

Carbon Neutrality & Deep Electrification of the Energy System

5 September 2022



75 YEARS
OF ECONOMIC INTEGRATION
AND COOPERATION
IN THE REGION

- **UNECE Sustainable Energy Division - Who we are**
- **UNECE Carbon Neutrality Toolkit**
- **Deep Electrification of the Energy System: the Case of the Transport Sector**
- **Can grids impede electrification of the transport sector? Challenges & Opportunities**

The Committee on Sustainable Energy and its six Subsidiary Bodies

Reducing the Environmental Footprint of the Energy Sector



- Group of Experts on Clean Electricity Systems
- Group of Experts on Coal Mine Methane
- Group of Experts on Gas Methane Management

Deep Transformation of the Energy System



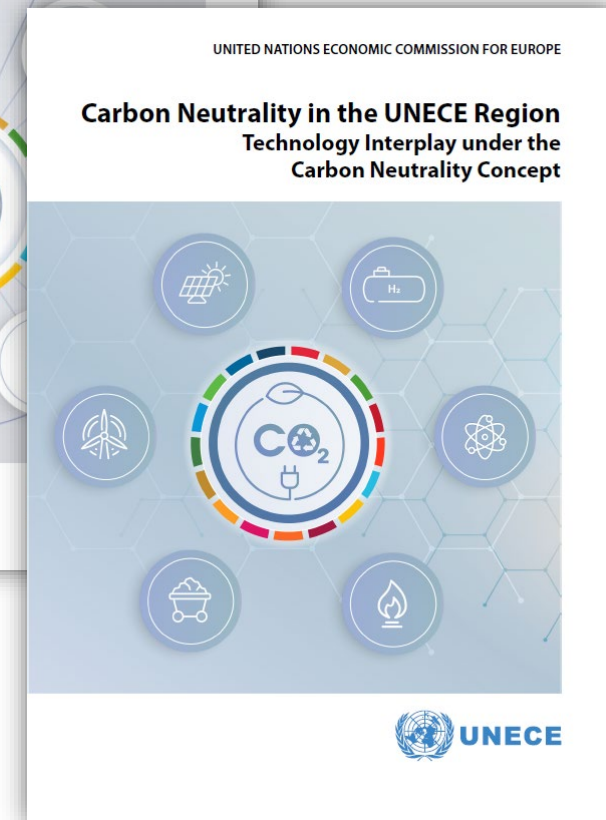
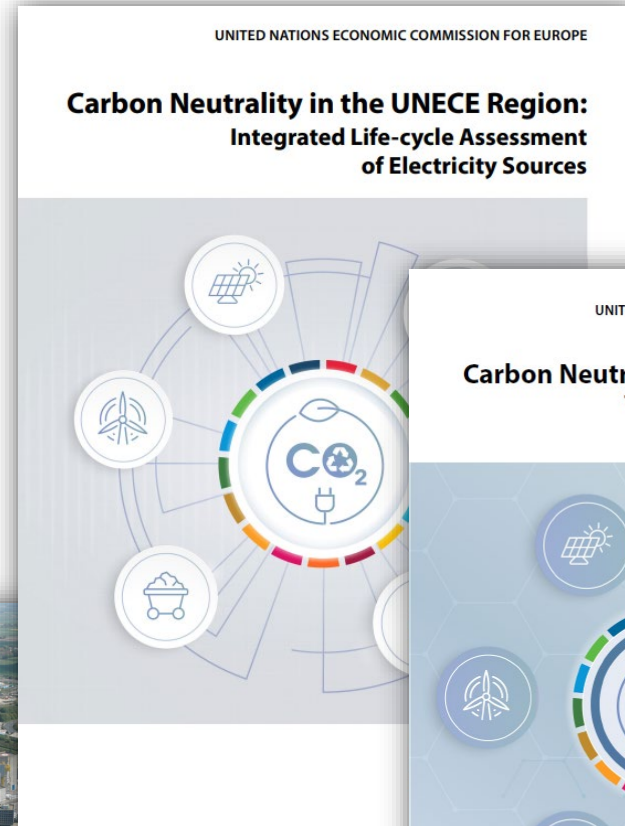
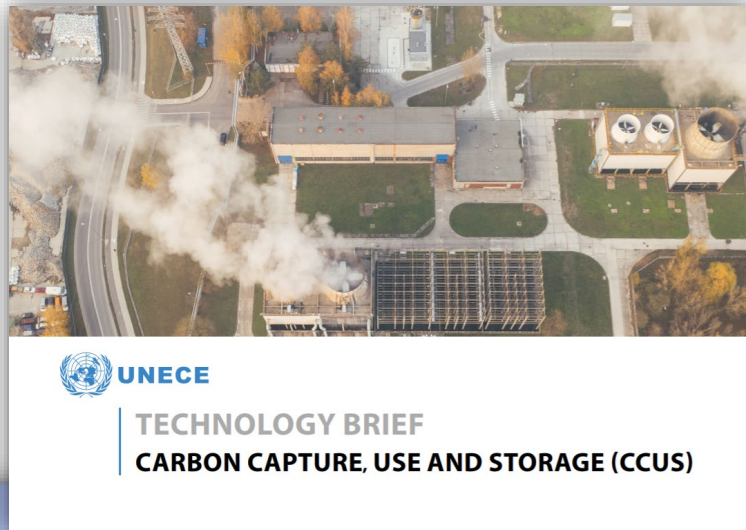
- Group of Experts on Energy Efficiency
- Group of Experts on Renewable Energy
- Group of Experts on Gas
- Group of Experts on Cleaner Electricity Systems

