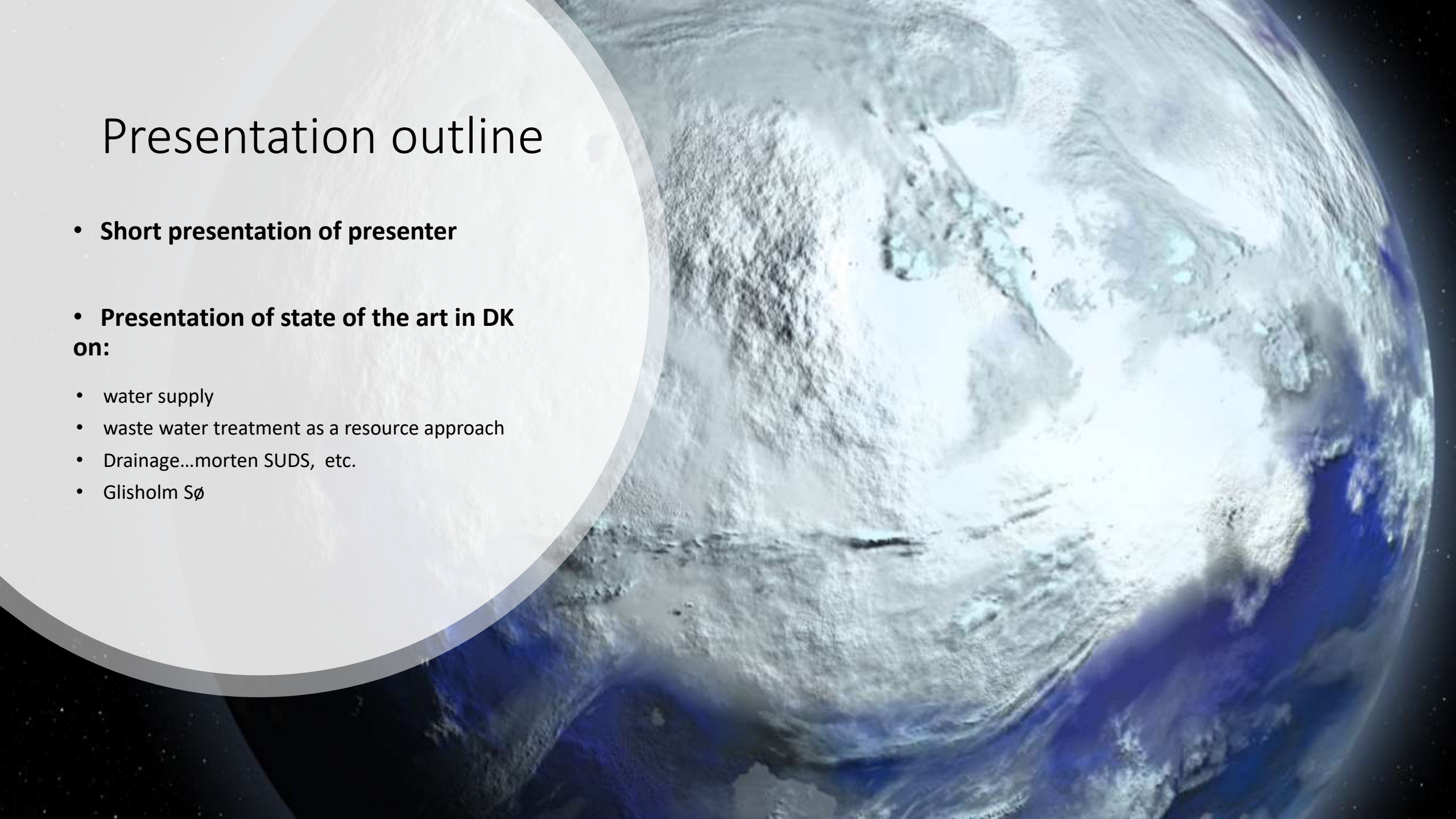

SDU
University of
Southern Denmark
SDU

Presentation outline

- **Short presentation of presenter**

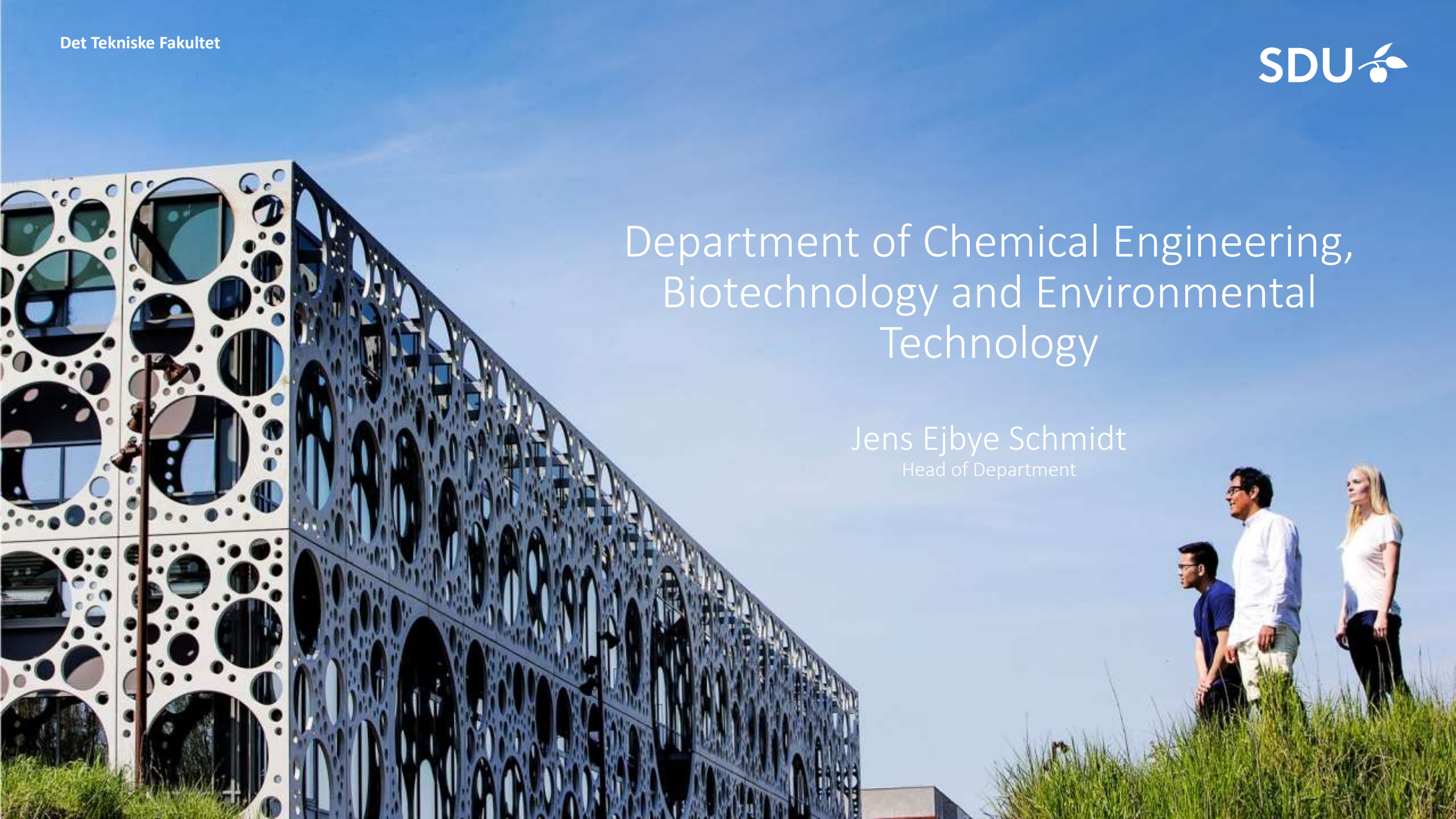
- **Presentation of state of the art in DK on:**

- water supply
- waste water treatment as a resource approach
- Drainage…morten SUDS, etc.
- Glisholm Sø



Department of Chemical Engineering, Biotechnology and Environmental Technology

Jens Ejbye Schmidt
Head of Department



SUSTAINABLE DEVELOPMENT GOALS

" At SDU, we have an obligation to educate the youth of the future to create value, not just for the local society, but also for the world community. The same applies to our research activities. This decision will have an extensive effect on the entire way we run the university.

Henrik Dam, Vice-Chancellor of SDU

SDU

Department of Chemical Engineering, Biotechnology and Environmental Technology – SDU KBM

Ambition

We assume responsibility for development of sustainable solutions and technologies for the future society, climate, environment and human health.

