

Sustainable Bioenergy for the Energy Transition

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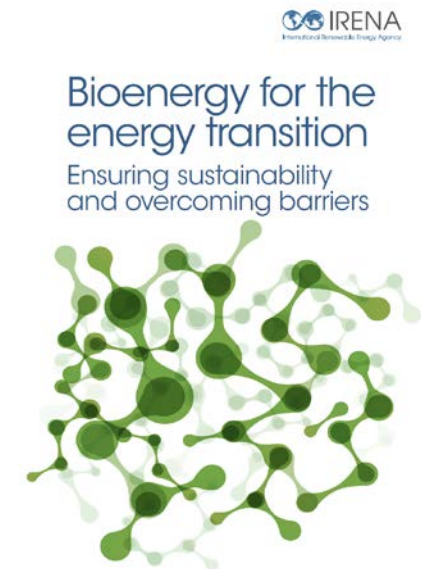
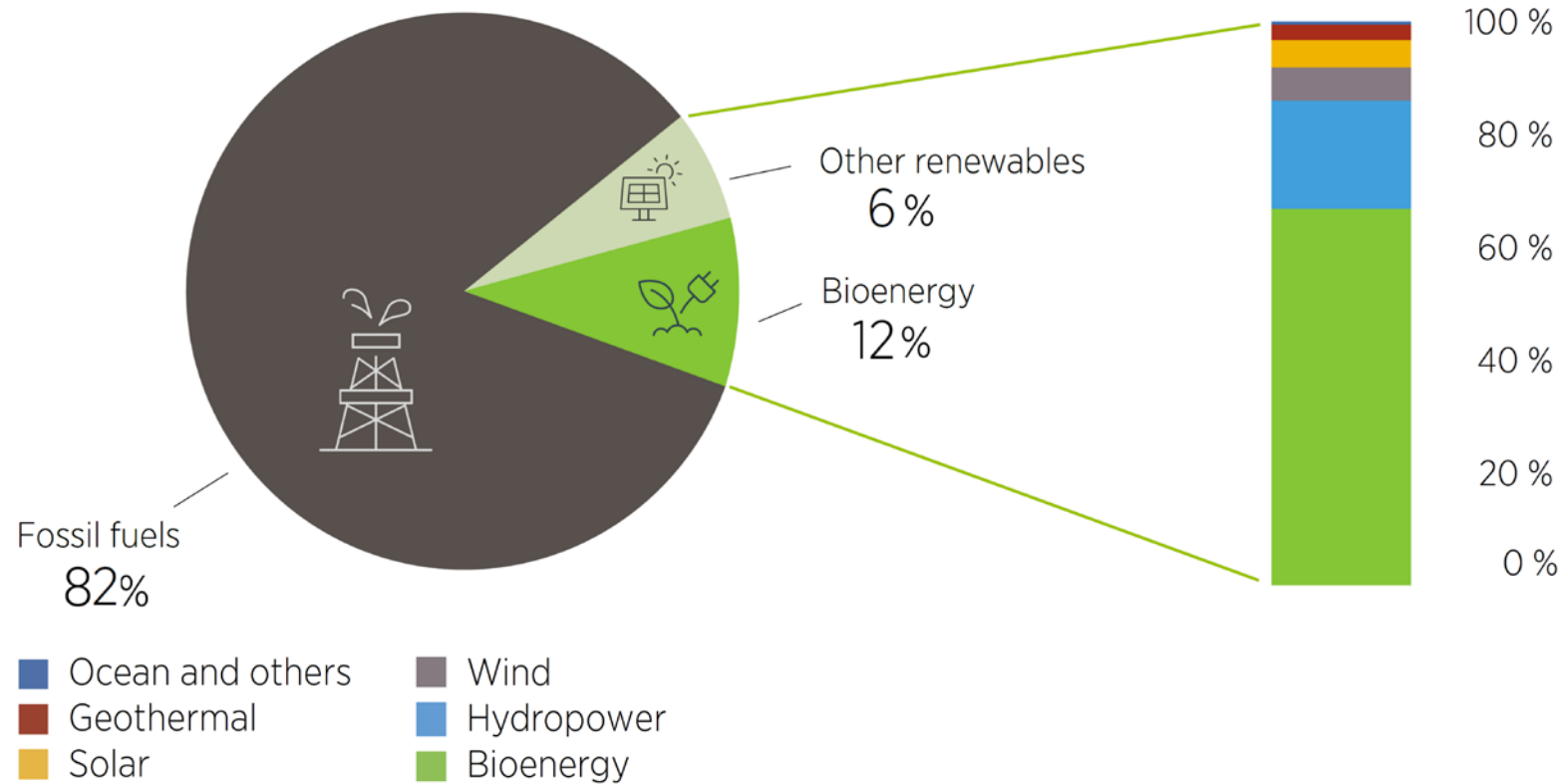
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Workshop on policies for sustainable bioenergy, Vienna, 30 November 2022



Bioenergy contributes the largest share of renewable energy consumption

Share of bioenergy and other renewables in global total final energy consumption, 2019

