



Technology Collaboration Programme
by IEA

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Reports and Statistics

Abandoned cropland could produce biofuels

In Norway, researchers from the Norwegian University of Science and Technology (NTNU) are studying a way to put less pressure on food production and plant and animal life – growing perennial grasses on abandoned cropland for biofuels and calculating the extent of areas available for this type of grass cultivation. Until now, no one has calculated the extent of areas available for this type of grass cultivation. NTNU investigated the question by examining satellite images from around the world. They found 83 million hectares, or 830 000 square kilometers of areas that until recently were used for food production but now no longer are. These locations roughly correspond to the land area of Sweden and Norway combined, or the equivalent of five per cent of the area currently used for food production worldwide. These are areas that have been heavily affected by humans, so many species are already gone. Grass production could increase biodiversity. The research group believes that most of these areas can be used to grow perennial grasses for biofuels instead of leaving them unused by humans. However, there is a large variation in how much this can cover of future biofuel demand. The researchers estimated that biofuel production on abandoned cropland could provide the energy equivalent of between 6 and 39 exajoules each year. This corresponds to between 11 and 68 per cent of today's bioenergy needs and 2 to 47 per cent of the expected production of biofuels in 2050. How much biofuel people can grow depends on many local factors and on how the areas are managed. Negative environmental impacts need to be weighed against the need for energy. It is estimated that around 20 exajoules could be produced every year if the increase land area is limited at 3 per cent and water use by 8 per cent.

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Climate benefits of agricultural biogas greater than previously thought

A report by Aarhus University for the Danish Energy Agency has concluded that the climate effect of biogas in the agricultural sector is greater than previously assumed. The report contains several updated results for the effects and provides a description and quantification of all relevant environmental and climate effects of biogas production, including energy production, greenhouse gas emissions, nitrogen leaching, ammonia evaporation, nutrient utilisation, and odour nuisance from application. The report looks at the effects of five biomass compositions. Aarhus University's report concluded that overall, there is an environmental and climate benefit from degassing. With a residence time longer than 45 days, the gain from biogas increases 'only marginally'. The effect depends, in particular, on the amount of highly metabolizable organic material in the biomass composition, according to the study. The report also found that methane emissions from cow manure are higher than previously calculated, and the emission from pig manure is lower. This means there is potential for greater reduction in methane from allowing cattle manure to be degassed, in particular, and that the climate effect of biogas in the agricultural sector is greater than previously assumed.

[More](#) (in Danish, Summary in English)

The Role of Renewable Transport Fuels in Decarbonizing Road Transport

In the light of climate change, there is an urgent need to decarbonize our societies. The road transport sector is specifically challenging, as transport demand is growing, and so are the sector's GHG emissions. Electric mobility powered by renewable power will not be able to solve this on its own, and renewable transport fuels will be needed to bridge the gap between GHG emission reduction targets and the projected actual emissions. A team of experts has assessed the transport sector and its projected development up to 2030 and 2050 for a number of countries, including Germany, Sweden, Finland, the USA, and Brazil. The work was initiated and carried out jointly by two Technology Collaboration Programmes of the IEA, namely the IEA Bioenergy TCP and the Advanced Motor Fuels TCP, with support of the Directorate General for Energy of the European Commission. The analysis is based on current national policies, projections of the vehicle fleet, and on the availability of renewable transport fuels. A key message from the project is that decarbonization of the transport sector can only be reached with a set of measures and fuel/energy options, of which biofuels constitute an important part. There is sufficient biomass available to support the large-scale roll-out of biofuels, and current vehicles can accommodate these amounts.

