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Climate-safe 1.5°C pathway by 2050: Technology solutions and investment needs

TUESDAY, 13 APRIL 2021 • 15:00-15:30 CEST

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SPEAKERS

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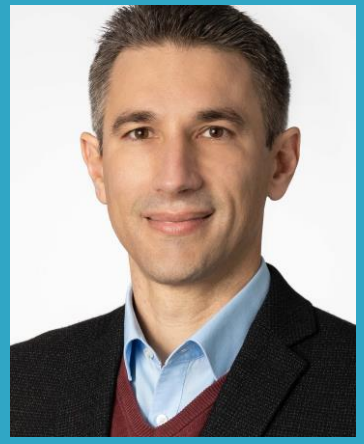

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Net zero emissions by mid-century

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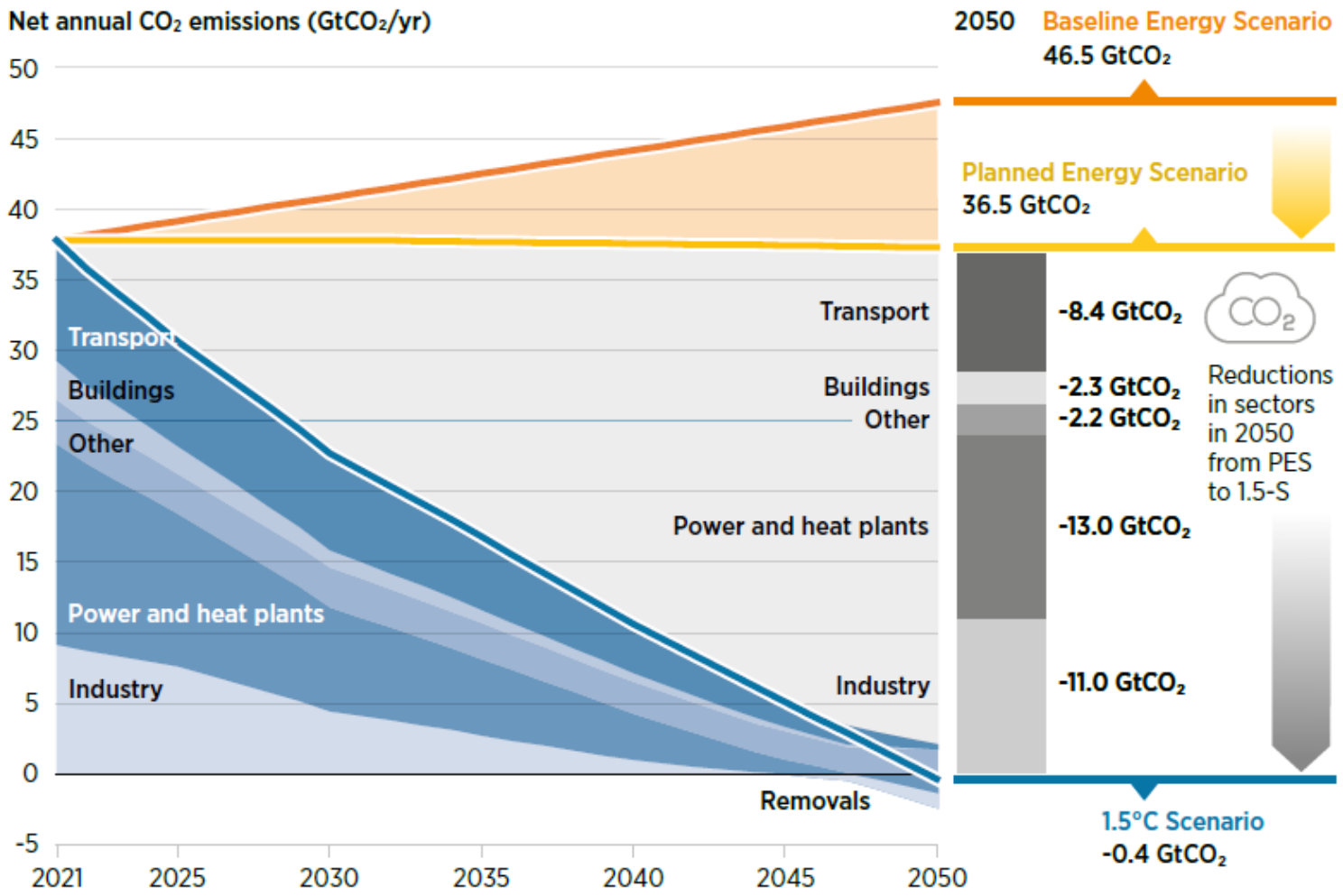
- Baseline emissions continue to rise, while the policies of governments (Planned Energy Scenario) result in flatlining of emissions
- For the 1.5°C climate target, global CO2 emissions need to drop to net zero by 2050
- Steepest decline necessary over the next 10 years – 2020 must be the decade of action



