



ICAO SEMINAR ON **GREEN AIRPORTS**

ATHENS, GREECE | APRIL 18-19, 2024





Prospects for Renewable Energy Supply

Integrating renewables in airport operations



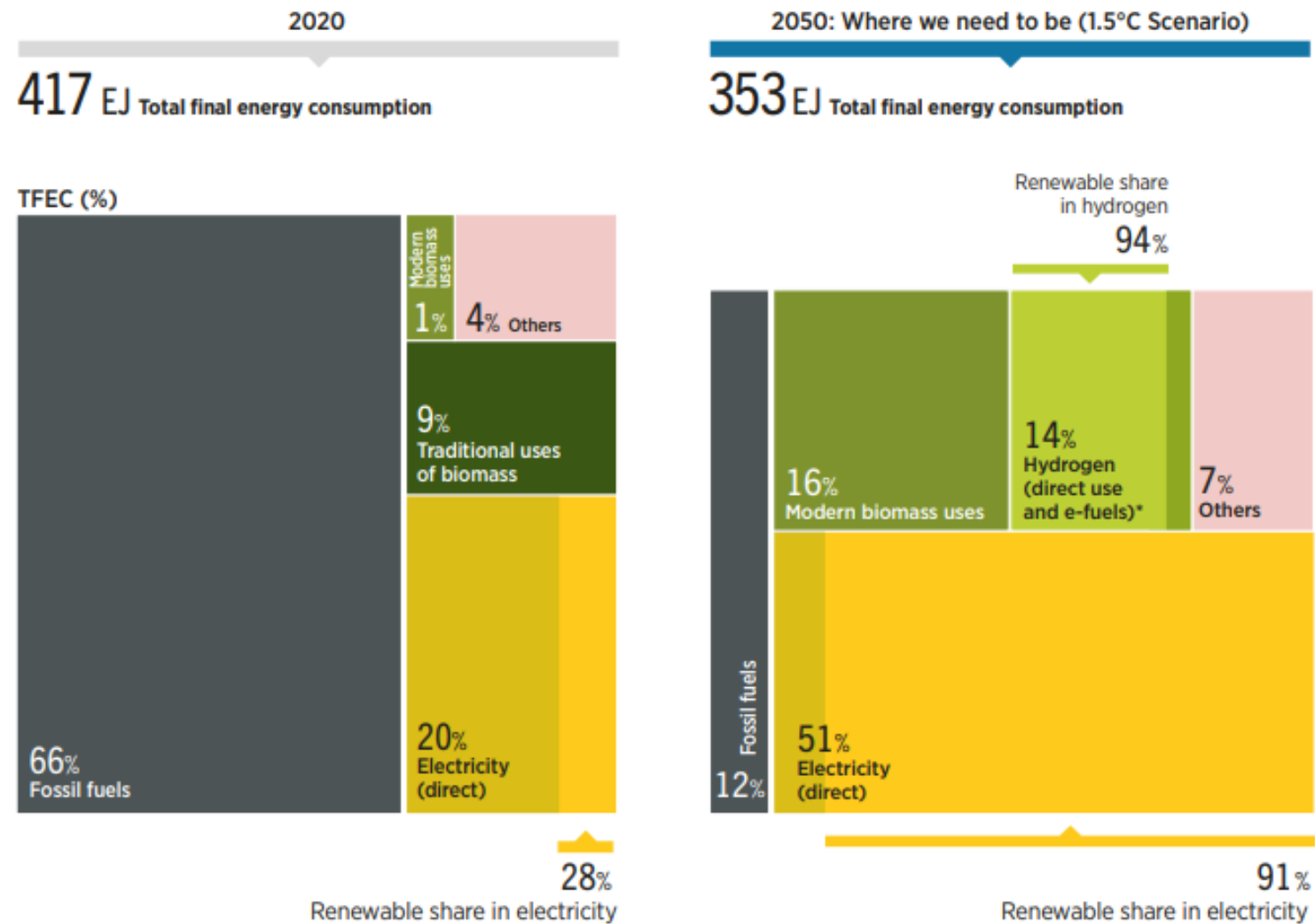
Luis Janeiro

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The decarbonization of the global energy system in one snapshot

