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THE ZEROPOLLUTION4WATER CLUSTER

Boost synergies between the twin topics

*HORIZON-CL6-2022-ZEROPOLLUTION-01-01 & HORIZON-CL6-2022-ZEROPOLLUTION-01-04
in contributing to clean water and zero pollution demonstrations in a climate change context*

INTRODUCTION

The European Union policy framework has secured public safety and health objectives by the advanced and well-developed EU water legislation, such as Drinking Water, Groundwater, Water Framework Directive (via River basin management approach and RBMP- river basin management plans) that are striving to be in line with the Green Deal Zero pollution ambition, Climate Adaptation initiative. However, Member States identified that diffuse pollution is still a significant pressure that affects 35% of the area of groundwater bodies, while quality standards (pesticides, herbicides, etc.) were exceeded in 15% of the groundwater bodies studied. Climate change and increasing water demand will exert **significant pressures on groundwater quality**. Furthermore, detrimental effects of natural/human-made disasters and increasing water temperatures due to climate change could deteriorate the **quality of drinking water sources** by favouring the conditions for enhanced eutrophication leading to algal and cyanobacterial outbreaks as well as pathogen development or the spread of invasive species. Emerging concerns are also rising at the level of **drinking water treatment and distribution**, notably in relation to disinfection operations, materials and products, ageing infrastructure, biofilm growth and possible harmful effects of unintentionally formed by-products and metabolites.

At the same time, considerable financial resources have been made available by the EU for to support the implementation of collaborative projects in the framework of the R&I FPs, such as Horizon 2020 and Horizon Europe. The purpose is to halt and prevent pollution of freshwater and further enhance water quality and its management for safe human and ecological use, considering the wider drinking water cycle to ensure its safety (from source to tap), as well as protection of groundwater resources against climate change and anthropogenic pollution.

In May 2021 the EC adopted the [EU Action Plan Towards a Zero Pollution for Air, Water and Soil](#) a key deliverable of the European Green Deal. This plan concerns air, water and soil pollution to be reduced to levels no longer considered harmful to health and natural ecosystems, that respect the boundaries with which our planet can cope, thereby creating a toxic-free environment.

This is translated into [key 2030 targets](#) to speed up reducing pollution at source. Among 6 targets there is an important target for water is about **improving water quality by reducing waste, plastic litter at sea (by 50%) and microplastics released into the environment (by 30%)**;

The EU Action Plan Towards a Zero Pollution for Air, Water and Soil aims to strengthen the EU green, digital and economic leadership, whilst creating a healthier, socially fairer Europe and planet. It provides an ambit to mainstream pollution prevention in all relevant EU policies, to step up implementation of the relevant EU legislation and to identify possible gaps.



Horizon Europe 2022 work programme for cluster 6 through the calls for proposals HORIZON-CL6-2022-ZEROPOLLUTION-01-01 and 01-04 recently granted funds to new seven projects that revolve around two main themes:

- **Preventing groundwater contamination and protecting its quality against harmful impacts of global and climate change** (HORIZON-CL6-2022-ZEROPOLLUTION-01-01, 3 projects have been selected) and
- **Securing drinking water quality by protecting water sources against pollution, providing innovative monitoring and treatment solutions, and ensuring safe distribution** (HORIZON-CL6-2022-ZEROPOLLUTION-01-04, 4 projects have been selected).

Referring to the call topic expected outcomes, the main purpose of the cluster of projects from these two topics (drinking and groundwater) is to develop, demonstrate (and possibly to deploy):

- enhanced knowledge base to assess pollution sources, pathways and combined effects on **drinking water systems and groundwater bodies**, including forward looking approaches to prepare for emerging challenges;
- advanced preventive and mitigating strategies and measures to protect **drinking water sources, treatment and supply** and **to protect groundwater** against harmful effects of global and climate change;
- effective risk assessment and risk management strategies enabling early warning systems and delivering ready-made outputs for decision-making **for drinking and for groundwater**;
- advanced, integrated and cost-effective water quality sensors and analytical methods for **drinking water**;
- innovative and robust monitoring systems and real-time information **on drinking water** quality, **from sources to supply**;
- use a robust knowledge on the occurrence, persistence and degradability of **disinfection by-products (DBPs) in drinking water**;
- advanced and cost-effective **drinking water treatment and disinfection** processes and technologies;
- enhanced scientific and technological base and guidance on measures **to manage drinking water quality and groundwater quality** and providing evidence, guidance and recommendations for policymaking, safety planning and implementation;
- relevant case studies as the evidence-based implementation of the European Green Deal.

The ZeroPollution4Water Cluster

The ZeroPollution4Water Cluster is a new-born initiative that originated from the coalition of seven different projects funded from the above-cited calls for proposals. The “sister founding” projects of the Cluster are as follows:

1. SafeCREW - Cordis: <https://cordis.europa.eu/project/id/101081980>
2. ToDrinQ – Cordis: <https://cordis.europa.eu/project/id/101082035>
3. UPWATER - Cordis: <https://cordis.europa.eu/project/id/101081807>
4. MAR2PROTECT -Cordis: <https://cordis.europa.eu/project/id/101082048>
5. NINFA -Cordis: <https://cordis.europa.eu/project/id/101081865>
6. H2OforAll -Cordis: <https://cordis.europa.eu/project/id/101081963>

7. intoDBP -Cordis: <https://cordis.europa.eu/project/id/101081728>

The cluster aims at creating further collaboration and synergy between the sister project, developing co-operation actions with other projects running and future projects – not necessarily funded by the EU R&I FP – and other initiatives, such as co-funded and co-programmed partnerships – e.g. Water4All, Biodiversa+, DUT, Process4Planet, and relevant KICs.

This effort, **with the continued support of the EC services such as project advisers and policy officers of the EC REA and relevant DGs**, intends to build a critical mass of knowledge and expertise to effectively contribute with the concrete evidence-based examples from case studies and to propose recommendations **on water effective management** from the perspective of a wider drinking water cycle (from source to tap including drinking water networks), as well as from the zero-pollution strategy viewpoint. In this way the cluster is aiming to contribute to: **(a) policy shaping and implementation, (b) identification of new R&I's challenges, and (c) exploitation of results** to achieve a Water-Smart Society.

The Cluster can dramatically facilitate the mutual integration and maximise the efforts and the impact of the sister projects that can result in

- **the production of common policy briefs or policy recommendations**, based on the evidence demonstrated via case studies/success stories from the cluster projects,
- **the capitalisation of R&I achievements and future needs assessment**
- **an integrated communication management** and wider stakeholders outreach and interaction.

The above can be supported by the creation of intra-projects **ZP4Water Cluster Working Groups or Task Forces**.

The ZP4Water Cluster will develop and share good practices and recommendations on drinking and groundwater management on cross-cutting topics.

The ZeroPollution4Water will facilitate the gathering of actors beyond the cluster projects, from different communities and areas of expertise to tackle inter-related challenges.

The Cluster will work on also on coordinated support actions for the **market uptake and exploitation of solutions**.

Policy development generated by the experience of the projects of the cluster is expected to contribute to the debate on the EU policy agenda with the Project4Policy (P4P) methodology¹. P4P is an initiative of the **EC which aims to use research and innovation project results to shape policy making**. The cluster, with the support of the REA and relevant policy DGs (such as DG ENV, CLIMA) , will draft a policy agenda tailored to the relevant policies (as DWD, GRW) as well as to the activities of the projects based on case studies developing success stories and best practices. This will enable to support the implementation of EU policies in the frame of the Zero Pollution and European Green Deal.

¹ [Project4Policy](#)

[Water Europe](#), as coordinator of the cluster, is organising together with the European Research Executive Agency and the projects the action plan of the cluster in the timespan of 2023-2026.

Water Europe (WE) is the recognized voice and promotor of water-related innovation, research, and technology development in Europe. WE is a purpose-driven multi-stakeholder association with over 250 members, representing the entire range of actors in the innovative water ecosystem. WE was established by the European Commission as a European Technology Platform. WE is guided in all its activities by its *Water Vision*, with the ultimate ambition of achieving a *Water-Smart Society*, in which:

- the value of water is recognised and realised to ensure water security, sustainability, and resilience.
- all available water sources are managed so that water scarcity and pollution are avoided.
- water and resource loops are largely closed to foster a circular economy and optimal resource efficiency.
- the water system is resilient against the impact of climate and demographic change.
- all relevant stakeholders are engaged in guaranteeing sustainable water governance.

The workplan can be divided into internal and external actions planning, that will involve cluster participants only, other external stakeholders and the general public.

Furthermore, new entries of relevant new funded projects suitable to be part of the cluster will be assessed on annual basis.

OBJECTIVE STATEMENT OF THE ZP4WATER CLUSTER

The objective of the ZeroPollution4Water cluster is to contribute to the creation of a toxic-free environment and achieve a Water-Smart Society by addressing pollution challenges in air, water, and soil. Focused on the European Union's Zero Pollution ambition and the European Green Deal, the cluster aims to improve water quality, safeguard drinking water sources, and protect groundwater against the harmful impacts of global and climate change. By leveraging collaborative projects funded through Horizon 2020 and Horizon Europe, the cluster aims to develop advanced preventive and mitigating strategies, effective risk assessment and management systems, and innovative monitoring and treatment solutions for drinking water and groundwater.

