EVALUATION OF CAPACITY DEVELOPMENT ACTIVITIES

In the project IWAMA – Interactive Water Management

IWAMA Interactive Water Management

Interreg Baltic Sea Region

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Evaluation of Capacity Development Activities (Output 3.1)

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1. Introduction

The aim of this report is to evaluate the impact of capacity development (CD) activities conducted within the Work Package (WP) 3 "Capacity development for wastewater sector experts" of the Interactive Water Management (IWAMA) project. These activities include the international onsite workshops and online training webinars. Originally, this evaluation should include outlook on the potentials of the training material package (TMP) usage by all the relevant stakeholders. This is partially addressed here, but to a greater extent in the Lifelong Learning and Wastewater Treatment in the Baltic Sea Region (Luste & Medkova 2019) report and in the instruction section included in the TMP itself.

The results of the WP3 are evaluated based on participant questionnaires and feedback conducted at the beginning, during the course of the project (after each workshop and webinar) and at the end of the project in order to follow up on the uptake of the lessons learned.

Figure 1.Capacity development steps during the IWAMA project

In IWAMA, capacity building was fulfilled through developing and sharing expertise, exchanging methods to deliver and receive knowhow, researching national synergies and increasing international interactivity. The activities implemented in the IWAMA project were structured to support both individual and institutional learning, and specific lifelong learning tools were elaborated based on identified established needs and requirements of wastewater treatment plants (WWTPs) and their personnel. The main goal of the capacity development activities was to improve (directly or indirectly) the resource efficiency in wastewater management in the Baltic Sea Region.

2. Methods & Data Collection

Data collection occurred in several steps on two different levels: horizontal and vertical. The horizontal level sets the greater picture of the current and future needs in the wastewater treatment (WWT) sector. Whereas the vertical level represents rather a fine-tuning of the main needs identified on the horizontal level, based on the actual capacity development needs and requirements of the partners.

This complex process, depicted in Figure 2 below, contributed to the continuous CD cross-level evaluation. Outcomes from both levels were essential for (1) identification of the needs in the WWT sector, (2) the development of the IWAMA CD tools for enhancing lifelong learning in the WWT sector, and (3) continuous improvement of the upcoming events.

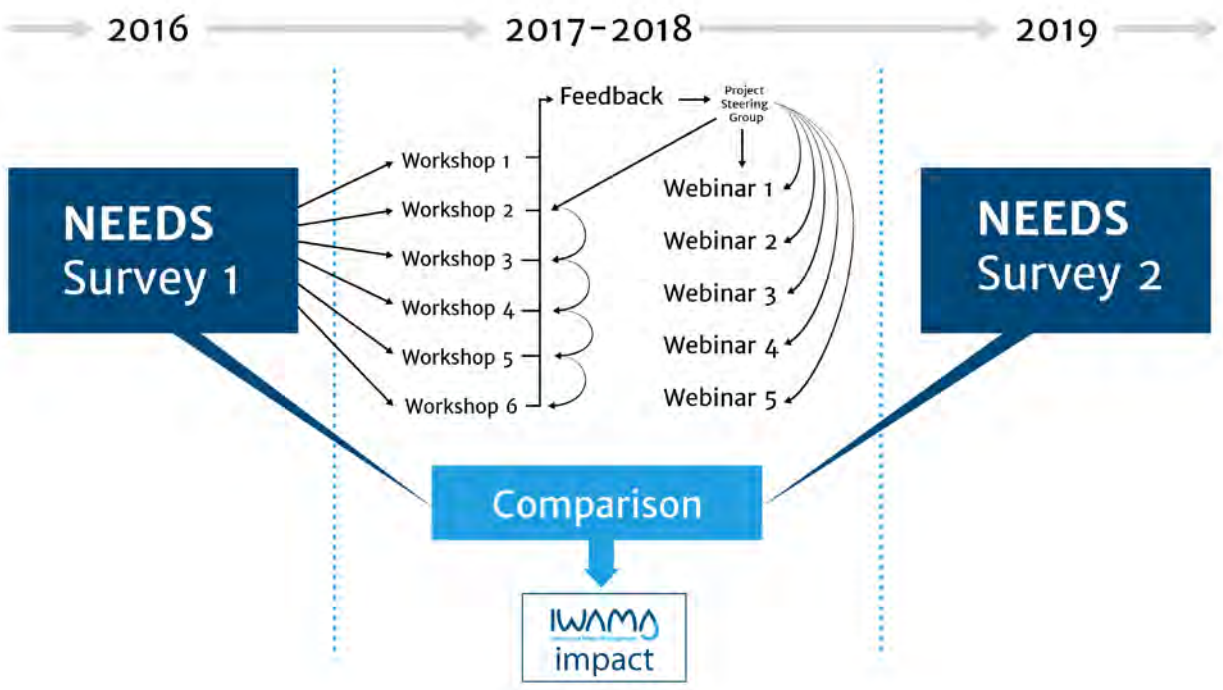

Figure 2. IWAMA capacity development process overview

The identified needs served as a basis for the content of the workshops and webinars organised in IWAMA (horizontal level). Alongside the outcomes of the feedback surveys, conducted after each workshop (vertical level), the Project Steering Group (PSG) continuously updated the topics, which required more attention, to be included in the workshops and webinars agenda as well as the other practicalities. Furthermore, those also have influenced the CD tools structure.

The horizontal level is presented by two main surveys: Survey 1 (conducted at the beginning of the project in 2016) and Survey 2 (conducted at the end of the project in 2019). The need identification as conducted in Survey 1 was supplemented during project discussions (separate surveys and group discussions), which are more in detail described in the Lifelong Learning and Wastewater Treatment in the Baltic Sea Region report (Luste & Medkova 2019). The vertical level included feedback surveys collected after each workshop and webinar during the course of the project.

Table 1. IWAMA workshops and webinars themes

IWAMA workshops and webinars themes

Workshops	
1	Identification of Capacity Development Needs in WWTP (Lahti, Finland)
2	Energy Production in WWT (Boltenhagen, Germany)
3	Energy Efficiency in WWT (Szczecin, Poland)
4	Smart Sludge Management (Tartu, Estonia)
5	Nutrient Reduction and Recovery (Kalmar, Sweden)
6	Constructional and Operational Challenges (Gdańsk, Poland)
Webinars	
1	Capacity Development
2	Energy Efficiency
3	Management and Maintenance
4	Pre- and Post-treatment on WWTPs
5	Co-operation and Symbiosis

Altogether six international onsite workshops and five online webinars were organized throughout the course of the IWAMA project (Table 1). All of the IWAMA workshops and webinars agendas can be found in Annex 1 of this document. The designated topics of the workshops were identified in advance based on the previous Baltic Sea Programme projects: Project on Reduction of the Eutrophication of the Baltic Sea Today (PRESTO, 2011-2014), Project on Urban Reduction of Eutrophication (PURE, 2007-2013) and IWAMA SEED project (2014). PRESTO and PURE projects identified the lack of training, awareness and interactive international information sharing as the major “bottlenecks” regarding the energy and resource-efficient management of the wastewater treatment processes. According to their results, the skill requirements in the WWTPs of the Baltic Sea Region are related to the operation of wastewater treatment and electrical facilities, mechanical aspects, as well as the additional requirements for WWTP

maintenance. Regular training should include updates regarding current processes, capacity development for the future requirements and knowledge of upcoming technologies (Rettig & Barjenbruch 2017). During IWAMA, these topics were then refined and the actual content of workshops and webinars was created also by taking into account the results of project surveys discussed during PSG meetings. The themes of the webinars had mostly arisen during the project implementation time, based on needs identification (horizontal level) and feedback collected after each of the workshops, as well as outputs from the key figure collecting process, energy efficiency and sludge audits. In average, 65-90 people attended each of the workshops and between 25-35 people participated in every webinar. Among the participants were project partners, associated partners, WWTP management representatives, water and wastewater associations, universities, experts, authorities and technology suppliers.

The standard workshop feedback survey was divided into several parts, dedicated to (1) practicalities and structure, (2) workshop content, (3) capacity development, and (4) comments for improvements and proposal for topics/speakers to be covered in the future workshops/webinars. Then, a short evaluation summary was sent to the PSG (Project Steering Group) and was discussed at the PSG meeting. Comments, proposals and wishes of the participants were taken into account when planning the next workshop or webinar. The number of respondents filling the feedback survey was over 20 on average (Table 2).

Table 2. Number of respondents to the workshops' feedback survey

	WS1	WS2	WS3	WS4	WS5	WS6	AVR.
number of respondents	8	11	27	31	27	23	21

In the beginning of the project, a link to the online feedback survey in Webropol was sent to all participants after the workshop. In order to increase the amount of received responses, the possibility of filling in the questionnaire during the workshop (as it went along), either online (on PC or using a smartphone) or using a paper version have been subsequently introduced. Furthermore, a short demonstration session on how to fill in the questionnaire was organised at the end of each workshop and a link to an on-line evaluation form was sent afterwards to all participants.

The possibility to fill in the feedback simultaneously during the workshop and online, either by using a computer or a smartphone was clearly the most preferred option (Figure 3). In this case, the participants had all their impressions and comments still fresh in their minds, which might have made it easier to fill in the survey. In general, the online option was more preferred than a paper version.

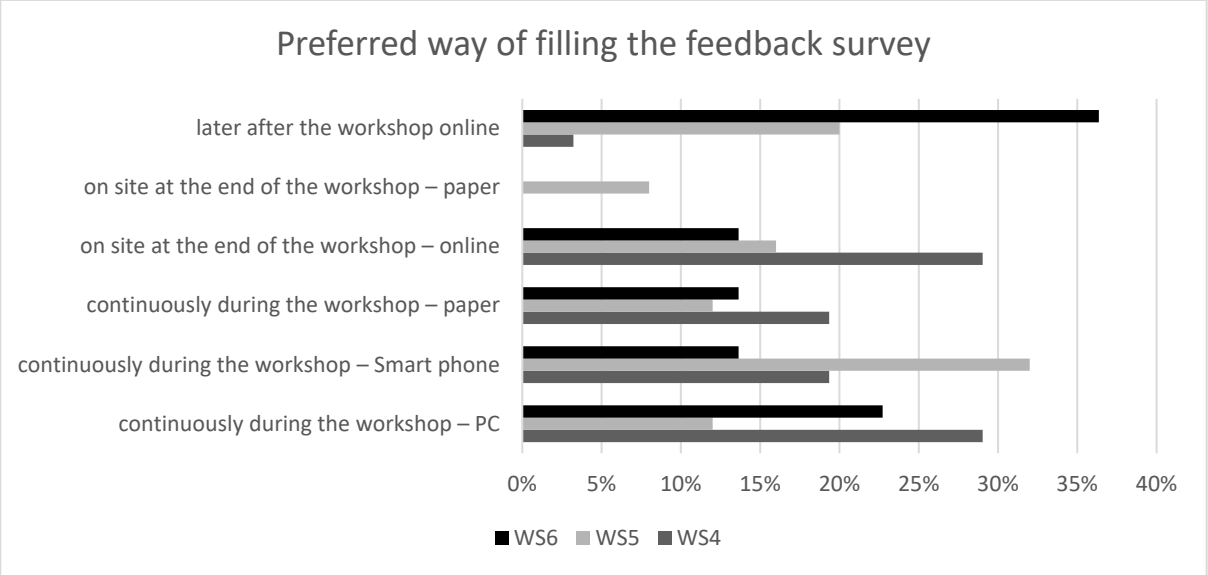

Figure 3. Preferred way of filling the feedback survey

3. Impact Results

In this chapter, the initial and final results on both levels (horizontal and vertical) are presented.

