



Biofuels to Decarbonize Transport



From the Task

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By Tomas Ekbohm, Glaucia Mendes Souza, and Hannah Edgren

Since publishing the last newsletter in July 2022, IEA Bioenergy Task 39 has moved forward in the triennium work. This issue provides an update of the current progress in programme of work for the current triennium (2022-2024) with business meetings, and publications and information dissemination activities. It also highlights recent reports and news articles of interest to biofuels stakeholders. **We are grateful to our Austrian colleagues, for authoring this newsletter’s feature article on biofuels-related developments in Austria.**

Our mission is to facilitate and advance development and deployment of sustainable, lower carbon intensity biofuels used to decarbonise the transport sector. Our method is to assist member countries transport biofuels stakeholders in their efforts to develop and deploy sustainable, lower carbon intensive biofuels through a coordinated focus on technology, commercialization, sustainability, policy, markets and implementation.

Current progress in the triennium

Task 39 has held three virtual business meetings during 2022 and now in September organized a two-day physical meeting in Sweden with a workshop on developments in Sweden regarding biofuels technology, policy and experience in introducing on large-scale environmental-friendly biofuel-based vehicles. In addition, a study visit was made to the world’s first biomass pyrolysis to pyrocrude-for-HVO plant by PyroCell at Setra saw mill in Gävle, Sweden.

Task 39 continues to actively organize and participate in other webinars and conferences with the goal of sharing the networks insights on how decarbonization of the transport sector can contribute to a “green economic recovery”. One such activity was presentations at the Advanced Biofuels Conference Sept. 2022 on Task 39 projects by the following people in Task 39: Paul Bennet, Glaucia Mendes Souza, Andrea Sonnleitner, Dina Bacovsky, Franziska Müller-Langer and Jack Saddler. In addition, Maria Georgiadou and Isabelle Ausdal made presentations related to the task work.

As of now sixteen countries participates in Task 39 including Australia (continuing, but awaiting confirmation), Austria, Belgium, Brazil, Canada, Denmark, European Commission, Estonia, Germany, Ireland, Japan, The Netherlands, New Zealand, South Korea, Sweden and the US. In addition, US Grains Council participates as limited sponsor.

Task 39 is much pleased to welcome China as new member. The Task leadership is continuing its efforts to expand Task membership and currently trying to re-recruit other countries including Norway, Finland and Türkiye. With the collaboration among these countries, Task 39 is set to deliver cooperative research projects to address and assess policy, markets and sustainable biofuel implementation issues.



Publication via the peer reviewed literature, to reach the broader transport biofuels community is listed below with selected papers, with coming report to be published in italics:

- *Improvement opportunities for policies and certification schemes promoting sustainable biofuels with low GHG emissions. Part 1: A review of policy frameworks* (Jinke et al. 2022; TPD).
- Challenges in determining the renewable content of the final fuels after co-processing biogenic feedstocks in the fluid catalytic cracker (FCC) of a commercial oil refinery (Su et al., 2021; Journal of Fuel) ([link](#))

Task 39 participated at the [Science Summit at the United Nations General Assembly \(UNGA77\)](#) with a presentation by Glaucia Souza of the Biofuels Emerging Markets Analysis ([link](#)).

Task 39 Programme of Work

The Task leads and coordinates activities in the three main program areas of:

- 1) **Technology and Commercialization** (T-projects): Technical/commercial aspects of producing and using low carbon intensity (CI) liquid and gaseous biofuels for transport, including both “conventional” and “advanced” biofuels
- 2) **Sustainability** (P-projects): Sustainability and carbon intensity metrics are playing an ever-increasing role in the policies used to develop and use biofuels. Biofuels sustainability/LCA assessment will stay a priority for the Task
- 3) **Policy** (P-projects): The “right” policies (such as LCFs) significantly influence the rate and extent of development, deployment and use of biofuels (e.g., bioethanol, biodiesel, renewable diesel, drop-in biofuels, etc.).

From previous triennium, the **Intertask project Success stories and lessons learned** is in the final stage of completion. The list of **ongoing** and proposed projects is provided below.

- **T39-T1** Ongoing progress in the commercialization of SAF/biojet fuel
- **T39-T2**: Progress in the commercialization of drop-in biofuels and co-processing to produce low-CI transport fuels
- T39-T3: *“Extend assessment of decarbonisation of the marine transport sector and evaluate the commercial production and use of biofuels”*
- **T39-T4**: Assessment of demonstration plants and commercialization progress
- T39-T5: *“Phase 2- Successes and Lessons Learned for Advanced Biofuel Technologies Commercialization (possibly InterTask with Tasks 40 and 45)”*
- **T39-T6**: Inter-Task project ‘Synergies of green hydrogen and bio-based value chains deployment’
- **T39-P1**: Implementation Agendas compare-and-contrast report of each member country’s biofuels policies that have been/are being used to develop, deploy and expand biofuels production and use
- T39-P2: *“Assessment of the sustainability of biofuels pathways, including social and environmental aspects of sustainability, the specific CI impact of “new/advanced” feedstocks, and also further compare and harmonize leading LCA models to support biofuels categorization and regulation (possibly InterTask with Tasks 45)”*
- **T39-P3**: Improvement opportunities for policies and certification schemes promoting sustainable biofuels with low GHG emissions. Part 2: Robustness of GHG emission certification and verification –a case study of selected biofuel value chains and policies
- **T39-P4**: Biofuel's production and use status in “emerging” economies.

As always, we appreciate your readership and value your input and feedback. Please feel free to contact us on how we can increase the newsletter’s value. Thank you for participating in the IEA Bioenergy Task 39 network!

Tomas, Glaucia and Hannah

IEA Bioenergy Task 39 Member Countries, Representatives and ExCo Members

Member Country	Task Representative (s) with NTLs in bold	ExCo Member
Australia (in discussion with IEA Bioenergy ExCo to continue)	Steve Rogers	Mark Brown
Austria	Dina Bacovsky , Andrea Sonnleitner	Hannes Bauer
Belgium	Robert Malina	Thibaut Masy
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Canada	Jack Saddler , Mahmood Ebadian	Oshada Mendis
Denmark	Sune Tjalfe Thomsen , Michael Persson	Mikael Pedersen
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Ireland	TBD	TBD
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New Zealand	Paul Bennett	Paul Bennett
South Korea	Jin Suk Lee	In-Gu Lee
Sweden	Tomas Ekbohm , Hannah Edgren	Jonas Lindmark
The Netherlands	Paul Sinnige , José Muisers, Stephan Janbroers	Ir Kees Kwant
United States	Jim McMillan	Jim Spaeth
US Grains Council*	Isabelle Ausdal, Mackenzie Boubin	-

* US Grains Council participates in Task 39 with same terms as other participating countries. Their participation is limited to one Task and to one triennium and there is no ExCo representation.

Biofuels in Austria - policy, production, and use.

By Andrea Sonnleitner and Dina Bacovsky, BEST – Bioenergy and Sustainable Technologies GmbH

Introduction

In Austria, the transport sector causes about 28.8 % of the annual CO₂ emissions (73.6 Mio t CO₂e) of the country in 2020. The Austrian transport sector showed a sharp rise in GHG emissions since 1990 with 14 Mio tCO₂eq in 2019 and 21 Mio tCO₂eq in 2020, a rise of 51% (UBA 2020). The reason was mainly the long-term trend of increased annual mileage in freight and passenger transport. In addition, the fuel export increased considerably since 1990, caused by lower fuel prices in Austria compared to neighbouring countries. The drop of transport caused GHG emissions in 2020 is caused by the effects of the Covid-19 pandemic with travel restrictions and restricted mobility.

