The Role of Bioenergy in the Net-Zero Emissions 2050 Scenario

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Bioenergiapäivä

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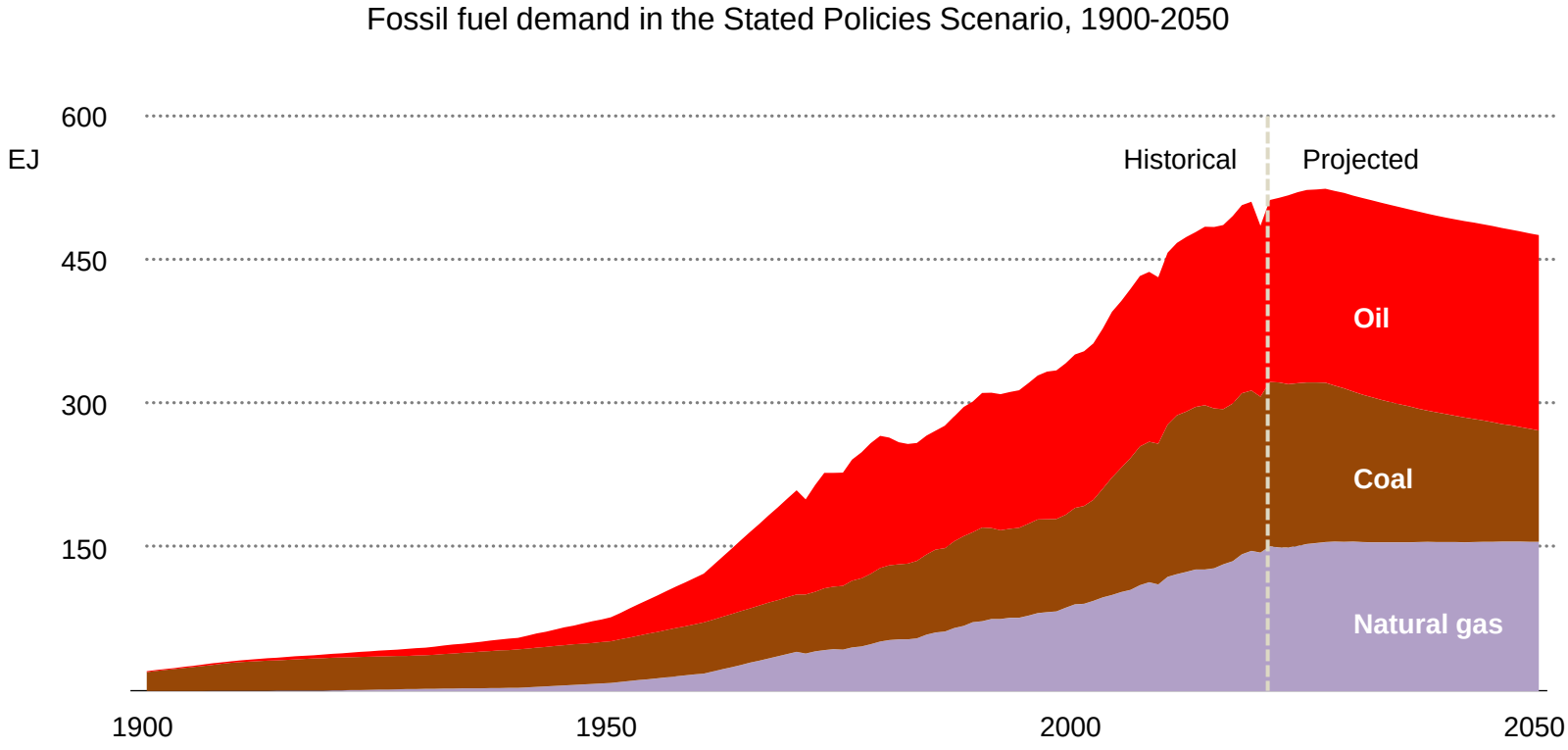
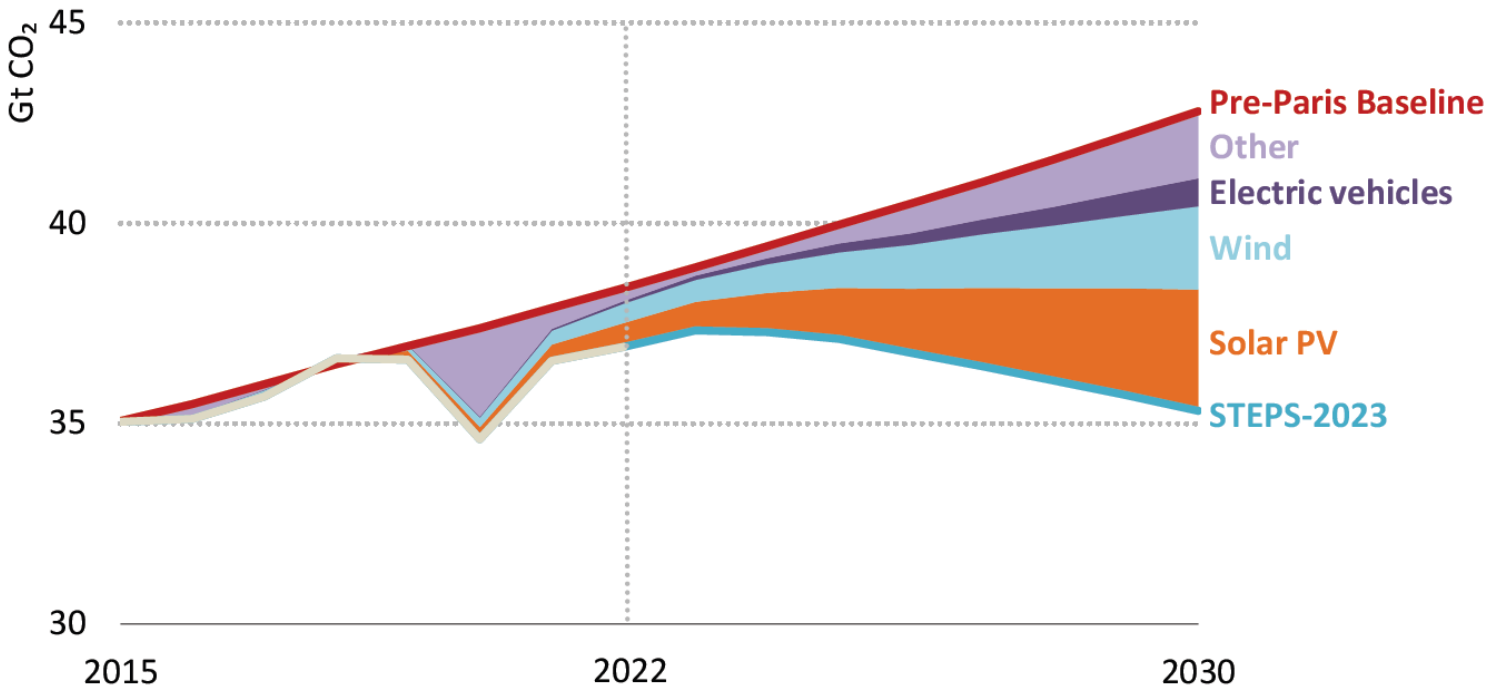
Peak fossil fuel demand is coming this decade