Sustainable Resource Management



- Expert Group on Resource Management
- Group of Experts on Renewable Energy
- Resource Efficiency and Circular Economy

UNECE Carbon Neutrality Toolkit



Carbon Neutral Energy System of the Future



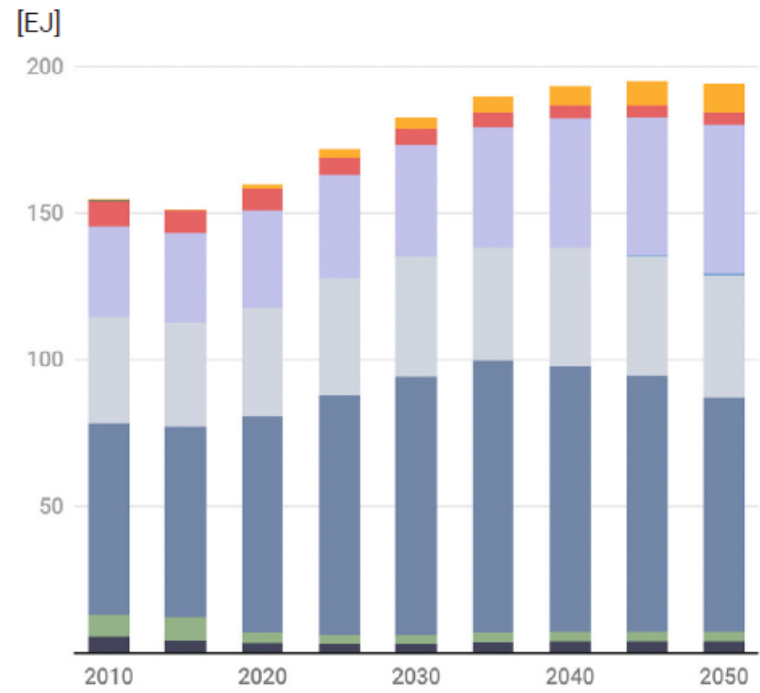
Transition from the current to a carbon neutral final energy mix will require structural changes