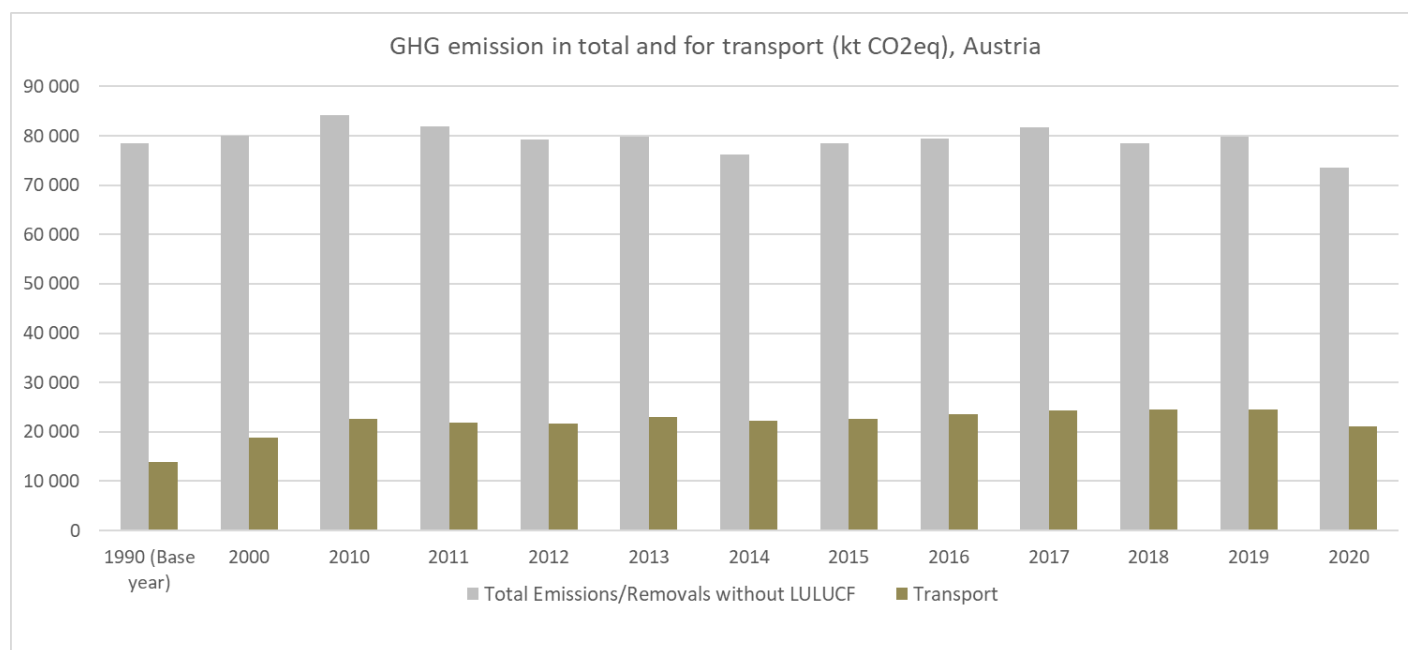


Figure 1: GHG emission trends in total and for transport (kt CO₂eq) for Austria

LULUCF... Land Use, Land-Use Change and Forestry; Data from UBA 2020

The road transport in Austria caused fuel sales of 317 PJ in the year 2020, which is nearly 47 PJ less than in the year 2019 due to the Covid-19 pandemic. Before 2020 the fuel consumption increased in the last years, along with a rising consumption of diesel. The petrol consumption decreases since the 90s. Diesel fuel has the biggest share of 77 % in fuel sales compared to petrol fuel with 17 % and fuels with biogenic origin with 5.7 % (BMK 2021).

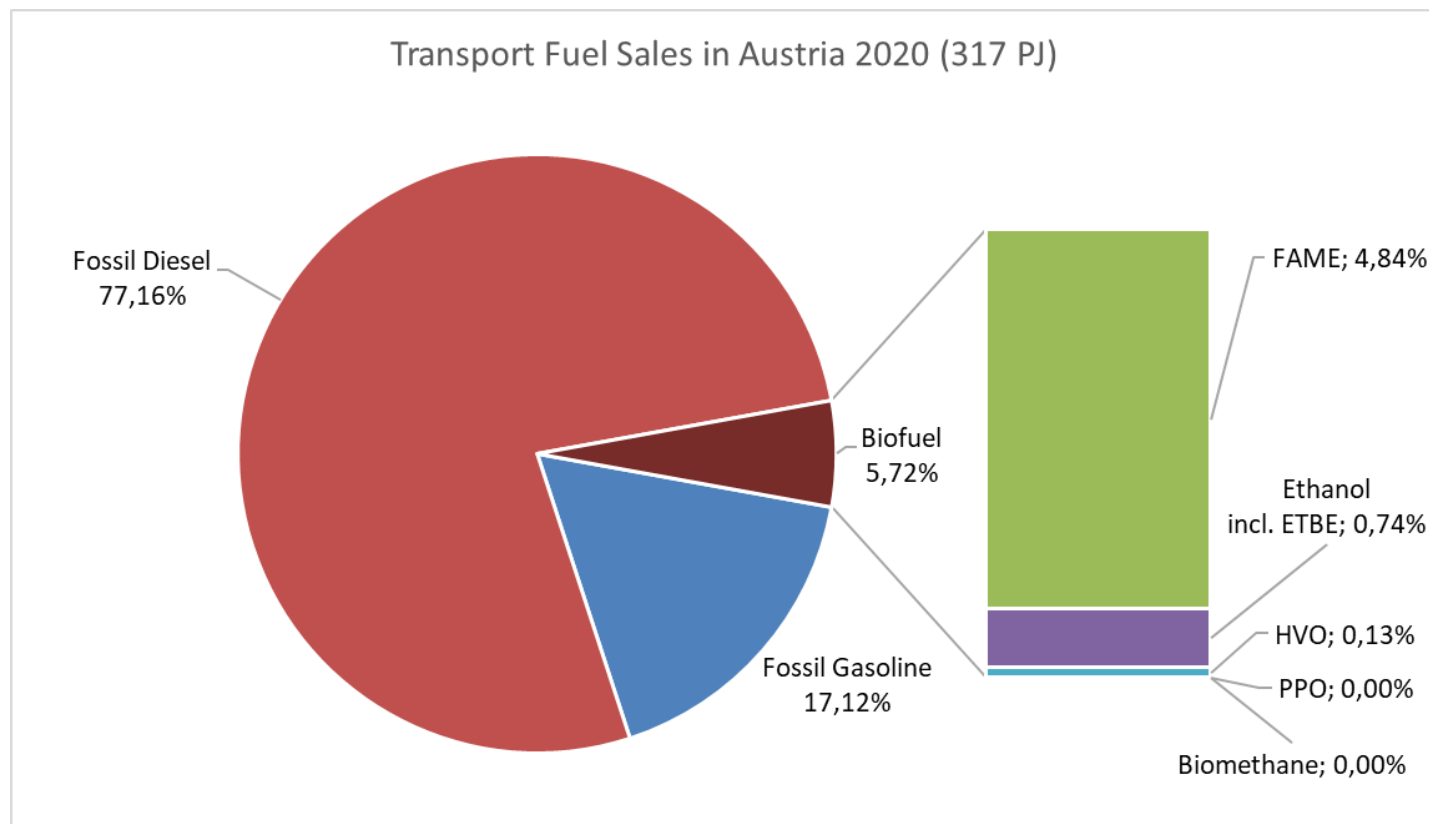


Figure 2: Transport Fuel Consumption in Austria 2020

Data from BMK 2021

Biofuels policy, goals, and promotion

The main legislations that have impacted the biofuels production and use in Austria include:

- EU Renewable Energy Directive (RED) 2009/28/EC
- EU Renewable Energy directive (RED II) 2018/2001/EU
- EU Fuel Quality Directive (FQD) 2009/30/EC
- EU ILUC Directive (EU) 2015/1513
- Fuel Ordinance BGBl. II Nr. 398/2012 idF BGBl. II Nr. 86/2018
- Sustainability Ordinance BGBl. II Nr. 157/2014
- Ordinance on Agricultural Feedstocks for Biofuels BGBl. II 250/2010
- Mineral Oil Tax Law BGBl. I Nr. 630/1994 idF BGBl. I Nr. 104/2018
- Bioethanol Blending Order BGBl. II Nr. 378/2005 idF BGBl. II Nr. 63/2016

Figure 3 shows the timeline of the biofuel policies that have been introduced in Austria to encourage the production and use of biofuels in the country since 1995. Biofuel blending mandate has been the key policy instrument in Austria to support the development and deployment of transport biofuels markets.