Today's policy settings are now sufficiently strong that they produce a distinct peak in fossil fuel use before 2030

A lot of progress has taken place since the Paris Agreement

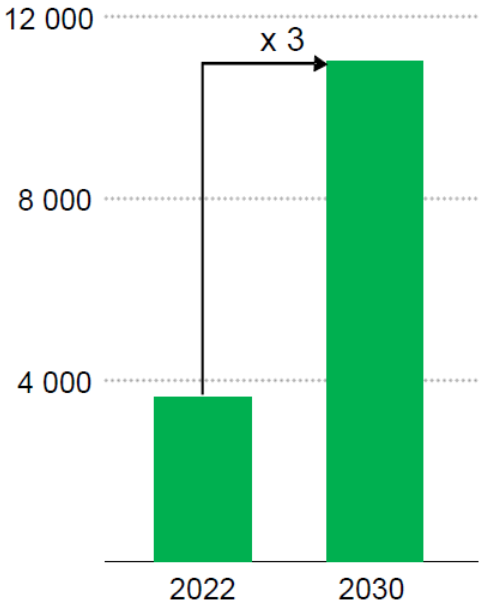
Global energy sector CO_2 emissions in the Pre-Paris Baseline Scenario and STEPS, 2015-2030



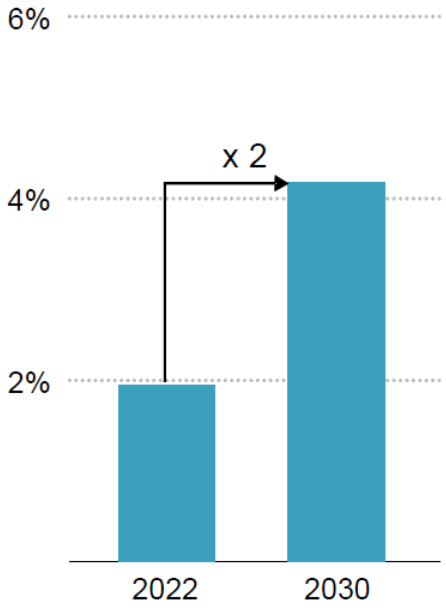
Solar PV, wind power and EVs reduce emissions by 6 Gt in 2030 in the STEPS relative to the Pre-Paris Baseline Scenario

We have the tools to go much faster

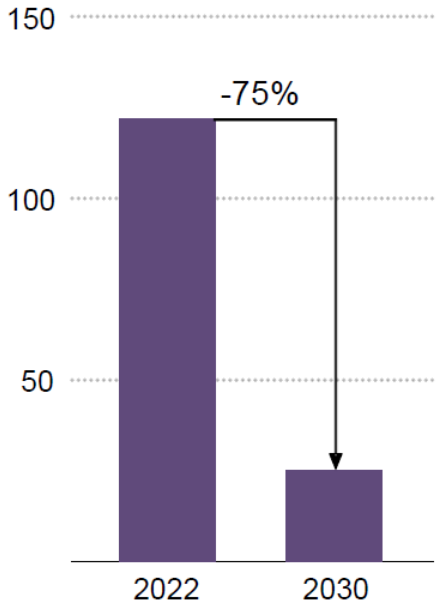
Renewables installed capacity (GW)



Annual energy intensity improvement



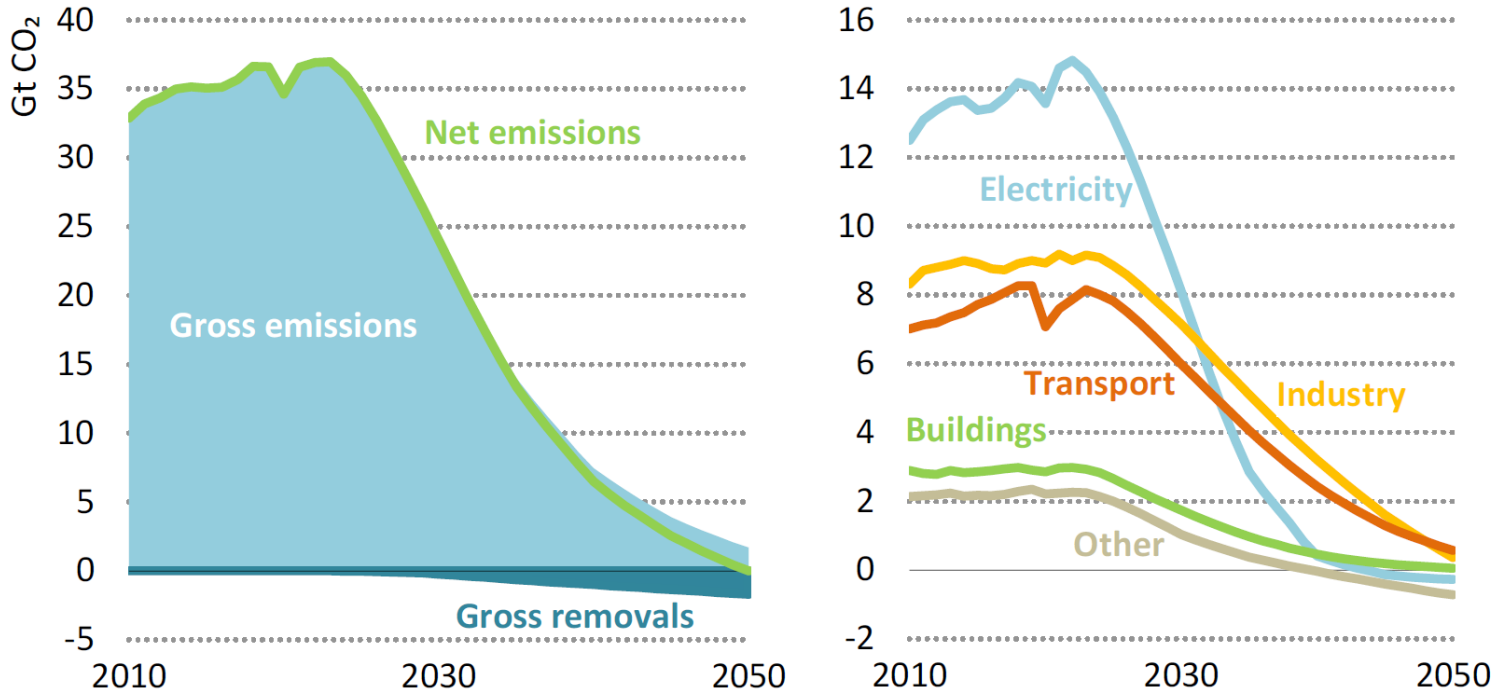
Methane emissions from fossil fuel operations (Mt)