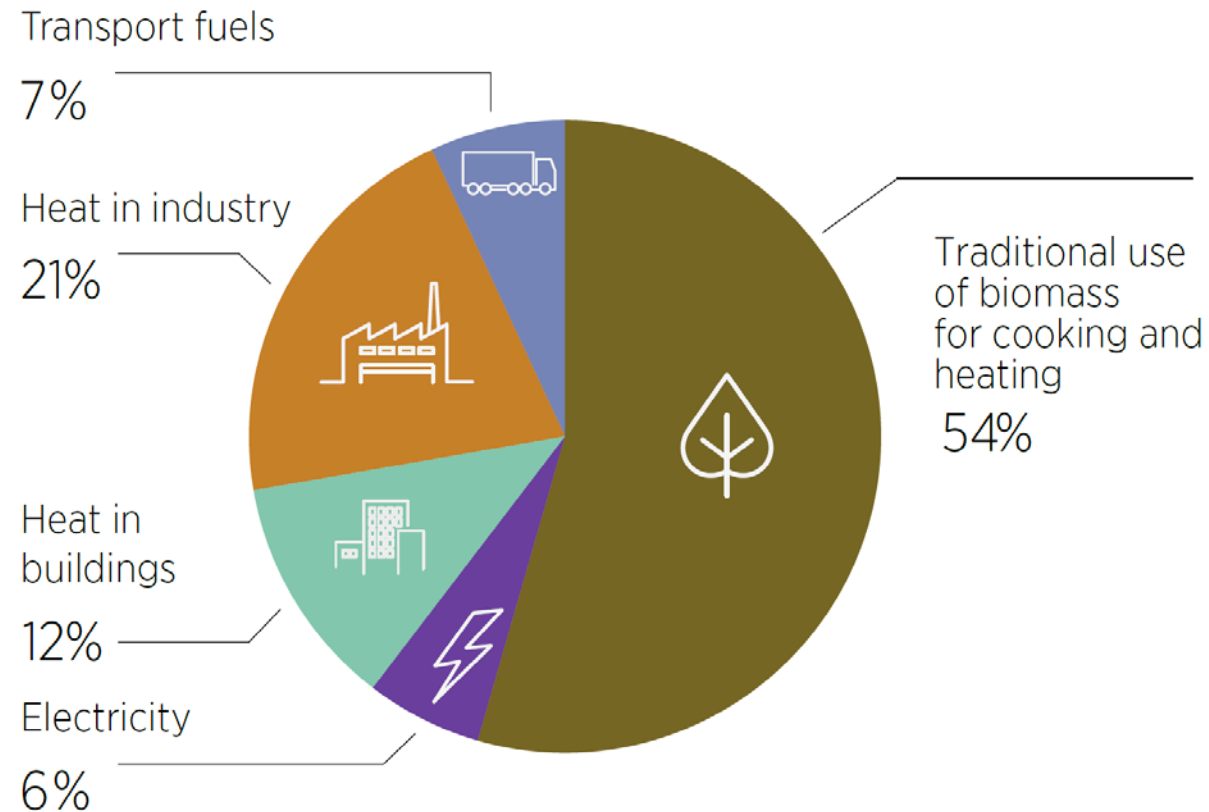


Source: IEA, IRENA

Bioenergy provided around two thirds of global renewable energy demand in 2019.