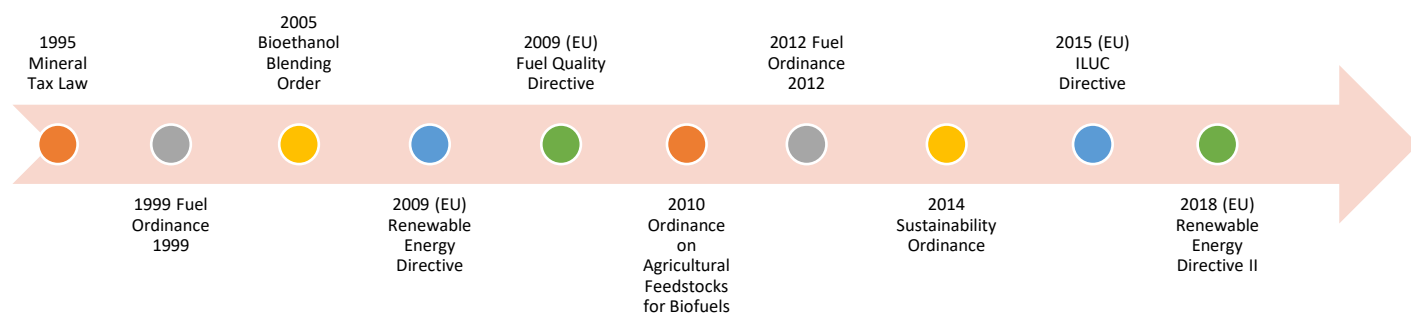


Figure 3: Timeline of biofuel policies development in Austria to encourage the production and use of biofuels

In Austria, the EU transport biofuels directive 2003/30/EG was transposed to national law with an amendment of the fuel ordinance (BGBl.II Nr.209/2004). Since 1.10.2005, 2.5 % (energetic) of the fossil fuels in the transport sector have to be substituted by biofuels. This goal has been reached by blending of diesel fuel with 5 % FAME. The percentage of substitution increased from 1.10.2007 to 4.3 % due to the admixture of ethanol to petrol fuels. With 1.10.2008 the substitution obligation according to the fuel ordinance was increased to 5.75 %.

In 2009 another amendment of the fuel ordinance (BGBl. II Nr. 168/2009) introduced specific sub-goals for the different type of fuels. From 1.1.2009 there was the obligation to substitute 5.75 % (energy) with biofuels, 3.4 % (energy) of gasoline and 6.3 % (energy) of diesel. The Austrian regulation defines values as % by energy content. These values can be fulfilled by adding 5% by volume of ethanol to gasoline and 7% by volume of biodiesel to diesel. The contribution of conventional biofuels is capped at 7% or lower, depending on the level of current consumption in the respective member state. With the amendment of the fuel ordinance in 2018 (BGBl. II Nr. 86/2018) additionally a sub-goal for advanced biofuels was created with a substitution obligation of 0.5 % (energetic) with advanced biofuels from 1.1.2020. The target was reduced from 0.5% to 0.05% for 2020 because of limited availability of this advanced fuel at cost-efficient prices in the market.

Table 1: Austrian targets in the transport sector

Increase the share of energy from renewable sources in the transport sector to 10% by 2020.
Reduce GHG intensity by at least 6% by 2020.
Cap for first generation biofuels of 7 %
Substitution goal (% energy content) – 3.4 % Ethanol, 6.3 % Biodiesel
Target for Advanced Biofuels 0.5 % since 2020

The Fuel Quality Directive requires a reduction of the greenhouse gas intensity of transport fuels by a minimum of 6% by 2020. Together with the Renewable Energy Directive, it also regulates the sustainability of biofuels.

Fuels can only be counted towards these targets if they fulfill the sustainability criteria (same thresholds and requirements as in RED and FQD). Any feedstock produced in Austria must comply with EU regulations. Imported feedstocks or biofuels must be certified by another Member State or a voluntary scheme approved by the EC or Austrian control bodies. Since 2021 palm-oil based fuels cannot be counted towards these targets.

Current biofuel production and use

The biofuels used in the Austrian transport sector are biodiesel (FAME), bioethanol, HVO, pure plant oil and biogas either as blending component or for direct use. The energetic substitution of fossil fuels with biofuels accounts for 6.08 % in the year 2020 – which fulfills the target of 5.75 %, but is another increase in comparison with the years before. The substitution with advanced biofuels amounted to 0.041 % and did not reach the (reduced) target of 0.05% (BMK 2021).

Table 2: Biofuel consumption in Austria 2020

Data BMK 2021

	Fuel in tonnes	Energetic Share of total biofuels
FAME	415,176	84.6 %
Ethanol	66,750	9,9 %
ETBE	15,280	3.1 %
HVO	9,639	2.3 %
Biogas	110	
Pure Plant Oil	107	

In 2020 the biofuels production decreased compared to the years before. This decrease in production was caused by reduced fuel consumption due to Covid-19 pandemic and the restrictions and measures from the government (lockdown, increased home office, ...). The production of FAME and ethanol over a longer period of time is depicted in Figure 4.