Energy-related greenhouse gas emissions peak by 2025 and decline by nearly 40% from today to 2030. Proven solutions available today deliver over 80% of what is needed this decade.

Emissions trends to 2050

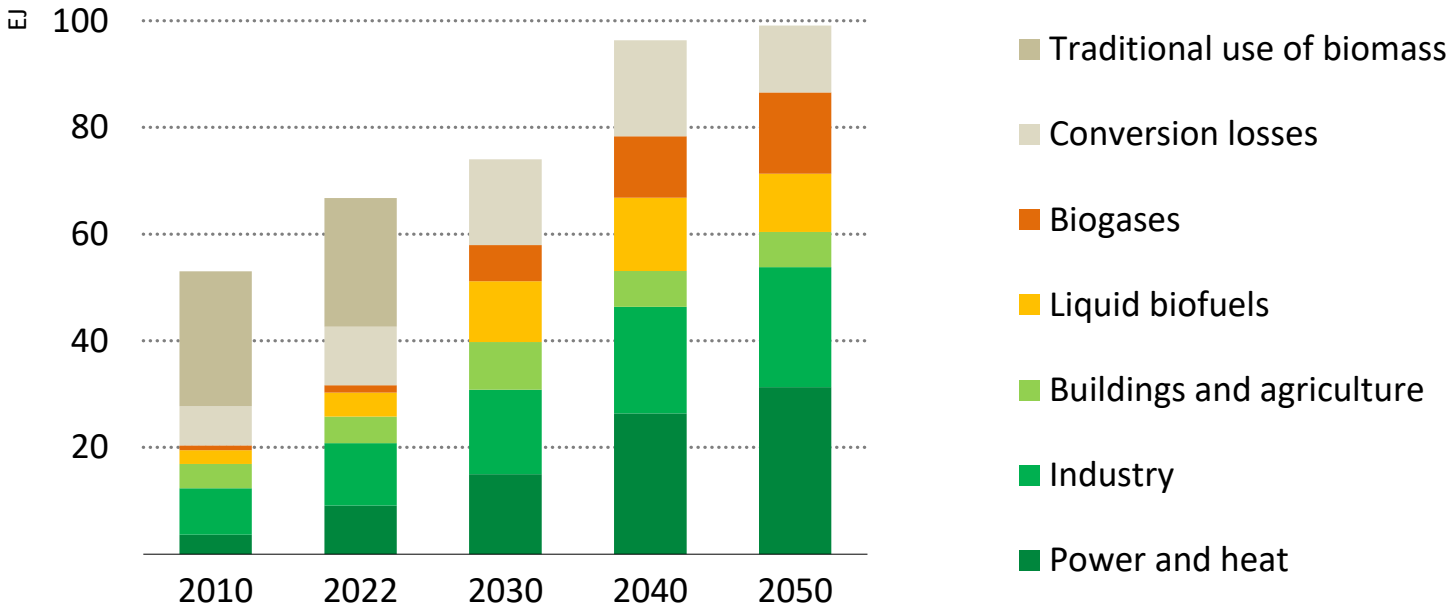
Energy sector gross emissions and removals, total net CO_2 emissions, and net emissions by sector in the NZE Scenario, 2010-2050.



