Interreg Baltic Sea Region

Mid-term evaluation of Programme impact

Case Study Report

IWAMA

Table of contents

1 Executive Summary

Impact on Target Groups by IWAMA

SO	Target Group	Processes where Target Groups are involved	Learning Experiences /Use of Project products and results	Specific Impacts on the Institutional Capacities of target groups	Dimension of institutional capacity
2.1.	Wastewater treatment plants (WWTPs), water associations, environmental centres, private companies, industries influencing local water quality (polluters), cleantech companies and educational institutes	• 6 international workshops and their webinars on the project website. • 80 participants on average attending each workshop and at least 25 watching the webinars so far. • Commitment to the Baltic Sea Challenge (BSC) network to act for the better state of the sea beyond the present legal requirements. • Joining knowledge based communities for lifelong learning and connecting them to the Baltic Smart Water Hub (UBC).	• More than 200 WWTPs of the region have been invited to participate in the evaluation, 100 provided their data, 65 compatible for benchmarking. Everyone will receive and access to the outcome data and the self-assessment tool. • 3 international and 5 national dissemination events, newsletters. • 21 completed commitments of project partners and relevant stakeholders registered in the BSC Bank of Actions. • Information spread to more than 300 stakeholders in the BSR region.	Increased knowledge on efficient elimination of nutrients from the wastewaters as well as commitment to utilize it; Benchmarking and self-audit tool for energy efficiency developed.	Enhanced institutionalised knowledge and competence; Increased capability to work in transnational environment
2.1.	Audited partner of WWTPs	• Development and testing of audit concept for smart energy management at 9 WWTPs. • The first of its kind common evaluation system for efficient energy performance and sludge treatment based on the wide range of data collected in the BSR.	The partnership incl. WWT operators, universities, associations and environmental centers will collect key figure and conduct in-depth audits allowing to derive generalized audit concepts for improving both energy efficiency and sludge handling.	Where feasible, new and resource efficient technologies for elimination of nutrients from the wastewaters will be considered.	More efficient use of human and technical resources for elimination of nutrients from the wastewaters
2.1.	Investing partner of WWTPs	Pilot investments into 8 WWTPs	Several partner WWTPs will pilot innovative energy efficiency solutions (upgrading existing treatment processes on different levels: simple and advanced control systems, decision making tool for optimized process operation and mass flow management on a regional level.	New technologies for elimination of nutrients from the wastewaters will be tested and produce practical knowledge.	Enhanced institutionalised knowledge and competence; More efficient use of human and technical resources

2 Project description

The project “Interactive Water Management” (IWAMA) aims at improving the resource efficiency in wastewater management in the Baltic Sea Region (BSR) by capacity development of the wastewater treatment operators and implementation of pilot investments, which are expected to result in reduced nutrient inflows to the Baltic Sea.

The Lead Partner of the project is the Union of the Baltic Cities, Sustainable Cities Commission which has its seat at the City Council of Turku, Finland. The partnership consists of 17 organisations representing wastewater treatment plants (WWTPs), wastewater operators’ associations, environmental centres and research institutions.

The project is being implemented under the Specific Objective 2.1 Clear waters: To increase efficiency of water management for reduced nutrient inflows and decreased discharges of hazardous substances to the Baltic Sea and the regional waters based on enhanced capacity of public and private actors dealing with water quality issues. The project duration is March 2016 to February 2019. It has a total budget of EUR 4.62 million, of which EUR 3.7 million is funding by ERDF.

Municipal WWTPs produce vast amounts of sewage sludge. This sludge contains nutrients, heavy metals and poorly biodegradable trace organic compounds. Potentially pathogenic organisms are also present in wastewaters. Singular solutions are not sufficient to solve the problems of lacking sustainability. Instead a comprehensive approach to WWT processes is necessary when continuing nutrient reductions.

When approaching WWT in BSR from the wider perspective, two urgent challenges arise: insufficient sludge management and the need to improve energy efficiency. Both are directly linked to the efficient nutrient removal and can be addressed through capacity development activities. Efficient and environmentally smart WWTP operations can influence the state of the sea and the climate.