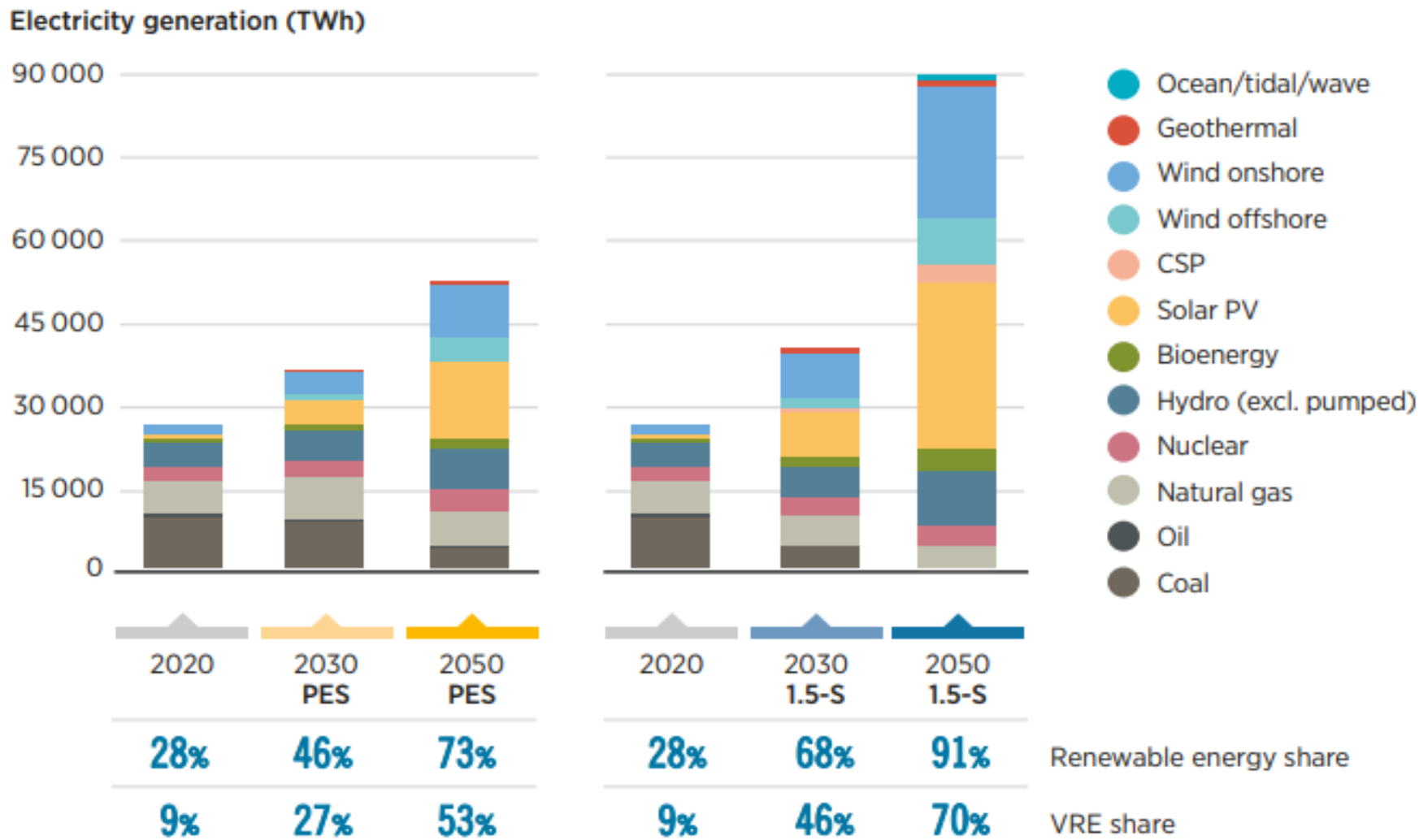
Breakdown of total final energy consumption by energy carrier in 2020 and 2050 under IRENA’s 1.5°C Scenario:



Source: IRENA, 2023. World Energy Transitions Outlook 2023: 1.5°C Pathway, Volume 1, International Renewable Energy Agency, Abu Dhabi.

