

## New biogas buses and biogas filling stations



### Main sector

- Smart urban mobility
- Governance and planning

### Overview

In the summer of 2016, Sonderborg Municipality approved a new SEGT (Strategic Energy plan for Green Transportation). The SEGT strategy outlines 4 intervention areas for a low-carbon transport strategy. Among these is public transportation with new biogas buses and sustainable transportation through promoting more biking and walking (learn more about the SEGT-strategy (in Danish) here: <http://www.projectzero.dk/da-DK/Transport/Gr%c3%b8n-transport-strategi.aspx>).

The new bio-bus concept is based on the following elements:

- 39 new energy-efficient buses, fueled by biogas (replacing old diesel buses);
- improved digital services notifying users of departures, arrivals, delays etc. on APPs and displays at major hubs;
- each of the new buses can carry 4 bikes on board, allowing a combined trip;
- new biogas fuel charged at a new centrally located service station;
- new biogas fuel potentially produced inside Sonderborg municipality.

The ProjectZero masterplan for Sonderborg and the SEGT plan also created a burning platform for replacing the old diesel buses with a more modern and low/zero carbon solution. An analysis showed that biogas buses are a better choice for Sonderborg due to the huge area of the municipality, the frequency of charging and the investment cost in infrastructure. The alternative was to introduce electrical buses. As biogas is considered zero-carbon, the new buses will be a zero-carbon mobility solution, reducing the area's carbon emissions by 2,660 tons of CO<sub>2</sub>.

### Business model used

The buses within Sonderborg's municipal borders are operated on a political "business" model whereby the city council subsidizes the ticket price as a part of the public transport system in Sonderborg. Children can use the buses for free.

The buses are operated by SYDTRAFIK on behalf of the municipality. SYDTRAFIK is a regional publicly controlled company with the purpose of operating municipal and regional buses efficiently. The owners are the Jutland municipalities within the region.

NGF Nature Energy is the manufacturer and distributor of biogas to the biogas filling stations in Sonderborg. NGF is also the potential local producer of biogas in Sonderborg.

The solution is more expensive than a traditional diesel solution. The additional cost will be covered by the city council.

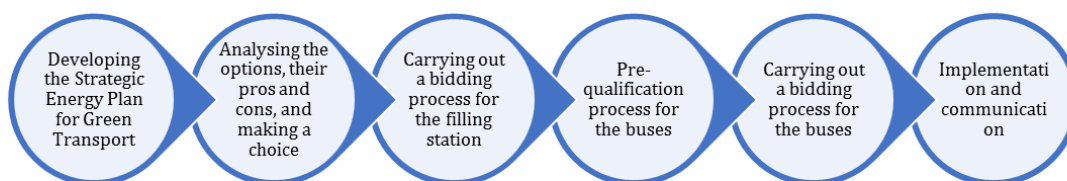


### Citizen engagement

Citizens will be addressed and involved when the buses are ready to operate. So far, citizens have been informed by the city council and an engagement event will be organized for them to test the use of the buses with their bikes for free.

After the new buses have been introduced, various campaigns are scheduled to motivate citizens to use the buses instead of driving cars. Citizens will also be involved in discussions about new bus routes and the frequency of buses on the main routes.

### Process



### Benefits

- A cleaner solution – less emissions
- Better integration with biking solutions
- Better digital information system
- Increased resource efficiency
- Independence in energy supply
- Better management of service providers
- Better (evidence-based) planning
- More efficient delivery of city services
- Improved data availability
- Increased comfort
- Social integration
- Behavioral change
- Traffic reduction

### Stakeholders

<b>Owner of the solution</b>	Sydtrafik (buses) NGF (filling stations)
<b>Service/technology provider</b>	Sydtrafik (buses) NGF (biogas)
<b>Users</b>	Sonderborg Municipality, citizens
<b>Investors</b>	Sydtrafik

## Investment/Finance

The biogas buses are leased for a period of 8 years. The investment will be annually ca. 400,000 Danish kroner more expensive compared to conventional diesel buses, but the socio-economic benefits outweigh this extra cost. For example, there are no emissions from biogas buses, which will reduce air pollution and carbon emissions from heavy duty transport. The municipality will finance leasing the buses.

## Potential for replication

The biogas solution is known in the market and already adopted by several municipalities in Denmark and abroad. As the buses are still more expensive than traditional diesel buses, the solution will mean higher traditional costs as externalities are not priced. In the long term, when the technology and market mature, electrical buses will play an important role in public transportation. The technology and pricing need to be more mature so to justify the infrastructure investments.

Infrastructure requirements include access to a gas pipe and a location for constructing the fueling station. It is optional, especially for somewhat rural cities and towns, to build a biogas production facility in which local manure, straw and food waste are processed into biogas.

## Contact

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