Bioeconomy & Low Carbon Technology Overview for June 2025

Our summary of low carbon technology developments for June 2025 is based on data and information collated by Gifford Consulting and provided on the website: Gifford Consulting

Highlights by Topic: June 2025

More information on these articles can be found on our website dashboards.

Contents

Biobased chemicals

1. **Biobased chemicals**: Belgium. The portfolio of DOMAMID® PA6 base polymers is now available with the International Sustainability and Carbon Certification (ISCC) PLUS certification, offering increased customer choice while maintaining high quality standards. DOMO develops bio-circular materials, which are derived from waste of biological origin (like used cooking oil), and circular-technical materials, which come from non-biological waste (such as textiles, plastics, and end-of-life applications). Link 09/06/2025.
2. **Biobased chemicals**: The Netherlands. Avantium N.V. was awarded €200,000 by the EU Horizon Europe program to participate in a consortium for the large-scale production of the biobased chemical 5-Hydroxymethylfurfural (5-HMF). The consortium, consisting of 12 European partners and led by Michelin Engineered Polymers, aims to construct and operate an HMF Flagship Plant to demonstrate the wide range of applications for HMF. Link 05/06/2025.
3. **Biobased chemicals**: United Kingdom. Econic Technologies, introduced Recreaire carbonate ethoxylates, a first-of-its-kind family of surfactants based on CO2. These new surfactants use carbon dioxide as a raw material, replacing traditional oleochemicals and a portion of fossil-based materials while improving sustainability, performance, and cost at scale. Recreaire is a flexible platform technology that can deliver sustainable analogues to a wide range of alkoxylate surfactants. Including varying amounts of CO2 (up to 45% by weight) introduces new properties to the molecules, which can offer unique benefits for applications in the cleaning, personal care, coatings, agrochemical, and metalworking industries. Link 24/06/2025.
4. **Biobased chemicals**: USA. Belgian biotech innovator AmphiStar and Kensing, a leading North American producer of high-purity surfactants, and the global leader in upcycled plant-based vitamin E and sterols, announced a strategic partnership to deliver sustainable, next-generation biosurfactants to the North American personal care market. AmphiStar's next-generation biosurfactants, produced by microbial fermentation of repurposed agri-food side streams, will be launched into the North American market by Kensing in an exclusive partnership. Link18/06/2025.

Biobased plastics

5. **Biobased plastics**: France. Futerro S.A., a Belgian company specialising in the production of lactic acid, lactide (two platform biomolecules), and PLA (polylactic acid), together with its sister company Galactic S.A. announced a partnership agreement. The agreement provides for the establishment of a new production facility by Galactic. This new plant will transform part of the lactic acid produced by Futerro into various derivatives and bio-based molecules for the agri-food and green chemistry markets. Link 11/06/2025.
6. **Biobased plastics**: The Netherlands. Avantium N.V. announced the signing of a capacity reservation agreement with BIOVOX, a pioneer in sustainable healthcare plastics. Under this agreement, BIOVOX has committed to using Avantium's PEF (polyethylene furanoate) in various pharmaceutical applications. This PEF is expected to be produced in a future industrial-scale facility, based on a technology license from Avantium. The multi-year capacity reservation ensures BIOVOX preferred access to PEF volumes produced by Avantium's future licensee network. Avantium has developed a proprietary process to produce FDCA (furandicarboxylic acid), the key building block for PEF, branded as releaf®. Following the completion of the world's first commercial FDCA plant in Delfzijl, the Netherlands, in October 2024. Link 03/06/2025.

7. **Biobased plastics**: United Arab Emirates. Sulzer signed a supply contract with Emirates Biotech to provide the proprietary equipment that will serve as the technological core of the world-scale Polylactic Acid (PLA) production facility being built by Emirates Biotech in the United Arab Emirates. As a global leader in separation and polymerization technologies, Sulzer will deliver a full suite of proprietary equipment designed to maximize output, minimize energy use, and support Emirates Biotech's goal of providing renewable, recyclable and biodegradable plastics at industrial scale. Link 11/06/2025"

Biodiesel

8. **Biodiesel**: United Kingdom. Argent Fuels expanded access to its High Blend Biodiesel to supply bus, coach, HGV fleets and rail in the south of the UK. As part of Argent Energy, Argent Fuels produces its own waste-based biodiesel, providing a sustainable alternative to fossil diesel. In 2008, it became the first UK business to supply high-blend biodiesel on a commercial scale. Link 26/06/2025.
9. **Biodiesel**: USA. FutureFuel Corp. announced its decision to temporarily idle biodiesel production upon completion of its remaining contractual obligations, anticipated to occur by the end of June. This decision comes despite welcome news last week from the U.S. Environmental Protection Agency proposing to increase biomass-based diesel mandates for 2026 and 2027. Link 25/06/2025.

Biofuels

10. **Biofuels**: Canada. Enerkem has it all: patented technology, public sector backing, global partners, and a flagship project in Quebec. It also has C$350 million in debt and as we reported last week, the company has filed for creditor protection as it reorganizes. GTESI reminds us: everything is in motion—companies, molecules, contracts, credibility. Enerkem didn't persist as a fixed form. It survived by transitioning hosts, from Quebec's ecosystem to Repsol's capital and industrial scale. The technology remained—but the structure had to change for it to endure. Link 04/06/2025.
11. **Biofuels**: France. Global Bioenergies has been unable to find strategic investors to finance the continuation of its business. The company has a gross cash position of 3.0 million euros. As a reminder, the 13.1 million euros in bank debt recorded on December 31, 2024. Link 05/06/2025.
12. **Biofuels**: Italy. Saipem was awarded from Enilive, Eni's company dedicated to biorefining, biomethane production, smart mobility solutions and the distribution of all energy carriers for mobility, a new contract for the engineering, procurement, and construction (EPC) activities aimed at expanding the Enilive biorefinery in Porto Marghera, near Venice, valued at approximately 155 million euros. The project involves increasing the plant's capacity from the current 400,000 to 600,000 tons per year and the production of sustainable aviation fuel (SAF) starting from 2027. Link 26/06/2025.
13. **Biofuels**: The Netherlands. UPM has announced that following extended technical, commercial, and strategic evaluations, it plans to discontinue the development of its potential second biomass-to-fuels refinery at the Port of Rotterdam. At the same time, UPM will continue to seek growth in biofuels by advancing the development of proprietary technologies enabling the extension of feedstock options to other forms of competitive and sustainable biomass and the work related to the qualification and commercialization of Crude Tall Oil (CTO)-derived UPM biofuels for jet engine fuels. Link 24/06/2025.