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CO₂ emissions policy jeopardizes commercial transport

IRU showed in a recent report that Measuring CO₂ emissions from commercial road transport only at the tailpipe, depending on the region, could double the true carbon picture in future fuel scenarios. Heavy-duty commercial vehicles, including coaches and trucks, emit just 950 million tonnes of CO₂ annually at the tailpipe, using the tank-to-wheel standard, about 2.5% of global emissions. While hydrogen and electricity are often mistakenly seen as zero emission fuels, if all CO₂ emissions are taken into account, including well-to-tank, a more realistic carbon picture of these alternative fuels emerges. In Europe, the US and China alone, on average, this would add 45% more CO₂ for electricity and 72% more for hydrogen versus conventional diesel, based on today's energy mix. A transition to fuels such as electricity and hydrogen for heavy-duty vehicles, without using low or zero-carbon energy sources, would therefore fail to account for between 400 and 700 million tonnes of annual CO₂ emissions. Road transport operators need certainty as they continue working on the enormous challenge of effectively decarbonising their fleets and operations, not unworkable fantasy options. IRU urges policymakers to use the more comprehensive well-to-wheel standard to evaluate and plan for decarbonisation investments and incentives. This will enable commercial road transport operators to decarbonise as effectively and rapidly as possible.

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Advanced biofuels to decarbonise European transport: Markets, challenges, and policies

Policy in Europe strives for energy security and gradual decarbonisation in highly polluting sectors like transport through innovation and improved value chains. However, despite rapid increase of electric vehicles in the European market, light and heavy-duty road vehicles still account for nearly three-quarters of transport CO₂ emissions, while emissions from aviation and marine continue to rise (IEA, 2020). Advanced biofuels are therefore essential for the transition to zero carbon. The Analysis of Europe's best informed political scientists reiterates that the future deployment of these fuels, in market shares that can lead to the desired decarbonization levels, still depends largely on the integration of tailored policy interventions that can overcome challenges and improve upstream and downstream performance. The work presented aims to i) inform on policy relevant challenges that restrict the flexible, reliable and cost-efficient market uptake of sustainable advanced biofuels for transport, and ii) highlight policy interventions that, have strong potential to overcome the challenges and are relevant to current policy, Green Deal and the Sustainable Development Goals (SDGs). Among the technologies considered is bio-CNG and bio-LNG from [MSW](#), [sewage sludge](#), [animal manures](#), [agricultural residues](#) or [energy crops](#).

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Inauguration of a first catalytic methanation reactor

Thanks to a research project carried out at EPFL, Switzerland, a new catalytic methanation reactor with a high CO₂ conversion rate (> 99.5%) and very compact design was developed. The methane produced from hydrogen and CO₂ from industry in the order of 0.72 kg/h (11 kWh), is injected directly into the distribution network. Moreover, the thermal energy dissipated by both the electrolyser and the methanation reactor is entirely recovered to preheat the gas before its expansion. The dimensioning of the equipment has been defined in order to produce synthetic methane as a band energy during almost the whole year, i.e. 79'000 kWh, while allowing a saving on the gas preheating energy of about 140'000 kWh. On the basis of the project results, Gaznat, the gas grid operator, has decided to develop a new methanation reactor, with a power 20 times higher than that of the reactor in service in Sion, i.e. 200 kW, with the aim of commercializing it on a large scale, in view of its rate of conversion of CO₂ and its efficiency largely exceeding the competing products currently available on the market.

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Study confirms: RNG in transport is more efficient than electricity

The first independent consulting firm to specialize in low-carbon strategies and climate change adaptation, Carbon 4 has just named RNG the most efficient alternative fuel for both cars and trucks. For all types of vehicles, bioNGV (RNG) will be at the top of the winners' rostrum in Europe in 2021. In France, the carbon footprint including vehicle manufacturing, use and end of life is only 71 gCO₂e/km for the B segment (trucks), compared to 81 g for electric, 170 g for CNG (natural gas), 172 g for E85, 180 g for simple hybrids, and 222 g for gasoline engines.

