STOP-IT

Deliverable 2.2 (M24)
Annual technical and policy brief based on the results of each CoP

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TITLE OF THE REPORT

D2.2: ANNUAL TECHNICAL AND POLICY BRIEF BASED ON THE RESULTS OF EACH COP

SUMMARY

This deliverable is designed as a brief overview of activities carried out in the Communities of Practice (CoPs) within the STOP-IT project, together with summarizing the feedback of the participants and facilitators, and providing recommendations for future CoP activities. It is envisaged that this brief supports the Work Package 2 (WP2) team in delivering high-quality information and support to the CoPs and their members. In developing this brief, all feedback and evaluation forms provided by the CoPs facilitators over the two years of STOP-IT have been taken into consideration, as well as feedback from the facilitators of the workshops and work meetings. Nine workshop reports and feedback from all facilitators were used in developing this brief, six from the first year and three reports for the second year. The evaluation by both the participants and facilitators of the workshops was summarized and consolidated in order to avoid duplication of information. Each year this document will be updated with the results of that year. This will result in a complete overview of the results of all CoPs at the end of the project. Recommendations for the WP2 team were formulated as a result of the feedback and recommendations provided by participants and facilitators.

DELIVERABLE NUMBER	WORK PACKAGE
D2.2	WP2

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AdB   Aigües de Barcelona

BWB   Berliner Wasserbetriebe

CO   Confidential

CoP   Community of Practice

CoU   Community of Users on Secure, Safe and Resilient Society

EC   European Commission

FL   Follower

FR   Frontrunner

KPI   Key Performance Indicator

L-CoP   Local Community of Practice

PU   Public

QA   Quality Assurance

RIDB   Risk Identification Database

SAB   Security Advisory Board

TG   Thematic Groups

WP   Work Package

Deliverable 2.2 will be developed as four different briefs combined into one. The document will be updated every 12 months, spanning the entire duration of STOP-IT. The current brief, the second in this series, builds on the workshop reports provided by the CoP facilitators after each workshop was carried out during the first and second year. This practice will continue until the end of the project. Therefore, the current brief will have overlap with the previous one. This brief was developed as a technical brief rather than a policy brief, as the local CoP workshops carried out to this point were only attended by stakeholders from organizations participating in STOP-IT. This remains a point of attention. So far, three project CoP activities were carried out with Frontrunner and Follower utilities and one specifically targeting follower utility, while the trans-project CoP is in the early stages of development, integrating the STOP-IT project in research networks dedicated to cyber-security and infrastructure protection and becoming more consolidated and more visible. As such, the current brief is looking to provide actionable advice to WP2 as well as CoP facilitators and managers based on the workshops that were held so far, in order to ensure the success of future workshops, which also will include external stakeholders. The authors envisage that the policy briefs related to the CoPs will be developed starting with the next version of deliverable 2.2, in order to provide input for the final deliverable of WP2, D2.3, which is due in M48 of the project.

The gradual development of the CoPs, from meetings to getting familiar with the project and the CoP setting towards more project content meetings, has been documented in this report. So far, ten local CoPs have been held, four project CoPs and several trans-project CoP activities were undertaken. After the workshops, the feedback from the participants, CoP leaders, managers and facilitators are in agreement that the objectives set have been realistic and have been achieved successfully during the workshops, or as follow up activities.

The suggestions, recommendations and feedback provided until M12 indicate a number of activities that were adopted between M12-M25 such as the creation of the living document to facilitate knowledge exchange between CoPs, the toolbox with moderation techniques to facilitate the organization of CoPs, the earlier distribution of materials, and holding a project CoP in the setting of the world café. The suggestions and recommendations after M12 aim at increasing the participation of external stakeholders, balancing the gender participation in workshops, designing KPIs for CoPs, designing a new evaluation form, providing a schedule of CoPs a few months in advance, providing support for practicalities surrounding the organization of CoPs, and continue to support knowledge exchange between water utilities and tool developers.

1. Introduction

One of the goals of STOP-IT is to create and facilitate vibrating communities developed by the Frontrunner utilities of the project and research organizations, in relation to cyber security in critical water infrastructure. The Communities of Practice (CoPs) developed throughout the project are designed to serve this purpose, and efforts are made from the beginning of STOP-IT to ensure they are operational during the project, as well as continuing to operate after the project ends in 2021. Within the STOP-IT project, a three three-level CoP approach is designed, (i) local level (Frontrunner water utility), (ii) project level (learning across locations and work packages) and (iii) trans-project level (transferability of knowledge and solutions to and from the project via interaction with other project/networks), see also D2.1.

The **local** CoPs are organized around the four Frontrunner utilities active in the STOP-IT project – Oslo VAV (Norway), Mekorot (Israel), Berliner Wasserbetriebe (Germany), and Aigües de Barcelona (Spain). Up to **M12** of STOP-IT the guideline for the set-up and management of the CoPs was elaborated (finalised in M6), and two rounds of CoP workshops already took place for Oslo and Barcelona, and one round for Berlin and Mekorot. **Between M12 and M25** two local CoPs took place; Mekorot (Israel), and Berliner Wasserbetriebe (Germany). For Aigües de Barcelona (Spain) and Oslo VAV (Norway) several dedicated technical meetings were held instead of a local CoP. The workshops are geared towards communication, data collection for project activities, and experience sharing with internal and external stakeholders of the Frontrunners. Monitoring how the CoPs are working towards these objectives is important in order to understand what works and what can be improved in organizing and carrying out the workshops, as well as understanding what potential follow-up activities should be encouraged. This monitoring activity is the object of the current brief, and is based on anonymous surveys taken at the end of the workshops by the participants. In addition, during the first year of the project, the facilitators have been asked to share their experiences in facilitating the workshops, feedback on the application of CoP guidelines, as well as recommendations to the WP2 team and the WPs that put forward the workshop requirements and materials. During the second year of the project, several of the recommendations made in the first year were used and recommendations for following years have been formulated.

