

D3.1 Community of Practice Roadmap and Facilitation Guidelines

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¹ PU = Public

PP = Restricted to other programme participants (including the Commission Services)

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Summary

In NextGen, stakeholders are involved through Communities of Practice (CoPs), organized in four face-to-face meetings at each demo case. The CoPs aim to create an engagement environment around the demonstrated circular water innovations in which stakeholders across the water value chain interact and collaborate. More specifically, the objective is to have strategic discussions on technical feasibility, economic aspects (societal cost-benefits), environmental impacts, and policy bottlenecks and barriers. The relevant stakeholders differ for each demo case. In general, these will include the water industry (operators), authorities (regulators, policy & decision makers), engineering companies, consultants, research institutes, representatives of non-governmental organizations, and potential end-users.

Organising and moderating the CoPs

This document provides a roadmap and facilitation guidelines for the CoPs. First, the approach for setting up and managing the CoPs is described. An important role is given to the organiser (coordinator) who is responsible for managing the CoP. In the case of NextGen, the CoP organiser is, the formal contact person of the demo case, i.e. either a representative of the demo case end-user or of the related research organization. The CoP organiser will be supported by the NextGen WP3 staff, as we appreciate this can be a demanding task.

The CoP organiser is also responsible for selecting a moderator (or if possessing the right skills, may choose to fulfil this task by him or herself). The main task of the CoP moderator is to create a conducive environment for knowledge exchange and learning. Conditions have to be created to facilitate open dialogue whereas individuals collectively develop new knowledge by making use of the diversity of perspectives and understandings at hand. An overview of moderation techniques is provided for the moderator to apply.

Monitoring outcomes is also an important requirement. The CoP organisers are responsible for the reporting of the meetings. The reporting format for NextGen CoP meetings is provided in Annex III. These CoP reports are essential input to the cross-fertilisation and reflexive learning between the different CoPs.

Roadmap and key topics

A general roadmap, with key topics and a time planning, has been developed, see the figure below. The key topics of the four CoP meetings are:

- 1) setting the scene
- 2) closing the loop
- 3) implementation
- 4) upscaling and evaluation

For these four CoPs meetings, information on the planning, the participants, the aim(s), related WP, method and central questions are provided.



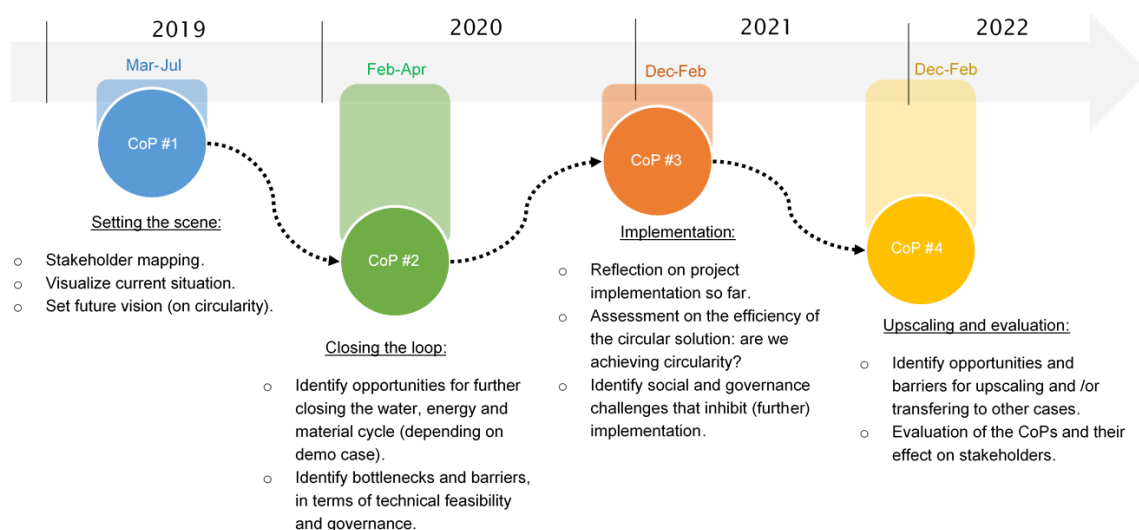


Figure: Overview of key topics and timeline of the suggested CoP meetings

Although this general roadmap has been developed, the guideline allows for flexibility to align to the unique local and demo case specifics and tailor the CoP meetings to the nature and needs of each demo case. Based on interviews conducted with the contact persons of all demo cases, suggestions on issues that could be addressed at the CoP meetings for each demo case are presented. Furthermore, it is advised to link the CoP meetings with regular stakeholder meetings or additional NextGen activities, including the technical workshops.

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1. Introduction

1.1 Communities of Practice in NextGen

NextGen will demonstrate innovative technological, business and governance solutions for water in the circular economy in ten high-profile, large-scale, demonstration cases across Europe. Work Package 3 focuses on stakeholder involvement and public outreach. The involvement of stakeholders in the development of water technology and management solutions for the circular economy is considered important for three reasons. First, water supports basic human services such as sanitation and drinking water, and each interference in the delivery systems of these services requires the support of stakeholders. Second, involving stakeholders can lead to multiple value creation as new types of knowledge can lead to new and broader perspectives on solutions. Third, stakeholder involvement can secure the (long-term) implementation of water solutions on the ground. This is in particular important for circular water solutions which rely on stakeholder engagement from the whole water value chain, i.e. from all related sectors in the circular economy.

WP3 aims at actively involving and engaging stakeholders from the whole water value chain, with a particular emphasis on end-users and the general public and will offer an engagement environment around the innovations demonstrated. WP3 will:

- Create and synchronise Communities of Practices to promote a multi-stakeholder approach to discuss CE water technologies in its institutional context (task 3.1)
- Engage end-users and citizens in experiencing and visualising CE water technologies by demonstrating Living Labs outreach, Augmented Reality (AR) and Serious Game (SG) activities (task 3.2).

Working towards these aims, in NextGen stakeholders are involved through Communities of Practice (CoPs), organized in four face-to-face stakeholder meetings at each demo case during the lifecycle of the project (4 years). These CoP meetings will be organised and moderated by a local project partner at the different demo cases. As a work package leader, KWR will provide a general structure for these meetings in order to enable cross-site information sharing and lesson learning.

The CoPs aim to create an engagement environment around the demonstrated innovations in which stakeholders across the water value chain interact and collaborate.

1.2 Aims of this document

This document outlines general guidelines for the NextGen CoP meetings (task 3.1). These guidelines have two aims. First, they aim to develop a synchronised approach for stakeholder involvement at all demo cases that allows for cross-site comparison and learning. Second, the guidelines aim to promote multi-stakeholder collaboration in the design and evaluation of circular water technologies at and across demo cases that allow stakeholders to jointly reflect on the circular technologies and maximise their potential.



Guidelines for engage end-users and citizens in experiencing and visualising CE water technologies (task 3.2) are beyond the scope of this report. Obviously, where relevant, the engagement activities will be discussed and linked to the relevant CoPs.

The guidelines came about in close cooperation with the demo case coordinators and other NextGen work packages, to take into account site-specific conditions, activities and plans. The guidelines have been developed taking into account the work and related requirements of other WPs in NextGen as well.

The result is a general structure which is similar for all demo cases to ensure that similar methods are used for stakeholder involvement at each demo case, that is attuned to on-going work in NextGen and generates comparable outcomes regarding stakeholder involvement in circular water solutions. At the same time, the guidelines allow for flexibility to align stakeholder involvement to existing conditions and future plans at the different demo cases.

This document is set up as follows. Section 2 describes the importance of stakeholder involvement for developing complex technologies. Section 3 provides general guidelines for CoPs. Section 4 sets out the NextGen CoP roadmap, including demo case specifics. This document also includes various appendices, providing, among others, information on moderation techniques and the reporting format.

This document builds on previous work on CoPs done by KWR and partners in H2020-projects such as BINGO and StopIT.



2. Stakeholder involvement in complex technologies

2.1 The importance of stakeholder involvement

Moving towards a circular economy requires new and innovate, and sometimes highly technological solutions that connect different subparts of the economy. In general, the development and implementation of these technologies faces two kinds of problems. First, up to now, the different subparts of the economy have been managed separately, either publically or privately, according to their own set of standardized rules, routines and practices. Second, people can be concerned and suspicious about new technologies, especially when they interfere with basic public services such as food and water. Whereas public outreach activities help to acquaint citizens with new circular technologies and aim to increase their trust in these technologies, research and experience over the last decades has demonstrated that involving stakeholders in an early stage of technology development contributes to an effective design and implementation of new technologies, while also building up trust.

Stakeholder involvement is seen as particularly relevant for managing complex (also referred to as “wicked”) socio-technological problems (Cuppen 2009). This term refers to problems that are very difficult to resolve because scientific uncertainty and value differences are both at the cause (Rittel & Webber 1973, Dunn 1998, Hisschemöller & Hoppe 2001). Scholars in this field have underscored the importance of stakeholder participation in early phases of developing solutions to ensure that all perspectives are taken into account in the knowledge development, design, and implementation process, so that the developed solutions make maximal use of all types of knowledge and is considered legitimate and fair by actors affected (Maasen & Weingart 2005, Callon et al. 2009).

In the move towards a circular economy, technological challenges and social innovations go hand in hand; circular solutions need to take account of both aspects to ensure their successful implementation. Therefore, the implementation of circular solutions can be seen as a complex socio-technological problem. This also means that stakeholder participation could be crucial for developing effective solutions. However, how far should stakeholder participation reach?