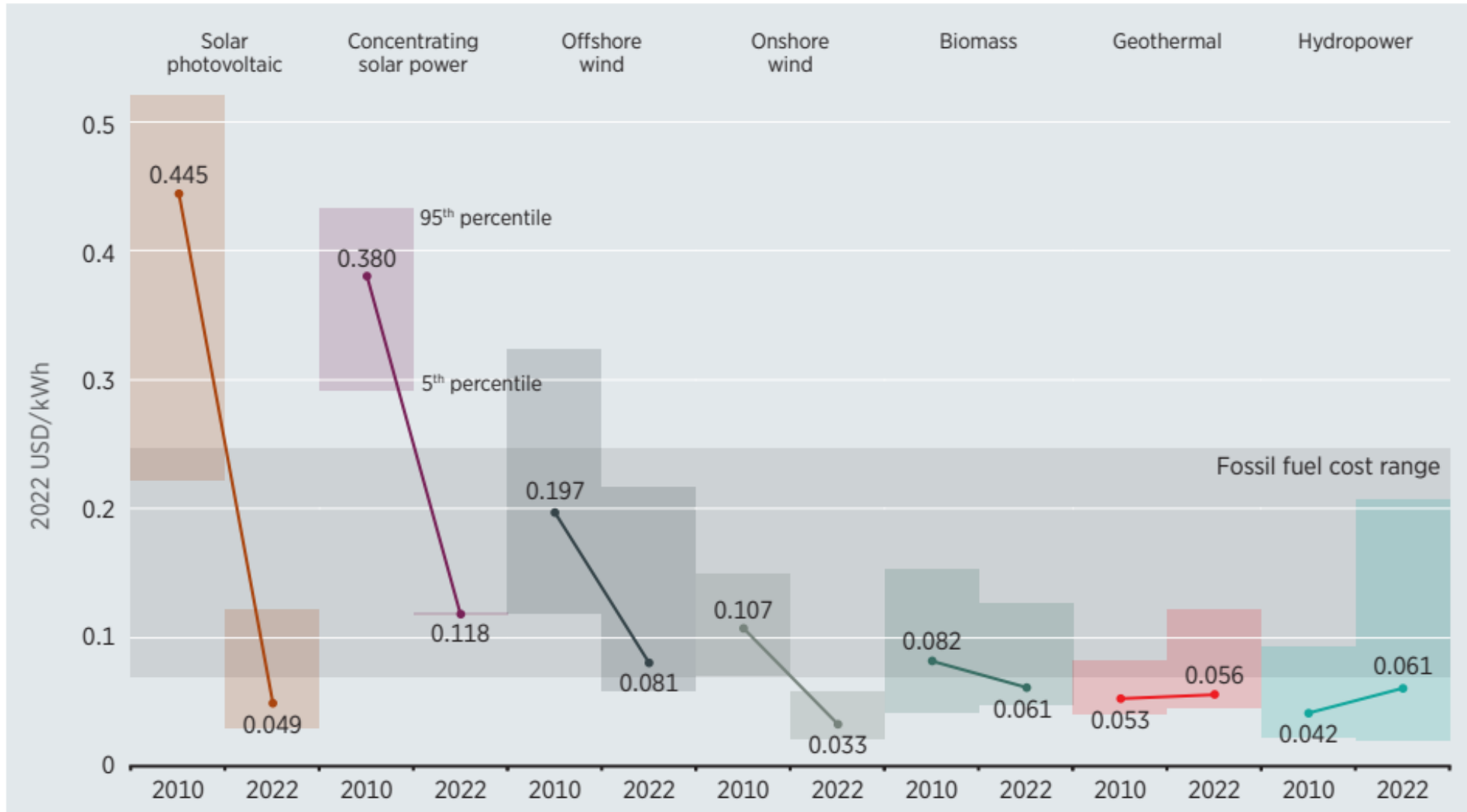
Solar and wind power, at the center of a decarbonized global power supply

Global power generation mix by energy source: Planned Energy Scenario and 1.5°C Scenario in 2020, 2030 and 2050



