

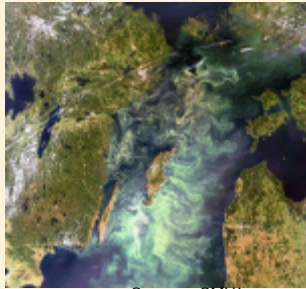
# **Partner meeting for the WAB project application, Sopot, August**

**27**

**Matilda Gradin, Linda Wolski and Sten Björk  
Trelleborg Municipality**

# An interrelated complex of problems

-demands integrated solutions



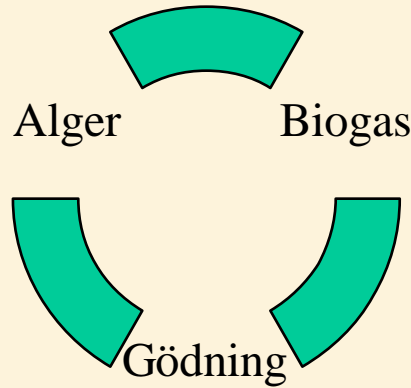
Source: SMHI



Source: <http://e-podatnik.pl>



Source: [www.skandetrafiken.se](http://www.skandetrafiken.se)



# The WAB-project deals with several environmental threats

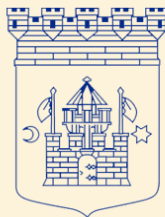
- Eutrophication of the Baltic Sea
- Climate change
- Emissions to the atmosphere- harmful substances
- The lack of wetland areas
- Ecological barriers in the landscape
- The use of limited natural resources
- Quality of the local coastal waters and others...



Foto: Johnny Carlsson



...by creating a joint solution...



# Brief summary of the WAB-project

- Restoration of wetlands along a local stream
- Construction of pond for growing and harvesting macroalgae
- Collection of algae in the coastal zone
  - Shores
  - At the bottom of shallow sea areas
  - Blooming cyanobacteria
- Fermentation of algae and wetland vegetation for biogas
- Spreading of organic material on arable land



# Restoration of a local stream: Tullstorpsån

- In Trelleborg only 10% of previous wetlands remain
- Consequence: lost habitat, reduction of biodiversity and nutrient reduction potential
- Recreation of wetlands
- Apart from estate owners/project management and local authorities, students and regional water authorities are also contributing with useful information



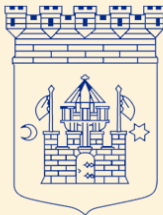
# Collection of blooming Cyanobacteria



Figure 1: *Nodularia spumigena* (Helcom, 2004)



- With oil booms for bunker oil spill
- Toxic *Nodularia Spumigena* –threat for recreation, tourism- and long term; economy
- Resembles an oil spill: toxic substance - health risk for humans, animals and marine life, specific areas protected



# Algae collection on 70% of Trelleborgs coastline

- Biogas potential ~13-14 GWh/year

-could replace 1300 cars driving 15 000 km/year



**N-reduction~150 tons**

Compared to 20 780 tons  
- Sweden's  
undertaking for the BSAP

**P-reduction~30 tons**

Compared to 290 tons-  
Sweden's undertaking  
for the BSAP

**Spatial distribution:**  
~30 km, 50 m from  
shore=  
151 ha



# Biogas in Skåne

Large demand for biogas in public transportation

- Regional political resolution 2007 on out-phase of fossil fuels in public transport

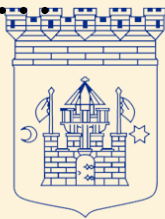
→2015 all city buses

→2018 all regional buses

→2020 alla vehicles

With a 5% travel increase per year **45 million m<sup>3</sup> of biogas is needed to 2018**

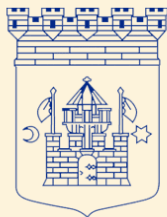
Last year public transportation used 3,3 million m<sup>3</sup> of biogas.





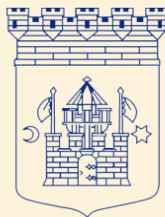
# Harvesting macro algae is a method with several advantages...

- Removes nutrients from the system
- Interrupts the recirculation of nutrients in sheltered bays
- Restores shallow bay ecosystem structure
- Reduces risk of anoxia
- Increases chances for fish larvae to hatch and survive
- Reduces smell
- Make better recreational use of coastal areas e.g. swimming, boating
- Increased aesthetic value of the coastal zone



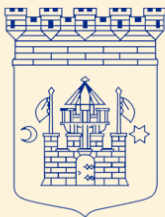
# Cadmium in the fermentation residuals

- Highest allowable concentration in fertilizers 0,75 g/ha and year in Sweden
- A dose of 100 kg N/ha and year will add another 4 g Cd to the soil
- The fermentation residuals need to be processed
- Chemical precipitation, ion exchange and adsorption
- Best results for ion exchange: 71-75 % reduction



# Ongoing activities in Trelleborg

- Marinebiological inventory of the coast  
(RAS + Swedish marine biologists)
- Algae collection techniques
- Study on legal aspects
- EIA on the algae collection
- Illustrated documentation for information material to the Public
- Continuous monitoring of water quality



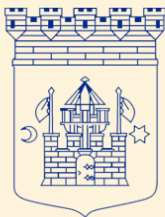
# Planned activities on the Swedish side

- Creating a fullscale process showing that the WAB-idea is possible
- System analysis of energy- and cost-balances
- Starting up an educational centre for renewable energy and resources utilization
- Continued inventories and monitoring on environmental impact



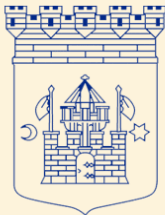
# Suggestions on activities on the Polish side

- Year 1: Feasibility study and algae occurrence warning system
- Year 2: Data collection and establishing of education program
- Year 3: Testing and evaluation of algae collection and biogas fermentation systems. Implementation of knowledge learned from year 1-2. Summary and evaluation of information and public information activities. Action plan for continuing activities.



# National/regional strategies on nutrient reductions/climate impact/environmental objectives

- Baltic Sea Action Plan
- National and regional strategies on nutrient reductions, climate impact reduction etc
- Swedish national environmental objectives



# Finally...

- Pilot project with high potentials for an improved coastal and marine environment
- Spreading the principle ideas for further development and adaptation
- Using latest research results

Your questions?

