Baltic Sea protection commitments

by IWAMA project partners

	Capacity development	Energy efficiency	Sludge handling
Investments and infrastructure		Energy optimized control system for efficient reduction of nutrients at Kaunas WWTP **p. 2**	Reject-water treatment system at Tartu WWTP **p. 9**
		Combined anammox-constructed wetland pilot plant at Gdansk WWTP **p. 4**	Efficient sludge treatment with sludge humification beds at Türi WWTP **p. 11**
		Smart planning of technological improvement at Slonim WWTP **p. 6**	Drying and incineration unit at Jurmala WWTP **p. 13**
		Analysing impacts of thermal hydrolysis on biogas production at Grevesmühlen WWTP **p. 7**	
Tools	Lifelong learning tools for wastewater sector **p. 15**	Regional benchmark for energy efficiency in wastewater treatment **p. 16**	Audit tool for smart sludge management **p. 21**
		Simulation-based decision making tool at Grevesmühlen **p. 18**	
	Baltic Smart Water Hub **p. 20**		
Education and engagement	Lifelong learning programme for wastewater sector operators in Estonia **p. 22**		
	Lifelong learning through German "Neighbourhood" concept **p. 23**		
	Importance of public participation in wastewater management in Kaunas **p. 25**	Energy and sludge audits implemented at Szczecin WWTP **p. 33**	
	Quadruple helix concept at Linnaeus University **p. 27**		
	Education and awareness raising at Daugavpils WWTP **p. 29**		
	Interactive eco-game for cleaning beaches in Kaliningrad oblast **p. 31**		

IWAMA Interactive Water Management

Interreg Baltic Sea Region

EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND

THE BALTIC SEA CHALLENGE

Energy optimized control system for efficient reduction of nutrients at Kaunas WWTP

Commitment finalized by:
Kaunas Water Ltd, Lithuania

Action

The pilot investment launched at the Kaunas wastewater treatment plant exemplifies a way to reach energy efficient reduction of nutrients entering the Baltic Sea. The pilot focuses on monitoring the aeration tanks for the nitrogen concentration and incoming airflow. Data collected from the airflow sensors allows optimization of the work of blowers. Further, to advance nitrogen removal, an additional methanol dosing point in the denitrification zone of the aeration tank is installed.

Result

The pilot consists of the following components and measures:

1. Online nitrogen measurement devices in the aeration tank;
2. Airflow meters in the aeration pipes;
3. Methanol dosing point replacement in the aeration tanks, directly to the denitrification zone;
4. Advanced process automatization for optimising the work of blowers.

The investment started with installation of four E+H Viomax CAS51D nitrate sensors in the aeration tank together with methanol dosing point replacement to the anoxic zones. In Kaunas WWTP methanol is used as an additional carbon source to improve denitrification. Nitrate concentration data collected from online sensors were used to optimize methanol dosage. During almost one year of operation with the new investment Kaunas WWTP improved total nitrogen removal efficiency by 3,2%, up to total 90,5% efficiency. New methanol dosing control strategy allowed us to use 12% less methanol than before.

To further improve nitrogen removal efficiency, additional ammonia analyzer E+H Liquiline CA80AM was installed. Data from analyzer is used for determining

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

ammonia concentration directly in the active sludge. This is important step in choosing correct oxygen set-point in the aeration tanks for nitrification. Before the installation of the new analyzer, oxygen setpoints were regulated according to ammonia concentration in the wastewater after secondary clarifiers. It resulted in process control time lag of ~6 hours.

Kaunas WWTP aeration system is designed to keep constant pressure, so as the aeration membranes gets clogged, airflow measurement is a solution to monitor the aeration membranes capacity. When the airflow drops below certain point, formic acid is injected to the system to dissolve scaling deposits and thus improving their capacity. Insufficient air flow to the aeration tanks results in unfavorable conditions to nitrification and nitrogen removal efficiency.

All these investments were prerequisite for an advanced process automatization, which combines data from all the sensors and regulates oxygen setpoint, methanol dosage, and nitrogen removal efficiency.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Combined anammox-constructed wetland pilot plant at Gdansk WWTP

Commitment finalized by:
Gdańsk Water Utilities Ltd, Poland

Action

The pilot investment in Gdańsk aimed to develop and test energy efficient and cost-effective concept uniting processes that require low energy consumption treatment. The pilot investment included a combined anammox-constructed wetland pilot plant and additional energy meters installed at the WWTP. The examined technology focuses on minimizing energy consumption for the removal of organics and nutrients while maximizing recovery of organic matter from wastewater to produce renewable energy.

The pilot investment at the Wschód WWTP in Gdańsk provided an excellent example of reaching low energy consumption and cost-effective processes to achieve effective wastewater treatment and maximal recovery of chemical energy for increased biogas production.

The concept enabled the possibility of recovering a high fraction of organic carbon. Increased carbon extraction improves energy balance of a plant due to higher production of biogas that can be utilized in a combined heat and power plant (CHP) to generate surplus renewable power. Furthermore, the anammox-based process allows a shortcut in the nitrogen cycle, as anammox

bacteria converts ammonium and nitrite directly into a nitrogen gas. This enables nitrogen removal at 60% lower oxygen consumption compared to conventional nitrification-denitrification systems. Besides, the process does not require a carbon source for denitrification that enables higher carbon extraction. Therefore, the concept of innovative combined technology considerably improves the energy balance of the plant and allows making it cost-effective and energy-positive. Recovering energy from wastewater treatment brings many environmental and health benefits.

Deammonification has been widely applied at wastewater treatment plants as a cost effective process to

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

treat sidestreams with high nitrogen load. Applying the deammonification process in the mainstream, however, still presents a challenge. Major barriers in this application include low temperature, low ammonia concentration and high COD/N ratio.

Result

The examined process configuration included primary, secondary and tertiary treatment steps. The physical-chemical primary treatment consisted of two stage flocculation tank and primary sedimentation tank. The secondary treatment incorporated integrated fixed-film activated sludge (IFAS) reactor, equipped with mixer and fine bubble air diffuser, and coupled with the secondary sedimentation tank. The IFAS reactor (720 litres) was inoculated with anammox bacteria immobilized on AnoxKaldnes K5 plastic carriers from the Sjölunda WWTP in Malmö and suspended growth activated sludge from the Wschód WWTP in Gdańsk. The tertiary treatment for removal of remaining organic matter and nutrients was demonstrated by two stage horizontal flow constructed wetland (HF-CW) followed by vertical flow constructed wetland (VF-CW).

The study results showed the possibility of applying the combined anammox-constructed wetland system to remove TN and organic carbon from the mainstream efficiently at low wastewater temperature and unfavourable COD/N ratio. After chemical precipitation in primary treatment the ratio of COD/N in wastewater was decreased from 8.0 ± 0.7 to 5.0 ± 0.4, which resulted in higher by 48% recovery of organic compounds compared to that observed at the Wschód WWTP. At hydraulic loading rates of the IFAS reactor between 15.0 and 22.2 l/h, the measured removal efficiency of TN in the examined process configuration was high and averaged 84 ± 9%, while the minimum and maximum removal was 67% and 98%, respectively.

Mainstream treatment with the innovative combined anammox-constructed wetland system maximizes energy recovery from wastewater by directing more organic carbon to anaerobic treatment from which more biogas can be captured and utilized in a combined heat and power plant (CHP) to generate renewable power. Reducing aeration energy consumption and maximizing recovery of organic carbon is the key to achieve energy-positive wastewater treatment plant.