For the **project CoPs**, we are looking to identify productive interactions between the participants. We learned in the first project year that the project CoPs are evolving rather organically over a longer period of time. Between M12 and M25 three project CoPs were held: one in Barcelona at the annual PSB meeting in June 2018, and two in Athens at the annual PSB meeting in June 2019. Monitoring of these activities is again based on surveys conducted at the end of the workshops and has led to recommendations for future sessions.

For the **Trans-project CoP** we are looking for cross-pollination potential with other related projects. The trans-project CoP activities are led by the project coordinator Rita Ugarelli. The activities started in the first year of the project and have been continued and further developed. Some new initiatives have also been undertaken such as (1) contributions to the CYBERWATER 2018 Physical and Cyber Safety in Critical Water Infrastructure workshop,

including a call for papers. (2) Participating in the joint kick-off of the Digital Water projects (12-06-2019) organized by EASME. (3) Formal engagement of Rita Ugarelli to collaborate with ERNCIP-Water group.

2. Local CoP activities and feedback

The CoP guidelines developed in WP2 make clear the need to measure the success of the CoP activities, especially related to the local activities carried out, as these are connected to the first line of users of results stemming from STOP-IT: the Frontrunner and Follower utilities, as well as connected local stakeholders. As part of the template provided to CoP managers and facilitators for reporting on each of the workshops, a specific section was designed to capture indicators related to outputs and outcomes of the workshops. These are envisaged to provide an overview of the direct indicators, such as number of participants and resulting follow-up actions, as well as to gauge the participants' satisfaction in relation to the activities of the CoP. Further work investigating the impact of these activities can be realistically performed during the last year of the project and beyond the project life span. In the following, a summary of the workshop goals, participants and their feedback, as well as feedback from the facilitator is provided. During the second year, however, no feedback from the facilitators was gathered separately. They were also asked to fill in the evaluation form.

2.1.   Workshop goals

A set of objectives is established before every workshop is set up. These objectives have the role of guiding the general motivation and work flow within the CoP meeting. They are supposed to be established by the leader of the project activity for which the workshop is developed. For the first 2-3 workshops it was envisaged that the objectives are set up in such way that participants become comfortable with the idea of the CoPs, the STOP-IT project and its ambitions, as well as the format of the workshops and the roles of the facilitator and community manager. Also, for the first workshops it was agreed that these are carried out with internal stakeholders of the Frontrunner's organizations primarily to pilot the concept of CoPs in STOP-IT and to become aware of the level of sensitive information that is shared within the activities. However, each workshop organizer was given the freedom to choose how open the workshop is to external organizations and to invite potential members of the CoPs, as needed.

For the *first workshop round* (Nov 2017), the objectives were set as follows:

- To introduce and update stakeholders with information about the STOP-IT project and personnel
- To refine the ambition, scopes and goals of the CoP
- To engage stakeholders in a collaborative approach to the project
- To collect and discuss stakeholders´ ideas and needs regarding the STOP-IT project
- To provide requested input to task 3.1 (questionnaire)

For the *second workshop round* (Feb-Mar 2018), the objectives set, were slightly different for each local CoP. Apart from introducing CoP members to the STOP-IT project, or bringing them up to date with the developments after the first workshop, the second workshop had the following explicit goal set as the main topic of the four local CoP workshops carried out

in February-March 2018: input to the risk identification database (RIDB) for work carried out as part of WP3, task 3.2 – Risk Identification.

For the *third workshop round* (July 2018-June 2019) the objectives and set up for each local CoP were different. While some Frontrunners chose for a clear local CoP (BWB, Mekorot), others chose for several separate sessions, which could be clustered as a local CoP (Oslo VAV, AdB). Being in the second year of the project, it can be assumed that the participants are now familiar with the concept of CoPs and STOP-IT itself. Therefore, the objectives of the workshops were more content orientated than in the first year. In general, the workshops were oriented towards the preparation of demonstration activities, exchanging user requirements with the tool developers, and showing the overall process of the tool development. The Frontrunners differ in their progress within the project. While some are already focusing on getting ready for demonstration, some are still at the risk identification part.

Overview of the workshop goals:

<u>Oslo VAV</u>:

Nov 2017: :
- To introduce and update stakeholders with information about the STOP-IT project and personnel
- To refine the ambition, scopes and goals of the CoP
- To engage stakeholders in a collaborative approach to the project
- To collect and discuss stakeholders´ ideas and needs regarding the STOP-IT project
- To provide requested input to task 3.1 (questionnaire)

Feb-Mar 2018:
- Risk identification: To identify and characterize risk events for the STOP-IT Risk Identification Database (RIDB), as input to task 3.2.
- To further develop the Local CoP, involving the water utility of Bergen municipality.

July 2018-June 2019:First meeting focusing on the operational level:

- To focus on the operational tools provided in WP5 and WP6, which led to a set of questions Oslo VAV wanted to have clarified during the PSB meeting.

Second meeting on the strategic and tactical level:
- To make an action plan in order to be ready to start the demonstration of the Module 1 "Risk Assessment and Treatment Framework" in Oslo VAV.
- To appoint one person responsible for the VAV modelling activities.
- To select one part of VAV's network in order to run the demonstration activities in the frame of WP4.

<u>Aigües de Barcelona</u>:

Nov 2017:

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- To introduce and update stakeholders with information about the STOP-IT project and personnel
- To refine the ambition, scopes and goals of the CoP
- To engage stakeholders in a collaborative approach to the project
- To collect and discuss stakeholders´ ideas and needs regarding the STOP-IT project
- To provide requested input to task 3.1 (questionnaire)

Feb-Mar 2018:
- Update the partners on project progress
- Provide requested input to task 3.2 (RIDB)

July 2018-June 2019:

- To discuss WP3 contents
- To develop and populate the Risk Identification Database (RIDB)

<u>Berliner Wasserbetriebe</u>:

Nov 2017:

- To introduce and update BWB and project partners with information about the STOP-IT project and personnel
- To define the organization, ambition, scopes and goals of the CoP
- To engage stakeholders in a collaborative approach to the project
- To collect and discuss stakeholders´ ideas and needs regarding the STOP-IT project
- To provide requested input to task 3.2 (Risk Identification Database (RIDB)

July 2018-June 2019:

- To exchange expectations and requirements of the end users of the tools developed
- To share the overall process of the operational tools developed in STOP-IT
- To share the overall process of the strategic and tactical tools developed in STOP-IT

<u>Mekorot</u>:

Nov 2017:

- To introduce and update stakeholders with information about the STOP-IT project and personnel
- To refine the ambition, scopes and goals of the CoP
- To engage stakeholders in a collaborative approach to the project
- To collect and discuss stakeholders´ ideas and needs regarding the STOP-IT project
- To provide requested input to RIDB survey

July 2018-June 2019:
- To identify the main cyber security threats in water systems
- To identify knowledge gaps in water systems
- To identify barriers for implementation of cyber security in water systems
- To formulate possible solutions for the identified threats, knowledge gaps and barriers

So far, the feedback from participants, CoP leaders, managers and facilitators, as well as from the beneficiaries of the information shared in the workshops (WP3, 4, 5) shows that the objectives set have been realistic and have been achieved successfully during the workshops, or during the follow up activities.

2.2.   Participants' workshop evaluation and feedback

The workshops set up as part of the CoP activities up to the first two rounds were mostly focused on engaging internal stakeholders (from Frontrunners and research institutes), in order to collect information required by WP3, which lead to the development of CoP core groups. For the two CoP sessions carried out so far during the first two rounds, eighty participants have attended in total – some of these are counted twice as they attended both sessions[1]. Feedback was generally positive with regards to the atmosphere, structure, openness, and collaborative opportunities, and less positive with regards to the lateness with which information about the workshop was provided, available time, and absence of external stakeholders. The following shows a summary of pros, cons and suggestions offered by workshop participants.

Pros:
- Collaborative, open, positive, engaging and productive atmosphere
- Clear structure, contributions encouraged from everyone
- Open discussion and main objectives of the workshop were achieved
- Good opportunity to meet other project partners in order to exchange experiences, ideas and needs
- Networking with different departments within own organizations
- Using the fault trees[2] helped to animate and structure the discussions
- Much of the time was dedicated to plenary and group discussions

Cons:
- Could have informed participants more/differently in advance
- Time was a bit short for discussion of complex issues (both WP3 questionnaire and local CoP); room for discussions within workshops sessions could have been longer
- Absence of external parties
- It has been more a working group meeting than a CoP meeting
- Filling the Excel table took time, but did not add much

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[1] Aigües de Barcelona and Oslo VAV had both two workshops each, while BWB and Mekorot held one each, combining the first and second set of objectives
[2] Fault Trees was one of the methods used to gather information for the Risk Identification Database (for WP3)

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- Explaining the fault tree approach took time (but was necessary)
- Communication of objectives before the meeting

Suggestions:
- Ensure that all participants have necessary background information, and/or make time for more detailed introduction to the workshop, make available detailed agenda in advance
- More precise announcement of topics discussed (e.g. to send presentations or questions as draft version before the meeting) so that stakeholders have the opportunity to prepare workshop discussions
- Put extra thought into the balance between eliciting information requested from other WPs and the format, needs & ambitions of the local CoP
- Select a specific topic in advance and organize the meeting with required people (both internal and external)
- Have more thematic meetings and provide more time for experience sharing between the utilities
- In general: Illustrations of the STOP-IT Project or the specific issue the workshop is focusing at should be provided (this would enhance the general understanding of the STOP-IT project or the subjects to be discussed)
- Avoidance of (too long) lectures in order to get the discussion started / to keep it alive

For the third round of workshops, they mainly focused on the preparation for demonstration activities, exchanging user requirements and expectations. At the local CoPs in Berlin, Israel and Oslo a total of 41 participants was present. Since no formal CoP in Barcelona was held, there is no information on the number of participants. Evaluation during the third round of workshops is based solely on the participants' evaluation through the evaluation form and a reflection round. The reflection round also included the feedback of the facilitator. It should be noted that only at the local CoP in Berlin an evaluation was conducted. This is something to pay extra attention to in the third year of the project. Overall, the workshop was valued positive in terms of atmosphere, exchanging ideas and discussion and getting more connected with other participants in the project. However, future sessions could be improved by having a more realistic planning, central location and more time for discussion on the end users' needs.

Pros
- The hosts were good.
- The tool developers appreciated the chance to discuss the user requirements and expectations.
- The presentations with examples and tutorials was valued positive.
- The opportunity to have a free exchange of ideas on the development of tools was valued positive.
- The participants were in general satisfied with the amount of discussion and the amount of participants was optimal for discussion.
- The session gave a clear overview of the current stage of the tool development.
- There was a positive atmosphere and people were getting connected.
- There was the opportunity to learn more about WP4 and WP5.

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Cons

- Wi-Fi and mobile connectivity was not very good.
- The location was difficult to find.
- There was too little time for everything on the schedule.
- There should have been more time reserved for discussion.
- Try not to get stuck in the discussion on one small detail.
- There was not enough space to have the chairs set up in one circle.

Suggestions:

- Provide extra instructions for locations that are difficult to find.
- The workshop could be held at a more central location.
- Reserve more time for discussion on end users' needs and expectations and how the research partners can contribute to those needs once the water utility has a clear picture of the technology.
- Provide lunch options for dietary needs, such as vegetarian options.
- There should be more time for the actual demonstration of tools.
- The results should be presented earlier to the water utility companies.
- Participants should schedule their returning flights better. This way participants don't have to leave halfway during the session.

As can be seen in round one, two and three of the workshops, the meetings are valued as they provide the opportunity for face-to-face discussions, enable project partners to meet and give tool developers the opportunity to get familiar with the end user requirements. Local CoPs seem to function as means to bridge the gap between tool developers and water utilities. As becomes clear from the latest feedback, some less positive points and suggestions were addressed in the planning of the CoPs during the third round. Less time was spend filling in questionnaires and excel tables. It also seems like the meetings had a more specific aim/theme in the third round. However, while not mentioned in the feedback this time, still no external parties were present, which remains an issue. The other suggestions made in the third round refer mainly to practical issues, such as location, dietary needs and returning flights. This could be solved by providing a checklist for the host. Other aspects that remain a point of attention are good moderation of the discussion and having a good balance between interactive parts and presentations during the workshop.

