

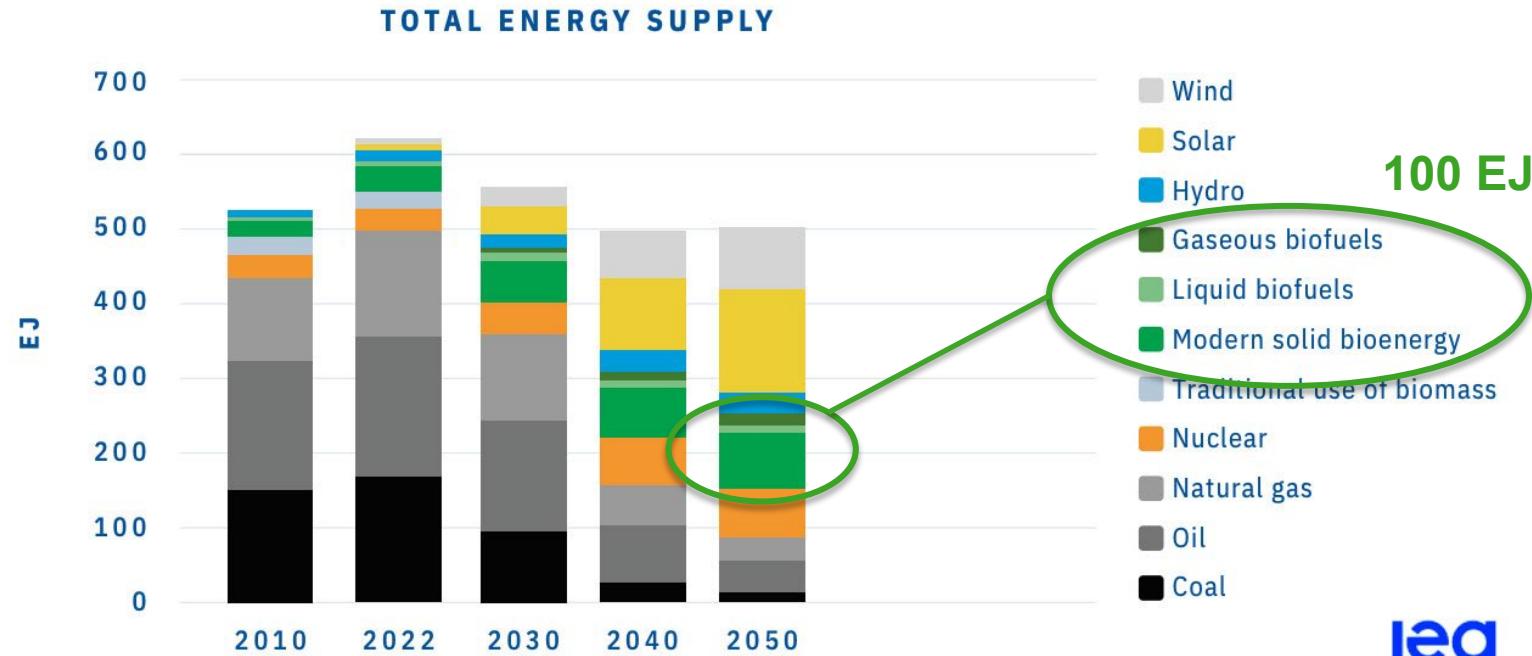
Die Rolle der Bioenergie in der Energiewende und wie IEA Bioenergy dazu beiträgt

Nationales IEA Vernetzungstreffen
19. Jänner 2026

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Net Zero by 2050 Szenario der IEA