3.1 Horizontal Level - WWT Sector Needs

At the beginning of the project, in 2016, the first IWAMA Capacity Development survey (Survey 1) related to the identification of needs in WWT sector was sent out to IWAMA partners, associated partners and their co-workers (e.g. Baltic WWTPs). Among the main recognised needs was the lack of knowledge in decision-making and in the maintenance of the WWTP.

Survey 1 consisted of four main categories (global, technical, economic and educational needs) and was mainly directed at the WWTP operators, but also at researchers, authorities, and employees of associations working in the field of WWT (experts). The needs of the WWTP operators were more technically and locally oriented, whereas the experts took up more global and regulative themes. The top ten needs of the wastewater operators, and the training organizations and the WWT experts recognized in Survey 1 are presented in Table 3 below. Table 3 depicts the differences in needs prioritisation of both groups. The needs identified by both groups are marked in bold. The results of Survey 1 also served a base for selecting CD tools to be developed or tested in IWAMA, for example, a WWTP game to give a more holistic overview of the WWT process, or the State of the Art reports (SOTA) to share information about local and national reforms and practices.

Table 3. Survey 1 - top ten identified needs, 2016

Technology	Ageing of current infrastructure	**WWT operators**
Economy and Education	Lack of financial implementation instruments	
Technology	The integration of intelligent technology, automation and monitoring	
Technology	The creation of new operation models/methods (sampling, analysis, reports)	
Technology	Industrial symbiosis of WWTP with operators from other sectors	
Technology	**Holistic management of the process**	
Regulatory	**Local/national legislation reforms/The new guidelines**	
Economy and Education	To obtain reliable information for the investment decisions	
Technology	To identify the most suitable technique	
Global	Knowhow to react to extreme weather phenomena (heavy rain, floods, etc.)	

Regulatory	To fulfill the demands of national legislation	**Training organizations & "WWT experts"**
Regulatory	**Local/national legislation reforms/The new guidelines**	
Regulatory	Development of the business around the wastewater management	
Regulatory	Implementation of the EU legislation/To fulfill the demands of the EU legislation	
Global	New compounds (e.g. chemicals, medicine residues) in the wastewater	
Technology	**Holistic management of processes**	
Global	Enhanced cooperation with the client interface	
Global	Operation planning via the customer needs	
Technology	The introduction of new water treatment technology	
Regulatory	Need of new standards, operation methods, business plans	

At the end of the IWAMA project, in 2019, the second Capacity Development survey (Survey 2) was carried out in order to compare the evolution of the CD needs during the course of the project in comparison with the initial ones identified by the Survey 1 in 2016.

The development of needs in the WWT sector is presented in Table 4. The top ten needs identified by both groups in Survey 2, included both initially recognized needs, marked in bold, and newly prioritized needs.

Table 4. Survey 2 - Total top ten needs, 2019

Global	**Need to remove new compounds (chemicals, medicine residues, etc.)**	4,06
Economy and Education	Funding for the new investments	4,06
Technology	Enhanced data collection & utilisation in management	4,00
Global	Requirements for tighter limit values	3,82
Economy and Education	**Lack of (financial) implementation instruments to put investmest into practice**	3,82
Technology	**Integration of intelligent technology, automation & monitoring**	3,82
Global	Objectives towards circular economy/ resource efficiency	3,76
Regulatory	**Fulfill demands of national legislation**	3,76
Regulatory	**Fulfill new recommendations & standards (e.g. HELCOM)**	3,76
Regulatory	Coordination & cooperation between administrative units & WWTPs	3,71

The most detailed comparison of the Survey 1 vs Survey 2 identified needs based on the four main themes (regulatory, technology, economy and education, and global) is presented below (Figure 4-7). Besides the changes in the legislation, the change in priorities can be explained by broadening knowledge and benefiting from shared expertise and experiences enabled by the IWAMA international

workshops, including site visits and case studies, and online webinars. The credit can be given also to the networking and peer discussions among all participants during these events.

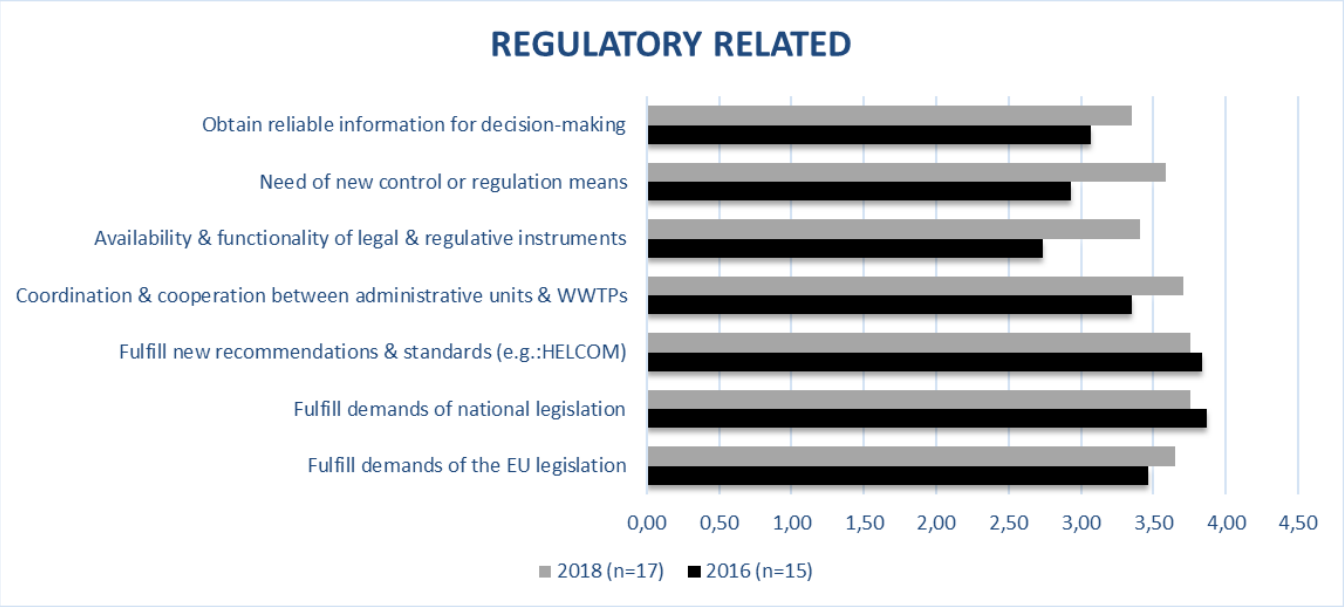

Figure 4. Regulatory-related needs comparison

The topics covered during the IWAMA workshops and webinars may have influenced the results of the Survey 2 in comparison with Survey 1 related to the regulatory needs in the WWT sector (Figure 4). These topics may widen the participant's' perspective because several national legislations were well presented and discussed in the workshops. At the same time, 'the more you know, the more you know you don't know' learning paradox proved the WWTP operators need of further knowledge development in the areas not considered of such importance in 2016, that are essential for decision making and controlling the utilisation of sludge. Moreover, several times it was discussed that limit values are still missing for some of the harmful components (e.g. medical residues, microplastics). These opened factors may have increased the needs related to the regulatory and legislation section.

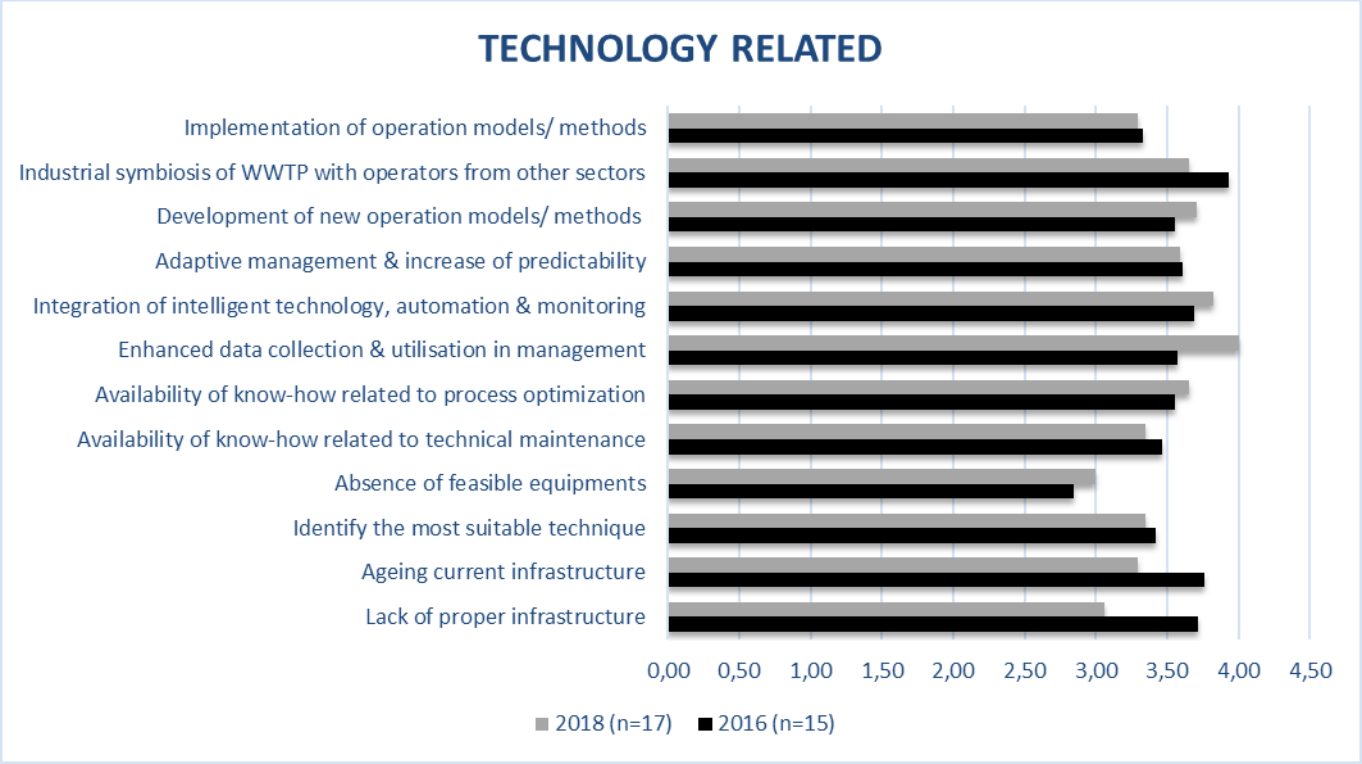

Figure 5. Technology-related needs comparison

Also, all the technology related needs were covered, at least to a certain extent, in the IWAMA workshops and webinars. From the above Figure 5, it is obvious that the initial needs directly related to the existing technology and maintenance factors in WWTP were sufficiently covered (e.g. Ageing infrastructure, Technical maintenance), and therefore, scored lower in 2018. Data management and automatization were well presented in IWAMA, however, more specific and hands-on knowledge is required. The knowledge shared related to data management and automatization can be considered as a novelty topic for many WWTPs.

