



Secure a sustainable water cycle against coming challenges

Jörg Simon, CEO Berliner Wasserbetriebe

Berlin

A growing unified city



- 3.5 million inhabitants, growing city: since 2014 plus 40,000 inhabitants per year
- 3,800 inhabitants per km²
- City area is about 900 km²
- 25% of city area is restricted for water catchment
- Rich in waters: two rivers Spree and Havel, many lakes
- Reunification in 1989

Berliner Wasserbetriebe

Largest integrated water utility in Germany



- In 1992, merger of the two companies of East and West Berlin
- Responsible for water, wastewater and stormwater
- Partially privatised in 1999 (49.9%)
- Re-municipalised in 2013, 100% owned by municipality of Berlin
- Germany's largest company that integrates water and wastewater management

Berliner Wasserbetriebe

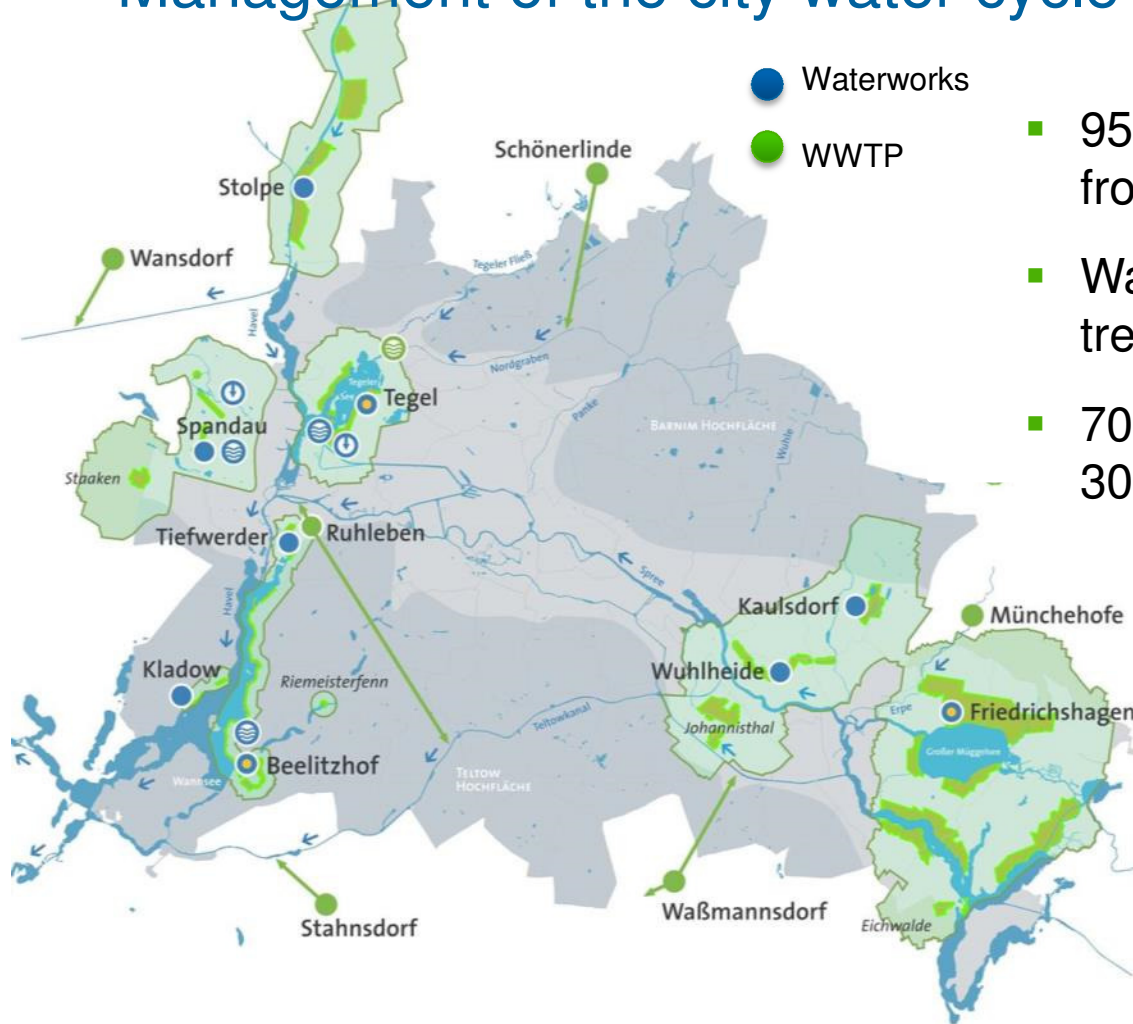
Key Figures



- 190 million m³/a water sales
- 240 million m³/a wastewater treatment
- 9 waterworks with capacities from 30,000 to 250,000 m³/day, 900 wells
- 6 WWTP with capacities from 40,000 to 250,000 m³/day
- 8,000 km water distribution network, less than 5% water losses
- 9,700 km sewer network, 1,100 km pressure lines
- 4,500 employees

BWB's mission

Management of the city water cycle as a whole



- 95% of drinking water is caught from city area

- Water is of very good quality and is treated near-naturally

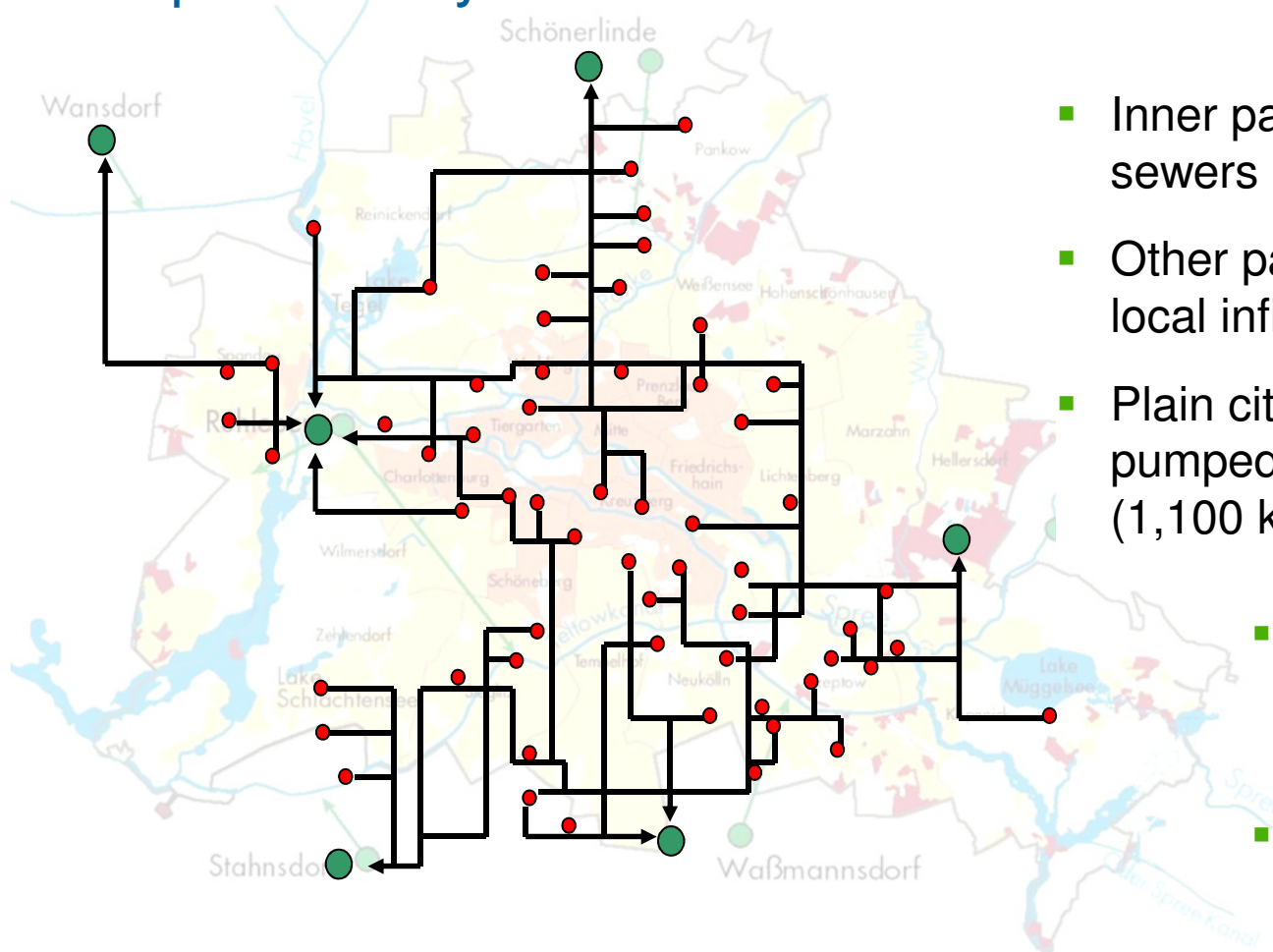
- 70% bank-filtrated water, 30% ground-water