This question has been a topic of discussion in the academic literature on stakeholder participation as well. Bottlenecks for stakeholder participation have also been outlined, which do not only relate to practical infeasibilities regarding time and expertise (Hajer 2009, Warren 2006) but also to the provision of political equality that micro-forms of participation may in effect undermine (Wynne 2003, Goodin 2008). As Warren (2006: 49) has argued, citizens “want safe airplanes and food, not the chance to participate in meat inspection and airline safety” (ibid.: 49). Following this scientific debate, it is important to organize stakeholder participation meaningfully and effectively.



2.2 Principles for stakeholder participation

Despite the fact that the merits of stakeholder participation have been increasingly recognized at EU, national, and local level (Collins & Ison 2006), and the number of participatory activities has grown significantly, the notion of stakeholder participation is still surrounded with ambiguities. Therefore, it is important to stress that stakeholder participation should not be considered as a binary variable that is either present or absent.

Indeed, there are various forms, or degrees, of participation. A classic reference point in this discussion is the participation ladder by Arnstein (1969), as depicted in Figure 2-1. This ladder, which despite being published some 45 years ago is still the most prominent characterisation of the different forms of participation, identifies eight different degrees of participation. The degrees vary from low level involvement at the lowest rung, described as manipulation, to the slightly higher rung of therapy, which Arnstein defines as essentially symbolic efforts or types of “non-participation” in which stakeholders are “educated” or “cured”. The next rung, informing, provides stakeholders with knowledge, yet the flow of information is usually one-way.

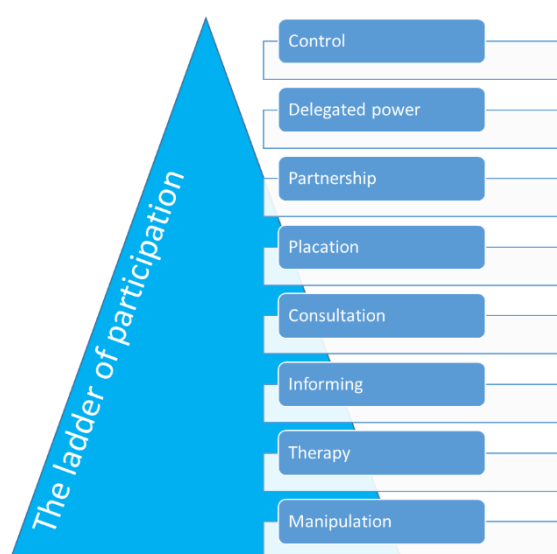


Figure 2-1: The ladder of participation
(adapted from Arnstein 1969)

The consulting rung aims to involve the opinions of stakeholders, but gives no guarantee that their input will in practice also be taken into consideration. In the placation case, this is somewhat less of a problem, for instance through including stakeholder representatives on decision-making boards, but the project’s initiators may still have exclusive decision-making power through a larger number of votes or the right to ignore given advice. At the partnership level, stakeholders are given a more direct influence on the content of a project: rules regarding participation are laid down and may thereafter not be changed without consensus across actors. Only the highest two levels, delegated power and citizen control, would award stakeholders real power. The differences between the different degrees of participation depend on what kind of information is given to stakeholders, what kind of

options they get to voice their opinion, and most important, what kind of power they get to actually influence decision-making (Arnstein 1969).

Based on a big pile the literature numerous design principles for stakeholder involvement can be identified, including Responsible Research and Innovation (RRI) Tools¹ and the core values of the International Association for Public Participation (IAP2)². Below, we summarize a series necessary stakeholder participation conditions, that have emerged from the prominent OECD Water Governance Initiative, an international multi-stakeholder policy forum created to share policy and practical experiences on water governance (Akhmouch & Clavreul 2016). All conditions are followed (in *italics*) by the practical implementation within the NextGen CoPs.

- **Inclusiveness and equity:** Map all stakeholders who have a stake in the outcome or that are likely to be affected, as well as their responsibility, core motivations and interactions. *In the NextGen CoPs, the stakeholders are partly mapped prior to CoP#1, and partly during CoP#1.*
- **Clarity of goals, transparency and accountability:** Define the ultimate line of decision making, the objectives of stakeholder engagement and the expected use of inputs. *In the NextGen CoPs, the goals, and expected use of inputs will be explicitly discussed during CoP#1.*
- **Capacity and information:** Allocate proper financial and human resources and share needed information for result-oriented stakeholder engagement. *In the NextGen CoPs, the organiser is encouraged to share information and organise capacity.*
- **Efficiency and effectiveness:** Regularly assess the process and outcomes of stakeholder engagement to learn, adjust and improve accordingly. *In NextGen, all CoPs are evaluated after each meeting.*
- **Institutionalisation, structuring and integration:** Embed engagement processes in clear legal and policy frameworks, organisational structures/principles and responsible authorities. *The CoPs provide for a structural approach with a clear set of principles.*
- **Adaptiveness:** Customise the type and level of engagement as needed and keep the process flexible to changing circumstances. *This guideline allows, or rather calls, for flexibility to align to the unique local and demo case specifics.*

¹ e.g.: <https://www.rri-tools.eu/-/step-by-step-guide-to-planning-your-public-engagement-activities>

² e.g.: Public Participation Pillars”, International Association for Public Participation (IAP2): <https://www.iap2.org/page/resources>



3. CoP Facilitation Guidelines

This section describes the approach of setting up and managing CoPs. It serves as a guideline how to organise and moderate CoP meetings in general. The key topics of the NextGen CoP meetings are not part of this chapter. Along with additional roadmap information, this will be discussed in the next chapter.

3.1 Introduction to CoPs

Communities of Practice (CoP) provide a useful perspective on knowing and learning. The concept was first introduced in 1991 by the cognitive anthropologist Jean Lave and the educational theorist Etienne Wenger in their book “Situated Learning. Legitimate Peripheral Participation” (Lave & Wenger 1991). Communities of Practice are defined as follows (Wenger et al. 2002):

“Groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.”

In a CoP, three elements are fundamental: the domain, the community and the practice. To cultivate a CoP, the combination of the three must be developed in parallel (Wenger-Trayner 2015):

- **Domain:** A CoP distinguishes from other networks since its members identify themselves by a shared domain of interest. Membership involves a commitment to the domain and a shared competence.
- **Community:** While showing their interest in their domain, community members develop and share information, help each other and join activities and discussions. In this form of interaction, members build relationships in order to learn from each other and to support each other.
- **Practice:** Members of a CoP do not only share a common interest, they are engaged in common practice, as an iterative social process, where they develop and utilize a shared repertoire of resources that builds together toward a common goal. These can be experiences, stories, tools or ways of addressing recurring problems. To develop this kind of a shared practice it takes time and continuous interaction.

A CoP can evolve naturally due to the members' common interest in a specific field, or it can be created deliberately with the goal of gaining knowledge related to a particular domain. When applied intentionally as a learning concept, the overall goal of a CoP is to maintain the already existing knowledge about a specific topic and use it to create new ideas through an ongoing exchange of information. Through the process of sharing information and experiences with the group, members learn from each other and have an opportunity to develop personally and professionally (Lave & Wenger 1991). The community offers the



opportunity to learn about already established standards but also about new techniques and approaches.

Organizations and community members benefit differently by the implementation of a CoP. Depending on a short-term and long-term view, the benefits to organizations as well as community members are listed in the table below:

Table 3-1: Benefits to institutions and community members (Wenger et al. 2002)

	Short-term value	Long-term value
	<i>Improve business outcomes</i>	<i>Develop organizational capabilities</i>
Benefits to institutions	<ul style="list-style-type: none"> • Arena for problem solving • Quick answers to questions • Reduced time and costs • Improved quality of decisions • More perspectives on problems • Coordination, standardization and synergies across stakeholders • Resources for implementing strategies • Strengthened quality assurance • Ability to take risk with backing of the community • Standardized messages 	<ul style="list-style-type: none"> • Ability to execute a strategic plan • Authority with clients • Increased retention of talent • Capacity for knowledge-development projects • Forum for “benchmarking” against rest of industry • Knowledge-based alliances • Emergence of unplanned capabilities • Capacity to develop new strategic options • Ability to foresee technological developments • Ability to take advantage of emerging market opportunities
	<i>Improve experience of work</i>	<i>Foster professional development</i>
Benefits to community members	<ul style="list-style-type: none"> • Help with challenges • Access to expertise • Better able to contribute to team • Confidence in one’s approach to problems • Fun of being with colleagues • More meaningful participation • Sense of belonging • Trust in technology 	<ul style="list-style-type: none"> • Forum for expanding skills and expertise • Network for keeping abreast of a field • Enhanced professional reputation • Increased marketability and employability • Strong sense of professional identity

The overall approach for setting up and maintaining CoPs is structured along a number of elements:

1. Set-up and launch:
 - Planning the community
 - Design the operating practice
 - Launching the CoP
2. Support and manage:
 - Moderate the CoP meetings
 - Monitor outcomes

Figure 3-1 shows a support diagram containing the different elements of CoP set-up and management and examples of questions that should be considered when designing the CoP,

as well as while the CoP is running. The different elements are presented in detail in the next section.