Share of global bioenergy consumption by end use, 2020

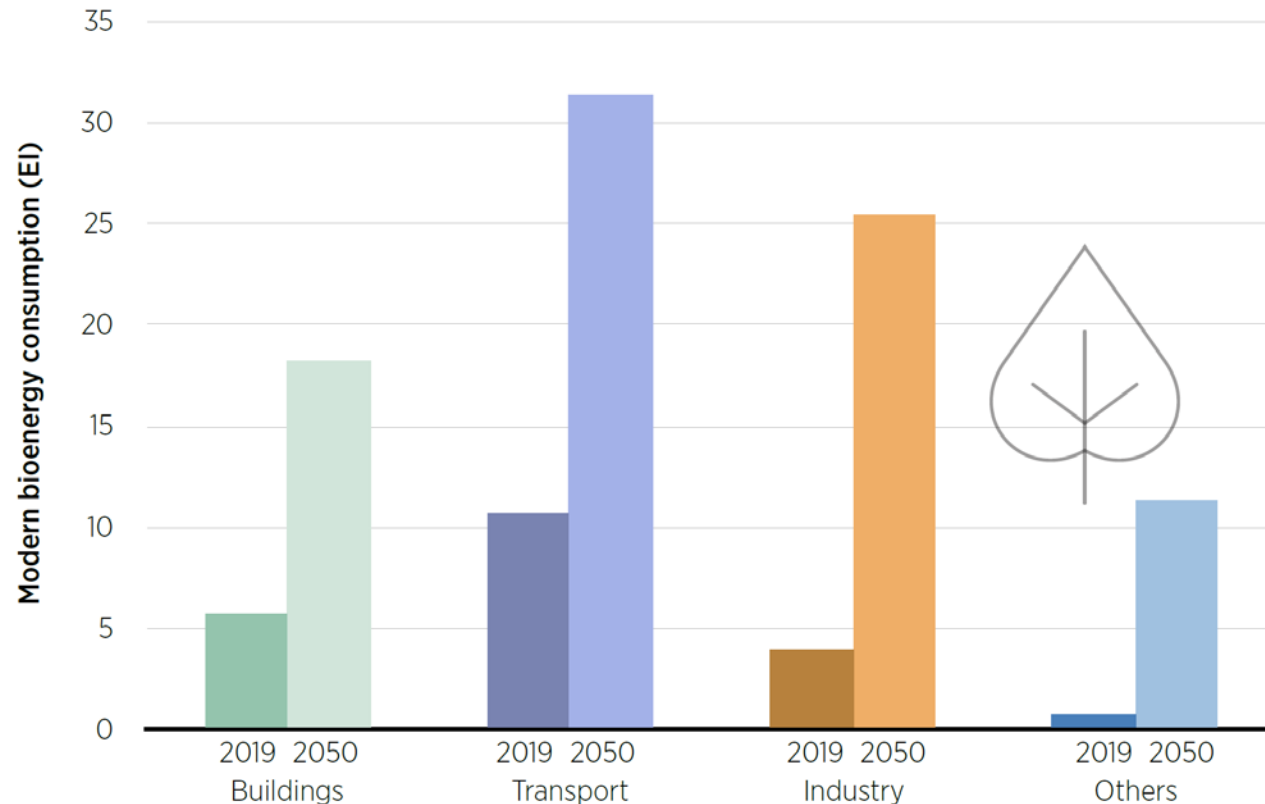


Source: IRENA, IEA

In 2020, more than 80% of bioenergy is used for cooking and heating in buildings and industry, providing 20% of total heat consumption.



Modern bioenergy consumption in 2019 and 2050 in IRENA's 1.5°C Scenario, by sector



Modern bioenergy can support the decarbonisation of all sectors.

By 2050, it could provide 20% of total energy use in industry and is one of few renewable options for aviation.

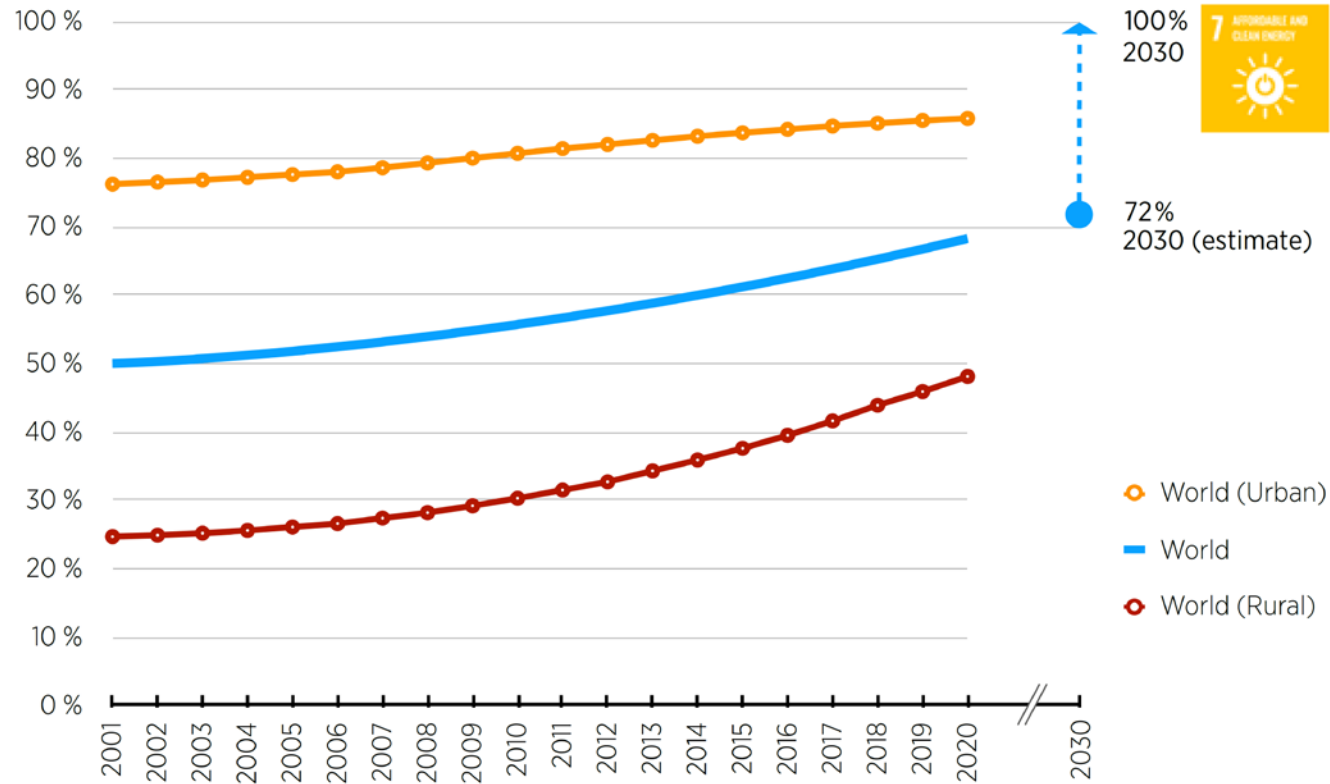
Note: "Others" includes bioenergy for non-energy use and as chemical feedstock; EJ = exajoule.

Source: IRENA



Modern bioenergy solutions can narrow the global gap of clean cooking

Global clean cooking access rates from 2001 to 2020 and forecast to 2030



Pellet cookstoves by Ecosense, India

Biogas digesters and clean cookstoves using solid biomass have played a significant role in helping people transition from inefficient biomass to clean cooking solutions, with successful examples in China, India, Nepal and Viet Nam.