The cluster's objective is to enhance the knowledge base to assess pollution sources and their effects on water systems, promote forward-looking approaches to tackle emerging challenges, and provide evidence-based guidance for policymaking and implementation. Through case studies and success stories, the cluster seeks to demonstrate concrete examples of effective water management practices and propose recommendations for sustainable water use across the entire drinking water cycle. Furthermore, the cluster aims to facilitate collaboration among projects, initiatives, and stakeholders to maximize the impact of research and innovation, support market uptake of solutions, and contribute to policy development through the Project4Policy methodology.

STRATEGY STATEMENT OF THE ZP4WATER CLUSTER

The strategy of the ZeroPollution4Water cluster revolves around collaboration, knowledge sharing, and policy influence. The cluster will foster cooperation among the seven sister projects and other relevant initiatives, creating a synergistic network that leverages expertise and resources to tackle

water pollution challenges comprehensively. By establishing cooperation actions with existing and future projects, the cluster aims to build a critical mass of knowledge and expertise, facilitating the effective exchange of best practices, lessons learned, and innovative solutions.

The cluster employs a multi-faceted approach to achieve its objectives. Firstly, it will focus on developing a knowledge base through research and innovation, enhancing the understanding of pollution sources, pathways, and their combined effects on water systems. This will involve forward-looking approaches to anticipate emerging challenges and develop proactive strategies. The cluster will prioritize the development and deployment of advanced preventive and mitigating measures to protect drinking water sources, treatment, and supply, as well as safeguard groundwater against the detrimental impacts of global and climate change.

The cluster's strategy will extend beyond research and innovation, aiming to influence policy development and implementation. By utilizing the Project4Policy methodology, the cluster will contribute to shaping EU policies related to water quality and pollution prevention. It will work closely with the European Commission's relevant policy directorates and agencies to draft a policy agenda based on case studies, success stories, and best practices from the cluster projects. Through these efforts, the cluster seeks to support the implementation of EU policies, particularly in the context of the Zero Pollution initiative and the European Green Deal.

The ZeroPollution4Water cluster's strategy combines research excellence, collaboration, knowledge exchange, and policy influence to achieve its objectives of creating a toxic-free environment, enhancing water management, and realizing a Water-Smart Society.

THE WORKING GROUPS OF ZP4W CLUSTER

RATIONALE

Following the meeting of ZP4W Cluster on 5th June 2023, the cluster members agreed on the establishment of the 6 Working Groups.

The WGs within the ZeroPollution4Water cluster serve as mechanisms for collaboration, knowledge exchange, policy influence, and market uptake. They provide a structured framework for achieving greater impact, fostering innovation, and contributing to sustainable water management practices.

The creation of working groups within the ZeroPollution4Water cluster aims to foster collaboration, enhance synergies, and maximize the impact of the sister and future projects of the cluster. The reasoning behind the establishment of these working groups and their rationale in the cluster can be summarized as follows:

1. **Internal collaboration and synergy:** The cluster intends to facilitate collaboration and synergy among the sister and future projects within the ZeroPollution4Water cluster. By bringing together the expertise, knowledge, and experiences of these projects, the working groups will create a platform for sharing best practices, exchanging insights, and identifying common challenges and solutions. The working groups facilitate the capitalization of research and innovation achievements from the running sister and the new projects of the cluster.
2. **Cooperation with other projects and Initiatives:** The cluster recognizes the value of cooperation within and beyond the EU Research and Innovation Framework Program (FP). The

working groups aim to develop cooperative actions with other ongoing and future projects not suitable to be part of the cluster, including those not funded by the EU R&I FP. This collaboration extends to initiatives like Water4All, Biodiversa+, DUT, and Process4Planet, EU Missions and other relevant initiatives, clusters and alliances. By leveraging these initiatives, the cluster through its working groups can broaden its scope, access additional expertise, and achieve greater impact.

3. **Policy Shaping and Implementation:** The cluster, with the support of EC services, seek to build a critical mass of knowledge and expertise, enable the production of common policy briefs or recommendations based on evidence from case studies and success stories. on effective water management to respond to the needs of the implementation of the EU zero-pollution strategy. The experience gained from the cluster projects is expected to contribute to the EU policy agenda through the Project4Policy (P4P) methodology. This initiative aims to use research and innovation project results to shape policy-making. The ZeroPollution4Water cluster, with the support of the EC REA and relevant EC DGs and other EC EAs, will tackle relevant policies such as the Drinking Water Directive (DWD) and Groundwater Directive (GRW), aligning with the Zero Pollution and European Green Deal objectives.
4. **Capitalization of Results and Communication:** The cluster facilitate the capitalization of research and innovation achievements from the running sister and the new projects. Additionally, the working groups coordinate integrated communication management, ensuring effective outreach to stakeholders and wider interaction.
5. **Sharing Good Practices and Recommendations:** The ZeroPollution4Water cluster, through the working groups, focuses on developing and sharing good practices and recommendations related to drinking and groundwater management. By addressing cross-cutting topics, the cluster contributes to knowledge dissemination to foster the adoption of sustainable and effective water management practices.
6. **Market Uptake and Exploitation of Solutions:** The cluster also develops coordinated support actions for the market uptake and exploitation of solutions developed within the cluster projects. This emphasis on market-oriented approaches helps bridge the gap between research and practical implementation, facilitating the broader adoption and impact of innovative water solutions. This will be done through coordinated initiatives that intend to foster the matchmaking between demand and offer of solutions, exploiting events or platforms such as the WE Market Place.

The **scope of the each WG as in the table will further be developed and fine-tuned** by each WGs in the development of the founding document and workplan.

Each WG nominates its leadership that is made by **one leader and one/two co-leaders**. Should there be any change or renewal of the leadership, please let the coordinators of the cluster know. **The WGs will also decide about the schedule of the regular meetings. It is suggested that regular WGs meetings should be set at from monthly basis to quarterly basis.**

THE WGS OF THE ZP4W CLUSTER

Name of the WG	Draft scope	Management
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<p>ZP4W Cluster Management and Coordination</p>	<p>This working group is responsible for the cluster's internal and external action planning. It will prepare, validate and review the cluster's strategy and action plan on annual basis. This WG will assess and review the activities of the cluster and validates the deliverables of the Cluster. A representative of the REA will also be a member of the WG as advisor. This WG will also be in charge of the admission on new projects in the cluster on the basis of admission criteria.</p>	<p>It is chaired by WE with the support of the REA and the co-leadership will be turned every 6 months by the projects' members. Each project of the cluster mandatorily nominates a permanent – for the duration of the project - representative and a proxy. The co-leader(s) will be decided in the first WG meeting.</p>
<p>Policy Advisory WG</p>	<p>This group would analyse the EU's policy and regulatory landscape for water pollution and management and find potential for the ZeroPollution4Water Cluster to contribute to related policy development. The WG will be the common area where sister projects collaborate to identify gaps in the current policy framework, examine the impact of existing policies on the ground, and produce policy recommendations in common policy briefs, grounded on the results of the case studies of the cluster projects that are based on the results from the research and knowledge within the cluster. The working group will work with the REA to ensure that the policy agenda contributes to the debate on effective water management and that the cluster meets its expectations and criteria</p>	<p>Each project nominates one representative and possibly a proxy for this WG. Leadership and co-leadership will be decided in the first WG meeting.</p>
<p>Communication WG</p>	<p>It will develop and implement a comprehensive communication and outreach action plan for the ZeroPollution4Water Cluster. The sister projects will produce a series of joint communication activities to increase public awareness of the cluster's aims, activities, and accomplishments, e.g.: the production of a joint newsletter, including contributions from all cluster's participants</p>	<p>Each project nominates one representative and possibly a proxy for this WG. Leadership and co-leadership will be decided in the first WG meeting.</p>

	<p>etc. The WG interacts with certain stakeholders and the general public to support, among other activities, knowledge transfer. Each project nominates one representative and possibly a proxy for this WG</p>	
<p>Technology and Innovation WG</p>	<p>This group would be responsible for identifying and developing innovative methods and technologies for reducing and managing water pollution (in particular related to drinking and groundwater). Within the ZeroPollution4Water Cluster, it will increase the cooperation between the sister projects to identify important technological and non-technological (e.g. drinking/groundwater management) solutions/issues and opportunities in the sector, assess the technological and market potential of emerging technologies, share the most advanced practices (based on case studies of the cluster projects), and build a roadmap for the innovation and technology development for drinking and ground water sound and smart (IT-based) management (e.g.: monitoring, risk assessment, modelling, prediction, assessment of the e.g. drink water infrastructure). The organization will leverage the cluster's presence of industry and technology suppliers to encourage the adoption and commercialization of innovative solutions. The WG could focus on relevant topics for the projects, such as sensor technologies, monitoring, risk assessment methods to address contaminants of emerging concern (CECs) in drinking and groundwater (preparation, distribution, ensuring safe water supply and quality), address water leakages, drinking and groundwater governance models (e.g. at city/urban/rural areas, etc</p>	<p>Each project nominates one representative and possibly a proxy for this WG. Leadership and co-leadership will be decided in the first WG meeting.</p>
<p>Data Management and Sharing WG</p>	<p>This group would focus on identifying and discussing existing frameworks for drinking and groundwater-related data management and sharing among the projects in the ZeroPollution4Water Cluster. They would</p>	<p>Each project nominates one representative and possibly a proxy for this WG.</p>