Read more: www.balticwaterhub.net

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Smart planning of technological improvement at Slonim WWTP

Commitment finalized by: Open Joint Stock Company "Slonimskiy vodokanal", Belarus

Action

The sewage treatment plant in the city of Slonim, Belarus, developed an architectural project for reconstruction of the current facilities allowing more effective and energy efficient operation. Throughout the reconstruction, the WWTP will launch biological treatment for better removal of nitrogen and phosphorus, install a UV-disinfection unit for treated sewage, replace control valves allowing automation of work, and complete other construction works leading to lowering of energy consumption and improving of treatment on the plant.

Result

The architectural project for reconstruction of the sewage treatment plant in Slonim aimed to design a large-scale complex solution to improve the plant meeting modern technological standards of operation and lowering energy consumption costs, simultaneously introducing better performance at reducing the loads of nitrogen and phosphorus entering the stream of the Shchara River.

The planned improvements cover the whole plant from renovation of all constructions and technological pipes and valves on the site, to introducing modernisation of technological equipment. Furthermore, the project involves installing technologies for better treatment: biological treatment in the WWTP's system, a buffer tank for receiving sewage from the local butter and cheese factory, UV-disinfection for treated sludge. After completion, designed changes will allow more automated, smooth and efficient treatment.

Through the introduced improvements, the reconstruction project has estimated reduction in the annual electricity and water consumption by 1.77 and 1.6 times respectively, automation leading to optimisation in the number of service personnel from 139 to 21 people, and ensuring decrease of various contaminants discharged to the river.

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Analysing impacts of thermal hydrolysis on biogas production at Grevesmühlen WWTP

Commitment finalized by: Joint body Grevesmühlen Water Supply and Wastewater Disposal, Germany

Action

Project activities related to Grevesmühlen WWTP have been carried out by two project partners: with the investment hosted by the plant, a decision making tool for optimized process operation and mass flow management has been prepared by the Aqua & Waste International GmbH company (p.18). To calibrate the developed tool, Grevesmühlen WWTP launched investigation of the process under varying conditions, focusing particularly on thermal hydrolysis.

The aim of thermal hydrolysis is to destroy the membrane of bacterias in the excess sludge with the help of high pressure and temperature. Through this process, water and nutrients within the bacterias are set free. One of possible benefits of performing thermal hydrolysis can be reduced amount of sludge mass in the digestion. Reduction of sludge mass leads to a higher detention time, which in turn can result in a higher biogas production and a better dewatering capacity of the digested sludge. However, there might be also disadvantages, as it is not investigated, how many nutrients are set free from the sludge as a function of pressure and temperature.

Result

On a laboratory scale, an anaerobic digestion was simulated with sludge from both a laboratory scale and an industrial scale thermal hydrolysis unit. Each sludge-batch was hydrolyzed with a different combination of pressure and temperature. Several parameters were measured each day, for example, sludge temperature, COD, nitrogen, phosphorus, dry matter and organic dry matter before and after the digestion. Moreover, biogas parameters like the amount of produced biogas, CH_4, CO_2, H_2S and O_2 were tested. Each sludge batch was digested up to 30 days.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

In the course of the observation on the laboratory scale, the amount of additional loads set free through hydrolysis was higher with decreasing temperatures of the sludge. At the same time, on the industrial scale it was observed the other way around, which was the expected result. Another unexpected outcome was the lower amount of the produced biogas from hydrolyzed sludge than from raw sludge. The reason for this can be that the hydrolyzed sludge has more loads, while the second step of the anaerobic digestion – the acidification – produces too many acids, which inhibits the whole anaerobic process.

The sludge was examined for organic dry matter and dewatering capabilities. On the laboratory scale, the results met the expectations proving that hydrolyzed sludge has a better dewaterability than raw sludge.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Reject-water treatment system at Tartu WWTP

Commitment finalized by:
Tartu Waterworks Ltd, Estonia

Action

Tartu Water Company is the second biggest municipal wastewater treatment plant (WWTP) in Estonia (100 000 PE) and one of the many WWTPs in BSR where anaerobic digestion of sludge is applied. Nitrogen-rich reject-water produced in anaerobic digestion, is commonly recirculated back to the process and thus increases the nitrogen load and challenges the main treatment process to keep the discharge limits. This increases the amount of external carbon to be added to the main nitrification-denitrification process. A full-scale deammonification technology was developed and installed with regard to demonstrate in-situ start-up of deammonification without external seed.

Result

In the frame of the construction of the anaerobic digester (2013-2015) in Tartu WWTP, the tanks were designed for nitritation of the sludge water before releasing it back to the influent of the plant. Ammonium nitrogen is oxidized to nitrite nitrogen during nitritation process, however, nitrogen removal process is still performed in main wastewater treatment process. In order to enhance nitrogen removal with cost efficient investment, a full-scale deammonification system was implemented for reject-water treatment using existing infrastructure. The deammonifying microbiological consortium was grown in-situ without a need of buying the sludge externally. In-situ start-up of the process without external inoculum decreases the budget and gives valuable competence on start-up of deammonification technology. Launching of deammonification process was performed in a way that does not influence WWTP efficiency. The installation reduces amounts of external carbon to be added and thereby operational costs.

As it is the first reject-water deammonification system in Estonia, operators of Tartu WWTP receive continuous support from University of Tartu to achieve optimal process efficacy. As a result, competence will be established and a case-study will be available for other interested stakeholders. Operating a full-scale deammonification system will be continued after the project lifetime. Additionally, as start up without purchasing an inoculum is not widespread, current installation demonstrates that deammonification without external seed is a cost-efficient process. Piloting that process has transnational relevance as a proof of applicability and sustainability of deammonification technology.

Continues »