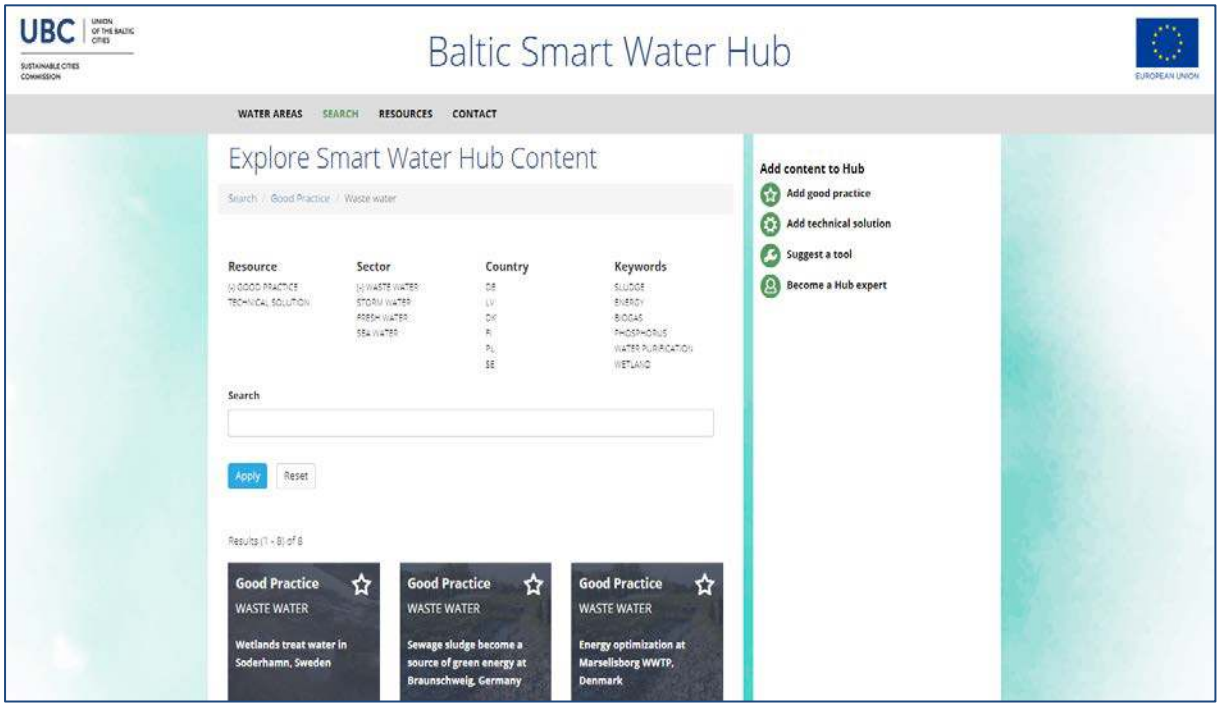
The project has three main fields of action: (1) capacity development (CD) to uptake of the state-of-the-art on smart sludge and energy management in the region as well as to use the lessons learned from the pilot investments, (2) smart energy management (EM) and (3) smart sludge management (SM). The smart energy and sludge management concepts will be developed and tested to improve the efficiency of WWT. The concepts will include the first of its kind common evaluation system for efficient energy performance and sludge treatment based on the wide range of data collected in the BSR. The pilot investments will be implemented for improved energy efficiency and enhanced nitrogen control as well as to increase the quality of sludge management and enhance the nutrient removal through sludge water treatment and new solutions for sludge hygienisation, stabilisation and drying.

IWAMA is a EUSBSR flagship under Policy Area NUTRI.

3 Expected results, outputs and activities

The project is at the stage producing its eleven main outputs:

- an online platform Smart Baltic Water Hub http://www.balticwaterhub.net/ showcasing good practices, technical solutions and tools as well as other relevant materials for the water sector (see picture below).
- tested training materials on smart EM and SM
- audit concept for smart energy management with four pilot actions as separate outputs
- audit concept for smart sludge management with three pilot actions as separate outputs



With the platform and most of the training materials already produced, the project presently is summarizing the audit results and starting the pilot actions. The project partners are actively participating in the international and WWT-related events, whereas the national events will be launched upon its closing for a better and more localized dissemination of the project results.