Biogas

14. **Biogas**: Denmark. Sumitomo Corporation established a joint venture North Sky A/S with Skovgaard Energy to produce biogas and Power to X business such as e-SAF. The new company aims to produce around 40 million Nm^3 of biogas – equivalent to the annual gas consumption of about 20,000 Danish households. It will also expand SE's existing biogas production sites across Denmark. Further, leveraging knowledge gained from the biogas business, the joint venture will develop other bioenergy sources, including e-SAF. This marks Sumitomo Corporation's first participation in a biogas production business. Link 18/06/2025.
15. **Biogas**: Italy. CycleØ announced the construction of a new 500 standard cubic meters per hour biomethane plant in Italy. The plant is 100% financed by the company and will be owned and operated by CycleØ, generating renewable natural gas for injection into the Italian gas grid. The plant is the first asset to be built, owned and operated by CycleØ in Italy, and is in Pontinia in the Lazio region to the south of Rome. It will use feedstocks from farms within a 15km radius of its location to produce 4 million cubic metres of biomethane per annum, or circa 45GWh, using anaerobic digestion. Link 12/06/2025.
16. **Biogas**: Italy. Anaergia S.r.l. signed a revised contract for two new biomethane production units with Techbau S.p.A., to build two new biomethane production plants in Italy. This revised contract is an expansion of the contact announced earlier this year, and it brings the total number of facilities Anaergia is supplying for Techbau to seven. Anaergia S.r.l. will supply state-of-the-art equipment for the biomethane production process for each of the facilities, while Techbau will serve as the general contractor, responsible for the engineering, procurement, and construction of the facilities that are to be strategically located across Southern Italy. Link 13/06/2025.
17. **Biogas**: Italy. Elevion Group and AB signed a framework agreement for the construction and maintenance of five biogas to biomethane upgrading plants in Veneto, Emilia-Romagna and Lombardy. The project is expected to have a significant environmental impact, with an estimated saving of 50,000 tons of CO_2 equivalent per year. Each plant will be equipped with accessory systems for the complete treatment and injection of biomethane into the national grid. Link 16/06/2025.
18. **Biogas**: South Korea. Anaergia Inc signed a significant agreement with New Jeju Bio Co. Ltd. to design and build the Jeju Bio Energy Biogas Plant. This major project, valued at around C$40 million. The gas produced will power a system that creates both electricity and heat. This energy will be vital for operating different parts of the plant itself, such as the waste processing, sanitization, and drying systems. This approach will maximize energy efficiency and reduce the plant's need for outside energy. Link 11/06/2025.
19. **Biogas**: Spain. CycleØ acquired Spanish waste management facility Grupo Azón Ramón y Cajal S.L. (GARYC) in a strategic move to transform municipal waste into renewable natural gas (RNG). This acquisition, part of CycleØ's €200 million expansion in Spanish renewable gas infrastructure, will enable the company to convert 121,000 tonnes of waste each year into biomethane, enough to supply the gas needs of approximately 4,000 Spanish homes. Link 25/06/2025.
20. **Biogas**: Sweden. Volvo Trucks reported a significant increase in sales of its gas-powered trucks, with global deliveries rising by more than 25% so far in 2024. The Swedish company has now sold over 8,000 gas-powered units worldwide, with strong demand in countries such as Sweden, Norway, the Netherlands, Spain, and the UK. A key factor behind the surge is the wider availability of Bio-LNG—a renewable fuel made from organic waste—which can reduce CO_2 emissions by up to 100% compared to diesel. Volvo's gas-powered models,

including the FM, FH, and FH Aero, are equipped to run on both fossil LNG and Bio-LNG. Built on the company's D13 diesel engine platform, these trucks use high-pressure direct injection (HPDI) technology to maintain strong torque and drivability. Link 18/06/2025.

21. **Biogas**: Switzerland. Empa inaugurated a pilot power-to-gas plant to demonstrate a novel method to produce synthetic methane that can serve as a renewable energy carrier, replacing fossil natural gas. The move-MEGA plant is generating methane from carbon dioxide captured from the air and hydrogen produced via electrolysis and solar power. The facility is the first to demonstrate the so-called sorption-enhanced methanation technology developed at Empa. The approach involves the use of zeolite pellets to absorb water produced as a by-product during methanation. As a result, the process can be carried out at lower pressures and temperatures and the generated methane can be used directly or injected into the gas grid without elaborate post-treatment. The methane can be also converted into hydrogen and solid carbon. The latter can serve as a long-term carbon dioxide sink or be used in building materials such as concrete or asphalt. Link 19/06/2025.

Biojet/SAF

22. **Biojet/SAF**: Argentina. GreenSinnergy GmbH and Axens signed a MoU to explore the development of sustainable aviation fuel (SAF) projects in Argentina and across Latin America. The collaboration leverages Axens's advanced technologies and GreenSinnergy's project leadership to address the growing demand for sustainable energy solutions in the aviation sector. Axens will serve as the licensor-of-record for key technologies, including CO2 capture, hydrogen purification, Fischer-Tropsch synthesis and upgrading of the final kerosene and naphtha. The partnership will initially focus on and prioritise the development of the Eco-Refinerías del Sur project in Chubut, Argentina. Link 16/06/2025.
23. **Biojet/SAF**: Australia. XCF Global Inc. and Continual Renewable Ventures Pty. Ltd. signed a non-binding MoU to launch New Rise Australia Pty. Ltd., a venture dedicated to the development and commercialization of synthetic aviation fuel projects across Australia. New Rise AU is expected to operate under a licensing agreement that leverages XCF's integrated SAF platform – including patent-pending site design, configuration, and layout that shortens development timelines and improves capital efficiency. Designed for rapid deployment and scalable growth, the first Australian facility is expected to follow the blueprint of XCF's New Rise Reno facility. Link 28/06/2025.
24. **Biojet/SAF**: France Luxaviation Group is exploring an active role in Haffner Energy's SAF Zero. Luxaviation potential involvement could take the form of cash funding to finance initial development activities, support in the strategic definition and global visibility as well as offtake agreements in relevant SAF Zero projects such as Paris-Vatry SAF. SAF Zero is dedicated to fast-tracking the production of sustainable aviation fuel (SAF) by establishing an investment and project development platform that brings key stakeholders together. Link 20/06/2025.
25. **Biojet/SAF**: Germany. Lufthansa Group is introducing an Environmental Cost Surcharge. The surcharge is intended to cover part of the steadily rising additional costs due to regulatory environmental requirements. These include the statutory blending quota of initially two percent for Sustainable Aviation Fuel (SAF) for departures from European Union (EU) countries from January 1, 2025, adjustments to the EU Emissions Trading System (EU ETS) as well as other regulatory environmental costs such as the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Link 28/06/2025.
26. **Biojet/SAF**: India. Praj Industries, International Air Transport Association (IATA), and Indian Sugar & Bio-energy Manufacturers Association (ISMA) signed a strategic MoU to drive the