We are transitioning to a world of abundant, cheap renewables

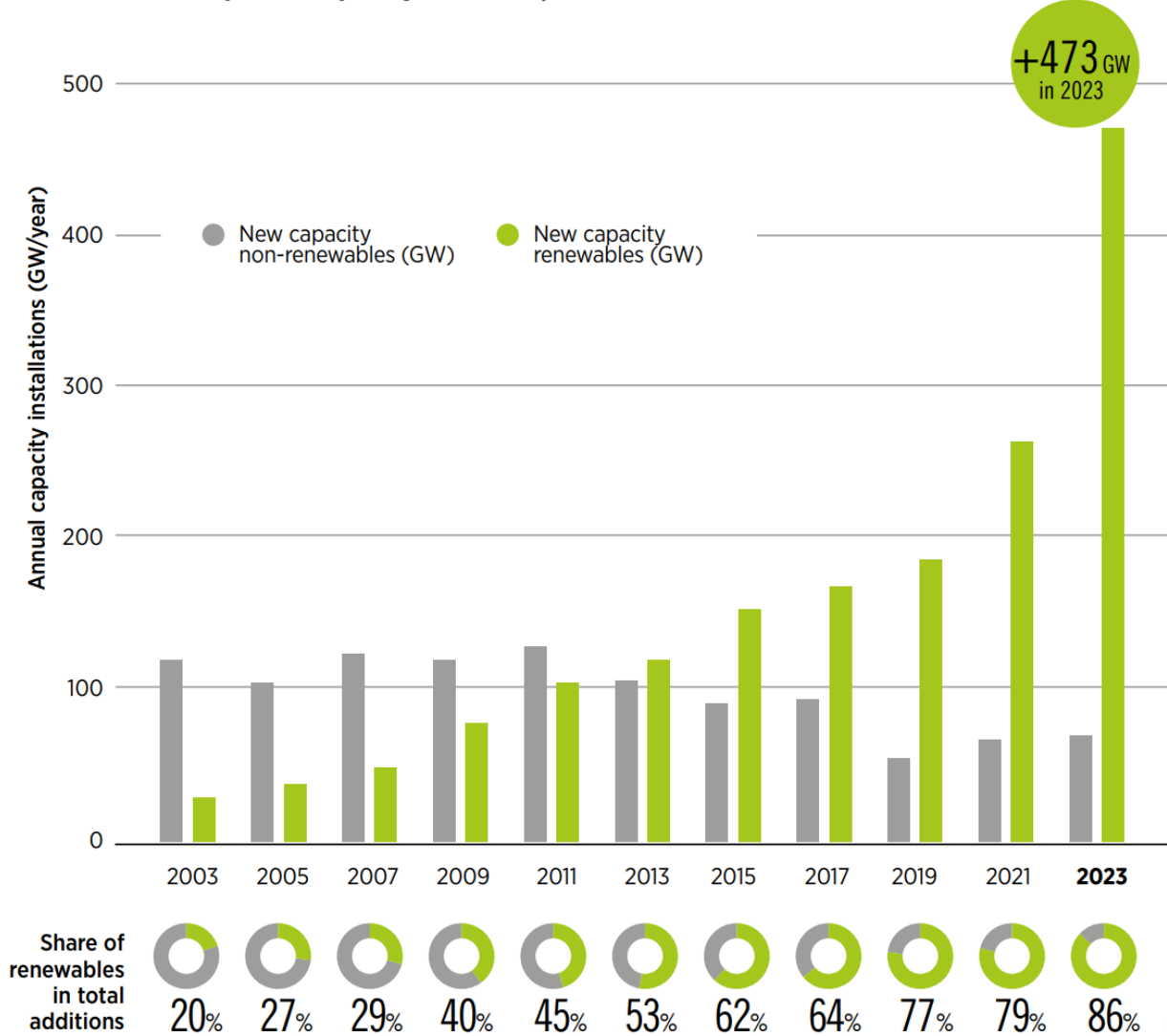
Global levelised cost of electricity from newly commissioned utility-scale renewable power technologies, 2010 and 2022