	<p>work to identify common data needs and standards, analyse data sharing protocols, as well as data quality and security. This WG will interact/establish the links to the ICT4Water Action Group on data sharing to align common contributions, e.g., to European green dataspace.</p>	<p>Leadership and co-leadership will be decided in the first WG meeting.</p>
<p>From R&I to Impact: Zero Pollution for Water Market Uptake and Investments WG</p>	<p>This WG aims to bridge the gap between Research & Innovation and market uptake in the field of zero pollution for water and facilitate the deployment of cutting-edge technologies, governance models and best practices (based on case studies of cluster’s projects that can help achieve zero pollution targets in the (drinking and groundwater) water sector. It will explore innovative business models and funding/investment mechanisms that can support the deployment of zero pollution solutions as well as collaborate with the water industry partners, policymakers, and other stakeholders to ensure that recommendations are practical and feasible. This WG can also develop the recommendations for the R&I gaps, needs and further actions for funding in providing the contributions to develop new Horizon Europe Work programmes for 2025-2027 and further (e.g., the 10th Framework Programme, that will come after Horizon Europe).</p>	<p>Each project nominates one representative and possibly a proxy for this WG. Leadership and co-leadership will be decided in the first WG meeting.</p>

FOUNDING DOCUMENT AND WORKPLAN TEMPLATES

Creating a work plan with objectives, actions, outputs, deliverables, and a related GANTT chart involves careful planning and organization. Each WG is requested to develop the founding document and the work plan using the given template.

Here is some advice to help you create a comprehensive work plan for the WG:

1. Define Overall Objectives: Start by clearly defining the overall objectives of the WG. These objectives should align with the goals and strategy of the ZeroPollution4Water cluster.
2. Break Down Objectives into Key Actions: Identify the key actions or tasks required to achieve each objective. Possibly assign responsibilities to the WG members for each action.
3. Determine Outputs and Deliverables: For each action, determine the desired outputs and deliverables. Outputs are the tangible results or products generated by completing an action, while deliverables are the specific items that need to be produced and delivered as part of the project.

4. Establish Milestones and Timelines: Set milestones or checkpoints throughout the project timeline to monitor progress. These milestones represent significant stages or completion points. Assign estimated start and end dates to each action and milestone.
5. Create a GANTT Chart as visual representation of the WG schedule and timeline. Include in the GANTT also the regular WG meetings.

SECTION 1: FOUNDING DOCUMENT

Name of the Working Group:	
Name of the leader, project, organisation, email address	
Name of the co-leader(s) project, organisation, email address	
Period covered by this plan	July 2023 – June 2024
Release date	
VERSION	1.0

MEMBERS of the WG (NAME, PROJECT, ORGANISATION, EMAIL)			
NAME	PROJECT	ORGANISATION	EMAIL

SCOPE OF THE WORKING GROUP AND STRATEGIC CONTEXT

EXAMPLE: This group would be responsible for identifying and developing innovative methods and technologies for reducing and managing water pollution (in particular related to drinking and groundwater). Within the ZeroPollution4Water Cluster, it will increase the cooperation between the sister projects to identify important technological and non-technological (e.g. drinking/groundwater management) solutions/issues and opportunities in the sector, **assess the technological and market potential of emerging technologies, share the most advanced practices (based on case studies of the cluster projects), and build a roadmap** for the innovation and technology development for drinking and ground water sound and smart (IT-based) management (e.g.: monitoring, risk assessment, modelling, prediction, assessment of the e.g. drink water infrastructure). The organization will leverage the cluster's presence of industry and technology suppliers to encourage the adoption and commercialization of innovative solutions. The WG could focus on relevant topics for the projects, such as sensor technologies, monitoring, risk assessment methods to address contaminants of emerging concern (CECs) in drinking and groundwater (preparation, distribution, ensuring safe water supply and quality), address water leakages, drinking and groundwater governance models (e.g. at city/urban/rural areas, etc)

OBJECTIVE OF THE WORKING GROUP FOR THE PERIOD JULY 2023 – JUNE 2024

BRIEF NARRATIVE DESCRIPTION OF THE OBJECTIVES AND DEFINITION OF THE OBJECTIVES IN BULLET POINTS

1. OBJECTIVE 1
2. OBJECTIVE 2
3.

INTERACTION AND COLLABORATION WITH THE OTHER WGs OF THE CLUSTER AND WITH OTHER STAKEHOLDERS (PROJECTS, PARTNERSHIPS, INSTITUTIONS..)

OUTPUTS, ACTIONS, AND DELIVERABLES RELATED TO THE OBJECTIVES

OBJECTIVE	ACTIVITIE(S)/ACTION(S)	RESPONSIBLES	OUTPUTS/DELIVERABLE(S)
OBJECTIVE 1		All of the participants of the WG/the leadership of the WG/participant X	
OBJECTIVE 2			
.....			

SECTION 2: GANTT

OBJECTIVE	OUTPUTS DELIVERABLES MILESTONE	JULY 2023 – JUNE 2024											
		MONTHS											
		JULY	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUNE
1													
	WATER CLUSTER EUROPE												
2													
...													

TIMELINE FOR THE WGS ESTABLISHMENT AND SETTING

- WGs have set their first meeting in the first half of July 2023
- In the above cited meeting will nominates the leadership and start planning their activities.



- The WG are requested to **develop and internally approve** – with a dedicated meeting - the founding document and the workplan – using mandatorily the provided templates - **by 01 September 2023, and send it to the coordinators of the cluster²**.
- Water Europe will provide feedback and combine the founding documents and workplans of the WGs in the comprehensive ZP4WCluster Action Plan paper that will be shared in September for final review.
- The ZP4WCluster Action Plan will be presented at the Water Cluster Europe on 19th October in Brussels, back-to-back to Water Knowledge Europe.

² andrea.rubini@watereurope.eu, implementation@watereurope.eu



AGENDA OF THE ZEROPOLLUTION4WATER CLUSTER

To monitor and update the progress of the cluster, as well as to plan the external events, the cluster projects are required to participate in internal coordination events. **These events will translate into an annual general meeting in March** every year, to assess and review the work done up to date, refresh the state of the art the projects, and evaluate and approve the annual workplan.

Therefore, the meetings will be held periodically, once a year, starting from March 2023. The online meeting on the 9th of March 2023 was the kick-off meeting of the clustering activities. A further meeting took place on 5th June that defined strategy and the establishment of the WGs.

Internal general Agenda 2023-2026 of the Zeropollution4water Cluster

<i>Year</i>	<i>Content and goal of the meeting</i>
March 2023	Kick-off meeting: Perspective and expectations from the EC and projects, presentation of projects by coordinators, open discussion on strategic themes, contact list update, discussion on the plan of action for March 2023-2026. Discussion will include 1) common policy briefs or policy recommendations , based on the evidence demonstrated via case studies/success stories from the cluster projects; (2) common workshops/webinars on a specific topic, etc
May 2023	Zero-Pollution4Water Cluster <u>Draft</u> Action Plan 2023 – 2026 developed
June 2023	Zero-Pollution4Water Cluster <u>Draft</u> Action Plan 2023 – 2026 validated
September 2023	Zero-Pollution4Water Cluster WGs Work Plans finalised Zero-Pollution4Water Cluster Action Plan Action Plan 2023 – 2026 finalised
March 2024, 2025, 2026	Annual meeting: Assessment and review of the work done up to date, state of the art the projects, evaluation, amendments and approval of the annual workplan.

External actions of the Zeropollution4water Cluster

In order to increase the visibility of the cluster, and to maximise its results, the cluster actors will organize and take part in different public events designed for a targeted audience. The events will be defined along three lines: public webinars or workshops, Water Project Europe online events, and Water Cluster Europe.

The webinars and workshops will guarantee projects to make use of a virtual showroom, in which in one hour the dynamics, impacts, actions, success stories, case studies and objectives of the joint efforts of sister projects will be enlightened and discussed. To do that, the theme, the narrative, and the angle of the webinar will be mainly decided by the projects' representatives. Each year the plan has to be updated and approved, considering potential new projects joining the cluster, that may cause the number to vary and the partners to adapt.

[Water Projects Europe](#) is one of the flagship format events of Water Europe, that through an engaging configuration brings together and links projects that tackle the same concerns, but not necessarily from the same European call for proposals, or in this case not only from inside of the cluster. In fact, Water Project Europe aims at channelling the efforts of the various initiatives, to create a shared space for knowledge and expertise exchange on a specifically selected topics in order to communicate, brainstorm and debate on vital water-related topics and their possible solutions. That means, that depending on the topic of each Water Project Europe, only certain projects will participate, and they will benefit from the establishment of a connection with outside of the cluster projects and their methods, know-how, and potential outcomes, in order to create the EU added value and impact to EU **policy 'shaping' or implementation; to create future business opportunities as well as to indicate further research needs for a specific topic (e.g. drinking , ground water security and safety, etc)**

The third dedicated tool is Water Cluster Europe, based on the Water Projects Europe format. Water Cluster Europe is being introduced by Water Europe to highlight the power of clustering activities, recognising their proper relevance. In a two hours public event, the goal is to cluster the seven projects to briefly present themselves and periodically – annual basis - showcase the achieved results and the intra and external synergies, echoing the communication efforts of them all.

However, to boost not only the motivation towards the cluster activities, but also to expand their, the first Water Cluster Europe event will be held on 19th October 2023, back-to-back to [Water Knowledge Europe](#), in person in Brussels.