certification and adoption of Sustainable Aviation Fuel (SAF) in the country. The partnership will focus on conducting a comprehensive Life Cycle Assessment (LCA) of SAF derived from Indian sugarcane feedstock via the Ethanol-to-Jet (ETJ) pathway—a critical milestone in demonstrating the environmental and economic viability of indigenous SAF solutions. Link 06/06/2025.

27. **Biojet/SAF**: Peru. Exolum commenced fuel storage and aircraft refuelling operations at the newly expanded Jorge Chávez International Airport in Lima, having successfully completed the construction of a state-of-the-art fuel storage facility. This infrastructure represents a significant milestone in the advancement of air transport across Latin America, setting a new benchmark as the most technologically advanced airport fuel supply system in the region. Link 04/06/2025.
28. **Biojet/SAF**: Philippines. SAFasia Inc. and Emerging Fuels Technology, Inc. signed a MoU to finalize a Master License Agreement (MLA) between SAFA and EFT. This agreement supports the development of multiple Sustainable Aviation Fuel (SAF) projects throughout the Philippines. These projects will utilize biogas produced from agricultural waste as feedstock and incorporate an innovative e-Reformer developed by the German company Caphenia. Caphenia's Plasma-Boudouard Reactor technology efficiently converts both methane and CO_2 in biogas into synthesis gas with exceptionally high conversion rates. EFT's proprietary Technology Platform then converts this syngas into SAF with the highest yields in the industry. Link 04/06/2025.
29. **Biojet/SAF**: USA Avina Synthetic Aviation Fuel Inc. (Avina) and Pittsburgh International Airport are partnering to develop the first on-airport sustainable aviation fuel (SAF) production facility utilizing one of the very first alcohol-to-jet (AtJ) pathways in the USA. Avina will build a state-of-the-art facility to provide ASTM-certified fuel on airport property just south of PIT's terminal by deploying KBR's innovative "PureSAF" alcohol-to-jet technology, developed and owned by Swedish Biofuels AB and exclusively licensed globally by KBR. Link 10/06/2025.
30. **Biojet/SAF**: USA LanzaJet and ATOBA Energy signed a MoU to collaborate on accelerating SAF deployment and creating new commercial models for the market. The two companies will partner to enable greater access to SAF through new pricing and offtake structures that balance the needs of both SAF producers and buyers. The agreement outlines a shared intent to evaluate commercial models that support SAF procurement in ways that reflect the value of the Alcohol-to-Jet (ATJ) fuel pathway pioneered by LanzaJet. Link 05/06/2025.
31. **Biojet/SAF**: USA. Honeywell, Johnson Matthey, GIDARA Energy and SAMSUNG E&A announced the formation of a strategic technology alliance to bring a groundbreaking end-to-end global solution to market for producing sustainable aviation fuel (SAF) from biomass and municipal solid waste. By collaborating, the companies plan to introduce a new joint technology offering that leverages the Fischer-Tropsch (FT) production process and aims to unlock abundant, globally available feedstock options to help meet the growing demand for SAF and support energy security. Link 09/06/2025.
32. **Biojet/SAF**: USA. Neste reached agreement with Amazon to provide 7,500 metric tons (2.5 million gallons) of neat Neste MY Sustainable Aviation Fuel™ for its Amazon Air cargo operations at San Francisco International Airport and Ontario International Airport in California, through to the end of 2025. This agreement makes Amazon the first company to purchase and use sustainable aviation fuel (SAF) at Ontario International Airport. Link 19/06/2025.
33. **Biojet**: The Netherlands. APG is investing up to €250 million in SkyNRG to enable the development and adoption of sustainable aviation fuel (SAF) worldwide. As part of an

investment round of up to €300 million, this investment allows SkyNRG to move forward with its plans to develop and construct SAF production facilities in Delfzijl, the Netherlands, as well as in Sweden (Project SkyKraft) and the United States (Project Wigeon). APG's investment builds upon a €175 million investment from Macquarie Asset Management (MAM) in 2023, who is also increasing its overall investment to SkyNRG in conjunction with this funding round to approximately €225 million. Link 26/06/2025.

Biomaterials

34. **Biomaterials**: China. HH Chemical launched BIODEX®, the world's first bio-based materials brand offering a fully integrated solution across the entire value chain – from renewable raw materials to finished consumer products. This breakthrough platform establishes a closed-loop ecosystem, enabling seamless integration from green sourcing to end-use applications. The BIODEX® product portfolio spans high-performance monomers, elastomers, polymer chips, fibers, functional fabrics, and customizable garments. Its proprietary PDO (1,3-Propanediol) and PTT (polytrimethylene terephthalate) platforms are fully commercialized and deployed at scale. Link 13/06/2025.

Cement

35. **Cement**: Greece. Holcim broke ground at the state-of-the-art OLYMPUS project at its plant in Milaki, Greece, engineered to produce 2 million tons of near-zero cement per annum from 2029. With a planned investment of EUR 400 million, the OLYMPUS project will put innovation to work to advance Europe's Clean Industrial Deal. The project has been selected for a grant from the EU Innovation Fund. Link 23/06/2025.

CO2 removal

36. **CO2 removal**: USA. Again, is developing a new facility to convert waste CO_2 into reusable chemical products and bring sustainable chemical manufacturing to Texas. The commercial plant will recycle waste CO_2 emissions from a tenant at the Diamond Infrastructure Solutions (Diamond) Texas City industrial park into sustainable chemicals, fertilizers and building blocks for products, including plastics and other materials such as acetic acid. Again's novel biomanufacturing technology feeds waste CO_2 gases directly into industrial bioreactors, where bacteria ferment it with hydrogen. This results in low-emission, industry-grade chemicals which are sold to customers at market-competitive prices. Link 18/06/2025.
37. **CO2 removal**: USA. Aircapture, a pioneer in direct air capture (DAC) technology, announced a $50 million Series A round led by the Larsen Lam Climate Change Foundation. The investment will enable the 2025 XPrize "Carbon Removal" winner to scale operations and accelerate deployment of its modular, revenue-positive DAC systems that deliver high-purity, on-site CO_2 to food, beverage, industrial, and agricultural customers. Link 25/06/2025.