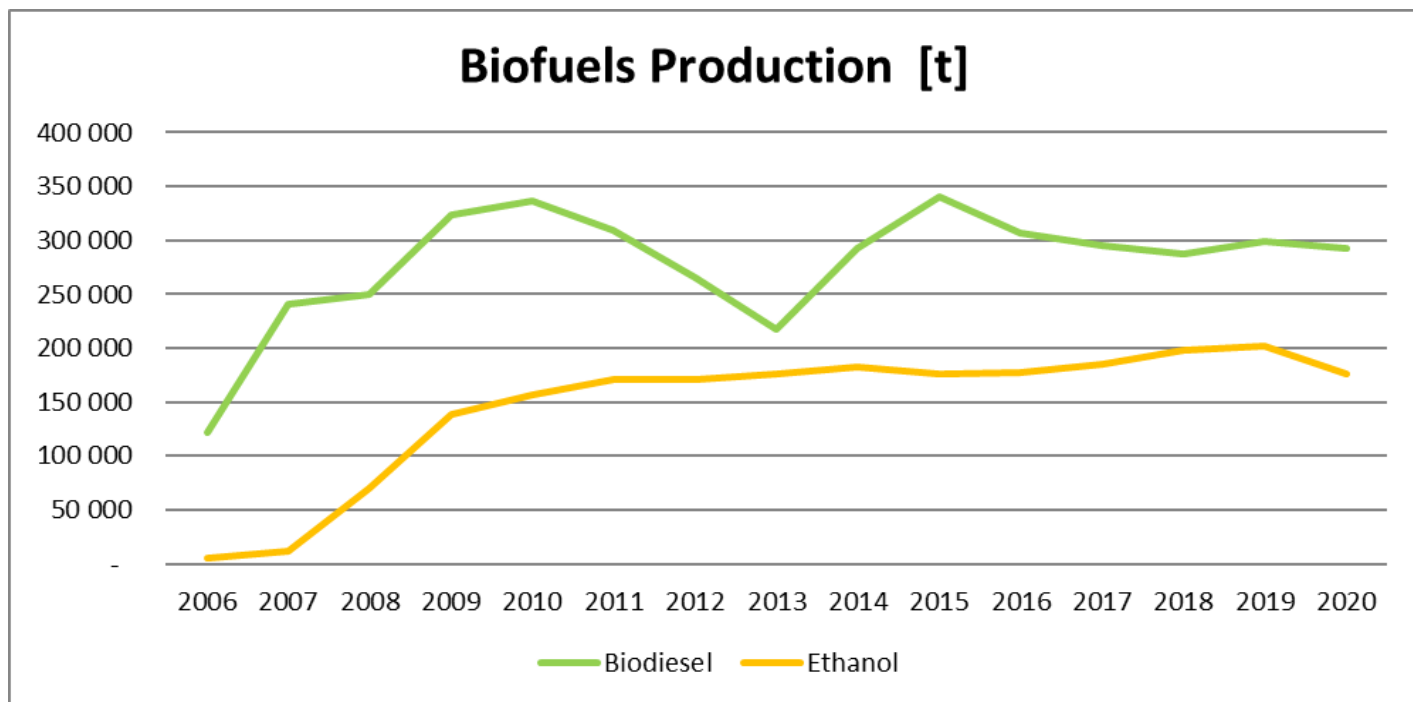


Figure 4: National production of FAME and ethanol over time (2006-2020)

Data BMK 2021

In Austria, one large bioethanol production facility and seven smaller FAME (biodiesel) production facilities were operating in 2020, and in 2021 another production facility producing ethanol from brown liquor started operation. Other fuels, which are produced in smaller production facilities with no relevant values available, are pure plant oils and biomethane.

The conventional bioethanol plant has a capacity of 246 ML/a located in Pischelsdorf. In 2020 about 175,000 tons of ethanol were produced in Austria, 25,000 tons less than the year before. The Pischelsdorf plant at this level of production is capable of displacing 1/3 of Austria’s soy protein imports through DDGS co-production. While Austria’s E10 ethanol demand could be met by the production capacity of a single plant, i.e., the AGRANA ethanol plant in Pischelsdorf, plans for E10 have been cancelled in 2012 and E5 remains the typical ethanol blend (AMF 2021).

The other bioethanol plant produces advanced ethanol from brown liquor at the pulp mill of AustroCel Hallein in Hallein. The capacity is 30 ML/a. The ethanol production is fully integrated into the mill that produces dissolving pulp for textile applications as the major product. Currently the facility represents Austria’s only production facility for advanced ethanol.

Table 3: Production plants for Bioethanol and advanced ethanol in Austria

Company	City	Capacity [ML/a]
AGRANA Bioethanol GmbH	Pischelsdorf	246
AustroCel Hallein GmbH	Hallein	30

According to the Austrian biofuels register eIna (UBA 2022), seven companies are registered in 2020 as biodiesel producers. Biodiesel is the main biofuel produced in Austria. Biodiesel production capacity in Austria is ~ 380 ML/year from 7 production facilities. Production reached its peak in 2015 with nearly 381 ML of biodiesel produced, with production falling to 322 ML in 2018. In the following years there was a slight increase in biodiesel production. The total production in 2020 was 292,500 tonnes.

Table 4: Biodiesel production plants in Austria

Company	City	Capacity [ML/a]
Biodiesel Süd GmbH	Bleiburg	22
Münzer Bioindustrie GmbH	Wien	157
HPF Biokraft Hirtl GmbH	Fehring	5
Abid Biotreibstoffe GmbH	Hohenau	56
Biodiesel Kärnten GmbH	Arnoldstein	56
Münzer Paltental	Gaishorn am See	67
Bioraffinerie Mureck GmbH	Mureck	17
Total capacity		380

Pure plant oil (PPO) was used in recent years directly as fuel, in particular by agricultural vehicles and road freight transport at a nearly constant level of about 17-20 ML. The estimation of the amount of plant oil used in transport is difficult, since production volumes can not be distinguished regarding intended purpose.

Biogas produced in Austria is mainly used on site for heat and power production, with an estimated production of 100-630 Mm³ of biogas per year. Beside the direct conversion into electricity processed biogas is fed into the national gas grid. Efforts are also being made to introduce "Bio-CNG" into the transport fuel market, but the number of CNG fuel capable vehicles must still be increased. At 4 biogas plants in Austria, the processed biogas is used as biomethane for refueling vehicles. In 2018 274 tonnes of biomethane were used in the transport sector.

In 2020 there was no active HVO production in Austria, the needed amounts for the transport sector were imported. There are plans for co-processing biogenic feedstock in the in the only oil refinery in Austria (company OMV). By 2025 approximately 200,000 t of sustainable feedstock should be co-hydrotreated together with gasoil.

Austria is a net importer of feedstocks for biofuel production. Austria is not self-sufficient in terms of vegetable oils in general (not only for biodiesel production) and UCO for biodiesel production. Feedstock for ethanol production is partly imported, as Austria is a small country and the production facility is close to the Czech border and close to a Danube port.

Biofuel produced from feedstocks with low carbon intensity find better markets in countries such as Germany and Sweden where a GHG reduction quota is obligatory. Therefore, there is a lively export of biodiesel produced in Austria from waste materials.

Advanced biofuels production

In Austria the production of advanced biofuels starts up – there are several projects for the demonstration and deployment of advanced biofuels:

Advanced ethanol production at AustroCel Hallein:

Since December 2020 an ethanol production from brown liquor fermentation at AustroCel Hallein is in operation. AustroCel Hallein is a spruce-based pulp production for textile fibres, with a production capacity of 155 kt/year. This facility already provides green electricity and district heating. The technology for advanced fuel production is the fermentation of brown liquor to ethanol with an installed capacity of 30 million litres per year.

Co-processing at OMV:

In Austria, there is one single oil refinery – the company OMV operates a refinery in Schwechat close to Vienna and its airport. The Schwechat Refinery is one of the most modern and one of the largest refineries in Europe. Crude oil and semi-finished products are distilled and refined; high-quality mineral oil products and petrochemical raw materials are produced. The processing capacity of the plant is 9.6 Mio tonnes of crude oil per year or about 190,000 barrels/day of crude oil can be processed.

OMV uses new technologies to increase the quality and stability of fuels with biogenic components through what is known as co-processing. Co-processing involves introducing biogenic feedstock already during the fuel refining process. The liquid biomass feed which can be for example rapeseed oil, sunflower oil or used cooking oil, is co-hydrotreated together with gasoil, producing a high-value fuel. OMV plans to implement co-processing at large scale, and by 2025, the company aims to co-process approximately 200,000 t of sustainable feedstock per year, depending on future legislation.

Syngas Platform Vienna and Waste2Value project:

A cooperation of industry and academia including BEST, Wien Energie, OMV, TU Vienna, SMS group and others led to the creation of the Syngas Platform in Vienna. For this purpose, a 1 MW pilot gasifier was constructed at the waste treatment facility in Vienna.



Figure 5: Pilot gasifier at the Syngas Platform Vienna

© BEST, Wolfgang Bledl

The Waste2Value project is driving the use of waste residues to produce hydrogen-rich syngas. The project focuses on waste fuels such as sewage sludge, industrial residues, waste wood and similar material.