Water Knowledge Europe is the specialized brokerage event of Water Europe that allows R&I stakeholders to network, to exchange knowledge and experiences, and to collaborate with key actors from across the water value chain.

The ZP4Water Cluster can exploit this event for starting – after almost on year of work – to present its Action Plan, outline the achievements, the case studies, the success stories and the barriers experienced. It would also be the place to start connecting to other projects, partnerships and initiatives as well as highlighting the common trajectory for policy recommendations and identification of R&I needs.

The public events of the cluster can be resumed as follow³:

[Proposed events for 2023-2026 Zeropollution4water Cluster \(external\)](#)

For the events, important topics and challenges that the projects are addressing will be selected as well as webinars/workshop will focus on topic or per “challenge area” that the case studies of projects are addressing. For eg. ‘Monitoring methods of specific emerging pollutants in drinking and groundwater (e.g. PFAS, pharmaceuticals, microplastics) and policy recommendations.

³ **Number and category of events will be agreed in each annual review of the action plan and activities are subject to availability of relevant funds to be dedicated by the cluster projects from their own budget.**

The actions and the activities should be linked to the purpose to draft a joint policy recommendations and R&I priority needs assessment on certain important topics (the topics can be discussed and defined during the 1st 2 months of the year and planned accordingly)

<i>Year</i>	<i>Content</i>
2023	<ul style="list-style-type: none"> ○ Water “Cluster” Europe in person 19th October 2023, Brussels Boost synergies between the twin topics HORIZON-CL6-2022-ZEROPOLLUTION-01-01 & HORIZON-CL6-2022-ZEROPOLLUTION-01-04 in contributing to clean water and zero pollution demonstrations in a climate change (back-to-back to WKE) ○ Webinars/workshops
<i>Annual revision of workplan on relevant ground or drinking water topics and number of events</i>	
2024/2025/2026	<ul style="list-style-type: none"> ○ Webinars/workshops ○ Water Projects Europe online. ○ Water Cluster Europe online ○ Participation/contribution to international events

ANNEX 1: PROJECTS SNAPSHOT

7 projects in total related to the extended drinking water cycle - from the source to the tap, enhancing water quality and its management for safe human and ecological use

Project name	CORDIS link	Number of case studies (countries)	Water utilities involved. abbreviations DC – demo-case, CS - case study	Key themes of R&I	Policy Key themes
ToDrinQ	https://cordis.europa.eu/project/id/101082035	5	NL, EL, FR, CH, Cz Demo cases range from rural communities (Beaune-FR, Val de Bagnes -CH) to large cities (Amsterdam, NL, Athens EL, Prague-Cz). The total population of these demo cases - about 6M people. <ul style="list-style-type: none"> •DC1.Amsterdam, NL; •DC2.Athens, EL; •DC3.Val de Bagnes, CH; •DC4.Beaune,FR; •DC5.Prague, Cz. 	<ul style="list-style-type: none"> • Develops novel real time sensing and water quality monitoring technologies (development of sensors for water quality monitoring, state estimation, use of AI), risk based assessment, and risk management related to Water Safety Plans; • innovative treatment systems (especially suitable for small-scale/modular, adaptable treatment plants, for eg PFAS and OMPs removal, pesticides detection, heavy metals detection, sensors for microbiological detection); • interoperable decision tools that support resilient, evidence-based treatment plant design and • improved overall water system operational awareness and response. 	D8.9 – Final report on policy recommendations about DWD and the Zero Pollution Action Plan Task 8.3 Dissemination and EU policy recommendations

SafeCREW	https://cordis.europa.eu/project/id/101081980	3	DE, IT, ES <ul style="list-style-type: none"> • CS1- Northern Germany (Hamburg & Berlin) Near-natural non-disinfected DW supply • CS2 - Milan city (Italy) Chlorinated DWSS • CS3 - Tarragona (Spain) Chlorinated DWSS 	<ul style="list-style-type: none"> • Support new DWD by generating advanced knowledge and developing tools and guidelines for disinfected and non-disinfected DWSS and addresses improved comprehensive water quality characterization, novel treatment solutions to actively respond to identified threats, and the management of distribution networks to avoid water quality deterioration up to consumers. • Novel data sets on the occurrence and concentration of so far unknown DBPs will be created, and commercial actors stimulated to further develop tools for DBP quantification and mitigation. • Transferable tools will be provided to end-users (water utilities, national/EU regulators, researchers, SMEs), including: <ul style="list-style-type: none"> o (I) reliable methods to evaluate microbial stability, characterise NOM, detect DBPs and account for DBP human health toxicity, o (II) protocols to select proper materials in contact with disinfected water, o (III) monitoring and modelling tools, also exploiting machine learning, for real-time optimisation of DWSS management, and o (IV) an integrated risk assessment framework to guide future interventions which ensure that both disinfected and non-disinfected DWSS can continue providing safe DW in the face of climate change. 	D4.4 – Policy brief to support unavoidable transition from non-disinfected to disinfected drinking water supply systems; D5.5 – Policy brief regarding disinfection and disinfection-by-products; Relevant to DWD
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H2OforAll	https://cordis.europa.eu/project/id/101081963	2	PT, ? <ul style="list-style-type: none"> Sensing infrastructure Demonstrator in PT -AC Águas de Coimbra treatment technologies. Lab pilot . Adventech 	Project AIMS 1) to assess main DBPs sources and fate through the development of fast, cost-effective and accurate sensor monitoring devices and also by modelling their spread in drinking water distribution systems. 2) In addition, DBPs toxicity and environmental impact will be studied in this project and measures will be proposed to protect drinking water chain. 3) On the other hand, breakthrough water treatments to remove DBPs or avoid their formation during water disinfection processes will be developed, paying attention to their life cycle analysis, costs and risks. 4) A central knowledge base with reliable data on the occurrence of DBPs in Europe and their effects will be created to increase awareness of society and governmental organizations about these drinking water contaminants in order to draw new policy responses and guidance. Key words: Toxicity assessment, risk assessment analysis; new disinfection strategies for prevention DBP formation; technologies to remove DBP from water	3 policy briefs in Task6.3 - measures to protect drinking water - best practices and recommendations for safety planning to the DWD and the Zero Pollution Action Plan; D6.2 – Safety planning recommendations on prevention measures to protect drinking water. D6.3 – First policy brief and recommendations on drinking water protection; D6.4 – Final policy brief on best practices and recommendations to the DWD and the Zero Pollution Action Plan
intoDBP	https://cordis.europa.eu/project/id/101081728	4	CY, IE, ES-2 <ul style="list-style-type: none"> CS1- LIMASSOL (CYPRUS) high variability of source water and quality and high formation of THMs; CS2- BARCELONA (SPAIN) high THMs formation potential in distributed water and changing conditions in the source reservoirs. High 	Focus on catchment protection and forecasting, transformative drinking water treatment, and real-time monitoring to combat the effects of climate and global change. In particular on pollution and risks related to disinfection by-products (DBPs) . Project will develop and apply advanced, integrated, and cost effective sensors and analytical methods thus expanding knowledge on water quality and DBP precursors to better understand its formation and human exposure in Europe. Monitoring results will feed into numerical forecasting tools to predict source water changes and formulate climate change adaptation pathways at catchment and treatment scale.	3 policy briefs foreseen (Policy recommendation and best practices; policy recommendations on the DWD and the Zero Pollution)

			<p>concentration of bromide in drinking water sources;</p> <ul style="list-style-type: none"> • CS3- MADRID (SPAIN) formation of N-DBPs (e.g., NDMA) from suboptimal generation of chloramines; • CS4- Co. MAYO (IRELAND) high formation of THMs from peatland dominated catchments. 	<p>Case studies from three European countries (CY, IE, ES-2 case studies) where compliance with DBP regulation currently is an acknowledged challenge.</p> <p>Key words: sensors, advanced monitoring and preediction.; reducton od DBPs in case studies;</p>	
UPWATER	https://cordis.europa.eu/project/id/101081807	3	<p>DK, EL, ES</p> <ul style="list-style-type: none"> • CS1: Aquifer beneath Stengaarden dump site, Copenhagen region, DK • CS2: Kifisos river and aquifer, Athens, EL • CS3: Besós river and aquifer, Barcelona, ES 	<p>AIMS: 1)To assess the effectiveness of different preventive measures (e.g. regulation, governance, and other non-technological measures) to minimise the release of chemicals at source 2)to develop and validate bio-based engineered natural treatment systems designed as mitigation solutions to protect groundwater pollution.</p> <ul style="list-style-type: none"> •DK site: Moving bed biofilm reactors and biofilters (TRL 3) will be used principally to remove pesticide contamination and PFAs, in addition to other organic contaminants that may be present •EL site: ZVI-bioelectrochemical wetland technology will be optimised to principally remove recalcitrant contaminants but also contaminants of emerging concern (CECs) in general, as well as metals and virus •ES site: floating wetland + ZVI-bioelectrochemical wetland technology (TRL3) will be optimised to principally remove recalcitrant contaminants but also CECs in general, as well as metals and virus •all CS will validate novel ceramic passive samplers (CPS) for monitoring of organic contaminants, 	<p>3 Policy briefs (1 at EU level, 2-local)</p> <ul style="list-style-type: none"> -in WP6: REACH, GWD at EU level, -D6.5 Policy briefs at local/regional & EU levels - to provide evidence of harmful pollutants affecting GW with case-specific recommendations (one per case site);