E-fuels

38. **E-fuels**: Finland. Tree Energy Solutions (TES) and CPC Finland Oy joined forces to produce electric natural gas (e-NG) derived from renewable hydrogen and carbon dioxide at one of the largest ports in Finland, the Port of Rauma. The planned facility will feature an electrolyser capacity of up to 500 MW. It is expected to produce 60,000 tonnes of green hydrogen that can be converted into more than 125,000 tonnes of e-NG per year. Link 27/06/2025.
39. **e-fuels**: Germany. INERATEC inaugurated ERA ONE, a Power-to-Liquid plant to produce e-Fuels and e-Chemicals. The plant in Frankfurt-Höchst is the largest of its kind in Europe and

will produce up to 2,500 tonnes of carbon-neutral e-Fuels annually. ERA, ONE uses CO_2 from biogenic sources and green hydrogen to produce synthetic crude oil, which is then processed into sustainable aviation fuel (e-SAF), e-Diesel and other products. The two feedstocks for the new plant come directly from the Frankfurt-Höchst industrial park where it is located. The CO2 comes from a biogas plant that recycles waste, and the hydrogen is a byproduct of chlorine production. INERATEC e-Fuels are "drop-in ready", Link 13/06/2025

40. **E-fuels**: Germany. INERATEC, and Rheinmetall, a global technology leader in the defence sector, signed a strategic partnership to deploy scalable Power-to-Liquid (PtL) solutions across defence and critical infrastructure sectors. This collaboration marks a milestone in building resilient energy systems that operate independently from fossil fuel supply chains and vulnerable infrastructure. Link 27/06/2025.
41. **E-fuels**: United Kingdom. Rivan designs and manufactures modular synthetic fuel plants that are vertically integrated with off-grid solar power. These plants use carbon captured from the air and hydrogen produced by splitting water to create chemically identical, decarbonised fuels. Starting with synthetic natural gas, Rivan will expand into liquid hydrocarbons such as aviation fuel. Link 11/06/2025.
42. **e-fuels**: Uruguay. Syzygy Plasmonics launched front-end engineering and design (FEED) work for NovaSAF 1, the world's first electrified biogas-to-sustainable aviation fuel (SAF) facility. The project, located in Durazno, Uruguay, is being developed in partnership with Kent, a firm known for its experience in SAF project execution. NovaSAF 1 is expected to produce more than 350,000 gallons of ASTM-certified SAF each year, using biogas and clean electricity in a breakthrough production process that aims to cut costs and carbon emissions. Syzygy says the plant will serve as a blueprint for scalable and low-cost SAF production worldwide. Link 05/06/2025.

E-methanol

43. **E-methanol**: United Arab Emirates. Masdar, Advario, and the CMA CGM Group signed a collaboration agreement to explore the development of an e-methanol bunkering and export facility at Khalifa Port and KEZAD in the United Arab Emirates. The project will provide critical infrastructure to complete the supply value chain and bridge commercial e-methanol production with key off-takers, such as CMA CGM, in support of accelerating the decarbonization of the global shipping industry. Link 10/06/2025.

Ethanol

44. **Ethanol**: Brazil. Vale announced that its partner Cummins Inc. has started the successful commissioning of a new ethanol fuel test cell, marking a significant milestone in both companies' joint project with Komatsu to develop an ethanol/diesel-powered surface mining haul truck aimed at reducing greenhouse gas emissions. The dual fuel program aims to retrofit existing diesel engines in Komatsu haul trucks to operate on both ethanol and diesel. These modified 230–290-ton haul trucks – the first vehicles of this size to run on ethanol in the tank – will be able to use up to 70% ethanol, potentially lowering CO2 emissions footprint by up to 70%. Link 09/06/2025.
45. **Ethanol**: Canada. Whitefox Technologies successfully installed Whitefox ICE membrane dehydration system at ALCO Energy Canada (formally IGPC Ethanol Inc.), in Aylmer, Ontario. This project increases ALCO's ethanol production capacity by just over 50 million liters per year (13.5 million gallons/year), an increase of 15%, while also making the plant operate more efficiently throughout distillation and dehydration. Link 12/06/2025.

46. **Ethanol**: Peru. Enersur, which produces biofuels and animal feeds in Peru, announced that it signed an association-sharing agreement with India's Praj Industries to build a plant that will produce up to 600,000 liters of ethanol per day. The $150 million deal will position the country in global biofuel production. The plant will be in the department of Canindeyú, about 280 kilometers northeast of Asunción. Link 09/06/2025.

Feedstock

47. **Feedstock**: Australia. Ampol, agribusiness GrainCorp, and investment firm IFM Investors are exploring how to refine canola oil within Australia for use in aviation. GrainCorp is planning a new canola crushing facility capable of processing 1 million tonnes of canola each year—almost double the capacity of its existing plant in Numurkah, Victoria. Australian airlines are already showing interest. Qantas recently imported 2 million litres of SAF from Malaysia—enough to power about 900 Sydney-to-Auckland flights once blended. The federal government has committed over $30 million toward building an SAF industry in Australia, including $8 million for Ampol and $6 million for GrainCorp. Link 17/06/2025.
48. **Feedstock**: France TotalEnergies and Avril concluded an agreement to jointly study the development of a French sector for intermediate crops to produce sustainable air fuels (SAF), thus helping to reduce CO 2 emissions from air transport. This agreement is part of the context of an ambitious momentum brought by the European Union, which by 2025 requires the incorporation of 2% of sustainable fuels into aviation, with a target of 70% by 2050. These crops also allow the co-production of plant proteins, thus contributing to the protein sovereignty of France and Europe in animal feed. They also have many agricultural benefits, including limiting soil erosion, improving soil erosion, reducing water losses and helping to preserve biodiversity. Link 20/06/2025.
49. **Feedstock**: France. TotalEnergies and Quatra signed a 15-year agreement beginning in 2026, for the supply of 60,000 tons a year of European used cooking oil to TotalEnergies' biorefineries. Under the terms of the agreement, Quatra will collect used cooking oil directly from restaurants, restaurant chains and industry in France and the rest of Europe. The oil will then be delivered to Quatra sites for filtering before being shipped to TotalEnergies' biorefineries to produce road biofuels and SAF. Link 24/06/2025.
50. **Feedstock**: France. TotalEnergies and Quatra, the European market leader in the collection and recycling of used cooking oil, signed a 15-year agreement beginning in 2026, for the supply of 60,000 tons a year of European used cooking oil to TotalEnergies' biorefineries. Quatra will collect used cooking oil directly from restaurants, restaurant chains and industry in France and the rest of Europe. Link 19/06/2025.
51. **Feedstock**: USA Datavault AI Inc. is developing an AI-driven multi-modal machine learning system to support biofuel crop optimization. The initiative focuses on increasing fatty acid metabolism efficiency in Brassica napus (canola) using high-performance computational modelling, supporting the EPA's goal to replace up to 140,000 barrels of crude oil per day with biofuels. The project will combine expertise in comparative genomics, multi-omics data processing and evolutionary biology to refine metabolic pathways in Brassica napus. Link 19/06/2025.