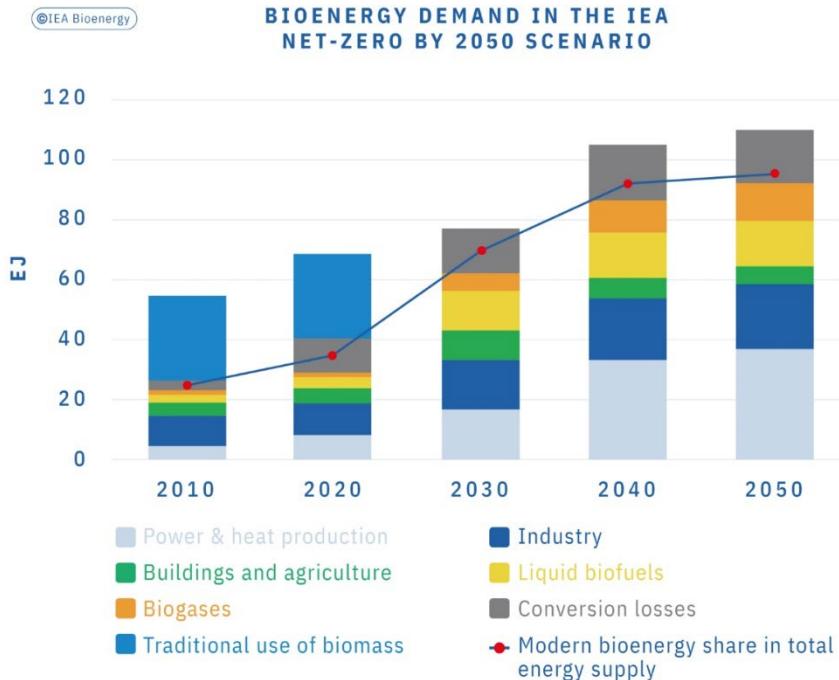


Data source: International Energy Agency (2023), Net Zero by 2050

Bioenergie soll laut NZE im Jahr 2050 rund 20% des Energiebedarfs decken

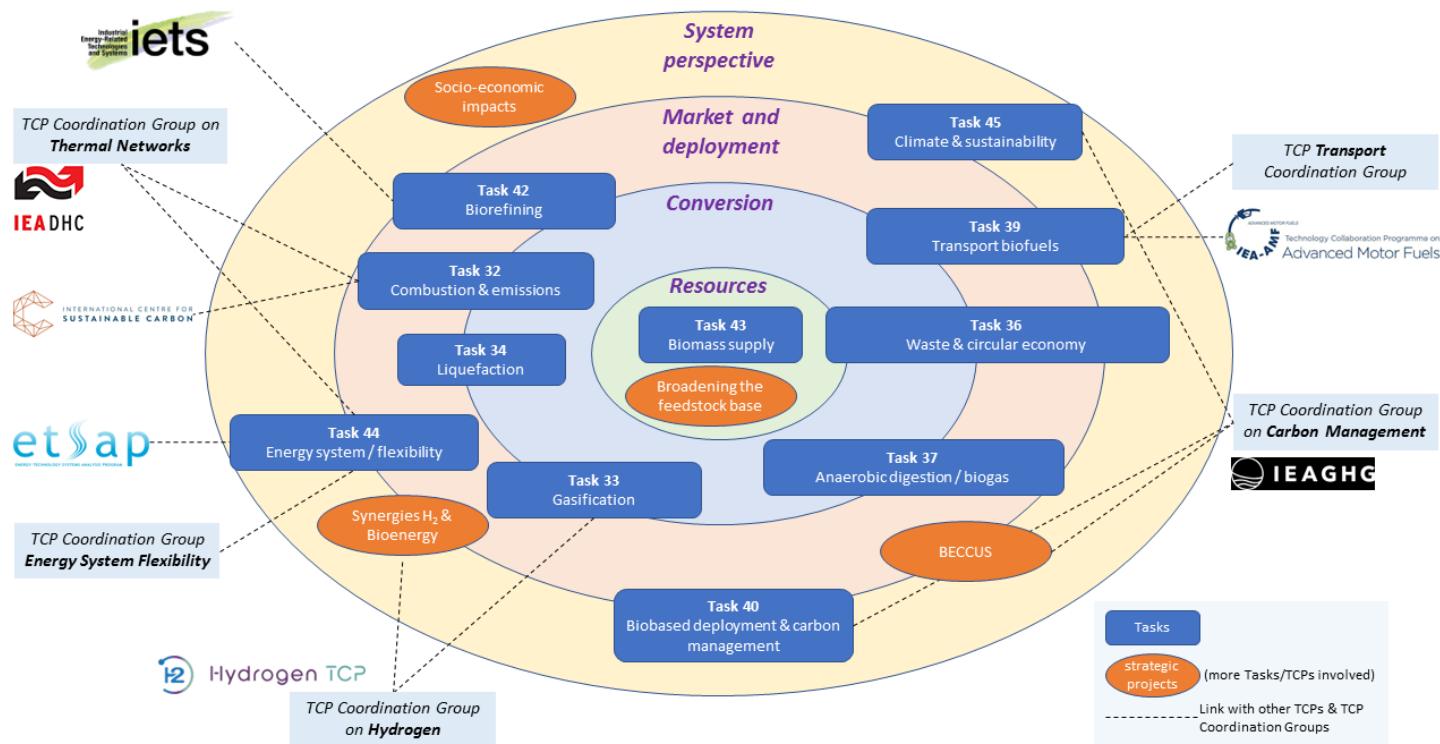


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- Traditionelle Biomassenutzung muss durch sauberere Energie ersetzt werden
- Die Produktion von moderner Bioenergie muss sich von 2020 auf 2050 verdreifachen
- Auch andere Szenarien kommen auf ähnliche Werte
- Bioenergie ermöglicht durch BECCS auch negative Emissionen