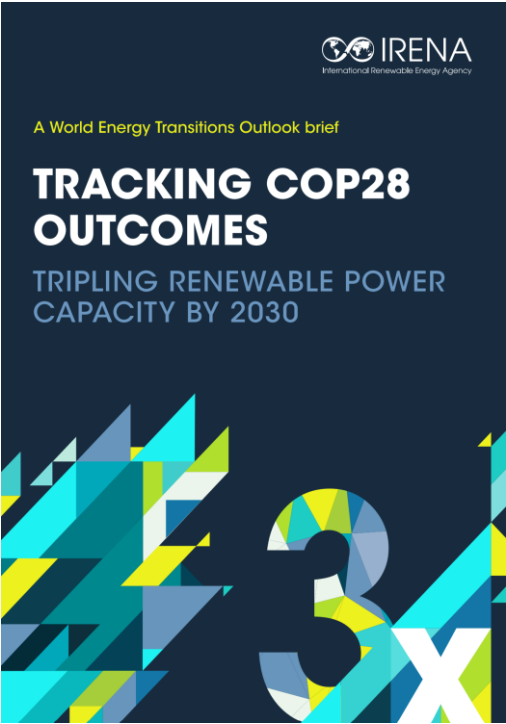
Source: IRENA, 2023. Renewable Power Generation Costs in 2022. Available from: <https://www.irena.org/Publications/2023/Aug/Renewable-power-generation-costs-in-2022>

Renewables dominate new capacity additions worldwide

Annual installed power capacity additions, 2003-2023



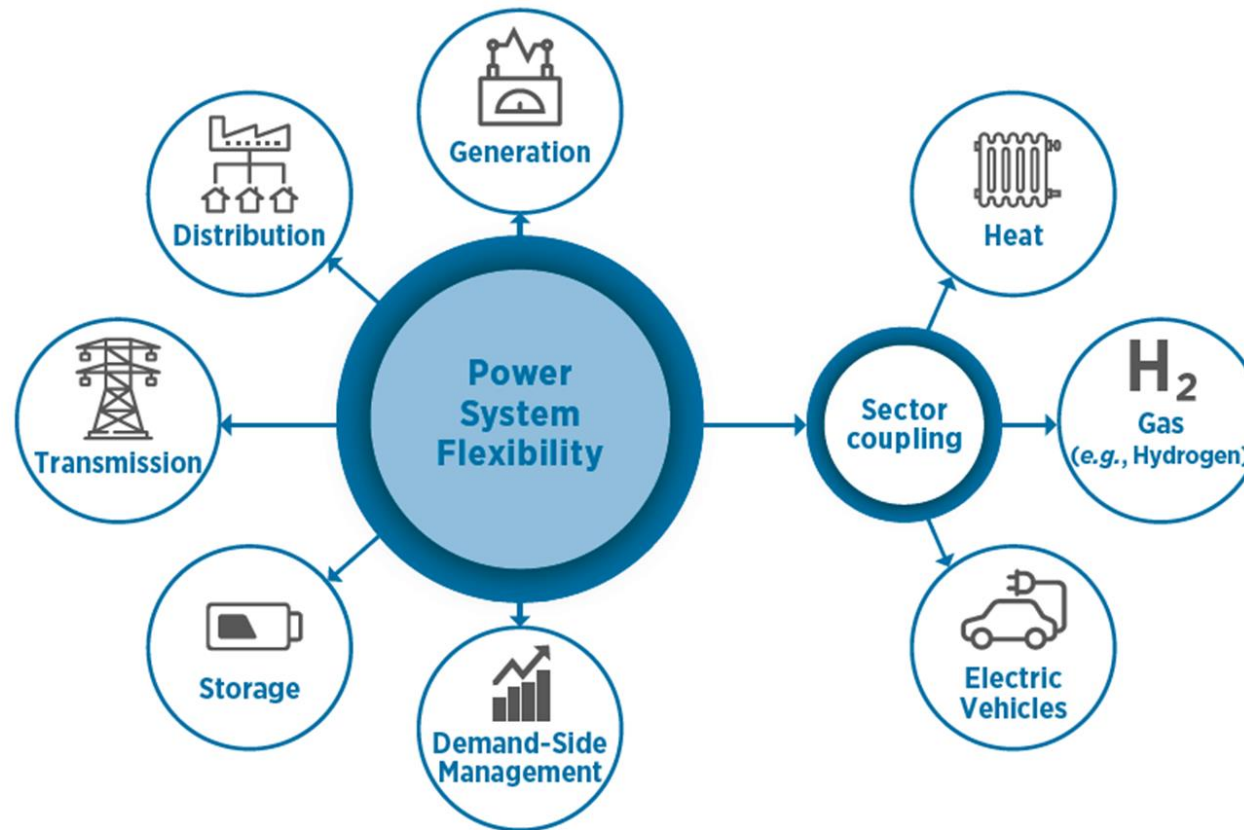
During COP28, more than a hundred countries have committed to **triple renewable energy capacity worldwide by 2030.**