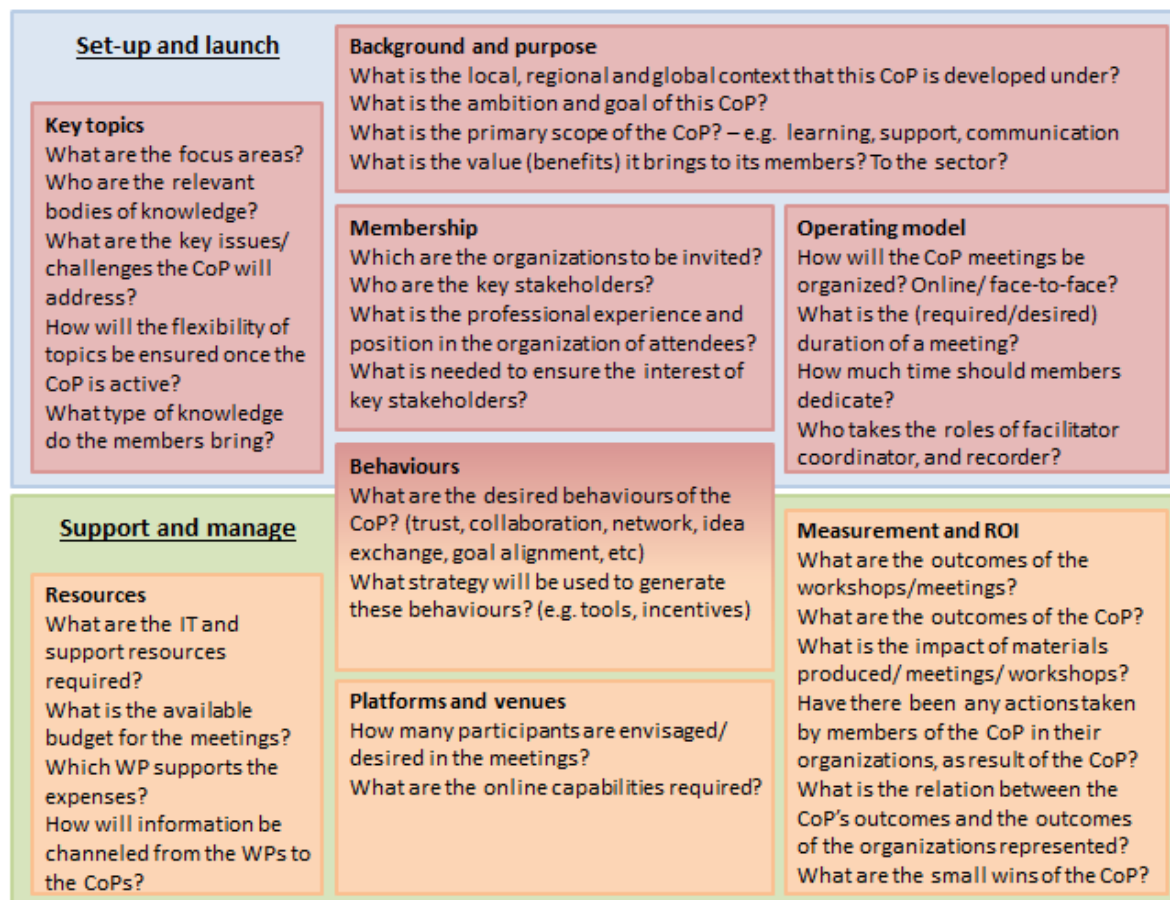


Figure 3-1: Support diagram for CoP set-up, launch, manage and support; adapted from the World Bank Group 2017, p. 20

3.2 Setting up the CoPs

3.2.1 Planning the community

An important role in setting up and running the CoPs is given to **the organiser** (coordinator) who is responsible for managing the CoP. The CoP organiser helps the community to focus on its domain, maintain relationships and develop its practice. The CoP organiser is responsible for the preparation and facilitation of the meetings. ***In the case of NextGen, the CoP organiser is, unless otherwise agreed, the formal contact person of the demo case, i.e. either a representative of the demo case end-user or of the related research organization.*** The CoP organiser will be supported by NextGen WP3 staff and activities. It is advised that the CoP organiser remains the same person throughout the entire existence of the CoP.

Next to the CoP *organiser*, with their crucial role of managing the meetings, a second role can be defined, i.e. the role of the CoP **moderator**. The moderator should be an 'independent expert', who is given the authority to lead, imposing clear rules and roles with the aim of generating an environment of trust and acting as a 'neutral' mirror when necessary. At the meetings, the role of the moderator will be essential to apply the

knowledge management model. ***For the NextGen CoPs, the CoP organiser is responsible for selecting a moderator, or if possessing the right skills, may choose to fulfil this task by him or herself.*** It is advised that next to the organiser, also the moderator remains the same person throughout the entire lifespan of the CoP.

Starting a CoP requires that the overall ambitions are set. Based on these ambitions the *relevant* stakeholders will be invited to become a member of the CoP. Importantly, these members should then agree on the common goals and shared values of their CoP and the domain (key topics) to address. As CoPs are designed to be flexible, the scopes and goals may adapt over the duration of the project due to the needs identified in the communities.

The CoP organiser is responsible for mapping all the potential stakeholders involved, ideally prior to organizing the first CoP meeting – starting at organization level and zooming in to individual level. The CoP members will be invited to join the CoP based on stakeholder networks and relationships. It is advised that the stakeholder participating remains the same person throughout the entire lifespan of the CoP. ***In NextGen the relevant stakeholders differ for each demo case. In general, these will include the water industry (operators), authorities (regulators), engineering companies, consultants, research institutes, representatives of non-governmental organizations, and potential end-users.*** It is in particular important to ensure the active involvement of policy representatives and decision-makers, at least when exploring themes directly relevant to policy-making. Such opportunities to explore the involvement of policy-makers are given at multiple instances, for example:

- in CoP #2, which aims, among other tasks, at identifying opportunities, bottlenecks and potential barriers
- in CoP #3, which aims, among other tasks, at identifying social and governance challenges that inhibit implementation and
- in CoP #4, which discusses replication and upscaling

The suggested themes of the CoPs are further analysed in Section 4.1.1 CoP Roadmap.

Again in general, the NextGen CoPs do not target the general public, unless they are directly involved as end-users. Public engagement in NextGen is organised in the activities of Task 3.2.

Given that not all CoP organisers may be familiar with stakeholder mapping, CoP #1 provides room for collectively mapping the most important stakeholders to engage when further closing the loop, meaning that prior to the first CoP, the organiser is only responsible for inviting all stakeholders already involved in the demo case. If needed, the CoP organiser will be supported by the NextGen WP3 staff. In any case, the WP3 staff will throughout the entire project remain in touch with the CoP organisers on the continuous involvement of all relevant stakeholders in upcoming CoP meetings at the demo cases.

As a result of the first CoP meeting, the ambition and desired goals are refined together with the members of the CoP, to ensure that these are in line with members' expectations. Working towards a shared objective is critical to community development. Questions that have to be answered by the community are: What are the main challenges we face? What is

the desired outcome of the CoP? What topics and issues do we really care about? The answers to these questions will help a community to develop a shared understanding of its objective, find its legitimacy in the organization and engage the passion of its members. In Annex 1 a CoP Group Interview Template (part A) is provided. This can be a useful aid when discussing the common objective with the CoP members.

All participants in the CoP meetings (and other participatory events) will be given information about the project, together with a consent form informing them of how the data collected will be used, of their right to withdraw at any time as well as the follow up anonymization procedures. To this effect, a template of an ***informed consent form*** for participating in NextGen meetings/interviews was produced in D8.1 and is included here in ***Annex IV***.

3.2.2 Designing the operating practice

Within CoPs, conditions have to be created to facilitate knowledge exchange. The CoP has to agree on specific ways to operate and to build relationships. Activities that generate energy and develop trust need to be organized. The CoP Group Interview template (part B) in Annex 1 can be used to find the CoPs specific way to operate and build relationships.

To capture and exchange the (mostly tacit) knowledge that is shared in the CoPs, a knowledge management model is proposed. NextGen aims to go beyond informing and rather use the CoPs for active consultation and collaboration with stakeholders, as elaborated on in Chapter 2. The *proposed knowledge management model is based on social learning and open dialogue* whereas individuals collectively develop new knowledge by making use of the diversity of perspectives and understandings at hand. This model is only presented as a generic guideline, which can be adjusted to local circumstances and requirements. Part C of the Group Interview template of Annex 1 provides specific questions for the design of an effective knowledge system.

To engage CoP-members in an open dialogue, the following principles can be applied (Medema et al. 2014):

- listening and speaking without judgement
- identification of underlying assumptions
- acknowledgement and respect for all contributions and ideas
- recognition of differences in perspectives and positions
- flexibility towards discussion topics

CoP meetings should be designed in such way that participants are willing to collaborate and learn together. To create such conditions aimed at social learning, Medema et al. (2014) emphasize the importance of building trust and mutual understanding, facilitating ongoing reflection by embracing an intentional learning approach, and creating an enabling environment for informal and open discourse and dialogue.

Transparency needs to be maximised so that the different stakeholders can take advantage of their differences and mutual dependence. The size of the learning group allows continuous feedback and the subject matter must be as concrete as possible. Those involved should be stimulated to think in systems and to critically analyse their own norms, values,

and assumptions explicitly. The moderator should support creativity, critical reflection and thinking outside the box. The role of the moderator is further described below.

3.3 Managing the CoPs

3.3.1 Moderating CoP meetings

The CoP meetings have to be organised: arrange venue and facilities, prepare an agenda, invite the members, etc. As the NextGen CoPs will have face-to-face meetings, suitable venues need to be chosen that match both the resources needed (e.g. IT) and available budget. The duration of the CoP meetings are to be determined by the organiser. Experience learns that the optimal duration of such meetings is different for different projects and cultural contexts. Having said that, it is advised to schedule at least a morning or afternoon, in order to discuss all topics and questions in such a manner that all stakeholders are heard and that there is room for mutual learning. **Furthermore, it is advised to link the CoP meetings with regular stakeholder meetings or additional NextGen activities, including the technical workshops.** In any case, it is important to always keep in mind that stakeholders are spending their valuable time – make this time as constructive and comfortable as possible and provide a fruitful atmosphere with some snacks and soft drinks if appropriate.