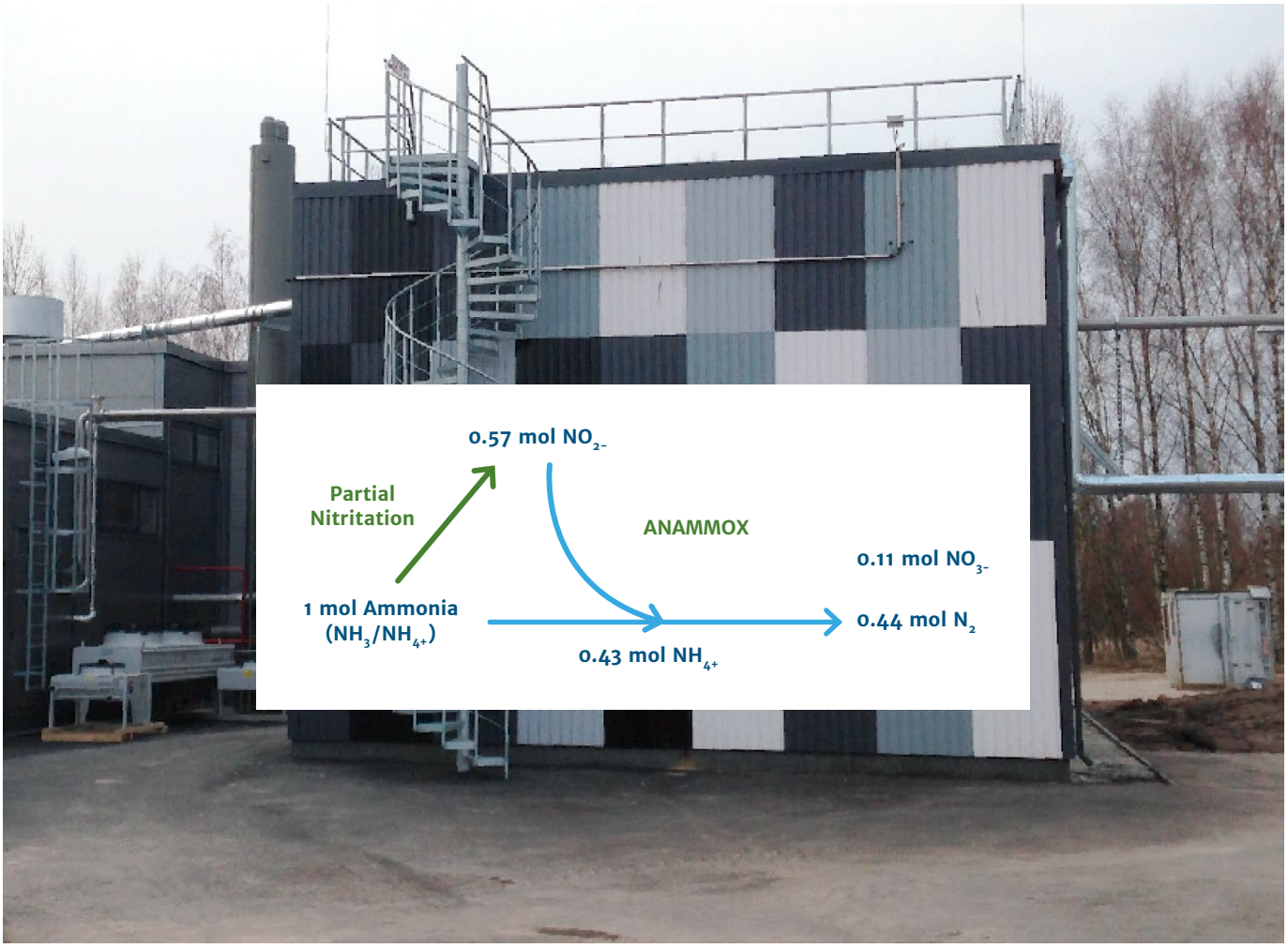
IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE



Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Efficient sludge treatment with sludge humification beds at Türi WWTP

Commitment finalized by:
Türi Water, Estonia

Action

Many good solutions for waste activated sludge management exist around the Baltic Sea Region, but most of them are not applicable for small wastewater treatment plants. A pilot investment was done in Türi and Oisu wastewater treatment plants (Estonia) in order to show a good example of efficient sludge treatment for small-scale plants by applying the technology of sludge humification beds. This technology allows treating sludge in a natural way without using any complicated mechanical facilities or chemicals, simultaneously ensuring low constructional and operational costs and low environmental impact.

Sludge humification is one of the solutions that provide an option for the phosphorus and nitrogen reuse: it is applicable on the small scale, it helps with decreasing and eliminating harmful substances and organisms from the sludge, and it allows using the treated sludge as a fertilizer.

Result

Considering that sludge management in humification beds is a long-term process lasting at least three vegetation periods, the time- and site-based planning based

on preceding studies is an essential part of the piloting process. The humification beds in Türi and Oisu were constructed next to the wastewater treatment plants and they have the same working principle, while their structure is a bit different in order to determine the most feasible practice.

Continues »

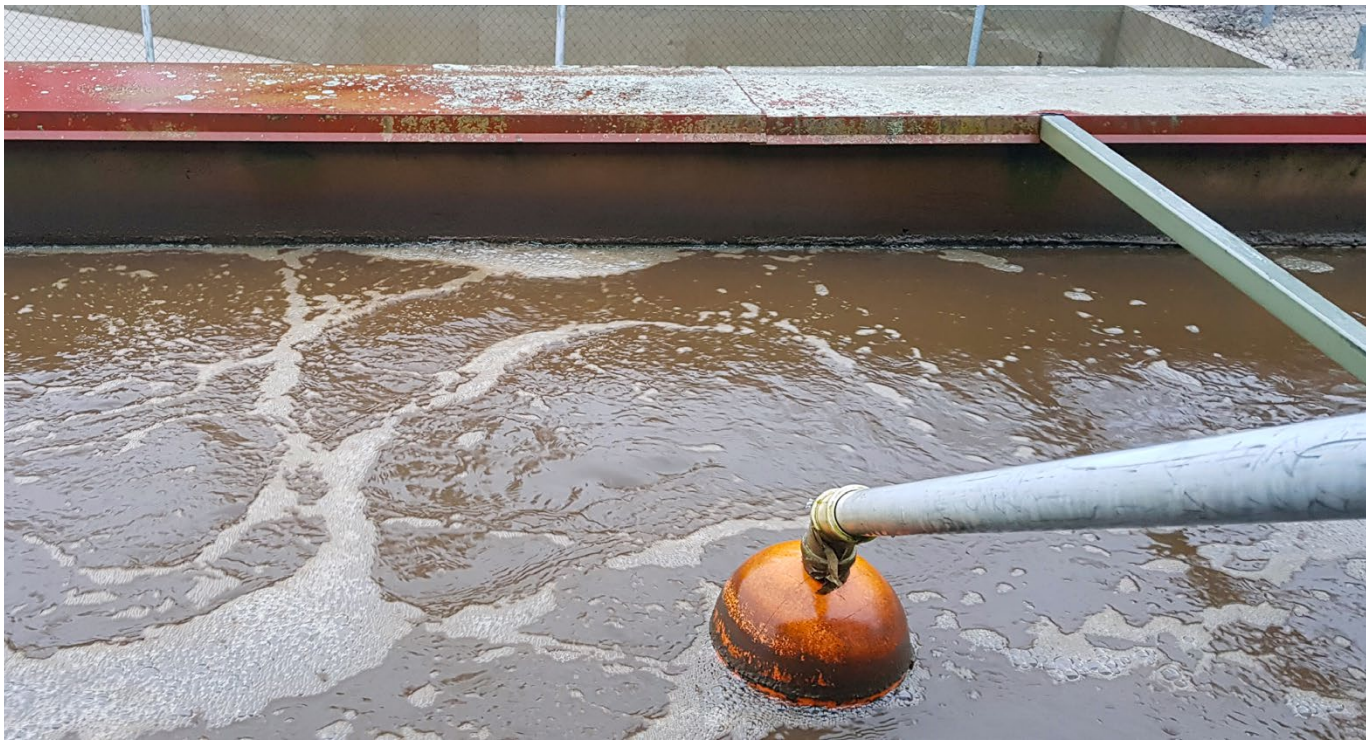
IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE



In Oisu, the beds were equipped with a leachate pumping system to lessen the amount of water in the humification beds during dewatering and plant growth period. In Türi, the excess water is not pumped away, as mechanical thickening is applied beforehand. The humification beds in both WWTPs are sowed with plants, which helps with the degradation of organic material, including refractory compounds, while also provides the ability to absorb the residues of toxic substances like heavy metals from the sludge. In order to extract the toxic substances absorbed in the plants, mowing or reaping can be used. Inefficient sludge treatment in WWTP may lead to increased loads of hazardous substances to the Baltic Sea, however, efficient sludge treatment is challenging for small-scale WWTPs. Sludge humification bed is a technology feasible for small WWTP, but underestimated in cold climate. Smart operation of the humification and degradation processes can convert the sludge into a quality product that can be applied in agriculture, greenery and recultivation.