In a second process step, the syngas is synthesized into liquid fuel (high quality diesel and kerosene). The current stage of the project runs to 2023 and covers construction and start-up of the pilot facility to gain the relevant operational experience. The Waste2Value research program examines the entire process chain, starting with the waste fuel, and including syngas production, purification, treatment, and synthesis through to the final refining and use of the FT fuel in fleet trials for public transport. The plant is worldwide the first of its kind designed to demonstrate the use of this technology in a single, end-to-end process in an industrial environment. The project results will allow the process to be evaluated in economic and technical terms, providing the basis for the planned industrial-scale implementation of the process.

Conclusion

In Austria the biofuel policies – implementing the respective EU Directives - led to a relatively stable production and use of biofuels in the country since 2005. The biofuel blending obligation leads to the use of biofuels in the common diesel and petrol fuels, but there are virtually no dedicated vehicles for higher blends of biofuels, thus it will be hard to reach higher substitution levels. Apart from the biofuel blending obligation there are no attempts to further increase the biofuel use in the Austrian transport sector.

Although Austria is a small country, there is a lot of expertise and know-how available and research projects and initiatives are going on to increase the share of biofuels, in particular advanced biofuels and to reduce the greenhouse gas emissions in the transport sector.

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In the News

Reports and Research

- January- In Illinois, new research from scientists at Argonne National Laboratory suggests that swapping heavy fuel oil with fuels made from wood waste, waste fats, oils, and greases could drastically cut planet-warming emissions from the shipping industry by 40% to 93%. The team also found that cleaner biofuels could be cost-effective after considering credits, like those offered by California's Low Carbon Fuel Standard ([Read more](#)).
- April- In 2010-2019 average annual global greenhouse gas emissions were at their highest levels in human history, but the rate of growth has slowed. Without immediate and deep emissions reductions across all sectors, limiting global warming to 1.5°C is beyond reach. However, there is increasing evidence of climate action, said scientists in the latest Intergovernmental Panel on Climate Change (IPCC) report ([Read more](#)).
- June- Sustainable biomass supplies can contribute 20–30% of the future global and European energy supply, leading to reduced overall mitigation costs, including realizing the net CO₂ removal from the atmosphere using BECCS concepts. Specific options, pathways, and preconditions are key to achieving such a substantial contribution of sustainable biomass in future (2050) energy and material supply (with a focus on the European setting) ([Read more](#)).

Policy and Regulatory Developments

- January- The Food and Agriculture Organization of the United Nations (FAO) and the European Commission's Joint Research Centre (JRC) today launched an important new bioeconomy publication for policymakers in countries and macro-regions. The *Guidance note on monitoring the sustainability of bioeconomy at a country or macro-regional level*, which was commissioned by the International Bioeconomy Forum (IBF) and released to coincide with the IBF plenary meeting on 29-30 November 2021, for the first time describes in easy-to-follow steps how countries and macro-regions, such as the European Union (EU), can monitor sustainability along with their bioeconomy strategies and policies ([Read more](#)).
- February- In Washington, D.C., the U.S. Department of Energy Office of Energy Efficiency and Renewable Energy Bioenergy Technologies Office released two new Requests for Information (RFI) around biomass and energy issues, focusing on biomass conversion research, development and analysis and community-scale resource and energy recovery from waste solutions ([Read more](#)).
- February- In Brazil, the environmental minister announced the upcoming Metanol Zero program on national radio that aims to use national banks to transform methane emissions into biofuel. The program is set to launch in 30 days with a focus on MSW and agricultural waste, from livestock to sugarcane. The eventual biogas production is seen as a future fuel for heavy vehicles to offset the country's diesel dependence where domestic logistics is dominated by trucking ([Read more](#)).
- February- In Belgium, the European Commission is considering taxation of fossil fuels and crop-based biofuels at the same rate as part of the revision of the 2003 Energy Taxation Directive in an effort to transition the biofuel supply more quickly away from agricultural feedstocks. With patchwork fixes of the taxation policy since its implementation, anomalies have popped up around the EU, such as in the Visegrad countries where biofuels are currently taxed higher than fossil fuels ([Read more](#)).
- February- In New Zealand, the debate about indirect land use change and the use of food crops as biofuels feedstocks have reared their ugly heads ahead of the country's plan to implement biofuel blending from April 1, 2023. Spooked by pushback received by the European Commission regarding their handling of feedstock sustainability, New Zealand is looking to limit corn-based ethanol and palm oil-based biodiesel. The cap on crop-based biofuels could be 50% but is still under discussion ([Read more](#)).

- March- In Belgium, the Commission published its Communication “REPowerEU: Joint European action for more affordable, secure, and sustainable energy”. The Communication aims to support the EU’s energy independence by accelerating the deployment of renewables and ensuring the affordability and security of energy supply ([Read more](#)).
- March- In Illinois, Illinois Soybean Growers (ISG) are celebrating the passage of the organization’s B20 Legislation, sponsored by State Senator Patrick Joyce (D–Essex). The legislation passed with strong bipartisan support from every region of Illinois, and it will now move to the Illinois House of Representatives where State Representative Eva Dina Delgado (D–Chicago) will be the lead sponsor ([Read more](#)).
- March- In India, Bloomberg reports Civil Aviation Minister Jyotiraditya Scindia has called on all airlines to quickly adopt sustainable fuels to help transition the aviation industry towards net carbon zero. The minister wants 96 Indian airports to be carbon neutral and powered by renewable energy by 2024 compared to the two that are considered “green” today. IndiGo and SpiceJet are both making moves towards incorporating SAF including securing SAF. Delhi airport is already working to reduce its fuel demand by using semi-robotic vehicles to tow aircraft that save 214,000 liters of fuel annually ([Read more](#)).
- April- The Canadian government awarded funding to several biofuel and bioenergy projects, including those focused on liquid transportation fuels, biocarbon, renewable natural gas (RNG), and sustainable aviation fuel (SAF) ([Read more](#)).
- April- The U.S. EPA on April 12 published a proposed rule approve Renewable Fuel Standard pathways for renewable diesel, jet fuel, heating oil, naphtha, and liquefied petroleum gas (LPG) produced from canola/rapeseed oil via a hydrotreating process ([Read more](#)).
- April- Sens. John Barrasso, R-Wyo., and Dianne Feinstein, D-Calif., on April 7 introduced legislation that aims to improve data reporting for renewable diesel and sustainable aviation fuel (SAF), incentivize their production, and eliminate unnecessary labeling regulations ([Read more](#)).
- May- In Iowa, Gov. Kim Reynolds signed into law HF2128, the Biofuels Bill. This bill was a top priority of hers, which she introduced to the legislature earlier this year and received strong bipartisan support. This historic bill makes Iowa the first state in the nation to adopt an E15 standard and expands access to higher blends of ethanol and biodiesel across the state, lowering fuel prices for consumers ([Read more](#)).
- May- In India, the Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved the Amendments to the National Policy on Biofuels -2018. The “National Policy on Biofuels – 2018” was notified by Ministry of Petroleum and Natural Gas on June 4, 2018 in supersession of National Policy on Biofuels, promulgated through the Ministry of New & Renewable Energy, in 2009 ([Read more](#)).
- May- the U.S. Department of Energy announced \$38 million to begin decarbonizing four of DOE’s 17 National Laboratories, including NREL and PNNL, in support of President Biden’s goal to reach net-zero greenhouse gas emissions no later than 2050, with a new Net Zero Labs Pilot initiative ([Read more](#)).
- June- The Government of Canada, represented by the Honourable Steven Guilbeault, Minister of Environment and Climate Change, has announced the publication of the final Clean Fuel Regulations (CFR). Published on June 29, 2022, the CFR is sending "a clear signal to investors and industry that now is the time to bring more clean technologies, energy efficiency practices, and affordable low-carbon fuels to market ([Read more](#)).
- June- Officials from some G7 countries, including Germany and Britain, push for temporary waivers on biofuels mandates to combat soaring food prices. The food crisis caused by the war in Ukraine has sparked a food versus biofuel debate, with some policymakers calling for an easing of mandates for blending biofuels into petrol and diesel to increase the supply of global grain and vegetable oil ([Read more](#)).