- Condition of surface waters is important

- Significant decrease in water consumption after 1989 (-40%), current development: increasing consumption (+5%)

Wastewater

Optimised system to reduce environmental impact



- Inner part of city: combined sewers (1,900 km)
- Other parts: separate sewers or local infiltration of stormwater
- Plain city area: Wastewater is pumped over long distances (1,100 km pressure lines)
- Present storage capacity for combined sewage: 230,000 m³
- 90,000 tons of sewage sludge per year

Energy

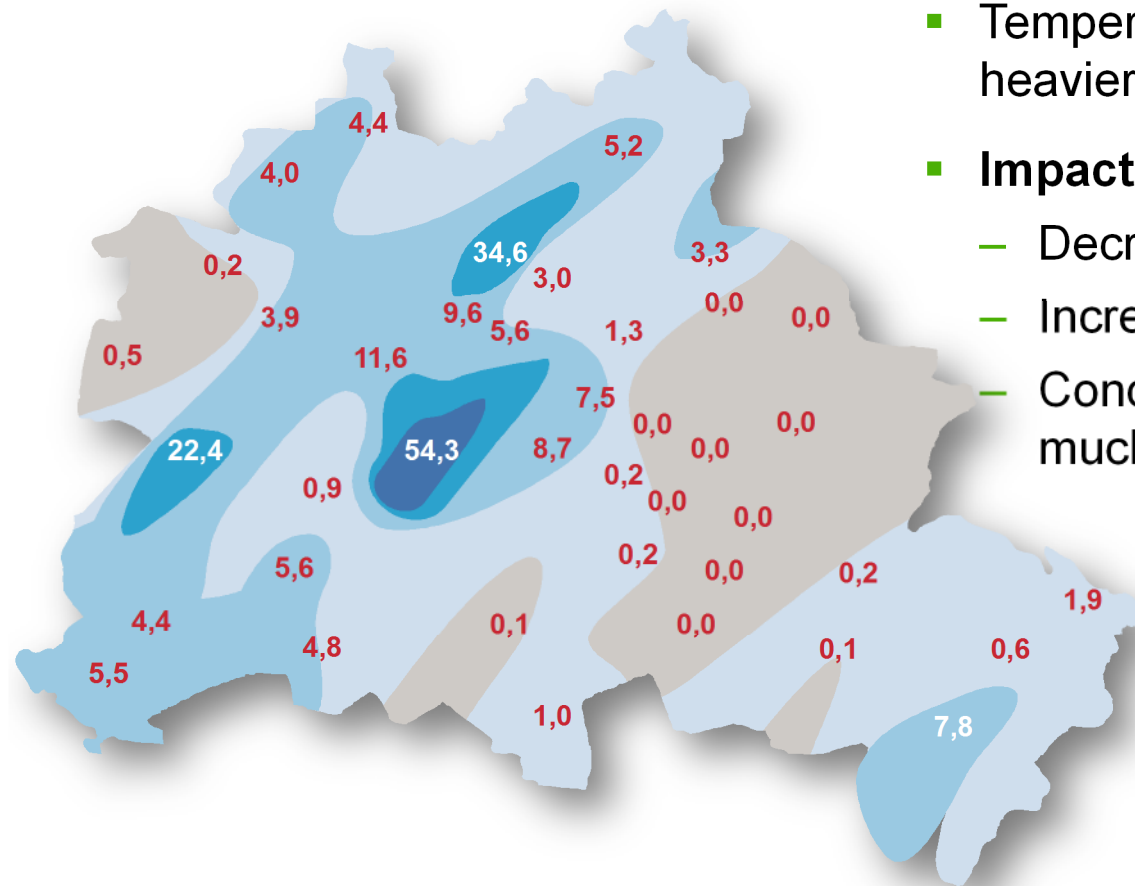
Ambitious CO₂ emission reduction targets



