



HAMBURG WATER CYCLE®
Jenfelder Au

**Green Energy from black water –
The HAMBURG WATER Cycle® in the settlement
„Jenfelder Au“**

Dr. Franziska Meinzingler
Brussels, 17th November 2014





New demands on water management

- HAMBURG WASSER wastewater: ~ 150 Mio. m³/a,
energy demand for treatment: ~ 165 Mio kWh/a

→ Higher energy efficiency gains more importance

Boundary conditions:

- Increasing number of inhabitants but decreasing water consumption

Important steps:

- Optimization of processes & extension of services
- Fundamental question: Are we optimizing the right system?

→ Execution of large-scale pilot projects

→ **HAMBURG WATER Cycle**[®]

HAMBURG WATER CYCLE®

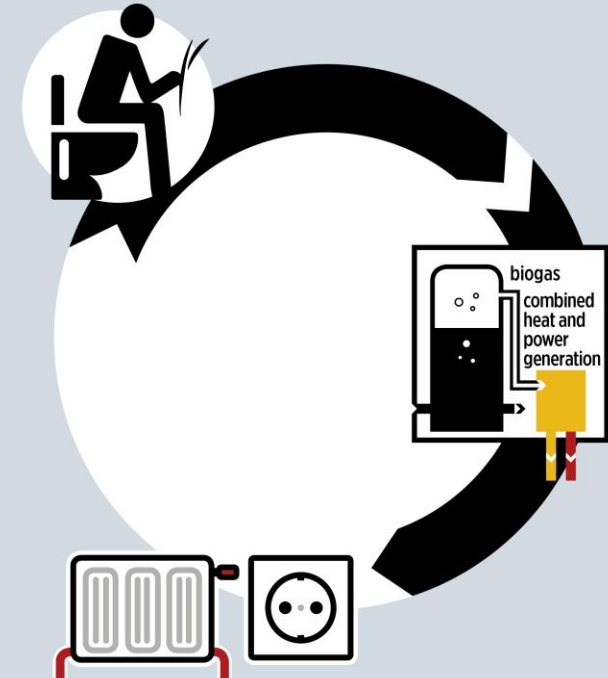
RAINWATER



GREYWATER



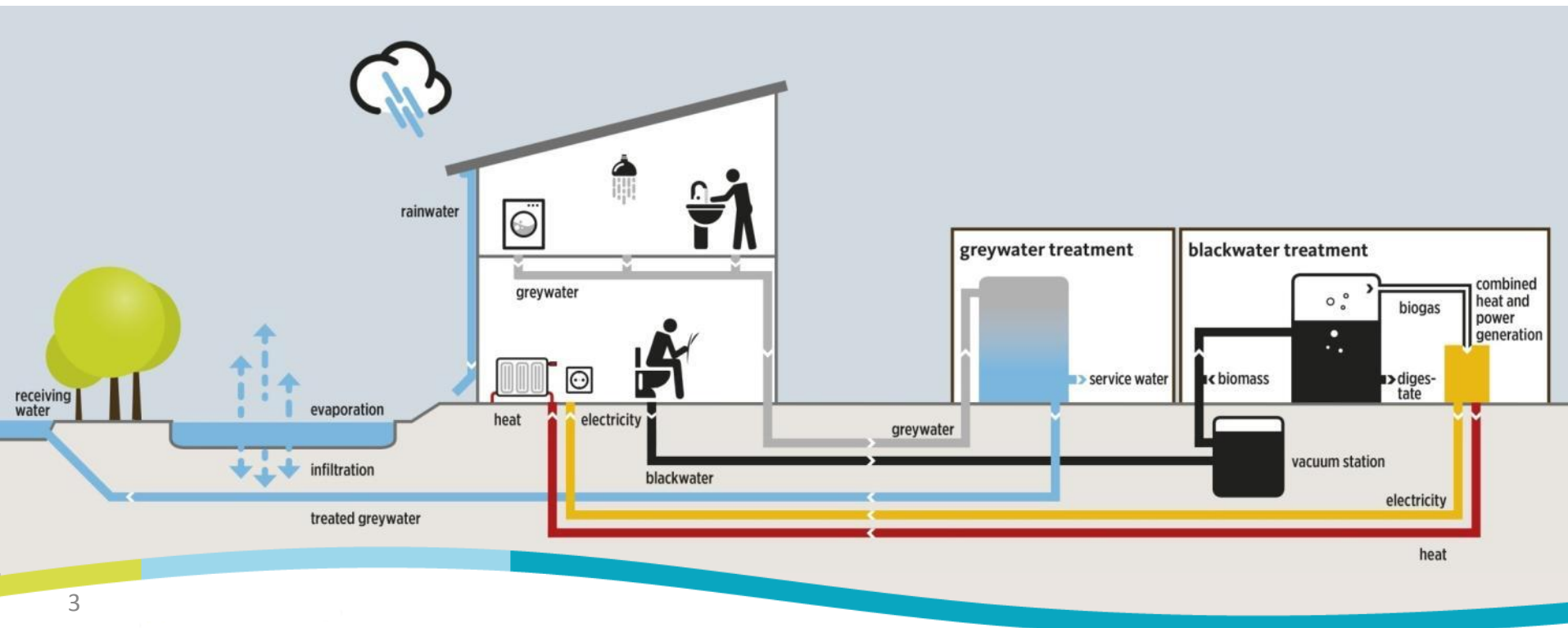
BLACKWATER



Source separation as a basis for an urban wastewater and energy project

