

The Baltic Biogas Bus project is designed to stimulate the use of biogas as a fuel for city buses, with the aim of reducing the environmental impact.

Baltic biogas future

The world is facing an increased demand for transport of all kinds, but more and more people are also becoming aware of the transport's impact on the environment and climate. Our transport systems and vehicles need to become more efficient and sustainable. At the same time, an increasing amount of people live and work in urban areas, which increases pressure on public transport systems to be accessible, safe and sustainable, resulting in a boosted interest in renewable biofuels. The Baltic Biogas Bus project and the extension stage, More Baltic Biogas Bus, aims to prepare for and showcase an increased, more energy cost efficient use of biogas as fuel in public transport buses as a way of minimising climate impact and reaching the EU 2020 targets.

Renewable and clean

Biogas is a completely renewable energy source and part of the natural 'eco-cycle'. Upgraded and used as transport fuel, biogas not only reduces greenhouse gas emissions but also helps to improve inner city air quality through low emissions of particles and nitrogen oxide. Taking into account that biogas can be produced from household food waste and wastewater, a 'resource' in all urban areas, makes it very attractive to public transport.

Biogas around the Baltic Sea

The main stage Baltic Biogas Bus (BBB) project was initiated by Stockholm Public Transport and started in 2009. With a total of 12 partners from eight different countries, the project aimed to prepare for an increased use of biogas buses in the Baltic Sea region. Apart from the project partners, several biogas producers and distributors, bus suppliers and other bus operators participated and provided input and experiences. During the three-year project, biogas production potentials were investigated along with different options for, and experiences from, biogas distribution and fuelling, implementation and usage. A main project outcome is a manual on how to introduce biogas buses in public transport.

The results and achievements were summed up in October 2012, concluding that biogas is the best choice available to lower emissions

An intercity CNG bus in Västmanland County, Sweden



from public transport city buses. One of the keys to success is long term, strategic and sustainable political decisions. But the project partnership also pointed to some areas, such as increased upgrading of biogas and improved energy efficiency in biogas buses, in need of further attention. The success of the project and the commitment from all partners opened the door to an extension stage project in 2013.

Even more biogas

In June 2013, the More Baltic Biogas Bus (More BBB) project was approved. The partnership for the on-going extension consists of eight partners from the original project accompanied by the new lead partner Västmanland Public Transport.

The More BBB project is divided into two main components: increased upgrading of biogas to vehicle fuel quality; and more energy efficient use of biogas as fuel in public transport buses. To demonstrate these two aspects of biogas development, the project features several concrete investments in 'green' technology throughout the region.

EU energy efficiency

The EU has put increased efficiency at the top of the energy agenda. In 2012, the EU adopted a new directive to promote energy efficiency within the Union in order to ensure the achievement of the EU 2020 targets. This obliges all member states to encourage energy efficiency improvements in households, industries and transport sectors. The More BBB project targets end use of energy in public transport buses, where improvements in energy efficiency could be made in two principal ways: technological and operational. The technological approach, i.e. developing more energy efficient engines and drivelines, is perhaps the most obvious solution. But the operational approach, for instance, more energy efficient driving habits, has significant fuel saving potential at a relatively low cost and should not be overlooked.

Going hybrid

In recent years, various electric and hybrid solutions have been given much attention. The More BBB partners will invest in, test and evaluate two different biogas-electric hybrid solutions. By combining biogas, possibly the cleanest renewable fuel available today, with the energy efficiency of the electric motor and driveline, the aim is to showcase the road to an even greener and cleaner public transport.

In Bergen, Norway, project partner Skyss with help from HOG Energi, has invested in two 24-metre, bi-articulated series hybrid buses from Belgian manufacturer Van Hool. The buses will use electric traction and the biogas engine will provide extra power to the generator when battery capacity is insufficient. In Västerås, Sweden, lead partner Västerås Public Transport has chosen a different approach, investing in a more standard performance 12-metre bus from Polish manufacturer Solaris. The bus uses electric traction powered by a 160kW battery, while the biogas is used purely for onboard heating purposes. By using renewable biogas for heating, a large energy 'guzzler', all of the battery capacity in the Västerås bus is dedicated to propelling it. Thus, in both Bergen and Västerås, albeit in very different ways, biogas will be used as a kind of range extender. Testing the two different applications will make significant contributions to further development on energy efficient public transport buses.

Eco-driving into the future

Energy efficient driving habits, often referred to as 'eco-driving', have been shown to save fuel, money and the environment, while also creating a safer and more comfortable ride for public transport passengers. Though successfully implemented in some cities and regions, eco-driving is still far from wide spread in the EU. The More BBB lead partner Västerås Public Transport is one of the forerunners in Sweden, having implemented an eco-driving 'regime' in full-scale. By installing eco-driving support systems in all buses, and pairing it with education and regular follow-ups with all drivers, the fuel savings are closing in on 10%.

Building on the Västerås experience, More BBB partners in Lithuania, Poland and Norway will invest in, implement and test eco-driving support systems in public transport buses. The aim is to further disseminate knowledge and



A CNG bus being refuelled with biogas in Stockholm, Sweden

experiences on cost efficient operational fuel saving efforts and its role in creating a sustainable public transport sector in the Baltic Sea Region. However, technological and operational energy efficiency measures alone will not be enough to reach carbon neutrality. To reach the EU 2020 goals and beyond we need a significant increase in bio-fuel supplies.

Increasing biogas supply

The EU 2020 targets state that the Union should get 20% of its energy supplies from renewable sources in 2020. There is also an on-going discussion on how much the target could, and should, be raised looking ahead to 2030. Many experts seem to agree that the transport sector poses the single biggest challenge. Biogas is one of few renewable vehicle fuels commercially available today. In Sweden, perhaps the world leading country on biogas as vehicle fuel, it has already played an important part in reducing fossil fuel dependence in public transport buses. While biogas is produced in many locations throughout the Baltic Sea region, it is very rarely upgraded and used as transport fuel, partly because of the extra investment needed. The aim of the More BBB project is to showcase biogas upgrading and to highlight the socioeconomic and environmental benefits of replacing fossil transport fuels specifically. Through this, the partners aim to lead the way to more biogas being upgraded and used in public transport buses throughout the EU.

The More BBB project will sum up its activities and investments in December 2014. By demonstrating a successful road ahead using renewable biogas in the most energy efficient way possible, we will get one step closer to the EU 2020 targets, making Europe a better place to live, work and invest in.

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