During the meetings, the main task of the CoP moderator is to provide structure, and to create a conducive environment for the learning process. Regarding the structure, the moderator has to help define common work goals and clarify working methods. The conducive environment for learning should ensure that values and assumptions can be discussed amongst the participants.

An open dialogue requires that participants are willing to discuss their diverging views and norms as equals. The moderator's task is to explicate such differences, as this is an important element of shared learning and a collaborative response. The moderator can guide this process by diverting from defensive reasoning and advocating appreciative inquiry. An appreciative approach can be facilitated by reframing problems to a focus on strengths and successes, e.g. by asking participants to identify what might work well and could contribute to the challenge discussed. Likewise, the participants can be asked to question the validity of the existing situations and underlying principles and use this for the identification of potential alternatives.

Thus, the moderator of a CoP should encourage the participants to articulate the reasoning and meaning underlying their thinking. This is done by stimulating self-generated explanations, self-evaluation, reflection and interaction between participants. Moreover, the moderator can model constructive behaviour by thinking and reflecting aloud and summarising progress. A suitable methodology, both for the moderator and in group assignments, is listening, summarising & elaborating (further questioning).

Depending on the purpose of the CoP meeting, i.e. problem definition, brainstorming, translating tacit knowledge into explicit knowledge, discussing complex issues, and decision making, the moderator can apply different moderation techniques. **Annex II provides an overview of moderation techniques.**



3.3.2 Monitoring outcomes

In order to ensure that the CoP meetings bring value, both for individuals attending and the organizations they represent, success measurement is defined as the collection and display of outcomes deriving from the CoPs. Therefore, a system of qualitative measurement of the outputs and outcomes of the CoP is set in place, as well as reporting on the value of the outcomes for the CoP members.

While CoPs are normally designed to last for years and tackle particular challenges brought up by their members, it is also important to look at the short term. Outcomes are typically determining the long term value, while short term value is brought to its members by “small wins” achievable in a short time. These small wins have the benefit of adding enthusiasm to the CoP members, and help them see the immediate value that the CoP participation brings. A small win for example can be the increased awareness about a topic that participants had limited knowledge of, and thus encouraging them to learn more about the topic and bring new questions to the CoP.

While CoP meetings are known to be engaging and energizing for the members, it is important to be aware that the actions that members take towards outcomes are carried out between meetings. As the meetings can be set months apart, the CoP organiser should aim to engage the CoP members in these activities and maintain a constant contact with them. Specific activities can be set at the end of the meetings for the members to act on in the period before the next CoP meeting. The activities have both the role of channelling lessons learned from the CoP in the day to day operations of members and to keep them engaged.

A way of measuring the outcomes of the CoP is defined by Wenger and Snyder (2000) as systematic anecdotal evidence. As there is no realistic way to quantitatively measure a community’s outcomes, systematic anecdotal evidence captures elements from the CoP members’ stories that connect community activities and their outputs with outcomes. Anecdotal evidence should be collected in a systematic way: on regular basis and covering the entire spectrum of members and their activities. Any quantitative measures should be added, such as “increase of efficiency by x%” or “improvement of operations leading to y% increase in customer satisfaction”. It is recommended that the CoP meeting agendas include a slot for participants to share their stories and capture these as part of the CoP reports or minutes. Importantly, the anecdotal evidence collected should capture both successes and failures, as the latter provides a basis to discuss and improve the actions CoP members take.

Minutes, evaluation evidence and a meeting report need to be generated following each CoP meetings. These documents form a crucial building block for the work carried out in NextGen WP3, and therefore is of high importance to the entire consortium. ***In NextGen, the CoP organisers are responsible for the facilitation of the evaluation and reporting of the meetings.*** The CoP reports will be collected by the CoP managers of WP3 (and included in the MS11 workshop memorial). The CoP reports are also important input to the cross-fertilisation and reflexive learning between the different CoPs (Subtask 3.1.3). ***The reporting format for NextGen CoP meetings and the evaluation form are provided in Annex III.***



4. NextGen CoP Roadmap

This chapter presents the NextGen CoP Roadmap. It does so in two parts. Section 4.1 describes the general structure of the CoPs in NextGen; it provides the key topics of the CoP meetings, outlines the calendar of the cross-fertilization meetings, and provides a time-line for all CoP activities. Section 4.2 describes the site-specific amenities.

4.1 Key topics of the CoP meetings

4.1.1 CoP Roadmap

The objective of the NextGen CoPs is to discuss CE water solutions in the institutional context of the demo cases, i.e. taking into consideration strategic discussion elements such as technical feasibility, economic aspects (societal cost-benefits), environmental impacts, as well as policy and governance frameworks, bottlenecks and barriers. To facilitate this and link these elements with the overall theme of CE, a general roadmap, with key topics and a time planning, has been developed. This section outlines the topics of the four CoP meetings. Based on the NextGen objectives and activities at the demo cases, the following key topics have been identified and are offered as a suggestion to the CoP facilitators:

- 1) *setting the scene*: during this stage, each demo case sets the framework for the CoPs that will follow and gets all participants acquainted with the case, its vision and links with circular economy. Basic tasks are suggested for this stage, such as stakeholder mapping, visualising the current situation and setting a future vision on circularity that will be shared among stakeholders, regardless of their professional perspective.
- 2) *closing the loop*: in this stage, the CoP may first identify opportunities for further closing the water, energy and material cycle. Moreover demo cases may identify technical feasibility bottlenecks and governance barriers (policy & regulations, circular economy interactions) that might inhibit the vision set in CoP #1.
- 3) *implementation*: this stage comes at a later phase of the demo cases, where CE developments are more likely to have been (partly) realised. It thus offers the opportunity of reflection on project implementation so far. Depending on the nature and context of each case, more specific reflection exercises may take place, such as assessing the efficiency (economic and environmental benefits) of the circular solution or identifying social and governance barriers that have inhibited or are likely to inhibit implementation.
- 4) *upscaling and evaluation*: at this late stage, there is the opportunity to reflect on the (completed) demo case. Having CE in mind, the stakeholders may also identify opportunities and barriers for upscaling and/or transferring to other cases. This stage is also accompanied by an evaluation of the CoPs and their effect on stakeholder engagement.

Figure 4.1 presents the sequence and key topics (with further details) of the four CoP meetings:



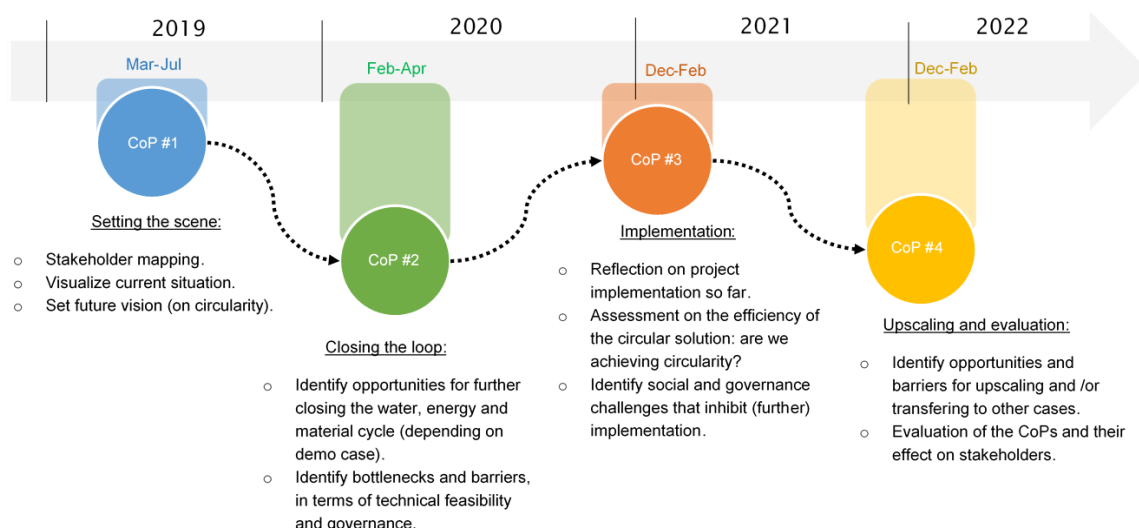


Figure 4.1: Overview of key topics and timeline of the suggested CoP meetings

For these four CoP meetings, information on the planning, the participants, the aim(s), related WP, method and central questions are presented in Table 4.1. All elements are elaborated on below:

- **Planning:** the four NextGen CoPs are scheduled between March 2019 and February 2022. Each CoP has to be organised within a specific period of three to five months, allowing the CoP organiser to adapt to the planning of the demo case, as well as to align with other regular and/or NextGen stakeholder meetings, including the technical workshops.
- **Participants:** In NextGen the relevant stakeholders differ for each demo case. In general, these will include the water industry (operators), authorities (regulators), engineering companies, consultants, research institutes, representatives of non-governmental organizations, and potential end-users. Prior to CoP #1, the organiser is responsible for inviting all stakeholders already involved in the demo case. During this first meeting, the group will collectively map the most important stakeholders to engage when further closing the loop. All these additional mapped stakeholders will be invited for CoPs #2 - #4. It is in particular important to ensure the active involvement of policy representatives and decision-makers, and the WP3 staff will remain in touch with the CoP organisers on the continuous involvement of all relevant stakeholders in upcoming CoP meetings at the demo cases. For additional inspiration of whom to invite, the CoP organisers are encouraged to read the reports of the other NextGen CoPs (available on the NextGen SharePoint).
- **Aim(s):** All CoPs are dedicated to a central theme, and accompanied by a number of aims aligned to the overall NextGen project. In addition to these overall NextGen aims, the organizers are encouraged to include additional aims, taking into account the needs and wishes of participating stakeholders, as well as demo specific characteristics.