As shown in Figure 6 below, various economic instruments, such as tax and policy incentives were presented in several events, however, it may have increased the need for new funding possibilities. The educational practices and issues were mainly discussed in targeted sessions during IWAMA. Around 70% of employees working in the WWTPs of the Eastern Baltic Sea region have no primary/secondary level studies in the area of wastewater treatment. Both specific secondary level WWTP operator and sanitary engineering studies are needed. In the Western Baltic Sea region, most of the employees have applicable studies for WWTP, but the educational material, as well as the quantity of higher education, does not meet today's requirements (at all the levels) and it should be more practice-oriented. In fact, the most highlighted common need regarding the different level studies was "practicality and practice training". Training courses with practical classes in the WWTPs or simulation of the processes were mostly missing and should definitely be introduced to the training programs (Luste & Medkova 2019). In the

participants' feedback, it was highly underlined that the lack of specific vocational education related to WWT prevails.

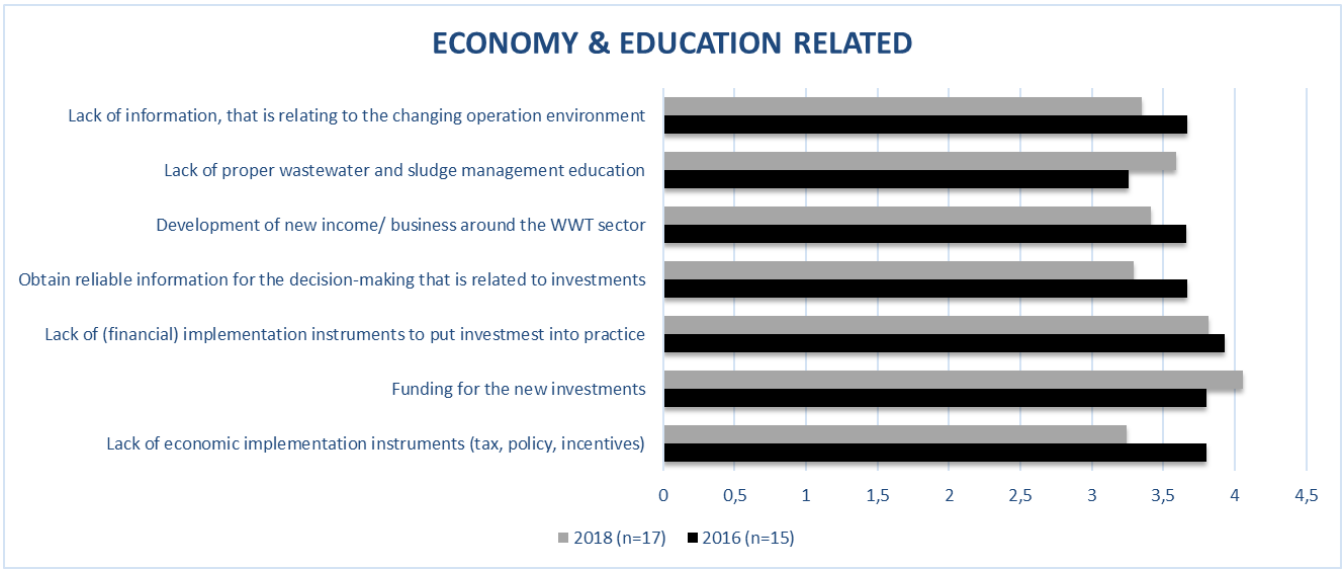

Figure 6. Economy and education-related needs comparison

The topic of WWTP maintenance related to changing weather phenomena (e.g. stormwater overflows, seasonal fluctuations) and new compounds removal (e.g. chemicals, medical residues) was often discussed in IWAMA. According to Survey 2, more information is still needed (Figure 7).

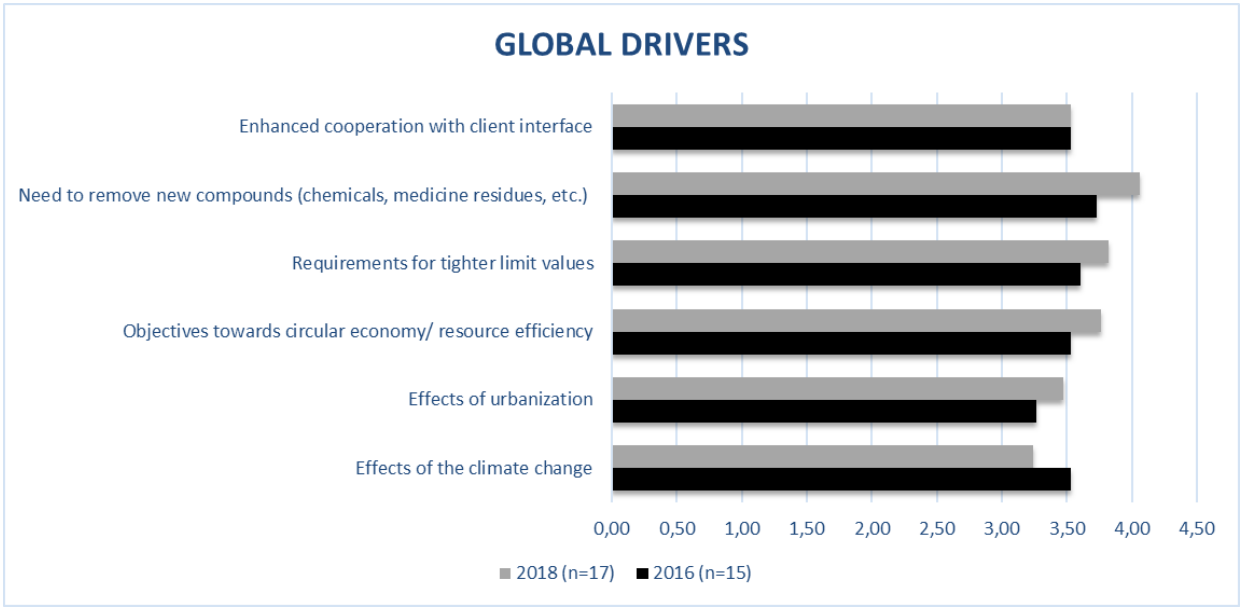

Figure 7. Global drivers related needs comparison

Survey 2 revealed other interesting findings. For instance, when asking whether IWAMA has introduced any topic/perspective/practice from different fields, which were previously unknown to the participants (Figure 8), besides the expected new practices and technologies, the new peer connections, multicultural perspectives, language/communication/ presenting skills and ICT skills scored very high. These skills strongly contribute to capacity development in general and are necessary for networking and connecting with peers for further knowledge exchange.

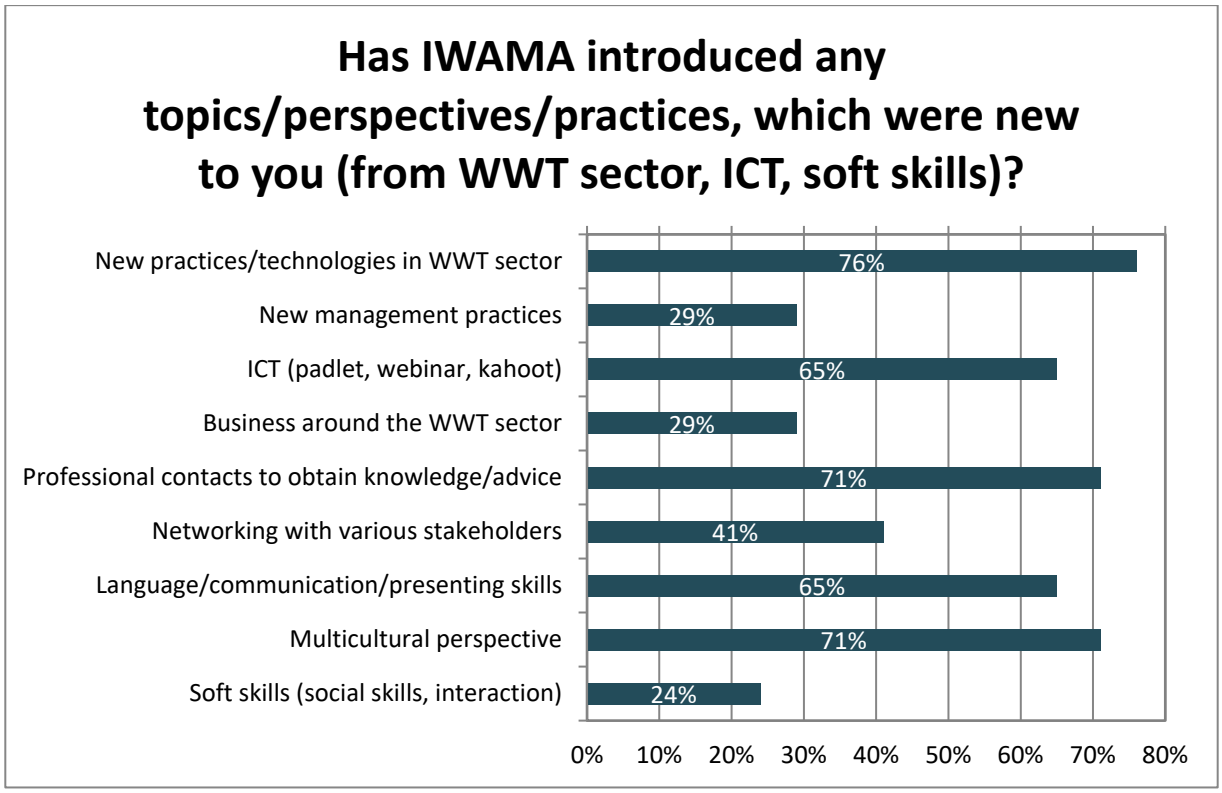

Figure 8. Unknown topics/perspectives/practices introduced by IWAMA (n=17)

The capacity development surveys also explored the ways how the know-how could be delivered and obtained. Survey 1 included also a section on the lifelong learning tools determined to the WWTPs and training institutions (CD tools needed in 2016 and in the future). Questions related to the lifelong learning tools were repeated again as a part of a feedback survey in 2018 (Figure 9). The IWAMA activities and several CD tools co-prepared during the project (e.g. webinars, self-audit tools, benchmarking, e-training materials, and the Baltic Smart Water Hub portal) most probably influenced the survey results. However, some of the highly used practices selected in 2016 have remained topical (e.g. peer learning, conferences, training courses and work shadowing). More methods and opportunities are identified to receive and deliver knowledge than expected in 2016. Practice-bound training is needed in the form of simulations. (Luste & Medkova 2019)

The most needed tool for the future is certification of the competences (wastewater card) and the development of the peer learning process with increased utilization of the online opportunities. Among the new working methods for managing and monitoring the process and knowledge retention are considered, for instance, implementation of job training for staff about methods and applications, simulation and enhanced on-site training.