2.3. Local CoP facilitators feedback

As the local CoP development is performed in coordination with the research institutes active in the project and in collaboration with the Frontrunners, it was important to gauge the perception that the facilitators have on the workshops performed so far. As such, the local CoP facilitators were asked to respond to the following questions, related to the set-up, management of the local CoPs, as well as the support offered from WP2:

1. How would you describe the facilitator experience overall? What have you gained/learned from this activity?
2. Are there/have there been follow up actions decided with CoP members so far?

3. Have the guidelines elaborated by WP2 through D2.1 provided you with the tools and knowledge you felt were required to facilitate the workshops?
4. What are your recommendations for:
    a. The WP2 team – elaborators of the CoP methodology in STOP-IT?
    b. The other WPs representatives that develop the workshop subject, materials and ideas?
5. What are your suggestions for improvement overall?

Primarily, all facilitators noted that the CoP approach has been a positive experience so far with direct learning outcomes for them, as well as for the participants. The first two workshops were mainly designed (aside for setting up the CoP) for Frontrunners to provide inputs for the work carried out in WP3, specifically in tasks 3.1 and 3.2., and as such, there has been less room for developing social learning and characteristics associated with the CoP approach. However, there is an overall beneficial sentiment that the facilitators are building their own role within the STOP-IT CoPs through their approach to the application of the concept, their role as the project tasks "translator" to actions, and through ensuring that attention is given to the goals, values and social learning between stakeholders. Follow up actions, including additional meetings and telephone-conferences, are being organized by the communities.

Facilitators reported that the guidelines prepared in WP2 for the design, set-up and management of the CoPs have been beneficial in forming a theoretical basis before the CoPs began operation. In practice, the CoP meetings took their own direction and are starting to form their own identity, an aspect considered while developing the guidelines: the CoPs were given flexibility in choosing the methods that they use in the meetings, such as the order in which they approach the subjects, adapt to local culture and work conditions, the Frontrunners primary interests, etc. Not all questionnaires, templates and recommendations were used as prescribed, which indicates that the facilitators are using their own best knowledge to lead the workshops. While this is in principle a good development for the CoPs so far, attention should be given to how much the workshops are straying from the overall direction of the project and, if needed, support should be provided from WP2 to correct any undesired deviations.

One particular point of attention raised by the facilitators, also seen in the participants' feedback, is that guidelines, suggestions, materials, and requests from work package leaders should be made available to both the facilitators and the CoP members more in advance compared to how this has been done so far. As noted by the facilitators, the local CoPs are now established but the immediate future of these CoPs is in the hands of the WPs that provide them with content. The suggestion is to clearly mark the future workshops on a 6-12 months basis, so that a calendar of events can be established. This will enhance the capabilities for the CoPs to collaborate (between locations, as well as between local-project-trans-project). Another suggestion is to have CoP members provide information in advance of the workshops, and then summarize, compare and discuss during the workshops, rather than asking for the information to be shared as part of the discussions. This feedback around proper communication and information sharing relates to the "what's in it for us?" question to which the CoP members should have a clear answer formulated for themselves.

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3. Project CoP activities and feedback

Project CoPs are designed to exchange experiences on the applicable outcomes of STOP-IT with project partners by promoting a multi-stakeholder approach to water system protection (see also D2.1). Up to M25, project CoPs have been launched on different levels:

i.   on Task- and Work Package (WP) level, within the Scientific Technical Committee (STC), the Project Advisory Board (PAB) and
ii.   as a project CoP of STOP-IT operators in order to connect Frontrunners, Followers and other WPs and
iii. as a project CoP specifically targeting Followers as part of the training sessions by WP8

CoPs on project level (i) will not be considered in this report as these CoPs consist mainly of project working groups and meetings and interactions, which will be described in corresponding WP deliverables and technical reports (in M18, M36, M48) accordingly.

This chapter will be structured along the different kinds of project CoPs.

3.1.   Project CoP connecting Frontrunners, Followers and WPs

In order to connect Frontrunners (FR) and Followers (FL) beyond project activities and tasks and to enhance exchange of knowledge and experiences, it was decided to provide a CoP for FR and FL water utilities. So far, three project CoPs of this kind were organized. A first meeting took place within the expanded local CoP workshop at Berliner Wasserbetriebe (Workshop on IT-Security on 12.-13.03.2018). At the meeting three (out of four) Frontrunner utilities and three (out of four) Follower utilities were attending.

The objective of this first water utility meeting was to bring together FRs, FLs, research institutions and technology providers in order to:

- Provide a framework for knowledge exchange between utilities
- Achieve a common understanding of upcoming tasks and tools developed
- Exchange experiences and ideas
- Discuss and define needs and expectations

A second workshop connecting Frontrunners, Followers and tool developers was held at the first PSB meeting in Barcelona (19.06.2018). At this meeting all water utilities participating in STOP-It were present as well as representatives from the research institutes and other parties involved in the STOP-It project. The CoP had the following objectives:

- To enable communication between FRs, FLs, research organisations and further project partners about existing risk management procedures.
- To provide feedback for FRs and FLs to their existing risk management concepts.
- To develop common agreements about do's and don'ts in risk management processes.

- To create the possibility to give input and expectations for future local CoP designs.

At the second PSB meeting in Athens, the third project CoP connecting Frontrunners, Followers and tool developers was held (19.06.2019). The CoP shifted its focus from risk management towards technical understanding of the tools, preparation for demonstration activities and created opportunity to exchange expectations and feedback between water utilities and tool developers. Objectives were:

- To ensure all Frontrunners and Followers have a profound understanding of the tools developed in STOP-IT (WP4, WP5 and WP6).
- Planning of the tool demonstrations with focus on open questions, technical requirements, participants, timeframes, demonstrated scenarios, key performance indicators and evaluation methods.
- For Frontrunners to provide feedback and recommendations to the tool developers.
- To enhance the involvement of water utilities into the tool development process for a higher degree of customization of the technologies.