- **Related WP:** Each CoP meeting relates to one or two NextGen WPs. In preparation of the meeting, the organiser is advised to be informed about these relating work packages and/or to involve the relevant task leader.
- **Method:** To support the CoP moderators in their role, Annex II of this guidance provides for a manual for moderation techniques, allowing them to pick the moderation technique best fitted to the specific situation and topic. In addition, to this general guidance, in each table methodological guidance is provided for the specific CoP.
- **Central questions:** The central topic and the aims of each CoP are operationalised in a number of central questions. Along with, among others, the minutes, the agenda, and the perspectives of the stakeholders (i.e. stories as anecdotal evidence), the answers to these questions are a central element in the CoP reports (see Annex III).



Table 4.1: Outline of the four CoPs

CoP #1	Setting the scene
Planning:	M9-M13 (March-July 2019)
Participants:	All stakeholders already involved in the demo case. Direct stakeholders (technology providers, site holders etc.) are prioritised.
Aims:	1. Mapping out the current CE demo case situation, along with a future vision 2. Inquiry of important stakeholders to engage 3. Identification of the key issues and defining the common objectives and benefits for all the stakeholders of the CoP
Related WP:	WP3
Method:	Round table discussion, appreciative inquiry, Annex I 'CoP Group Interview Template', Annex IV 'Consent Form', Annex III 'Reporting Format & Evaluation Form'
Central questions:	<p>1. From a CE perspective, how do the different stakeholders value the demo case current situation, and how do they envision the future?</p> <p>Appreciative Inquiry questions:</p> <p><i>a. Describe what you value most about the demo case?</i></p> <p><i>b. If you could further close the water, energy and material loop of the demo case in any way you wish, what would it look like?</i></p> <p>2. Who are the most important stakeholders to engage when further closing the loop?</p> <p>3. What are the key issues and goals of the CoP for all stakeholders?</p> <p>Appreciative Inquiry questions:</p> <p><i>a. Describe a time when you were part of an extraordinary display of cooperation between diverse organizations or groups. What made that cooperation possible?</i></p> <p><i>b. Describe your three concrete wishes for the future of this CoP.</i></p>

CoP #2	Closing the loop
Planning:	M20-M22 (Feb-April 2020)
Participants:	All stakeholders involved in CoP #1 + new stakeholders identified during CoP #1 and as a result of the fellow CoP#1 reports. Ensure the participation of policy/decision makers.
Aims:	1. Identify opportunities for further closing the water, energy and material cycle 2. Identify technical feasibility bottlenecks and governance barriers (policy & regulations, circular economy interactions)
Related WP:	WP1 and WP4
Method:	Round table discussion, open dialogue, Annex II 'Moderation Techniques', Annex III 'Reporting Format & Evaluation Form' Use of <i>Policy Survey</i> (to be developed in WP4) to guide the discussion on governance barriers. Ensure the participation of policy/decision makers. Use of <i>CE Infographic</i> (to be developed in WP1) to guide the discussion on CE interactions and economic aspects.
Central questions :	Address again with the new participants the key issues and goals of the CoP for all stakeholders. Use the <i>CE Infographic</i> to put the demo case solution within a broader CE perspective by discussing: 1. What opportunities and (technical feasibility + governance) barriers do the different stakeholders see for further reducing the use of freshwater resources, i.e. for further closing the water cycle? 2. What opportunities and (governance) barriers do the different stakeholders see for further maximising the recovery of energy and heat, i.e. for further closing the energy cycle? 3. What opportunities and (technical feasibility + governance) barriers do the different stakeholders see for the additional valorisation of materials from wastewater streams to replace conventional sources, i.e. for further closing the materials cycle? Use the <i>Policy Survey</i> to reflect on the governance (policy & regulations) barriers by discussing whether the following areas of policy and regulation were helping or hindering the development of the demo case:

	<ul style="list-style-type: none"> • Discharge to / pollution of water, abstraction of water, quality of water for (non) drinking water purposes • Waste handling, end of waste status, sludge management, agricultural land management & development • Gas production, electricity production, air quality & emissions, energy usage & efficiency • Certification of chemical products, health & safety of workers, procurement of public goods, planning & building.
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CoP #3	Implementation
Planning:	M30-M32 (Dec 2020 - Feb 2021)
Participants:	All stakeholders involved in CoP #2. Ensure the participation of policy/decision makers.
Aims:	<ol style="list-style-type: none"> 1. Reflect on implementation of the demo case technology 2. Placing the technology in its wider social and governance context 3. Assessment of the efficiency (economic and environmental benefits) of the circular solution by optimising toolbox development and discussing the value of the technology in the wider CE context
Related WP:	WP2 and WP4
Method:	Round table discussion, open dialogue, Annex II 'Moderation Techniques', Annex III 'Reporting Format & Evaluation Form' Use of <i>NextGen Toolbox</i> (to be developed in WP2) to discuss the economic and environmental benefits.
Central questions:	<ol style="list-style-type: none"> 1. What is needed to (further improve the) implementation the demo case technology in practise? 2. What are the most important social and governance challenges and opportunities facing the (further) implementation of the demo case technology? 3. What are the wishes, questions and needs of the stakeholders regarding the <i>NextGen Toolbox</i>, including its functionality and required level of detail?

	4. What is the efficiency of the demo case CE solution with respect to the economic and environmental benefits (using the <i>NextGen Toolbox</i>)?
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CoP #4	Upscaling and evaluation
Planning:	M42 - M44 (Dec 2021 - Feb 2022)
Participants:	All stakeholders involved in CoP#2 and CoP#3. Ensure the participation of policy/decision makers.
Aims	1. Upscaling opportunities demo case technology 2. Evaluation CoP
Related WP:	WP3 and WP4
Method:	Round table discussion, Annex II 'Moderation Techniques', Annex III 'Reporting Format & Evaluation Form'
Central questions:	1. Which opportunities and (governance) barriers do the different stakeholders see for up-scaling solutions and transferring them to other geographic areas? – Technology transference 2. To what extent and how has the demo case/NextGen challenged the thinking and practises of each stakeholder? 3. To what extent and how have the stakeholders been able to challenge and add value to the demo case? 4. How do the different stakeholders evaluate the merits of the different COPs?

In order to get a first impression of these demo case specifics, interviews have been conducted with the contact persons of all NextGen demo cases. The main characteristics of each demo case, as summarised by the contact persons, are outlined in Table 4.3 (an extensive overview of the demo cases is available at <https://nextgenwater.eu/demonstration-cases/>). Following a process of validation between the demo case partners, the content of each interview has been used to make suggestions on issues that could be addressed at the CoP meetings for each demo case, seen in Table 4.4 (all interview results are available at NextGen's digital platform SharePoint).

Overall, the key topics listed for the 4 CoP meetings at the demo cases are very much in line with the general roadmap of the NextGen CoPs (as described in 4.1): 1) setting the scene, 2) closing the loop, 3) implementation, 4) upscaling and evaluation. It is noted that the findings in Table 4.4 are suggestions and are not in any way binding each demo case; on the contrary, each case is flexible to change or adapt the CoP meetings theme, target group and form as the project progresses and new needs are highlighted. Likewise, the number of CoP meetings can be adjusted to fit the demo case needs; there might be the case that more than four CoP meetings are needed, for instance if the case needs to be demonstrated at different stakeholder groups after the implementation phase.

Table 4.3: Overview of the case studies and their main characteristics.

Demo case	Regional [R] / Local [L]	Cycle: Water [W] Energy [E] Materials [M]	Pilot Technologies / Goals
Altenrhein	L (WWTP)	M	<ul style="list-style-type: none"> GAC from sludge Ammonia (N) stripping/recovery P recovery
Athens	L (SM pilot)	W/E/M	<ul style="list-style-type: none"> WW non-potable reuse Energy and nutrient recovery
Braunschweig	L (WWTP)	M/E	<ul style="list-style-type: none"> N/P recovery (ammonia stripping and struvite production) Optimize thermal energy balance of N/P recovery Produce fertilizer alternatives from WW sludge
Bucharest	L (WWTP)	W/M	<ul style="list-style-type: none"> Treated WW reuse to replace cooling water for thermal power plants Increase efficiency of N recovery Use of WW sludge as alternative fertilizer

Costa Brava	L (WWTP)	W/M	<ul style="list-style-type: none"> • WW non-potable reuse (gardens, aquifer recharge) using regenerated RO membranes from desalination plants
Filton Airfield	R (multi-zonal site)	W/M/E	<ul style="list-style-type: none"> • Blue-green area development (through RWH/SUDS) as part of the general development plan
Gotland	R (island)	W	<ul style="list-style-type: none"> • RWH for aquifer recharge • Municipal WW reuse for aquifer recharging • Small-scale desalination
La Trappe	L (brewery WWTP)	W/M	<ul style="list-style-type: none"> • WW non-potable reuse (aquifer recharge, irrigation, production uses/bottle-washing) • Carbon, nitrogen and phosphorus recovery
Spernal	L (WWTP)	E/M	<ul style="list-style-type: none"> • Increase energy efficiency in WW treatment, through the use of anMBR • Energy (biogas) production as part of the WW treatment. • N/P recovery, production of fertilizer alternatives.
Westland	R (municipality)	W/E/M	<ul style="list-style-type: none"> • Large-scale RWH for aquifer recharge and recovery for horticulture irrigation • WW reuse and nutrient recovery from large WWTPs • Thermal energy harvesting from industrial areas (and possibly WWTPs) and reuse in horticulture

The abbreviations shown in the table are as follows:

WWTP: Wastewater Treatment Plant

WW: Wastewater

RWH: Rainwater Harvesting

SUDS: Sustainable Urban Drainage Systems

GAC: Granulated Activated Carbon

SM: Sewer Mining

N/P: Nitrogen / Phosphorus

RO: Reverse Osmosis

anMBR: anaerobic Membrane Bioreactor

Table 4.4: Demo case-specific suggestions on the CoP meetings.

