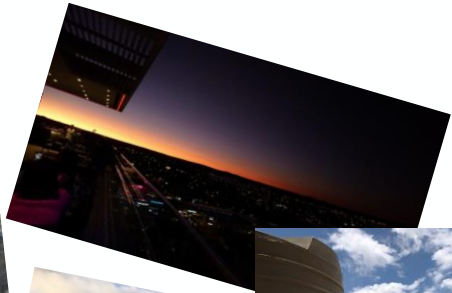


MORE THAN  
8,000 KM  
**DISTANCE ...**

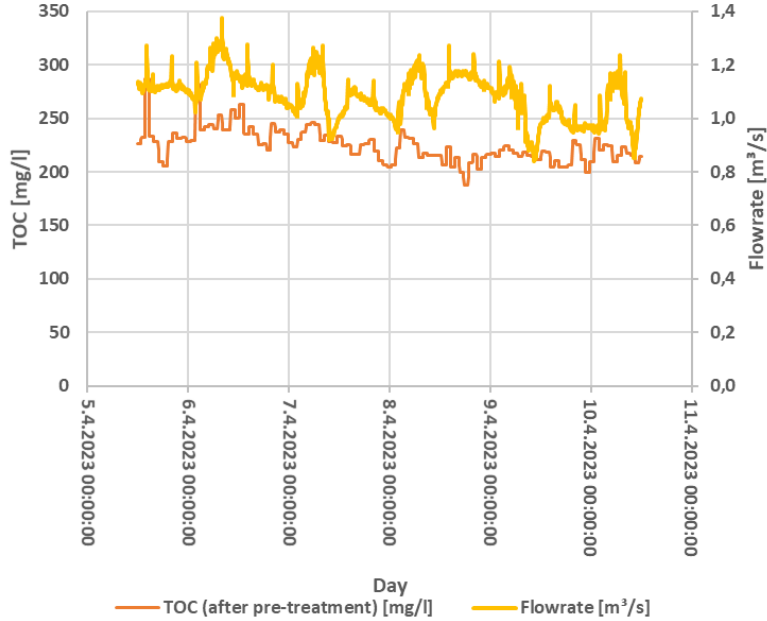


... BUT A LOT OF  
**SIMILARITIES!**

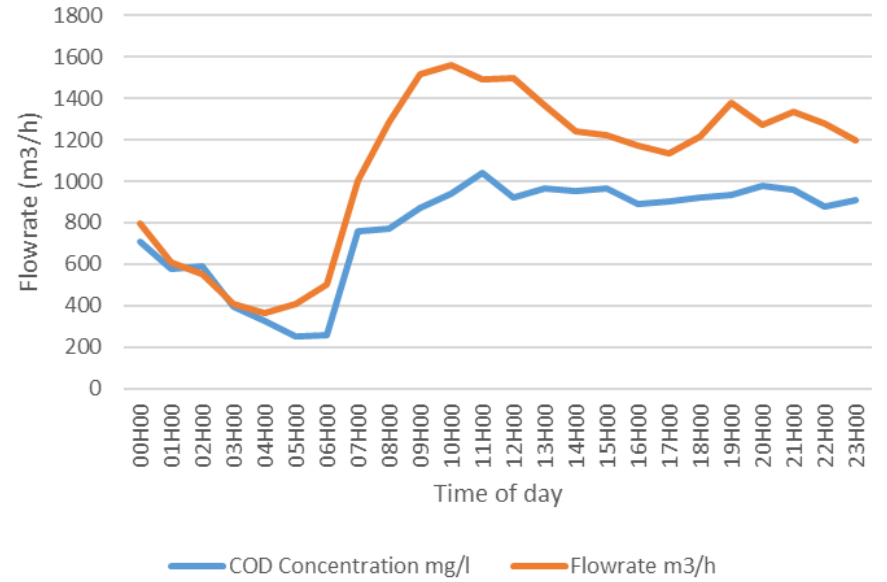


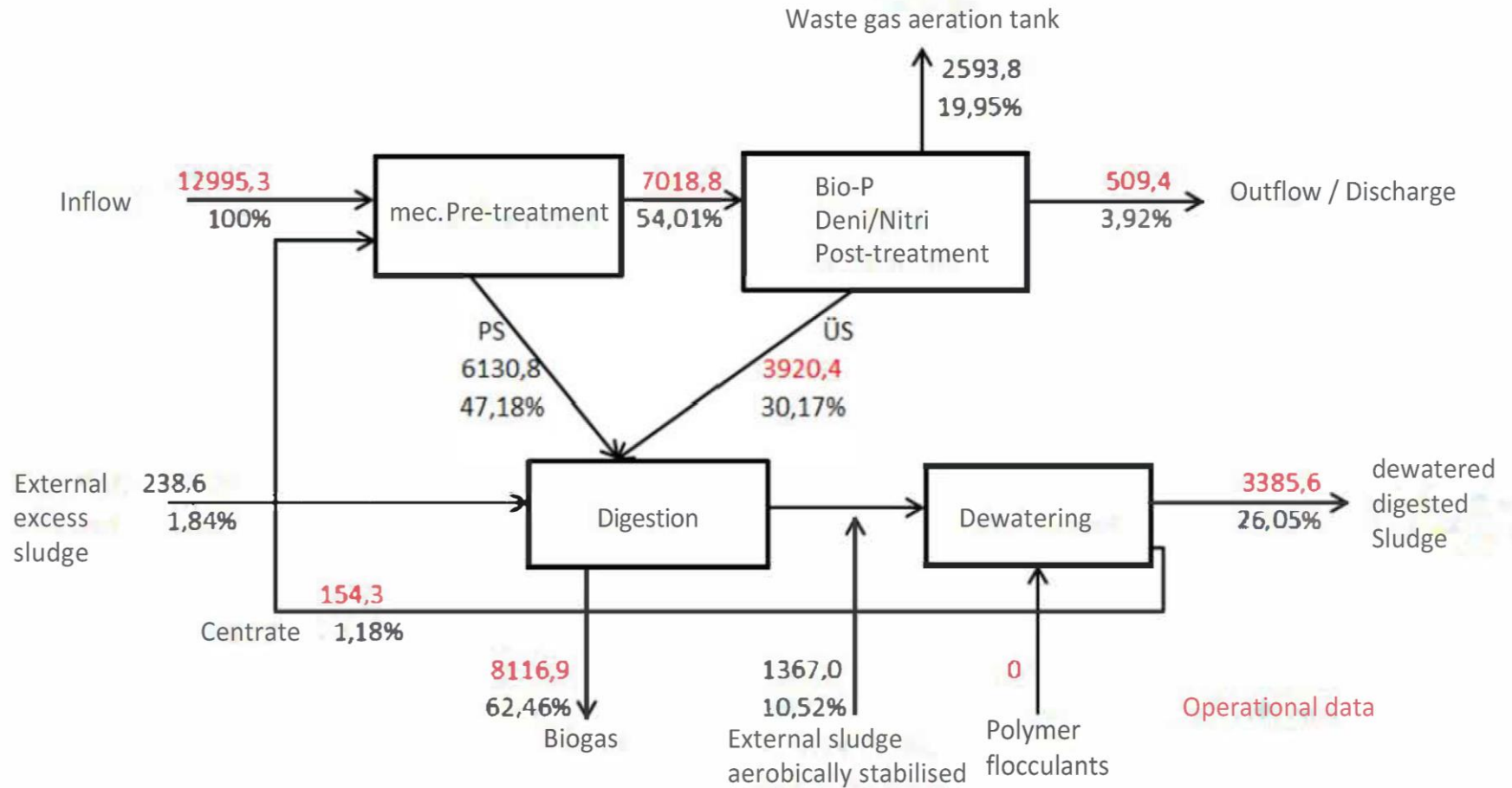


Online variations in influent flowrate TOC  
WWTP Seehausen



Hourly variations in influent flowrate COD-  
Gammams-25 October 2022







## SPECIAL TASKS WINDHOEK

- Preparedness for rainfall events:
  - Use of buffer tanks to retain and temporarily store the stormwater to relief the wastewater treatment plants from extreme hydraulic overloads
  - Incorporate the Namibia meteorological Services for better preparedness
- Implementation of a better repair and maintenance management plan
- Setting up of a sewer training facility
- Awareness: education of the public (e. g. pre-school kids)
- General benchmarking (staffing structures)
- Increase the direct portable reclamation capacity



## SIMILAR TASKS

Year 2020	WWTP Bremen-Seehausen	WWTP Gammams Watercare works	WWTP Bremen-Farge
Start of operation	1966	1963	1973
Inflow COD [ppm]	903	980	893
Inflow [m <sup>3</sup> /d]	118,645	26,000	15,595
Industrial sewage [%]	35	<10	<10
Effluent COD [ppm]	50	41	30
COD removal [%]	94.2	95.8	96.4

