HCR SYD: **GREEN** WASTEWATER **TREATMENT** PLANT WITH **AMBITIOUS** GOALS

In Denmark, we see wastewater as a resource.
Carbon, heat energy, sludge and treated wastewater must be optimally utilized and the nutrients in the wastewater must be reused.

Based on this, Hillerød Utility started work in 2013 on the establishment of a green wastewater treatment plant (capacity 100,000 PE) with ambitious goals.

The plant was built on a number of principles:

- Positive net energy
- CO2 neutrality
- Optimal use of resources
- Symbiosis between private and public institutions
- Integration of the facility into natural surroundings with public access
- Environmental care is of high importance

The facility was commissioned in 2018.

A unique design process right from the start

The staff working at the facility were deeply involved in the design phase of the project. Each room were designed with operators, in order to ensure sufficient space to allow for manual handling where required e.g. in regards to sensors and valves.

The result was that high standards for the working environment at the plant were incorporated from the start. 3D models were a key tool to ensure common understanding and alignment.

A treatment plant for the community

The treatment plant has a unique architecture. It is located in the Climate and Environmental Park in Hillerød Municipality where the public has full access. In the design of the facility, a living workshop was envisioned, where the public learns about both wastewater management, the surrounding nature and handling cloudbursts using various sustainable drainage systems.

Industrial symbiosis

An industrial symbiosis of relevant major players was established to map and make good use of the possibilities provided by collaboration with other players on various material and energy streams.

Today, the symbiosis network consists of some of the largest private companies and public institutions- and associations. The network meets 3-4 times a year to discuss new opportunities.

The projects related to the treatment plant include:

- Organic waste from the hospital and two of the largest private companies will be collected and directed to our digester for the production of biogas.
- Neutralization of industrial wastewater by use of wastewater.
- Utilitisation of ocher sludge from the waterworks used for precipitation processes in the wastewater treatment plant – potentially reducing cost for chemicals.
- Surplus heat used in the local district heating network.
- Upgrading of the produced biogas for direct use in the natural gas network or as fuel for vehicles.
- Treatment of pharmaceutical wastewater from the local hospital.

Advanced technology - strict wastewater requirements

A tertiary treatment stage is established to meet the very strict effluent requirements of TN = 3.66 mg/l and TP = 0.182 mg/l.

Technology

- Pre-filtration to recover carbon for biogas production through anaerobic digestion.
- The anammox process is applied for the treatment of reject water from the mesophilic sludge treatment process, extraneous grease and household waste from private companies and the hospital.
- Three parallel biological treatment lines that provide the opportunity for experimentation in collaboration with schools, universities and private companies, e.g. by testing new equipment, technologies and process solutions.

CO2 neutral

- The entire treatment process is planned to become energy-producing and CO2-neutral with intelligent utilization of carbon sources, biogas and residual heat.

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