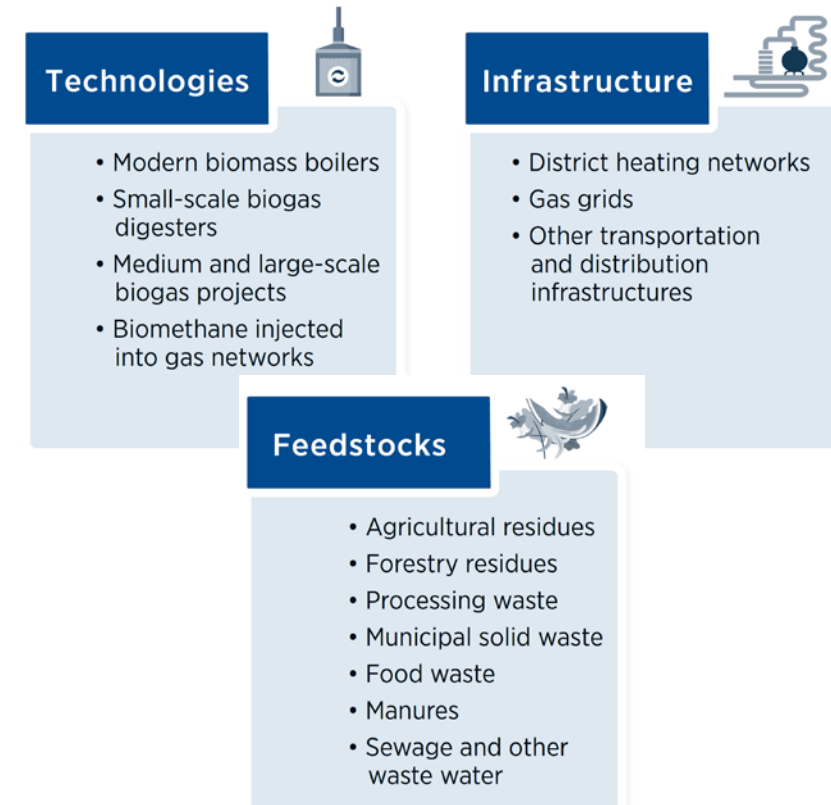


Trends in bioenergy for buildings in the 1.5°C Scenario



Source: IRENA

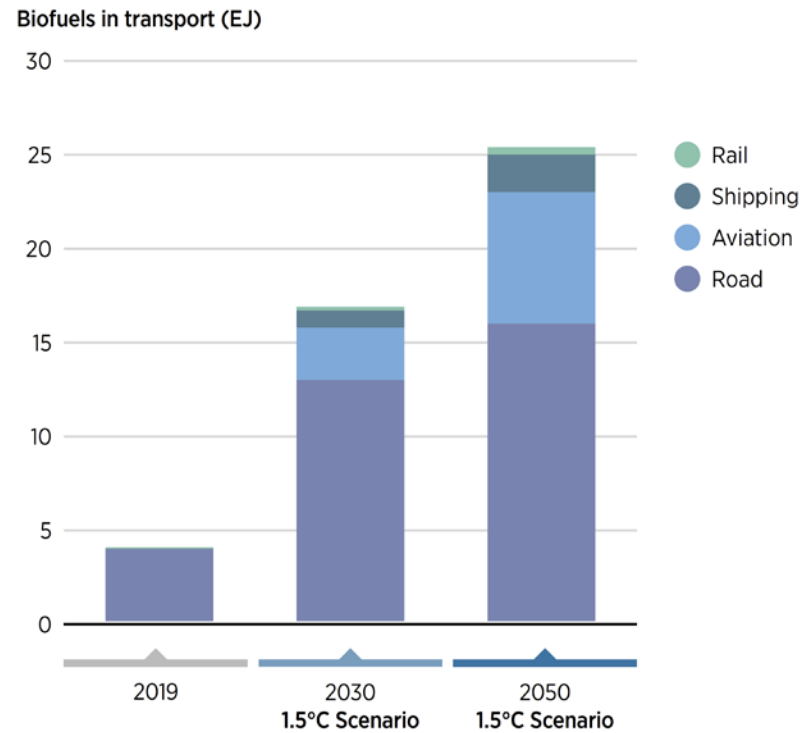
Major pathways for modern bioenergy use in buildings



Biogas and biomass heat can be competitive with fossil fuel options if low-cost feedstocks (e.g., residues and waste) and existing infrastructures are available.