Expected outputs and outreach to target groups

Expected Project Results
Increased capacity of WWT operators in choosing and operating cost-effective technologies will promote the uptake of the best available technology for energy saving and sludge handling in BSR. The WWTPs will move away from singular solutions for nutrient reduction and towards comprehensive approach to WWT processes with efficient energy and sludge management. The current forerunners in the region will become more visible to motivate and empower others to follow on their tracks and implement voluntary actions that go beyond the legal requirements. Wastewater sector professionals will be enabled to choose both most appropriate solutions for energy efficient nutrient removal on different technological levels, and most suitable sludge treatment technologies at both small and big scale. This will eventually result in more effective operation of WWTPs with reduced energy consumption, better integration of sludge treatment facilities to the main

wastewater treatment processes, and improved effluent quality, which contributes to better environmental state of the Baltic Sea.
WWTPs, their associations and environmental/educational centres that provide training and lifelong learning in WWT sector, and local/regional authorities that in most cases have their share of operators' ownership – will enhance their institutionalised knowledge and competence, get to know how to more efficiently use their human and technical resources, and naturally, after 3 years of joint activities in a pan-Baltic consortium covering ten countries in the region, also increase their capability to work in transnational environment. The knowledge gained at the international on-site workshops and webinars, will be used by partners and associated partners for further development of their organizations' capacity. The training materials package, compiled based on the joint effort of transnational learning activities, data collection, audit and piloting outcomes, also translated to national languages and distributed for the use of the knowledge based communities, will be widely available in the launched Baltic Smart Water Hub so that the future emerging communities can benefit from it as well. Moreover, the WWTPs undergoing the auditing of energy and/or sludge management with the outcomes of this processes would be able to better attract new financial resources for future investments. Same applies to WWTPs outside the consortium that will benefit from the training materials package and implement the audit concept(s) to identify potential solutions for improving their operation.
The private sector will be encouraged to get involved in networking activities and contribute its perspectives to the capacity development providing further insight to potential new solutions and smart technologies for WWT.
Expected Documented Learning Experience
The partnership incl. WWTPs operators, universities, associations and environmental centres will collect key figure and conduct in-depth audits allowing to derive generalized audit concepts for improving both energy efficiency and sludge handling. Several partner WWTPs will pilot innovative energy efficiency solutions (upgrading existing treatment processes on different levels: simple and advanced control systems, decision making tool for optimized process operation and mass flow management on a regional level and a combined process with anammox and constructed wetland in the main stream) and sludge handling solutions (humification beds, reject-water treatment system and combined solar- and biodrying). The progress of these pilots will be continuously communicated to the rest of consortium and to the relevant local/regional authorities to ensure joint learning and finalized with the documented reports to be showcased for all interested parties.
Expected Other Outputs
No. of enterprises receiving non-financial support - 30
No. of enterprises cooperating with research institutions - 18

*as defined in the Application Form Sections 3.8, 5.1 and 5.2.

As for the Expected Other Outputs the project has already managed to double the number of enterprises receiving non-financial support, whereas the number of enterprises cooperating with research institutions has already reached 30.

4 Project partnership

The project partnership consists of 17 partners from seven different countries. Among them there is one international association of local municipalities, four research organisations, three non-governmental institutions, eight infrastructure and public service providers – WWTPs and one SME.

There are also 12 associated partners. Three additional countries are involved. Among the partners there are another eight WWTPs, three non-governmental and one

research institution.

Regional and Local Public Authorities	Union of the Baltic Cities, Sustainable Cities Commission c/o City of Turku (FI)			
Research Organisations	Technical University of Berlin (DE)		Lahti University of Applied Sciences (FI)	
	University of Tartu (EE)		Linnaeus University (SE)	
Non-governmental institutions / not-for-profit organisations	DWA German Association for Water, Wastewater and Waste DWA Regional group North-East (DE)	Estonian Waterworks Association (EE)	Environmental Center for Administration and Technology (LT)	
Infrastructure and public service provider	Kaunas Water Ltd (LT)	Water And Sewage Company Ltd of Szczecin (PL)	Gdansk Water Utilities Ltd. (PL)	Joint body Grevesmühlen, Water supply and Wastewater disposal, corporation under public law (DE)
	Tartu Waterworks Ltd (EE)	Türi Water (EE)	Daugavpils Water Ltd (LV)	Jurmala Water Ltd (LV)
For-profit organisation	Aqua & Waste International GmbH (DE)			

In the project there is only one private partner from Germany. The project did not aim to involve more private companies as partners. As a matter of fact, there are only very few private companies dealing with the nutrient removal. Those which are interested in the public project events are welcome to do so. In the event in Sczezin, Poland several of them had a chance to have a brief pitching about energy efficiency. It was accepted with enthusiasm from the audience.
It is of utmost importance to exchange the information within the industry including the private companies who are commercializing the research findings. The only private partner of the project contributes with his expert knowledge on SM & EM. It has a considerable role in one of the pilot actions of the project. So far the involvement of the private company in the project works well. The other private companies to contribute to the project will be chosen by a public procurement procedure. During the interviews the project partners – a WWTP and a WWT association – they stress that the private companies might be very interested in the project outcomes, especially, if the pilot activities such as, for example, sludge dehydration will turn out to be successful.