Tasks und Aktivitäten in IEA Bioenergy





Wie trägt IEA Bioenergy zur Systemtransformation bei?

- Bewusstseinsbildung / Basisinformationen
- Forschung und Technologieentwicklung
- Übersichten über den Status Quo der Implementierung
- Hervorhebung von best practice Beispielen
- Infoaustausch zu Trends

Basisinformationen



DIOENERGY REVIEW
How bioenergy contributes to a sustainable future

Start reading Discover the contents

HOME CHAPTERS SEARCH

CHAPTERS

Strategic view on biomass and bioenergy

1. Transitioning towards sustainability
2. Environmental sustainability
3. Economic considerations
4. Social sustainability and the need for a just transition
5. Reaping the multiple benefits of bioenergy
6. Enabling policies and research needs

Technologies for sustainable bioenergy

7. Biomass combustion
8. Gasification for multiple purposes
9. Direct thermochemical liquefaction
10. Biogas production for heat, electricity, renewable gas, and transport
11. Transport biofuels
12. Biorefining

What is bioenergy?

Bioenergy is renewable energy derived from biomass. Biomass is defined as organic material derived from plants and animals. Examples of biomass used for bioenergy are wood, agricultural residues, municipal solid waste, and animal manure. Biomass energy reduces fossil fuels from industry, agriculture, forest and landscape management, and households. The biomass is converted to solid, liquid or gaseous fuel which can be used to produce heat and/or electricity, or can be used as transport fuel.

Biomass overview from biomass to biogas and back

* Biogenic process residue can also be used for internal energy requirements

Some examples of biomass feedstocks for energy:

- Firewood
- Low-Quality Residues
- Poor Quality Wood Waste
- Nice Residues
- Rice Straws
- Organic WTW
- Sludge from Waste Water Treatment
- Manure
- Nice Residues
- Organic Compost
- Household Composting

FACTSHEET

Residential solid biofuels combustion – continuous improvement over time

Combustion of solid biofuels in stoves and boilers (<100 kW) contributes significantly to space and domestic water heating in residential dwellings in many countries over the globe. It provides a non-electrified source of energy for space and water heating of electrical grids that will face growing demands in the future, especially in energy sectors that are more fossil fuel sourced biomass resources. It can be combined with other heating sources, such as solar heating, to meet the heat demand in an optimal way.

Types of solid biofuels and appliances commonly used in residential solid biofuels combustion are firewood in wood stoves, inserts and wood log boilers and pellet boilers (Figure 2).

FACTSHEET

Modern and better performing devices

Residential technology research aims to both increase efficiencies and to improve better combustion and improved emissions of solid biofuels.

Figure 2: Pictures of selected technologies, a wood stove (left) and a pellet stove (right).

FACTSHEET

Bioenergy, the carbon cycle and climate change mitigation

When biofuels are used for transport, heat or electricity, carbon dioxide (CO₂) is released into the atmosphere in the same way as when fossil fuels are used. However, these CO₂ emissions tell us little about the overall impact of biofuels on climate change. This factsheet shows how bioenergy and fossil fuels differ in their interactions with the carbon cycle and how bioenergy can contribute to climate change mitigation by limiting the increase in atmospheric CO₂ levels.

Bioenergy and fossil fuels in the carbon cycle

Figure 1 gives an overview of the carbon cycle; the flow of carbon (in solid, liquid and gaseous forms) between the different pools, or reservoirs, where it is stored. Most of the Earth's carbon is found in the atmosphere, oceans, and land. The carbon stored in fossil fuels is called fossil carbon and is often referred to as fossil, or geological, carbon.

The rest of the carbon is found in the atmosphere, oceans, and land, where it is stored in plants, animals and other living organisms, soils, freshwater, and blanket products such as construction timber and paper. Fossil fuels are a fast source of carbon in the atmosphere due to the large exchanges of carbon between the different pools, and the time that carbon remains in a pool ranges from a few years to centuries. In contrast to the slow processes associated with geological carbon storage, fossil fuels are a fast source of carbon in the atmosphere.

