

Biogas as an alternative fuel solution in the transportation sector

The European Union has agreed on climate and energy targets of 20% energy consumption coming from renewable energy sources by 2020.

Transportation targets for Ireland have been set at 10% from alternative fuels such as biodiesel, bioethanol, biomass to liquid, e-gas or Synthetic gas from wind turbines for example converted into hydrogen and sustainable produced electricity used to charge electric vehicles. Ireland has the lowest transportation targets in line with Malta. Germany has a set target of 18% and Sweden has the highest binding target in the transportation sector of 49%. Under the Renewable Energy Directive Act, member states have the obligation to fulfil those targets but this can vary from country to country which depending on where their starting point.



The overall renewable energy target for Ireland is 16% by the year 2020. There are three main areas for each country in accumulating those targets; these being heat, electricity and transportation. In achieving those targets, there are different weighting factors applied, depending on the source and final usage. In Article 21 of Directive 2009/28/EC12, biofuels produced from 1st generation have a weighting factor of 1, whereby biofuels produced from anaerobic digestions for example, such as biomethane production coming from 2nd generation can be applied a weighting factor of 2. This makes biofuels from 2nd generation more useful in achieving those targets.

The most convenient way of selling those biofuels (liquid or gaseous) is a filling station. In Germany for example, there are

numerous biofuel mixes available which up to now are not available in Ireland. The most common biofuels in Germany are available as E10 (10% of Ethanol blend), E15, E85, B10 (10% of Biodiesel blend), B80, Biogas10 (10% of Biomethane blend), Biogas50 or B100 which has a 100% biogas concentration. The higher the concentration rate, the faster the targets can be achieved. The ordinary petrol and diesel has been already pre-blended in the oil refineries, with up to 6.25% biofuel for petrol and 7.0% for diesel fuel can be. There is no need to classify those fuels as biofuels due to the low bio mix contribution, but the government has the obligation to ensure fuel has been blended to comply with EU directive legislation 2003/30/EC.

In Germany, biogas powered vehicles have seen an increasing uptake, especially in the commercial haulage and transportation sector. Biogas, when measured in kWh in comparison to fossil fuels is cheaper, cleaner, and quieter. Also road tax is lower due to reduced emissions. The arguments in favour of investing in biogas powered vehicles are convincing. OEM vehicles and trucks from nearly all leading brands are offering CNG powered engine options, with standard warranty and no or only marginal driving range limitations. In the European Union there were 1'125'768 CNG light duty vehicles, 12'745 CNG buses and 9349 CNG trucks registered in 2014 .

By the end of 2014, Europe had a total of 2834 gas filling stations installed across Europe. The majority of these countries is in Italy with 974, Germany with 919 and Austria with 173 gas filling stations in place. Up to now, Ireland has not even one commercial gas filling station, which can be accessed for public refuelling. There is huge potential for development for Ireland in this market. According to the latest figure published by SEAI, Irelands 10% fuel tar-



get coming from renewables was 4.9% in 2012. It is also important to mention, that fossil fuel imports in the transportation sector account for 99% .

Having analysed all factors, Ireland should follow the lead of the renewable energy leaders in increasing the biogas production in order to serve gas filling stations with “green gas”, which will stimulate the job market, reduce emissions and contribute to achieving the agreed 2020 targets. However, with less than five years to go time is running out.

Acknowledgements

This research was financially supported by EU Marie Curie ITN ATBEST - FP7 project (Advanced Technologies for Biogas Efficiency, Sustainability and Transport) which is an EU collaboration project between Germany, Ireland, United Kingdom and Sweden. ■