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Renewables, efficiency and electrification dominate energy transition

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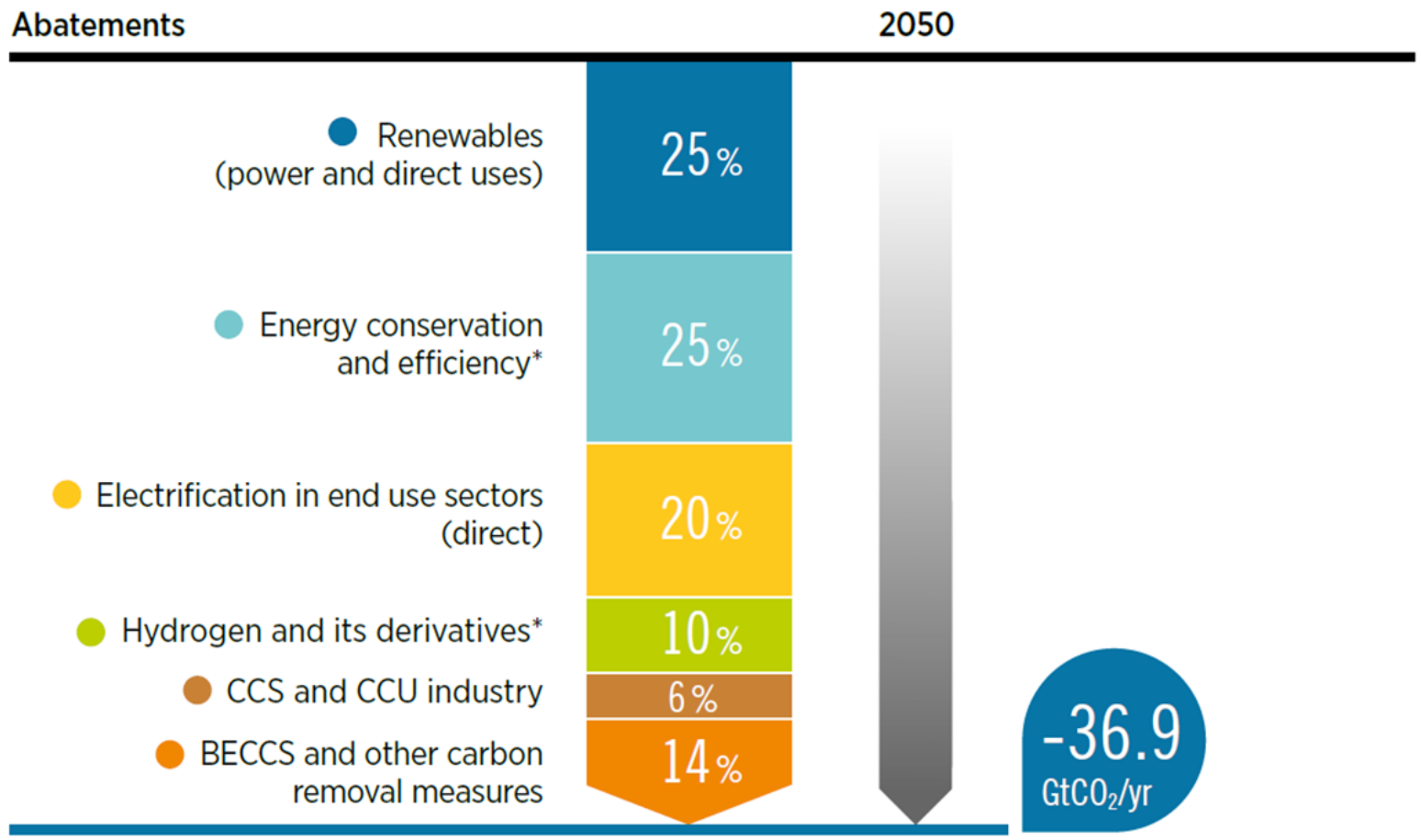
Six components of the energy transition strategy



90% of all decarbonisation in 2050 will involve renewable energy through direct supply of low-cost power, efficiency, electrification, bioenergy with CCS and green hydrogen.

