for drinking water research or Swedish water research networks (cluster venture) e.g. stormwater, drinking water, wastewater etc.

Some queries followed on the last point. The funding for research clusters are to ensure networking, that all participants come together and to increase knowledge transfer between stakeholders. Networks are open to those with connections to university or other partners or if you work in water supply issues and have unique competence to offer. The key message from Kristina is that one conversation led to multiple conversations with multiple stakeholders – cascade of actions.

There is a time investment for conducting interviews and undertaking the KT process. Scientists received 5% funding for KT, but the communications and KT could be subcontracted. The point was raised that scientific researchers don't have the skillset, and while communication professionals get paid, the scientists don't - so how to get scientists themselves to engage as they are needed for the knowledge transfer process.

An overview of the directives and ways for participants to contribute was presented by Lisa Sheils (EPA, Ireland) had been previously presented in Session I. To recap, there are many opportunities, but these are not always taken advantage of – e.g. there was a public consultation for input into the WFD fitness check, but of the participants only 2 provided input. This poses the question why more of the experts did not contribute. If the policy processes are not understood, then you cannot influence policy, and science needs to influence policy, not politics.

The potential for KHCEC members to contribute to policy processes in the near future was identified as the following:

- Under WFD, Significant Water Management Issues (SWMI) in Ireland for the development of the river basin management plans (RBMPs), six-month consultation period will be open from January 2020 and requires input from all stakeholders from all countries. The Welsh consultation period is already open so check in other Member States for similar processes.
- The Marine Strategy Framework Directive (MSFD) consultation period for fitness check is currently open for all stakeholders.
- New Water Reuse Regulation <https://ec.europa.eu/environment/water/reuse.htm>

Intrigo presented on best practice in developing and using various communication tools, e.g. word based (press release and twitter), and visual (infographics and video). See presentations provided for more information.

5.2. Group exercise on communication channels/mediums

Following the introductory presentations, the same carousel methodology as session II was used. There were three tables: science to policy, visuals, words and facilitators on each table. Each facilitator had various assets relevant to the topic and captured the inputs from the participants. The objective was that by the end of the session, Seed Group members had the confidence and willingness to agree to try at least one knowledge transfer in their own country and report back before the end of the current phase.

5.2.1. Science to Policy

The Science to Policy Table continued where it left off in session II. In order to make things tangible, case studies were used for this session.

The first case study was the issue of a single substance, glyphosate in the environment which has been the subject of media attention and legal cases recently.

Participants were asked to consider the expected outcome of policy engagement on the subject. Ideas for “outcomes” included;

- Conversation: with experts in order to pool knowledge and obtain a consensus position on the issue
- Awareness: in terms of risks, knowledge gaps, applying the precautionary principle due to the gaps
- Research Prioritisation: secure funding to carry out more RTD on gaps



Figure 3: Science to policy table discussions

- Policy Change: ensure that appropriate legislation is in place. Where there are protocols for decision making, ensure that they have appropriate criteria to ensure the right result comes out
- Behaviour Change: try and influence consumer purchasing behaviour to remove demand and usage of the products.

The second case study related to the reform of the WFD where there is currently a consultation period (Jan – June 2020). The discussions highlighted that there are a lot of elements involved and the different experts in the KHCEC specialise in different aspects. However, it was agreed that there is a lack of consensus positions from the scientific community on the area of CEC's. This is one of the areas where the KHCEC could be of main added value. This led to a discussion on whose role is it to communicate how the KHCEC could work with other organisations/networks to communicate a consistent message.

Message?

- There is a need to obtain clear and consistent messages from the scientific community.
- Key topics prioritised for communication by participants: AMR, Trace Organic Chemicals (parameters, what to monitor and remove, and to what level?), (W)WTP operations in view of treatment and re-use, Endocrine disruptors.
- Perhaps different experts from the Seed group could form sub-groups to work on developing consensus evidence-based positions on key topics.

Channel?

- Respond to EU public consultation (submissions)
- Respond to National consultation (submissions or workshops)

Medium?

- Whilst individual submissions/inputs were identified as the channel, it was felt that a consensus position that is pushed by multiple individuals/organisations/networks/member states would be more powerful in influencing the agenda. Perhaps the development of a **KHCEC position paper** as a basis for all communications and channels would be very useful.

Who?