While CO₂ emissions from fossil fuel use transfer carbon from geological storage into the atmosphere, harvesting and using biomass for energy returns carbon to the atmosphere that was recently removed by plant photosynthesis, and as new plants grow, carbon is removed from the atmosphere again. This is the same for biofuels as for fossil fuels, but the rates of these carbon flows, which in different ways influence how much carbon is emitted and removed from the atmosphere. The net effect on atmospheric CO₂ levels is determined by the way in which all these carbon flows are affected by bioenergy systems.

Forschung und Technologieentwicklung

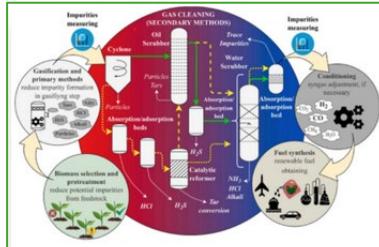


ROUND ROBIN ANALYSIS OF THE QUALITY PARAMETERS OF DIRECT THERMOCHEMICAL LIQUEFACTION OILS

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Even though fast pyrolysis bio-oil is a standardized commodity for the use in industrial scale boilers, reliable analysis of quality...

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GAS CLEANING FROM GASIFICATION FOR PRODUCTION OF BIOFUELS AND BIOCHEMICALS

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Gas cleaning is a crucial step in the gasification process to producing high quality biofuels and biochemicals. In a gasification process,...

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STATUS REPORT ON GASIFICATION IN IEA BIOENERGY MEMBER COUNTRIES

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This report by Task 33 (Gasification of Biogenic and Waste Feedstocks for a Sustainable Future) provides a comprehensive overview of the...

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QUANTIFYING BIODIVERSITY IMPACTS OF BIOENERGY SYSTEM – LATEST DEVELOPMENT IN THE SCOPE OF LCA

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Status der Implementierung

Delivering Sustainable Fuels
Pathways to 2035

BRAZIL, INDIA, ITALY AND JAPAN PLEDGE FOR QUADRUPLING OF SUSTAINABLE BASED Oct 2024

The International Energy Agency published its first report on the Outlook for Biogas and Biomethane: A global geospatial assessment. The report, which was published in October 2024, provides a comprehensive analysis of the global market for biogas and biomethane, including projections for future growth and the potential for sustainable energy production.

Outlook for Biogas and Biomethane
A global geospatial assessment

World Energy Outlook Special Report



International Energy Agency IEA

Technology Collaboration Programme by IEA

IEA Bioenergy Technology Collaboration Programme

Facilities Contact Us Facilities About Who is who Activities: Tasks News Events Publications FAQ

Facilities

Global database of biomass conversion facilities, including advanced biofuels, combustion, gasification and pyrolysis plants.

Filter Projects

Owner	Name	Location	Info
Aanevoima Oy	Aanekoski power plant	Finland	Info
Aarhus University	Center for Biorefining Technologies	Denmark	Info
Acelen	Acelen Bahia	Brazil	Info
Advanced Bioenergy Lab eGen	Reallabor ABL	Austria	Info
Advanced Biofuels Solutions Ltd	Swindon Advanced Biofuels Plant	United Kingdom	Info
Advanced Biofuels Solutions Ltd	ABSL bio-SNG demonstrator	United Kingdom	Info
Advanced Biofuels Solutions Ltd	Swindon Advanced Biofuels Plant	United Kingdom	Info
Aemetis	Aemetis Carbon Zero 1	United States	Info
Aemetis/Lanzatech	Project Aemetis Riverbank	United States	Info
Aerni Pratteln	CHP Pratteln	Switzerland	Info
AEW Energie AG	Pelletvergasser AEW Rheinfelden	Switzerland	Info

Map



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operational | under construction | planned | non operational | no status



LOWERING HINDERS FOR MARITIME BIOFUELS

Apr 2025

Biofuels could be the key to cleaner shipping, but higher costs, lack of



SYNERGIES OF GREEN HYDROGEN AND BIOBASED VALUE CHAINS DEPLOYMENT

Oct 2025

Hydrogen is a key element in achieving a climate-neutral energy system. While electrolytic hydrogen has attracted most attention, the

Best practice / Case studies



PROCESS HEAT FROM FOREST RESIDUES FOR THE BATTERY INDUSTRY IN AUSTRIA

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The use of biomass for energy in industry is growing rapidly in the last 15 years or so. Until about 2010, the use of biomass residues for...