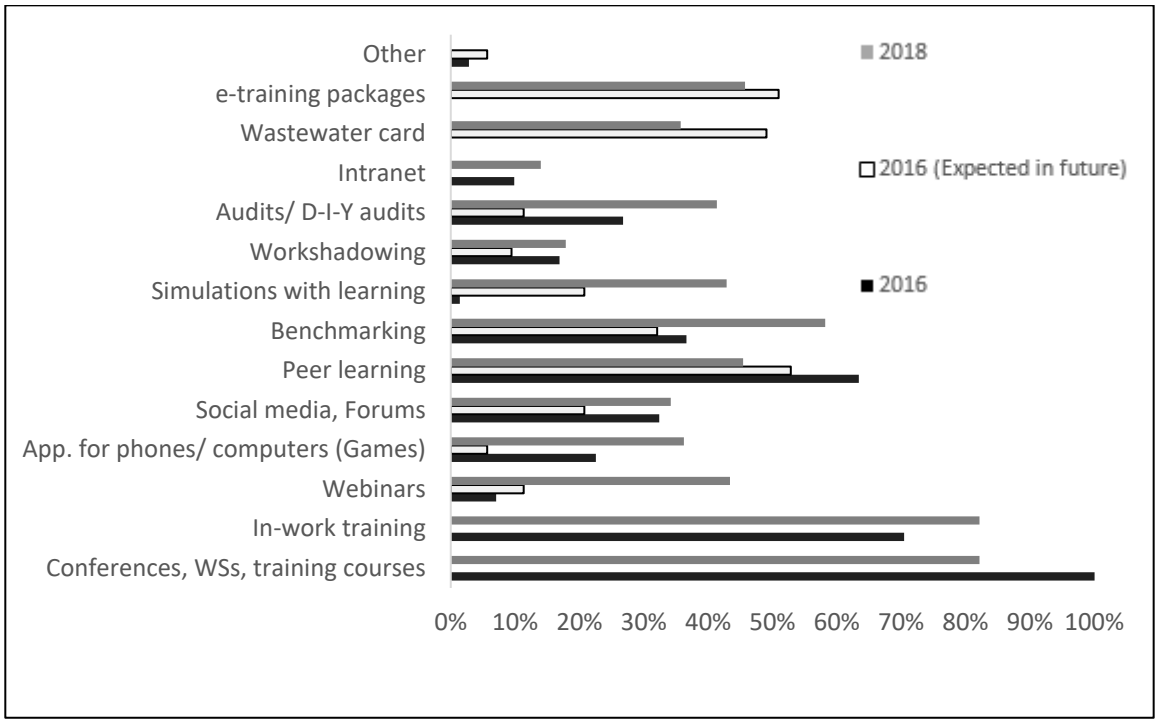

Figure 9. What kind of lifelong learning tools are needed in 2018, when compared to the situation during the year 2016 and the expectations for the future (in 2016) in the Baltic region (n=34)

3.2 Vertical Level - International Onsite Workshops and Online Webinars

Based on the workshop feedback surveys, the communication, practicalities and structure of the workshop were rated very high, reaching a total average of 4,5/5 (Table 5).

Table 5. Workshop communication, practicalities and structure satisfaction rates overview

IWAMA WSs Collective Feedback	WS1	WS2	WS3	WS4	WS5	WS6	AVR.
How satisfied were you with the practicalities and structure of the CD workshop?							
Communications							
Preliminary Info via e-mail (E.g., Directions, Practicalities document)	4,8	4,4	4,7	4,7	4,8	4,6	4,6
Registration to the workshop	4,9	4,4	4,8	4,9	4,9	4,6	4,7
Info during the workshop	4,8	4,5	4,8	4,6	4,7	4,5	4,6
Info after the workshop		4,4	4,7				4,5
Practicalities							
Accessibility to event locations	4,6	3,8	4,7	4,5	4,7	4,6	4,5
Accommodation	4,3	4,5	4,5	4,5	4,6	4,4	4,5
Venue (Main event)	4,8	4,5	4,7	4,7	4,7	4,0	4,6
Food and organization of meals/ coffees	4,9	3,9	4,8	4,6	4,9	4,4	4,6
Guided city tour	4,5		4,3	3,8	4,5	4,4	4,3
Evening program (Mobile game/ Networking Dinner)	4,5	4,5	4,4	4,7	4,9	4,7	4,6
Organisation of the site visit (incl. Transportation)			4,5	4,5	4,7	4,3	4,5
Structure							
Agenda following the theme of "Energy Production in WWTPs"		4,4	4,7	4,5	4,4	4,4	4,5
Compatibility and propriety of the workshop structure/The workshop structure itself - the content flow (e.g.: from regulations/legislation to practical examples) and the continuity of the key idea/theme	4,5	4,5	4,8	4,5	4,4	4,3	4,5
Balance of educational sessions and project-related sessions	4,5	4,2	4,4	4,4	4,3	4,3	4,3
Balance of lectures and interactive sessions	4,6	4,3	4,4	4,2	4,2	4,2	4,3
Time for networking/ discussions	4,1	4,1	4,5	4,1	4,4	4,3	4,2
Average Total	*4,6*	*4,3*	*4,6*	*4,5*	*4,6*	4,4	4,5

Also, the average score related to the presentation content and its usability for work provided on Day 1 (usually, the main day of the workshop for all) and Day 2 (internal project partner meeting) reached a high score; 4,1 (average Day 1) and 4,3 (average Day 2) as seen in Table 6 below.

Table 6. Content satisfaction rate (usability of presentation content)

IWAMA WSs Collective Feedback	WS1	WS2	WS3	WS4	WS5	WS6	AVR.
How useable (in your work) did you find the contents of the following sessions - Day 1?							
Average Total	*4,4*	*4,2*	*4,1*	*4,1*	*4,1*	3,9	4,1
How useable (in your work) did you find the contents of the following sessions - Day 2?							
Average Total	*4,3*	*4,1*	*4,3*	*4,3*	*4,4*	4,1	4,3

Concerning capacity development and the practices implemented during the workshops, the overall evaluation of the respondents scored a total average of 4.0/5 (Table 7). It should be noted, that the feedback surveys were only evaluating the "feasibility of the obtained knowledge". In other words, how likely the information will be utilized in the practice.

Table 7. The feasibility of the workshop practices' contribution to Capacity Development

IWAMA WSs Collective Feedback	WS1	WS2	WS3	WS4	WS5	WS6	AVR.
Evaluate the feasibility of the workshop practices' contribution to the Capacity Development:							
Holding interactive sessions (e.g. suppliers' orienteering, parallel sessions) related to WS themes	3,4	3,5	4,1	4,2	4,2	4,2	3,9
Presenting "WWTP cases" from the Baltic Sea area		4,3	4,3	4,3	4,2	4,3	4,3
Holding more specific group discussion/lessons for different target groups (e.g. Neighbourhood sessions; day 1)	3,7	3,5	4,2	4,1	4,1	4,2	4,0
Panel discussion (new method)				4,2	4,4		
Using already tested ways (e.g. Padlet) to implement and maintenance Capacity Building/Using already tested applications during the workshop (e.g. using Padlet for collecting questions during the workshop)		3,7		4,1	4,1		4,0
Average Total	3,8	3,9	4,1	4,2	4,1	4,2	4,0

At the last workshop, participants were asked to choose the most effective method/practice used in all IWAMA workshops and webinars (Figure 10). As the most preferred practice used were found **site visits** to WWTPs, WWTP **case studies** and **neighbourhood sessions** dedicated to target topics and issues (CD group was one of them). At WS4, a **panel discussion** among the presenters was introduced and was appreciated by the participants. The interactivity was boosted by padlet application, where questions from the audience to the speakers/panellists could be asked. Also, a **suppliers' orienteering** was introduced as a new practice, which enabled networking and knowledge exchange between WWT operators, technology suppliers as well as academia. The orienteering provided new valuable insights about technologies emerging in the sector.

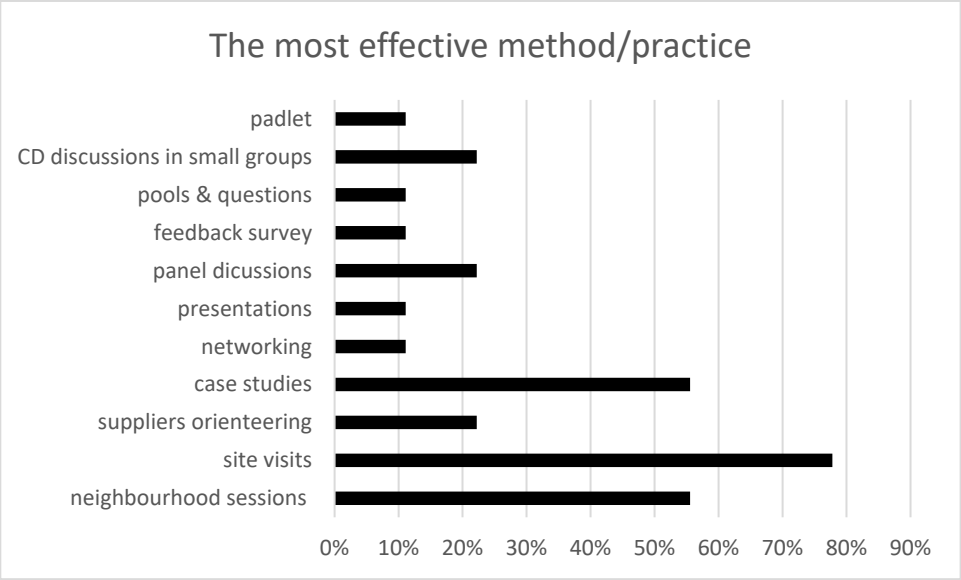

Figure 10. The most effective method/practice used in IWAMA capacity development

In general, increasing interactivity with the audience proved to be challenging. For that, **neighbourhood discussions**, targeted for a group of people with the same interest in a specific issue within a broadly defined workshop topic were organised. Usually, there were three groups, into which participants could register while confirming their workshop participation. The neighbourhood themes were related to Capacity Development, Energy Efficiency and Sludge Management. In these neighbourhood sessions, an issue to trigger the discussion was either selected and agreed upon beforehand or occurred during the session based on the current interest.

