03 GRID SLIDE

The machine

Grid Slide is a plant using waste products by way of sewage and local renewable energy in terms of changing sea levels to produce electricity and valuable nutrients.

The plant includes a varity of processes:
- Production of biomass in the cultivation of microalgae.
- Cleaning sewage water
- Production of energy by converting biomass into electricity.
- Recycling nutrients and reducting CO2 emission

Production of biomass and cleaning of water.

Algae are found wherever there is water, including in the sea around Copenhagen. Algal growth is based on photosynthesis which is one of the world's most important biological processes, sunlight splits CO2 in water (H2O) and oxygen (O2) and produces biomass - the building blocks of all life forms.

Three minimal steel structures rise like narrow oblong towers. The design carries translucent screens (bioreactors) suspended as scales of a fish. Surrounded by a cloud of slender structural steel work, the bioreactors creates giant curved characters hanging in the cloud. Changes in the sea level operate floatin pumps that press algae-filled water into the towers. By the force of gravity the colored algae liquid is distributed in to the towers bioreactors. The towers exposes the algae to the sun's light and enables photosynthesis.

Microalgae are fed with nutrients in the form of wastewater and CO2 collected locally from the treatment plant Lynetten, and from Amagerværket (Amager Power Station).

The algae purifies the water while the number of algae increased up to six-fold during one day. Their explosive growth enable a constant harvesting. At harvesting the algae is filtered from the now treated water. The algal mass can be extracted as a raw material as part of a series of value-added products, such as cosmetics and products for the pharmaceutical industry.

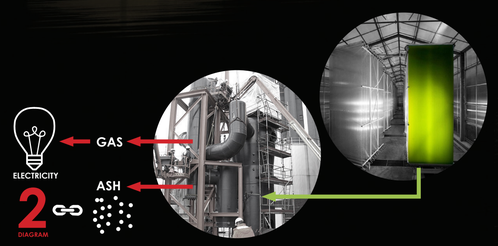
Production of energy and recycling nutrients.

Gasification involves heating the biomass through a process by which the biomass in a short time get heated by hot sand, and in the proces transforms into a gas and a nutritious ash.

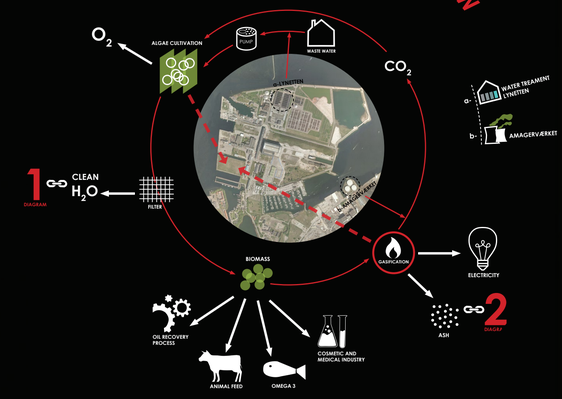
The ash is a renewable agricultural fertilizer consisting of carbon split from CO2 by the algae and phosphor, accumulated in the waste water. CO2 emitted through the process is collected and assimilated by algae in the bioreactors.

The gas runs a turbine, wich delivers electricity to the Energy Grid. Production takes place in the buttom of the eastern tower. Visible for visitors, but enclosed by glass screens.

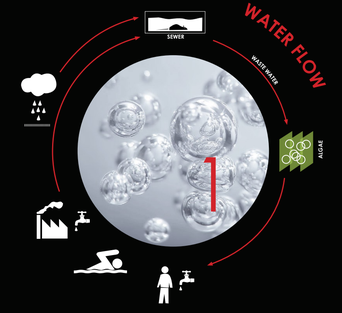
The turbine delivering 2.5 MW providing electricity for 18.000 inhabitants.



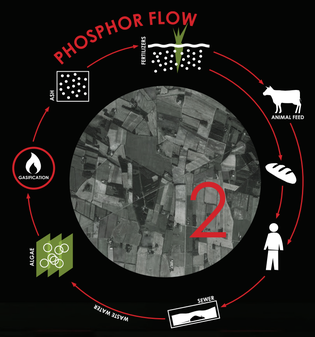
GRID SLIDE PRODUCTION FLOW



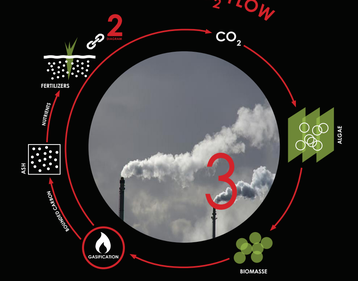
WATER FLOW



PHOSPHOR FLOW



CO_2 FLOW



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