HWC – flagship project Jenfelder Au

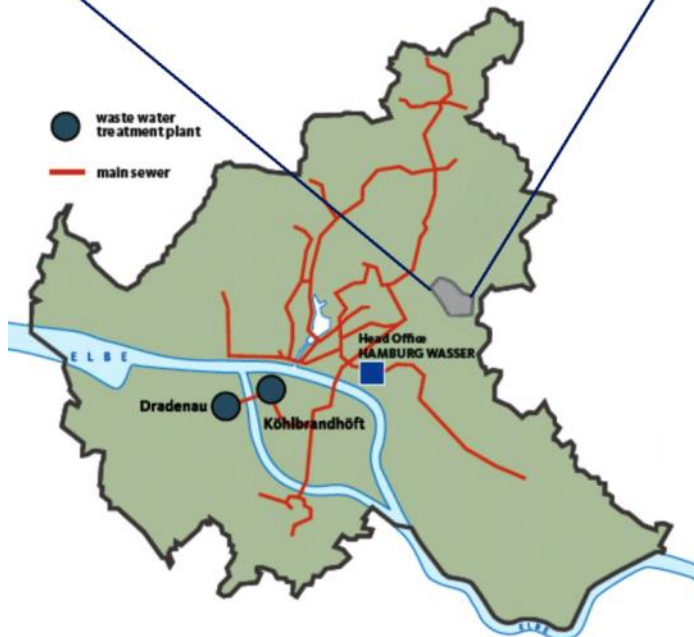
- Separate collection of blackwater, greywater and rainwater
 - Transportation of the blackwater by use of vacuum technology
 - Blackwater recycling allows fermentation with other biomass and therefore a renewable energy extraction on site
- residential heat and power supply!





Situation and geography

- Revitalization of former military barracks into a new urban district
- Realization: 2011 – 2017
- more than 600 housing units with about 2.000 residents
- Low energy and passive houses
- Integration of the innovative concept HAMBURG WATER Cycle®



International classification and support

- Largest separating sanitation system throughout Europe
- Professional operation by HAMBURG WASSER
- Realisation is supported by two German Ministries and the European Commission

