State of art in WWT sector of BSR countries based on previous UBC projects

Presenting results and conclusions of LearnWater, PURE and PRESTO

Agnieszka Ilola
Communications coordinator
UBC Sustainable Cities Commission

Turku, 9 December 2016

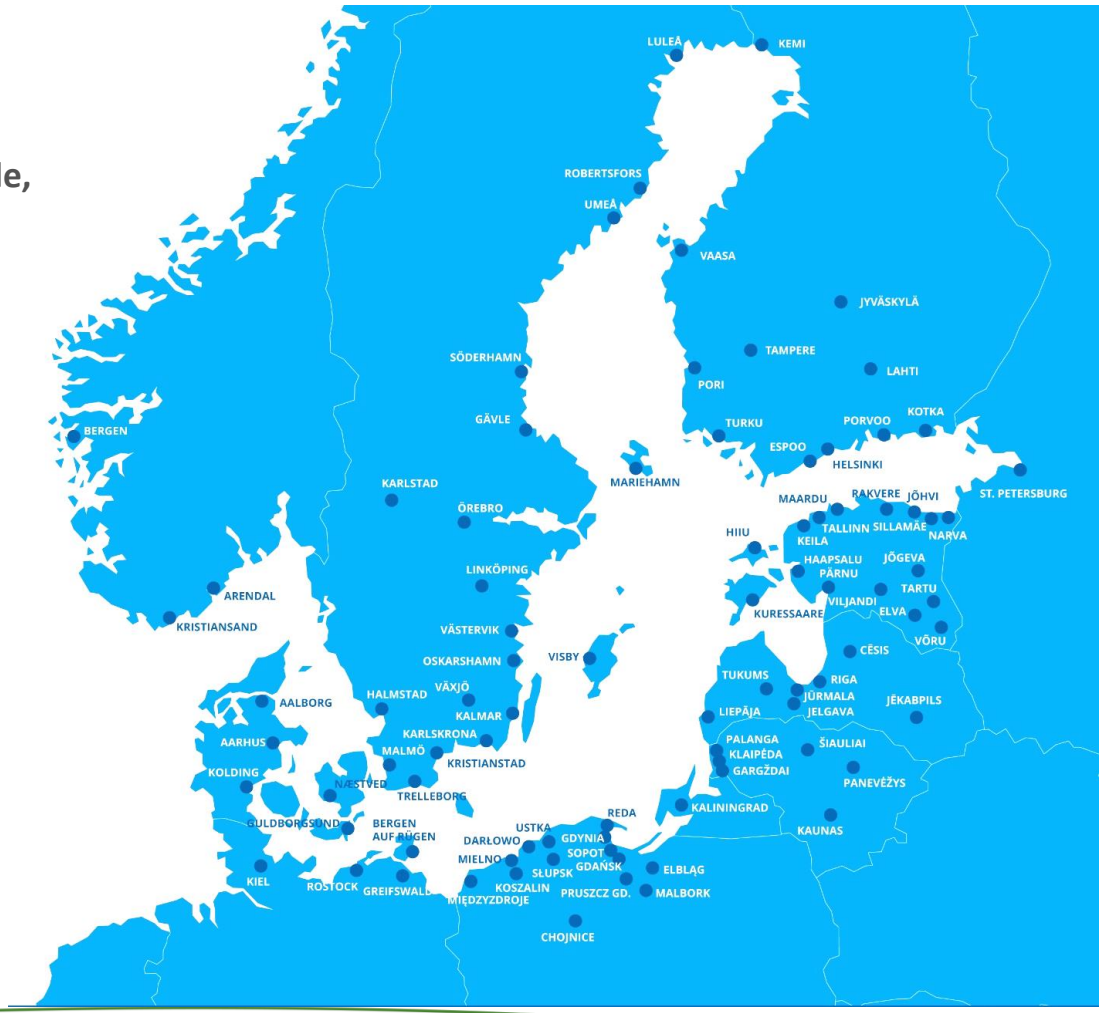
Union of Baltic Cities (UBC) City Network

UBC is the leading city network in Northern Europe, working to foster sustainable, smart and safe cities.