As can be seen, these project CoPs have developed over the past two years of the project. While the first one was mainly set to up a framework for knowledge exchange, create common ground and shared expectations between all the parties involved, gradually the CoPs aim shifted towards knowledge exchange on the content of the project. First on risk management, but as the project tools and modules developed, the emphasis of the CoPs shifted towards preparation for demonstration. However, exchanging knowledge between the various participants remains an objective. Based on the feedback by the participants the goals set are realistic and have been met.

3.1.1 Participants' workshop evaluation and feedback

Similar to the local CoPs, the project CoPs are evaluated by the participants through the evaluation form.The overall feedback on the first project CoP meeting connecting FRs, FLs and WPs was very positive and the participating (and also other) partners from water utilities were indicating interest on further meetings. This has led to provide such a session within the annual project meetings in Barcelona (2018) and Athens (2019). The project CoP in Barcelona was viewed overall positive. The participants mentioned their intention to keep the communication with the other partners, and keep the momentum and understanding that was generated during the session going. In Athens the participants were very positive in general about the project CoP too. Specifically, they mentioned their appreciation of the opportunity to have face to face discussions, gain better understanding of the tools, but also expressed the need to bridge the gap between the worlds of water utilities and the research institutes/technology providers.

The most positive and negative aspects of the workshop and suggestions for improvement were:

(1= Berlin , 2= Barcelona or 3= Athens indicated the meeting to which the feedback refers.)

Pros:

- Collaborative and productive atmosphere (1,3)
- Very engaged participants (1,3)
- Meeting the other team members, exchanging ideas and discussions on several topics, receiving feedback from group members (1,3)
- The use of the world café method (3)
- To get a low level explanation of what the different WPs do and the overall status of the project (3)
- Presentation and explanation of BWB site and test lab and network (good opportunity for knowledge exchange) (1)

Cons:

- Room for discussions within workshop sessions could have been longer (1)
- Only a little number of technology providers was attending the workshop, this would have enhanced the discussion and the exchange with water utilities (FR & FL) (1)
- It was not possible to get an explanation/demo on all tools (3)
- The temperature in the rooms was too warm (3)
- Some tools provide solutions to problems that the water utilities don't have (3)
- The sessions of the world café should be 15 min longer (3)
- Day two as a whole was too long (3)
- More information on the tools should be provided beforehand (3)
- There should be clearer and better prepared elevator pitches of the tools by the tool developers (3)
- There are some misconceptions about the client-provider roles in the project (3)
- An overview on how the tools interact/how to run de demo's/needed data and dependencies between modules is still missing (3)
- Followers should be more included (3)

Suggestions for improvement of future workshops/meetings:

- More precise announcements of topics discussed (e.g. to send presentations or questions as draft version well before the meeting) so that stakeholders have the opportunity to prepare workshop discussions (1)
- Have the project managers inquiries and questions for the group in advance (1)
- Use the world café method for the next project CoP (2). *This one has already been implemented.*
- Provide working air conditioners
- Use an easier to find location or provide better directions
- Organize feedback session for the tools for FR and FL
- More information on the status of the tools and when they are actually ready
- WP2 should enhance communication with FR and FL

3.2.   Project CoP for Followers

In order to transfer the applicable outcomes of STOP-IT to the Follower water utilities, the first project CoP meeting targeting the Followers has been held on day two and three of the PSB meeting in Athens (19.-20.06.2019). The gender balance was 33,3% women and 66,7% men. All Follower water utilities were represented. This project CoP had the following objective:

- To train the FLs – Profile 1 according to the classification of Deliverable 8.1
- To check MS13 for the first round of training activities delivered
- Use the feedback to improve the training materials for profile 1

During the session, the presentation, training material and a video explaining the added value for the decision makers was presented. This gave the Followers the opportunity to provide feedback on the materials and also to express their challenges and need for training material.

Overall, based on the feedback the goals of the session seem to have been realistic and met.

3.1.2 Participants' workshop evaluation and feedback

Overall the participants evaluated the first project CoP focusing on the Followers as positive.

Only the most interesting parts of the training session were mentioned:

- To get an overview and general information.
- To see the progress of the work that has been done by Sintef and ICCS.
- To have a face to face meeting.
- The opportunity to talk to each other.

The only suggestion for improvement was to:

- Make an overview of the status of where the different Followers are in the process also in cooperation with the Frontrunners.

4. **Trans-project CoP activities and feedback**

With regards to the trans-project CoPs, the activity is driven by STOP-IT coordinator Rita Ugarelli. During the first year, collaborations have been established with relevant communities: the ICT4Water cluster (www.ict4water.eu/), the "Community of Users on Secure, Safe and Resilient Societies" (CoU) (www.securityresearch-cou.eu/about), the FP7 project SCOUT (www.scout-project.eu/) and the Net4Society (www.net4society.eu). During the second year of the project, STOP-IT partners contributed to the physical and cyber safety in critical water infrastructure workshop by the NATO science for peace and security program, and STOP it partners participated in the joint kick-off of the Digital Water projects (12-06-2019) by EASME. Furthermore, Rita Ugarelli is now formally engaged to collaborate with the ERNCIP-water group.

The ICT4water cluster aims at safe, sufficient, valued and "smart" water for EU citizens by stimulating the development of innovative water management products and services, based on Information and Communication technologies and enabling greater cooperation among researchers, industry, water regulators, operators and users across the EU. The cluster comprises 20 ongoing H2020 projects, including STOP-IT and 13 concluded projects.

The collaborative activities established are:

- Contribution to the ICT4water newsletter by STOP-IT (WP9)
- Participation to the ICT4Water cluster events (e.g. the EIP Water conference in Porto in September 2017 and the combined events of ICT4Water cluster and the WssTP working group on ICT and Water)
- STOP-IT was presented by Rita Ugarelli (SINTEF) within an ICT4Water dedicated session at the coming 13th International Conference on Hydroinformatics (HIC 2018). (www.hic2018.org/) in June 2018. STOP-IT is member of the ICT4Water Cluster and actively involved in the implementation of their ACTION PLAN.
- Rafael Giménez (CET), Gustavo Gonzalez (ATOS), Rita Ugarelli (SINTEF), are the leaders of the action "Cybersecurity"
- Christos Makropoulos (KWR) is the leader of the action "Actor Awareness - Water & Digital
- Andreas Hein, Fabian Vollmer and Achim Mälzer (IWW) presented STOP-IT at BSI, Germany to connect the expert group for the water sector to the project. BSI is the German Federal Office for Information Security.
- Strong presence of STOP-IT partners at the ICT4Water annual event – June 2019 (SINTEF, KWR, CET, and EUT). At this event it was confirmed that STOP-IT is still the only project dealing with cybersecurity in the water sector. Ways to collaborate have been discussed.

