

## **Biogas plants make good use of waste in Germany**

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The agriculture magazine “Top Agrar” reported in two recent online columns on the progress being made with waste and manure utilisation in biogas plants in different German states.

In the sparsely populated eastern state of Thuringia 176 biogas plants with a combined capacity 83.3 MW (electric) contribute strongly to local energy supply. About a quarter of all manure (including 42% of all liquid manure) produced in the state is already utilized in anaerobic digestion facilities for producing biogas. The State environment minister, Juergen Reinholz, said that Thuringia is targeting a renewables share of 22% of final energy consumption by 2015, 86% of which may be biomass, with biogas technology playing a pivotal role.

According to the minister, there is scope for a further expansion of the biogas sector, focusing on the remaining manure resource base, as well as on farm residues (such as straw) in combination with the cultivation of energy crops.

In the coastal state of Lower Saxony, which borders the Netherlands, biogas technology is even more interwoven with the local farming sector, which is more divers and smaller scale than in the east of Germany. As of 2010, Lower Saxony had a total number of 1,300 biogas plants with a total installed capacity of 650 MW (electric); 80% of which were in the hands of farmers. About 3,000 farms profit directly from this portfolio of biogas plants, either as owner-operators, or as providers of digester feedstock or users of recycled digester nutrients. In Lower Saxony 35% of all liquid manure, and 25% of all solid manure are already utilized for anaerobic digestion.

In addition the states biogas plants digest 1.4 million t/y of organic waste, which represents 80% of all organic waste that is currently handled in Lower Saxony. The fertilizer nutrients that are contained in this waste, and are made available for agricultural use via anaerobic digestion annually, are sufficient for the fertilisation of 40,000 ha of highly productive agricultural land in Lower Saxony. Biogas technology therefore not only enhances the states energy self-sufficiency and energy security, but also fertilizer nutrient self-sufficiency and security. Considering that the vast majority of remaining world phosphorus (fertilizer) resources are located in volatile, and potentially unfriendly, North African countries, the nutrient aspect of biogas technology will become increasingly important in the future.

The vast majority of biogas plants operating in Germany today have been developed based on the long term investment security provided by Germany’s feed-in tariff system for renewable electricity, at no cost to the government. While biogas experts throughout Germany agree that electricity generation will remain the dominant use for biogas in Germany for the foreseeable future, they also agree that biogas to transport fuel and biogas to natural gas grid injection schemes will become more common in Germany. The “Top Agrar” column notes that in Thuringia 3 biogas to natural gas grid injection schemes were commissioned in 2010. This may be seen as the start of a new development

phase in the German biogas sector. Countries with a strong primary sector, such as New Zealand, have much to gain from following Germany's lead, and adopt biogas technology at a broad scale to address energy, environmental and security problems that are not going to diminish in the future on their own accord.