Energy sector CO_2 emissions are reduced 65% by 2035 and reach net zero by 2050, with residual emissions of 1.7 Gt balanced by atmospheric removals of the same magnitude

Bioenergy to play a major role in various forms

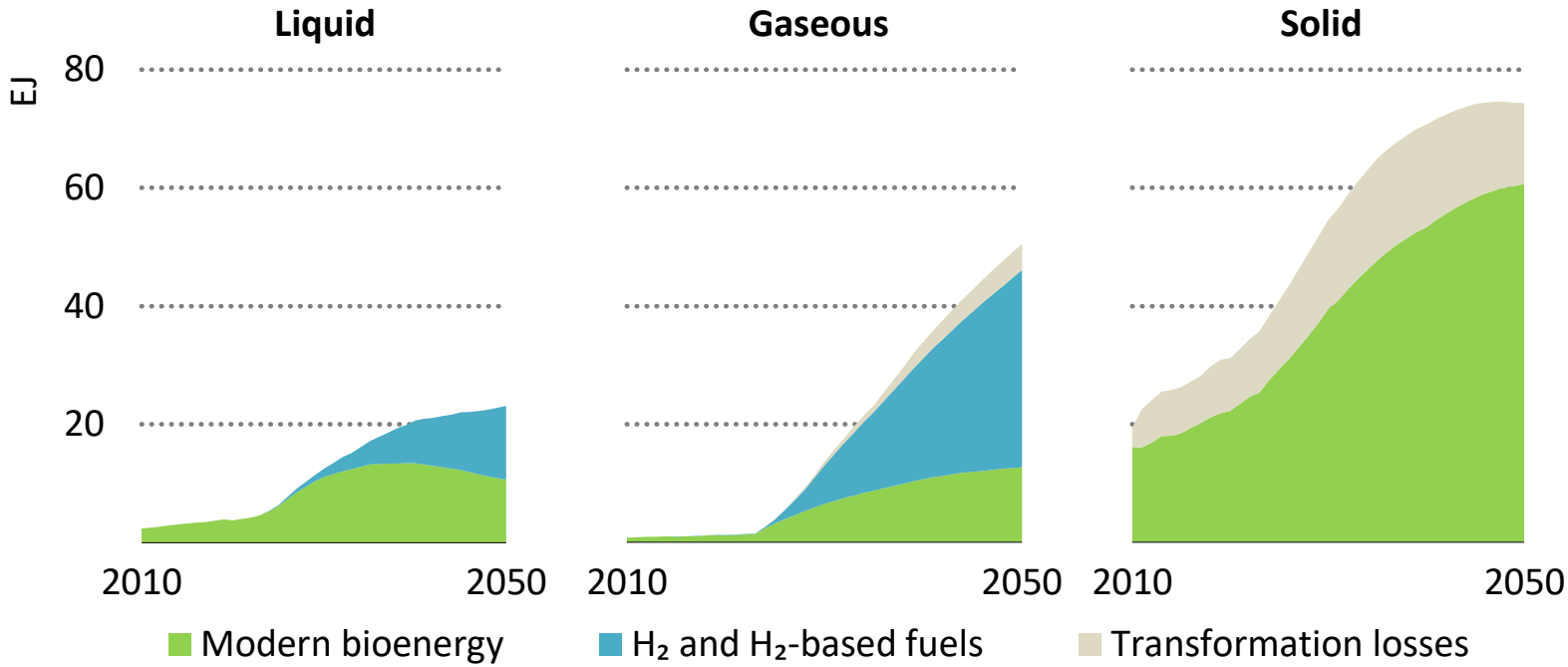
Primary bioenergy use by sector and economic grouping in the NZE Scenario, 2010-2050.



Modern bioenergy use more than doubles to 2050, meeting almost 20% of total energy needs and becoming the second largest source of energy supply. Global demand in 2050 is well below the assessed sustainable potential.