The "Community of Users on Secure, Safe and Resilient Societies" (CoU) has been launched in January 2014 and has since developed to become an efficient platform of exchanges among different actors of different branches of security and crisis management. The CoU has

developed a thematic programme for 2018, among which a dedicated theme focuses on water safety and security (Theme 2).

The collaborative activities established are:

- On the 8th of March 2018, Rita Ugarelli (SINTEF) participated to the "Science to Science" round-table on Theme 2, to present the project on behalf of the STOP-IT consortium
- The CoU will create an expert team on cyber security and Rita Ugarelli expressed the availability to join on behalf of the consortium. The expert team will also interact with NATO on selected topics.
- At the 7th of June 2018 Rita Ugarelli (SINTEF) attended the 11th CoU Theme 12 "Urban CIP", led by DG HOME with European Reference Network for Critical Infrastructure Protection (ERNCIP). The event focused on urban critical infrastructures:
  - FP7 and H2020 Projects (see list below) for the "science to science" panel.
  - Involvement of policy DGs and MS in the "policy to policy" panel.
  - Bringing scientists, policy-makers and industry/SMEs together around crisis management at city level and CIP in the "policy to research & innovation" panel with involvement of stakeholders.
  - Involvement of practitioners in the "Interactions with practitioners" panel.
  - Projects of relevance to the theme: SMR, RESOLUTE, IMPACT, CARISMAND, CUIDAR, SMART-RESILIENCE, DARWIN, ATENA, DEFEND, STOP-IT, SAURON, GAMMA, SUCCESS

The SCOUT project is based on the use of multiple innovative and low impact technologies for the protection of space control ground stations and the satellite links against physical and cyber-attacks. STOP-IT was presented at the final workshop of SCOUT by Juan Caubet (EURECAT) the 15th of March 2018 within the AFCEA conference "Protection of critical infrastructures: the SCOUT workshop" devoted to the thematic topic of protection of critical infrastructure. No short term follow up items are foreseen in relation to the SCOUT project, but according to Juan Caubet there is high potential for collaboration with the other projects presented at the workshop.

STOP-IT has been invited to events organised by ERNCIP (https://erncip-project.jrc.ec.europa.eu/) and to contribute to their activities. ERNCIP (European Reference Network for Critical Infrastructure Protection) is an EC platform, which is formed by different Thematic Groups (TG). Aigües de Barcelona (AdB), Frontrunner of STOP-IT, is involved in one of those TG (Chemical and Biological Risks to drinking water). Since M12, Rita Ugarelli is formally engaged to collaborate with the ERNCIP – water group. ERNCP- water group is about the release the draft guidelines for a water security plan and is looking for STOP-IT water utilities, interested to provide feedback. This was also briefly mentioned at the STOP-IT PSB meeting in June 2019. Furthermore, Rita Ugarelli will attend the annual event of ERNCIP at the end of October 2019 to present STOP-IT. Moreover, the ERNCIP colleagues

have expressed interest to revise and complement the RIDB and the RRMD, which has to be discussed in future STC meetings.

In October 2018, STOP-IT partners (ICCS, Bergen, Oslo, and SINTEF) have contributed to the CYBERWATER 2018 Physical and Cyber Safety in Critical Water Infrastructure workshop organized by the NATO science for peace and security program. The workshop brought together experts from 12 NATO countries and 6 partner countries, envisaging to formulate "Best practices" based on recommendations and conclusions for policy and practices. An important result from the event was a call for papers for ASCE J. Environ. Eng. Special Collection "Physical and cyber safety in critical water infrastructure". Christos Makropoulos and Rita Ugarelli are involved as co-authors. At the PSB meeting in Athens the attendees were asked to also submit papers for the next issue.

Lastly, STOP-IT partners SINTEF, KWR, Eurecat participated in the joint kick-off of the digital water projects on 12.06.2019, which was organized by EASME. This resulted in establishing valuable connections with the newest H2020 projects in digital water.

At M25 of the project, the trans-project activities have continued making STOP-IT visible in the most relevant networks/communities at EU level related to safety, security and CIP. Besides making STOP-IT visible, a direct outcome of the active participation is the opportunity to link with ended and ongoing FP7/H2020 projects on CIP, with high potential for a dedicated trans-project CoP workshop, which could be included into the agenda for the PSB meeting in 2020. Other concrete outcomes are Rita Ugarelli's formal engagements with ERNCIP and the publication from Christos Makropoulos and Rita Ugarelli. Moreover, feedback was received from the STOP-IT project officer on the current interactions with EC-related communities mentioning the positive feedback on STOP-ITs input for ICT4Water, as there will be a community of users event later this year where CIP will be important. This has been indicated as an opportunity to bring all the CIP/INFRA projects together. Therefore, it can be concluded that during the course of the project, STOP-IT will become more visible and can contribute more to relevant network/communities at the EU-level.

5. Critical review of CoP workshops

Summarizing the feedback and indicators provided by both, the CoP participants and facilitators, creates a basis for improvement of the future operation and knowledge gathering/sharing within the CoPs. The following subchapters are primarily directed towards local and project CoPs. For trans-project CoPs there are currently no particular recommendations for improvement, as most activities are developing on longer time frames and in connection to other projects and initiatives.

5.1.   Lessons learned in year one

The CoP guidelines were designed to support the CoP facilitators and managers in the setting up, starting and managing the activities carried out in the workshops. These guidelines were not set up as hard prescriptions, and each CoP had flexibility in how to carry out the initial activities. In the guidelines it was suggested that the first CoP workshop should start with an introduction to the CoP concept, leading the participants through the different aspects that the activities will cover. In practice, for some of the CoPs it was found that introducing and discussing the different CoP aspects gradually, in relation to the specific tasks required, was more efficient than discussing the concept of CoP and its operation itself.