Use of biofuels in transport in the 1.5°C Scenario



Source: IRENA

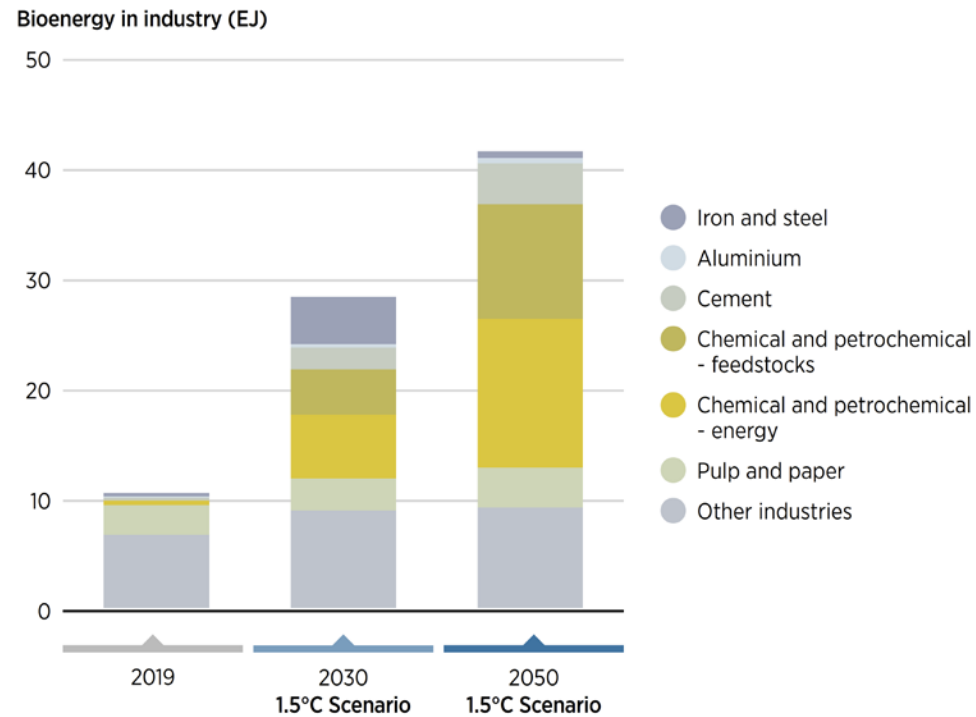
Overall policy framework for deployment of renewables in transport



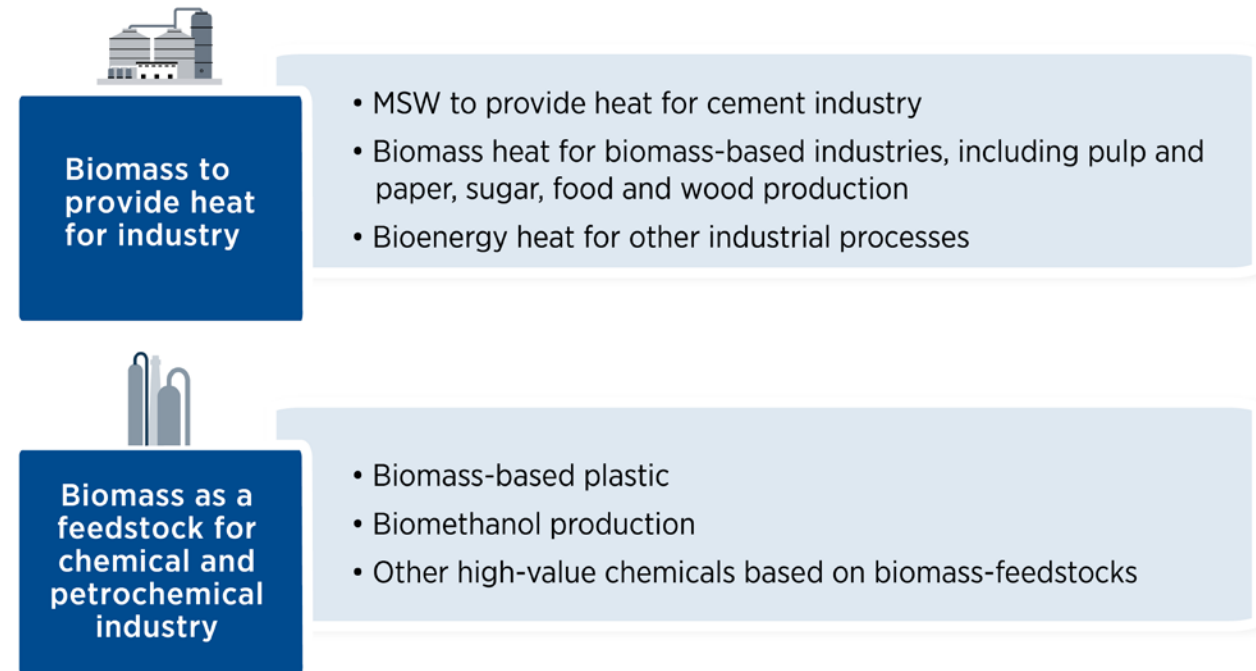
Bioenergy's role in the decarbonisation of transport will need to be co-ordinated with other options such as electric vehicles, green hydrogen or green ammonia.