Source: IRENA (2024), Tracking COP28 outcomes: Tripling renewable power capacity by 2030, International Renewable Energy Agency, Abu Dhabi.

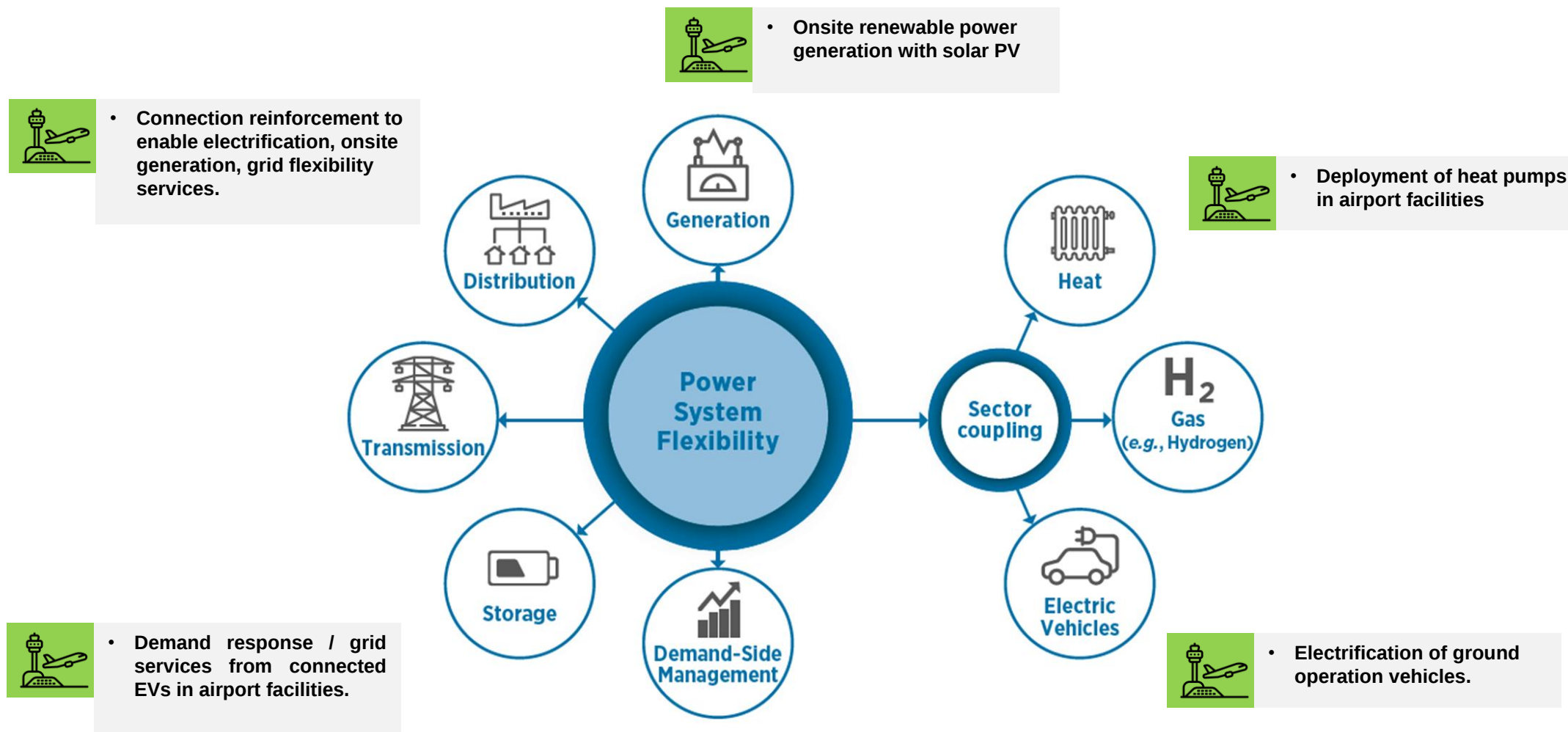
Airports can play an important role in integrating more renewables into energy systems