According to the feedback received, respondents found the content of the sessions very useful, inspiring, supporting their daily work as well as their work related to IWAMA. The presentations widened their perspectives, enabled networking, and gave ideas for future choices in wastewater treatment. Some participants from academia stated that the content offered them a good background to refresh their connection to the practical side. Some participants mentioned that technology-related information was especially useful due to its novelty and for the future upgrading endeavours. Knowledge gained during the workshops was passed on through discussions, emails, presentations and links and shared with colleagues and in students' lectures.

In the feedback survey, participants were also asked to suggest topics they would like to learn about more or to propose a speaker for an upcoming event. In every survey, a question related to the improvement of the feedback survey itself was given, therefore the form and the length of the survey was continuously developing to better fit the participants' expectations and receive quality data.

Findings from the webinars feedback lead to a set of tips on how to create an ideal webinar and are available in Annex 2 of this report

4. Conclusions

In the bigger picture, the needs identified in IWAMA are corresponding to the general research and knowledge challenges in the water sector according to the European Union of National Associations of Water Suppliers and Waste Water Services. Thus, the impact of the actions is also affecting on the following European water sector goals (Tisserand 2017): The value of water in the circular economy; Control approach for micro-pollutants; Growing impact of climate change on water; Resource efficiency in the water sector. Especially the goal of the capacity development activities was to positively impact (directly or indirectly) the resource efficiency in wastewater management in the Baltic Sea Region.

All identified needs from the IWAMA surveys and from the later feedbacks were, at least to a certain level, addressed by the capacity development activities (i.e. workshops, webinars, capacity development tools, facilitation of national knowledge-based communities). The main themes of the IWAMA project - energy efficiency and sludge handling - certainly affected the content that could be provided. The impact of the activities can be reviewed as (1) a general increase of knowledge/ implementation of the new operation models related to specific questions or (2) as an enabler (e.g. new skill) helping to reach the informational/ functional needs.

The practice-bound knowledge and information-share was highly appreciated (see Figure 3, Table 7, Figure 9). Based on the IWAMA surveys, the most highlighted common need regarding the different level studies was "practicality and practice trainings" (Luste & Medkova 2019). Thus, the practice-bound presentations and hands-on methods in IWAMA may explain the relatively good rating of the feedback surveys. The practice-based CD workshops with the thematic groupings may have lowered the communication threshold and enabled the fruitful information-share among the various stakeholders. During the IWAMA project, the elaborated capacity development and lifelong learning tools have enhanced regional cooperation of the wastewater sector actors, helped wastewater treatment operators develop their activities and capacities, and boosted expertise exchange supporting smart development of the Baltic Sea Region.

The IWAMA workshops and webinars created an international platform that enabled a dialogue among the WWTP operators from different countries but most of all, among various stakeholders from different fields, including academia, authorities, water and wastewater associations, and technology suppliers. Moreover, professional networking with various stakeholders and the development of communication skills were recognized to have a good impact in Survey 2. Due to the international character of the

project and its events, concurrently with the professional knowledge (hard skills), a variety of soft skills, including communication, social computing (e.g. webinar, Baltic Smart Water Hub, teleconferences among national knowledge-based communities), multicultural and social skills have been advanced. This may have a strong impact on tackling the bigger challenges in WWT sector, such as knowledge retention, on-site training organisation, and sharing of national good practices on the international level. The above-mentioned skills enable tackling the more specific problems, for example, technical issues.

Due to the different situations in the countries surrounding the Baltic Sea, there is no one-fits-all model for capacity development and lifelong learning. The motivations, incentives and barriers to learning are different in different countries. The age structure of the workforce and the availability of computers at the workplace are two examples of such differences, and, therefore, a wide spectrum of solutions are needed for successful staff development. Thus, the true impact derives from the increase of the awareness and understanding what should be known more and how to reach and share this information. In this sense, it seems that a part of the presentations worked as the eye opener and increased the need for the supplementary knowledge (e.g. effect of global drivers on the WWT sector, data management and digitalization).

4.1 Capacity Development after IWAMA

Besides the immediate short-term impact of the IWAMA project (during its implementation) on capacity development, also the long-term impact can be recognised. This is due to the comprehensive approach to the future use of the IWAMA CD tools by the national knowledge-based communities (NKBC) network continuously built during the project:

- Organizing international workshops and site visits not only influenced the CD of the participants; it mediated networking, leading into peer discussions, exchange of knowledge and experience, and engage new partnerships.
- Baltic Smart Water Hub enhances international interactivity and shares knowledge between different operators, technology suppliers and research institutions to maintain capacity development.
- Training Material Package (TMP) is managed and updated by the NKBCs, therefore, it is a vast “living” educational library to be used for planning new engineering courses and degrees in vocational schools and universities. This continuous capacity development in the network is improving the resource efficiency in wastewater management in the Baltic Sea Region.
- Continuation of national knowledge-based communities work after IWAMA to ensure the durability of the achieved results.

Also, the developed tools promote the idea of lifelong learning as voluntary and self-motivated learning with the possibility for feedback. The tools include the option of collecting data, which in turn can be utilized for further development of lifelong learning facilities. The tools designed in IWAMA project include WWTP game, electronic Training Materials Package with the virtual testing, and the publication on lifelong learning opportunities and challenges.

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Annexe 1: IWAMA (6) workshops and (5) webinars agenda collection

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Agenda for IWAMA 1st International Capacity Development Workshop:

Identification of Capacity Development needs in WWTP

20.–21.09.2016 Lahti, Finland

Venues:

Sibelius Hall (Lakeside, 2 km from Centre): **www.sibeliustalo.fi/en/sibelius-hall**
FelmanniCampus (in the Centre): **www.fellmannia.fi/?page_id=12**
Kariniemi Waste Water Plant (across the road from Sibelius Hall): **www.lahtiaqua.fi**

Tuesday 20.9.

8.00 Bus from Hotel Scandi
8.15 Bus from Hotel Cumulus

8.30 Coffee and registration

9.00 Welcome to Lahti address and the workshop program, *by Sami Luste, Lahti University of Applied Sciences (LUAS) and Olena Zinchuk, UBC Sustainable Cities Commission*

Workshop on Capacity building needs and tools

9.15 Introduction to workshop and presentation of proposed tools for capacity building (onsite workshops, webinars, training materials for lifelong learning), *by Sami Luste, LUAS*

9.45 Group work and presentations, *by LUAS*

11.00 Conclusions on Capacity building needs and tools
- Proposal on the WP 3 next steps, *by Sami Luste, LUAS*
- Welcome to WORKSHOP 2 – Plans and expectations, *by DWA German Association and LUAS*

11.30 Lunch

12.30 Introduction of partners and their role: national knowledge-based communities
Each national knowledge-based community presents themselves and their ideas on sup porting and developing lifelong learning of WWT sector experts in their country, *by DWA, EVEL, ECAT Lithania, ECAT Kaliningrad and Linnaeus University*

14.00 Preliminary Results of Key Figure Collection/Instructions for Key Figure Collection, *by Matthias Barjenbruch, Technical University of Berlin and Taavo Tenno, University of Tartu*

14.15 Coffee and division into clinics
All participants will take part in each clinic. Group letter is marked on your nametag.

Clinic and moderator	group/time		
	14.30	15.00	15.30
Reporting Clinic: Expert assistance for reporting period 1, *Jussi Välimäki, UBC Sustainable Cities Commission*	Group A	Group B	Group C
Baltic Sea Challenge Clinic: Expert assistance for formulating the commitment, *Anna Kotaviita, UBC Sustainable Cities Commission*	Group B	Group C	Group A
Learning to take part in and present in a webinar, *Päivi Kärnä, Lahti University of Applied Sciences*	Group C	Group A	Group B

16.00 Closing words of the day, *by Olena Zinchuk, UBC Sustainable Cities Commission*

16.15–18.00 **Optional walking tour**
(incl. the site of Lahti 2017 FIS Nordic World Ski Championships and Lahti City Hall)

19.30–22.00 **Evening networking event and dinner**

Wednesday 21.9.

8.00 **Audit team meeting** at FellmanniCampus, 2nd floor, room 231
Obligatory for team leaders and coordinators of students' group Berlin Technical University, University of Tartu, LUAS and Linnaeus University, and the participating WWPTs from Kaunas, Szczecin, Gdansk, Grevesmühlen, Tartu, Türi, Daugavpils and Jurmala)

10.30 Buss to Sibelius Hall from Hotel Scandic
10.45 Buss to Sibelius Hall from Hotel Cumulus

SMART ENERGY AND SLUDGE MANAGEMENT IN LAHTI
11.00 Energy efficiency and sludge management, *by Jouni Lillman, Lahti Aqua Ltd.*
11.45 Sludge treatment, *by Ari Savolainen, Labio Ltd.*

12.15 **Lunch**

13.15 **Division into clinics and departure for site visit**
Group number is marked on your nametag.

Clinic and moderator	group/time		
	13.15-14.45	14.45-15.00	15.00-16.30
Investment clinic for WWTPs *Jussi Välimäki, UBC Sustainable Cities Commission*	**Group 1**	**Coffee break**	**---**
Life-long learning tools clinic for National knowledge-based communities to continue discussion of needs and expectations based on pre-questionnaire *Sami Luste, Lahti University of Applied Sciences*	**---**		**Group 2**
Kariniemi WWTP site visit, *Lahti Aqua*	**Group 2**		**Group 1**

16.30 Notes from the clinics, *by Sami Luste, Lahti UAS*

16.45 Closing address, *by Olena Zinchuk, UBC Sustainable Cities Commission*

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DWA Clear Concepts. Clean Environment. Regional Group North-East

Agenda for IWAMA 2nd International Capacity Development Workshop:

Energy Production in WWT

14.–15.02.2017 Boltenhagen, Germany

Monday 13.2.