Demo Case	Specifics on CoP Meetings
Altenrhein	<ul style="list-style-type: none"> - CoP #1/#2 should align with the pilot plant technology application and results. An important point is to obtain, demonstrate and communicate the effectiveness of the proposed technology (e.g. showcasing and discussion of test results in GAC recovery and N/P stripping). - CoP #3/#4 could be used to reflect on the economic and environmental efficiency of the technology, demonstrate circularity and discuss upscaling/replication with larger groups. For instance, CoP meetings could cover subjects such as: <ul style="list-style-type: none"> o Comparing cost against other commercial solutions. o Exploring commercialization and business models. o Regulatory requirements for recovered bio-based products o Showcasing the results to other WWTPs. o Showcasing the results to end users for the recovered P/fertilizer (e.g. farmer groups). o Promoting the advantages to environmental organization or media partners.
Athens	<ul style="list-style-type: none"> - CoP #1 can be used to inform and engage key partners (show goals, aims and processes of the pilot as part of NextGen). A showcasing of the economic and environmental assessment tools (collaboration with WP2) can be also arranged. - CoP #2/#3 could be used to: <ul style="list-style-type: none"> o assess (application of <i>NextGen Toolbox</i>) and communicate the pilot results so far. Is circularity being achieved? o explore the challenges in terms of legislation (related to the EU Minimum quality requirements for water reuse), permits, the need to engage more partners and authorities etc. that inhibit a potential upscaling/replication to other areas. - CoP #4 could provide an opportunity to demonstrate the technology to strategic partners, such as the Decentralized Administration of Attica. This would help enable its integration to broader urban policies and replication to multiple sites.
Braunschweig	While the topic of nutrient recycling has been discussed before for the case of Braunschweig, the CoP meetings offer the opportunity of regular, periodic communication where different recurring themes can be discussed. Hence, the CoPs can be used to systematically inform about and reflect on different issues for the pilot, receive feedback by the stakeholders on their needs and try to overcome any barriers for successful

	<p>implementation of the nutrient recycling scheme. The themes that can be attached to one or more, if needed, meetings include:</p> <ul style="list-style-type: none"> - Demonstration of the recycling technology and discussion on the acceptance of recycling products by farmers and the general public. This is a more pragmatic topic suited for CoP#1 meeting that includes: (a.) demonstration of what is done on-site and what can be produced from recycling, (b.) identification of possible barriers and obstacles to apply the fertilizer, (c.) development of the requirements in order to increase and ensure acceptance of the nutrient products with farmers and the public. - Designing the optimal fertilizer product needed by farmers. In collaboration with farmer groups, this theme can be used to explore the end-user requirements of the product and ways to achieve them. The ideal physical and quality characteristics of the product can be discussed, along with a comparison between the obtained product from the pilot and conventional fertilizers. Other issues that could be explored include nutrient efficiency, the presence of contaminants and the risk assessment of the recovered products (QCRA). - Exploring the legal framework of sludge reuse. As a primary topic for CoP #2/#3, this theme could be used to bring together stakeholders that enable/apply the necessary policies and national legislation for sludge reuse, such as relevant authorities and other WWTP companies who are experienced in sludge reuse. More specific topics that can be explored include legal (quality) requirements, national fertilizer regulation, REACH certification, legal uncertainties for the product application etc. - Transferability/replication of the technology. This is a topic suited for end-stage CoP meetings and comprises the exploration of technical requirements, legal issues and market restrictions that potentially inhibit or enable the transfer of the particular technology to other sites and its broader inclusion to the fertilizer market.
Bucharest	<ul style="list-style-type: none"> - CoP #1/#2 should align with the pilot construction/operation project phases and the requirements of the direct end-users. For instance, the meeting could be used to: <ul style="list-style-type: none"> o get informed on thermal water quality requirements and compare them to the treated WW quality o analyse and communicate the results of the land pilots which use fertilizer alternatives produced by the WWTP. - CoP #2/#3 could be used to explore legislation barriers, especially regarding sludge reuse and the production of fertilizer alternatives. These barriers might prevent an efficient upscaling of the demonstrated sludge reuse technologies, e.g. in other WWTPs. The advantages of

	<p>reusing sludge vs. other solutions (e.g. incineration) would then have to be demonstrated.</p> <ul style="list-style-type: none"> - CoP #4 could be used to demonstrate circularity to broader groups, such as other WWTPs and farmer groups from other provinces.
Costa Brava	<ul style="list-style-type: none"> - CoP #1/#2 could be used to enable the pilot construction and operation, for instance by: <ul style="list-style-type: none"> o forming a technical panel on RO regeneration (e.g. partners from desalination plants and WWTPs) o identifying the pool of end-users for the treated water (e.g. private small or larger-scale land owners), with the help of the municipalities and the local communities. - CoP #2/#3 could focus on discussing potential barriers of legislation on water reuse, e.g. monitoring of emerging pollutants to support WFD and UWWTD policy implementation. CoP#2 could also be used to discuss the demo case solution within a broader CE perspective (using the <i>CE Infographic</i>), and CoP #3 could be also used to reflect on the results and efficiency of the technology. - CoP #4 could be used to communicate the demonstrated technologies beyond the pilot scale, e.g. with the engagement of external agencies, larger-scale end-users and other WWTPs in the province. Another idea would be to establish a web of observers that would be interested in re-applying the technology to other cases.
Filton Airfield	<ul style="list-style-type: none"> - CoP #1 could be used to create strong contact links between NextGen partners and the development company, in order to gain insight on the project phases and promote circular water management as part of the broader development vision for Filton Airfield. - CoP #2/#3 could be used to bring together stakeholders involved in different project phases (design, construction and management, regulators), in order to reflect on (achieved) water circularity (using a.o. the <i>CE Infographic</i> and <i>NextGen Toolbox</i>) as the project is being realized. With policy representatives regulatory requirements related to building and construction will be discussed. - CoP #4 could be used to communicate the projects results (in terms of circularity) to broader interested groups, such as consumer groups, panels of “future inhabitants”, media partners, entrepreneurs that could be part of the business cluster in the site etc.
Gotland	<p>In Gotland, creating platforms of communication between different stakeholder groups is important to evaluate different distributed technologies in the area and ensure that they will be accepted by the local</p>

	<p>community. The CoP meetings could be aligned to this need and come in the form of platforms of dialogue between stakeholders.</p> <ul style="list-style-type: none"> - CoP #1 could be used demonstrate the different technologies, as well as their timeline and project phases, to key stakeholders. - CoP # 2/#3 could feature platforms where technical feasibility and regional governance/regulatory issues are explored (including the EU Minimum quality requirements for water reuse), with engineering companies and municipal/provincial stakeholders. - CoP #4 could be employed to generate acceptance with the local community (end-users) and facilitate upscaling. For instance, the following themes could be explored: <ul style="list-style-type: none"> o disseminating the project vision and results to the local community, in collaboration with citizen/community organizations, the municipality, local landowners etc. o exploring business models with entrepreneurs that would allow further exploitation of distributed technologies in different contexts or communities, within and beyond Gotland.
La Trappe	<ul style="list-style-type: none"> - CoP #1 could be pragmatic and tied to the project realization. The meeting could be used to bring stakeholders involved in the project construction and operation together, in order to discuss project phases, data needs, set targets in terms of water quality etc. At the same time, stakeholders potentially interested at later phases of the project could be identified. - CoP#2 could be used to demonstrate the loop closure for water in La Trappe in a selected pool of partners, especially with regards to the efficiency of the applied technologies (using the QMRA tool) and the stages of water reuse (aquifer recharge/irrigation/beer production) that the project aims at achieving. - CoP#3 could be used to reflect on the achieved reuse efficiency and economic and environmental benefits with the structurally involved stakeholders. Is circularity at the desired level achieved? Are any improvements needed? - CoP #4 could be used to disseminate results and demonstrate the upscaling and reuse of the technology to other sites. For instance, the following themes could be explored: <ul style="list-style-type: none"> o demonstrating the project's innovation to selected partners (e.g. entrepreneurs). o upscaling the demonstrated technologies to urban contexts, such as the city of Eindhoven.

Spernal	<ul style="list-style-type: none"> - CoP #1 could be used to set goals and identify and map stakeholder groups, such as: <ul style="list-style-type: none"> o technology providers/engineering companies, o end-user groups for the fertilizer alternatives o regulatory stakeholders that could be invited at later phases. - CoP #2/#3 could be tied to the project phases as it unfolds and discuss/reflect on the project realization and its results. Regulatory stakeholders could be also involved to discuss frameworks and barriers for material reuse, e.g. REACH obligations and the new European 'CE fertilizer' regulation. - CoP #4 could be used to disseminate results and discuss market opportunities to uptake the demonstrated technologies and end products. This could be combined with other projects, such as WOW (Interreg) to discover market opportunities, provided that the timelines of the projects are aligned.
Westland	<p>Due to the high complexity, large number of different technologies and respective stakeholder groups, as well as different aspects of the water-energy-materials cycle, the CoP meetings could be done thematically, as part of the circular concept.</p> <ul style="list-style-type: none"> - CoP #1 could be used for stakeholder and project mapping (per each technology theme or aspect of the water-energy-material cycle), in order to identify all possible groups, interactions, timelines and integration potential with other projects. <p>CoP #2 could be used to discuss how all CE initiatives contribute to a circular Delfland region. With representatives of water authorities, province and municipalities, alternative strategies to close the water cycle will be discussed, making use of a <i>CE Infographic</i> and UWOT modelling exercises from WP2. To be included in the discussion is the new obligation by Dutch law for horticulture to have a water purification system or zero emission.</p> <ul style="list-style-type: none"> - CoP #3 could be employed as communication platforms to bridge different stakeholder groups and projects under a single "circular" theme. Possible themes are: <ul style="list-style-type: none"> o Regional-scale RWH and reuse for Westland (from greenhouses and urban areas) o Water reuse and energy/nutrient recovery from regional WWTPs o Industrial thermal energy harvesting, storage and recovery for horticulture

	<ul style="list-style-type: none"> - CoP #4 could be used to disseminate regional circularity to the local community and selected media partners, as well as explore business models for selected technologies used in Westland.
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Annex I: CoP Group Interview Template

This Annex presents a number of key questions to discuss with the members of a CoP at the start of their community. The questions are derived from the World Bank Group (2017, p. 51-53).