Read more: **www.iwama.eu**

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Drying and incineration unit in Jurmala WWTP

Commitment finalized by:
Jurmala Water Ltd, Latvia

Action

Jurmala WWTP is designed for a working capacity of 35 400 PE and treats municipal wastewater via biological phosphorus and nitrogen removal in a circular basin without primary settling tank, no industrial wastewater is accepted. Sludge treatment consists of a two-chamber sludge storage tank, a drum thickener and two decanter centrifuges. Currently, approximately 10 tons of dewatered sludge are landfilled daily. Within the framework of the IWAMA project, Jurmala WWTP is piloting a drying and incineration unit.

Unit is designed to reduce the amount of surplus sludge from the wastewater treatment process by using vapor of the thermal decomposition of volatile products and non-condensable gases as fuel. It is integrated into the existing technological chain of WWTP. Sludge is fed to the drying part of the unit via surplus sludge feed screw, where it is dried by gas and steam flow. Additional heating source may be used at this stage. After drying, sludge is fed to the incineration part of the unit where a gasification reaction occur in the magnetron generated microwave field. The external power consumption of the unit must not differ significantly from conventional drying-incineration setups.

Result

It is expected that as a result of this pilot a decrease of landfilled sludge by at least 70% is achieved, thus significantly reducing the sludge biomass accumulation in the environment.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

It is foreseen that the gas from the incineration process may potentially be burned in a heat exchanger to obtain hot water for heating or to generate electricity for the premises of WWTP. Although latter processes are not in the scope of the IWAMA project, the supplied unit must ensure that they are possible, prompting energy efficiency issues. It is also possible to study the potential use of sludge ash in the production of building materials, excluding landfilling in general.

Reduced sludge removal rate also means reducing air pollution from used transport equipment.

Overall, as a result of this particular pilot project, an innovative approach shall be implemented towards solving the problem of small WWTP surplus sludge utilization, which is very topical in the water sector and aims to protect the environment.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Lifelong learning tools for wastewater sector

Commitment finalized by:
Lahti University of Applied Sciences, Finland

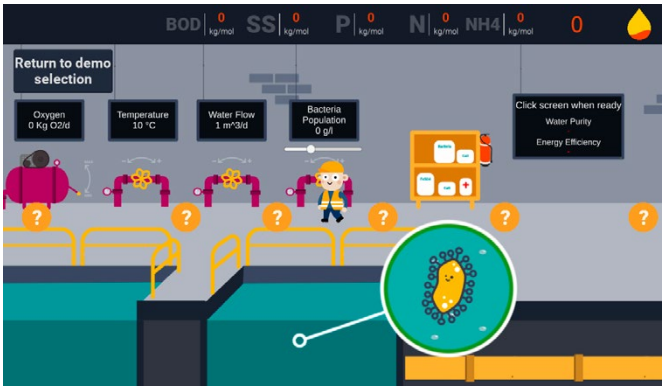
Action

Structured lifelong learning in the wastewater sector is crucial for improving the state of the Baltic Sea and reducing the pollution load. Capacity development and lifelong learning tools developed by Lahti University of Applied Sciences enhance regional cooperation of the wastewater sector actors, help wastewater treatment operators develop their activities and capacities, and boost expertise exchange supporting smart development of the Baltic Sea Region.

Result

Capacity development actions implemented in the IWAMA project aimed at increasing the opportunities for lifelong learning in the field of the wastewater management, particularly for WWTP operators. Capacity building was fulfilled through sharing and developing of expertise, exchanging methods to deliver and receive knowhow, researching national synergies and increasing international interactivity.

The activities during the IWAMA project were structured to support capacity development, and specific lifelong learning tools were elaborated based on established needs and requirements of WWTPs. The IWAMA workshops and webinars created an international platform where different actors could share their experience, knowledge and practices among different level actors (e.g. operators, authorities, scientists, suppliers). National knowledge based communities formed in the project have planned how to continue the work after IWAMA to insure durability of the achieved results.



Several lifelong learning tools were specifically designed in the project: WWTP game, electronic Training Materials Package with the virtual testing, and publications of lifelong learning opportunities and challenges. These 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.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

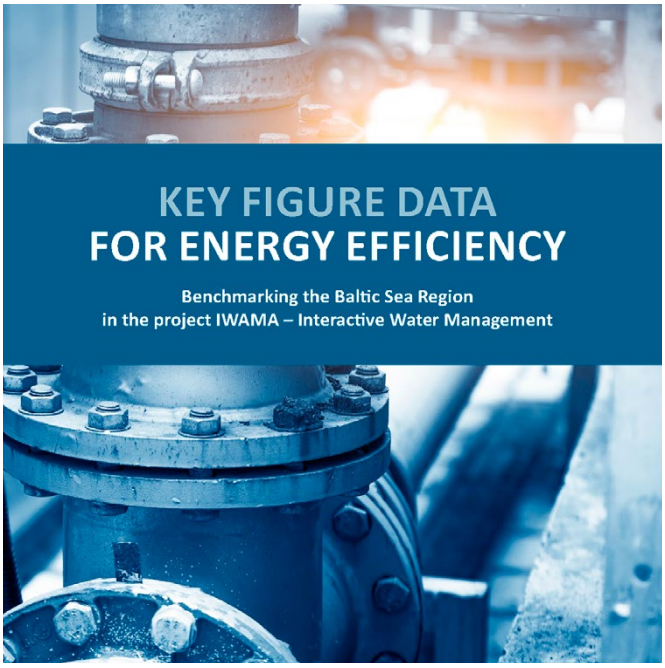
Regional benchmark for energy efficiency in wastewater treatment

Commitment finalized by:
Technical University of Berlin, Germany

Action

The comparative benchmark in smart energy management in relation to nutrient removal highlights current situation and trends in the wastewater treatment sector of the Baltic Sea Region. More than 65 WWTPs contributed to the development of the benchmark with their data, which allowed evaluating general inflow parameters, treatment efficiency in relation to energy consumption and energy production at WWTPs in different countries. The work included harmonization of input data due to different reporting habits in the BSR. Main key figures describing the treatment processes have been selected.

The answers were collected from Sweden, Finland, Russia, Estonia, Latvia, Lithuania, Poland, Belarus and Germany.



Result

The benchmark report reveals how WWTPs in the region operate under different legal requirements and diverse restrictions regarding nutrient effluent values. Different technologies are applied with varying success in high treatment efficiency combined with low energy consumption. Several factors influential for the performance of WWTPs were identified throughout the work: the age of WWTP and installed equipment, motivated and well-trained staff in combination with the availability of financial resources devoted to upgrading of WWTPs, and constrains of national legal requirements. HELCOM requirements are adopted and fulfilled by many WWTPs in the Baltic Sea Region. Half of the WWTPs considered in the evaluation are operated using less than 37 kWh/(PECOD,120·a). But only 20 % consume less than 23 kWh/(PECOD,120·a). This benchmark is proposed to be aimed by all plants in the region.