				<p>specifically CECs (TRL 4), viral passive samplers (VPS) for tracing faecal pollution via virus concentrations (TRL 3) and Diffusive Gradients in thin-Films (DGT) for trace elements (metals)</p> <ul style="list-style-type: none"> • all CS will apply a combination of CPS and compound specific isotope analysis (TRL 3) • all CS: will elucidate the link between emission source and occurrence in groundwater (source apportionment) 	
NINFA	https://cordis.europa.eu/project/id/101081865	8	<ul style="list-style-type: none"> • Innovative monitoring strategies and sensors • Hydrogeological and reactive transport models • Risk assessment <p><u>Treatment technologies:</u></p> <ul style="list-style-type: none"> • Solid/liquid separation + membrane filtration + AOP + HTC + inoculated bio-char + wood • chip bioreactor for minimising nutrients and pesticides leaching • Metal recovery (Pd, Pt) through membrane concentration + chemical extraction + centrifugal and/or electromagnetic separation / Modular NBS + 	<p>Around 35% of the area of GW bodies are affected by diffuse pollution with pesticides and nutrients from agriculture and farming, which leads to eutrophication.</p> <p>-Other pollution sources, including sewage from wastewater treatment plants (WWTPs) and runoff infiltration in cities (during storm events), jeopardise GW quality with contaminants of emerging concern (CECs) such as pharmaceuticals and antibiotic resistance genes (ARG), hydrocarbons, heavy metals, and microplastics (MP), among others.</p> <p>-Since water bodies are interconnected, contaminants end up in rivers, wetlands, lakes, and oceans. Moreover, aquifer exploitation for water consumption leads to increased pressure on GW resources, which also affects their quality, especially in coastal aquifers, due to saline intrusion.</p> <p>These problems are aggravated by global and climate change effects, such as longer drought periods leading to a lack of aquifers natural recharge, or an increased sea level worsening saline intrusion.</p> <p>Additional knowledge is needed to understand the synergistic effects and risks of multiple stressors and pollutants.</p> <p>The development of cost-efficient monitoring strategies and technologies for preventing GW</p>	<p>2 policy briefs; Relevant to GWD and DWD - source water protection</p>

			<p>ad hoc AOPs for hydrocarbons and MP removal</p> <ul style="list-style-type: none"> • NINFA Platform 	<p>contamination, as well as early-warning and Decision Support Systems (DSS) for sustainable GW governance and management, is still a challenge.</p> <p>NINFA will provide</p> <p>1) a novel strategy based on an early-warning DSS and knowledge base (the NINFA Platform) and</p> <p>2) a series of innovative and cost-effective monitoring, modelling and treatment solutions, considering diverse pollutants (nutrients, pesticides, salinity, CECs, ARG, and MP)</p> <p>3) and synergistic effects regarding stressors derived from climate and global changes, with the aim of preventing GW contamination, protecting its quality and enhancing its resilience.</p>	
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<p>MAR2PROTECT</p>	<p>https://cordis.europa.eu/project/id/101082048</p>	<p>7</p>	<p>NL, PT-2, IT, ES and TN, S.Africa(ZA) Demo sites(WP5) -to demonstrate and validate technologies for GW prevention; -protection of coastal aquifers; -innovative technologies for monitoring (<i>advanced sensors, tracers, analytical methods</i>) of water contamination (<i>patogen detection, real time integrated sensing system, salt micropollutants</i>); - risk management strategies (<i>e.g.early warning systems</i>)</p> <ul style="list-style-type: none"> • Katvijk, NL • Korba, Tunisia • Frielas, PT • EmiliaRomagna, IT • Cape Flats, South Africa • Marbella, ES • Lima river estuary, PT 	<p>MAR2PROTECT will provide a holistic approach to prevent groundwater (GW) contamination from global change (GC) and CC impacts based on a new-generation managed aquifer recharge (MAR). The core of the innovative MAR is the M-AI-R DSS (MAR decision tool for GW quality) that will incorporate technological and societal engagement information using an AI-based evaluation to improve GW quality.</p> <p>To ensure a high replication potential, M-AI-R DSS will collect information from 5 demo sites in EU (PT, IT, ES, NL) and 2 in non-EU countries (TN, ZA) which were carefully chosen by their degree of maturity from previous successful projects and a wide range of settings in terms of climatic conditions, water sources, type of pollution, MAR scheme and political/societal context.</p> <p>- Innovative technologies for monitoring of water contamination (WP3); Innovative sensors for real-time detection of micropollutants; special techniques (sensors online, onsite offline, IoT, analytical methods, real-time remote monitoring, monitoring bacteria growth in water) for detection of micropollutants, pathogens. A full characterization and analysis of the different sensors will be performed using water samples from the demo sites. All technologies will be tested and validated in demo sites until TRL5.</p> <p>MAR2PROTECT will ensure a strong engagement of civil society in GW prevention actions, up to a SRL equal to 6. The project will involve national and EU policy makers that, in collaboration with a Community of Practice formed by worldwide experts, will guarantee the strengthening EU policy for the prevention of GW contamination</p>	<p>2 policy briefs on prevention of GW contamination (deliverables D7.3, D7.4; D6.6, D6.7) as part of the dissemination plan ; task T6.6 - policy analysis and recommendations regarding risk management plans at basin/regional scale for GW recharge, technological and non-technological solutions for prevention of GW pollution; Relevant to GWD and Water reuse - MAR case studies</p>
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ANNEX 2: PARTICIPANTS PROFILING ZEROPOLLUTION4WATER CLUSTER

****Excluding partners (0 euro contribution)****

Higher or Secondary Education Establishments:

Politecnico di Milano *Italy* (SafeCREW), Technische Universiteit Delft *Netherlands* (ToDrinQ), Rheinisch-Westfaelische Technische Hochschule Aachen *Germany* (ToDrinQ), Ethnicon Metsovion Polytechnion *Greece* (ToDrinQ, UPWATER), KWR WATER BV *Netherlands* (ToDrinQ), Aarhus Universitet *Denmark* (UPWATER), Universitat De Barcelona *Spain* (UPWATER), Alma Mater Studiorum - Universita Di Bologna *Italy* (MAR2PROTECT), Institut Mines-Telecom *France* (NINFA), Universita Degli Studi Di Roma La Sapienza *Italy* (NINFA), Universidade De Coimbra *Portugal* (H2OforAll), Institut Superieur Des Sciences Biologiques Appliquees De Tunis *Tunisia* (MAR2PROTECT), Kauno Technologijos Universitetas *Lithuania* (MAR2PROTECT), Stellenbosch University *South Africa* (MAR2PROTECT), Universitaet ULM *Germany* (H2OforAll), University Of Haifa *Israel* (H2OforAll), Uniwersytet Gdanski *Poland* (H2OforAll), Kungliga Tekniska Hoegskolan *Sweden* (H2OforAll), Universiteit Twente *Netherlands* (H2OforAll), University Of Cyprus *Cyprus* (intoDBP), Universita Degli Studi Di Catania *Italy* (intoDBP), Dundalk Institute Of Technology *Ireland* (intoDBP), The Hebrew University Of Jerusalem *Israel* (intoDBP).

Research organizations:

DVGW *Germany* (SafeCREW), KWB *Germany* (SafeCREW), Fundacio Eurecat *Spain* (SafeCREW), Umweltbundesamt *Germany* (SafeCREW), Helmholtz-Zentrum Fur Umweltforschung GMBH – UFZ *Germany* (SafeCREW), Agencia Estatal Consejo Superior De Investigaciones Cientificas *Spain* (UPWATER), Institut National De L Environnement Industriel Et Des Risques – INERIS *France* (UPWATER), IWW Rheinisch Westfalisches Institut Fur Wasserforschung Gemeinnutzige GMBH *Germany* (UPWATER), Fundacion Nueva Cultura Del Agua *Spain* (UPWATER), NOVA ID FCT - Associacao Para A Inovacao E Desenvolvimento Da Fct *Portugal* (MAR2PROTECT), Centro Interdisciplinar De Investigacao Marinha E Ambiental *Portugal* (MAR2PROTECT), Stichting Ihe Delft Institute For Water Education *Netherlands* (MAR2PROTECT), Instituto De Telecomunicacoes *Portugal* (MAR2PROTECT), Acondicionamiento Tarrasense Asociacion *Spain* (NINFA), Stichting Wetsus, European Centre Of Excellence For Sustainable Water Technology *Netherlands* (NINFA, H2OforAll), Stichting Deltares *Netherlands* (NINFA), Cyens Centre Of Excellence *Cyprus* (H2OforAll), IVL Svenska Miljoeinstitutet AB *Sweden* (H2OforAll), Fundacio Institut Catala De Recerca De L'aigua *Spain* (intoDBP), Fundacion Privada Instituto De Salud Global Barcelona *Spain* (intoDBP).