- It was suggested that individual scientists/institutes in the seed group could respond to national or EU public consultations based on position paper.
- In addition, the KHCEC position paper could be used to get wider support > fed into Water JPI (National funders & national positions) > European Commission (DG ENV & DG RTD).
- Alternatively or additionally, it might be possible to approach other organisations/networks to develop a joint position paper from the outset. Potential networks identified included; JPI AMR, NORMAN, WSSTP – now Water Europe, JPI Oceans.

Outcome of successful transfer to WFD consultations?

- Improved programme of measures in future WFD
- Research prioritisation focused on fulfilling current knowledge gaps that could inform WFD implementation.

5.2.2. Written Communication - Twitter

For this session, the facilitator had pre prepared a draft twitter feed for discussion based on the scientific document. Upon presenting the proposed Twitter thread, it was agreed that the tweets were not exciting enough to warrant high levels of engagement from the general public, nor scientific enough to attract scientific interest. It was agreed that Twitter would best be used to engage broad audiences and so the tweets should target society and follow the key messages that were discussed during the Science-to-Society workshop.

Initially, participants struggled to keep the messaging simple whilst ensuring that the tweets were scientifically robust. Quite quickly, the attendees realised that it was best to keep the tweets short, simple and personalised, talking to the reader as a consumer in lay terms. Time was limited yet the following tweets were agreed (Table 7).

It was then proposed that Intrigo could consider finalising the text and providing supporting images to the KHCEC to allow them to share these messages within their own networks.

Table 7. Tweets developed during the meeting

Text	Image
A portion of antibiotics* taken will end up in the toilet. Where does it go then?	Toilet – perhaps comical
It isn't just antibiotics* that go down the toilet, it's a whole universe of CECs	Graphic showing how small the proportion of antibiotics are compared to all the CECs that exist.
There is where CECs end up, and some comes back to you.	Graphic showing the 'CEC cycle' from the home to wastewater treatment plants to the environment, etc.
You can do your bit and here is how: 1.) Next time you go to the pharmacy, only take what you need 2.) Choose Ibuprofen over Diclofenac as it is easier to treat and less harmful on your kidneys (example only; both are no antibiotics)	Images to support solutions. This could be done in multiple threads.
Is water even pure and how pure do we want it? In fact, drinking 2 litres of pure water can kill us and so some "impurities" have benefits. Pure water should only have a place in the lab or in your iron.	Images relating to the importance of clean water, and what minerals are important for us.
Our actions are having an impact on others. For example, it is becoming harder to treat pets with antibiotics and fish are being affected by birth control pills.	Cute pet alert.
Every medicine** that you dispose of down the toilet could end up back in your drinking water.	Cartoon of simplified 'CEC cycle'.
Next time you go to the pharmacy, only take what you need	
*where antibiotic can be replaced by any household CEC **creams, personal care products or household products	

5.2.3. Visual communication - Infographics

For this exercise, participants were presented with a four-section infographic “story” describing: 1) what are CECs? 2) the challenge of monitoring studies for a broad variety of CECs in aquatic systems, 3) CEC occurrence in WWTP effluents, and 4) next steps.

Designed by Intrigo beforehand as a starting point, it was agreed by all that the layout of the story is good, but that there is work to be done on the infographics and the figures depending on the target audience (see Figure 5 left top picture).

Figure 4 captures the many infographic replacements suggested/workshopped. It was agreed that it might be good to make two versions: one with only minor changes to Intrigo’s version for presentation to industry and scientists (trendy, business-like) and one with more descriptive images for broader audiences. Many of these, particularly the mirrored tableaus 3 and 4, and the marching CECs could make for good standalone infographics as well. Table 8 below lists the suggested changes.

Intrigo will take the suggestions (Figure 4) and finalise the infographics for the Seed Group to distribute as suits.

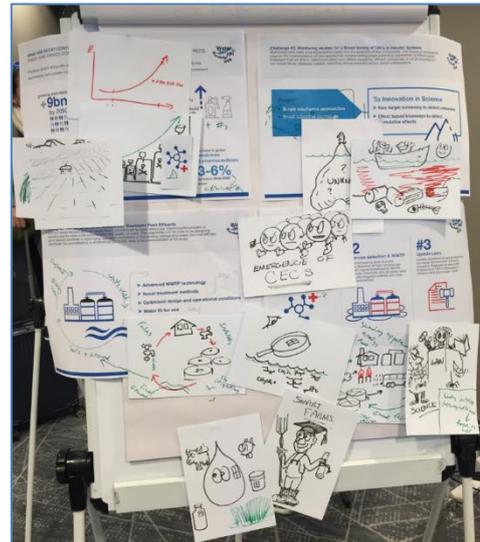


Figure 4: Results of infographic brainstorming.