Iberotel Boltenhagen, room Otto Lilienthal

17.30 **PSG meeting**

Tuesday 14.2. Energy Production

Iberotel Boltenhagen, room Caspar David Friedrich

8.30 **Coffee and registration, welcoming words**

9.00 **Energy in WWTPs – current trends and future needs,** *by Jörg Krampe, University of Technology in Vienna, Austria*

9.30 **Anaerobic sludge treatment**
Process of digestion, operating conditions, optimization of process, ***by Taavo Tenno, University of Tartu, Estonia***

9.50 **Co-fermentation of additional substrates,** *by Matthias Barjenbruch, Technical University of Berlin, Germany*

10.10 **Discussion**

10.30 **Coffee break**

11.00 **Possibilities of sludge disintegration,** *by Karl-Georg Schmelz, Emschergenossenschaft/ Lippeverband, Germany*

11.30 **Thermal disintegration of surplus sludge – results of pilot and full scale investigations at WWTP Grevesmühlen with the Haarslev HCHS system,** *by Wolfgang Pfeiffer, University of Applied Sciences Technology, Business and Design Wismar, Germany*

12.00 **Hydrothermal Carbonization: the part to an energy autonomous sewage plant**, *by Tina Günther, Grenol Ltd., Germany*

12.30 **Discussion**

12.45 **Lunch break**

13.45 **Energy management at WWTP in Baltic Sea region – selected case studies**
WWTP Rostock
WWTP Lübeck
WWTP Turku
WWTP Gdansk

14.45 **Neighbourhood session**
Group 1
- Target group: Associations + Linnaeus University
- Topic: Lifelong learning chaired *by Lahti University of Applied Sciences (LUAS), Finland*

Group 2
- Target group: WWTP + University of Tartu
- Topic: energy consumption by aeration and reduction potential chaired *by Technical University of Berlin, Germany*

15.30 **Coffee break**

16.00	**Wrap up of Neighbourhood session**
16.15	**Increase of biogas utilization**, *by Jörn Franck, Dr. Born – Dr. Ermel GmbH, Germany*
16.45	**Baltic Sea Challenge** – Experiences from years of cooperation, *by Gennadi Gramberg, Tallinn city Environment Department, Estonia,* *Salla-Maria Lauttamäki and Lotta Ruokanen, Baltic Sea Challenge Coordinators*
17.30	**Closing words of the day**, *by Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
19.30	**Evening networking event and dinner**

Wednesday 15.2. Grevesmühlen WWTP and Project Meeting

Iberotel Boltenhagen, room Caspar David Friedrich

8.30	**Presentation of WWTP Grevesmühlen**, *by Remo Borgwardt, Zweckverband Grevesmühlen, and Henning Zeich, Aqua&Waste Ltd., Germany* **Presentation of water and energy management at shrimp farm, Grevesmühlen**, *by York Dyckerhoff, Cara Royal shrimp farm in Grevesmühlen, Germany*
9.15	**Bus transfer to Grevesmühlen**
9.45	**WWTP Grevesmühlen – detailed tour**
12.00	**Bus tranfer back to Boltenhagen**
12.30	**Lunch break**
13.30	**Think tank of the Capacity Development process in WP3**, incl. - content and format of the future workshops & webinars - situation with training materials package - issues arisen in the discussion with the associations *by Sami Luste, Lahti University of Applied Sciences (LUAS), Finland*
14.30	**Project Communication Strategy**, *by Agnieszka Ilola, UBC Sustainable Cities Commission, Finland*
15.00	**Coffee break**
15.30	**Expert assistance for reporting period 2**, *by Jussi Välimäki and Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
16.00	**First Results of Key Figure Collection**, *by Stefan Rettig, Technical University of Berlin, Germany and Taavo Tenno, University of Tartu, Estonia*
16.15	**Teaser: Next Workshop in Szczecin**, *Water And Sewage Company Ltd. of Szczecin*
16.30	**Closing words** *by DWA, UBC*

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ZWiK Szczecin

Agenda for IWAMA 3rd International Capacity Development Workshop:

Energy Efficiency in WWT

7.–8.6.2017 Szczecin, Poland

Wednesday 7.6. Energy Efficiency session

Radisson Blu Hotel Szczecin, hall "VIVALDI", 1st floor

8.30	**Coffee and registration**
9.00	**Welcome to Szczecin** *by Mayor of the City of Szczecin and Waldemar Gill, Chair of the Board of Water And Sewage Company Ltd. of Szczecin and, Poland*
9.15	**Welcome to the workshop: program & practicalities** *by Olena Zinchuk, UBC Sustainable Cities Commission, Finland, and Krzysztof Maciejewski, Water And Sewage Company Ltd. of Szczecin, Poland*
9.30	**Energy efficiency in wastewater treatment process,** *by Anett Baum, German Association for Water, Wastewater and Waste*
10.00	**Choice and operation of blowers** *by Ove Fjordmand, Sulzer Pumps A/S, Denmark*
10.30	**Coffee break**
11.00	**Efficient aeration – oxygen transfer** *by Martin Wagner, Technical University of Darmstadt, Germany*
11.30	**Suppliers' orienteering session** *organized to present and discuss energy efficient solutions with representatives from companies*
13.00	**Lunch break**
14.00	**Public participation in water management – energy efficiency example** *by Dariusz Szwed, Słupsk Mayor's Foreign Affairs Office, Poland*
14.15	**Energy efficient wastewater treatment in Szczecin** *by Piotr Miakoto and Jacek Jasiulewicz, Water And Sewage Company Ltd. of Szczecin, Poland*
14.30	**Energy efficency at WWTP in Baltic Sea region – selected case studies** WWTP Krakow *by Bartosz Łuszczek, Krakow Waterworks* WWTP Berlin *by Carsten Lüdicke, Berlin Water Company* WWTP Odense *by Anders Bækgaard, Utility of Odense VCS Denmark* WWTP Växjö *by Ingrid Palmblad Örlander, Technical Department of Växjö Municipality*
15.30	**Coffee break**

15.45	**Parallel neighbourhoods sessions** additional halls "REYMONT" and "MICKIEWICZ", both 2nd floor
	Group 1: Capacity development "Designing IWAMA Training Materials Package as a CD tool" *chaired by Lahti University of Applied Sciences, Finland* – Target group: Associations, Linnaeus University, experts involved in educational activities
	Group 2: Energy efficiency "Blowers and pumps"*, chaired by Technical University of Berlin, Germany* – Target group: WWT experts working with/interested in energy-related issues
	Group 3: Sludge management "Should wastewater sludge treatment be centralized?" *chaired by University of Tartu, Estonia* – Target group: WWT experts working with/interested in sludge-related issues
16.30	**Closing of the day and briefing of day 2 programme**
17.30	**Meeting for the optional walking tour**
19.30	**Evening networking event and dinner at the Wyszak Brewery and Restaurant**

Thursday 8.6. Site visit and Project Meeting

Pomorzany WWTP and Radisson Blu Hotel Szczecin, hall "VIVALDI", 1st floor

8.30	**Gathering for bus transportation to the site visit**
9.00	**Presentation of WWTP Pomorzany**, *by Mirosława Dominowska, Water And Sewage Company Ltd. of Szczecin*
9.30	**WWTP Pomorzany – detailed tour**
11.30	**Bus tranfer back to Radisson Blu Hotel Szczecin**
12.00	**Lunch break**
13.00	**IWAMA project outputs and their application/dissemination** *by Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
13.20	**Teaser for next event: IWAMA Water Forum launching the Smart Baltic Water Hub**, *by Agnieszka Ilola, UBC Sustainable Cities Commission, Finland*
13.40	**Key figure Collection results and greetings from the audits**, *by Stefan Rettig, Technical University of Berlin, Germany, and Markus Raudkivi, University of Tartu, Estonia*
14.00	**Reporting and communication session**, *by Olena Zinchuk and Agnieszka Ilola, UBC Sustainable Cities Commission, Finland*
14.15	**Budget change session**, *by Jussi Välimäki, UBC Sustainable Cities Commission, Finland*
14.30	**Closing words, feedback evaluation & coffee**
15.00–	**Possibilities for individual consultations with WP leaders & LP**

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Tartu Veevärk

Agenda for IWAMA 4th International Capacity Development Workshop:

Smart Sludge Management

8.–9.2.2018 Tartu, Estonia

Thursday 8.2. Sludge management

Venue: STRUVE Hall at Dorpat Convention Centre

Sludge legislations session

08.30	**Registration and coffee**
09.00	**Welcoming words** *by Toomas Kapp, Tartu Waterworks*
09.10	**Practicalities and introduction to the programme,** *by Taavo Tenno, University of Tartu*
09.30	**EU perspective and German legislation concerning sludge,** *by Claus-Gerhard Bergs, formerly Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety*
10.00	**Sludge legislation in Finland: sludge based fertilizer products for agricultural use,** *by Ari Kangas, Environmental Ministry of Finland*
10.20	**Estonian legislation and certification system, basis for End of Waste for sewage sludge,** *by Vallo Lemmiksoo, Estonian Life Science University, aqua consult Baltic*
10.40	**Coffee break**

Sludge handling perspectives

11.00	**Pharmaceuticals in municipal sludge - is it a real threat or should they be ignored?** *by Egge Haiba, Tallinn University of Technology*
11.20	**HELCOM vision to sewage sludge handling and recycling of nutrients,** *by Dmitry Frank-Kamenetsky, HELCOM*
11.40	**Panel discussion "Legislative changes concerning sewage sludge and perspectives for the future use and utilization"**
12.20	**Lunch**

Session on new sludge handling technologies and case studies

13.20	**Effect of thermal and chemical hydrolysis on sludge dewatering, drying and incineration,** *by Peter Hartwig, aqua&waste International*
13.40	**Sludge treatment in reed beds - state of the art through 30 years of experience,** *by Steen Nielsen, Orbicon A/S*
14.00	**Production of synthetic fuels and green hydrogen from sludge (TO-SYN-FUEL),** *by Nils Jäger, Fraunhover Society for the Advancement of Applied Research*
14.20	**Coffee break and division for moving to parallel sessions**

Neighbourhoods session

14.40 **Parallel Neighbourhoods session**

Group 1, venue STRUVE Hall: How to finance upcoming investments caused by potential changes in national/ international legislations?

Group 2, venue BAER Hall: How to increase the demand for the end-product of your sludge treatment processes (humus, compost etc)? How to increase the product value?

Group 3, venue PETERSON Hall: Practicalities, how to operate a digester?

Group 4, venue OSTWALD Hall: Practicalities, how to operate a composting process in the WWTP?