WWTP = Waste Water Treatment Plant



## SPECIAL TASKS BREMEN

- Climate change adaption within the city of Bremen is needed in future to manage heavy rainfall events or extreme urban heat island effects. Thus, establishing a sponge city by decoupling of large sealed areas or roof greening, for instance.  
[www.klimaanpassung.bremen.de](http://www.klimaanpassung.bremen.de)
- Climate change will have a negative impact on the waterbodies of Bremen. Hence, the release of treated wastewater into the river Weser may have to be reconsidered.
- Possible options for the future:
  - Use of treated wastewater for industrial purposes (further treatment needed)
  - Groundwater recharge with treated wastewater
  - Producing drinking water from wastewater through establishing new treatment steps
- Currently, we are looking into further treatment processes to achieve higher WWTP effluent qualities (i.e. removal of micropollutants).



German-African Partnership for Water and Sanitation - GAPWAS

ASK THE EXPERTS vol. 6

# Valorising the end-products of domestic and industrial wastewater treatment

25.04.2023

The way of WWTP Bremen-Seehausen to an energy neutral plant



African Water and  
Sanitation Association  
Association Africaine de  
l'Eau et de l'Assainissement



German Water  
Partnership



1 WWTP Farge



4 Pressure Pipe Findorff



2 Control Center Seehausen



5 Stormwater Basin MVA



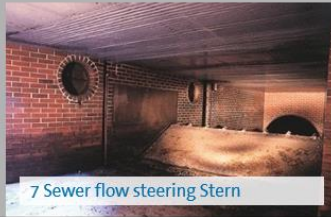
2 WWTP Seehausen



6 Main Pumping Station Findorff



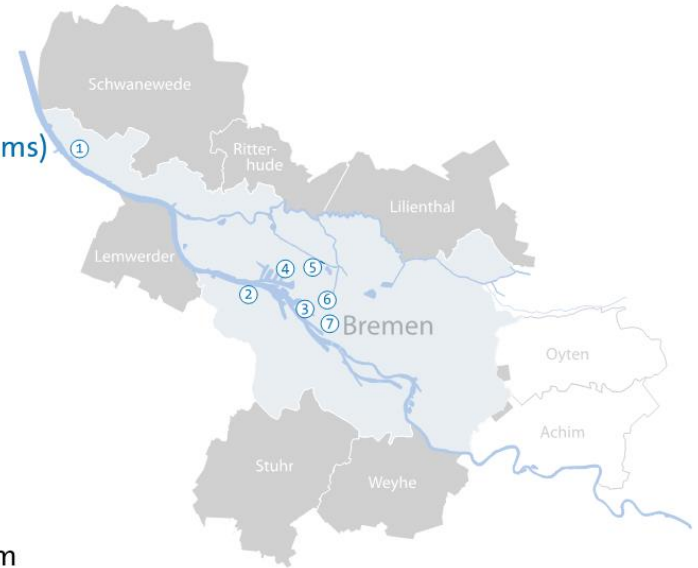
3 Headquarter



7 Sewer flow steering Stern

## Sewer system (Mixed- and separated Systems)

- 2,200 km Sewer
- 130 km pressure pipes
- 200 pumping stations, Stormwater basins
- Storage Volume for Stormwaterevents  
270,000 m<sup>3</sup>
- 230 km Sewer-CCTV-  
Inspection per year
- Sewer information system
- 700 km sewer cleaning per  
year
- Operational sewer  
information system