- Established in 1991 by 32 cities
- appr. 90 member cities in 10 countries around the Baltic Sea
- UBC Secretariat is based in Gdansk (PL)

7 Commissions:

- Cultural Cities
- Inclusive and Healthy Cities
- Planning Cities
- Safe Cities
- Smart and Prospering Cities
- **Sustainable Cities**
- Youthful Cities



UBC UNION OF THE BALTIC CITIES
SUSTAINABLE CITIES COMMISSION

EUSBSR EU STRATEGY FOR THE BALTIC SEA REGION

IWAMA Interactive Water Management

UBC Sustainable Cities Commission

- Operating since 1997
- Hosted by City of Turku
- International team of 17 professionals

Focus areas:

Sustainability management

Local climate work

Water management (waste water, storm water)

Energy management and Energy efficiency

Sustainable urban mobility

Sustainable urban planning

Maritime policies

The Baltic Sea Region is one of the most active regions in sustainable development in the world. BSR is a region:

with **similarities** and **differences**

with **common challenges** and **problems**

with **common goals**

State of the Baltic Sea is our common concern!

PURE – Project on Urban Reduction of Eutrophication

Funded by the INTERREG IVB Baltic Sea Region Programme 2007-2013

Duration: 17.9.2009 - 16.9.2013

Budget: EUR 3.2 million

PURE
project on urban
reduction of eutrophication

IWAMA
Interactive Water Management

PURE – Project on Urban Reduction of Eutrophication

PURE aims:

Improved wastewater treatment (phosphorous removal)

- technical audits and investments in WWTPs
→ (0,5 mg/l)

Picture: www.mtv3.fi

Improved sludge handling capacity

- technical audits and sludge handling plan

Commitment and actions around the Baltic Sea Region

- information collected from BSR, benchmarking, matchmaking for WWTP, cities, funders, decision makers etc.

Project improves wastewater treatment and supports selected WWTPs to reach phosphorus content of 0,5 mg/l in outgoing wastewaters.

PURE
project on urban
reduction of eutrophication

IWAMA
Interactive Water Management

PURE project

Partners:

- Union of the Baltic Cities, Sustainable Cities Commission, (Lead partner, FI)
- John Nurminen Foundation (Content coordinator, FI)
- Baltic Marine Environment Protection Commission HELCOM (Information and dissemination, FI)

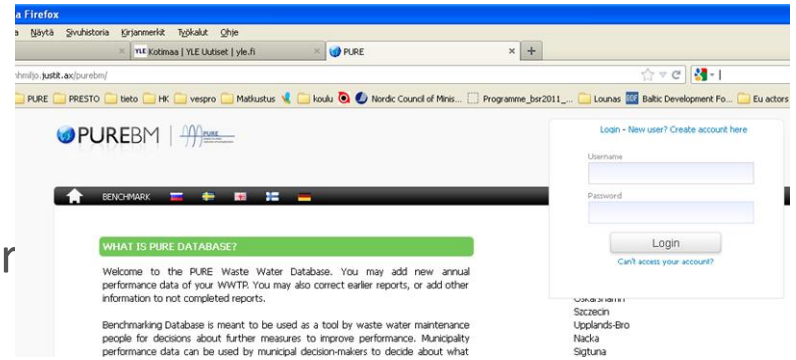
P-investments, technical audits and sludge handling:

- Riga Water Ltd. (LV)
- Jurmala Water (LV)
- Brest Municipal Water and Wastewater Enterprise Vodokanal (BY)
- Järve Biopuhastus Kohtla-Järve (EE)
- ZWIK - Water and Sewage Company of Szczecin (PL)
- Municipality of Gdansk (PL)
- Sewage Management Facilities Lübeck (DE)
- Mariehamn Town (FI)

PURE project

PURE outputs

- **Technical audits** and reports in selected WWTPs
- Concrete **investments** resulting in annual reduction of 300-500 tons of phosphorus
- Suggestions for sludge handling
- **Book of good practices** in sustainable sludge handling at municipal WWTPs
- **Online database** on urban wastewater treatment: monitoring, benchmarking, matchmaking in the Baltic Sea Region