Final Energy Supply [EJ] Reference Scenario

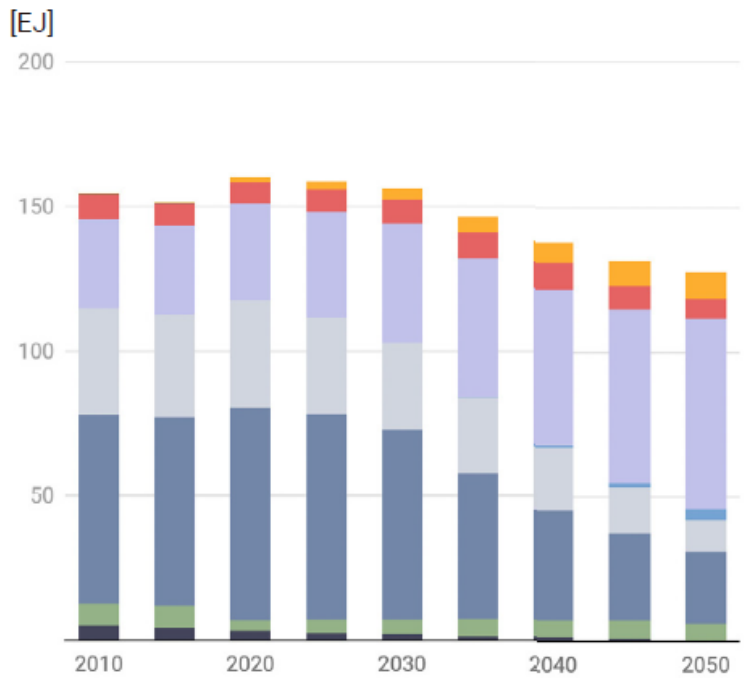
Final Energy Supply [EJ] Carbon Neutrality Scenario

■ Coal ■ Biomass ■ Liquids ■ Gas ■ Hydrogen ■ Electricity ■ Heat ■ Geothermal ■ Solar



