

POTENTIAL OF BIOMETHANE FOR ENERGY SUPPLY IN THE TRANSPORT SECTOR IN PORTUGAL

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ABSTRACT

Use of renewable fuels in the transport sector is being promoted worldwide. Although new conversion technologies for efficient biofuel production from lignocellulosic materials are currently being developed, some bioethanol and biodiesel production routes have limitations with regard to resource efficiency and reduction of greenhouse gases. Compared with other vehicle biofuels available presently, biogas has several advantages from an environmental and resource-efficiency perspective [1].

In September 2007 Andrea Tilche from the Directorate General for Research of the European Commission, while presenting an interesting plenary lecture in the 11th IWA World Congress on Anaerobic Digestion, stated that "...Through the application of Life Cycle concepts, data elaborated from statistics related to EU countries show that anaerobic digestion has the potential of contributing to the Kyoto and the EU post-Kyoto objectives for a significant fraction, in particular if biogas is used as a biofuel. If we extend the analysis to energy crops and we compare it with other biofuels through a Life Cycle approach, the biogas shows a very large advantage in terms of km/ha of energy crops...."

In Portugal biogas production is not well accepted in many sectors, in part due to bad past experiences, especially in the agro industrial sector. According to the biogas barometer published in May 2007 [3], Portugal is one of the countries where biogas valorization is less implemented with only 0,9 toe/1000 inhabitants, compared to UK and Germany with 28,1 and 23,3 toe/1000 inhabitants, respectively. The biogas production and usage is highly influenced by local policies. Climate change, fossil fuel depletion and fuel security are examples of driving forces for promoting biogas production in different countries. For instance valorisation of biogas is clearly one of the country's energy priorities in Sweden. This sector is not only devoted to the production of electricity (54 GWh in 2006) and heat (20.7 ktoe), but also to the production of vehicle fuel as well as for reinjection into the natural gas network (replacing the equivalent of 1.8 million m³ of natural gas per year) [3].

In Portugal the biogas potentially generated in landfills and in other anaerobic organic waste treatment processes is not well estimated. Based on data presented by Xergi in Nov 2007 [4] the global biomethane potential in Portugal would be 83 millions of cubic meters biomethane per year, considering agro industrial activities such as pig, cow and chicken manure, fish, meat and dairy processing industries, but excluding landfills or sludge digesters. Should this potential be used in the creation of a new energy supply stream to the Transportation sector in Portugal, it would be possible to partially replace the current diesel consumption in heavy duty vehicles, including up to 100% replacement in specific niche markets. Moreover, the effective utilization of this potential is estimated to promote the creation of 1500 jobs, representing an investment around 500 M€.

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