Private for-profit entities (excluding Higher or Secondary Education Establishments):

BioDetection Systems B.V. *Netherlands* (SafeCREW), Tutech Innovation GMBH *Germany* (SafeCREW), MM SPA *Italy* (SafeCREW), Het Waterlaboratorium Nv *Netherlands* (ToDrinQ), VEOLIA EAU - Compagnie Generale Des Eaux *France* (ToDrinQ), VEOLIA CESKA REPUBLIKA,

A.S. *Czechia* (ToDrinQ), Etaireia Ydreysesos Kai Apochetefseos Proteyoysis Anonimi Etaireia *Greece* (ToDrinQ), Olisens Tech *France* (ToDrinQ, UPWATER), Oxymem Limited *Ireland* (ToDrinQ), ORVION B.V. *Netherlands* (ToDrinQ), Chimiki Technologia P. Dimopoulou -P.Tazes & Sia Oe *Greece* (ToDrinQ), Tarh-Terra Ambiente E Recursos Hidricos LDA *Portugal* (UPWATER), Barcelona Regional Agencia Metropolitana De Desenvolupament Urbanistici D Infrastructures SA *Spain* (UPWATER), Center For Technology Research And Innovation (CETRI) LTD *Cyprus* (NINFA), Wings Ict Solutions Information & Communication Technologies IKE *Greece* (NINFA), FCC AQUALIA SA *Spain* (NINFA), Hidrotec Tecnologia Del Agua SL *Spain* (NINFA), AQUATEC Proyectos Para El Sector Del Agua SA *Spain* (MAR2PROTECT), DHVMED LTD *Israel* (H2OforALL), IRIS Technology Solutions, Sociedad Limitada *Spain* (H2OforALL), Sociedade Portuguesa De Inovacao Consultadoria Empresarial E Fomento Da Inovacao SA *Portugal* (H2OforALL), ADVENTECH - Advanced Environmental Technologies LDA *Portugal* (H2OforALL), Atlantium Technologies LTD *Israel* (H2OforALL), AC Aguas De Coimbra EM *Portugal* (H2OforALL), AQUASOIL SRL *Italy* (intoDBP), S.K. Euromarket LTD *Cyprus* (intoDBP), Canal De Isabel II Gestion S.A. *Spain* (intoDBP), S CAN GMBH *Austria* (intoDBP), Scan Iberia Sistemas De Medicion SL *Spain* (intoDBP).

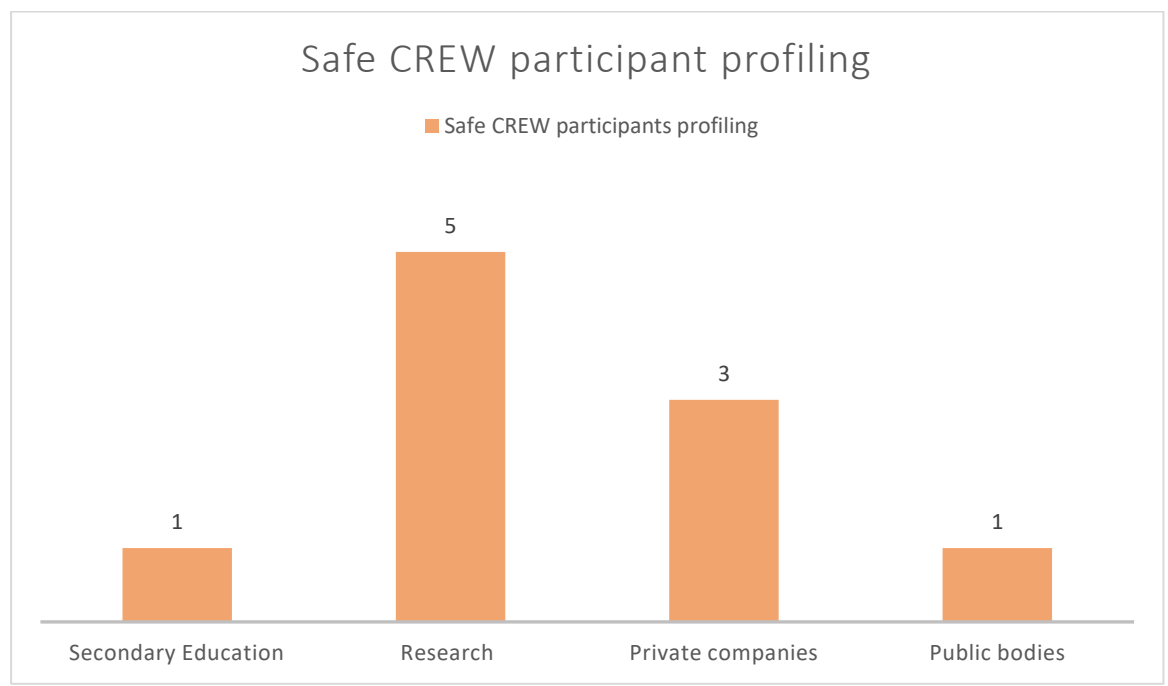
Public bodies (excluding Research Organisations and Secondary or Higher Education Establishments):

Consorci Concessionari D'aigues Per Als Ajuntaments I Industries De Tarragona *Spain* (SafeCREW), Ayuntamiento De Los Alcazares *Spain* (NINFA), Water Board Of Lemesos *Cyprus* (intoDBP), Ente De Abastecimiento De Agua Ter-Llobregat *Spain* (intoDBP).

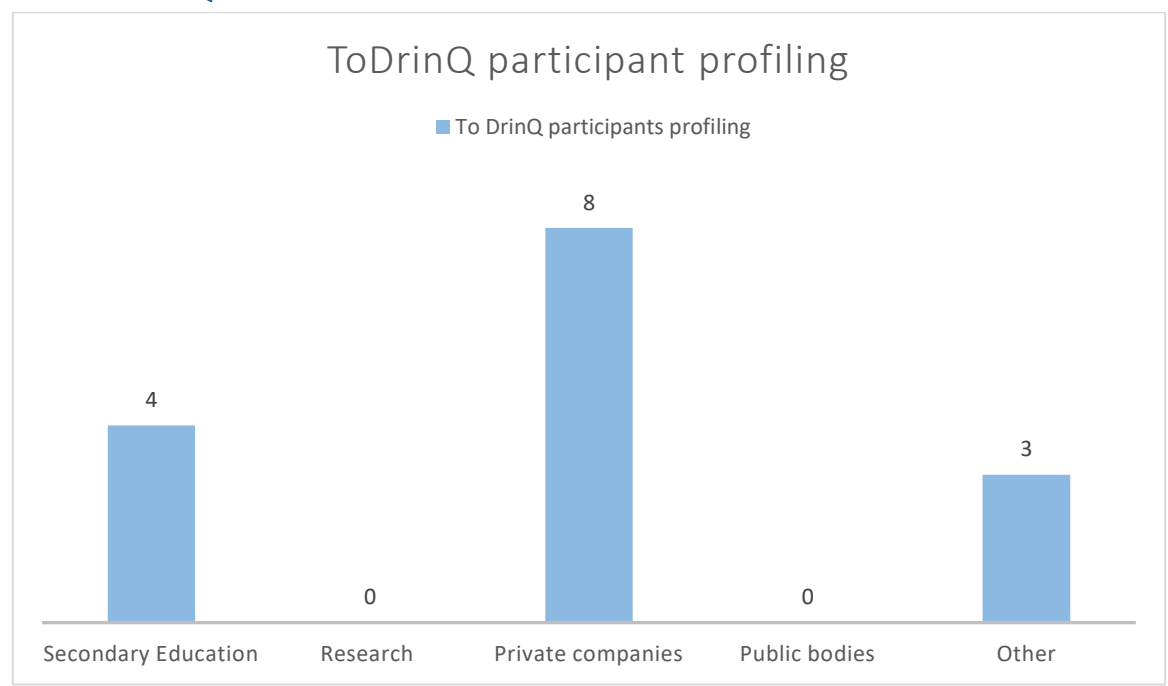
Other:

Centre Belge D'etude Et De Documentation De L'eau *Belgium* (ToDrinQ), Stichting Waternet *Netherlands* (ToDrinQ), Water Europe *Belgium* (ToDrinQ, H2OforALL, intoDBP), Stichting Future City *Netherlands* (UPWATER), Fundacion Empresa Universidad Gallega *Spain* (MAR2PROTECT), Fundacion Centro Andaluz De Investigaciones Del Agua *Spain* (MAR2PROTECT).