- 370 GWh energy consumption per year
- Increase of customer generated energy up to 30% by means of:
 - digester gas
 - wind power
 - photovoltaics
- Carbon dioxide emissions were reduced by more than 60% in last 20 years
- Focus on optimisation of energy consumption

Impact of climate Change

Preserving the inherited water management system
more important than ever



Precipitation Berlin, 8 August 2007

- Temperature rise, increasing evaporation, heavier single events of precipitation
- **Impact on water management in Berlin:**
 - Decreasing groundwater recharge
 - Increasing share of bank-filtrated water
 - Condition of surface waters becomes much more important
- Need for optimised stormwater management
- Effort in place to reduce carbon footprint

Adaptation Strategies

Sustainable management of the city resources



Drinking water

- Protection of resources regarding quality and quantity

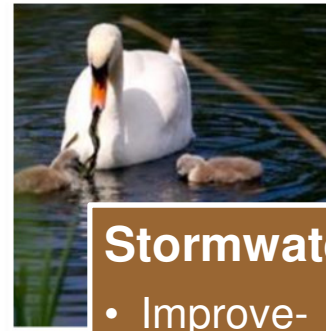
a)



Wastewater

- WWTP: Expansion of treatment capacities

b)



Stormwater

- Improvement of the condition of surface waters

c)



Energy

- Increasing share of renewable energies

d)

a) Drinking Water

Protection of resources regarding quality and quantity



- Optimisation wells: layout and operation
- Improvement of quality monitoring system
- Where necessary: Decoupling of WWTP from water cycle
- R&D in relevant fields (bank filtration ...)
- Additional aspects:
 - Sulphate in river Spree from coal mining activities
 - Increasing consumption of pharmaceuticals

b) Wastewater

WWTP: Expansion of treatment capacities



- Fourth treatment stage in WWTP: reduction of nitrogen and phosphorus
- Where necessary: UV-disinfection
- Additional aspects:
 - Trace organics
 - Reduction of germs
 - Growing population
 - Microplastics

c) Stormwater

Improvement of the condition of surface waters

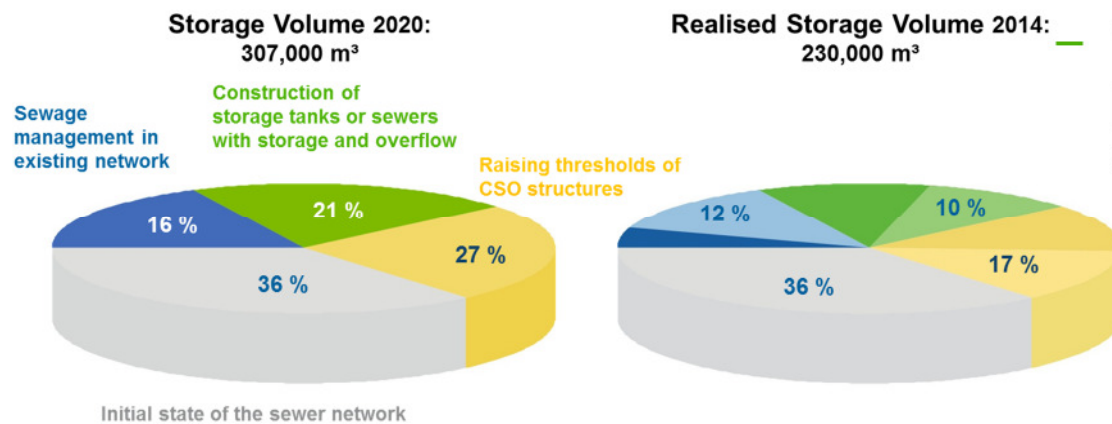


- Quality improvement of surface waters: Reduction of combined sewage overflows

- Capacity extension of storage in sewers (today: 230,000 m³, in 2020: 307,000 m³)