Part A - Key questions on the common objective

Goals: develop a shared understanding of the domain and objectives, find its legitimacy in the organization, and engage the passion of members.

- What topics and issues do we really care about?
- What are the development challenges we want to address?
- What outcomes do we want to focus on?
- What is out of scope?
- How is this domain connected to the organization's strategy?
- What is in it for us?
- What kind of influence do we want to have?
- How will we communicate the community's goals and achievements, and to whom?

Part B - Key questions on the community operation

Goals: find the community's specific way to operate, build relationships, and grow.

- What roles are members going to play?
- How will decisions be made?
- What kind of activities will generate energy and develop trust?
- What kind of behaviours can we expect from each other (respect, honest feedback, etc.)?
- How can the community balance the needs of various segments of members?



Part C - Key questions on the knowledge systems

Goals: design the community in a way that it becomes an effective knowledge resource to its members.

- How will community actions result in outcomes?
- What kinds of learning activities to organize?
- How should we use collective learning, versus expert-apprentice, versus external research/expertise?
- Where are the sources of knowledge and benchmarks outside the community?
- What are the benefits for members?



Annex II: Moderation techniques

This annex is designed to support the moderators of the CoP's by providing them with a manual for the moderation techniques allowing them to pick the moderation technique best fitted to the specific situation and topic.

Depending on the purpose of the CoP meeting, i.e. problem definition, brainstorming, translating tacit knowledge into explicit knowledge, discussing complex issues, and decision making, different moderation techniques are applicable, see Table 0-1.

Table 0-1: Overview moderation techniques and purpose

Moderation technique	Introduction	Problem definition	Brainstorming	Explicit knowledge	Complex discussion	Decision making
Interview	X					
Elevator pitch	X					
Asking the right questions		X				
The other way around			X			
Expert knowledge				X		
World café method					X	
Perspectives						X
Scenario's						X

Interview

What is it?

The interview technique is an active introduction technique for larger groups (Dirkse-Hulscher & Talen, 2007). In the interview exercise, the participants are split in several couples. Both participants have to interview each other. Afterwards the participants have to introduce the person they interviewed. This exercise allows the participants to really listen to each other in comparison to a traditional introduction round where the participants are usually preoccupied with how to introduce themselves when it is their turn. Moreover, it forces the interviewer to actively listen as they have to introduce the interviewee later on.

When to use it?

This technique is useful during the introduction phase of a CoP when the participants do not know each other yet. It is suitable for large groups.



How does it work?

- Preparing questions
The moderator can prepare interview questions before hand and write them on a white board or flip over before the session starts.
- Forming couples
The moderator the participants the instruction to find a participant who they have not met before and form pairs.
- Assignment explanation
The moderator explains that the pairs have to interview each other based on the given questions.
- Start and stop
It must be clearly explained how much time the participants have for each interview. The moderator has the responsibility of time management. After the time for the interview has passed, the participants are asked to return to their places.
- Introduction round
When all the participants have returned to their places everyone is asked, one by one, to introduce the person they interviewed. The described person has the opportunity to adjust the introduction if something is incorrect.

Requirements

- White board/ flip over, chairs, questions, paper, pens.

Elevator pitch

What is it?

The elevator pitch is a method for participants to briefly introduce themselves (Dosière & Willems, 2016). In the elevator pitch exercise every participant introduces him/herself in one minute, who they are, what they do and the reason why they are participating in the CoP. This exercise is slightly more formal, but it has the advantage of getting to know each other fast in a larger group. It gives everyone some insight in the people surrounding them and their main problem related to the project. Moreover, it leads the way for more informal conversation later on and can serve as an ice breaker at the start of the CoP.

When to use it?

This technique is useful during the introduction phase of a CoP when the participants do not know each other yet. It is suitable for large groups.

How does it work?

- Preparing questions
The moderator can prepare questions before hand and write them on a white board or flip over before the session starts.
- Explanation and preparation time



The moderator explains the participant's assignment: introduce yourself in one minute to the group based on the questions the moderator has prepared. The participants get five minutes to prepare their answers.

- Introduction round
One by one the participants are asked to step in front of the group and introduce themselves in one minute. The moderator is responsible for the time management and signals the beginning and end of the minute.

Requirements

- White board/flip over, microphone (depending on group size), paper, pens.

Asking the right questions

What is it?

Asking the right questions is a method to identify the concrete problem that needs to be tackled (Dosiè & Willems, 2016). This exercise helps to formulate a concrete problem definition through asking several questions. This exercise is selected as it forces the participants to explicitly formulate what they want to know and thereby defining the problem. This method helps to structure complex problems and allows for a more concrete discussion.

When to use it?

This method is suitable in the early stages of the CoP's when the problem definition is not yet concrete. Especially when tackling complex issues this method helps to clarify the main issue.

How does it work?

- Preparing an issue and set of questions
Either the moderator prepares an issue or the moderator asks one of the participants to prepare a current issue and a set of questions concerning the issue that would help them solve the problem.
- Explaining the question
The participant is asked to present their issue to the group followed by questions to which they need to be answered. The other participants come up with questions of which they think are necessary to tackle the problem adequately. At the same time the moderator writes these questions down on the flip over. The moderator serves as a discussion leader.
- Group discussion
The group is asked to discuss the presented issues and questions. The moderator is responsible for time management.
- Reflection
The reflection will also serve as a brief summary. The moderator will help the group reflect on their discussion by asking them to define the main conclusion from the



discussion, what they have learned from the discussion, what new insights they acquired and which aspects are still unclear.

- Looking ahead

The group is asked to think ahead about the requirements for solving the problem. Who and what would you need? Where do you need to start? What obstacles can be expected? How can the participants help each other? The moderator writes the answers down.

Requirements

- White board/ flip over, pen/ marker, chairs .

The other way around

What is it?

After the problem definition is clear it is necessary to gather as many different approaches as possible before selecting an approach. Brainstorming often leads to new insights. The other way around is an exercise where the participants are asked to think of ways to worsen the problem instead of fixing it. The aim of the assignment is to break free of fixed thinking patterns and brings out new perspectives (Dirkse-Hulscher & Talen, 2007).

When to use it?

This method is suitable as a brainstorming technique. It is likely to bring new insights.

How does it work?

- Reformulating the problem and assignment
Instead of asking the participants to come up with a solution they are asked to think what should happen to worsen the problem.
- Writing down ideas
The participants have two minutes to write down their ideas. This could be done in pairs of two.
- Gathering ideas
The moderator will ask everyone to present their ideas. At the same time the moderator divides the flip over in two sides. On the left side the moderator writes down the ideas.
- Translate ideas into solutions
After all the ideas are written down, the group will try to translate the ideas into solutions for the original problem. All the solutions should be written down on the right side of the paper.

Requirements

- Flip over/whiteboard, pen for flip over/whiteboard, pens for the participants, paper for the participants, chairs and tables.

Expert knowledge

What is it?

In order to make knowledge available to a broader audience, it must be made explicit. Experts often do not realize they have a lot of tacit knowledge and make decisions automatically. The expert knowledge method is an active way to elicit tacit knowledge. The room is divided into two separate areas (yes or no). The moderator will pose questions which can be answered by yes or no. The experts have to stand in the area corresponding with their answer. Their answers can be discussed (Dirkse-Hulscher & Talen, 2007). This method allows for the generation of new ideas and offers more insight in thinking patterns. The participants can learn why certain decisions are made by experts and this can lead to questioning their own thinking patterns.

When to use it?

It is a method best used for knowledge exchange of tacit knowledge.

How does it work?

- **Preparation**
In order to have a detailed discussion, the participants have to be familiar with the subject. If the moderator deems it necessary for the participant to prepare he/she has to provide reading materials. The moderator has to prepare questions tailored to the knowledge level of the participants.
- **Introducing the theme**
The moderator has to provide the participants with basic knowledge of the subject.
- **Asking everybody to stand**
The moderator divides the room in two areas, true or false in advance of the CoP. During the session the moderator asks the participants to stand.
- **Asking questions**
When everyone is standing the moderator will pose a question and will explain the answer areas. The participants get few minutes to think about their answer and will walk to the area matching their answer.
- **Explanation**
The moderator will ask one person to explain their answer.
- **Pay attention**
The moderator has to stop the participant from explaining when he/she notices the explanation is incorrect. The assignment is not about the discussion, but about the reasoning behind the answer. This should be made clear to the participants.

Requirements

- Tape to divide the room in separate areas, reading materials.

The world café

What is it?

The world café setting is a method for relatively larger groups to discuss complex issues (Bijanju, et al., 2015). The overall theme and topic of the CoP is defined before the CoP starts. Several questions are prepared in advance. Each question is assigned to a table. The group is divided into smaller groups and are assigned to a table where they can discuss the posed question. After a certain amount of time, the groups switch tables and pick up the discussion at the new table where the previous group left off. The process will repeat itself until each group has visited every table and the session will end with a plenary conclusion.