Fermentation

52. **Fermentation**: Brazil. Amyris rebuilds Post-Bankruptcy - At the Barra Bonita plant, Amyris is completing the construction of its fourth precision fermentation line, which is expected to be operational in early 2026. Link 16/06/2025.

Hydrogen

53. **Hydrogen**. USA. Cleveland-Cliffs has abandoned its $500m hydrogen-based steel project in Middletown, Ohio, and shifted focus to extend the life of its coal-fired blast furnace. The Middletown facility had been backed by a $500m US Department of Energy (DOE) grant under former President Joe Biden. But Goncalves admitted that even with the grant, Cleveland-Cliffs would need to spend an additional $1.1bn to replace the coal-based blast furnace with a hydrogen-fuelled plant. Link 06/05/2025.
54. **Hydrogen**: As hydrogen refuelling infrastructure developers look to make progress, Taylor Wharton has warned that boil-off losses ranging from 10% to 50% continue to threaten hydrogen's commercial case. Liquid hydrogen is often considered one of the most effective ways to transport hydrogen due to its higher energy density compared to compressed hydrogen. Most refuelling stations, especially in US, use liquid hydrogen. However, boil-off occurs when liquid hydrogen warms above -253ºC and reverts to gas and can lead to losses across the value chain from production to use. This is in addition to high energy consumption of liquefying hydrogen. Hydrogen fuelling stations today face significant boil-off losses ranging from 10% to as much as 50%. Link 26/06/2025.
55. **Hydrogen**: Australia. Viva Energy launched its Australia-first renewable hydrogen refuelling station at the company's Energy Hub in Geelong. The facility is the nation's first publicly accessible commercial hydrogen refuelling station and will be the hub for a fleet of hydrogen-powered, emission-free commercial heavy vehicles servicing the Geelong region. The project incorporates a 2.5-megawatt electrolyser for the generation of renewable hydrogen using recycled water from Barwon Water's Northern Water Plant. The project includes a fleet of hydrogen fuel cell electric vehicles (FCEVs) – including prime movers, buses and rubbish trucks – operated by local businesses. Link 18/06/2025.
56. **Hydrogen**: Brazil. Neoenergia announced that it has started construction of the first green hydrogen power plant in the country that will serve as a supply point for light and heavy vehicles. Located in Taguatinga municipality, Brazil's Federal District, the power plant will require more than BRL30 million (USD 5.4m/EUR 4.6m) in investments and will be powered by a photovoltaic (PV) plant. Outside Brazil, Neoenergia's parent company, Spanish utility Iberdrola (BME: IBE), has been operating two green hydrogen plants in Spain since 2022. Link 16/06/2025.
57. **Hydrogen**: France. Atawey has raised €22m ($25.8m) as it looks to ramp up deployment of hydrogen refuelling facilities. The company acquired now-insolvent McPhy's refuelling business last year. Following the McPhy business acquisition, Atawey said it operates 51 hydrogen refuelling stations and two production sites in the French Alps. It is eyeing new deployments in Italy, Spain, and Benelux to support heavy-duty vehicles like buses, off-road applications, and trucks. Link 28/06/2025.
58. **Hydrogen**: France. ZeroAvia announced the UK Government has awarded the company, and consortium partners a grant to develop a novel liquid hydrogen management system. The project, co-funded through the ATI Programme, will culminate in integration of the lightweight fuel system into a Dornier 228 before a series of flight tests. The Liquid Hydrogen System Integration & Flight Test (LH-SIFT) project will rapidly develop a Liquid Hydrogen Management System (LHMS) and create an adaptable flight testbed capability. The testbed capability will benefit UK and global LH2 supply chains. Link 24/06/2025.
59. **Hydrogen**: Germany. ABO Energy GmbH & Co completed its first hydrogen project consisting of a 5-MW electrolysis plant, a wind turbine and a hydrogen refuelling station with a trailer filling facility. The electrolysis plant is expected to produce up to 450 tonnes of hydrogen per

year. The project was supported with funding of EUR 12 million (USD 13.8m) provided under the National Innovation Programme on Hydrogen and Fuel Cell Technology (NIP) by Germany's ministry for digital and transport. Link20/06/2025.