## Treatment

- WWTP Seehausen  
1,000,000 Inh
- WWTP Farge  
160,000 Inh

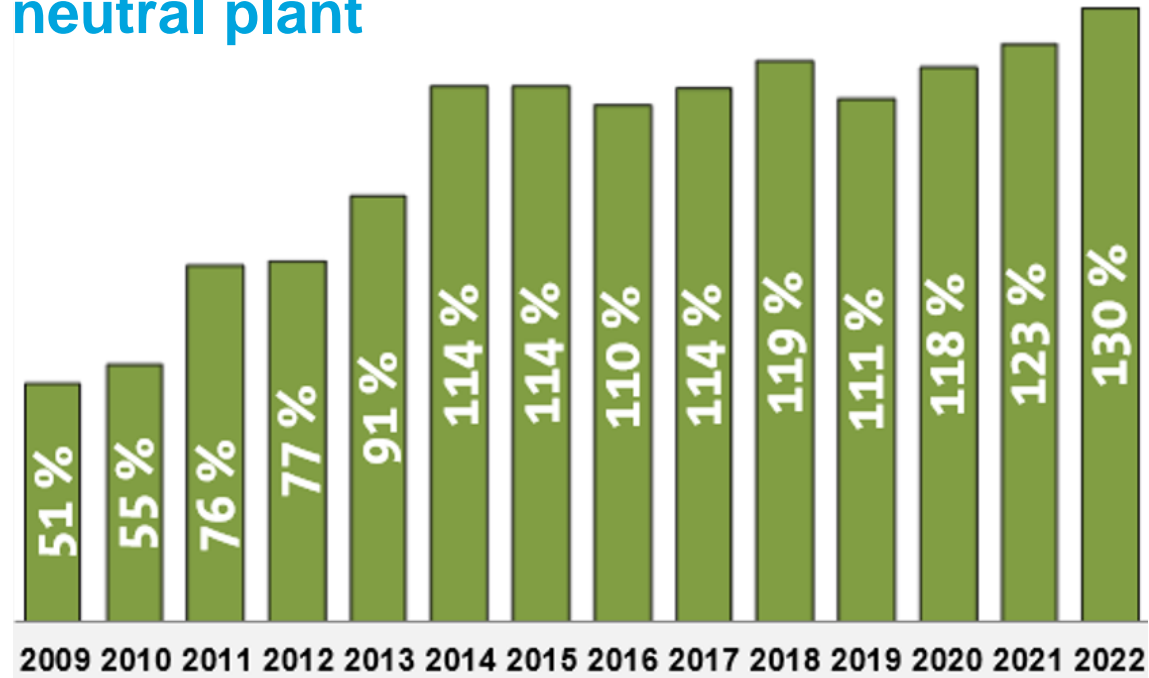


African Water and  
Sanitation Association  
Association Africaine de  
l'Eau et de l'Assainissement