Reference Scenario

Final Energy Supply 2050



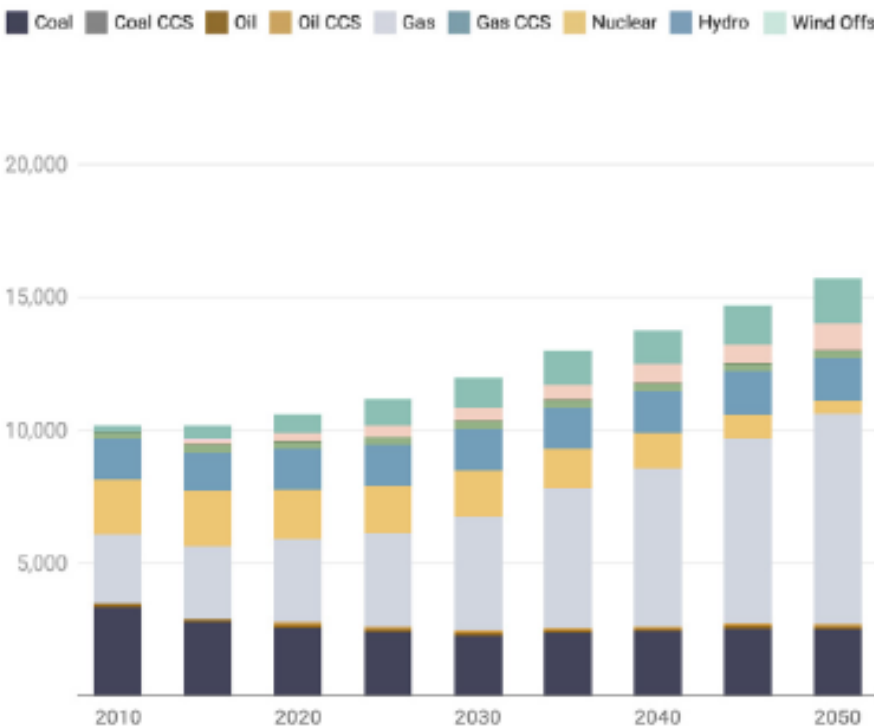
Carbon Neutrality Scenario

Final Energy Supply 2050

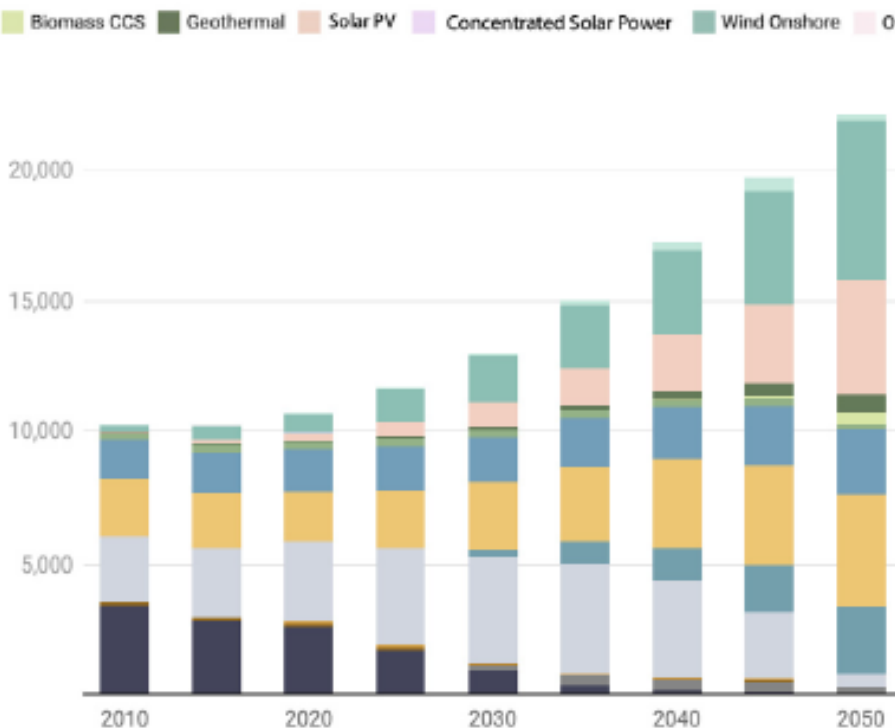
The impact of doubling electricity demand will have knock-on effects



