

Sofiyska voda experience in the implementation of circular economy principles

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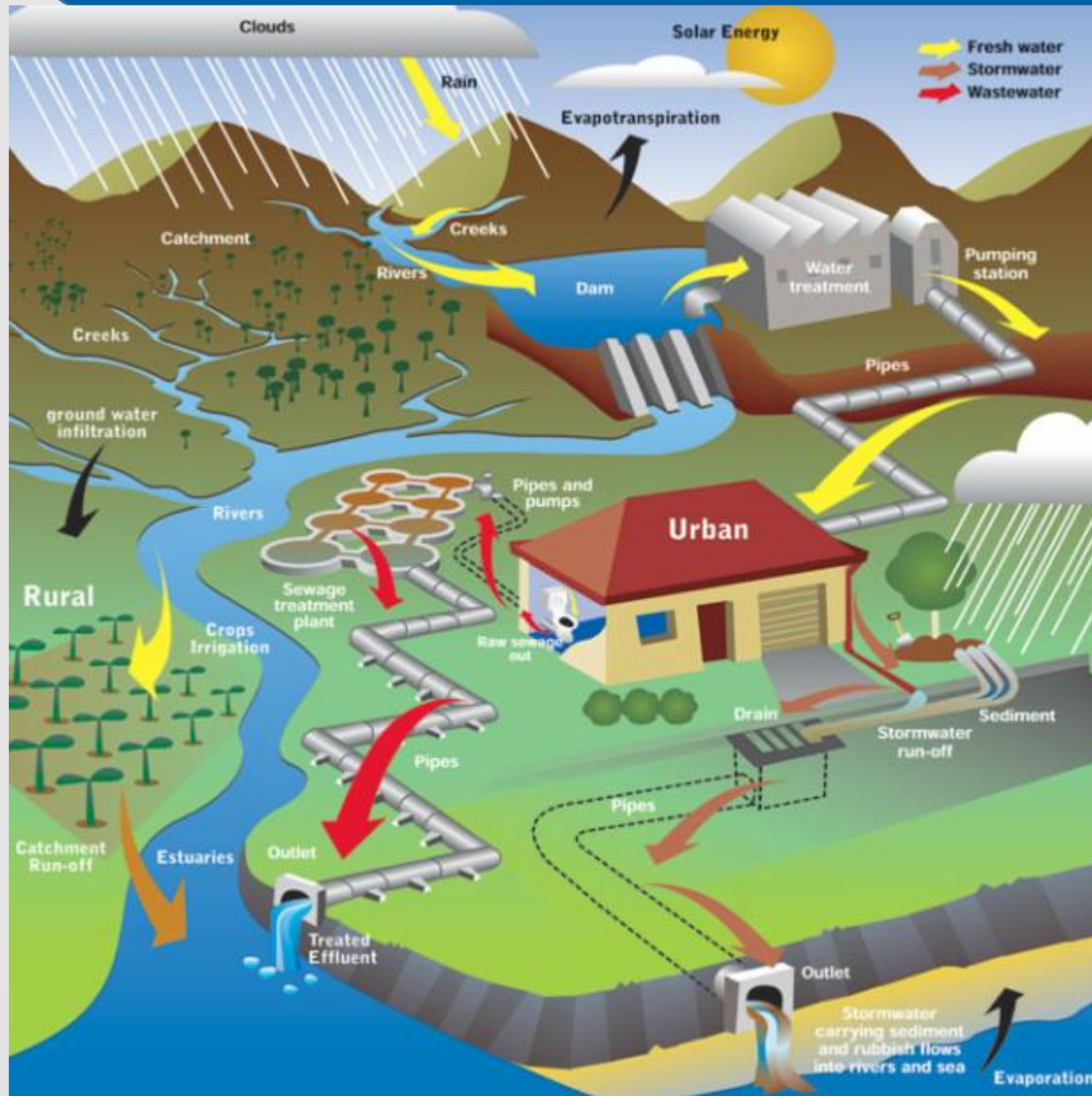




- Water and sanitation sector in the context of circular economy
- WWTP Kubratovo
- Sludge recovery
- Energy production and efficiency