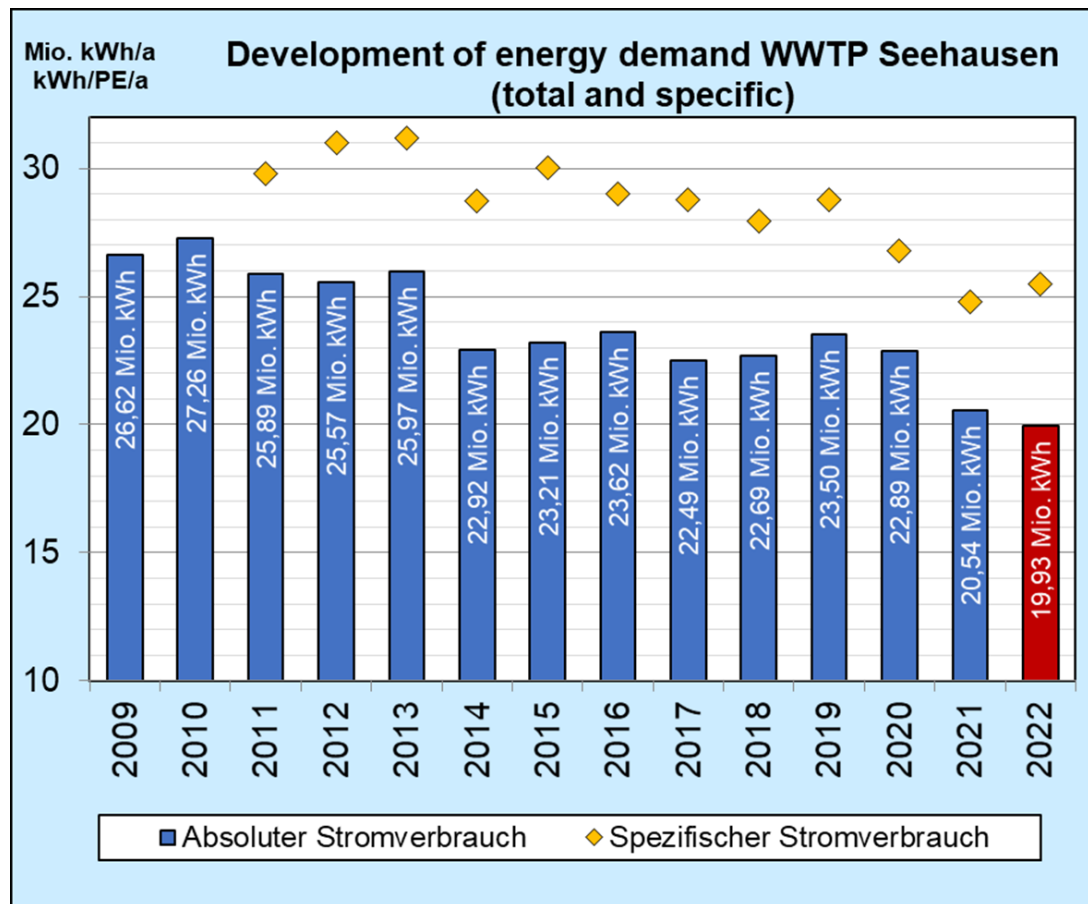
German Water  
Partnership

## The way of WWTP Bremen-Seehausen to an energy neutral plant



**Development of energy self-production**  
(on site – gas, wind and sun)





# Way to energy neutrality

## More efficient in energy-



### Repowering

3 combined heat and power unit (1.4 MW el/unit) and a wind turbine (2 MW). Higher gas production.

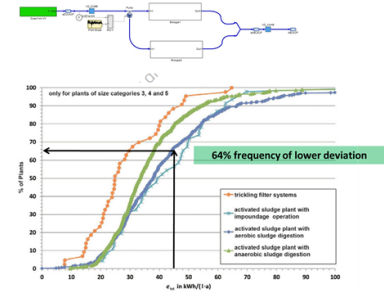
**production**



### Reinvestment

New (economically viable) aggregates with a lower specific demand (compressors, pumps, ...)

**demand (technical)**



Figures 1 and 2: Specific total power consumption depending on the cleaning process

### Optimization

Digital twin of WWTP and focus on processes with high demand (aeration).

**demand (process)**

## Set of rules DWA A-216

### What is the DWA Set of Rules?

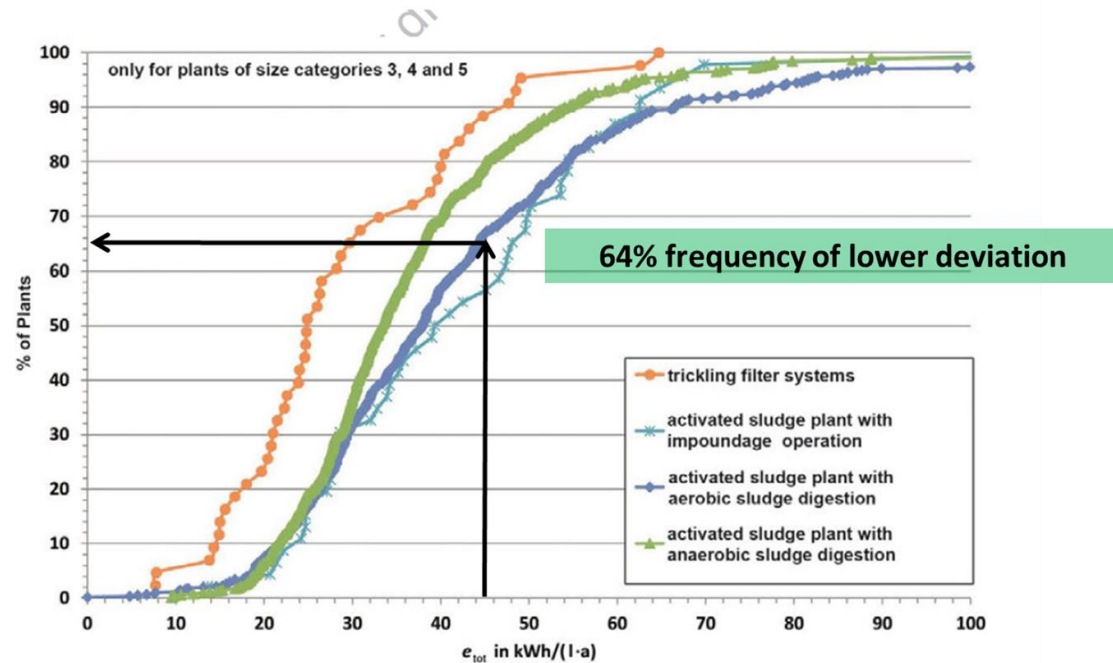


Technical standards are an important factor in efficaciously and economically protecting the environment and material goods and in promoting quality assurance. The DWA therefore incorporates into its standards the most recent findings on time-tested procedures. The DWA Set of Rules consists of

Standards and Guidelines and is prepared by more than 2400 specialists, who are engaged in the association in an honorary capacity and work in more than 340 specialist committees and working groups.