Role of bioenergy in industry in the 1.5°C Scenario



Pathways of bioenergy for decarbonisation of industry



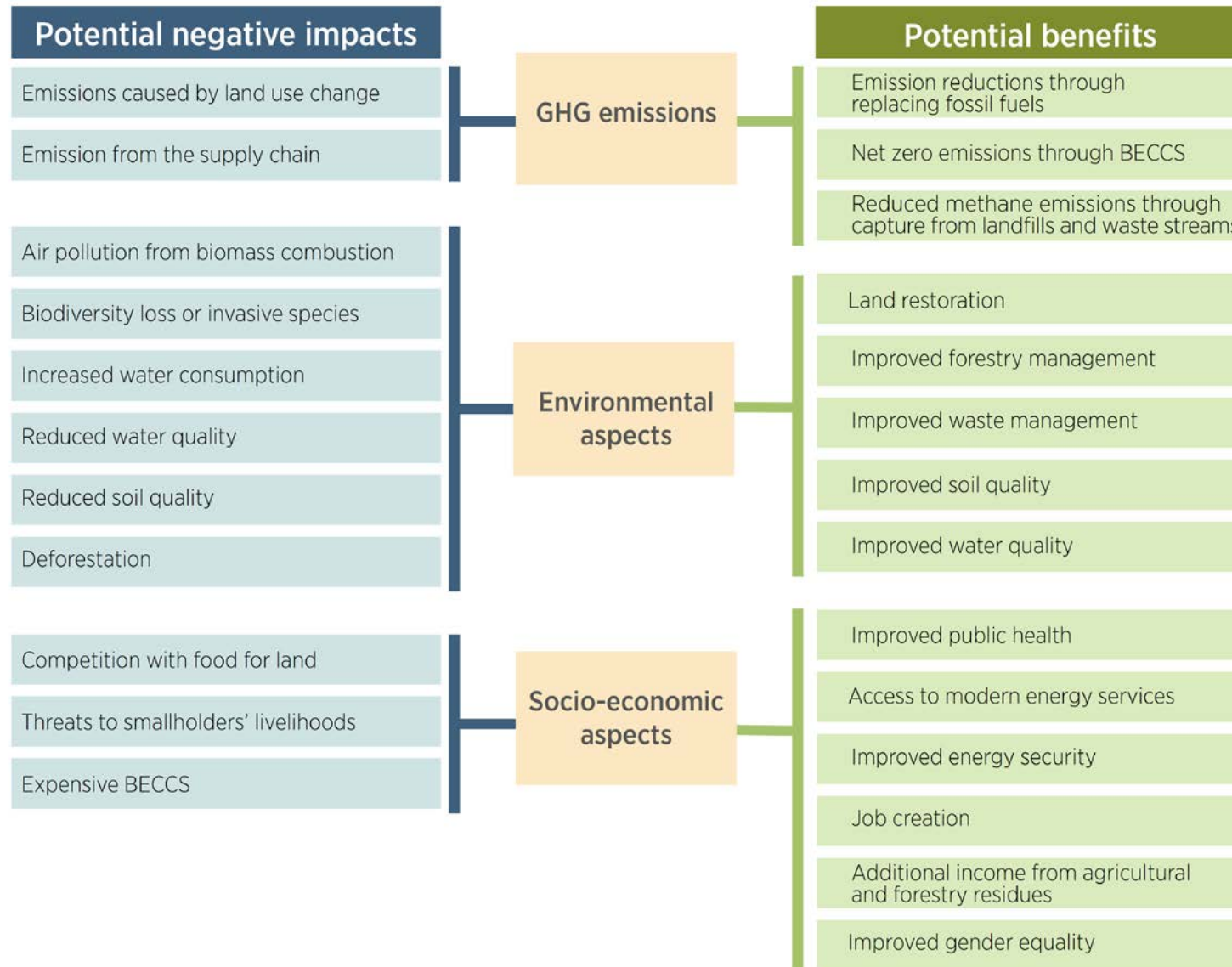
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Source: IRENA