60. **Hydrogen**: Germany. ArcelorMittal SA (AMS:MT) will not proceed with its DRI and EAF decarbonisation plans for its flat steelmaking sites in Bremen and Eisenhuettenstadt, Germany. The projects in Germany were backed with EUR 1.3 billion (USD 1.5bn) in stated aid. According to the company, the European steel market is under unprecedented strain due to weak demand and high levels of imports. Link 23/06/2025.
61. **Hydrogen**: Germany. Badenova plans to invest EUR 4 billion (USD 4.64bn) in energy transition projects by 2050, including over EUR 200 million in the current year. In 2024, Badenova invested EUR 143.3 million, up from EUR 122 million a year earlier. The investment volume is expected to increase further in 2025, exceeding EUR 200 million. Link 27/06/2025.
62. **Hydrogen**: Germany. ITM Power launched a German-based subsidiary that will build, own, and operate green hydrogen plants based on the OEM's electrolysis technology. Hydropulse GmbH will focus on supplying industrial customers with "dependable hydrogen needs" in areas like chemicals, steel, food processing, refineries, and mobility, through long-term offtake agreements. Hydropulse-built plants will be configured around a customer's demand profile and operated through a "remote operations centre. Link 26/06/2025.
63. **Hydrogen**: Germany. Thyssenkrupp Nucera has reportedly been selected to provide a Front-End Engineering and Design study for a 600MW green hydrogen project being developed by an undisclosed company. Link 05/06/2025.
64. **Hydrogen**: Germany. Toyota Motor Europe is integrating its fuel cell systems into 40-tonne hydrogen-powered trucks, supplied by VDL Groep, to mark the beginning of real-world demonstrations for zero-emission heavy-duty logistics. Under an agreement with logistics providers Vos Transport Group, CEVA Logistics, Groupe CAT, and Yusen Logistics, the vehicles will operate across Belgium (Diest), France (Lille), Germany (Cologne), and the Netherlands (Rotterdam and Weesp). Heavy-duty fuel cell trucks can boost the demand for hydrogen, which is one of the key contributors, along with the implementation of the EU's Alternative Fuel Infrastructure Regulation (AFIR). Link 20/06/2025.
65. **Hydrogen**: India. AVTL plans to develop an ammonia terminal in India, which will support green hydrogen-based exports "in the future." Located in Pipavav, AVTL will invest approximately $61m into what will be India's first independent ammonia storage terminal. With a storage capacity of around 36,000 tonnes, the terminal is intended to support the fertiliser market. The facility is expected to be commissioned by the end of 2026. Dutch multinational company Royal Vopak is a 42.23% shareholder in AVTL. The company currently has six ammonia storage locations within its global network. Link 23/06/2025.
66. **Hydrogen**: Ireland National Gas signed a MoU with Gas Networks Ireland (GNI) for collaboration on hydrogen and biomethane gases, and blends of these gases in the natural gas system. The MoU will enable it to share information and outcomes from its respective operational improvement activities, and to explore mutually beneficial projects. Link 20/06/2025.
67. **Hydrogen**: Japan. Hazer Group is to develop a clean hydrogen and graphite project in Nagoya, Japan, using methane pyrolysis. Integrating with Chubu Electric's LNG supply chain and infrastructure and Japanese utility Chiyoda Corporation, the project aims to produce 2,500 tonnes of clean hydrogen a year and will be designed as a scalable platform with potential to expand to meet growing demand. Producing hydrogen through methane pyrolysis produces no CO2 emissions and provides a value-added solid carbon byproduct which can be used in various industries. Link 03/06/2025.

68. **Hydrogen**: Norway. A new joint venture between Norwegian Hydrogen, Sigma and Karmsund Group will work with Hydepoint to build the plant at Karmsund's Haugalandet facility, which could begin delivering hydrogen in 2028. Karmsund Hydrogen says the plant could produce over 3,000 tonnes of green hydrogen per year, with the players already engaging with potential industrial and maritime customers. Link 25/06/2025.
69. **Hydrogen**: Poland. Polish oil and gas firm Orlen Group has secured PLN 1.7bn ($459m) in funding to support the development of clean hydrogen production. Green H2 and Hydrogen Eagle, two of Orlen's strategic programmes, have been backed with non-repayable funding under the National Recovery Plan. It's aimed to help scale up infrastructure and build a hydrogen supply network around Poland and across Europe. Hydrogen Eagle is expected to produce hydrogen using renewable electricity and electrolyser solutions, and from municipal waste. The hydrogen will be utilised for the transport and industrial sectors. Link 18/06/2025.
70. **Hydrogen**: Saudi Arabia. This project is a shared effort between ACWA Power, Air Products, and NEOM, and it is moving forward – about 80% complete. The plant is set to produce 600 tonnes of carbon-free hydrogen per day by the end of 2026, in the form of green ammonia. In May 2023, the NEOM Green Hydrogen Company successfully completed a major financial deal worth $8.4 billion. This substantial funding was boosted by a significant $6.1 billion loan, secured from a group of 23 important local, regional, and international banks and financial organizations, including key players like the Saudi Industrial Development Fund and the National Investment Fund. Link 06/05/2025.
71. **Hydrogen**: Spain. Spain's Miteco allocated €524m ($598m) to five green hydrogen production projects located across Andalusia, Aragon, Asturias, the Basque Country, and the Region of Murcia. Together, the projects (listed below) will add 425MW of electrolysis capacity to Spain, producing up to 55,200 tonnes of green hydrogen per year. The projects represent part of the EU's Important Projects of Common European Interest (IPCEI) Hy2Use, and direct aid will be distributed from Spain's Recovery, Transformation, and Resilience Plan (PRTR). Link 06/05/2025.
72. **Hydrogen**: The Netherlands. Air Products, Airbus, and Rotterdam the Hague Airport (RTHA) outlined plans to develop a dedicated hydrogen hub in the Netherlands aimed at decarbonising the aviation sector. Under a Memorandum of Understanding (MOU), they plan to combine their collective knowledge of hydrogen and its required infrastructure, along with the practical application of the fuel at airports, with a specific focus on RTHA and Amsterdam Airport Schiphol. Link 09/06/2025.
73. **Hydrogen**: The Netherlands. Uniper is scaling back its investments in the Netherlands, citing regulatory uncertainty, and has paused development of its biomass-to-hydrogen project, CarbHyGreen. Uniper has decided to reduce development activities in the Netherlands and to postpone decisions on further investments, pending clarity on the design of the capacity market in the country. Link 10/06/2025.
74. **Hydrogen**: United Kingdom Air Products has scrapped its green hydrogen terminal project at the Port of Immingham, in the UK. Despite receiving planning approval in February, the company has now confirmed that the absence of firm policy support and financial backing from the UK government made the project untenable. The Immingham Green Energy Terminal would have imported green ammonia from Air Products' flagship 2.2GW NEOM project in Saudi Arabia and cracked it back into hydrogen. It was also slated to include a 300MW domestic hydrogen production facility. Combined, the infrastructure would have produced 76,000 tons of hydrogen annually. Link 24/06/2025.

