Ejby Mølle – energy producing WWTP (WRFF)

Anders Bækgaard, VCSDenmark
IWAMA 3rd International Capacity Development Workshop
Energy Efficiency in WWT

Szczecin, Poland, June 7.-8. 2017
Odense & VCS Denmark

- 3rd largest city in Denmark; pop. 200,000
- Birthplace of H.C. Andersen
- VCS Denmark est. 1853 (first in Denmark)
- Staff of 210 provide water supply, “used” water management for a population equivalence of 400,000 and contribute to climate change adaptation
- Operate 6 WTPs; 8 WRRFs (Water Resource Recovery Facilities); 3,400 km of sewerage
- Provide operational services, training and consultancy on domestic and foreign markets
Means:

• Save energy by more efficient behaviour and process management
• Production of more electricity and district heating by increased efficiency in the biogas facility
• Utilize energy sources with low potential (i.e. heat pumps and turbines)
• Store CO2 by afforestation
• Sun and wind energy production
• Move energy consumption to times of the day with a low CO2 footprint

The VCS road to energy- and CO2 neutrality
Ejby Mølle case - Odense

- Ejby Moelle WWTP, 385,000 PE – situated in Odense owned and operated by VCS Denmark.
- In 2011 a project aiming at changing Ejby Mølle from energy consumer to energy supplier was initiated with a changed focus on the use of the resources.
- Energy optimization through energy reduction and energy production.
- The project identified energy optimization opportunities; concentrate on short-term, readily implementable scenarios to reduce consumption and/or increase generation, decreasing GHG emissions.
- Collaborative approach identified “operational” path to energy self-sufficiency without major capital investments.
- The current challenges will be to target reduction of emissions from all processes including byproducts like N2O and Methane.
ACHIEVING ENERGY INDEPENDENCE AT AN ADVANCED WASTEWATER NUTRIENT REMOVAL FACILITY

Ejby Mølle WWTP
Odense Denmark

2013 WEX Global Innovation Award in Water and Energy!

Our ambition is to make Ejby Mølle a net energy producing WWTP as one of the first plants of its kind in the World.
Deammonification

- DEMON
- Sidestream deammonification
- Mainstream hydrocyclones
Energy Balance

[kWH] (Electricity) & (Production) & (Consumption)
WATER’S WORTH IT®

MEET Anna Moxie
ALEXANDRIA’S nitrogen-eating, water-cleaning HERO!

CREATIVITY IS THINKING UP NEW THINGS.
INNOVATION IS DOING NEW THINGS.
VCSDenmark – total energy balance

Energy Consumption and -production

<table>
<thead>
<tr>
<th>Year</th>
<th>Total energy consumption el, heat, transport</th>
<th>Energy production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>20 GWh</td>
<td>15 GWh</td>
</tr>
<tr>
<td>2013</td>
<td>25 GWh</td>
<td>22 GWh</td>
</tr>
<tr>
<td>2014</td>
<td>20 GWh</td>
<td>28 GWh</td>
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<tr>
<td>2015</td>
<td>25 GWh</td>
<td>30 GWh</td>
</tr>
<tr>
<td>2016</td>
<td>25 GWh</td>
<td>30 GWh</td>
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Thank you for your time
Welcome!

IWA World Water Congress & Exhibition
Copenhagen, 18 – 23 October 2020

www.iwa2020copenhagen.dk
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