15.25 **Transfer to the main hall**

Final use practices

15.30 **Final use practices – case Helsinki region,** *by Mikko Wäänänen, Helsinki Region Environmental Services Authority*

15.45 **End of Waste for sewage sludge in Estonia - startup of the certification centre,** *by Mait Kriipsalu, Estonian University of Life Sciences*

16.00 **Recycling sewage sludge ash for agricultural application in Germany,** *by Harald Plank, Huber SE*

16.15 **Summaries of the parallel discussions**

16.35 **Teaser for the next event: 5th IWAMA CD Workshop on Nutrient reduction and recovery in Kalmar, Sweden,** *by William Hogland, Linnaeus University*

16.45 **Closing of the day and briefing of day 2 programme**

18.00 **Gathering for bus transportation to the networking dinner at the Estonian National Museum (Muuseumi tee 2)**

Friday 9.2. Site visit and Project Meeting

8.30 **Gathering for bus transportation to the site visit**

9.00 **Presentation of Tartu WWTP**

9.30 **WWTP – detailed tour and transfer back to the meeting venue**

IWAMA partner sessions

Venue: Struve Hall at Dorpat Convention Centre

11.00 **Reporting remarks,** *by Olena Zinchuk, UBC*

11.20 **Budget change summary and underspending situation,** *by Jussi Välimäki, UBC*

11.40 **Lunch**

12.40 **Information about the IWAMA tour at IFAT 2018 in Munich, Germany,** *by Stefan Rettig, Technical University of Berlin*

12.45 **Capacity Development and Training Material Package overview,** *by Sami Luste, Lahti University of Applied Sciences*

13.05 **IWAMA Final Publication (including BSC commitments)** *by Agnieszka Ilola, UBC*

13.20 **Project output publications and translation needs,** *by Olena Zinchuk, UBC*

13.35 **On site feedback evaluation,** *by Katerina Medkova, Lahti University of Applied Sciences*

13.45 **Closing words and coffee**

14.00- **Possibilities for the individual consultation**

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Agenda for IWAMA 5th International Capacity Development Workshop:

Nutrient reduction and recovery 13.–15.6.2018 Kalmar, Sweden

Wednesday 13.6. – Study visit to Kalmar WWTP

10-12.00	**Possibilities for individual consulations**
13.00	**Gathering at Calmar Stadshotell for bus transportation to the site (via airport)**
13.30	**Visit to Malmfjärden site of the Life Sure project – Sediment Uptake and Remediation,** *by Fabio Kaczala, Kalmar Municipality, and Bengt Simonsson, TechMarket AB, Sweden*
14.15	**Presentation of Kalmar WWTP and design of the new plant, Q&A session,** *by Regine Ullman and Qing Zhao, Kalmar Water Company, Sweden*
15.00-16.00	**Tour around the facility**
16.00	**Bus transportation back to Calmar Stadshotell**

Thursday 14.6. – Nutrient reduction and recovery

Venue: room "Stora Festsalen" at Calmar Stadshotellet (Stortorget 14)

8.30	**Registration**
9.00	**Welcome to Kalmar,** *by Roger Kaliff, City Council Kalmar Municipality, Sweden*
9.15	**Welcome to the workshop: program & practicalities,** *by William Hogland, Linnaeus University, Sweden and Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
9.30	**Keynote on importance of nutrient recovery from circular economy perspective,** *by Jyrki Laitinen, Finnish Environmental Institute*
9.55	**Overview of the activities of the European Sustainable Phosphorus Platform,** *by Ludwig Hermann, President of ESPP, Belgium*
10.15	**Coffee break**
10.30	**Overview of process engineering approaches to phosphorus recovery and their opportunities to comply with the legal requirements,** *by Matthias Barjenbruch, Technical University of Berlin, Germany*
11.15	**Phosphorus and Nitrogen removal from the sludge water stream - technologies and practical experiences,** *by Bernd Kalauch, P.C.S. Pollution Control Service GmbH, Germany*
11.30-12.15	**Panel discussion regarding the nutrient reduction and recovery in WWT in the BSR** *moderated by William Hogland, Linnaeus University, Sweden*
12.15	**Lunch break**
13.15-14.15	**Selected case studies on nutrient reduction and recovery in Baltic Sea region**

13.15 Activating of the digester with thermal chemical hydrolysis and recovering of nitrogen, *by Andreas Dünnebeil, PONDUS Verfahrenstechnik GmbH, Germany*

13.30 PAKU-process – Thermal treatment of sludge and phosphorus recovery process, *by Arttu Laasonen, Endev Oy, Finland*

13.45 Piloting phytoremediation of a site with the use of sludge in circular economy context, *by Inga Grinfelde, Latvia University of Life Sciences and Technologies*

14.00 Sludge treatment as soil improver for agricultural purposes, *by Jyri Koivisto, Suomen Ekolannoite Oy, Finland*

14.15	**Resource Water Recycling Plant – a new paradigm for waste water treatment and nutrient recycling,** *by Gunnar Thelin, Ekobalans AB, Sweden*
14.30	**Biomanure – nutrient cycle in society,** *by Gunnar Bergström, More Biogas AB, Sweden*
14.45	**Mussel farms counteracting eutrophication,** *by Susanna Minnhagen, Kalmar Municipality, Sweden*
15.00	**Coffee break**
15.30	**Parallel Neighbourhoods sessions** *Group A, room Stora Festsalen:* ***Nutrient removal****, chaired by the Technical University of Berlin, Germany* *Group B, room Lilla Festsalen:* ***Reuse of nutrients from sludge****, chaired by the University of Tartu, Estonia* *Group C, room Kvarnholmen:* ***Capacity development "Using IWAMA Training Materials Package as a CD tool"****, chaired by Lahti University of Applied Sciences, Finland*
16.30	**Summaries from the Neighbourhoods hosts**
16.45	**Teaser for next event: Workshop on Constructional and Operational Challenges in Gdansk, Poland, 19-21 September 2018**
16.55	**Closing of the day and briefing of day 2 programme**
17.30	**Guided walking tour on the history of the city, ending at Kalmar Castle ramparts**
19.30	**Evening networking dinner at the Kalmar Castle restaurant**

Friday 15.6. – IWAMA partner session and study visit to Sandvik desalination plant

Venue: room "Stora Festsalen" at Calmar Stadshotellet (Stortorget 14)

9.00	**Budget change outcomes,** *by Jussi Välimäki, UBC Sustainable Cities Commission, Finland*
9.10	**Reporting remarks,** *by Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
9.20	**WWTP Game preview and feedback,** *by Sami Luste, Lahti University of Applied Sciences, Finland*
9.45	**Project output publications and deadlines,** *by Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
10.00	**National dissemination events,** *by Agnieszka Ilola, UBC Sustainable Cities Commission, Finland*
10.15	**Coffee break**
10.45	**Key Figure Collection reports,** *by Stefan Rettig, Technical University of Berlin, Germany, and Markus Raudkivi, University of Tartu, Estonia*
11.00	**Investment updates by WWTPs**
11.45	**On site feedback evaluation and closing**
12.00	**Lunch**
13.00	**Gathering for the bus transportation to Öland island**
14.00-16.00	**Visit to Sandvik desalination plant – from brackish water from the Baltic Sea to clean drinking water in the tap,** *by Anders Lindholm, Borgholm Energi AB, Sweden*

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GIWK

Agenda for IWAMA 6th International Capacity Development Workshop:

Constructional and operational challenges 20.–21.9.2018 Gdańsk, Poland

Wednesday 19.9. – Arrival and optional consultations/site visit

12.00–15.00	**Possibilities for individual consultations**
18.00	**Gathering at Hotel SCANDIC GDAŃSK for bus transportation to the site**
18.30	**Visit to Kazimierz Water Tower**

Thursday 20.9. – Main workshop day

Venue: room Amsterdam at Hotel SCANDIC GDAŃSK (Podwale Grodzkie 9)

9.00	**Coffee and registration**
9.30	**Welcome to Gdańsk,** *by Piotr Grzelak, Vice-Mayor for Housing and Public Utilities Policy, city of Gdańsk, Poland*
9.40	**Welcome to the workshop: program & practicalities,** *by Jacek Skarbek, Gdańsk Water Utilities Ltd., Poland and Olena Zinchuk, UBC Sustainable Cities Commission, Finland*
9.50	**Development of strategies towards a sustainable water sector,** *by Helen Barndõk, Keskkonnateenused OÜ, Estonia*
10.10	**Maintenance control strategies,** *by Tiina Kärner, Tallinn Waterworks, Estonia*
10.30	**Coffee break**
11.00	**Optimisation of the WWTP performance and design using computer simulation,** *by Jacek Mąkinia, Gdańsk University of Technology, Poland*
11.30	**Can these complex models help with operation and online control? Examples of good, bad and the ugly,** *by Imre Takacs, CEO of Dynamita, France*
12.00	**Variation of loading of WWTP – seasonal influences,** *by Matthias Barjenbruch, Berlin University of Technology, Germany*
12.30	**Lunch break**
13.30	**Dewatering, thickening and polymer dosing,** *by Julia Kopp, Kläranlagenberatung Kopp, Germany*
14.00–15.00	**Case Studies on solutions to personnel demand and management challenges**
14.00	**"Young DWA",** *by Sajjad Tabatabaei, Vice-Chairman of Young DWA – German Association for Water, Wastewater and Waste*
14.15	**Knowledge Management and Retention in Finnish WWTPs,** *by Sirpa Sandelin, Satakunta University of Applied Sciences, Finland*
14.30	**Järvamaa vocational training system,** *by Lauri Lagle, Estonian Waterworks Association*
14.45	**Polish experiences in vocational trainings and skill enhancement in water and wastewater sector,** *by Alicja Loch-Dzido, Gdańsk Water Foundation, Poland*

15.00	**Coffee break**
15.30	**Parallel Neighbourhoods sessions** *Group A, room Amsterdam:* ***Selected aspects of maintenance from energy efficiency perspective****, chaired by the Technical University of Berlin, Germany* *Group B, room Kalmar:* ***Dewatering and using polymers****, chaired by the University of Tartu, Estonia* *Group C, room Turku:* ***Capacity development "Translations, situation with the CD tools implementation and gaps in the Lifelong Learning Manual"****, chaired by Lahti University of Applied Sciences, Finland*
16.30	**Summaries from the Neighbourhoods hosts**
16.45	**Teaser for next event: IWAMA Final Conference in Turku, Finland, January 2019**
16.55	**Closing of the day and briefing of day 2 programme**
18.00	**Gathering for a guided walking tour around the old city**
19.30	**Evening networking dinner at PG4 Brewery Gdańsk** (Podwale Grodzkie 4)