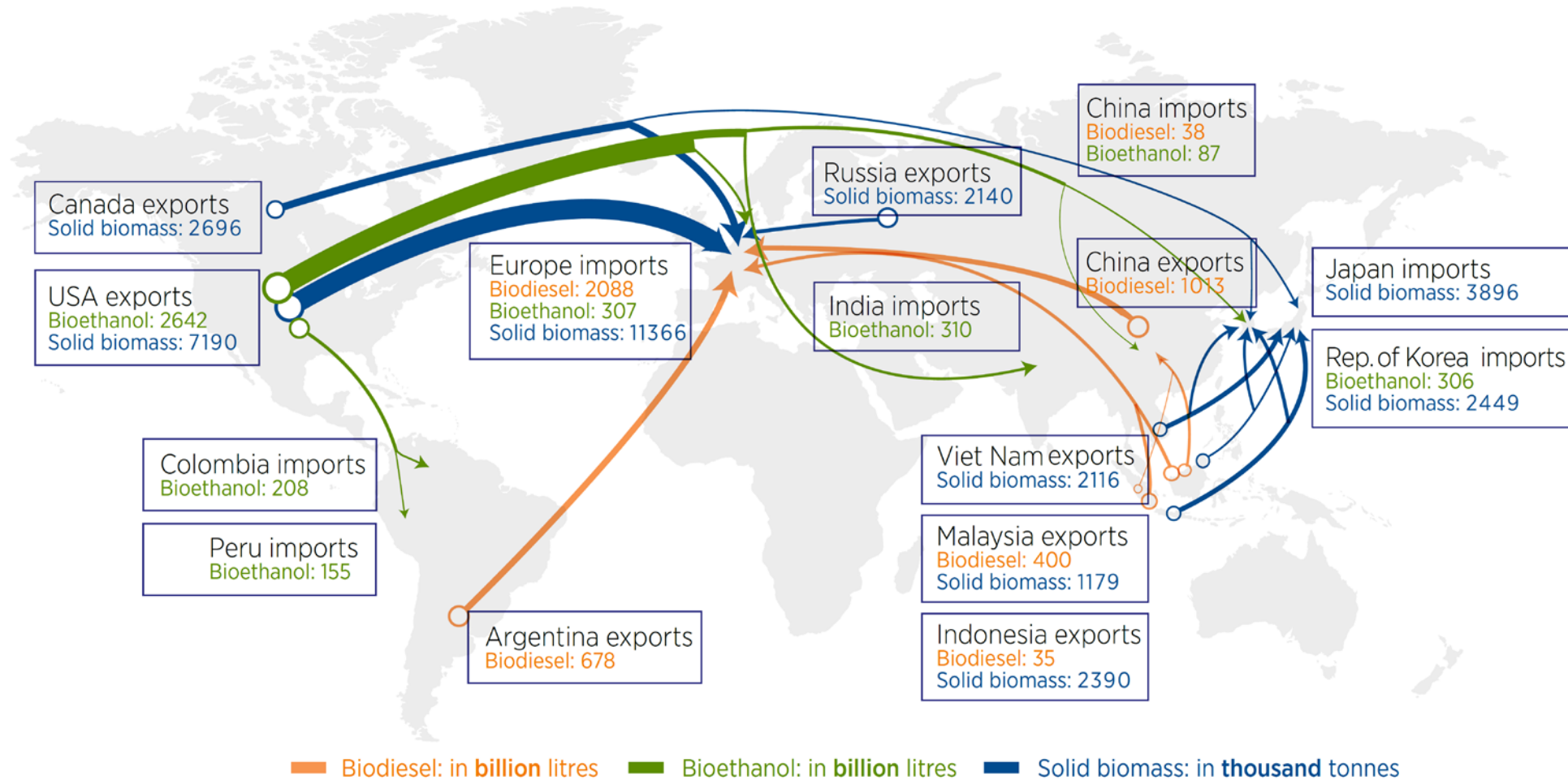
Bioenergy sustainability is a complex topic