- General
- Nutrient
- Sludge

For more information visit:
http://www.purebalticsea.eu

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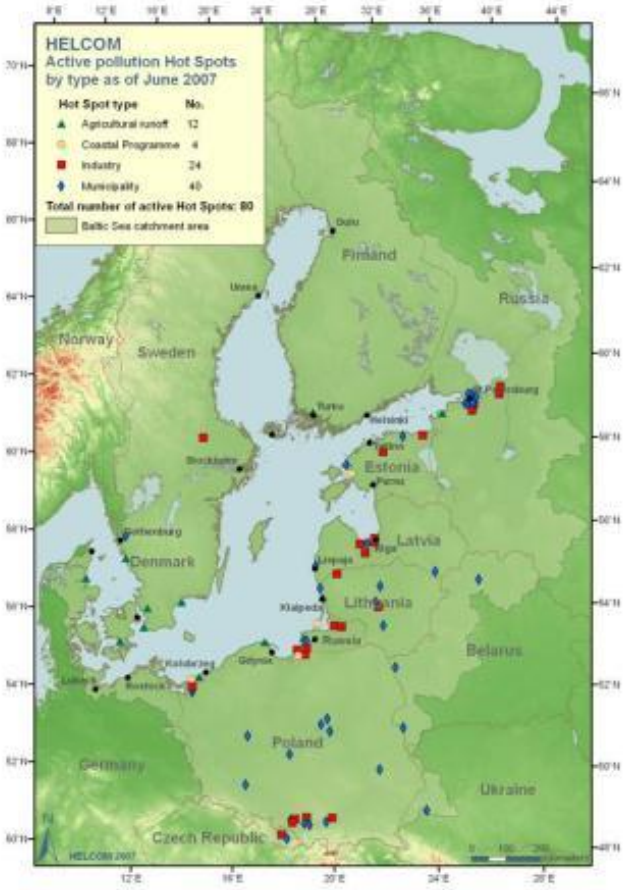
PURE project

PURE database and benchmarking

- a user-friendly database for municipalities and municipal water companies
- developed by local users to other local users for **practical needs** like developing sewage supply and benchmarking
- monitor the loading, level of wastewater treatment and technology used in the Baltic Sea region
- colleting information about projects' implementation



Three PURE partner wastewater treatment plants deleted from the HELCOM hot spot list!

PURE
project on urban reduction of eutrophication

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PURE project

PURE database – benefits

- **Information for municipalities about the performance including sparsely populated areas (not connected)**
- Tool to influence municipal (political) decision making
- **Information for WWTP's about the performance and relation to the top 20 and HELCOM recommendations**
- Tool for investment decisions
- **Information about the nutrient load to the Baltic Sea**
- More accurate picture about the situation and development needs
- **Information about projects' implementation around the Baltic Sea**
- More accurate picture about what has been done and where

The database could easily be expanded later to include the collection of other data from the WWTPs.

PURE project

Technical audits

In order to estimate the investment needs of PURE partners technical audits were conducted in:

- **Brest** (BY)
- **Jurmala** (LV)
- **Kohtla-Järve** (EE)
- **Gdansk** Wschod (PL)
- **Szczecin** Pomorzany and Zdroje(PL).

The technical audits considered the current technical processes and necessary technology to decrease the concentration of phosphorus in purified wastewater to the HELCOM recommended level of 0.5 mg/l.

PURE project
Investments

Investment in Riga:

- storage and dosing tanks for phosphorus precipitation chemical to improve the phosphorus removal efficiency
- magnetic flow meters to provide exact wastewater flow measurements needed in steering of the process
- an additional sludge thickening centrifuge to achieve the necessary capacity for excess sludge removal and to prevent wash-outs of activated sludge

Investment in Jurmala:

- new air flow meters and pressure sensor
- additional polymer station to improve sludge treatment (separate chemical dosing to the thickening and dewatering equipment)
- division of the anaerobic and aerobic zone to internal zones and to lower the walls between the anaerobic and aerobic zones

PURE project

Investment in Belarus

- Co-operation with downstream countries to ensure long-term sustainability and integration
- High potential for cost-effective nutrient removal investments exists
- In most cities, wastewater infrastructure is in sufficient condition to implement fast-track low-cost measures to improve nutrient removal
- Water utility personnell skilled and motivated, however, enhanced nutrient removal methods largely unknown before PURE and PRESTO
- Industrial wastewaters entering municipal plants and control of industrial discharges pose a difficult challenge for treatment
- Sludge disposal an acute problem
- Increase in operational costs as well as loan instalments seen problematic due to tariff policy
- Administrative challenges due to contradictions in EU requirements and Belarusian legislation, no clear procedures for using ENPI financing in Belarus