WATER AND SANITATION SECTOR IN THE CONTEXT OF CIRCULAR ECONOMY



Drinking water supply

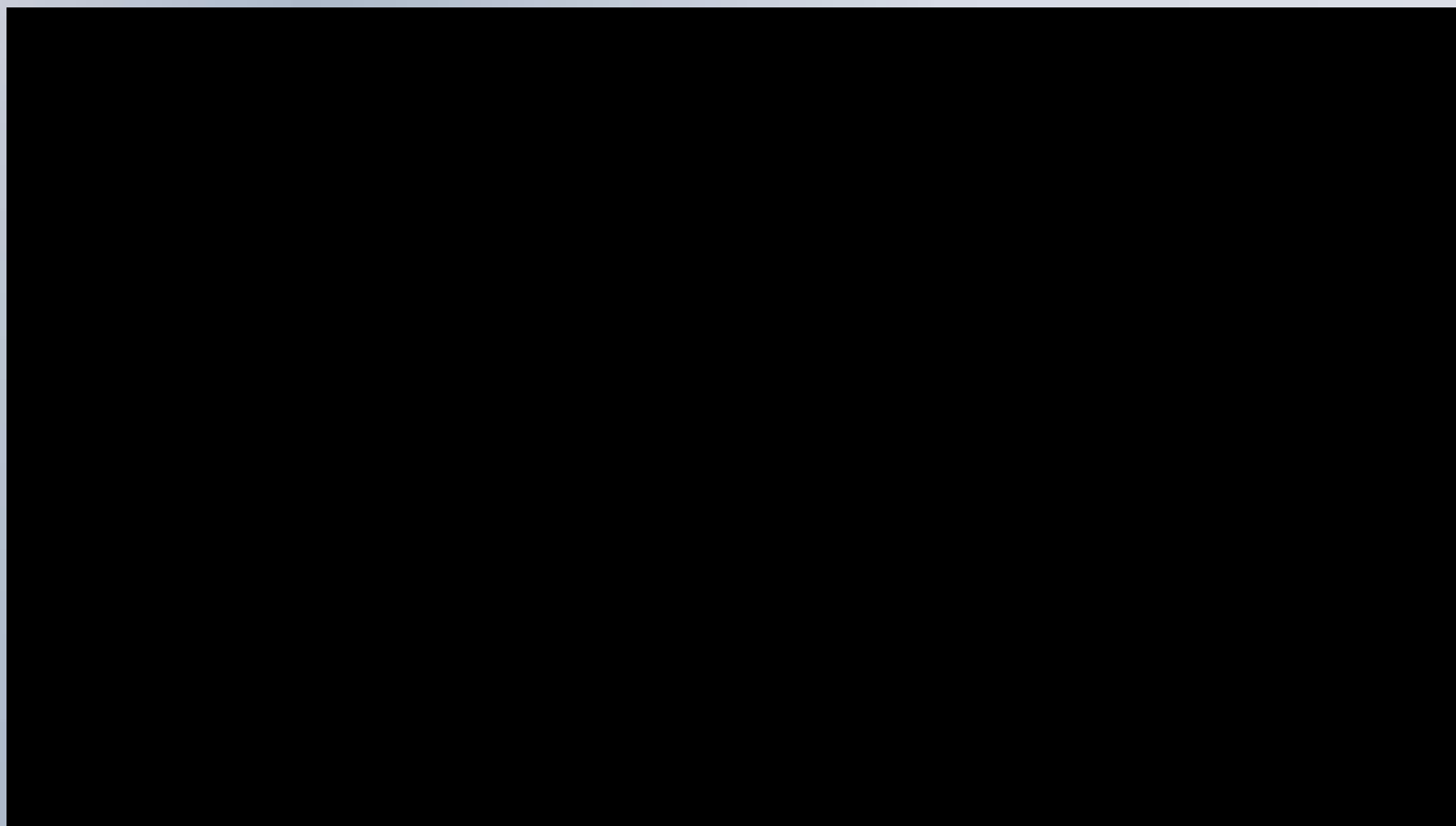
- Water sources and river catchments
- 4 Drinking water production plants (capacity 1 145 000 m³/day)
- 64 reservoirs
- 16 drinking water pump stations
- 35 chlorination station
- 250 hydrophore installations
- 4 000 km drinking water network

Sewerage and waste water treatment

- 1 600 km sewerage network
- 4 sewerage pump stations
- 1 urban waste water treatment plant
 - Capacity - 1.3 mln. Population equivalent
 - More than 400 000 m³/day treated waters
 - 120 000 t/yearly sludge generated
- 1 local wastewater treatment plant

WATER AND SANITATION SECTOR IN THE CONTEXT OF CIRCULAR ECONOMY







Sludge treatment line (Stabilization)

- *Gravity thickeners for excess activated sludge*
- *Mechanical thickeners*
- *Anaerobic digesters (methane tanks)*
 - *4 methane tanks x 7000 m³*
 - *Mesophilic digestion (35-40°C)*
 - *15 - 19 days overtime*





Sludge treatment line (Dewatering)