In the guidelines the importance of the roles of facilitators of the CoPs were clearly recognized: "The CoP facilitator is designated from the related research institute and supports the CoP manager. The facilitator should be an 'independent expert', who is given the authority to lead, to impose clear rules and roles, and who can generate an environment of trust." In practice, this aspect was proven, as the facilitator has the important role to keep Frontrunner utilities engaged, to collect their needs for corresponding tasks and project activities and vice versa.

As the CoPs take shape through the development of workshops and connected activities, social learning takes place between the members of the CoP. So far, there was less need (and time available) for development of social learning and characteristics associated with the CoP format. However, as the CoPs develop as part of the STOP-IT project, including external stakeholders (not only members of the organizations represented in STOP-IT), social learning will most likely take shape through the stakeholder interactions with the project.

Sets of questionnaires, materials, and templates are provided to the CoP facilitators and managers, as well references to the CoP guidelines, prior to the workshops being organized. To this point, the facilitators reported that it would have been excessive to use all questionnaires, templates and recommendations exactly as provided; instead, the facilitators had the freedom to tailor the approach and use only materials that were needed in the workshops.

The CoP activities in the first project year were focused on (1) setting up the CoPs and (2) providing information required for WP3 of STOP-IT – namely, the identification of risks for the

Frontrunner utilities systems. Up to now, FRs were mostly asked to provide information, but it is envisaged that as the CoPs advance and coalesce by attracting more members, STOP-IT will also need to focus on showing the benefits in terms of "what is in it for us" to the members.

The distinction between local and project CoPs is blurry in practice; however, this is not perceived as a problem. Instead, while allowing for flexibility for the organic development of project CoPs, efforts are made to be inclusive in the approach, especially for the STOP-IT utilities.

During the first year the lessons learned led to the formulation of the list of recommendations below. It builds on the consolidation of participation indicators, feedback from members of the CoP, as well as feedback from facilitators. The recommendations provide actionable information, mostly dedicated to the WP2 team, while facilitators and managers should be informed about the actions taken by the WP2 team on the basis of the following recommendations.

1. Efforts should be made to balance the gender representation in the workshops
2. The CoP guidelines may be more appropriate for formal meeting formats. They should be considered and applied for the annual meeting, when a dedicated session for utilities is programmed as a project CoP
3. Material and information should be provided earlier by WPs or task leaders responsible for the workshop (i.e. info material, graphics, suggested moderation techniques etc.), graphics are already prepared to clarify the STOP-IT project and approach to participants
4. Dates for CoP events/meetings should ideally be set for the upcoming 6-12 months in advance in a calendar of activities
5. Ensure that attention is given to the goals, values and social learning between stakeholders
6. Ensure and enhance experience sharing between the local CoPs, as well as with project and trans-project CoPs
7. Involving more/external stakeholders is relevant for experience sharing, user requirements, technology development, testing experiences, and the building of contact networks
8. Focus on experience sharing in the coming project year and, to the extent possible, expand beyond the local situation and connect FRs
9. Try keep the meetings lively by avoiding long lectures and the filling of Excel files/questionnaires during meetings. These activities should be carried out before or after the actual meeting, while the meeting should be reserved for discussing results and summaries of these activities
10. Try placing more emphasis on what the input/feedback will be used for to show what the next steps will be (envisaged characteristics of RIDB, capabilities of the solutions, etc.), provide some visions, knowledge that will be inspiring and show the participants 'what's in this for me'

D2.2 Annual technical and policy brief based on the results of each CoP

11. Explore the provision of a toolbox of moderation techniques (in case there is no suggestion from the WPs or task leaders who are responsible for workshops content). This could be for instance a short presentation showing 3-5 useful moderation techniques, such as world café, visioning etc., which could support the discussions

12. Implement a more illustrative overview of outcomes and storylines, identifying the stage of the project in relation to project activities, what results are envisaged to be obtained through the information requested, what are the future steps to be taken

5.2. Lessons adopted in year two

Of the twelve recommendations mentioned in the list in the previous subchapter, four points have been implemented within the CoPs in the second year. The first point, organising a project CoP at the annual meeting has been implemented. Moreover, the preferred working method mentioned in the participants evaluation, the world café method, has been used. The second implemented recommendation is the provision of materials and information earlier. The agenda and instructions for CoP preparations have been send to the participants a few weeks in advance. The instructions for the project CoP in Athens have been send several times in draft versions and the final version 1.5 weeks in advance. The agenda for the local CoP in Berlin has also been send a few weeks in advance of the workshop. The third implementation refers to more information sharing between local CoPs. Based on this recommendation a "living document" was created where the main results of the local CoPs will be published continuously. This living document can only be accessed by project partners and has the goal to make knowledge exchange between the Frontrunners easier. The fourth used recommendation was the toolbox of moderation techniques. During the second year of the project a toolbox of moderation techniques has been developed by WP2 containing eight moderation techniques. The techniques are clustered, based on the situation in which they are suitable and explained to the extent that hosts should be able to adopt these techniques by reading the toolbox. The toolbox has been shared on the Innovation Platform (the internal platform of the STOP-IT project), and is thus accessible by all project partners.

Other recommendations cannot be implemented right away and are more ongoing processes to which should be paid attention during the entire duration of the project. This holds true for the suggestion to make effort to balance the gender representation in workshops. For the formal local CoPs in year two (Berlin and Israel) it is possible to provide a percentage for the amount of women present. For the local CoP in Mekorot (Israel), this was 22.2% and for BWB (Germany) this was 31.6%. For the project CoP the percentage of women present was 33.3%. Ideally this percentage would be close to 50% and to achieve this remains an ongoing process, which should communicated to the water utilities as WP2 has only limited influence in this.

The suggestions to ensure that attention is given to the goals, values and social learning between stakeholders and trying to keep meetings lively by avoiding long lectures and filling in excel files is also a point that should be kept in mind continuously during the project. While

the CoPs during the second year allowed for a sufficient amount of discussion, some participants mentioned that the presentations were still too long. Therefore, this remains an ongoing process.