The partners which are research organisations provide a content expertise to the project in all of its three fields CD, SM & EM. They benefit from being able to advance their applicable research and bring in students to the sites. This allows the students to see the industry in action and provides some "publicity". Usually the WTTPs are public companies that are not that attractive employers as the private companies. Being involved in the project activities the students can see that the public companies can also be dynamic and interesting working places.

The project does not have public authorities as their direct partners, but is very much connected to them since the WTTPs are normally publicly owned utilities. Thus the public authorities have their say in the project, especially, where it concerns investments for which the WTTPs need a good contact and support from their respective public authorities. Largely everything goes on well. When the project

will have its final results ready, they will be distributed also nationally and this is when the public authorities will learn more about the project.

5 Contribution of the project to the EUSBSR

IWAMA is a EUSBSR flagship under the Policy Area NUTRI. The aim of the Policy Area is exactly in line with the project, i.e. it wants to reduce nutrient inputs to the Baltic Sea to acceptable levels or rather tries to eliminate them at all. The project uses every possibility via the EUSBSR network to reach out to a wider public using the opportunities of being a flagship. The latest event was the 9th Annual Forum of the EU Strategy for the Baltic Sea Region organized on 4–5 June, 2018 in Tallinn, Estonia. IWAMA project representatives took the opportunity to reach out to more than 700 participants from the region with the information on project activities and achievements.

The project partners see their EUSBSR flagship status not only as a means of information exchange about also a way to work with the policy-makers on regional and national levels. When working in the areas where new approaches and technologies are being developed, it is important that relevant legislation is promptly introduced.

Besides being active as the EUSBSR flagship, the partners of the project have all joined the Baltic Sea Challenge initiative http://www.itamerihaaste.net/en by formulating their commitments in a form of the major project outputs, such as project investments, audits and workshops. The Baltic Sea Challenge is a free-of-charge, international network focused on protecting the waters. Its members commit to take up a concrete voluntary action to protect the waters beyond the present legal requirements and their core operations. The network provides members with the channel for information dissemination which they can use to spread a word tell about their work and gain access to versatile events. There are more than 270 organizations already in the BSC network. The project partners have already invited their networking partners to follow the example.

The project partners admit that it is a bit early to speak about exact benefits that the project will bring to implementation of the EUSBSR as presently there is a lot of research on-going. However, it is clear that in case the project succeeds to come up with new technologies, its contribution to the EUSBSR will be obvious. Irrespective of the potential success of the piloting activities, bringing WWTPs into a broader network for solving the specific problem of nutrient reduction is also deemed of high significance.

6 Communication and outreach to target groups

The project has its Communication plan supplemented by the visual guidelines and the calendar. There are two main project target groups:

1. the primary target group consisting of people working on the implementation of the actual project activities such as partner WWTPs, their associations and environmental/educational centres that provide training and lifelong learning in WWT sector, and local/regional authorities that in most cases have their share of operators' ownership and

2. the secondary target groups that consist of a wide range of stakeholders, such as the other WWTPs in the region, national and international water, wastewater and waste associations, higher education and research institutions, local public authorities, regional public authorities, national public authorities, enterprises, business support organizations, local citizens, international networks and other EU funded projects.

The Lead Partner is responsible for both internal and external communication. A communication team consisting of two people – one working full-time, the other one working 4 days a week for the project has been set up at the Union of the Baltic Cities. It has proven to be a well-functioning system to house the project overall management and communication under the same roof.

Already upon development of the project, it has been agreed that each partner, including the associate ones, will appoint one person with respective skills and network to carry out communication at the partner level. Normally, WWTPs would not have communication and/or public relation personnel, but here every partner has tried to ensure that the staff member responsible for communication has the necessary skills. For some of them, it would mean appointment of a staff member from the administration or the chief engineer. Having an engineer with communication skills cannot be underestimated for a project like IWAMA, which bears a very technical character. Engineering expertise is always necessary to verify the communication to be sent out. Therefore it is of great value when the communication person understands also technicalities. It has to be also emphasized that the information is always also tailored to the target groups. It could be more or less technical depending on the target group.

The communication strategy has been well-considered from the very beginning of the project elaboration as its aims at having a wider impact on the local societies. The project has been structured so that it has strategic partners who support reaching its aim and distributing its outputs on the local level. These strategic partners are national/regional water & waste water associations. They are motivated and efficient channels for project information dissemination and learning experiences. They have networking channels and interest in capacity development. Thus building the project communication on existing and verified channels has turned out to be very effective.