We assume responsibility for the education of the next generation of engineers who can take the key role in this sustainable development.

The department is divided into three units, each with a specific research area:

SDU Biotechnology

SDU Chemical Engineering

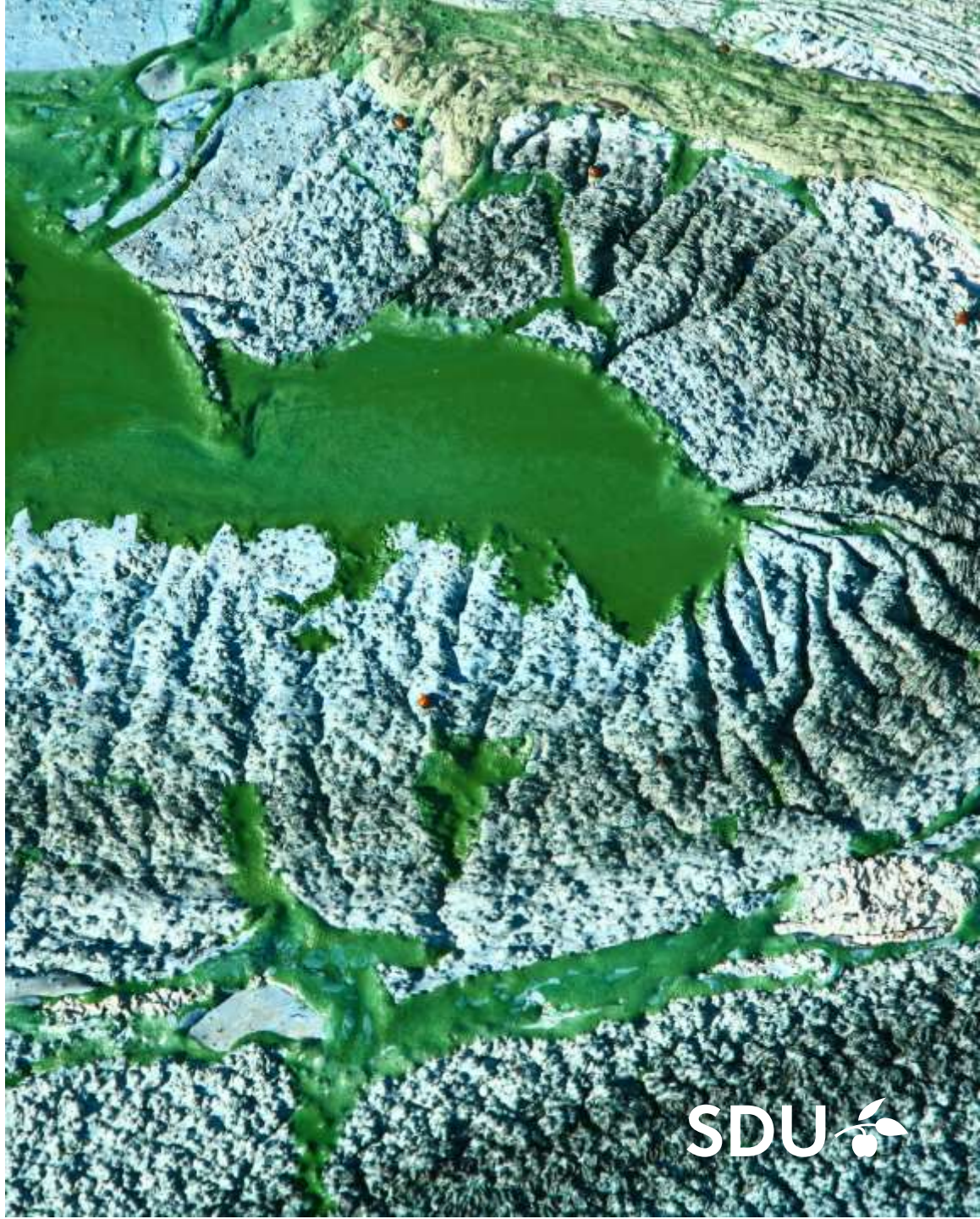
SDU Life Cycle Engineering

Outline

Introduction

Example of the trends within the wwt sector

Example on innovation/joint development wthin urban drainage design



Sustainable Utility – A Danish Experience