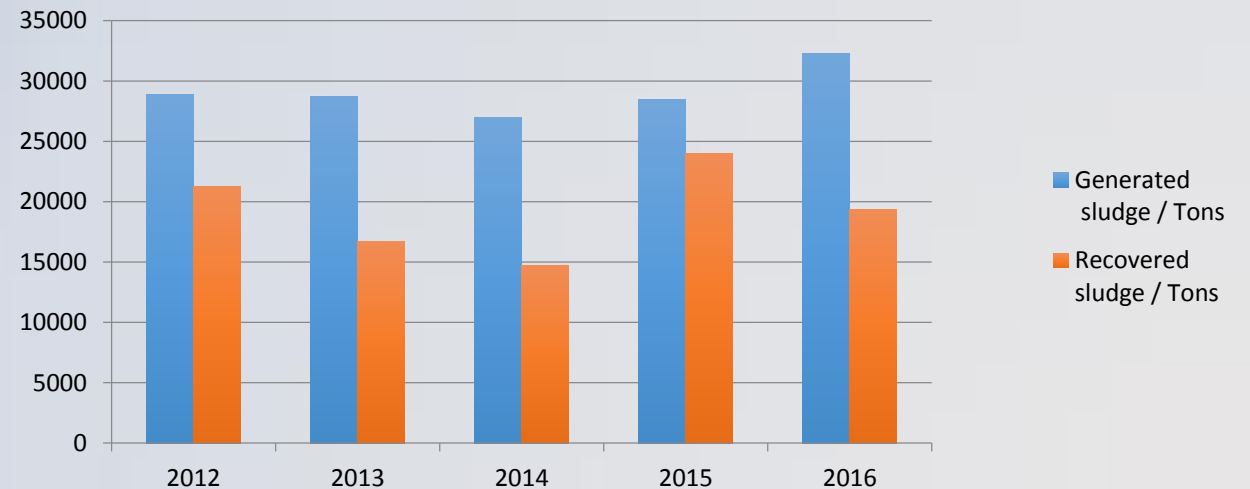


• Belt filter presses

- 5 pcs.
- 15 -30 m³/h
- 22 - 28% dry matter content in dewatered sludge

• Limming

- Add CaO before the process of recovery in agriculture



Legal National framework Sludge utilization ordinance



- ▶ *Continuous Sludge quality tracking on following parameters*
 - ▶ *General - pH; humidity; Nitrogen; Phosphorous; Mercury; Calcium; Magnesium*
 - ▶ *Heavy metals - chromium, copper, zinc, cadmium, lead;*
 - ▶ *Microbiological - Salmonella sp.; E.coli (coliforms); Clostridium perfrngens; viable Helminth eggs*

SLUDGE RECOVERY





► *Energy production*

- *Double membrane gasholder - 970 m³*
- *Cogeneration installation*
- *3 cogeneration units*
- *1063 kW electricity per co-generator*
- *1088 kW heat per co-generator*
- *Capacity - 35 000 - 39 000 m³/day of biogas*





TENDENCY IN ELECTRICITY CONSUMPTION AND ELECTRICITY SELF-SUFFICIENCY OF
SWWTP OVER YEARS

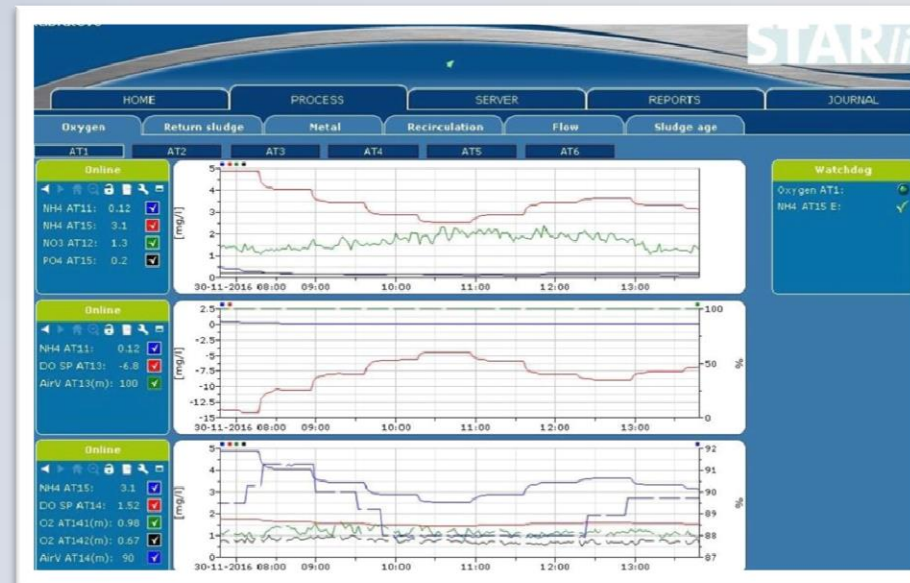


Energy Consumption Ratio



Technological improvements to reduce energy consumption

- ▶ *New Heat Recovery System from CHP exhaust gases*
- ▶ *New blowers - efficient alternative to the old Russian Blowers*
- ▶ *Integrated STAR System software from Kruger for efficient Blower operation control*





Our dream for Sofia - to reach an energy
independent water supply system

ка вода



THANK YOU FOR YOUR ATTENTION!

Софийска вода



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