Target Groups
WP2,3,4: WWTP´S, water associations, environmental centres, private companies, industries influencing local water quality (polluters), cleantech companies and educational institutes

Source: Application Form Section 4

Primary target group members, i.e., project partners are being reached by regular e-mail communication, meetings vis-à-vis and the project intranet. The project partners also exchange with information during the events. So, for example, for the workshops an average participation of 80 representatives, instead of 50 planned, has been reached so far. After the real-time events, the workshop webinars are being uploaded on the project website available for everyone interested. This allows for a wider sharing of knowledge. So far there have been on average 25 views of the webinars after workshops, but there are more expected in the future after the promotional campaign at the end of the project.

The secondary target group, i.e. strategic network partners / stakeholders are being informed by a project website (average 166 monthly visitors), social media channels such as Facebook (FB) and Twitter (TW) with slightly more than 100 followers, bi-annual newsletter and e-mails

The project representatives emphasize that a decision to co-operate with the national WWT associations has been a strategic success. There is a regular communication with the Nordic associations, in particular. Some of the Baltic state and Polish association have had difficulties to participate due to the language barriers, but these difficulties are being mitigated by translations. Due to the extensive communication of the national WWT associations within the region, the Nordic and Baltic partners are being brought together in events also outside the project.

Communication and feedback from the decision makers, i.e. local authorities responsible from WWT has been implemented through the project partners. Most often the partners would signal about the challenges or inquiries from the mayor's office related to the decision making process. All of the problems so far have been successfully settled. The decision makers putting forward their commitments to the BSC is a sign that they fully support the project idea. The commitments are being promoted internationally, thus putting a bigger value on them.

There is a good co-operation with the MA/JS of the Programme in relation to communication activities and support. The project received clear guidelines, templates and visibility guidelines. There was one training on communication provided by the Programme MA/JS. The project follows updates on the Programme website including the Programme news, project library, social media, etc. It might be a good idea for the Programme to consider webinars and more on-line materials as a tool of information support. The project also benefits significantly from more communication channels provided by the Programme.

Language barrier has appeared to be a problem in the project communication. The themes covered can be very technical and complicated. Therefore it has been good that there is a budget for translations. For a better perception of the project results locally, national information / project result dissemination events are planned upon the closure of the project.

7 Impact on target groups

The learning within the project is on its way. It is a comprehensive collection of the key figure data for developing a benchmarking for sludge and energy management. More than 200 WWTPs of the region have been invited to participate, out of which more than 100 filled in the questionnaire providing their data. Out of these responses approx. 65 are deemed to be compatible for analyses and elaboration of the tool. The tool will allow WWTPs to carry out a self-assessment on where their stand regionally as to the levels of nutrients in the WW and the energy consumed to reach it.

Though most of the main project outputs and results have not yet been finalized, nevertheless the ones produced and disseminated so far have led to institutional learning experiences for both target groups of the project.

The interviewed project partners indicate at the very effective project partnership which allows the WWTPs to gain expertise and thus also knowledge and competence that WWTP and students is deemed to be a very efficient way to gain the institutional learning experiences through capacity development events and discussions.

Besides the impact on the availability of knowledge, mechanisms for its transfer and utilisation, the partners emphasize the effect that the project is going to have on the overall resource efficiency, but energy, in particular. Successful piloting actions are expected to lead to know-hows for significant reduction of both nutrient levels in sludge as well as energy necessary to reach these levels.

The expected results of the project lead to a potential impact among targeted stakeholders in the following dimensions and characteristics of institutional capacity:

Dimensions of Institutional Learning induced by the Project			
Enhanced institutionalised knowledge and competence	Impact on the availability of knowledge about the ways to reduce nutrient levels in the waste water as well as the energy necessary for that	Impact on the availability of mechanisms for knowledge transfer about the ways to reduce nutrient levels in the waste water as well as the energy necessary for that	Impact on the utilization of knowledge about the ways to reduce nutrient levels in the waste water as well as the energy necessary for that
More efficient use of human and technical resources	Impact on the utilization of human resources	Impact on the utilization of technical resources	Impact on the application of time-and/ or resource-saving measures
Increased capability to work in transnational environment	Impact on the available competences to work transnationally	Impact on the frequency of transnational contacts	Impact on the intensity of transnational contacts

Due to the pilot investments leading to automatization of certain processes the human resources will experience certain need for their skills upgrade. Thus it is expected to have an impact also on the utilisation of human resources.