Per Henrik Nielsen
phn@vandcenter.dk

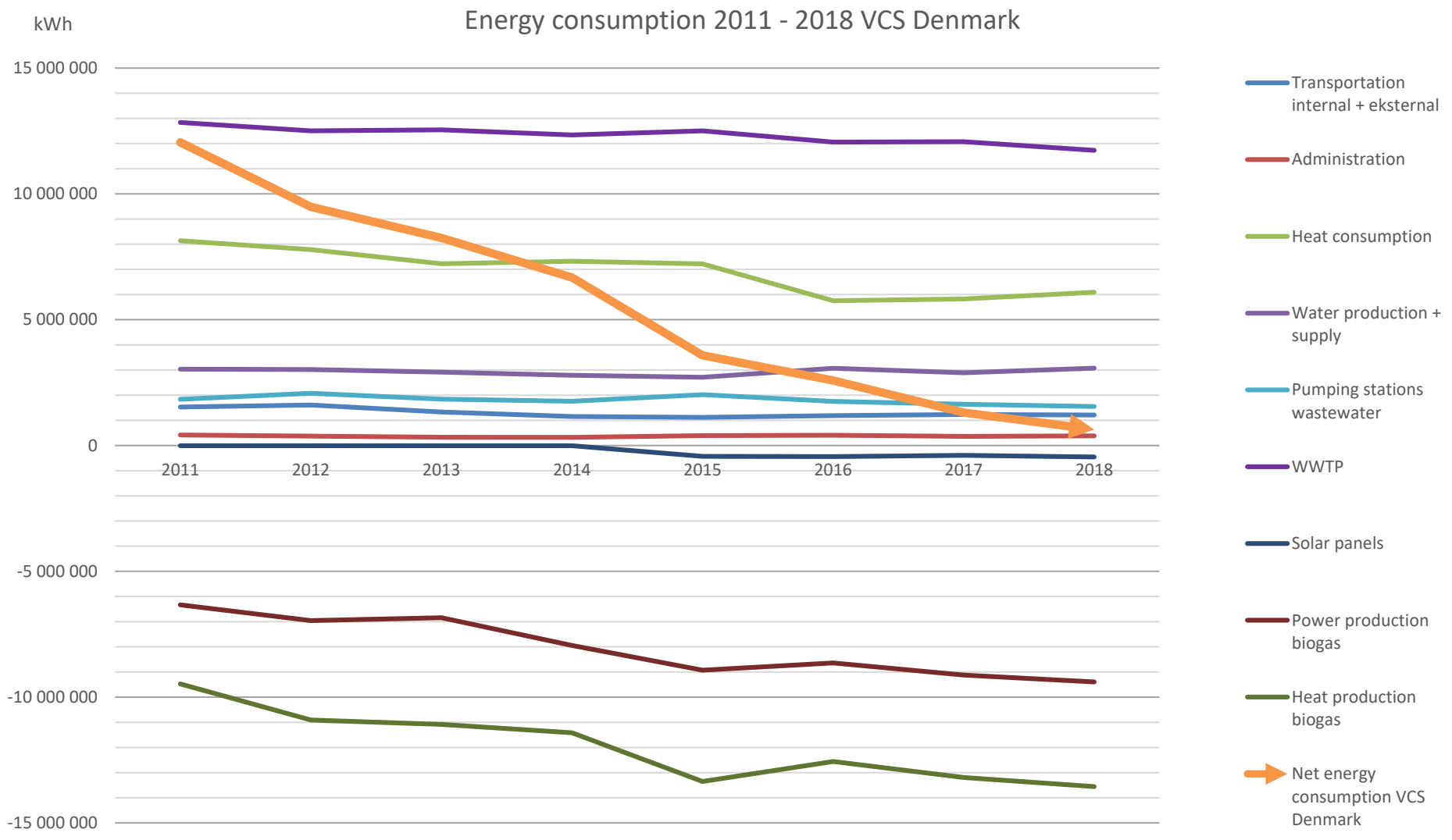
WATER RESOURCES UTILITY OF THE FUTURE TODAY

VCS Denmark
PRACTICAL WATER KNOWLEDGE

Ejby Moelle WWTP

- 410,000 PE BNR facility
- 76% energy self-sufficient in 2011

Changes in energy profile for VCS



Full-scale plant for P-recovery, Aarhus Vand

- Version 2.0 to be commissioned in November 2017 at Marselisborg WWTP
- Reuse 50% of the Phosphorous in the wastewater

Opening of the plant in Aaby by the danish minister of environment in november 2013