Continues »

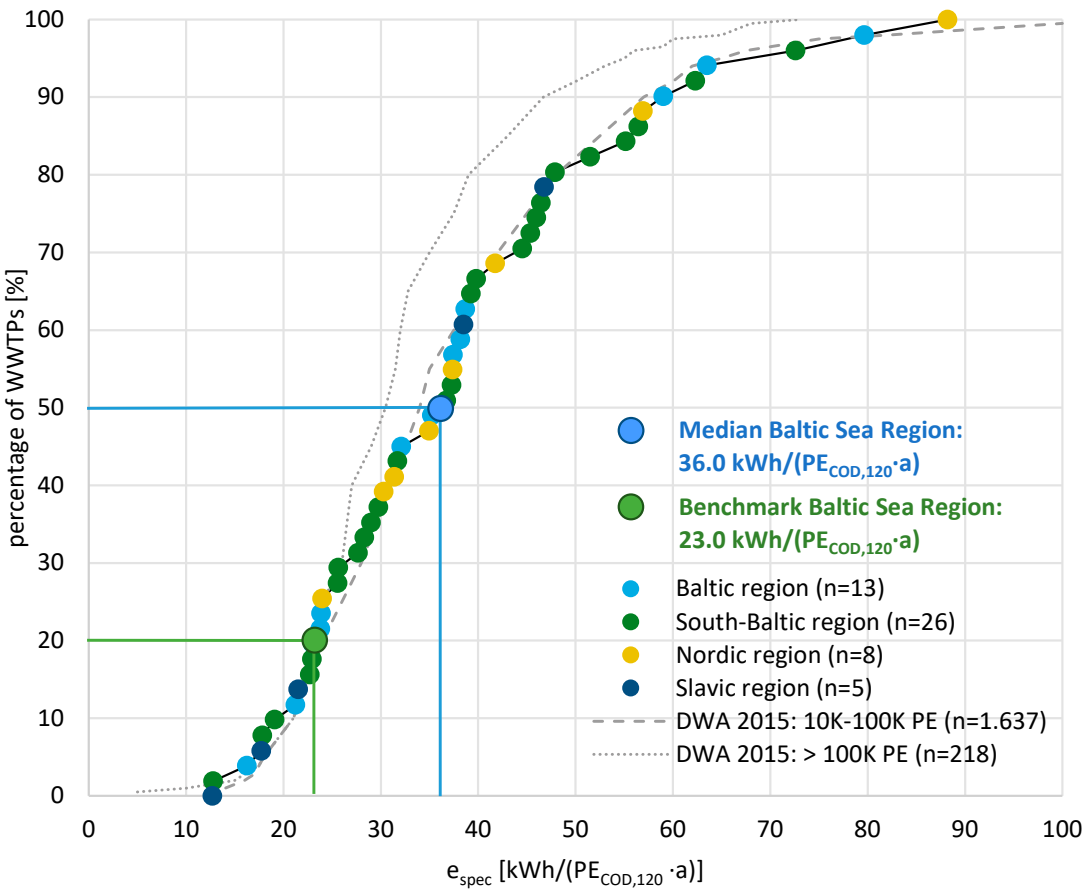
IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE



The report on key figure data is available for all water sector professionals in the Baltic Sea Region providing general information on the regional situation and technical details on the processes applied. The full report (**Key figure data for energy benchmark**) is available on the IWAMA project website. Main key figures are displayed in user-friendly graphs, offering the opportunity to calculate respective values and compare. Benchmarking of the status of wastewater treatment plants helps in detecting possible performance gaps that can be further improved. Large deviations from the regional average indicate a demand for a detailed energy audit in order to identify the potentials for energy optimization in the treatment process. For this purpose, an **energy self-audit tool** was developed in the project, which is free to use.

Read more: **www.iwama.eu**

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Simulation-based decision making tool in Grevesmühlen, Germany

Commitment finalized by:
Aqua & Waste International GmbH, Germany

Action

A simulation model of the WWTP Grevesmühlen, Germany, was developed in a step-by-step approach, based on a detailed baseline study and operational data analysis.

WWTP Grevesmühlen currently has a capacity of approx. 65,000 PE, with the incoming wastewater characterized by high proportions of industrial discharges (dairy, coffee production). In addition to the biological treatment, based on the activated sludge process, a central sludge treatment forms the core of the plant. Due to additional digestion of sewage sludge from surrounding WWTPs and various co-substrates, the biogas yield is high. Besides a sludge thickening and co-substrate receiving station the plant is equipped with a thermal hydrolysis unit to intensify the digestion processes, aiming to further improve the biogas production and dewatering characteristics of the digested sludge. The sludge liquor is treated in a partial flow treatment, based on a two-stage deammonification to significantly reduce the nitrogen load.

The complex overall system allows an energy-efficient treatment of wastewater without compromising the effluent quality. The decision-making tool aims to link the inter-dependent treatment components.

Result

The simulation model developed for the WWTP Grevesmühlen consists of four functional groups. The first blocks serve to set the input values for the model (operational data of the WWTP, standard values etc.). This unit is followed by the modules for adjusting the kinetic parameters and fractioning. The next group includes all steps for the regular treatment of the incoming wastewater (primary clarifier, 4-lane alternating nitrification/denitrification, secondary clarifier). This is complemented by the blocks of the sewage sludge treatment (thermal hydrolysis, anaerobic digestion with co-fermentation and sludge liquor treatment based on the deammonification process).

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Optimization potentials are identified based on a successful calibration and validation of the simulation model including pre-treatment, aerobic biological treatment, sludge digestion, co-fermentation, thermal hydrolysis and deammonification. Subsequently, the findings are implemented in the full-scale operation of the treatment plant. The verification process includes a detailed measurement campaign before and after implementation of the optimization actions.

Successful implementation and application of the decision-making tool will contribute to minimization of the discharge of nutrients to the Baltic Sea by optimizing the treatment performance of the WWTP Grevesmühlen. In addition, the energetic optimization will contribute to the significant reduction of the operational costs of the treatment plant.

Read more: www.balticwaterhub.net

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Baltic Smart Water Hub

Commitment finalized by: Union of the Baltic Cities Sustainable Cities Commission, Finland

Action

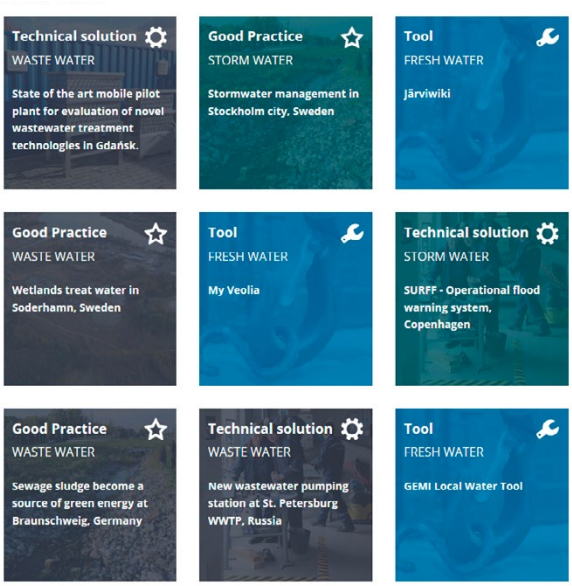
Baltic Smart Water Hub is visually appealing and easy-to-use open web portal showcasing most recent good practices, technical solutions and tools for the water sector experts in the Baltic Sea Region.

The Baltic Smart Water Hub is a place of technical expertise and a database of exemplary solutions existing in the water areas of the Baltic Sea Region. The Hub covers four water areas, in which the information is presented: fresh and sea water, storm water and wastewater. Through recognizing these areas, the Hub emphasizes various water management aspects: handling storm waters, river monitoring, lake restoration, coastal area management, wastewater treatment.

The Hub consists of four core elements, through which actors can cooperate, share and learn: good practices, technical solutions, tools and experts.