- July- The European Parliament has taken a positive step on EU renewable energy policy. The Committee on Industry, Research and Energy (ITRE) has decisively voted in favor of increasing the ambition for GHG emissions reduction in transport while leaving Member States free to use crop-based biofuels in their transport energy mix ([Read more](#)).
- July- Strategic Biofuels, the leader in developing negative carbon footprint renewable fuels plants, announced that the State of Louisiana has enhanced its nation-leading carbon capture and sequestration (CCS) legislation with provisions that provide additional carbon dioxide (CO₂) reservoir storage security for projects in Caldwell Parish, the site of Strategic Biofuels' Louisiana Green Fuels project ([Read more](#)).
- July- The U.K. government on July 19 released its Jet Zero strategy. The initiative, in part, requires at least 10 percent sustainable aviation fuel (SAF) use by 2030. It also aims to kickstart a domestic SAF industry, supported by a new £165 million (\$197.91 million) Advanced Fuels Fund ([Read more](#)).
- July- The government of India on July 4 announced it is expanding the excise duty exemption on ethanol and biodiesel to encourage higher biofuel blends, according to a notice published by the Ministry of Finance ([Read more](#)).
- August- The U.S. Senate passed the Inflation Reduction Act of 2022. The bill includes a wide range of provisions benefiting the biofuel and bioenergy industries, including a new tax credit for sustainable aviation fuel (SAF), a new technology-neutral tax credit for clean transportation fuels, and a new tax credit for clean hydrogen production ([Read more](#)).
- September- The European Parliament stressed the need for renewable energy to be increasingly used and energy consumption to be drastically slashed by 2030 during an historic vote. MEPs voted on September 14 to raise the share of renewables in the EU's final energy consumption to 45% by 2030, under the revision of the Renewable Energy Directive (RED) -a target also backed by the European Commission under its *RepowerEU* package ([Read more](#)).
- September- The UK government has revealed the Emissions Trading Scheme (UK ETS) will align its measurement of the environmental credentials of sustainable aviation fuels (SAFs) with sustainability rules that underpin the UK's biofuels policy until 2025 ([Read more](#)).
- September- the U.S Department of Energy announced a \$46 million award for 22 projects to decarbonize the transportation and generation sectors. The projects will develop waste conversion and carbon capture technologies to produce fuels from biomass and waste streams, and enable algal systems to capture carbon and turn it into alternative clean energy sources ([Read more](#)).

Industry Developments

- January- In Denmark, the Prime Minister announced that she wants all domestic flights to be fossil fuel free by 2030. Although she admitted that it would be a major challenge to achieve, she said Denmark needed to lead the way to push for the energy transition in aviation. Sweden last year announced it also wanted all domestic flights to be fossil fuel free by 2030. There has been "flight shaming" due to the carbon footprint of air travel that the Danish prime minister wants to end, saying that "To travel is to live and therefore we fly" ([Read more](#)).
- January- In Denmark, BP and Maersk Tankers, with support from the Danish Maritime Authority, have successfully completed trials using biofuel-blended marine fuel in product tankers, demonstrating that sustainable biofuels can be used as a marine 'drop-in fuel' to help reduce carbon emissions in shipping ([Read more](#)).
- January- the CBH Group partnered with leading dry bulk operator Oldendorff Carriers to conduct the first biofuel trial on a grain vessel exporting from Australia, using biofuel supplied by big name bp. Is the grain being shipped? ISCC-certified barley going to Intermalt whose largest brewing customer is Heineken. Sustainable grain on a sustainable ship for more sustainable beer ([Read more](#))

- January- In the Netherlands, Spliethoff Group's constant striving to reduce its CO2 emissions has led to two trials using biofuel on its vessels. The first trial took place between June and November last year on BigLift Shipping's HTV BigLift Baffin ([Read more](#)).
- January- In the Netherlands, KLM will start adding 0.5% Sustainable Aviation Fuel (SAF) for flights departing from Amsterdam. In addition, KLM will offer its customers the option of purchasing an extra amount of sustainable fuel. In this manner, KLM aims to stimulate the market for SAF ([Read more](#)).
- February- In California, Aemetis, Inc. has signed an offtake agreement with Japan Airlines for 90 million gallons of blended sustainable aviation fuel to be delivered over the 7-year term of the agreement. The blended sustainable aviation fuel to be supplied under this agreement is 40% SAF and 60% Petroleum Jet A to meet international blending standards ([Read more](#)).
- February- In Washington state, Boeing announced a supply agreement for two million gallons (7.5 million liters) of blended sustainable aviation fuel (SAF) with EPIC Fuels to power its Commercial Airplanes operations in Washington state and South Carolina through 2022. The agreement is the largest announced SAF procurement by an airframer and further demonstrates Boeing's commitment to decarbonizing aviation ([Read more](#)).
- February- In Illinois, LanzaJet has entered into a memorandum of understanding (MOU) with Marquis Sustainable Aviation Fuel to construct a 120 million gallons per year integrated sustainable fuels plant in the U.S. using low-carbon intensity feedstocks to produce SAF and renewable diesel via the LanzaJet™ Alcohol-to-Jet process. The plant will employ on-site carbon capture and sequestration and renewable energy to produce SAF, resulting in a lifecycle greenhouse gas reduction of more than 70% compared to conventional jet fuel ([Read more](#)).
- February- In Germany, it's full speed ahead for Kohler Engines and its commitment to lessen the environmental impact of its engines. The company recently approved use of EN15940- compliant Hydrotreated Vegetable Oils, or HVOs, for all its diesel engines – either pure or as a blend with conventional diesel ([Read more](#)).
- March- Neste has established a 50/50 joint venture with Marathon Petroleum to produce renewable diesel following a conversion project of Marathon's refinery in Martinez, California. Through the JV Neste obtains a 50% interest in the Martinez Renewable Fuels project. The production output will be split evenly between the joint venture partners, and each partner will be responsible to market the products under its own brand and responsibility. The facility will be operated by Marathon, which has long experience as a leading refinery operator and in executing major capex projects in the US. Both Neste and Marathon will be responsible for feedstock sourcing for the joint venture ([Read more](#)).
- March- In Nebraska, Union Pacific Railroad will begin using a higher biodiesel blend in locomotives it acquired from Wabtec. The new collaboration helps Union Pacific as it works to increase the percentage of low-carbon fuels consumed to 10% of its total diesel consumption by 2025 and 20% by 2030 ([Read more](#)).
- March- In France, TotalEnergies' Normandy platform has successfully started production of sustainable aviation fuel (SAF). This new site complements the biojet fuel production capacities of La Mède biorefinery (Bouches-du-Rhône) and the Oudalle plant (Seine-Maritime) ([Read more](#)).
- March- In the UK, DB Cargo UK has successfully trialed the use of 100% renewable Hydro-treated Vegetable Oil (HVO) as it continues to look for new and innovative ways to power its fleet and decarbonize its operations ([Read more](#)).
- March- In Singapore, Anglo American has successfully completed a sea trial using biofuel blended with very low sulfur fuel oil (VLSFO), reducing carbon emissions by approximately 10%. The trial further demonstrates the potential for sustainable biofuel to be used as a 'drop-in' fuel, improving its viability to help reduce emissions in the shipping sector. The fuel was blended and bunkered in Singapore, marking an important step in establishing a local supply chain and a cost-efficient, low-carbon biofuel offer for the region ([Read more](#)).