3rd Generation Biogas plant – Anaerobic-Based Biorefinery

Crude Oil

Petroleum Refinery

Fuels

Aviation Fuel
Kerosene
Gasoline
Fuel Oil

Petrochemicals

Olefins and **Aromatics** for polymers, resins, adhesives, detergents, fibers, lubricants

Changing the Paradigm: From "CH_2" To "CH_2O"

Wastewater, organic waste and residuals

Bio- Refinery

Bio fuels

Biogas

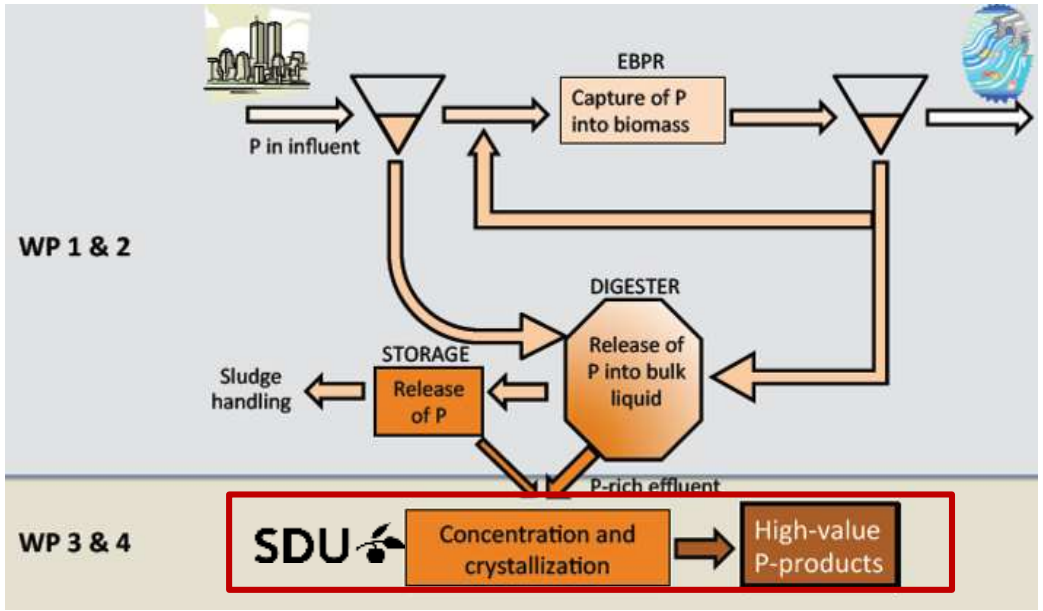
Added value Bio-chemicals

RecoverP – Recovery of phosphorus from wastewater treatment systems

Aim: To increase phosphorus recovery from wastewater and transform it into high quality phosphorus products that can be used in agriculture and industry.

Outcome: A novel hybrid process of oxidation and crystallization is developed allowing up to 90% of phosphorus recovery rate with improvement of products purity. Results published in 6 peer-reviewed articles, one pending patent (WO2019057984).

Financial support: Innovation Fund Denmark, 4106-00014B.



Other participating parties: Krüger A/S, VandCenterSyd, Aarhus Vand, Billund Vand A/S, herning Vand, Aalborg forsyning, University of Viena, KU Leuven, Institute of Chemistry of Clermont-Ferrand.