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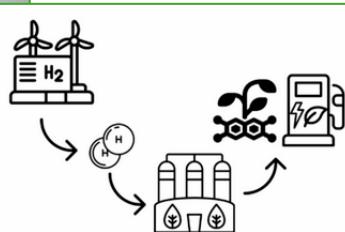


REPLACING COAL WITH BIOMASS AT GOLDEN BAY CEMENT, NEW ZEALAND – AN INDUSTRIAL PROCESS HEAT CASE STUDY

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Biomass for industrial process heat The use of biomass for energy in industry is growing rapidly in the last 15 years or so. Until about...

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INTEGRATION OF BIOREFINERIES AND GREEN HYDROGEN – TECHNO-ECONOMIC FEASIBILITY AND CASE STUDIES

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Various opportunities can be unlocked when connecting decentralised produced green hydrogen and regionally available bio-resources,...

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FULL-SCALE WASTE-TO-ENERGY CCS IN NORWAY

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This case study report presents the latest developments regarding the Hafslund Celsio full-scale CCS project at their Klemetsrud Waste to...

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Trends erkennen – und reagieren



BECCUS SCIENCE AND POLICY

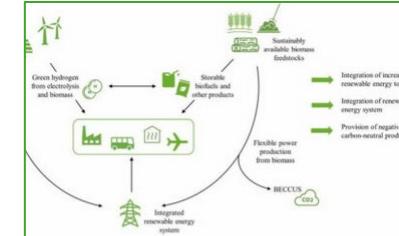
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Bioenergy with Carbon Capture, Utilisation, and Storage (BECCUS) is a critical technology for climate change mitigation, enabling the...

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- SP Special Projects
- Socio-economic impacts of bioenergy



FLEXIBLE BIOENERGY – ENABLER FOR ENERGY TRANSITION FOR ZERO EMISSION ENERGY SYSTEMS

Aug 2025

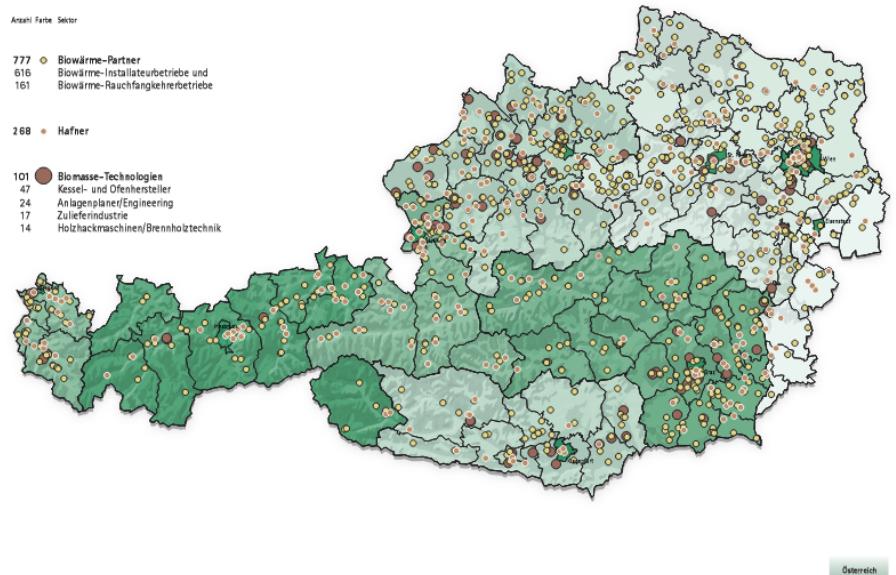
This article is part of the IEA Bioenergy Annual Report 2024 and was developed by members of IEA Bioenergy Task 44, a group of...

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Bioenergie ist in Österreich stark verankert, Technologien werden aber auch exportiert



Unternehmen



Biomasseverband listet im Bioenergie Atlas 2023:

- 777 Biowärmepartner
- 268 Hafner
- 270 Biogasanlagen
- 20 Biotreibstoffanlagen
- 2.461 Biomasseheizwerke
- 168 Biomasse-KWK-Anlagen
- 48 Pelletsproduktionen
- 62 Einrichtungen in Lehre, Forschung und Ausbildung
- **101 Biomasse-Technologie Firmen**



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