- March- In California, through its Sustainability Fund, Shopify has committed buy \$2.5 million worth of Twelve's E-Jet fuel. Through this first-of-its-kind agreement, Shopify's purchase of E-Jet will support Twelve as it scales, accelerate future adoption by commercial airlines and freight carriers, and help bring more E-Jet to market. Shopify is supporting nine new entrepreneurial, tech-driven companies through our Sustainability Fund, bringing its total carbon removal purchase commitment to \$32 million ([Read more](#)).
- April- In Denmark, NORDEN has launched a 100% carbon-neutral biofuel sailing option for customers looking to decarbonize their supply chains. The biofuel sailing is the first in a range of green freight products to be rolled out to customers this year as part of NORDEN's transition to zero-carbon shipping by 2050. NORDEN has secured supply of biofuel made from waste cooking oil and is in discussion with several customers over the first carbon-neutral freight contract ([Read more](#)).
- April- In Japan, Mitsui O.S.K. Lines, Ltd., its wholly-owned company MOL Chemical Tankers Pte. Ltd., leading commodity trading company Trafigura Pte Ltd., and its vessel fuel supply joint-venture company TFG Marine Pte Ltd, have signed a Memorandum of Understanding this month. The MOU is for a joint study on the full-scale supply of biodiesel fuel (BDF) for MOLCT-operated vessels in bunkering ports around the world. Based on the MOU, the companies will move forward with the study, with the intention to establish a global supply of BDF for MOLCT's operated fleet ([Read more](#)).
- April- In Sweden, as part of the strategy to switch to large-scale renewable fuel production, Preem will sign a \$308.7 million loan agreement with Swedish Export Credit Corporation (SEK). The loan is covered by the Swedish National Debt Office's program for green credit guarantees ([Read more](#)).
- April- In the Netherlands, Ryanair announced a partnership with Neste to power approximately a third of its flights at Amsterdam Airport Schiphol (AMS) with a 40% SAF blend. This blend will reduce greenhouse gas emissions by over 60%, supporting Ryanair's Pathway to Net Zero by 2050 decarbonization goals. Ryanair has already significantly advanced this commitment by partnering with Trinity College Dublin to open the Ryanair Sustainable Aviation Research Centre and investing \$22 billion in its 'Gamechanger' fleet, which offers 4% more seats but are 16% more fuel & CO2 efficient and reduce noise emissions by 40% ([Read more](#)).
- April- Bunge and CoverCress Inc. announced a unique commercial partnership to bring a new renewable oilseed and animal feed crop to market. The agreement establishes a long-term commercial relationship between the two companies and supports the expansion of CCI's CoverCress technology, a new winter oilseed crop that is ideal as a lower carbon intensity feedstock to help meet the growing demand for renewable fuels ([Read more](#)).
- May- In California, Air Products is teaming up with World Energy to build a new \$2 billion major expansion project at World Energy's Sustainable Aviation Fuel (SAF) production and distribution hub in Paramount, California. The LA county facility is the world's first commercial scale and North America's only SAF production facility and its total fuel capacity will be expanded to 340 million gallons annually ([Read more](#)).
- May- In Iowa, on the occasion of the official opening ceremony on May 6th, VERBIO CEO Claus Sauter said in front of the attending state Governor Kim Reynolds and other representatives from politics and business: "The plant in Nevada (Iowa) is our first plant in the USA. Until summer 2022, we will achieve full-scale production. Then we will process up to 100,000 tons of corn stover into renewable natural gas (RNG) every year and make it available for the market as a climate-friendly, renewable biofuel ([Read more](#)).
- May- Together with its partner Nordic Marine Oil, Neste is piloting a new Neste MarineTM 0.1 co-processed marine fuel in Scandinavia – a solution helping the maritime sector to reduce greenhouse gas (GHG) emissions. The ISCC PLUS certified marine fuel enables up to 80% GHG emission reduction over the life cycle compared to fossil fuels without compromising the product quality and performance ([Read more](#)).

- May- In Singapore, GoodFuels and ITOCHU Corporation announced a new partnership agreement to scale sustainable marine biofuel in Singapore, Japan, and Asia-Pacific. The long-term partnership, which was signed on 12 May 2022, will combine GoodFuels' deep expertise in sustainable biofuels, extensive client and sourcing portfolio, and strong sustainable impact brand with ITOCHU's mature trading and supply operations and developed client base. Under the partnership, GoodFuels will be mainly responsible for sourcing, production, technical expertise, and brand marketing whilst ITOCHU will be responsible for logistics, blending, and distribution. Both parties will share responsibilities in sales and marketing and work jointly towards scaling capabilities in production and sourcing ([Read more](#)).
- May- A team of energy industry companies led by SGP BioEnergy is joining the Government of Panama to develop the world's largest biofuels production and distribution hub. Once complete in five years, Biorefineria Ciudad Dorada (Golden City Biorefinery), located in Colon and Balboa, Panama, will be the largest advanced biorefinery and Sustainable Aviation Fuel (SAF) production platform in the world producing 180,000 barrels per day (2.6 billion gallons per year) of biofuel ([Read more](#)).
- May- In the UK, Rolls-Royce has taken a significant step towards meeting its net zero goals, set out last year, with the approval by Power Systems of its Series 4000 and Series 1600 diesel engines for use with a range of EN15940-certified synthetic diesel fuels in power generation applications. Following successful testing, including in the field, both types of engines can use a range of sustainable fuels including Biomass to Liquid (BtL), Hydrotreated Vegetable Oil (HVO) and Power to Liquid (PtL) fuels such as e-diesel. They can all be used to replace conventional diesel fuel ([Read more](#)).
- May- In Germany, the Handelsblatt newspaper said that Verbio could be looking at refurbishing the PCK Schwedt refinery in eastern Germany into biofuel production, a facility that Alcmene Group is trying to take over, although neither company commented on the report. The facility, majority owned by Russian energy company Rosneft, is reliant on imports of Russian oil it receives via pipeline from Poland. Part of Verbio's plans could include expanding biogas activities in the area to help decarbonize the refinery in the long run ([Read more](#)).
- June- In Romania, Renewables Now reports that Clariant has opened its \$150 million cellulosic ethanol plant in Dolj. Feedstock contracts have been signed with more than 300 local farmers to secure the required 250,000 metric tons of straw required annually. The facility will produce 50,000 metric tons of cellulosic ethanol annually. Production was last expected to start in Q4 2021 following the start of construction in 2018. The project has received about \$43 million in funding from the European Union ([Read more](#)).
- July- In Finland, Neste, MAN and Altens signed a partnership contract aimed at promoting biofuels in France. France is a strong market for biodiesel and FAME, but many OEMs would like to see more renewable diesel, HVO100, on the market. The objective of this partnership is to promote the common vision of Neste, MAN and Altens of the crucial role that biofuels can and must play in the sustainability transformation of the transportation of goods and people ([Read more](#)).
- July- In Spain, Sustainable energy firm XFuel announced it has secured €8.2 million funding, laying the foundation for the commercialisation of its next-generation synthetic diesel, marine and jet fuel technology. XFuel's patented technology efficiently converts biomass waste into low-cost, drop-in fuel that can be used in road, marine, and aviation applications ([Read more](#)).
- August- In the UK, Imperial College London is establishing a ground-breaking research institute dedicated to developing clean, safe, and sustainable air-travel. Supported by a £25 million (€30 million) philanthropic donation, the Brahma Vasudevan Institute for Sustainable Aviation will pioneer the breakthroughs and technologies needed to support the aviation industry's transition to zero pollution ([Read more](#)).