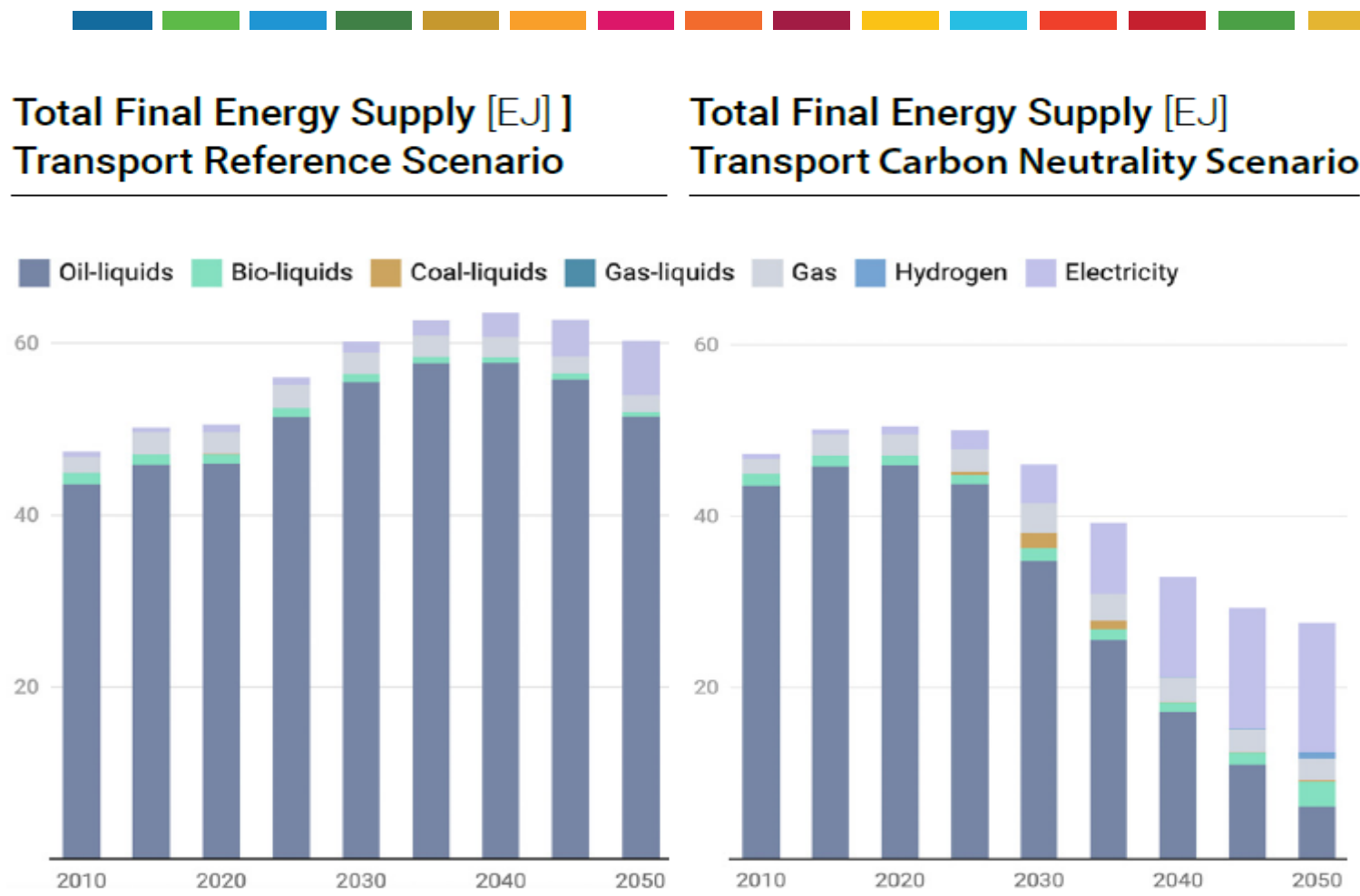
Electricity Generation Mix [TWh] Reference Scenario



Electricity Generation Mix [TWh] Carbon Neutrality Scenario



Transport sector will experience profound changes. Lack of raw materials and recyclability might hinder deep electrification



Can grids impede electrification of the transport sector?

Challenges & Opportunities



- **Identified challenges:**
 - Power generation is still carbon intensive
 - Intermittency of solar and wind power results in supply and demand mismatch
 - Risks of existing grid network overloading exist
- **Solutions for policymakers:**
 - Invest into reliable low- and zero-carbon electricity capacity
 - Promote deployment of distributed energy sources and smart grids
 - Develop and deploy energy storage solutions

Geneva, Palais des Nations and Online Switzerland



SUSTAINABLE ENERGY WEEK 2022

ENERGY SECURITY, RESILIENCE AND NET ZERO

TANGIBLE ACTIONS TO DELIVER A SUSTAINABLE ENERGY FUTURE

19-23 SEPTEMBER 2022 | PALAIS DES NATIONS | GENEVA

This year's **UNECE Sustainable Energy Week** features several hybrid events including the

- **18th session of the Group of Experts on Cleaner Electricity Systems**
- **UNECE Regional Forum on Climate Initiatives to Finance Climate Action and the SDGs**
- **31st session of the Committee on Sustainable Energy**



ENERGY



Sustainable Energy Division

UNECE

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