Furthermore the project outputs can lead to a greater, if not complete treatment of sludge which is a by-product of WWT. The project examines possibilities to incinerate it completely or to use it as a resource itself – a fertilizer. The first scenario will require certain changes in the legislation and thus a need for a greater involvement of the respective policy makers in the future, whereas the latter scenario will lead to a greater need to co-operate with other policy fields and private for-profit companies. Both of these groups are already among the project target groups. They are well informed about the current state of affairs in the industry.

The interviewed project partners stress importance of the experience and the access to the knowledge due to the international character of the project. So far WWTPs have not been among the forerunners of international co-operation, but with the project like IWAMA they experience the power of transnational co-operation that is already leading to significant growth in their institutional capacity building. Not to underestimate also the fact that this way they become more attractive employers for the young professionals, but engineers, in particular.

Presently the partners are implementing pilot actions which are expected to show what effects could be reached. The outcomes will be disseminated to the other WWTPs with the help of associations. A partner association from Germany affirmed that they are participating in the project with great interest in its outcomes and are already distributing information about the project to its approximately 1200 members. The main benefit as seen by its members from such projects like IWAMA lies in the possibility for the lifelong learning and exchange of knowledge on the new technologies. For the next projects in the field they would like to see also their regional authority – the main decision maker among the project partners.

Examples of learning and capacity development for relevant stakeholders:

http://www.balticwaterhub.net/ Informs about technical solutions and good practices for waste water, in a wider context than only for the project IWAMA. It is a sector-wide knowledge repository. It has some 76 visitors monthly at the moment with more expected after the promotion campaign at the end of 2018.

Collection and estimation of the key figure data for sludge benchmark

The Key Figure Questionnaire for compiling the sludge and energy benchmark was prepared by the WP 4&5 leaders – the Technical University of Berlin and the University of Tartu. The questionnaires were tested on the audited WWTPs in Tartu, Türi, Lübeck and Grevesmühlen. It was then disseminated among more than 200 WWTPs in the BSR mainly with the assistance of the WWTP associations. More than 100 responses were received and from those 66 sets of data can be used for comparison reasons. They became a basis for a comparative benchmark about both the general inflow parameters and overall sludge treatment situation. The answers were collected from Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Poland, Belarus and Germany.

Presently the WP leaders work on analysis and evaluation of the obtained information. The process is interlinked with the energy and sludge audits carried out by the students and their supervisors at the partner WWTPs during the spring of 2017. The audits included not only measurements done on site, but also requesting specific data and processing the results. The process has been novel and educational for both the sides involved.

The first results of the sludge benchmark show that the overall WWTP influent parameters in the region vary more than expected, with a tenfold difference between the highest and lowest reported values. Around 60% of the reported values were inside the expected range though; the big variance could be partially explained by the different amounts of industrial wastewater accepted to the municipal WWTPs.

8 Annex

List of Interviews conducted for the Case Study Research

Name	Organisation	Role in Project	Contact data (email or phone)	Date of interview
1.	Union of the Baltic Cities	Project Manager	olena.zinchuk@turku.fi +358 40 729 8501	June 6, 2018
2.	Jurmala Water Ltd	Project Partner	kristine.bendza@gmail.com +371 67811363	June 7, 2018
3.	Union of the Baltic Cities	Communication Officer	agnieszka.ilola@turku.fi +358 44 5002 133	June 6, 2018
4.	German Association for Water, Wastewater, and Waste - North-East	Target Group representative	dwa@dwa-no.de +49 3917 348 816	June 11, 2018
5.	Aqua & Waste International GmbH	Project Partner	hartwig@aquawaste.de +49 5119625120	June 20, 2018

List of revised documents

- the Interreg Baltic Sea Region Programme 2014-2020 Project library https://projects.interreg-baltic.eu/projects/iwama-10.html
- Project websites http://www.iwama.eu/about
- http://www.jurmalasudens.lv/?ct=notikumi&fu=read&id=159&start=1
- https://www.dwa-no.de/de/suche.html?keywords=iwama
- Project application form
- Communication Plan for IWAMA
- Mid-term evaluation from IWAMA
- Project FB page https://www.facebook.com/iwamaproject/
- Project TW account https://twitter.com/iwama_project
- Website of the Policy Area Nutri EUSBSR:

  http://groupspaces.com/eusbsr-nutrient-inputs/