Resource efficient urban water management
– seen at the European level

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EEA Mission statement:
The European Environment Agency aims to support sustainable development and to help achieve significant and measurable improvement in Europe’s environment through the provision of timely, targeted, relevant and reliable information to policy-makers, public institutions and the public.
Flows of information

**Expansions**
- Floods Directive
- Marine Strategy Framework Dir.

**Sharing**
- Additional parameters
- Prof. organisations

**Tools**
- Distributed systems
- Linked open data
- SensorWeb

**Reporting**

**Compliance**

**Performance**
- Actual emissions
- Resource efficiency
- Energy intensity

**Visualisation**

**Analyses, Indicators,..**

**Modelling**
- Policy scenarios
- CC scenarios

**Web-services**
- Open API's
- ArcGIS online

**European Environment Agency**
Interactive WISE map viewer provide overview of urban wastewater management at European level - here treatment pathways for generated pollution load (p.e.) Based on data from about 27,500 agglomerations and treatment plants Available from Waterbase UWWTD
Zoom in-details from same UWWTD map viewer with other selection of background layers.
- basic details per UWWTP can be shown in pop-up windows (Source: Waterbase)
- potential to expand with more info, e.g. on treatment technology installed
- to be provided by water utility associations?
Example of graphical display from UWWTD data viewer: distribution of types of waste water treatment in size categories.
Green Economy
- allows us to consider resource efficiency in the context of ecological resilience and social equity

(Source: UNEP, 2012; EEA, 2011)
Water Utility sustainability components
- inspiration in indicator development (SE)

**Ecological sustainability**
- Environmental requirements
- Efficient use of resources
- Water balance

**Sustainable assets**
- Status of assets
- Needs for renovation
- Economy in balance
- Sufficient competence

**Sustainable service to consumers**
- Water quality
- Reliable delivery
- Satisfied consumers

Source: Balmér, 2012
Concepts from international water accounting can be used

System of Environmental-Economic Accounting for Water (SEEAW)

Several terms used:
- Water productivity = 1/(Water use intensity) [product unit/m3 water]
- Economic water productivity [value of product (e.g. €) / m3 water]
- Water accounting
  - Physical (hydrological balance)
  - Economic (monetary value)
- Emission intensity [t pollutant/year per GDP, GVA, inhabitants..]

Aggregation scale is important
- Current statistics often only at national scale
- Much more data exist
- Potentials for improving water knowledge base in cooperation with utility and industry organisations
Measuring what matters

Efficiency Indicators relate environmental pressures to human activities.

They provide insight in the efficiency of products and processes.

Indicators provide the tools to gather information necessary for informed policy making.
Water Resource Efficiency Indicators
in development in co-operation with water utility associations
(IWA, EWA, EUREAU, WssTP and benchmarking networks)

• Is drinking water distribution and water consumption in urban areas resource efficient?
  • Specific water losses
  • Specific consumptions in household sector

• Is pollution load generation and emission intensities from urban areas resource efficient?
  • Specific effluent loads from UWWTPs

• Is urban water supply and sanitation operated with high energy efficiency?
  • Specific electrical energy consumption and co-generation in UWWTPs
Water statistics on water consumption - services and private households
- data coverage far from complete
Almost all countries have absolute decoupling of P and N emissions from population growth in domestic sector between 1990 and 2009.

But arising from different emission intensity levels:

- 3 left bars calculated from population distribution to treatment types and %removal
- 1 right bar based on reported actual emissions / derived emission factors per p.e.
- Missing data on industrial load portion per UWWTP
Specific discharges of Phosphorus per p.e.load
generated from data published in WISE Waterbase for 13 Member States

Source: WISE UWWTD
Swedish averages

Water use

- Water distribution: 0.22 kWh/m³
- Drinking water treatment: 0.24
- Pumping to waterworks
- Wastewater treatment
- Pumping sewage

Energy consumption in urban water cycle

- > 50 kWh/m³
- 1.5 – 4.5 – 40 kWh/ kg BOD
- xx kWh/ kg N
- xx kWh/ pe / yr

Source: Lingsten et al. 2008
Swedish Water
Specific energy consumption in UWWTPs (kWh/p.e./y)

Example of presenting aggregated results from benchmarking (weighted mean and 90 percentiles)

For illustration, may not be representative for NUTS1 units shown

Potential to expand to all European countries!

Source: aquabench, 2013
Utility operational performance is initial step of wider water management strategy (Water Stewardship Process)

Source: European Water Partnership
Challenges for corporate accounting and stewardship

• Data on performance must be clearly defined and comparable
• Indicators must balance complexity and simplicity with clear messages
• Data policy must be respected – but subject to adequate transparency for referencing
• Open data policies on a disaggregated basis support multiple use and analyses
  • Can be used - and misused !
  • Depend on building and maintaining mutual confidence  !!
Optional pathways for data sharing with water utilities/associations

Data on performance

Individual plants
Individual utilities

Benchmarking

National associations
(Benchmarking networks)

Coordination

EU/International associations
(IWA, EWA, Eureau, WssTP)

WISE reporting

National reporters

Reference datasets

Thematic datasets (attributes)

Interactive viewers

Web services

Datasets

WISE Water Data Center

Indicators

To be discussed with the EU/international associations
Summary

• **Water resource efficiency** – in a broad definition – is already high on several political agenda’s

• Some **benchmarking indicators** can be used to support a series of European level indicators (WREIs)

• A **cooperation** between leading associations (IWA, EWA, EUREAU and WssTP) and EEA has **identified and illustrated** use of benchmarking data

• **Options for expansion** to cover (all) European countries and organisation of dataflows is put forward to discuss

• **Let’s do it ? !**
Thank you!

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References:

• aquabench: http://www.aquabench.de/
• European Water Partnership: http://www.ewp.eu/