Slide 1

- Overall aim should be that the four outside elements are neutral or good for society, but they are having an unseen negative impact.
- The current central image looks as though it’s a positive thing, when in fact it’s bad.
- The use of absolute numbers (e.g. 110,000,000) vs percentages might be more impactful.
- Include figures on anything with an infographic.

Slide 2

- Single substance approaches are still applicable in some scenarios, so rather than moving from them to the innovations in science, consider describing the latter as being added as an additional toolset.
- Maybe change the narrative to describing how much we have yet to learn or how new technology is revealing how much more there is than we used to realise.

Slide 3

- The three main parts of the cycle are: drinking water > wastewater > surface and ground water > drinking water
- Use a broad tableau with this central cycle in the middle but being fed into by visible things in the background, such as farms and manufacturing plants, and showing the surface and ground water. The point is to show how much more there is to this cycle than might be realise, and how many points of risk there are for contamination.

Slide 4

- The image of step #2 can be used in slide 3.
- An infographic showing scientists providing lawmakers with the knowledge they need to construct policy would be good.

Figure 5: examples of the infographic brainstorming



6. Session 4: Next Steps and Legacy Plan

6.1. Agreement on next steps for remaining current KHCEC phase

The current KHCEC phase runs until February 2020. Norbert reminded participants that it will be important to design products that can be easily understood and translated into local languages where necessary. It will be useful to design communication assets that can be used in different channels with interchangeable detail e.g. images which could work for antibiotics, EDCs etc.

The following steps are still to follow during the current KHCEC phase:

1. Elaboration of end-user/stakeholder-oriented outputs

- It was agreed that Intrigo will revise the twitter thread and develop two infographics based on existing content that could be used by the Seed Group to carry out pilot knowledge transfer in their own countries.
- When it comes to the science to policy, there is a need to consult with the Steering Group and Seed Group as to what is possible in the timeframe remaining in the project.

- There was no agreement on the next steps in relation to the scientific document. That needs to be discussed post event.
2. **Communication of outputs**
 - All Seed Group members will be asked to complete at least one Knowledge Transfer exercise before the end of the current phase using the assets being developed.
 - Intrigo will also share a template for each Seed Group member to complete outlining knowledge Transfer strategy and metrics to measure carrying out activity + impact of transfer.
 3. **Evaluation of impact**
 4. **Review of activities**
 5. **Lessons learnt**
 - See 6.2.

6.2. Legacy Planning Update

Steering Committee chair Kristina Laurell led the final session on the next steps for the remaining period of the current KHCEC phase (until February 2020). It is hoped that each Seed Group member will carry out at least one Knowledge transfer pilot exercise before the end of the current phase using/adapting assets developed centrally by the facilitator. Furthermore, Kristina will be in contact to capture feedback into the assessment of the current phase. There are currently discussions taking place on the terms of reference of the next phase and Kristina will update Seed Group members in due course.