The same can be said for the next two suggestions: involving more/external stakeholders for experience sharing and building contact networks. This remains an open issue. While during the second year of the project there have been more project CoPs and more trans-project CoPs activities and BSI expressed their wish to participate in a local CoP, the focus needs to lie on building networks and sharing experiences with a broader range of stakeholders.

Finally, some recommendations are not solely meant for WP2 and collaboration with other WP's are necessary. The suggestion to implement a more illustrative overview of outcomes and storylines, identifying the stage of the project in relation to project activities, what results are envisaged to be obtained through the information requested, what are the future steps to be taken, the request to show what is done with the recommendations of the users and what are the next steps within the project. While all of this could certainly be done in the CoPs, input from other work packages is needed.

5.3. Lessons learned in year two

The work of WP2 in the second year of the project mainly consisted of implementing the recommendations made in the previous year, as described in the previous sub-chapter, and supporting new local and project CoPs. Based on the observation and evaluation of these workshops, lessons can be learned.

One of the positive aspects of the project CoP held in Barcelona was that the participants were very positive about the concept of CoPs and said to be very motivated to continue CoPs in the following year. In practice however, little initiative was taken. Two formal local CoPs were held and the other companies organized several separate workshops. It is the responsibility of the Frontrunners to organize local CoPs as is written in D2.1: "The meeting topics will be decided by the CoP managers in collaboration with WP or task leaders and *support from WP2* as part of the preparatory work for the meetings." WP2 could also more proactively offer their support, however WP2 is dependent on Frontrunners to communicate this with WP2. Examples of this more proactive support could be to make an annual schedule to indicate periods where FRs should organise CoPs. This requires closer contact with the Frontrunners as they decide on meeting topics. This should be done for local CoPs, as well as for project CoPs.

During the first year several forms such as the evaluation form and templates for minutes and workshop have been designed in WP2 and been made available on the Innovation Platform. D2.1 states that at each CoP a person should be appointed to take the minutes and write workshop reports as these minutes and reports are crucial for other work packages within the STOP-it project. However, only for the CoPs where a member from WP2 was present, an evaluation as conducted and a report was written. Therefore, it can be concluded that it is not enough just to make these forms available, but WP2 should actively these forms and

stressing the importance of these forms to the CoP coordinator. Again, this requires input and information of the Frontrunners in regard to organizing local CoPs.

Another lesson learned during the second year relating to the monitoring of the CoPs was brought to our attention during the review of D2.1 and D2.2. Here it was mentioned by the reviewers that KPI's are missing. During the third year of the project, the KPI's for CoPs will be developed based on a literature study that has been conducted within KWR for the Nextgen project. As the foundation for CoPs will be the same in both projects, the same literature study can be used. However, the KPI's will be tailored to the goals and aims of the STOP-IT CoPs.

As KPI's will be formulated, they also will have to be monitored. The current evaluation form is not equipped to monitor the KPI's. Hence, an action following the formulation of KPIs integrated into STOP-IT CoP evaluation and reported on M36 report..

Most of the feedback received from the participants in the workshops relates to practical issues, such as the centrality of the venue, the directions of the venue, dietary needs, and working climate control systems. While this is the responsibility of the CoP organizer and not WP2, WP2 could support the Frontrunners by providing them with a checklist with practicalities for organizing a workshop.

The tool developers and water utilities were very positive about the opportunity to better understand each other's needs, expectations, and background and have face-to-face meetings. The CoPs seem to function well in bringing various stakeholders together and exchanging explicit and tacit knowledge.
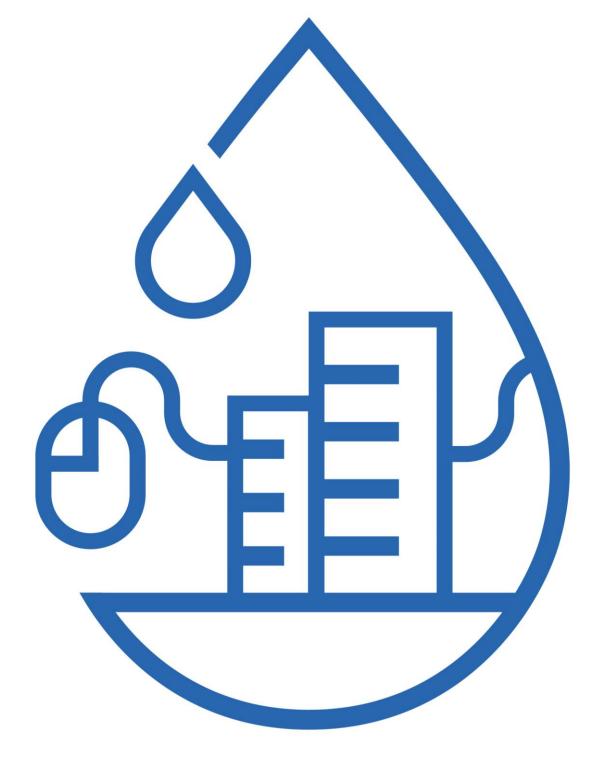
5.4.   Recommendations for future workshops

The recommendations list from year one, combined with the lessons learned in year two, results in the following list of recommendations for future workshops:

1. Keep making efforts to balance the gender representation in the workshops
2. Set up an CoP events/meetings schedule for the upcoming 6-12 months in advance in a calendar of activities
3. Keep ensuring that attention is given to the goals, values and social learning between stakeholders
4. Keep involving more/external stakeholders for experience sharing, user requirements, technology development, testing experiences, and the building of contact networks
5. Keep trying to keep the meetings lively by avoiding long lectures
6. Try to create a better connection with the other WPs that develop tools to implement the suggestions made in the previous year, such as presenting a graphic overview of their progress and next steps during the CoPs
7. Creating a CoP schedule for the upcoming years

8. Actively offer the evaluation, minutes and workshop report template and stress the importance for the monitoring of CoPs to the workshop hosts, alternatively be present at the workshops
9. Provide a checklist with practicalities for organizing a CoP to the Frontrunners
10. Design KPI's for CoPs
11. Design a new evaluation form based on the new KPI's

STOP-IT