Energy system flexibility enablers



Airports can play an important role in integrating more renewables into energy systems

Energy system flexibility enablers



Beyond airport operations , the decarbonization of the aviation sector will require a combination of renewable solutions:



Additional
efficiency
improvements



The continued improvement of energy efficiency measures and technologies is critical. Improved aerodynamics, weight reduction and the integration of more efficient engines, for example, can reduce energy demand and thus CO₂ emissions. **Further reductions could come from a modal shift in short distance travel**, likely to rail transport.

Biofuel



Sustainable, low-carbon biofuels are the most technologically straightforward pathway to decarbonise aviation. Biojet can be used as a drop-in fuel on existing and future aircraft. Their scale-up will require major policy developments to ensure sustainability.

Synthetic fuels



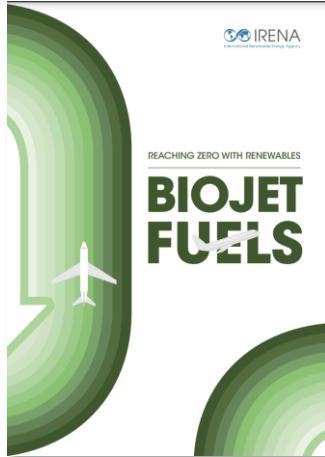
Synthetic fuels can also play a significant role in the decarbonisation of aviation. can be achieved in the medium term through **e-kerosene** and in the long term, possibly by **green hydrogen**. E-kerosene requires a renewable carbon source, which makes the scalability of fuel production more challenging.

Electrification



Direct electrification, in the form of electric or hybrid electric aircraft could play an important role in reducing aviation emissions for short-haul aviation in the medium- to long-term.

Some of IRENA's work on renewable solutions for the aviation sector



This report provides a comprehensive analysis of biojet fuels as a decarbonisation option for the aviation sector with a focus of reaching zero in time to fulfil the Paris Agreement.

Citation: IRENA (2021), Reaching Zero with Renewables: Biojet fuels, International Renewable Energy Agency, Abu Dhabi.

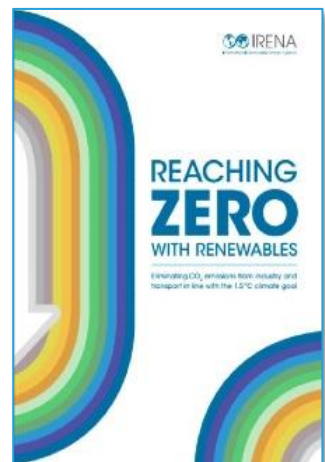
Download report [here](#)



This first volume of the 2023 Outlook provides an overview of progress by tracking implementation and gaps across all energy sectors and identifies priority areas and actions based on available technologies that must be realised by 2030 to achieve net zero emissions by mid-century.

Citation: IRENA (2023), World Energy Transitions Outlook 2023: 1.5°C Pathway, Volume 1, International Renewable Energy Agency, Abu Dhabi.

Download report [here](#)



A comprehensive study of deep decarbonisation options for hard to abate sectors, focused on reaching zero into time to fulfil the Paris Agreement and hold the line on rising global temperatures.

Citation: IRENA (2020), Reaching zero with renewables: Eliminating CO₂ emissions from industry and transport in line with the 1.5C climate goal,

Download report [here](#)



This report – prepared in support of Italy's presidency of the G7 – elaborates on the technological pathways and systemic innovations needed to decarbonise five hard to abate sectors: iron and steel, chemicals and petrochemicals, road freight transport, shipping and aviation. It aims to provide actionable recommendations that the G7 can follow to accelerate global efforts to decarbonise these sectors.

Thank You