- Optimised operation of pumping stations

- Where possible: Transformation of paved areas into permeable areas, decentralised solutions



d) Energy

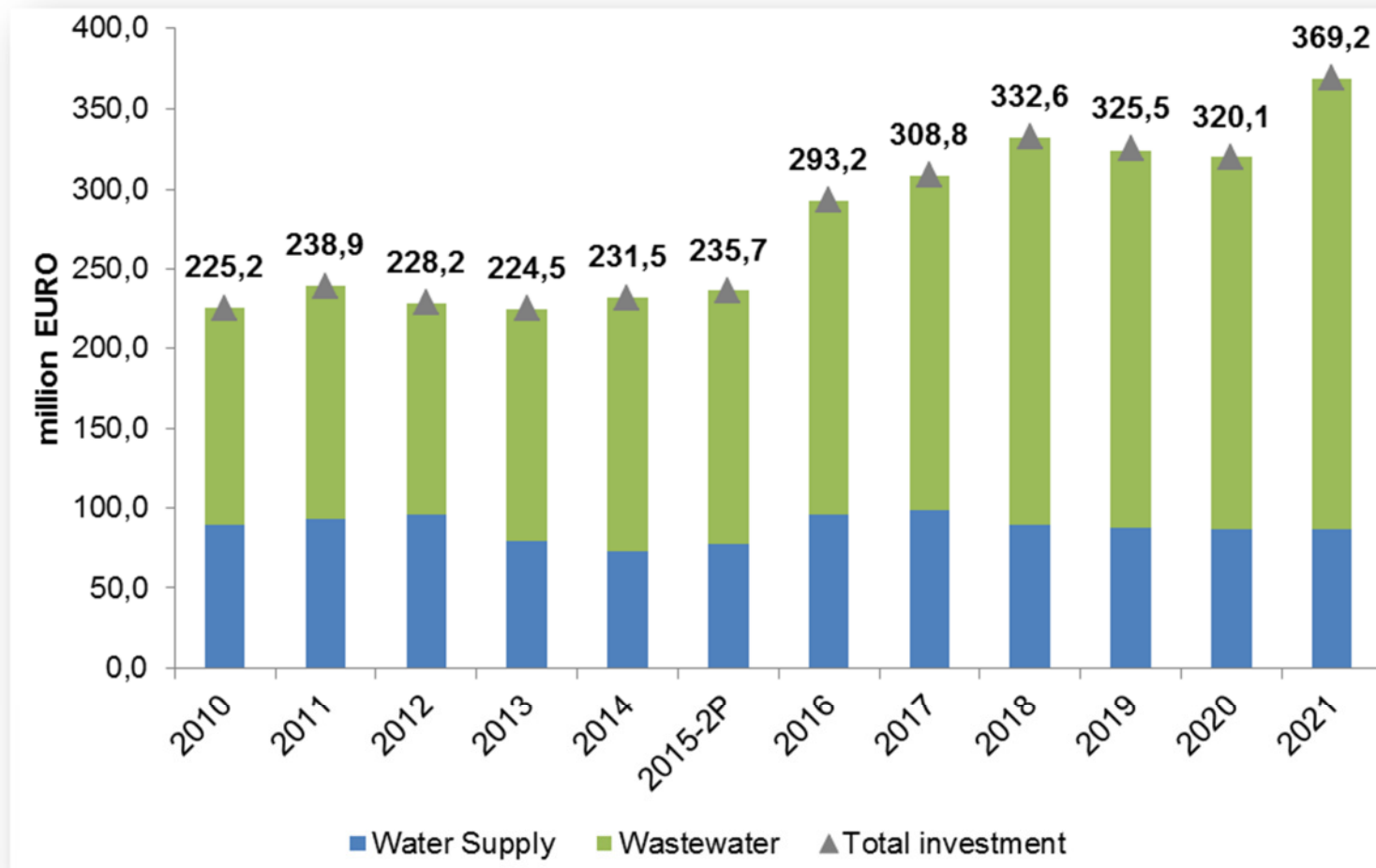
Increasing share of renewable energies



- Further optimisation of energy consumption
- Increasing production of digester gas by means of power-heat generation
- Increasing the share of renewable energies:
 - Optimisation of customer generated energy
 - Purchase of electricity from renewable sources

Increasing Investments

Main Focus Wastewater Disposal



Conclusion



To prepare for the future in a context of climate change we are:

- unlocking the full potential of unique Berlin water cycle system through operational optimisation and comprehensive water cycle management by strengthening our efforts on keeping, respectively achieving a good condition of surface waters
- keeping a focus on further energy optimisation
- prioritising future investments in stormwater capacity, water and wastewater treatment capacity and energy optimisation