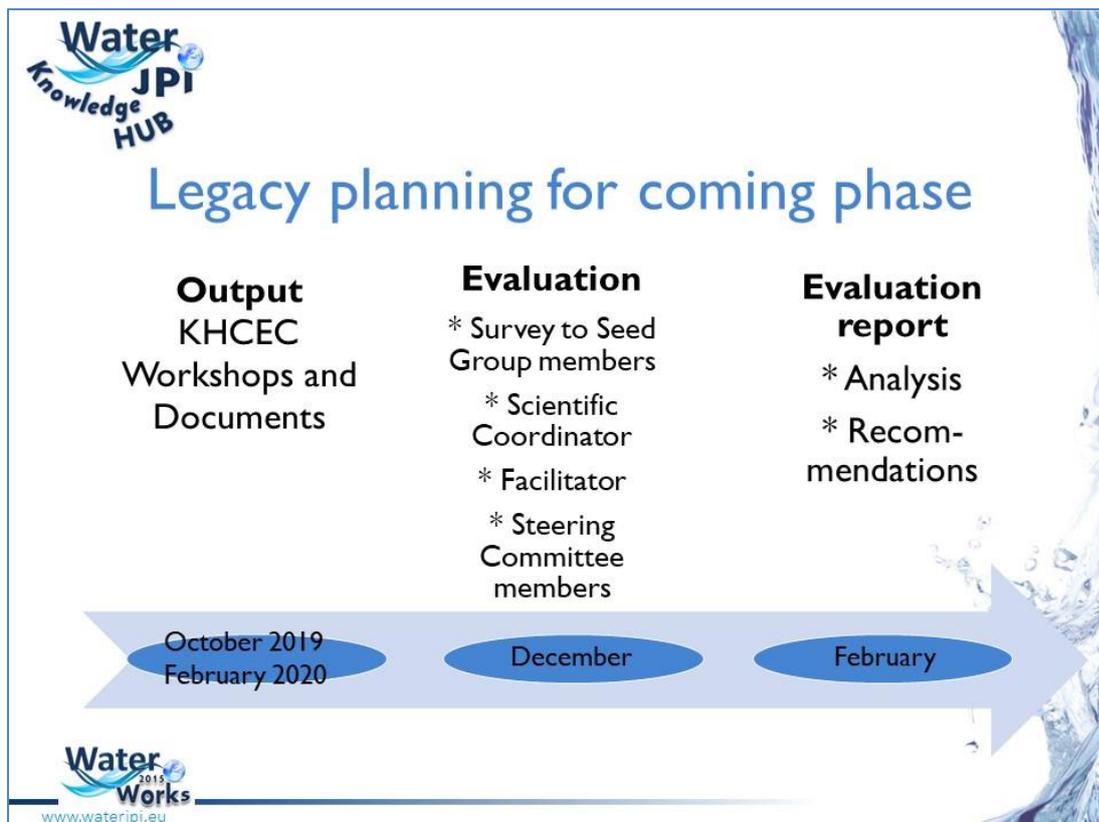


Figure 6: Slide from Kristina showing legacy planning.

7. Close of Meeting

Dominique Darmendrail, Water JPI Coordinator, closed the meeting reflecting on her positive experience of the meeting and recognising the importance of Knowledge Transfer. She informed participants that a decision is still pending on the future of the knowledge hub and that in the last period it was important to close out the work in order to show the national funding agencies the benefits of funding such a hub. She thanked the Scientific Coordinator, Facilitator, SC chair, EPA Ireland and Seed Group for their efforts to date.

8. Conclusions and Implementation

The fourth KH workshop began by providing an update on progress in the last period (March to October 2019) and setting the scene with respect to the scientific exercise that took place. This led into group exercises where participants were facilitated in brainstorming and co-creating elements of suitable knowledge transfer strategies for different target stakeholders. Stakeholders were profiled and key messages, channels, tools etc. were identified. This exercise was useful in helping participants better understand the components required for successful knowledge transfer.

In the afternoon, participants were introduced to good practice with regards to developing specific communication products for different channels and then took part in a highly interactive session working to co-create communication assets for different audiences. The co-creation was extremely beneficial and highlighted the need for a mixed expertise (science + communication expertise) to be able to develop fit for purpose products for different target stakeholders.

The exercises demonstrated for participants the level of strategy required for customised knowledge transfer, but the discussions also regularly highlighted the challenges in relation to effective knowledge transfer – resourcing, timeliness, roles. In particular, Seed Group members mentioned that they are extremely busy already and knowledge transfer is not always highly regarded within their own institutions/career pathway and they do not always have the skills.

The workshop concluded with an update on actions in the remaining period and legacy planning for the next period.

Overall, the 4th workshop marked an evolution in the activities in the KHCEC, moving from necessary stages of set up and structuring of the platform into an operational phase where the participants were co-developing outputs and defining the KHCEC's potential future role in transferring knowledge from science to stakeholders.