- August- Fulcrum Bioenergy, a clean energy company pioneering the creation of renewable, drop-in transportation fuels from landfill waste, have announced that it has completed a \$20 million equity investment in Fulcrum by SK Innovation, the energy arm of South Korea's SK Group. In addition, Fulcrum and SK Innovation will work together to enter into an exclusive licensing agreement providing the opportunity to explore the possibilities of bringing Fulcrum's patented and proprietary waste-to-fuel process to South Korea and select countries in Asia ([Read more](#)).
- August- Strategic Biofuels, the leader in developing negative carbon footprint renewable fuels plants, announced today that the Port of Columbia, home to the Louisiana Green Fuels project (LGF) has been awarded a \$1 million grant from the Department of Homeland Security and FEMA through its Port Security Grant Program. The PSGP is part of a series of grant programs created by Congress and implemented by DHS to help strengthen defenses around the nation's critical infrastructure ([Read more](#)).
- September- Canadian company Anaergia has signed an agreement with European Energy. Under the terms of this agreement Anaergia is to supply European Energy with up to 60,000 tonnes per year of liquefied biogenic Carbon Dioxide for a period of 10 years ([Read more](#)).
- September- In the United States (US), renewable natural gas (RNG) and renewable fuels company Aemetis Inc., has announced that it has finalized US\$7 billion worth of sustainable aviation fuel (SAF) and renewable diesel (RD) supply agreements. The supply contracts cover 100 percent of Aemetis Riverbank plant production capacity for up to 10 years ([Read more](#)).
- September – In Brazil, Shell, Raízen, Hytron, USP and SENAI Form a Partnership to Convert Ethanol Into Renewable Hydrogen. First of its kind in the world, the agreement includes the construction of two plants that will produce hydrogen from ethanol and a fueling station for buses that circulate around the University of São Paulo (USP) campus, in São Paulo ([Read more](#)).

Upcoming Meetings, Conferences & Webinars

IEA and ISGAN workshop: Flexibility for resilience in integrated systems, 3 - 4 Oct 2022 Paris Time

<https://www.iea.org/events/iea-and-isgan-workshop-flexibility-for-resilience-in-integrated-systems>

ISGAN and IEA's Digital Demand-Driven Electricity Networks (3DEN) Initiative are co-organising an international high-level expert workshop to enhance international collaboration and research, share best practices and provide policy support deploying flexibility for resilience. This workshop will gather international experts to present and discuss how innovative flexibility services can be developed to support grid operation with high penetration of renewable energy sources, bringing evidence from ongoing analysis and successful case studies. It will also discuss how these services can be integrated in the investment planning stage, thus building up resilience for future-proof power systems.

22nd Annual IEA-IETA-EPRI Workshop on Greenhouse Gas Emissions Trading, 4 - 6 Oct 2022 Paris Time

<https://www.iea.org/events/22nd-annual-iea-ieta-epri-workshop-on-greenhouse-gas-emissions-trading>

The 22nd annual workshop organised by the International Energy Agency (IEA), International Emissions Trading Association (IETA) and Electric Power Research Institute (EPRI) will take place in four hybrid sessions (in-person and virtual participation possible) distributed among 4, 5 and 6 October 2022. The event will be hosted at the IEA (9, rue de la Federation, Paris).

9th Annual EPRI-IEA Challenges in Decarbonisation Workshop a Window into the Global Energy Transition, 6 - 7 Oct 2022 Paris, France

<https://www.iea.org/events/9th-annual-epri-iea-challenges-in-decarbonisation-workshop-a-window-into-the-global-energy-transition>

Two years into the “decade of action” to achieve international climate objectives, there is greater appetite from governments and industry to take bolder action on decarbonisation. Ensuring a resilient and decarbonised power system will require rethinking how power markets work to ensure sufficient investment in new technologies. This year’s EPRI-IEA Challenges in Decarbonisation Workshop takes a snapshot of our current moment in the energy transition. The workshop will take an in-depth look at how leading policymakers and energy stakeholders are adapting to address today’s biggest challenges, such as record energy prices and the need for security of supply as well as bright spots such as emerging technologies and emerging approaches to drive investment in clean energy.

Clean Energy Transitions in the greater Horn of Africa Regional Dialogue, 7 October 2022, Kampala, Uganda

<https://www.iea.org/events/clean-energy-transitions-in-the-greater-horn-of-africa-regional-dialogue>

The International Energy Agency (IEA) organises the Clean Energy Transitions in the greater Horn of Africa Regional Dialogue conference, which will take place on Friday, 7 October 2022 between 13:00 – 16:00 (CET). This conference, organised with the support of the Ministry of Energy and Mineral Development of Uganda, aims to discuss how best to advance clean energy transitions in the greater Horn of Africa countries: Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan and Uganda. The event will highlight best practices, policy recommendations, and foster regional collaboration towards clean energy transitions. It will take stock of the region’s energy landscape, areas of progress and best practices on its clean energy developments to better inform and guide country policymakers when defining their transition pathways.

Argus Biofuels Europe Conference, 11 October - 13 October 2022, London, UK & Online Access

<https://www.argusmedia.com/en/conferences-events-listing/biofuels>

The Argus Biofuels Europe Conference returns to London in-person at the Hilton London Bankside and online on 11-13 October 2022. The event will bring together the biofuels industry to gain insight from industry leaders into the latest impacts of geopolitical tensions on biofuels markets. The event will also show the evolving landscape for policy in the EU, how biofuels will continue to play a role in the energy transition with feedstock availability. The event will start with a SAF Focus Day for developments on regulation, global SAF supply and demand and alternative technology pathways.

IEA Bioenergy ExCo Workshop - Technology advances in liquid biofuels and renewable gas

17. October 2022, TUtheSky, Getreidemarkt 9, 1060 Vienna

<https://nachhaltigwirtschaften.at/en/iea/events/2022/20221017-iea-bioenergy-exco-workshop-technology-advances-in-liquid-biofuels-and-renewable-gas.php>

In conjunction with the IEA Bioenergy ExCo 90 Meeting international and national experts will gather to explore the advances being made in biofuels technologies, as well as technologies to produce renewable gas (biomass based), and will discuss what is needed to accelerate their roll out to the market.

SVEBIO Biopower and Bioheat Conference, Lund, Sweden 9 – 10 November 2022

<https://www.svebio.se/evenemang/stora-biokraft-och-varmekonferensen-3/>

More biopower from cogeneration and industry! How can we produce more electricity in large and small plants? How can district heating free up more electricity in cities? Can the cogeneration plants produce their own bio-oil for peak load, electricity production and biofuel? You will find out this and much more during one of the biggest bioenergy conferences of the year. This year's study visit is carried out on the morning of November 9 at Örtofta power plant, Kraftringen and Perstorp Fjärrvärme for Againty's ORC facility.

SVEBIO Nordic Pellets Conference 1-2 February, 2023, STOCKHOLM, Sweden

<https://www.svebio.se/evenemang/nordic-pellets-conference-2023/>

The Swedish Bioenergy Association (SVEBIO), the Swedish Pellets Association (PelletsFörbundet) and Bioenergy International welcomes participants, online and on-site, to Nordic Pellets Conference 2023 in Stockholm, Sweden. To be held as a hybrid event – with both online and on-site participation options and a special prize for members of Svebio, PelletsFörbundet and companies or organisations being members of Bioenergy Europe or World Bioenergy Association.