SUDS retrofitting as a lever for urban renewal and resilient stormwater systems

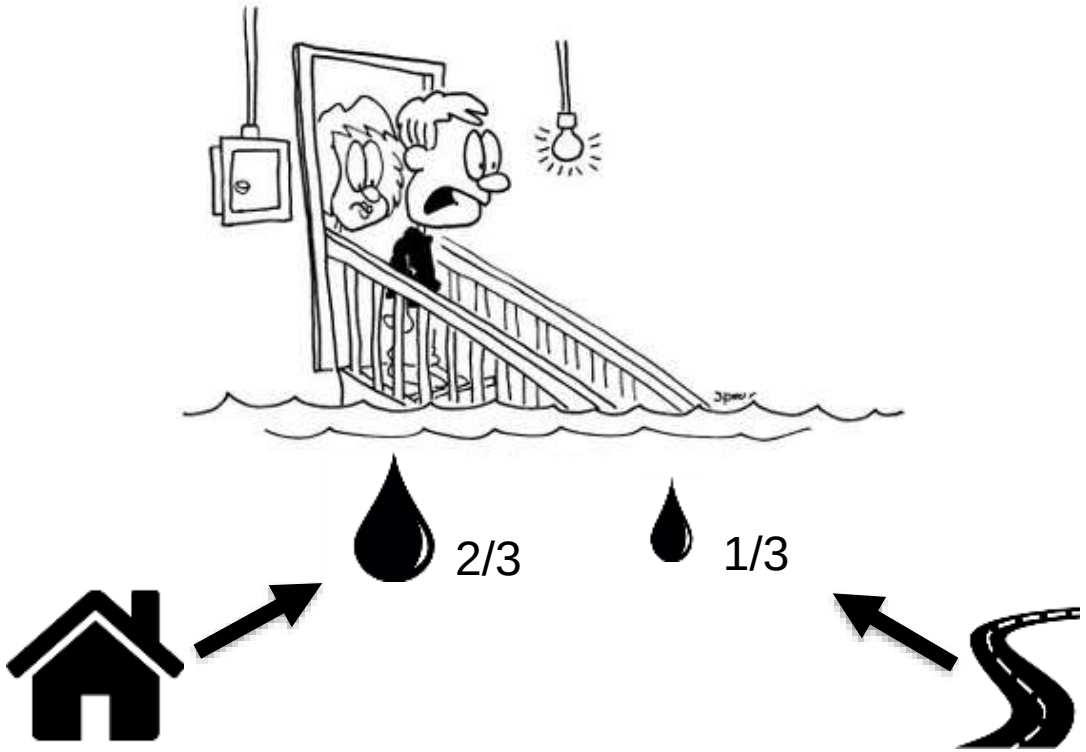
Mr. Martin W. Soerensen - mws@vandcenter.dk

VCS Denmark
PRACTICAL WATER KNOWLEDGE

DEN EUROPÆISKE UNION
Den Europæiske Fond for Regionaludvikling
Vi investerer i din fremtid

Citizen involvement?

…because they hold 2/3 of the solution



2/3 of the runoff comes from privat areas

1/3 of the runoff comes from public areas

... in our average residential areas

Hjallese - Agerlandsvej

Permeabel asphalt


Cykelarena - Højstrupparken


Sanderum – Huse opkøbt

Parks


Bellinge

Road + waterway


Dahlsvej – Skt. Klemens

SUDS-land development

Curbextension - Langelinie

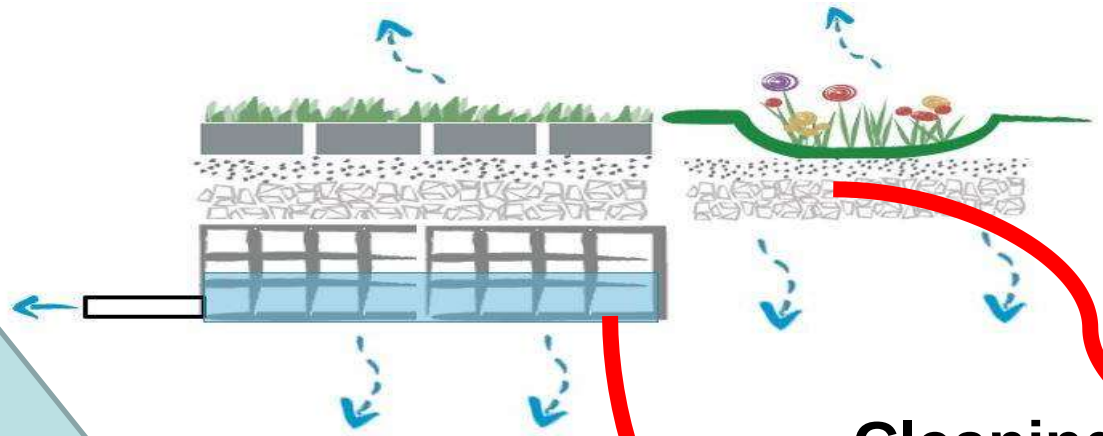
Using SUDS as separating-approach in a combined sewer area

Before

After

The project in bullits…

- 20 hectar residential area
- Combined sewer
- Capacity problems
- SUDS as sewer-sparation
- Public and private S.water
- Added value



Cleaning

Detension

From pipes to SUDS

Transport to WWTP

- Meeting citizens on their home turf, works good
- SoMe is good, but can be a loos canon

- Street-meeting
- ”Office-camping”
- Project Facebook
- ”Neighbor-nudging”
- ”Garden-walk-about”
- Public meeting
- News-letters
- ….