Potential aspects related to bioenergy sustainability



Wood pellets, biodiesel and bioethanol are major bioenergy commodities

Global bioenergy trade in major markets, 2020

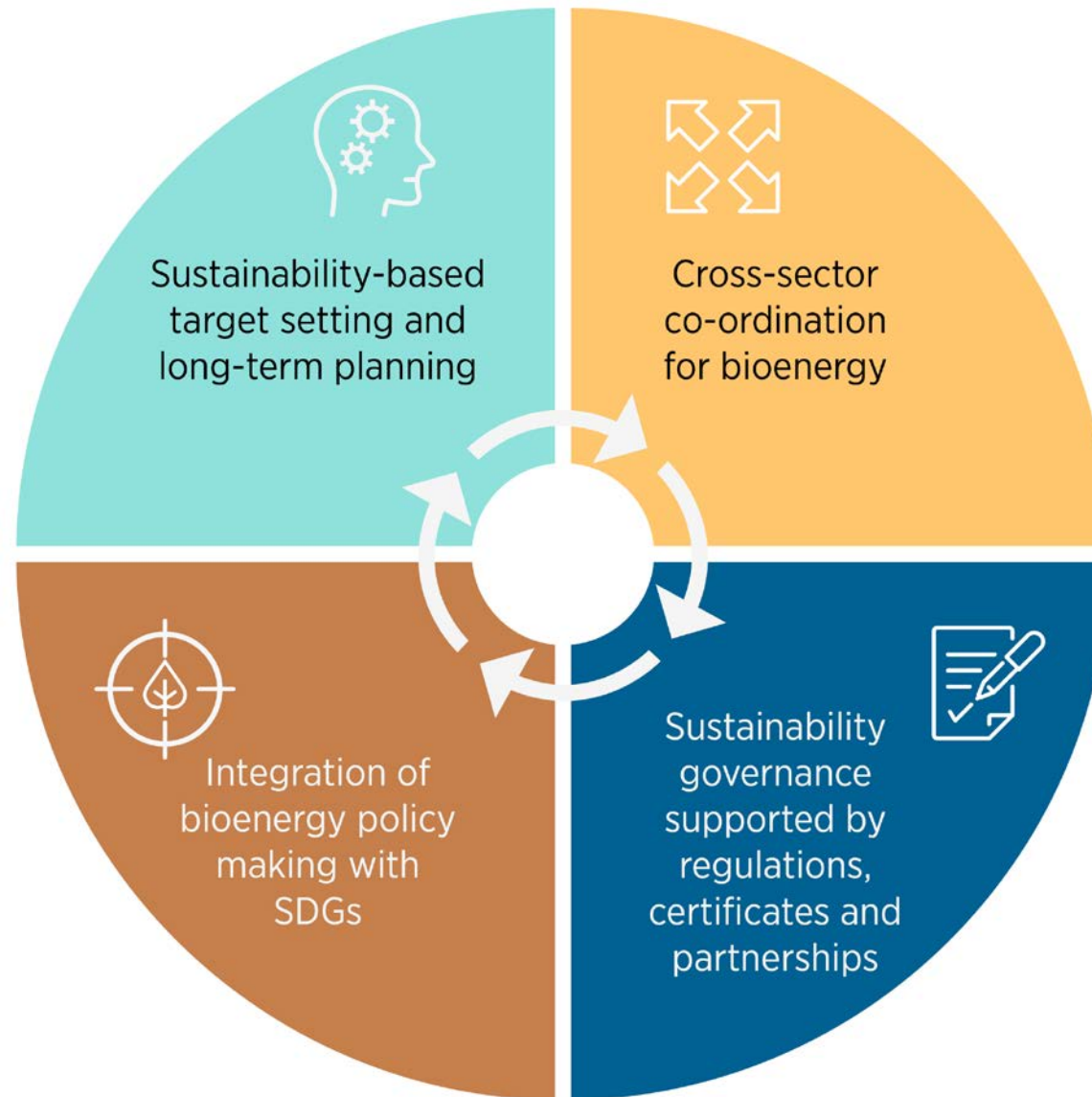


Note: The figure does not include all bioenergy trade due to limited data. Other international trade of bioenergy may exist but is not shown in this figure.

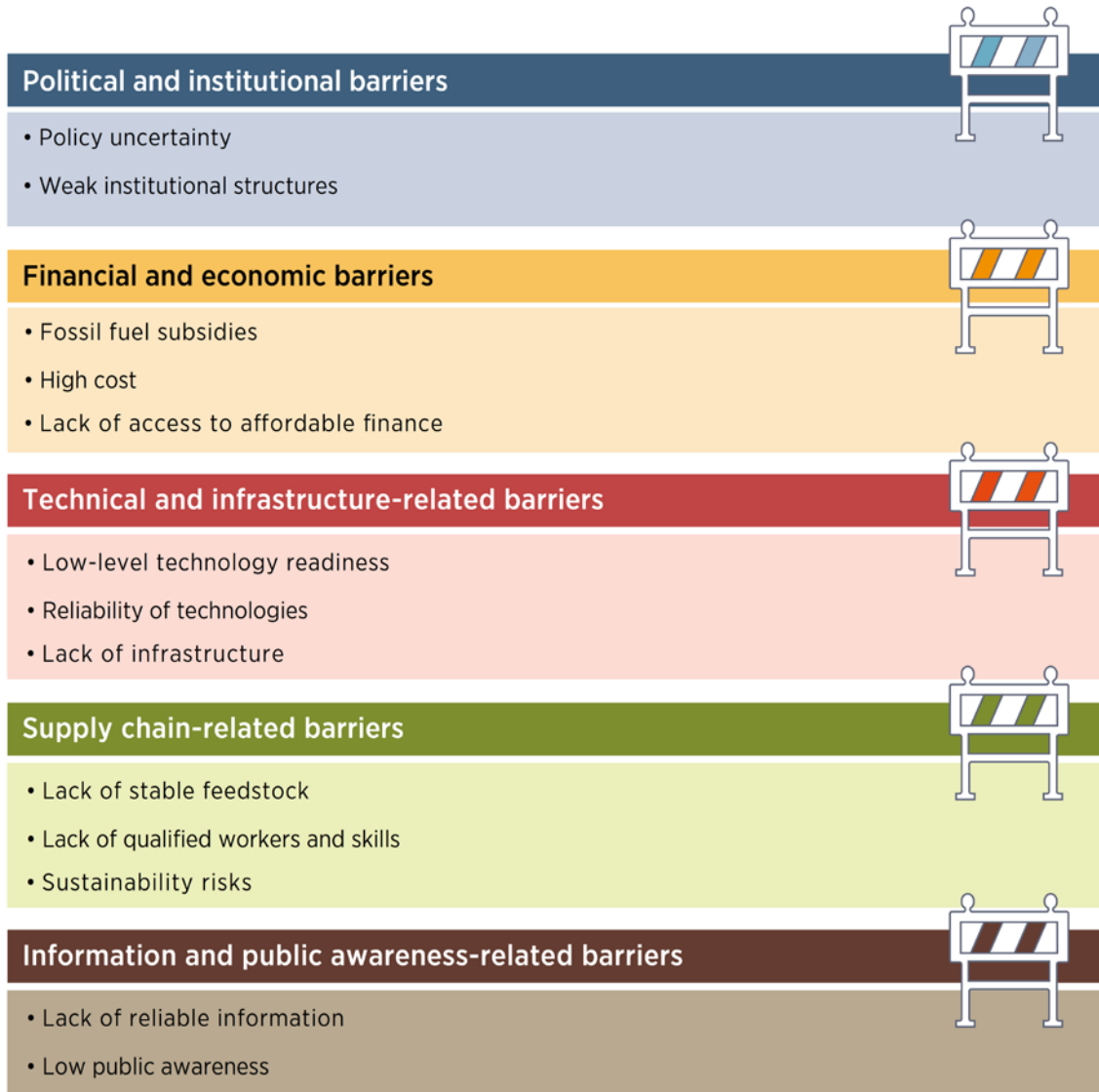
Source: IRENA analysis based on Argus, Japanese Forestry Agency, UNComtrade, and USDA



A comprehensive policy framework is necessary to ensure sustainability



Policies and regulations are needed to tackle cross-cutting barriers



Policy uncertainty has been a main barrier to developing renewables, including bioenergy, due to the lack of long-term policy commitments and targets.

Weak supply chains are another major barrier for large-scale bioenergy projects. They also can be a reason for high production costs





THANK YOU

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