Result

Through the demonstrated cases, Hub users can find ideas for investments, solutions to similar challenges and tools to use in the daily work. Information about existing funding instruments, regional policy framework and coordinates of potential networking associates is also available in the platform. Users can submit their own content to the Hub through an on-line form and by doing so promote their organisation´s expertise in the region.



The portal is continuously expanding with novel tested solutions, providing users the best variety of available water management related information around the Baltic Sea Region.

Visit the Hub and share your good practise!

Read more: www.balticwaterhub.net

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the BALTIC SEA CHALLENGE NETWORK implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Audit tool for smart sludge management

Commitment finalized by:
University of Tartu, Estonia

Action

The audit tool for smart sludge management was developed to measure the process effectiveness and potential for improvements at wastewater treatment plants. The tool analyses efficiency and feasibility of smart sludge management taking into account such factors as sludge handling technology and flows, energy and chemical consumption, automatic calculations of operational parameters. Most of the results are shown in comparison with the data collected for the benchmark (iwama.eu), which enables comparability of the achieved values with other plants and developed benchmarks in the Baltic Sea Region.

First sludge management audits were performed on 9 WWTPs (Estonia, Latvia, Lithuania, Poland and Germany) in order to develop the tool.

Result

There is a large amount of waste activated sludge produced in the Baltic Sea Region. Waste activated sludge contains variety of pollutants (heavy metals, pharmaceuticals, pathogens) and nutrients (nitrogen, phosphorous). In order to reduce the flow of pollutants into water bodies and to promote recycling of nutrients, it is essential to support smart sludge management. Sludge audit tool is an openly available public instrument supporting

WWTPs operators in performing a self-audit for better efficiency of their sludge handling.

The uniform and thorough audit concept considers regional and technological peculiarities, which increases the potential of practical application of the tool. Based on achieved results, WWTPs can obtain knowledge about important operational parameters and possibilities for the improvement of the process. Plants can benefit from the enhancement of sludge management, as it leads to higher energy production, lower energy consumption and reduces loads of hazardous substances and nutrients in the effluent.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the BALTIC SEA CHALLENGE NETWORK implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Capacity development ✓
Energy efficiency ✓
Sludge handling ✓

Lifelong learning programme for wastewater sector operators in Estonia

Commitment finalized by:
Estonian Waterworks Association (EVEL), Estonia
Järvamaa Vocational Training Centre (JKHK), Estonia

Action

Smart operation of a wastewater treatment plant cannot be fulfilled without educated professionals. Therefore, it is important to enable lifelong learning of operators and education of young professionals to ensure the high-level performance and ability to work with advanced technologies. To increase the level of knowledge in operation of WWTPs, a special 2-years study program for operators was developed and launched in Estonia.

Result

The study program developed for WWTP operators tackles the problem of educating professionals, keeping them up to date with latest technologies and advanced practices in the field. This program focuses also on raising the attractiveness of the wastewater treatment sector by empowering students with knowledge about technical developments and automation available on the plants.

In the program launched in September 2017 only 20% of the learning process takes place in the classroom – the rest of education involves practical experience obtained in companies. Studies culminate in a vocational examination, and the prize for successful passing of courses is a certificate meeting European professional standards.

Supported by the Ministry of Education, the core of this educational program lies in active cooperation between different stakeholders: water associations, wastewater treatment plant operators, companies and universities.

The Järvamaa Vocational Training Centre in Estonia has a vision of creating an international centre of excellence for the water treatment sector. Once established, the centre will provide a foundation for lifelong learning, with basic courses systematically followed by further training. Combined into one centre, these educational initiatives will enable effective and continuous education.

Read more: www.iwama.eu

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the BALTIC SEA CHALLENGE NETWORK implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Lifelong learning through German "Neighbourhood" concept

Commitment finalized by:
German Association for Water, Wastewater and Waste (DWA), Regional group North-East

Action

In IWAMA project, German concept for lifelong learning in the wastewater treatment sector called "Neighbourhoods" was tested in the international context during capacity development workshops. This method allowing exchange of experiences under guidance of experts proved to be extremely useful.

The neighbourhood concept is a self-help system for WWT operators providing experience exchange on site leading to sharing knowledge and practice with the neighbours. Establishing of neighbourhoods is a voluntary pooling of WWTP operators that ensures optimal process control at the plant. Experience exchange maintained during regular meetings on site leads to enhanced qualification, which improves the quality of work. Neighbourhoods are formed based on short travel distances. The size of each neighbourhood should not exceed personnel of more than 20 WWTPs.

Result

Learning from the neighbour is a useful approach, as the actors are on the same level and "speak the same language". Every wastewater treatment "neighbourhood" is guided by a high-qualified teacher or adviser. The teacher is responsible for coordination of meeting date, location and programme. Involvement of the teacher assures transfer of new information from beyond the daily work to the WWTP employees, which leads to a better qualification and in the end helps to improve the water quality. Each teacher can be organizationally assisted by a chairman elected by the neighbourhood.

Each neighbourhood can select own topics for their meetings, which ensures discussing region-specific aspects. Topics are usually presented by external experts or suppliers, but these presentations should not be biased, but provide a market overview or demonstrate different solutions.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Once a year teachers of a region meet for their skill enhancement. During this meeting, a guideline for the topics of the next neighbourhood meetings is developed. The organizing institution names a supervisor, who is in charge of professional guidelines, including the topics, annual meetings of teachers, selection of teachers and their mentoring. The teachers taking part in the neighbourhood work receive information about the current challenges in the field and new ideas for their daily work, e.g. new research topics for representatives from academia.

Benefits of the "Neighbourhood" work are:

- Sustainable increase of the efficiency reducing operational costs and efforts
- Useful experiences for the operation and the enlargement of sewers and WWTPs
- Up-to-date information (e.g. new laws and regulations and cognition of the operational safety)
- Practical tools to support daily work, e.g. forms and operational instructions
- Benchmark of efficiency
- Detecting problems and development measures

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Importance of public participation in wastewater management in Kaunas

Commitment finalized by:
Environmental Center for Administration and Technology, ECAT – Lithuania

Action

Active public participation, support and involvement are very important for successful implementation of water policy and requirements in water management field. Every person has a significant role in protection of the Baltic Sea and they must take some actions in order to reduce their contribution to the nutrient and hazardous substance loading, and to help restore the good status of the Baltic Sea. Therefore, public education and awareness raising are crucial in activating participatory approach among citizens.

Result

Two awareness raising events were organized for Kaunas district communities (Lithuania). Environmental Center for Administration and Technology in cooperation with Kaunas District Municipality invited Zapyškis and Kačerginė inhabitants for discussion about proper wastewater management, protection of the Baltic Sea, public involvement and active participation in this field. Specialists from Kaunas District municipality, local wastewater treatment plant (WWTP) as well as consultants from Kaunas District Public Health Office participated in both events. Expert presentations and active discussions helped Kaunas District inhabitants better understand the environmental problems and realize how much they affect the quality of the living environment and public health. Participants received not only theoretical knowledge about integrated water management, advanced wastewater treatment and most pressing environmental challenges, but also had a chance to clarify their local concerns with the support of specialists from municipality and Kaunas WWTP.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

In addition to the IWAMA project and Baltic Sea Challenge, other initiatives supporting local actions for better state of the Baltic Sea were introduced. An ongoing investment project "Renovation and development of water supply and wastewater management infrastructure in Kaunas district", which aims to ensure quality of drinking water supply and wastewater management by modernizing and expanding the water supply and wastewater management infrastructure was presented. Thorough discussions helped citizens better understand importance of such projects and possibilities to get involved in local actions. Participants got good understanding about their responsibility for safe environment and good ideas what they can do themselves in wastewater treatment sector. These informational events were highly valued by both participants and specialists. It is foreseen to organize such events in other neighborhoods of Kaunas District in the near future as well.