Dealing with the sceptic for something new…externally/internally

Communications skills are needed…

Climate adaptation Denmark

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March 2019

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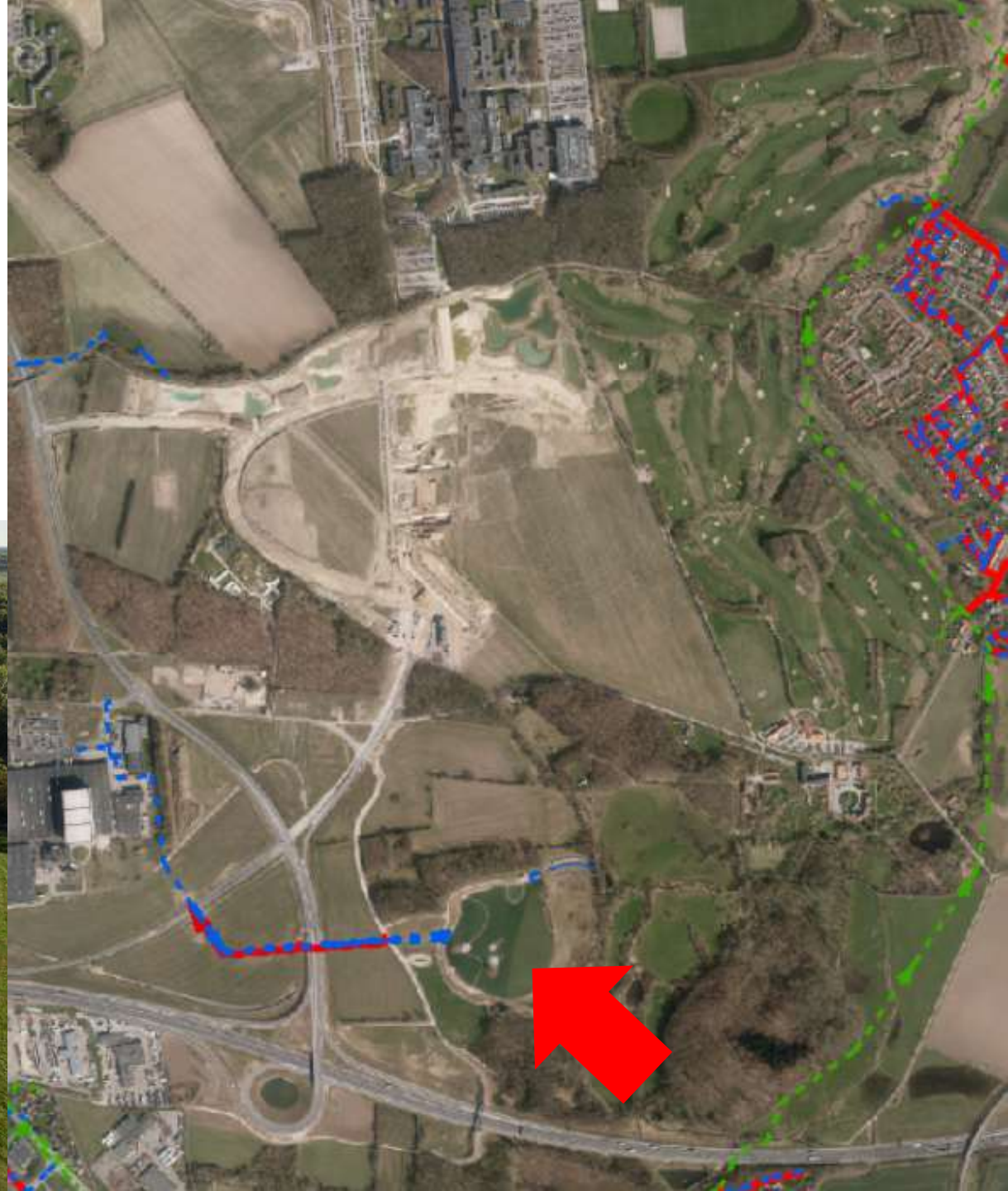
Glisholm sø


Prøv avisen
1 md for 48,-
Nybolig
Erhverv
Padder, troldænder og vandrefugle har fået ny sø
VVS
Mest læste



Thank you for your attention