When to use it?

The world café method is a useful method to facilitate knowledge exchange. By creating an informal atmosphere, and small groups contribution is likely to be higher than in larger groups. Moreover, it allows gathering a lot of information in a short period of time and gathering more in depth insights by building on the insights of the previous groups. Lastly, by dividing the topic in smaller sub questions, multiple issues can be discussed at once.

How does it work?

- Before the session

The moderator selects a theme and designs 3-5 easily explained questions. The moderator selects 3-5 hosts (depending on the amount of tables) and explains their responsibilities:

- Hosts should give a 2-3 minute explanation at the beginning of each discussion.
- Encourage discussion in the group.
- Stay at their table and recap the findings from the previous group for the new one.
- During the plenary discussion they provide a brief summary of the key findings.
- Select the participants (not necessary in this case).
- The moderator has to set up the room by putting 3-5 tables in the room and surround them by chairs. Each table needs to have a flipchart or a paper cloth on which ideas can be written down.

- Introduction and discussion

At the start of the session, the participants are assigned to a table and the moderator briefly explains the session:

- Each table has to choose a reporter who will stay behind with the host. This is to ensure consistent reporting.
- The host will give a 2-3 minute explanation and the discussion can begin.
- During the discussion participants should write down their ideas on the flip over or the paper table cloth. They are only allowed to write their ideas down after they've expressed it out loud. This allows the reporter to write it down as well.
- The discussion can begin and each round will last around 20 minutes. The moderator is responsible for time management and will let the participants know when it is time to switch tables.. The participants have to move clockwise to the



new table. Only the host and reporter will stay behind. When the new group arrives, the host will give a 3-4 minute summary of the discussion of the previous group.

- **Reflection**
After three rounds of conversations, the group should come back together again for a plenary reflection and conclusion. The host of each table will be asked to give a 5 minute summary of key points from their table. In case the host hasn't written the findings down, this should be done by the organizer.
- The world café will last approximately 75-90 minutes; this includes the plenary concluding of the session.

Requirements

- A host and reporter per table, participants (12-30), 3-5 tables and chairs for all the participants, one flipchart per table, marker and pens per table, timers.

Perspectives

What is it?

In the perspectives method every participant is assigned a perspective which they have to adopt in the following discussion. A decision is made on the provided perspectives (Dirkse-Hulscher & Talen, 2007). The different possible solutions will be discussed and everyone has to come up with arguments against and in favor of the solutions based on their assigned perspective. The moderator writes down all the arguments. Everyone switches back into their own role and based on the arguments mentioned before, a decision is made.

When to use it?

This method is useful in the final phases of a project or CoP when decisions have to be made and hence consensus has to be reached between a wide range of actors. By being forced to take up someone else perspective, more understanding is created between the actors of the CoP. This in turn can lead to better communication between the participants and possibly lead to less pushing of personal agenda's

How does it work?

- **Repeating the options**
The moderator repeats all the options and writes them down on a flip over.
- **Mapping the parties**
The moderator makes an inventory of all the parties of interest and writes them down on cards.
- **Changing perspectives**
The moderator hands out the cards with the different roles to the participants and makes sure no one receives his own role. The participants are allowed to discuss their arguments concerning the decision with participants who are assigned the same perspective. The moderator can provide questions to help them form an opinion.



- Discussion
The moderator leads the discussion and writes down all mentioned arguments. At the same time the moderator makes sure that the participants offer arguments from their assigned perspective.
- Changing back perspectives
After the first discussion it is time to change back perspectives. Everyone can now bring up arguments from their own perspective.
- Decision making
The moderator lists the arguments that have been made during the discussion and will ask the participants to vote for their preferred solution.

Requirements

- Flip over/whiteboard, pen/marker, cards

Scenario's

What is it?

In the scenario's method the moderator and the group create scenarios based on the consequences of possible approaches. This allows for a comparison between different approaches (Dirkse-Hulscher & Talen, 2007). The scenario's method helps to make a well thought decision by looking at all the possible outcomes of choosing a certain path.

When to use it?

This method is useful in the final faces of a project or CoP when decisions have to be made and hence consensus has to be reached between a wide range of actors. Listing the possible outcomes of several options allows the participants to make a well informed decision.

How does it work?

- Discussion summary
This technique is usually applied after a discussion to gather possible solutions. The moderator summarizes all the proposed solutions and suggests together with the group concept decisions and writes them down on a flip over.
- Explaining the method
The moderator explains to the group that he wants to gather as many consequences as possible for each decision. The focus should be on possible negative consequences and they should also list the effects on every actor group to create an outcome scenario for each decision.
- Scenario outcomes
The group is divided in smaller groups. Each group is assigned a concept decision for which they should create a scenario. In order to make a fair comparison, the moderator can hand out a standard form to write down the consequences.
- Scenario discussion



The groups discuss the scenarios while focusing on the consequences that have the biggest impact. The other participants are asked to come up with ideas to lower the impact of these consequences.

- Summary and decision making
The created scenario's form the basis of the decision. The moderator summarizes the consequences of each scenario and writes them down on a flip over. There are two possible options to make a decision. Either the moderator decides based on the scenarios and consequences or the groups votes for one.

Requirements

- Flip over, pen/marker, paper, pens, tables, chairs.



Annex III: NextGen CoP Reporting Format

CoP Meeting Report

The CoP organiser is responsible to prepare and share a CoP Meeting Report after each CoP meeting.

Title of CoP Meeting (key topic):

- Organizing partner:
- Moderator:
- Meeting Place:
- Date:

Agenda for the meeting

- Please insert the agenda from your meeting

Objectives

- Describe the CoP meeting objectives

Participants characterization

- **Table** The table below shows the number of participants, the respective sector of activity and the level of governance each stakeholder is active in.

Table: Overview of stakeholders

Institution / sector	No. of participants (registrations)		
	In total	Male	Female
Water industry			
Authorities			
Engineering companies			
Representatives of other sectors			
Research institute			
End-users			
Other: name			
Other: name			

Description of meeting's activities

- Provide a summary of activities carried out. Were there plenary or working group sessions? Presentations by whom on what? (Provide presentations as appendices).
- Describe the moderation technique and method for open dialogue applied.

Main achievements

- Describe briefly the main outcomes and results from the meeting, including the answers on the central questions such as outlined in Section 4.1 ‘Key topics of CoP meetings’, as well as any actions to be taken by members, as agreed upon.
- Summarise the perspectives of the stakeholders (i.e. stories as anecdotal evidence).

Reflexive notes

- Describe your observations on stakeholder engagement (e.g. do we need to add others?)
- Describe any relevant observations for further steps

Annex

- List of Participants
- Presentations
- Evaluation by Participants: Summary



CoP Meeting Evaluation Form

This evaluation form is to be completed at the end of each CoP meeting by all participants. The organiser is responsible for the distribution and collection of these forms.

Place: _____ **Date:** _____

It was a pleasure to have you in this meeting. We would like to know your opinion, so that we can improve future events and meet your expectations. Your identification is optional. Thank you for your collaboration!

Name (*optional*): _____

Organization (*optional*): _____

Please rate each of the following items between 1 and 5
(1 = poor; 2 = sufficient; 3 = medium; 4 = good; 5 = very good)

1. Meeting preparation and logistics	
Meeting information provided in advance (e.g. dates, venue, agenda)	
Meeting venue (adequacy of the room where the meeting took place)	
Materials distributed during the meeting to support the sessions	
Comments: (<i>optional</i>)	
2. Overall assessment of the meeting	
Attainment of the objectives of the meeting (the objectives of meeting were met)	
Positive and collaborative atmosphere among participants	
Duration of the meeting (1=totally inadequate; 5=adequate)	
Opportunity for individual participation and input in the meeting	
Comments: (<i>optional</i>)	

3. Evaluation of the sessions

Clarity of presentations/speakers	
Discussions (moderation, conclusions reached)	
Comments: <i>(optional)</i>	

(1=excellent; 2=good; 3=average; 4=poor)

Pros and cons of the meeting

In your opinion, what were the most positive and less positive aspects of the meeting?

Most positive

Less positive

Suggestions for improvement

What suggestions for improvement do you have for future meetings?

Thank you!

Please give this questionnaire back to the meeting organizer before leaving.



Annex IV: Consent Form

CONSENT FORM

Title of Project: **NextGen: Towards the Next Generation of Water Systems and Services for the Circular Economy.**

Researcher in charge of meeting/interview: **[Name/Affiliation]**

Thank you for participating in this meeting/interview, which is intended for research purposes only, and aims at investigating **<purpose>**.

Please initial all boxes

1. I confirm that I have read and understood the purposes of this meeting/interview. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I agree to allow researchers of the NextGen project to record the meeting/interview and analyse an excerpt for internal reporting of the project, project deliverables, and to potential publishing of conference/journal papers. ☐
3. I understand that the data collection will not be linked to me as an individual, not even internally in my institution/organisation. ☐
4. I understand that at the end of the project (after 2022), all personally identifiable data will be anonymised and sources (audio recordings etc.) will be destroyed after 5 years. ☐
5. I understand that my participation is voluntary and that I am free to withdraw at any time, even after the completion of the meeting/interview (*but before my data has been anonymised*), by contacting the researcher/interviewer, without giving any reason. ☐
6. I give permission to the researchers to use the pictures taken during the meeting/interview for the purposes of disseminating the NextGen project. ☐

Name & e-mail of participant

Date

Signature

Note: This consent form may be translated in the local language of each meeting in case the organiser considers it necessary for the participants; otherwise the English version will be used.



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