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Quadruple helix concept at Linnaeus University

Commitment finalized by:
Linnaeus University, Sweden

Action

The Eco-Tech Conference is biannually organized by the Linnaeus University to bring together different stakeholders to discuss latest research and innovations and share knowledge and experience among international experts, scientists, authorities and non-governmental activists. The Eco-Tech 2018 particularly focused on elaborating energy management for purifying domestic and industrial wastewaters.

Result

The topical issue for the Eco-Tech 2018 conference was the scarcity and quality of water. The drinking water resource should be reorganized so it will not be used any longer for flushing sewage-pipes when they are clogged; for diluting industrial process water to reduce the pollutants concentration to an acceptable level before sending it to the municipal sewage plant; for spraying of demolition waste to avoid dust. Wastewater should become an element of the circular economy.

The wastewater and storm water should be seen as resources both for urban and rural areas without polluting the environment. The Eco-Tech 2018 joined multinational academic and industry forces to discuss this topic and elaborate the situation.

To include wastewater into the circular cycle, WWTPs must be constructed in a different way and produce water of different qualities to be sent back for various uses in society where the drinking water-quality is not required. Moreover, the challenge of guaranteeing the quality of the potable water arises when using new parameters not considered in the past, such as the removal of micropollutants. Eco-Tech joins the industry and volunteers from all over the world who do the clean-up from plastics at their homes. This is the Quadruple Helix extended approach applied by the Eco-Tech conference format, which allows comprehensive discussions of existing solutions for common challenges.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

The Eco-Tech conference concept is closely intertwined with the activities done in the IWAMA project that help wastewater treatment sector to develop efficient and environmentally smart operations to save costs through process optimisation and investments. This opens the gate for new business opportunities and innovative, cost and energy efficient technology development. Thus, Eco-Tech 2018 becomes a step forward towards sustainable development and action to elaborate progress in solving Baltic Sea challenges.

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Education and awareness raising at Daugavpils WWTP

Commitment finalized by:
Daugavpils Water Ltd, Latvia

Action

Daugavpils water Ltd. enables excursions to its own museum, WWTP and water intake facilities to introduce the importance of clean water supply, functionality of the wastewater system, importance of wastewater treatment, as well as to demonstrate the complexity of the process.

The target group for the excursions are children and teens (from 7 to 18 years old). The goal of the commitment was to raise the awareness of the importance of the Baltic Sea protection.

Result

Daugavpils water Ltd contributed to the IWAMA project with several activities, one of them being dissemination of information about project goals and tasks on how to improve the management of wastewater treatment processes on the local level. Project training materials were distributed both among specialists (company's employees, representatives of supervising institutions, participants of educational courses and participants of environmental seminars held by the company), and among educational institutions and children's centers through guided tours and special events dedicated to important

environmental dates: International Water Day, International Environment Day, International Baltic Sea Protection Day.

This allowed attracting attention, raising awareness and widely demonstrating positive results of innovative technologies implemented in the framework of the IWAMA project aiming to save energy and improve the environmental situation in the Baltic Sea Region.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

One of the technologies implemented within the IWAMA project was an investment into installing new equipment (1 valve on aeration system and 42 energy meters) in Daugavpils WWTP, which allows organizing maintenance works without harm to technological (biological) process and keeps separate electricity records by main consumer groups (return sludge pumps, aeration mixers, compressors, centrifuges). Collected real time data allows to control, analyze and in short time correct and optimize settings of equipment used, reducing energy consumption while maintaining the required quality of wastewater treatment.

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Interactive eco-game for cleaning beaches in Kaliningrad oblast

Commitment finalized by:
State Autonomous Institution
Environmental Center "ECAT-Kaliningrad", Russia

Action

Complex and vulnerable environment of lakes, which are attractive tourist destinations also supplying citizens with fresh water, requires careful protection in the Baltic Sea Region. An example of action that can be undertaken by any citizens, an interactive campaign was launched on raising environmental awareness and sustainable behavioural patterns on the Vishtynetskoe lake – the largest freshwater reservoir in the Kaliningrad region connected to the Baltic Sea through the river network. An ecological quest prepared for collecting garbage from the lakeshore engaged local residents into cleaning the territory while raising environmental responsibility and attention to the environment protection.

Result

The main aim of the action was to reduce the pollution load to the Vishtynetskoe lake from non-organized tourism. A good and creative way to tackle this problem was a developed clean-up campaign with interactive components – the campaign was integrated into the local festival "Vishtynets Day" to reach bigger audience. The ecological quest was developed as an interactive environmental game, where participants need to go through 8 points of control solving riddles, answering questions and quizzes, demonstrating their knowledge and creative potential. During the organized event, proving their worth, the teams were separately collecting garbage along the lakeshore, which was lately evaluated with additional points.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE

Altogether 11 teams took part in the eco-quest collecting 40 garbage bags. This action resulted in a cleaner state of the lake, but also in raising the environmental responsibility of citizens and their involvement into conscious environmental protection. The action brought attention to the environmental status of the Baltic Sea and its water resources and led to promotion of sustainable tourism both in the area and on all other coasts. The importance of the organized eco-quest is in its attractiveness and captivating character of the game activating citizens and challenging them to perform better in the cleaning campaigns.

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

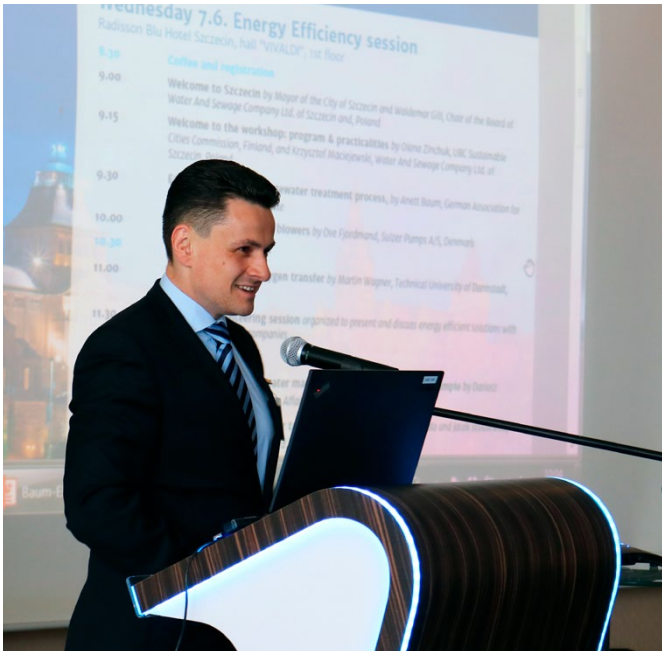
The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN REGIONAL DEVELOPMENT FUND
EUROPEAN UNION
THE BALTIC SEA CHALLENGE

Energy and sludge audits implemented in Szczecin WWTP

Commitment finalized by:
Water and Sewage Company of Szczecin Ltd, Poland



Action

Within the IWAMA project, sludge and energy audits were carried out at the Pomorzany and Zdroje WWTPs in Szczecin, Poland. Works on data collection by external auditors began with a detailed inspection of both WWTPs and consultations with WWTP staff. Sludge samples for the audit were collected and examined in a laboratory in Estonia. Energy audit was supported by installation of specific energy measurement equipment and final analysis was done by the Technical University of Berlin.