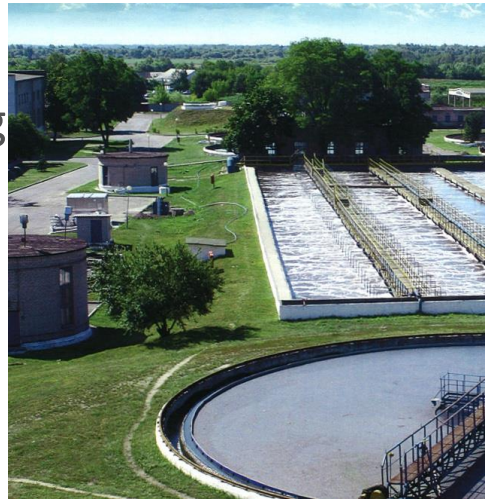
PURE project

First enhanced P-removal in Belarus - Brest

- *310 000 inhabitants*
- *Located on the border of Belarus and Poland, discharges to the Bug river flowing to the Vistula and further to the Baltic Sea*
- *high phosphorus concentrations in outlet – even 11 mg P/l*

Investments:

- chemical storage reservoir including a dissolving station
- chemical phosphorus removal system, dosing points before primary sedimentation and after secondary sedimentation
- annual load reductions up to 250 t/a



For more information visit:
http://www.purebalticsea.eu

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PRESTO - Project on Reduction of the Eutrophication of the Baltic Sea Today

Funded by the INTERREG IVB Baltic Sea Region Programme 2007-2013

Duration: 9.6.2011 - 8.9.2014

Budget: EUR 4.5 million

Recognized as a project with high macro-regional importance and granted a **flagship status**.

PRESTO

IWAMA Interactive Water Management

PRESTO project

Project improves quality of local waters and the Baltic Sea by reducing nutrient load through transnational investments, education and awareness raising in Belarus and Baltic Sea region

Results:

- **decreased** transnational **nutrient load** to the Baltic Sea originating from municipal waste waters by app. 400 t/a
- **improved water quality** of transboundary River Daugava and River Neman
- **increased competence** of wastewater operators, design engineers and university teachers and students
- **increased awareness** about the harmful effects of nutrients' over load in the Baltic Sea Region
- significant **technology transfer** between EU and Belarus
- international network of water experts
- **new** international **project proposals** both academic and practitioners

PRESTO

IWAMA
Interactive Water Management

PRESTO project

Partners:

Union of the Baltic Cities Sustainable Cities Commission - Lead Partner (FI)

John Nurminen Foundation (FI) coordinating investments in BY

Full scale investments in water utilities of Grodno, Molodechno and Vitebsk (BY)

Small scale investments to optimize the process in water utilities of Kaunas (LT) and Daugavpils (LV)

Feasibility studies for modern wwt and sustainable sludge handling in water utilities of Lida and Baranovichi (BY) and Daugavpils (LV)

Technical University of Berlin, (DE) leading **capacity building**

Universities: Belarusian National Technical University, Brest State Technical University, Polotsk State University

PRESTO project

Associated Partners:

Water utilities of Lida, Brest, Polotsk, Slonim (BY) and St Petersburg (RU)

Belarusian Ministry of Housing and Communal Services
Belarusian design institutes
University of Latvia

Advisory status:
Finnish Embassy in Belarus
HELCOM, NDEB

PRESTO

IWAMA
Interactive Water Management

PRESTO project

Investments in Vitebsk

- *350 000 inhabitants*
- *Located by the river Western Dvina flowing to the Baltic Sea via Latvia*

Investments:

- chemical phosphorus removal system, including a dissolving station for solid chemical
- renewal of air blowers for improved aeration
- changes in feeding of mechanically treated wastewater to biological treatment

PRESTO project

Investments in Grodno

- *330 000 inhabitants*
- *Located by the river Neman flowing to the Baltic Sea via Lithuania*

Investments:

- chemical phosphorus removal system
- biological nutrient removal (A2O-system) in one part of the plant
- increasing biological nutrient removal efficiency in the aeration basins by changing the wastewater feeding points
- renovation of the aeration system in one part of the plant

PRESTO

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Interactive Water Management

PRESTO project

Investments in Molodechno

- *95 000 inhabitants.*
- *Located by the river Usha, a tributary of the Neman River flowing to the Baltic Sea via Lithuania*

Investments:

- chemical phosphorus removal system, including a dissolving station for solid chemical
- basic biological nutrient removal system (AO process) consisting of mixers, dividing walls and nitrate recirculation
- on-line nitrogen and phosphorus analyzers

PRESTO

IWAMA
Interactive Water Management

PRESTO project

Capacity building and awareness raising

- 6 thematic training workshops
- 4 public forums
- Site visits:

- Belarus: Grodno, Lida, Vitebsk, Minsk, Brest
- Russia: St. Petersburg
- Latvia: Daugavpils
- Lithuania: Kaunas
- Germany: Berlin
- Finland: Turku, Helsinki

For more information visit:
http://www.prestobalticsea.eu

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Interactive Water Management