SPONSORED BY THE

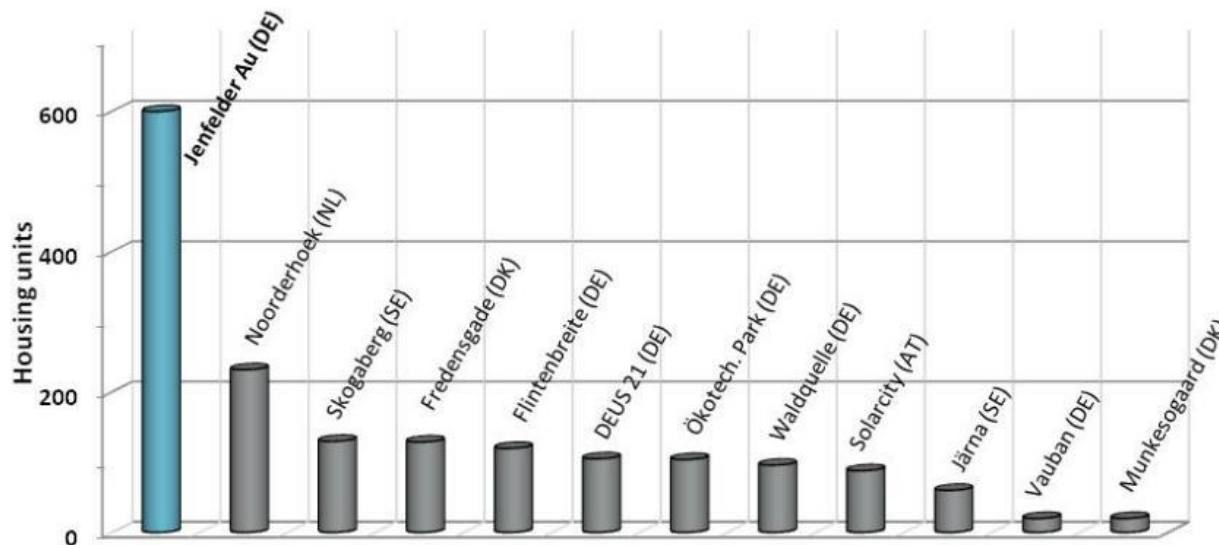


Federal Ministry of Education and Research

Gefördert durch:



Bundesministerium für Wirtschaft und Energie



aufgrund eines Beschlusses des Deutschen Bundestages



HWC – impressions of the construction

2009



2012



2013



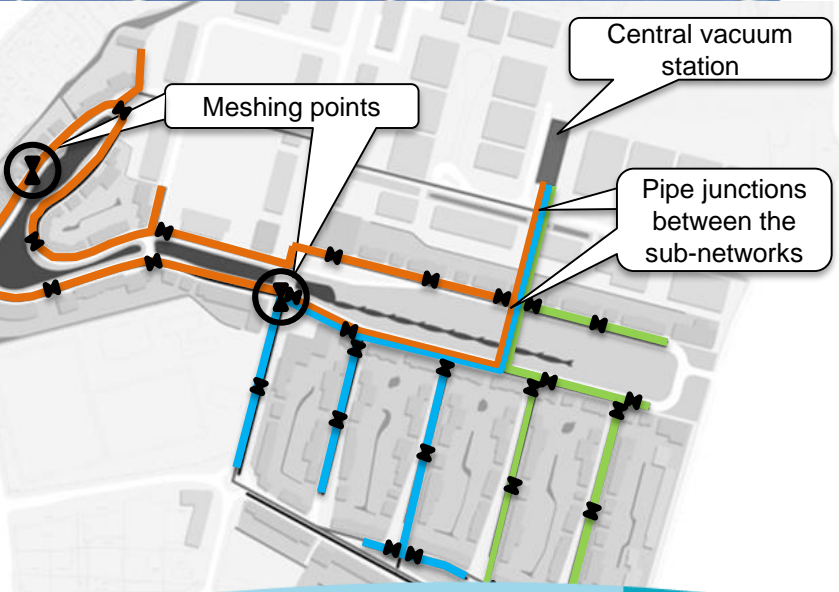
HWC – impressions of the construction

2014



in future



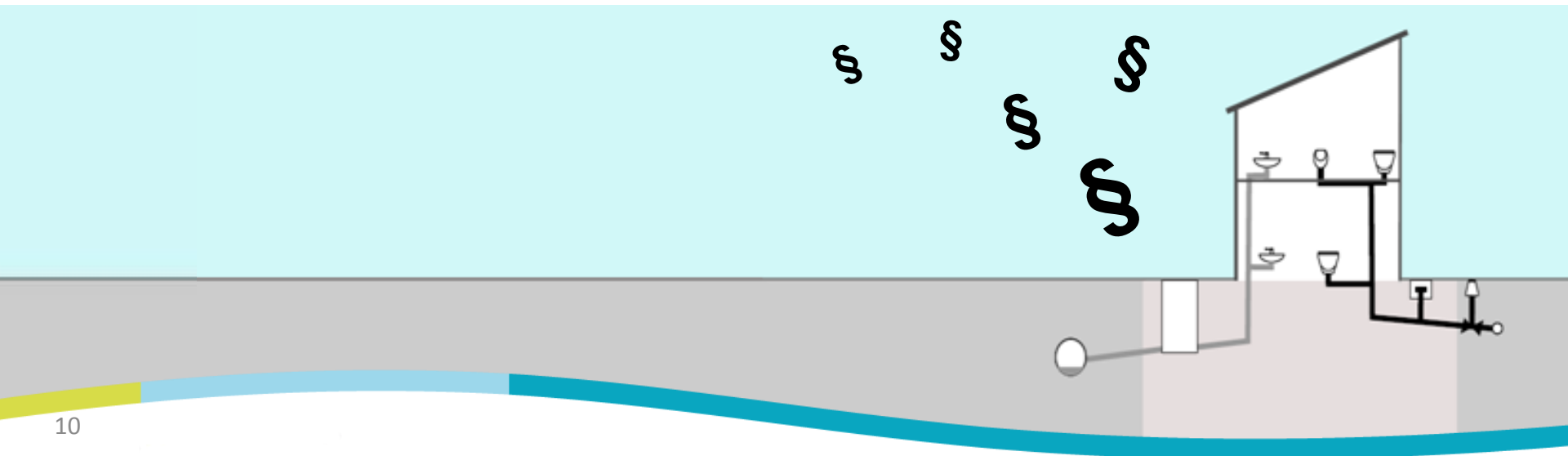


Vacuum toilet

- Central part of the HWC: concentrated blackwater for fermentation
- Reducing drinking water demand: only 0.5 - 1.0 Liter per flush
- Low dilution as a pre-condition for efficient biogas generation and potential nutrient recovery
- Ambition to construct a highly reliable, customer friendly, large-scale blackwater vacuum network

Adaption of policy framework:

- HAMBURG WASSER:
 - responsibility ends at boundary between public and private ground
 - interest in smooth & efficient operation including in-house components
 - revision chamber, leakage tests, ...
- Wastewater law in Hamburg (HmbAbwG) covers so far drainage based on gravity flow sewers and pressure
 - for HWC change of law necessary, this process is in progress since 2010



Stakeholder analysis

Hamburg Ministry of Finance

District authority Wandsbek

Future Inhabitants

Hamburg Ministry of Urban
Development and Environment

International building
exhibition Hamburg

Investors/ owners

Architects, building planners

Chamber of Crafts

Plumbers,
building companies

HAMBURG WATER



The HAMBURG WATER Cycle:

- Combination of supply and disposal
- Intelligent integration of wastewater management based on source control with energy generation

Advantages:

- Energy potential & nutrients of blackwater become reusable
- Climate neutral biogas – CO₂ neutral local heat supply
- About 30% water savings

Special challenges:

- Many stakeholders with different interests
- Legal framework and organisational boundaries need to be adapted



Thank you for your attention!

Questions?

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