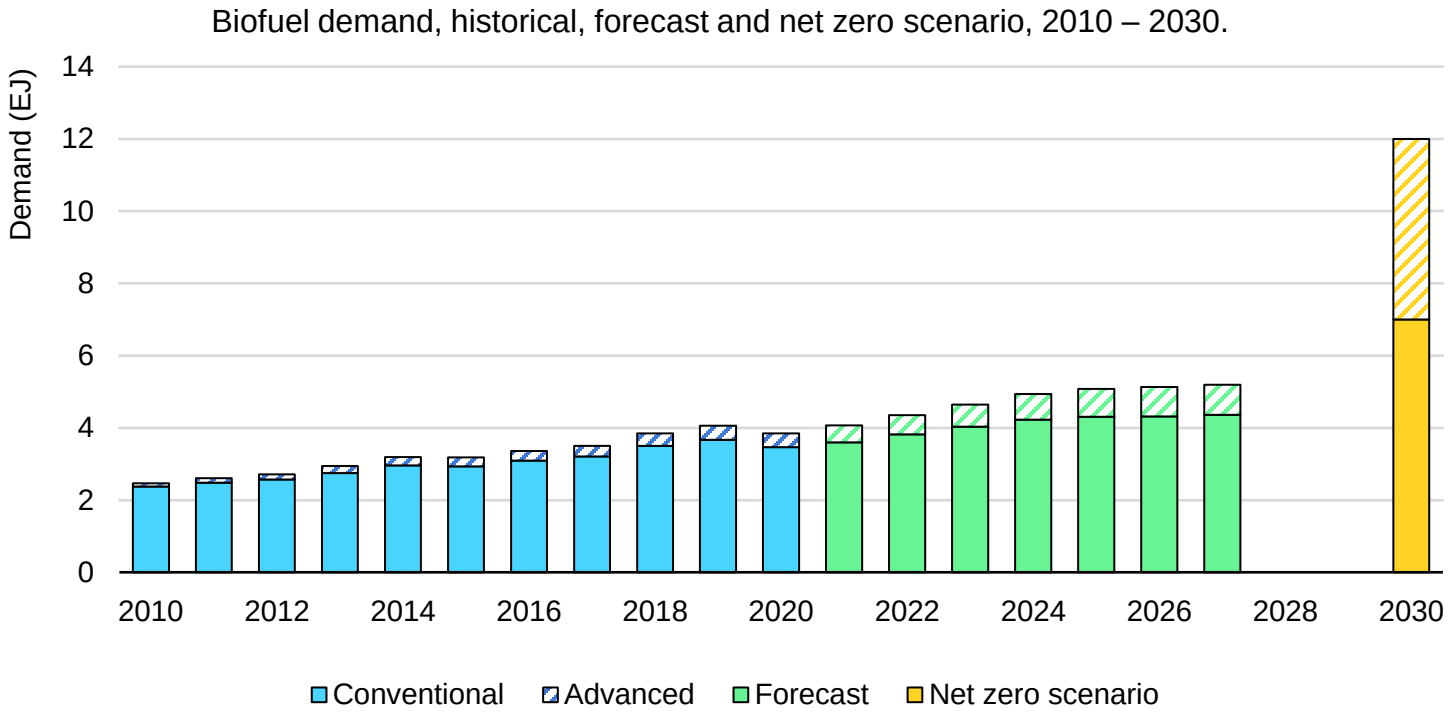
Low-emissions fuels are critical for achieving net-zero emissions

Low-emissions fuel demand in the NZE Scenario, 2010-2050.



Low-emission fuels are used to substitute for fossil fuels in hard-to-abate applications where electrification is costly or not available.

Liquid biofuels are not on track for net zero



The United States, Brazil, Indonesia, India and Canada drive 80% of new biofuels demand to 2027. Achieving net zero requires stronger demand policies, diversifying supply chains and expanding advanced fuels.

Conclusion

- Reaching net-zero emissions globally by 2050 is a critical and formidable goal, requiring an unprecedented transformation of how energy is produced, transported and used.
- The pathway to net-zero hinges on immediate and massive deployment of all available clean and efficient energy technologies, as well as boosting clean energy innovation.
- Modern bioenergy, together with hydrogen and hydrogen-based fuels, help to decarbonise sectors where direct electrification is costly or not available.
- Sustainable bioenergy is an essential component of the Net Zero Emissions Scenario that needs to more than double to 2050. It provides flexible electricity generation, high temperature heat for industry and low-emission fuels for long-distance transport.