PRESTO project

Capacity building and awareness raising

- Framework paper on development of the education on WWT in Belarus
- new courses at universities
- educational material package
- pilot course on nutrient removal for engineering students

For more information visit:
http://www.prestobalticsea.eu

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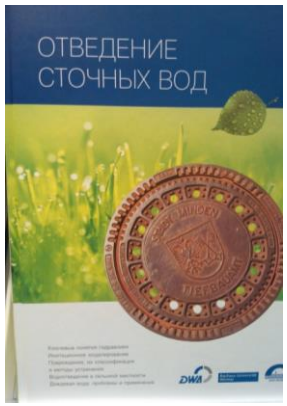
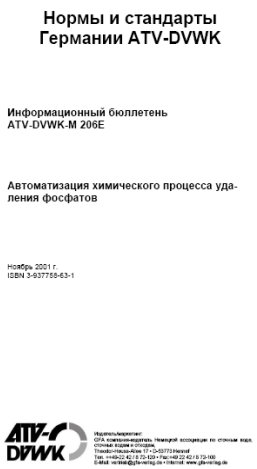
PRESTO project

Capacity building and awareness raising

- literature on modern WWT in RUS
- DWA standards translated to RUS
- approximation of Belarusian regulations and standards to the EU regulations

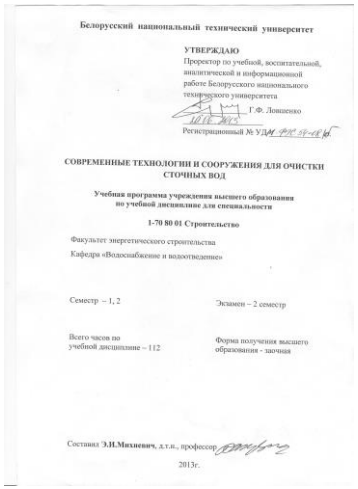



Нормы и стандарты
Германии ATV-DVWK

Информационный бюллетень
ATV-DVWK-M 206E

Автоматизация химического процесса уда-
ления фосфатов

Ноябрь 2001 г.
ISBN 3-937758-63-1


Белорусский национальный технический университет

УТВЕРЖДАЮ
Проректор по учебной, воспитательной,
аналитической и информационной
работе Белорусского национального
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Г.Ф. Ловшенко

СОВРЕМЕННЫЕ ТЕХНОЛОГИИ И СООРУЖЕНИЯ ДЛЯ ОЧИСТКИ СТОЧНЫХ ВОД

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Кафедра «Водоснабжение и водоотведение»

Семестр – 1, 2
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Составил Э.И.Михневич, д.т.н., профессор

2013г.

For more information visit:
http://www.prestobalticsea.eu

IWAMA
Interactive Water Management

Building Neighbourhood Learning Facility for Water Experts in Belarus - LearnWater

Funded by the Council of the Baltic Sea States and Swedish Ministry of the Environment

Duration: 1.4.2014 – 31.3.2015
Budget: 24 840 EUR

Partners:
UBC, Sustainable Cities Commission, FI

Technical University of Berlin (TUB), DE

Association of water and wastewater enterprises “AquaBel”, BY

Vitebsk Municipality Unitary Manufacturing Enterprise (Vitebsk Vodokanal), BY

Council of the Baltic Sea States
Environment & Sustainability
Regeringskansliet
Ministry of the Environment Sweden

IWAMA
Interactive Water Management

Learn Water project

Germany has successfully implemented a peer-to-peer learning concept "Neighbourhoods" since 1968. It is done through facilitated meetings, at which members of a "neighbourhood" discuss and look for solutions to a specific existing problem. A board of water management experts and operators develops a yearly programme which supports and guides the operators in their meetings. Concept of "Neighbourhoods" is used as a mean for systematic lifelong learning.

In the framework of LearnWater project, similar life-long-learning scheme was introduced and tested **in Belarus, but the "Neighbourhoods" have to be adjusted to Belarusian conditions**.

LearnWater project

LearnWater results:

- Introduction of “Neighbourhoods” models from Germany and Poland to Belarussian wastewater operators and organizing a pilot event in Vitebsk (BY) *”Process optimization in relation to energy efficiency”*

- Framework Paper describing life-long learning status in BY and adjustment of “Neighbourhoods” concepts to Belarussian needs

- Development of IWAMA project to mainstream the lifelong learning concept in Baltic Sea Region (and Belarus) and to bring experts from other countries into the future cooperation

Thank you!

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