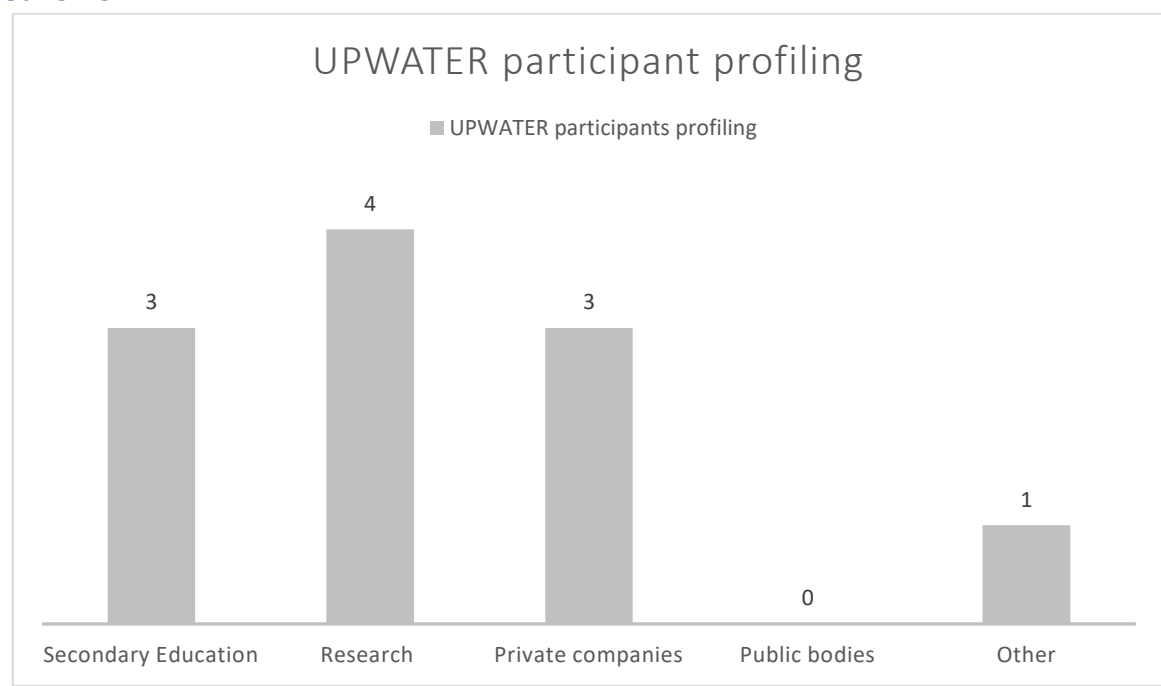
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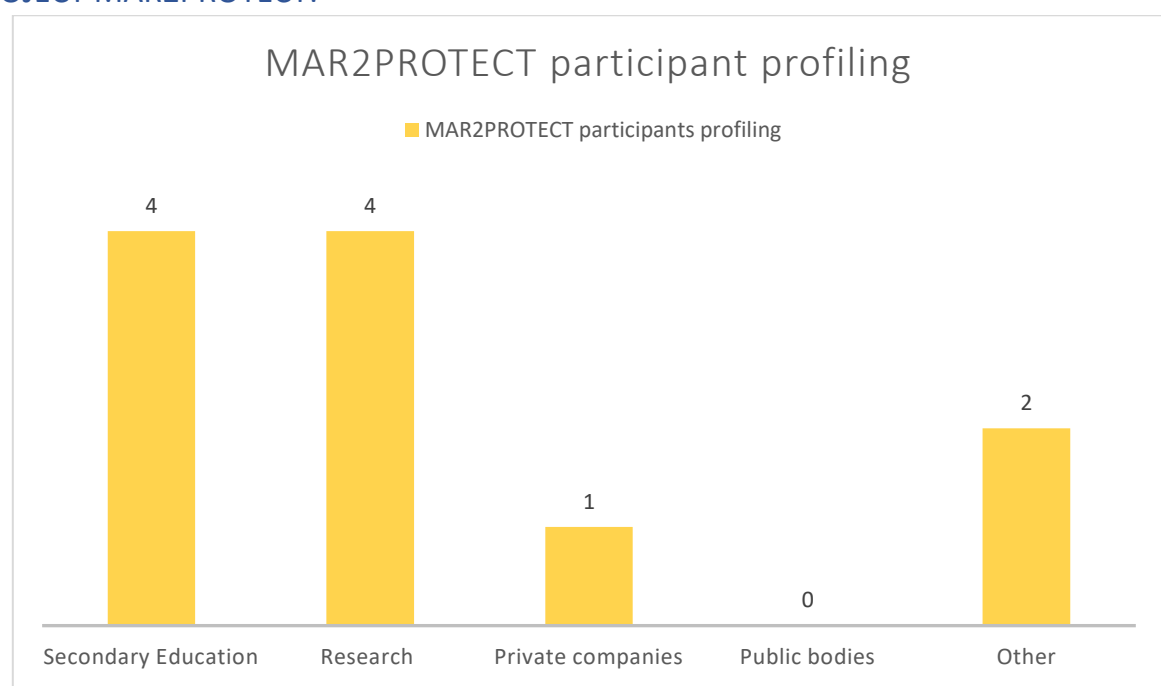
PROJECT ToDrinQ:



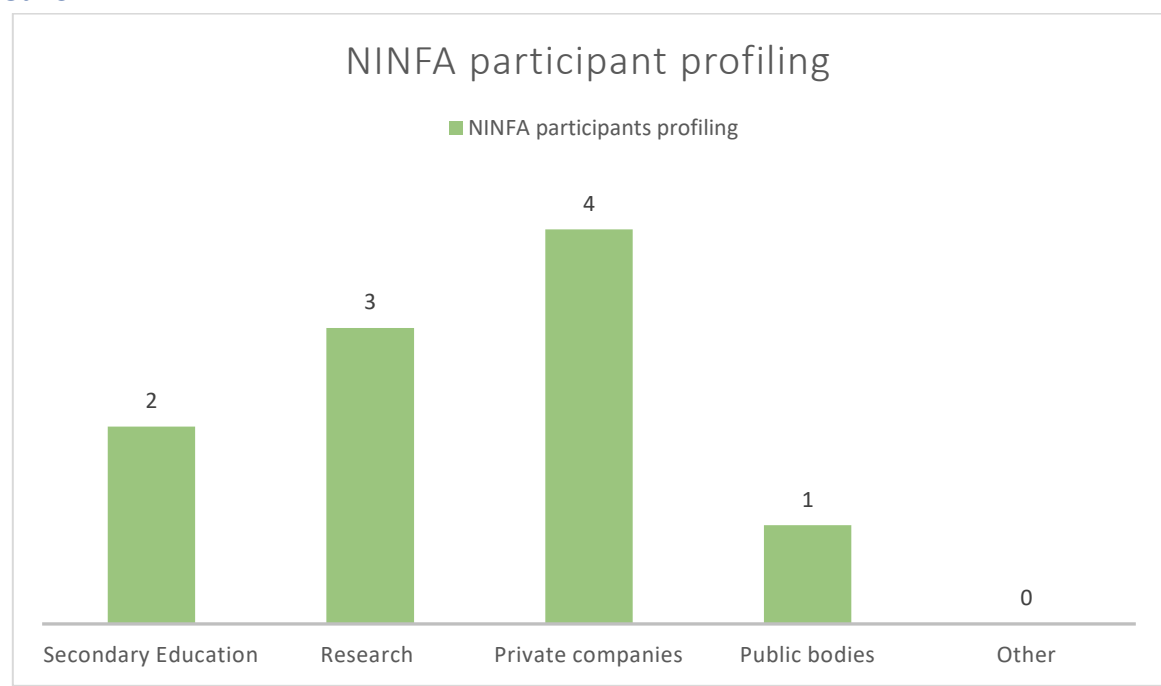
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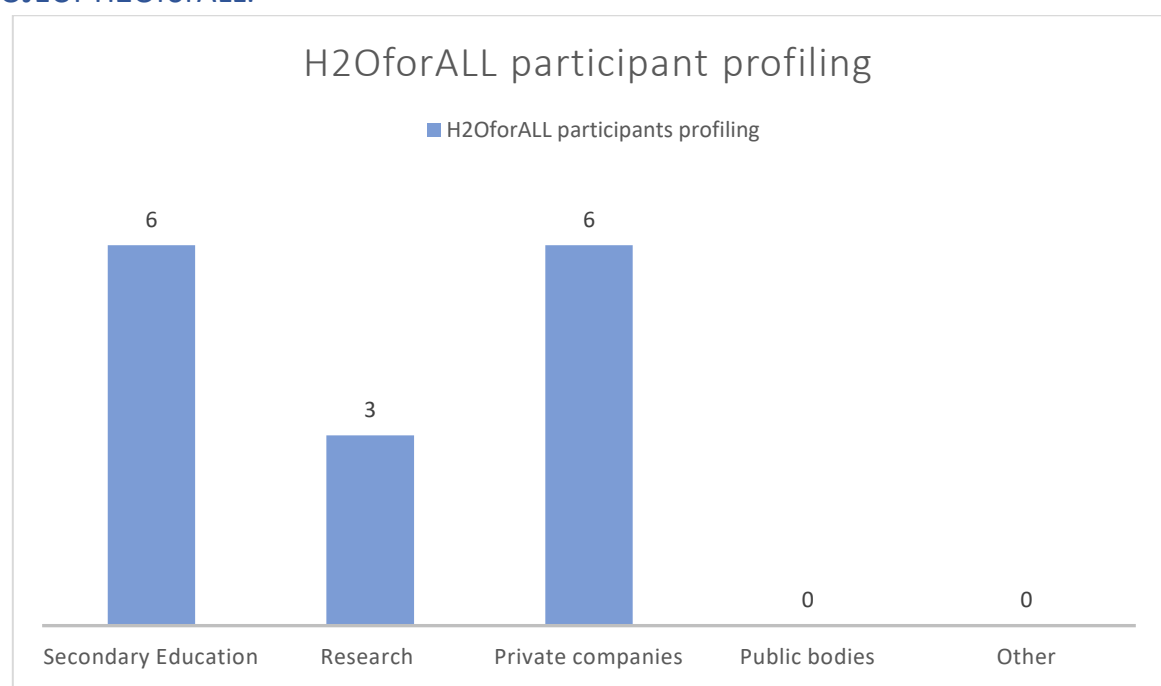
PROJECT MAR2PROTECT:



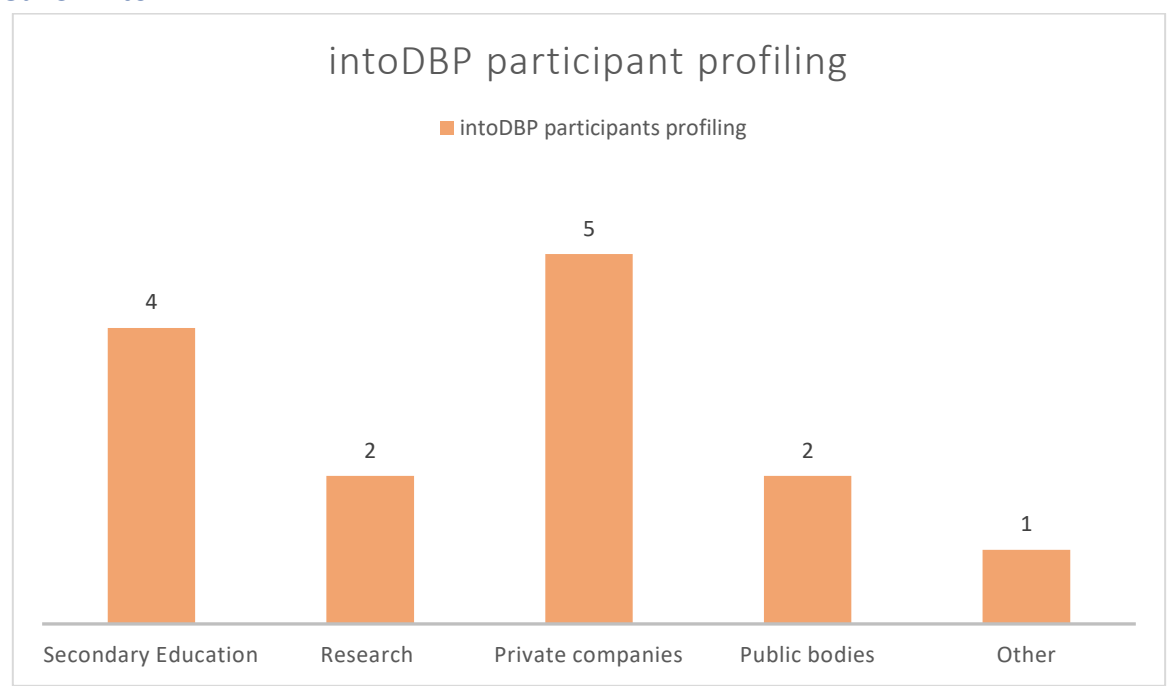
PROJECT NINFA:



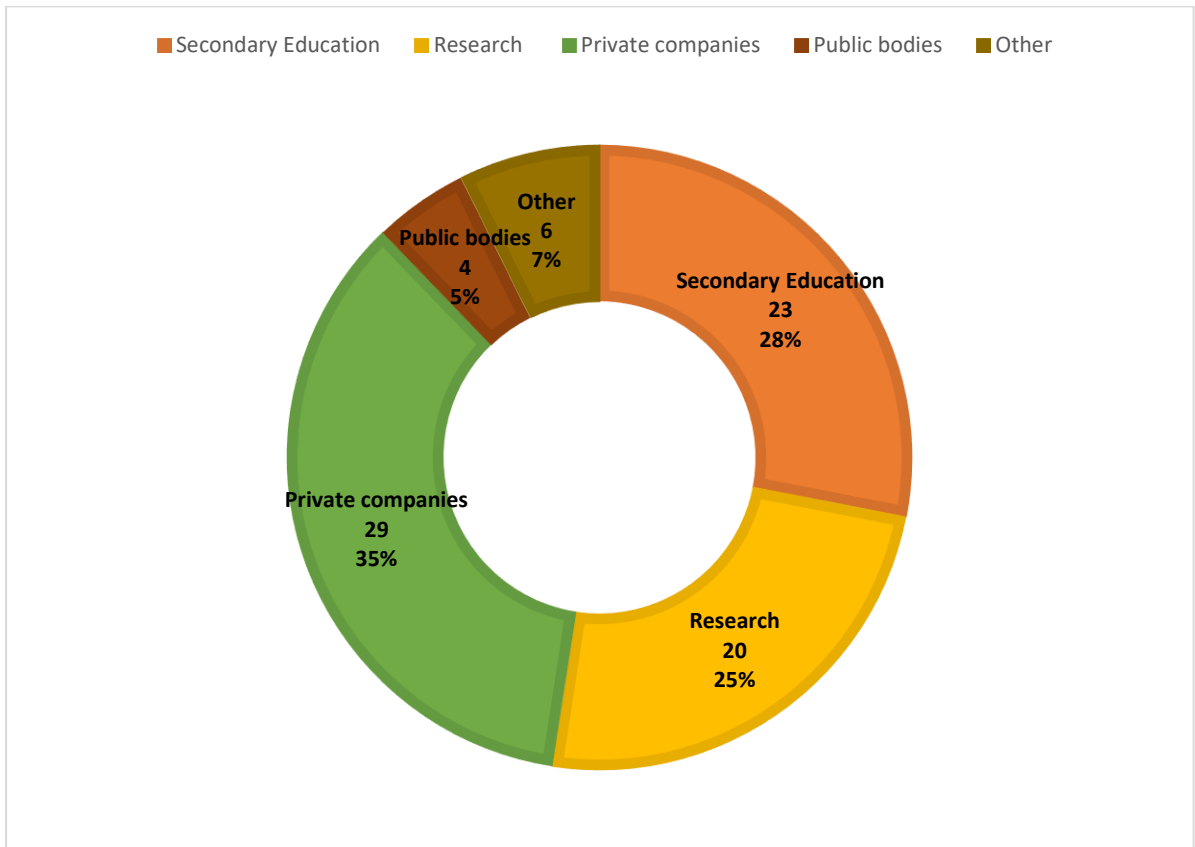
PROJECT H2OforALL:



PROJECT intoDBP:

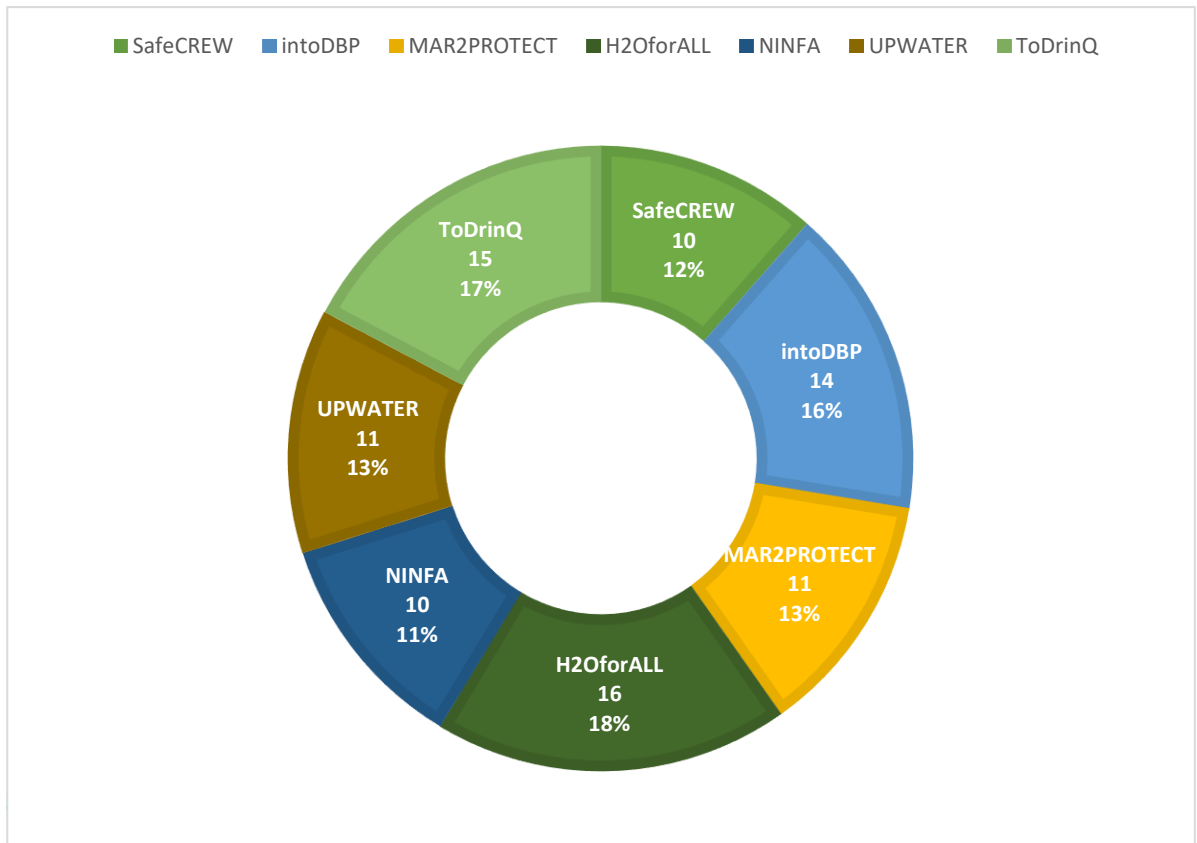


TOTAL CLUSTERING PROFILING



PERCENTAGE OF PARTICIPANTS PROJECT/CLUSTER

(with repetitions of companies in more than one project)



COUNTRIES OF PARTICIPANTS TOTAL CLUSTER