9. Next Steps

The next steps are to:

- Finalise the outputs (tweets and infographics)
- Decide upon how to use the scientific document
- Seed Group members to carry out pilot Knowledge Transfer in their own countries
- Work to define terms of reference and funding of next phase
- Begin the evaluation and reporting phase of current phase

Annex 1. List of Attendees

Participant name	Participant affiliation
Georgia BAYLISS BROWN	Intrigo Ltd.
Aimie CRANCH	Environmental Protection Agency
Enda CUMMINS	University College Dublin
Dominique DARMENDRAIL	ANR / Water JPI
Kristof DEMEESTERE	Ghent University
Laura FORSSTRÖM	Academy of Finland
Avril HANBIDGE	AquaTT
Harri HAUTALA	Science Adviser
Kevin JEWELL	Bundesanstalt für Gewässerkunde
John JOYCE	Spindrift
Norbert KREUZINGER	TU Wien
Foon Yin LAI	Swedish University of Agricultural Sciences
Kristina LAURELL	Formas
Corinne LE GAL LA SALLE	University of Nîmes
Zakhar MALETSKYI	Norwegian University of Life Sciences
David MURPHY	Intrigo Ltd.
Elzbieta PLAZA	Royal Institute of Technology Sweden KTH
Keegan PORTER	AquaTT
Lisa SHEILS	EPA Ireland
Henning SØRUM	Norwegian University of Life Sciences
Timo TARVAINEN	Geological Survey of Finland
Fiona WALSH	Maynooth University
Apologies	
Eva GREENE	Intrigo Ltd.
Matthew O'HARE	UKRI Natural Environment Research Council
Annemarie VAN WEZEL	University of Amsterdam IBED
Alice WEMAERE	Environmental Protection Agency
Karin WIBERG	Swedish University of Agricultural Sciences

Annex 2. Programme

Water JPI KHCEC Workshop, 24 October 2019 (Dublin, Ireland)	
08.30	Registration
09.00	<p>Session 1: Knowledge Hub Activities Update <i>Chair: David Murphy</i></p> <ol style="list-style-type: none"> Welcome Address (<i>Kristina Laurell</i>) Round table introductions Update on activities March – Oct 2019 (<i>David</i>) Reflections from KHCEC Experts who attended SRIA expert workshop on previous days (22-23 October) (<i>Open Discussion</i>)
09.30	<p>Session 2: Scientific Pilot Exercise <i>Chair: Norbert Kreuzinger</i></p> <ol style="list-style-type: none"> Reminder of process (<i>Norbert</i>) Review of the latest version of scientific documents Identification of Key Messages (<i>Open discussion</i>)
10.00	Coffee
10.30	<p>Session 2: Scientific Pilot Exercise <u>continued</u> <i>Chair: David Murphy</i></p> <ol style="list-style-type: none"> Define target stakeholders (Policy/Industry/Society) Per Target Stakeholder - What are the key CEC messages that you want to transmit? What is the eventual impact of knowledge transfer? Profile the target users (<i>Facilitated discussions</i>)
11.30	<p>Session 3: Knowledge Transfer <i>Chair: David</i></p> <ol style="list-style-type: none"> Setting the Scene <ol style="list-style-type: none"> Examples of National Strategy for disseminating KHCEC outputs (<i>Presented by Kristina on behalf of Karin Wiberg, Sweden</i>) Science to Policy (<i>Lisa Sheils EPA Ireland</i>) Written Communication – press release and twitter (<i>Georgia Bayliss-Brown</i>) Visual Communication – infographics and video (<i>Keegan Porter</i>) Group Exercises on communication channels/mediums
	Photo Session
12.30	Lunch
13.30	<p>Session 3: Knowledge Transfer <u>Continued</u></p> <ol style="list-style-type: none"> Group Exercises on communication channels/mediums (continued) Report Back by facilitators
14.45	<p>Session 4: Next Steps for Current Phase & Legacy Planning <i>Chair: Kristina Laurell</i></p> <ol style="list-style-type: none"> Agreement on next steps for remaining period of current KHCEC phase (Oct '19 – Feb '20) (<i>David & Norbert</i>) Legacy planning (2020-22 phase) update (<i>Kristina</i>)
15.25	Close of meeting by Dominique Darmendrail (Water JPI)

Annex 3. Resources

Handout – developing a knowledge transfer strategy

Broad Stakeholder Group: <i>Circle relevant group</i>	Science / Policy / Industry / Society
Key Message(s):	
Target Stakeholder(s):	
Successful Transfer Outcome:	
What is the profile of the targeted stakeholder(s)?	Technical level
	Role/responsibility
	Current mandate
	Preferred sources of information/knowledge
	Key influencers
Channels: <i>What communication channels do you propose to use?</i>	
Timing: <i>Are there any milestones (e.g. policy process deadline) or events (e.g. consultation) that might influence transfer activities?</i>	