75. **Hydrogen**: United Kingdom. Hydrogen Transition Energy (HTE) submitted planning permission to the Kent County Council to build a £120m ($162m) waste-to-hydrogen plant. The plant will break down waste into its basic molecular components, producing syngas that is then converted into clean hydrogen, with minimal emissions and around 70% of the energy recovered to make the plant self-sustaining. The hydrogen produced is expected to supply commercial heavy fleet operators and local authority waste management operations that want to decarbonise. Link 04/06/2025.
76. **Hydrogen**: USA Georgia Power and Mitsubishi Power completed a second trial blending hydrogen and natural gas fuels at both partial and full load on an M501GAC natural gas turbine at Georgia Power's Plant McDonough-Atkinson in Smyrna, Georgia. Link 19/06/2025.
77. **Hydrogen**: USA. Assuming that the development of hydrogen is slowed or paused in the U.S., that doesn't mean that projects everywhere will be affected equally. So far, the European Union (EU) is still betting big on what it refers to as "renewable hydrogen" as a cornerstone of its energy transition strategy, rolling out a mix of subsidies, regulatory frameworks, and market-building tools to jumpstart demand and supply. Under its REPowerEU plan, renewable hydrogen consumption in the EU is expected to reach 20 MMtpa by 2030, evenly split between domestic production and imports, making it a potential outlet for U.S. production. The EU's goal is to have renewable hydrogen meet 10% of its energy needs by 2050. To achieve this, the EU is utilizing its Hydrogen Bank to underwrite projects, doling out billions in state aid and innovation funding. Hydrogen has a well-established, if limited, role in the U.S. economy that is not going to change, but the economics of green and blue hydrogen look very challenging at best. Link 09/06/2025.
78. **Hydrogen**: USA. Caterpillar trialled a gas combined heat and power (CHP) system using 100% hydrogen, supplying a Minnesota utility system. The US Department of Energy-backed trial saw the 2MW Cat G3516 generator set use both 100% hydrogen and 100% natural gas for up to 200 hours on each fuel type. Hydrogen offers a low-carbon alternative to natural gas in CHP systems, which already operate efficiently by producing both heat and power. Using hydrogen can significantly cut CO_2 emissions while supporting decentralised energy models. However, it brings challenges, including potential increases in NOx emissions, infrastructure requirements, and the high cost and limited availability of green hydrogen. Link 28/06/2025.
79. **Hydrogen**: Uzbekistan. Plug Power is considering a 2GW of electrolyser deployments in Uzbekistan at a planned $5.5bn green chemicals facility with Australia's Allied Green Ammonia (AGA). AGA says the plant is targeting an annual output of around 800,000 tonnes of urea, 350,000 tonnes of SAF, and 35,000 tonnes of diesel, using 4GW of renewable energy and 6,000 tonnes per day of biomass. Link 10/06/2025.

Marine fuels

80. **Marine fuels**: Australia. NH3 Clean Energy, Pilbara Ports Authority, and Oceania Marine Energy aim to establish hydrogen-derived, low-emission ammonia bunkering operations at the Port of Dampier in Australia by 2030. Under a Joint Development Agreement (JDA), the partners will collaborate to deliver the necessary infrastructure, regulatory approvals, and commercial frameworks to support the refuelling of ammonia-powered bulk carriers exporting iron ore to Asia. NH3 will continue to develop its WAH2 ammonia production project in Western Australia. The initiative has already completed Pre-FEED and is targeting FEED entry by mid-2025. Link
81. **Marine fuels**: Denmark. BlackCoral Energy and Biofuel Express announced a new joint venture aimed at delivering physical biofuel supplies to the maritime industry. The collaboration will initially focus on ports in Denmark, southern Norway, southern Sweden,

northern Germany, and select other locations in Europe. This strategic partnership combines BlackCoral Energy's strong foothold and network in the marine fuel and bunkering sector with Biofuel Express's deep expertise in high-performance renewable fuels such as HVO100 Renewable Diesel and B100 Biodiesel RME Premium. Link 04/06/2025.

82. **Marine fuels**: Japan. Mitsui O.S.K. Lines, Ltd. (MOL) and Samsung Heavy Industries Co., Ltd (SHI) acquired Approval in Principle from the Lloyd's Register for the design of a 174,000 LNG Carrier equipped with Solid Oxide Fuel Cell (SOFC) technology. The 174,000 LNG carrier will be equipped with a 300kW SOFC, supplied by Bloom Energy, to be used as an auxiliary power generator and the ship will be delivered in 2027. Link 06/06/2025.
83. **Marine fuels**: Spain. Spanish energy firm Moeve, formerly Cepsa, reached a strategic agreement with compatriot shipping company Armas Trasmediterránea to supply second-generation (2G) marine biofuels in the Canary Islands. Approximately 40,000 tons are set to be delivered through December 2025 under a long-term contract, with the potential for extension into 2026. Link 03/06/2025.

Methanol

84. **Methanol**: India. Precedent Research reported that the global green methanol market size is calculated at $2.64 billion in 2025 and is forecasted to reach around $36.88 billion by 2034. The North America market size surpassed $0.89 billion in 2024 and is expanding at a CAGR of 34.13% during the forecast period. North America led the green methanol market by capturing the largest share in 2024. This is due to increased investments in clean energy and beneficial government policies. Substantial tax credits and incentives offered by governments for green hydrogen and clean fuel. Link 03/06/2025.

Plastic recycling

85. **Plastic recycling**: France. CARBIOS, a pioneer in the development and industrialization of biological technologies, announced its first multi-year offtake contracts with L'ORÉAL and L'Occitane en Provence for biorecycled r-PET from its future commercial plant in Longlaville. Link 16/06/2025.
86. **Plastic recycling**: Germany. The innovation project KISS („KI-basierte Qualifizierung, Steuerung und Optimierung von Stoffströmen zur Schließung von regionalen Ressourcenkreisläufen"– "AI-Based Qualification, Management, and Optimization of Material Flows to Close Regional Resource Cycles") aims to return plastics to the circular economy in a sustainable and economically viable way. Initiated by RIGK, in collaboration with plastship, RAM and Veridis Technologies, and supported by Technologieland Hessen, the project is developing an AI-powered platform to analyse, classify and identify optimal recycling routes for used plastics. The focus is on high-quality applications such as films and packaging. Link 26/06/2025.

Policy

87. **Policy**: United Kingdom. New report from BB-REG-NET highlights how differing departmental priorities are creating contradictory policies that stifle innovation and limit economic growth in the sector. The UK's bioeconomy development is being impeded by policy fragmentation, according to a new report from BB-REG-NET, a network established to develop regulatory standards to support market adoption of bio-based and biodegradable materials. It finds that the UK could generate upwards of £204 billion in annual revenue by transitioning to bio-based and biodegradable solutions, while saving greenhouse gas emissions. Link 06/06/2025.