Based on the audits, benchmarking was prepared by experts from both universities.

Result

During the energy audit, all the process facilities of WWTP were subjected to detailed examinations. Sludge audit was focused on the sludge treatment node with an indication of the quality of sewage sludge tested at each processing stage. WWTP staff participated actively in the audit, providing laboratory data series on the quality of raw and treated sewage on an ongoing basis. The final audit report contains three main chapters: financial analysis, conclusions and recommendations.

When considering the financial analysis for the Pomorzany WWTP, the audit experts pointed on very low staff costs of the WWTP maintenance considering plant size and importance. Pomorzany WWTP was also ranked first among other tested WWTPs in terms of fees incurred for neutralization of 1 ton of dry sludge mass. Other rather well rated values were the amount of electricity produced, heat produced and total energy produced from biogas.

Continues »

IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

In the recommendations, auditors pointed the possibility of significant energy savings leading to lower operating costs in the future. The greatest potential is in exchange of a 10-year fine bubble system and use of a less energy-intensive system of mixing biological reactors based on modern agitators cooperating with inverters. Only these two components consume half of the power in WWTP. Reduction of energy consumption in this area would bring measurable benefits.

In the three-year ZWiK's Investments Company Plan, modernization of aeration system along with the improvement of the mixing of biological reactors was placed as a priority. Implementation of the latter upgrading will take place in 2019-2020.

Another audit recommendation is related to the final ash management after the sewage sludge is incinerated. Ash includes significant amounts of phosphorus, reaching up to 15% of the waste mass. Phosphorus recovery solutions are explored by Pomorzany WWTP and so cooperation with the West Pomeranian University of Technology in Szczecin and local chemical plants was initiated.

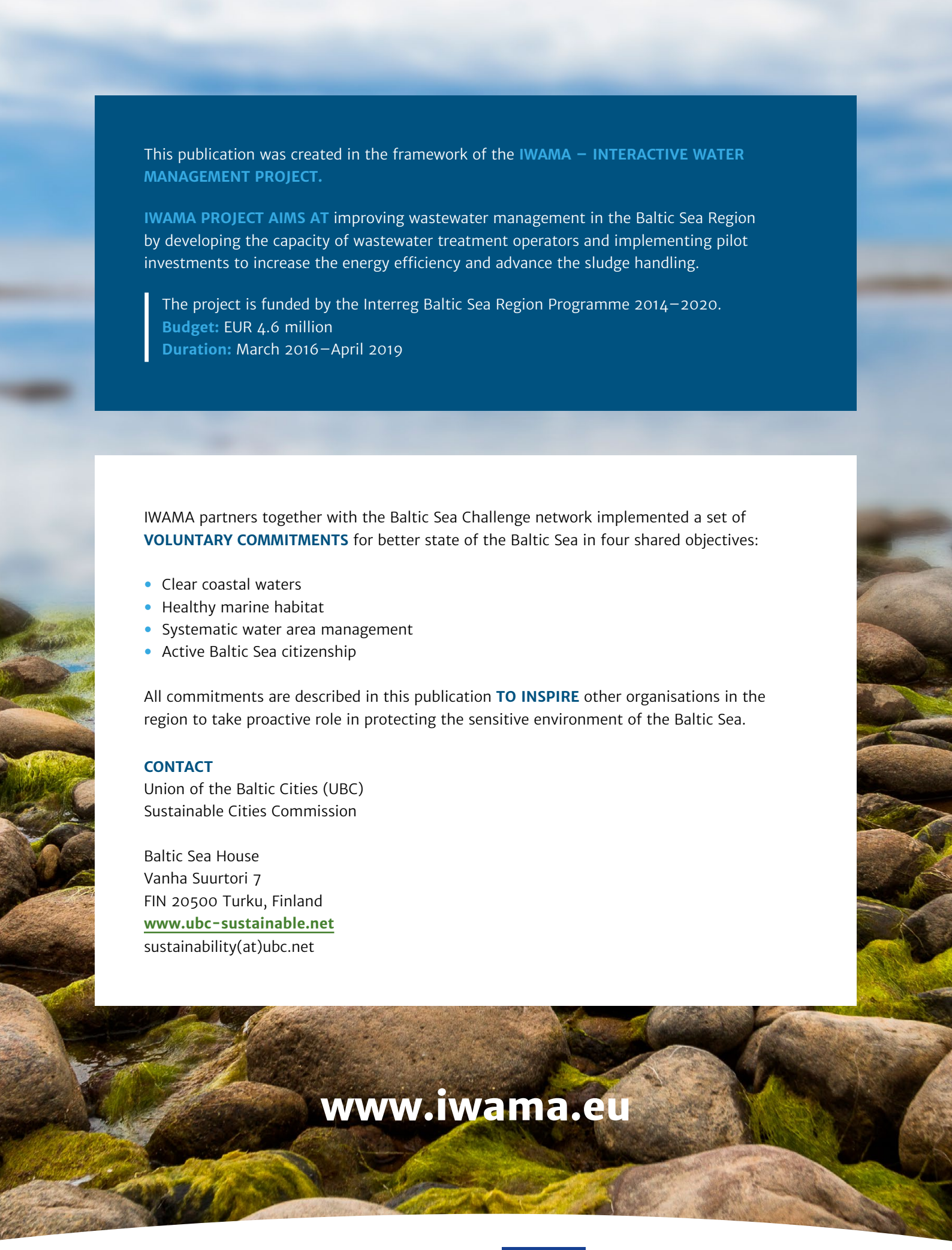
IWAMA (INTERACTIVE WATER MANAGEMENT) project improves the resource efficiency in wastewater management by developing the capacity of the wastewater treatment operators and implementing pilot investments on energy efficiency and smart sludge handling.

www.iwama.eu

The partners of IWAMA in cooperation with the **BALTIC SEA CHALLENGE NETWORK** implemented voluntary commitments for better state of the Baltic Sea in the context of the project. Their commitments are described in this publication and available in the Bank of Actions at the Baltic Sea Challenge website.

www.balticseachallenge.net

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE



This publication was created in the framework of the **IWAMA – INTERACTIVE WATER MANAGEMENT PROJECT.**

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

The project is funded by the Interreg Baltic Sea Region Programme 2014–2020.
Budget: EUR 4.6 million
Duration: March 2016–April 2019

IWAMA partners together with the Baltic Sea Challenge network implemented a set of **VOLUNTARY COMMITMENTS** for better state of the Baltic Sea in four shared objectives:

- Clear coastal waters
- Healthy marine habitat
- Systematic water area management
- Active Baltic Sea citizenship

All commitments are described in this publication **TO INSPIRE** other organisations in the region to take proactive role in protecting the sensitive environment of the Baltic Sea.

CONTACT
Union of the Baltic Cities (UBC)
Sustainable Cities Commission

Baltic Sea House
Vanha Suurtori 7
FIN 20500 Turku, Finland
www.ubc-sustainable.net
sustainability(at)ubc.net

www.iwama.eu

IWAMA Interactive Water Management
Interreg Baltic Sea Region
EUROPEAN UNION EUROPEAN REGIONAL DEVELOPMENT FUND
THE BALTIC SEA CHALLENGE