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EBA's annual report 2020 published

The European Biogas Association (EBA) launched recently an enhanced edition of the EBA Statistical Report. This publication features the most recent data and statistics on the development of the European biogas and biomethane markets, as well as potential growth forecasts for the coming years. The biogas sector now produces 167 TWh or 15.8 bcm of biogas and 26 TWh or 2.43 bcm of biomethane. At the end of 2019, in total 18,943 biogas plants and 725 biomethane plants were operational across Europe. These figures show that biogas and biomethane can contribute substantially to the much-needed decarbonization of the gas sector, making renewable gases available for transport, industry and heating. Biomethane production in 2019 increased by 15% relative to the previous year. France is leading the development of the biomethane market with over 1,000 biomethane injection projects at different stages of development in the country. 2013 saw the beginning of a move away from energy crops, towards agricultural residues, bio- and municipal waste and sewage sludge. Since 2017, almost no new plants were established to run on energy crops. EBA's Statistical Report has summarised for the first time the growth potential for biogas and biomethane according to different studies. There is a strong consensus that by 2030, the biogas and biomethane sectors combined can almost double their production and by 2050, production can more than quadruple. The potential biogas and biomethane production calculated for 2030 could reach up to 44 bcm, equivalent to 467 TWh.

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TYNBP second report

The second Ten Year Network electricity and gas joint Scenario Report of ENTSO-E and ENTSG developed three scenarios for Europe. Scenario work is the first important step to capture the interactions between the gas and electricity systems and is therefore paramount to deliver the best assessment of the infrastructure in a hybrid system. Scenarios are not forecasts; they set out a range of possible futures to test electricity and gas infrastructure needs and projects. The scenarios are ambitious as they deliver a low carbon energy system for Europe by 2050.

ENTSO-E and ENTSOG have developed credible scenarios that are guided by technically sound pathways, while reflecting country by country specifics, so that a pan European low carbon future is achieved.

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IEA: A wealth of energy statistics, balances and CO2 emissions data

The IEA Energy Data Centre provides the world's most authoritative and comprehensive source of global energy data. In February, it began publishing an early release of its complete supply and demand energy statistics, energy balances and CO2 emissions data. The early release covers more than 60% of global total energy supply and over 63% of global CO2 emissions related to fuel combustion. In addition to significant member countries such as Germany, the United Kingdom and the United States, the data covers important emerging economies such as China, India, Brazil and South Africa. Visit the IEA Data and Statistics webpage to learn more about the early release and IEA data products more generally.

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Research Library for the Organics Recycling industry completed

NNFC has announced that the development of a Research Library for the Organics Recycling industry is complete, and the Research Library, an online platform compiled of research undertaken across the composting and anaerobic digestion industries, with effort being focused particularly on the past decade and on research that is of relevance to the UK, has been launched. Not only will the library collate research that has been carried out across the industries, but it will also highlight 'research gaps'; areas of research that are limited or absent altogether.

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ENGIE produces renewable gas from solid non-recyclable waste

A year after successfully producing biomethane from forest biomass, the GAYA platform achieved a world first and took a historic step forward with the production of its first cubic meters of renewable gas from Solid Recovered Fuel (SRF). In the absence of dedicated recycling channels, this type of fuel is mostly made up of waste wood, paper, cardboard and plastic resulting from economic activities. ENGIE's demonstrator has validated the integrated operation of the entire chain of innovative technologies under industrial conditions. This configuration maximises the production of renewable gas. Based on the work already undertaken, ENGIE plans to build a first industrial unit in Le Havre, France, starting in 2023, the SALAMANDRE project. From 2026, this will allow 70,000 tonnes of non-recyclable waste per year to be used to produce up to 150 GWh of renewable gas, equivalent to the consumption of 670 urban buses. In addition, the multi-energy process will allow production of 45 GWh of renewable heat to meet urban and industrial needs. As an alternative to landfill, which is due to be phased out, the GAYA chain is positioned as the channel of reference for making use of non-recyclable waste to produce a storable renewable gas, which can substitute for natural gas and as such has multiple end uses: sustainable mobility, industry, the tertiary sector.

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