Friday 21.9. - Site visits and meeting at WWTP premises

Venue: Education Centre at the Gdansk Waste Water Treatment Plant (Benzynowa 26)

8.30	**Gathering at Hotel SCANDIC GDAŃSK for the bus transportation to the meeting venue**
9.00	**Presentation of Gdańsk WWTP,** *by Marek Swinarski, Gdańsk Water Utilities Ltd., Poland*
9.30	**Presentation on sidestream and mainstream anammox,** *by Jacek Mąkinia, Gdańsk University of Technology, Poland*
9.50	**Information about the next Audit Group Meeting,** *by Stefan Rettig, Technical University of Berlin, Germany*
10.00	**Division into groups and start of the site vists** • *WWTP* • *Combined anammox- constructed wetland pilot-plant* • *Incineration and CHP plants*
13.00	**Lunch**
13.45	**Gathering for the bus transportation back to the Hotel SCANDIC GDAŃSK**
21.15	**Gathering at the Hotel SCANDIC GDAŃSK for an optional walk to the Hevelius Fountain Show**

IWAMA Interactive Water Management

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IWAMA 1st Webinar — Agenda

Friday 9.12.2016

connect.funet.fi/iwama/

The testing starts at 8:45 (German, CET = +1 GMT)/ 9:45 Estonian & Finnish time and the **program starts at 9:00/10:00**. Please join the webinar in time so that possible connection problems can be solved before the event. **Please insert your name and organisation in your login name.**

8.30	Instructions for presenters
8.45	**Testing of the connections**
9.00	**Welcome – 5 min** Welcome to the Webinar & program *Olena Zinchuk, UBC Sustainable Cities Commission*
9.05	**State of art based on previous projects – 30 min** Presenting results and conclusions of the previous projects: LearnWater, PURE and PRESTO *Agnieszka Ilola, UBC Sustainable Cities Commission*
9:35	Questions – 10 min
9:45	**Capacity Development right now – 15 min** Capacity development needs based on questionnaire results, greetings from CD team of IWAMA *Sami Luste, Lahti University of Applied Sciences (Lahti UAS)*
10.00	**Enhancing energy and resource efficiency in waste water treatment – 35 min** Experiences of updating & optimizing old WWTPs *Anna Mikola, PhD, Aalto University*
10.35	Questions – 15 min
10.50	**Conclusions – 10 min** *Sami Luste, Lahti University of Applied Sciences (Lahti UAS)*
11.00	**End of the webinar**

2nd IWAMA Webinar on Energy efficiency

23 May 2017 13:30 – 15:00 CET

connect.funet.fi/iwama/

The goal of the IWAMA (Interactive Water Management) project is to promote capacity development in efficient nutrient removal, smart sludge and energy management, and to improve lifelong learning in the wastewater treatment sector. The webinars are organized to support the capacity development.

You are welcome to join those presentations which are of interest to you.

There is also a possibility to influence the conversation before the webinar: Send your questions to the presenters by 18th May 2017 through https://www.webropolsurveys.com/S/AE65CC913BDB7CCF.par

Testing starts at 13:15 CET (+1 GMT) and the **program starts at 13:30 CET**. Please join the webinar in time to be able to solve possible connection problems beforehand. **Please insert your name and organisation when logging in.**

13.00	Instructions for presenters
13.15 (CET)	**Testing of the connections**
13.30	**Welcome – 5 min** Introduction to webinar & program *Olena Zinchuk, UBC Sustainable Cities Commission*
13.35	**Utilizing data and sensors in the biological WWT – 20 min** Automation, data utilization and sensors in wastewater treatment *Dr. Henri Haimi, Finnish Consulting Group*
13.55	Interactive discussion based on pre-sent questions – 20 min
14.15	**Technical Safety Management – 20 min** *Sandra Haase, German Association for Water, Wastewater and Waste (DWA)*
14.35	Interactive discussion based on pre-sent questions – 20 min
14.55	**Conclusion – 5 min** *Sami Luste, Lahti University of Applied Sciences (Lahti UAS)*
15.00	**End of webinar**

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3rd IWAMA Webinar on Management and maintenance of WWTP

25 September 2017
12:30 – 13:45 CET
connect.funet.fi/iwama

The goal of the IWAMA (Interactive Water Management) project is to promote capacity development in efficient nutrient removal, smart sludge and energy management, and to improve lifelong learning in the wastewater treatment sector. The webinars are organized to support the capacity development.

You are welcome to join those presentations, which are of interest to you.

The testing starts at **12:15 CET (German time)** and the **program starts at 12:30 CET**. Please join the webinar in time so that possible connection problems can be solved before the event. **Please insert your name and organisation in your login name.**

12.00	Instructions for presenters
12.15 (CET)	**Testing of the connections**
12.30	**Welcome** Introduction to the webinar & program *Olena Zinchuk, UBC Sustainable Cities Commission*
12.35	**Wastewater treatment management with the data** *Mika Kujala, Lahti Aqua Oy*
12.50	Questions, interactive discussion
13.00	**Possibilities to enhance the management of wastewaters** *Hannu Poutiainen, South-East Finland University of Applied Sciences (XAMK)*
13.20	Questions, interactive discussion
13.30	**Conclusion** *Sami Luste, Lahti University of Applied Sciences (Lahti UAS)*
13.45	**End of webinar**

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4th IWAMA Webinar on Pre- and post-treatment on WWTP

09 April 2018
09:00 – 10:30 CET
connect.funet.fi/iwama_ws

IWAMA (Interactive Water Management) project aims to promote capacity development in efficient nutrient removal, smart sludge and energy management, and to improve lifelong learning in the wastewater treatment sector. A series of webinars have been organized in the project to support the capacity development of operators and management of wastewater treatment plants.

The program starts at 09:00 CET. Please join the webinar in time to solve possible connection problems before the event begins. **Please insert your name and organisation in your login name.**

You are welcome to join those presentations, which are of interest to you.

09.00 (CET)	**Opening words and practical instructions** *Sami Luste, Lahti University of Applied Sciences*
09.10	**The FAST-process and sieves at Kalmar WWTP – effective pre-treatment for a nitrogen reduction plant** *Regine Ullman, Kalmar Vatten AB*
09.30	Questions from the audience and discussion
09.40	**Advanced phosphorus and particle removal** *Matthias Barjenbruch, Technical University of Berlin*
10.00	Questions from the audience and discussion
10.10	**Conclusions** *Sami Luste, Lahti University of Applied Sciences*

IWAMA 5th Webinar "Co-operation and symbiosis"

4 December 2018
10:30 – 11:30 CET
connect.funet.fi/iwama_ws

IWAMA (Interactive Water Management) project aims to promote capacity development in efficient nutrient removal, smart sludge and energy management, and to improve lifelong learning in the wastewater treatment sector. A series of webinars have been organized in the project to support the capacity development of operators and management of wastewater treatment plants.

Times of the program are in CET. Please join the webinar in time to solve possible connection problems. **Remember to insert your name and organisation in your login name.**

10:30-10:35 **Opening words**
Sami Luste, Lahti University of Applied Sciences

10:35-11:00 **Industrial wastewaters and (municipal) wastewater treatment plants**
Dr. Peter Hartwig, Aqua consult Ingenieur GmbH

Questions from audience

11:00-11:25 **Symbiosis via water economy platform – Case Blue Economy Mikkeli (BEM)**
Panu Jouhkimo, Development company Miksei

Questions from audience

11:25-11:30 **Closing words and invitation to the IWAMA Final Conference**
Agnieszka Ilola, Union of the Baltic Cities Sustainable Cities Commission

Annexe 2: IDEAL WEBINAR - based on the feedback collected in the IWAMA project

The use of Adobe Connect (AC) for organizing webinars is considered to be successful. One of the reasons is a fact that it is an easy way to connect with other project partners and stakeholders to not only discuss a topic but to also share documents, presentations and other materials at the same time. Most of all, it enables the exchange of experience without timely and costly travelling.

The use of AC is regarded as easy and user-friendly. The most preferable kind of such an organized webinar was selected as a lecture given by an expert with question and answer section at the end. Other kinds of webinar were a discussion – weighted content and a clinic type used for specific training or information distribution. The content clinics identified several topics:

- Information exchange regarding investments
- Discussions about benchmarking, audit results and project implementation challenges
- Possibilities of sludge use and products
- New methods, models and technical solutions answering the needs of the WWTP operators in the Baltic Sea Region
- New business/funding opportunities in the Baltic Sea Region
- Knowledge share among project partners
- Advanced nitrification
- Energy and sludge management

The announcement about a future webinar should be done well in advance, at least 2 weeks before the webinar takes place, to let the audience reserve their time for the event. The duration of the presentation should be rather short, ideally 15 minutes and a maximum of 20 minutes, not to lose active listeners and concentration, and to prevent participants from leaving the webmeeting room. The number of presentations should not exceed three different presentations per web-meeting. The total webinar duration should not exceed 2 hours. According to the feedback, rather shorter webinars (1 hour) more often are seen as ideal, due to their occurrence during working hours. All partners should be actively involved in disseminating information about a coming webinar among various stakeholders to enable building up the national knowledge-based communities.

According to the participants, it is beneficial to have the camera on and have the picture of the speaker visible in order to add the human touch to the online tool. Furthermore, the participants would appreciate being able to turn their microphones on and ask questions instead of typing. Due to the technicalities connected with the webinar presentation recording, in the course of IWAMA webinars it was decided to mute the participants and only the hosts and presenters have the microphone active. The general participants were given the possibility to raise a hand and ask questions by typing it in the chat box and one of the hosts, dedicated for that specific session, would then read the question on loud to be recorded at the end of the session.

In general, it is preferred to have a Q&A session after each presentation separately instead of a common Q&A session at the end of the webinar. It is appreciated to use other interactive tools besides the PowerPoint presentation during the webinar, also questions/quizzes for the audience (polls), links to websites for further/extra information, evaluations.

The language of the webinar brings limitation. In IWAMA webinars, English was used as a common language. Both the PowerPoint and the audio+video recording were later on available in the library on the IWAMA project webpage. This enabled the listeners to come back to the material later on and share it among colleagues. Sometimes, providing the presentation material beforehand to the audience may decrease the language barrier and enable broader audience participation. At the same time, it may increase the interactivity of the audience in terms of question preparations.

For IWAMA purposes, the speakers invited to the webinars were representatives of academia, experts, consultants, associations and operators from WWTP with concrete examples in order to satisfy both theoretical and practical needs of the participants.

WWW.IWAMA.EU

IWAMA project aims at improving wastewater management in the Baltic Sea Region by developing the capacity of the wastewater treatment operators and implementing pilot investments to increase the energy efficiency and advance the sludge handling.

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