



Newsletter IEA Bioenergy Task 37: 11/2020

IEA and Task 37 Publications

Integration of biogas systems into the energy system

With increasing shares of intermittent variable renewable electricity (such as solar and wind power) in the future energy system, the overall design and operation of biogas facilities for energy provision may change significantly. Biogas is a versatile energy carrier which can be used to produce electricity, heat and after upgrading serve all functions of natural gas, including transport. A new report by IEA Bioenergy Task 37, entitled “Integration of Biogas Systems into the Energy System - Technical Aspects of Flexible Plant Operation”, addresses the flexibility of biogas systems. Biogas systems are not only dispatchable but can produce electricity to match an electricity demand profile, while facilitating voltage and grid stability. Gas is also a major component of the heat sector both for district heating which is seasonal in nature and for industries which have a more constant demand but very large scale energy requirement. Renewable gaseous fuels (including hydrogen and biomethane) have a great potential to decarbonize transport fuel use in haulage and intercity buses. The report represents the ability of a biogas plant operator to control operation in a manner to best match the output of the biogas plant with the demand of the users of the Integration of biogas systems into the energy system. The report addresses the complexity of these systems in terms of operational logistics and availability of feedstock at times to match variation in energy output.

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Integration of Anaerobic Digestion into Farming Systems

This recent case story of IEA Task 37 assesses the role of biogas integrated into the farming system through examination of policy, practices and strategies in four very distinct countries with very different climatic conditions. These countries include Australia (6th largest country by area, driest inhabited continent, low levels of population density), Canada (2nd largest country by area, incredibly cold in the north, while warm in the south, sparsely populated), Italy (mountain, continental and Mediterranean climates with very fertile regions such as the Po valley with potential for year round agriculture) and the UK (well populated industrial country with temperate oceanic climate). The adoption of anaerobic digestion (AD) has grown in all four of these countries over the last decades, albeit at different rates. In all cases, energy and climate change policies have been the dominant drivers that have enabled growth. In Australia, AD is used primarily to reduce the environmental impact of wastewaters from red meat processing and piggeries. The section by Canada describes the regulatory framework for AD in agriculture in the different provinces. Italy has seen widespread adoption of the Biogas Done Right concept – a set of innovations that includes AD as a core technology. In the UK, AD of manure along with improved crop production technologies, including precision agriculture, are reducing the environmental footprint of agriculture. Other environmental benefits such as the destruction of pathogens and weed seeds are also noted.

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German country report 2020

In a recent update of Task 37 the biogas development in Germany is highlighted in five chapters including 1) Biogas plant inventory; 2) Biogas production and utilization; 3) Financial support system; 4) National strategies and 5) Biogas research: project examples. In addition, all AD relevant legal and technical regulations other than energy are compiled. In the section on biogas research the major projects financed by the German government through FNR or the European Commission are summarized.

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Case stories from Denmark: Deep-bedding and food-grade CO₂

In brand new case stories of Task 37 from Denmark, two outstanding achievements are described. One deals with the huge potential of deep bedding. In Denmark, about one-third of all dry matter in livestock manure is contained in deep bedding. Over the last decade, most Danish biogas plants added deep litter to their co-digestion substrates. The report highlights five methods of pre-treatment of the bedding material to increase gas yield that are applied in DK. The second story deals with Production of food grade sustainable CO₂ from a large biogas facility. Biogas typically consists of 60% biomethane which is used as a renewable fuel, while the remaining 40% is a natural residual product in the form of CO₂. Instead of wasting this residual CO₂ and emitting to the atmosphere, a unit was designed to recover all of the CO₂ in a seven-step process. The sustainable CO₂ is free of microorganisms, and that it is odourless, tasteless and meets all the standards required for utilization in many sectors, including the food industry. GO' CO₂ is ideal for carbonation in the soft drink as well as for cooling and freezing food.

More on [Deep-bedding](#) and [Food-grade CO₂](#)

Advanced Biofuels – Potential for Cost Reduction

Decarbonising transport will require a range of bio-based transport fuels, and especially advanced low carbon fuels which are suitable for long-haul transport applications including aviation. A number of appropriate technologies to produce such fuels are being developed and commercialized. However so far, their production has only reached a limited scale. The costs of these advanced biofuels are currently higher than those of the fossil fuels which they can displace and of more conventional biofuels such as ethanol from sugar or corn, or biodiesel. This report consider what scope there is to reduce the production costs of a range of advanced biofuels, and to identify under what conditions they could become affordable. IEA Bioenergy Task 41 in collaboration with Artfuels Forum has published an update on the current costs of producing a range of advanced biofuels, based on extensive contact with industry and other players active in the field. The report based on a study of the Sub-Group on Advanced Biofuels (SGAB) (under the European Commission's Sustainable Transport Forum (STF)) and published in 2017.

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IEA's key world energy statistics 2020

IEA Key World Energy Statistics (KWES) is an introduction to energy statistics, providing top-level numbers across the energy mix, from supply and demand, to prices and research budgets, including outlooks, energy indicators and definitions. KWES is part of the IEA's annual edition of the world's most comprehensive series of energy databases and data services, which include World Energy Statistics and Balances and the full range of fuel information data services.

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World Energy Outlook 2020

The *World Energy Outlook 2020*, the International Energy Agency's flagship publication, focuses on the pivotal period of the next 10 years, exploring different pathways out of the crisis. The new report provides the latest IEA analysis of the pandemic's impact: global energy demand is set to drop by 5% in 2020, energy-related CO2 emissions by 7%, and energy investment by 18%. Renewables take starring roles in all our scenarios, with solar centre stage. Supportive policies and maturing technologies are enabling very cheap access to capital in leading markets. Solar PV is now consistently cheaper than new coal- or gas-fired power plants in most countries. The *WEO's* established approach – comparing different scenarios that show how the energy sector could develop – is more valuable than ever in these uncertain times. There are four pathways presented: The **Stated Policies Scenario** (STEPS), in which Covid-19 is gradually brought under control in 2021; the **Delayed Recovery Scenario** (DRS) with a prolonged pandemic causing lasting damage to economic prospects; the **Sustainable Development Scenario** (SDS) and the new **Net Zero Emissions by 2050 case** (NZE2050) extending the SDS analysis.

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Renewables 2020 – forecast to 2025

In sharp contrast to all other fuels, renewables used for generating electricity will grow by almost 7% in 2020. Global energy demand is set to decline 5% – but long-term contracts, priority access to the grid and continuous installation of new plants are all underpinning strong growth in renewable electricity. This more than compensates for declines in bioenergy for industry and biofuels for transport – mostly the result of lower economic activity. The net result is an overall increase of 1% in renewable energy demand in 2020. The biofuels industry has been strongly impacted by the Covid-19 pandemic. Global transport biofuel production in 2020 is anticipated to be 144 billion litres (L), equivalent to 2 480 thousand barrels per day (kb/d) – an 11.6% drop from 2019's record output and the first reduction in annual production in two decades. The greatest year-on-year drops in output are for US and Brazilian ethanol, and European biodiesel.

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