88. **Policy**: United Kingdom. The UK government has allocated over GBP 500 million (USD 679m/EUR 586m) in new funding to create the UK's first regional hydrogen transport and storage network. The infrastructure will connect hydrogen producers with end users, including power stations and industry, helping to create thousands of jobs in industrial region. Link 16/06/2025.
89. **Policy**: USA. In Washington, the US Environmental Protection Agency proposed a rule to establish required Renewable Fuel Standard volumes and percentage standards for 2026 and 2027, as well as to partially waive the 2025 cellulosic biofuel volume requirement and revise the associated percentage standard due to a shortfall in cellulosic biofuel production. EPA is also proposing several regulatory changes to the RFS program, including reducing the number of Renewable Identification Numbers (RINs) generated for imported renewable fuel and renewable fuel produced from foreign feedstocks and removing renewable electricity as a qualifying renewable fuel under the RFS program (eRINs). Link 17/06/2025.
90. **Policy**: USA. The Trump Administration will cut $3.7bn in federal funding for major Biden-era clean energy demonstration projects, including over $330m in financial support for ExxonMobil's clean hydrogen project in Baytown, Texas. Up to 24 hydrogen and carbon capture projects had been previously backed by the Department of Energy's (DOE) Office of Clean Energy Demonstrations (OCED), created under the 2021 Bipartisan Infrastructure Law to scale up emerging clean energy technologies. Among the most prominent cuts are $332m for ExxonMobil's Baytown refinery, $99m for Ørsted's hydrogen-based clean methanol project near Houston, and $375m for Eastman Chemical's chemical recycling facility. Link 03/06/2025.

Pyrolysis

91. **Pyrolysis**: Canada. Airex Energy, Groupe Rémabec, and SUEZ, opened Carbonity, the plant will begin with an annual production capacity of 10,000 metric tons of biochar, which is expected to triple by 2026, making it the largest facility of its kind in North America. The plant will produce carbon-rich biochar from approximately 58,000 tonnes of forestry residues annually, sourced from Groupe Rémabec's operations. Carbonity is powered by Airex Energy's proprietary technology. Its proprietary and patented DryFX™ and CarbonFX™ technologies are at the heart of the plant's innovative process. Link 10/06/2025.
92. **Pyrolysis**: United Kingdom. Quadrise signed a Joint Development Agreement with renewable fuel technology experts Alder Energy LLC. Alder's proprietary pyrolysis oil upgrading technology is designed to produce stable Alder Renewable Crude and associated products such as Alder Pyrolysis Sugars. Under the JDA, the Quadrise and Alder teams intend to collaborate in respect of the use of Alder's APS product as a potential cost-effective renewable feedstock for bioMSAR. Link 19/06/2025.

Recycling plastic

93. **Recycling plastic**: Germany. TechnoCompound GmbH and RE Plano GmbH, a subsidiary of REMONDIS Recycling, agreed to strengthen their cooperation in the use of post-consumer recyclates (PCR) for automotive applications. This is being done against the backdrop of the several EU regulations that are currently being discussed and have already been passed regarding the sustainability of companies and products, including the End-of-Life Vehicles Directive. Link 03/06/2025.
94. **Recycling plastic**: USA. Plastyx is well underway to meet its goal to source 200,000 tons of plastic waste by the end of 2025. Plastyx is joint venture is between US-based chemical recycler Agilyx and Circular Resources. The joint venture is designed to offer the European

chemical recycling industry reliable, high-quality feedstock for food-grade and other high-performance packaging applications. Agilyx and ExxonMobil formed Cyclyx International, a plastic waste feedstock management company, in 2021. LyondellBasell has also joined the joint venture as a founding member. Cyclyx is building a circularity centre to in Houston, Texas, with capacity to produce around 136,000 tonnes of plastic feedstock for chemical and mechanical recycling, with ExxonMobil and LyondellBasell holding offtake rights. Link 23/06/2025.

Renewable diesel

95. **Renewable diesel**: USA. T Bros Oil & Gas Co. announced the opening of its state-of-the-art bulk renewable diesel depot in Barstow, California, set for Summer 2025. This cutting-edge facility marks a transformative step for sustainable logistics and economic growth within the vital Southern California transportation corridor, reinforcing Barstow's pivotal role in the region's supply chain. Link 05/06/2025.

Textiles

96. **Textiles**: China. Jilin Chemical Fiber Co. Ltd (JLC) announced the expansion of two of its Next Generation Man-Made Cellulosic Fibre (MMCF) product lines, signalling continued investment in low-impact textile innovation within the Chinese MMCF sector. The company will increase production of JIRECELL™, a viscose filament yarn made from 70% FSC-certified wood and 30% recycled cotton CIRCULOSE® pulp, to an annual capacity of 10,000 tonnes, with potential for a further 10,000 tonnes per year thereafter. Additionally, JLC will commence commercial-scale production of REBOOCEL, a staple fibre made with 70% FSC-certified bamboo and 30% post-consumer recycled bamboo from furniture, targeting an annual output of 30,000 tonnes. Link 09/06/2025.

GIFFORD
CONSULTING

Company Summary – **June 2025**

Frequency of mention

Company	Frequency
Air Products	3
TotalEnergies	3
Anaergia	2
Avantium	2
CycleO	2
Ineratec	2
US Government	2
ABO Energy	1
Again	1
Agilyx	1
Aircapture	1
Airex Energy	1
AmphiStar	1
Ampol	1
Amyris	1
ArcelorMittal	1
Argent Fuels	1
Atawey	1
Avina Synthetic Aviation Fuel	1
AVTL	1
Axens	1
Badenova	1
BB-REG-NET	1
BlackCoral Energy	1
Carbios	1
Caterpillar	1
Cleveland-Cliffs	1
Datavault	1
Total	**94**

Topics & Themes/Category Summary– **June 2025**

Frequency of mention

Category	Frequency
Hydrogen	27
Biojet	12
Biogas	8
e-Fuels	5
Feedstock	5
Biobased chemicals	4
Biofuels	4
Marine fuels	4
Policy	4
Biobased plastics	3
Ethanol	3
Biodiesel	2
CO2 removal	2
Plastic recycling	2
Pyrolysis	2
Recycling plastic	2
Biomaterials	1
Cement	1
e-methanol	1
Fermentation	1
Methanol	1
Renewable diesel	1
Textiles	1
Total	**96**