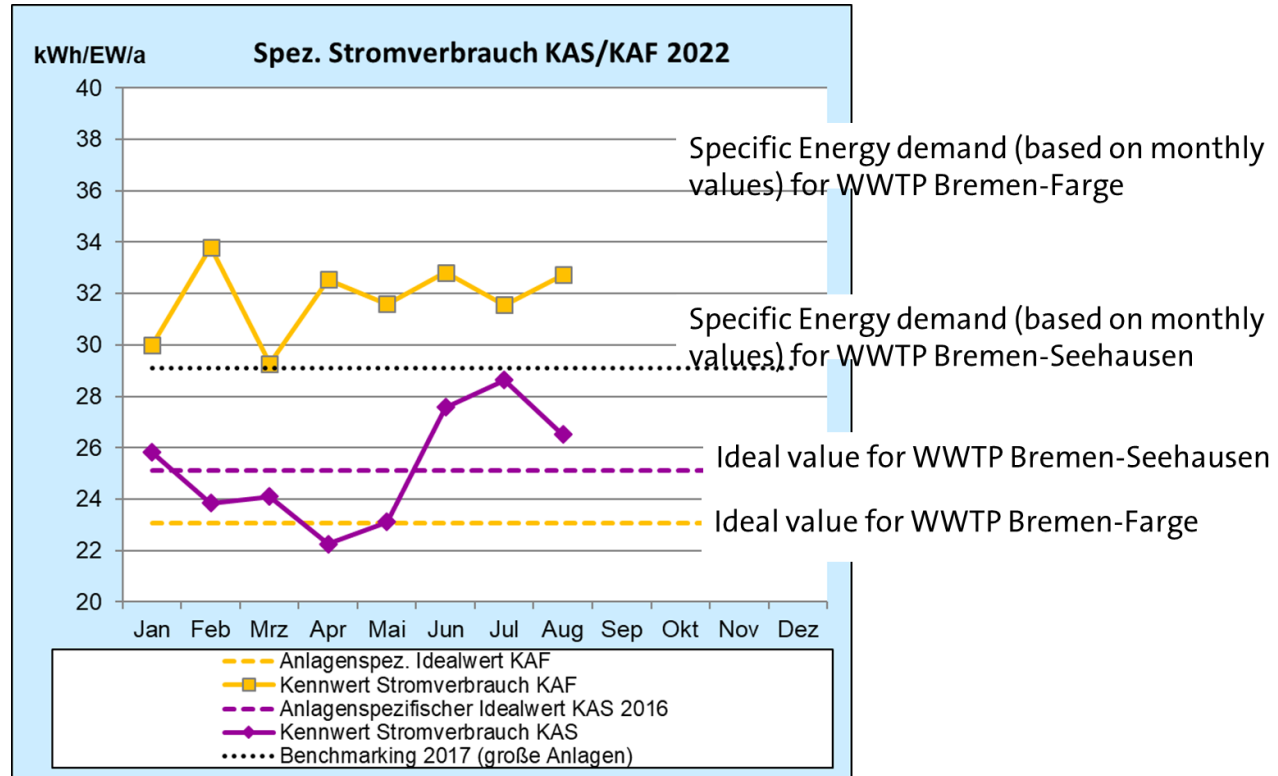
The DWA Set of Rules is viewed in Germany as the general basis for planning, construction and operation of plants in water, wastewater and waste management, as well as in soil conservation. It makes a considerable contribution to keeping the cost of environmental protection at a reasonable level. With this Set of Rules, the associations assume individual responsibility for their specific areas of expertise and unburden the state to a considerable extent: it should be noted that the DIN standards and the rules and standards of the DWA are of equal importance.

# Energy Check



Figures 1 and 2: Specific total power consumption depending on the cleaning process

## Energy Check



## Summary

- ▶ We started at a good point because the main aggregates for energy production and demand had to be renewed.
- ▶ Energy neutrality was a main goal of the whole company and not a one-man-show.
- ▶ We reduced the specific demand of aggregates and the process and raised the efficiency of production.

# Thank you for your attention!

## Any Question?

**Jörg Oppermann**

Process engineer

hanseWasser Bremen GmbH  
[oppermann@hansewasser.de](mailto:oppermann@hansewasser.de)



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