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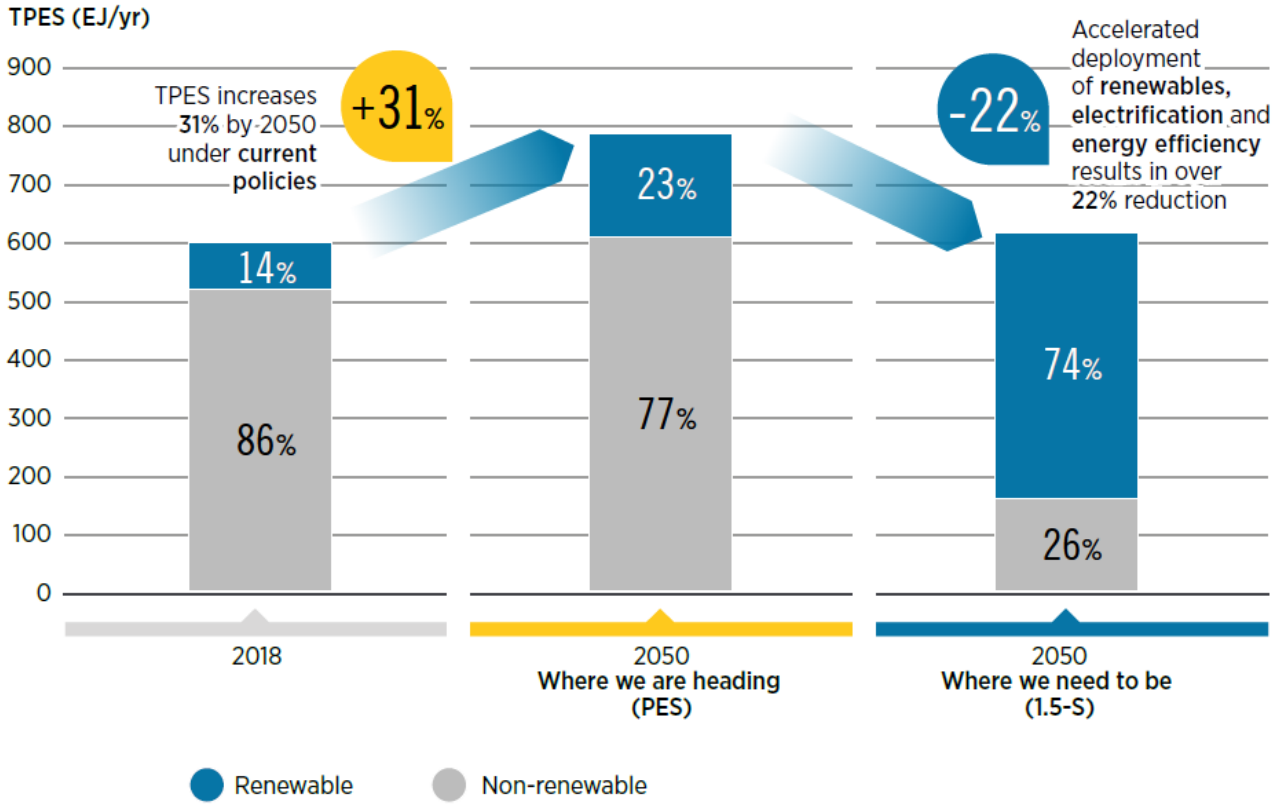
The global energy supply becomes more efficient and more renewable



- The share of renewable energy in primary supply must grow from 14% in 2018 to 74% in 2050 in the 1.5°C Scenario.
- This entails a 8-fold growth in the pace of renewable share growth, and a 2.5-fold increase in the rate of energy intensity improvement.

Electricity is the central energy carrier in future energy systems

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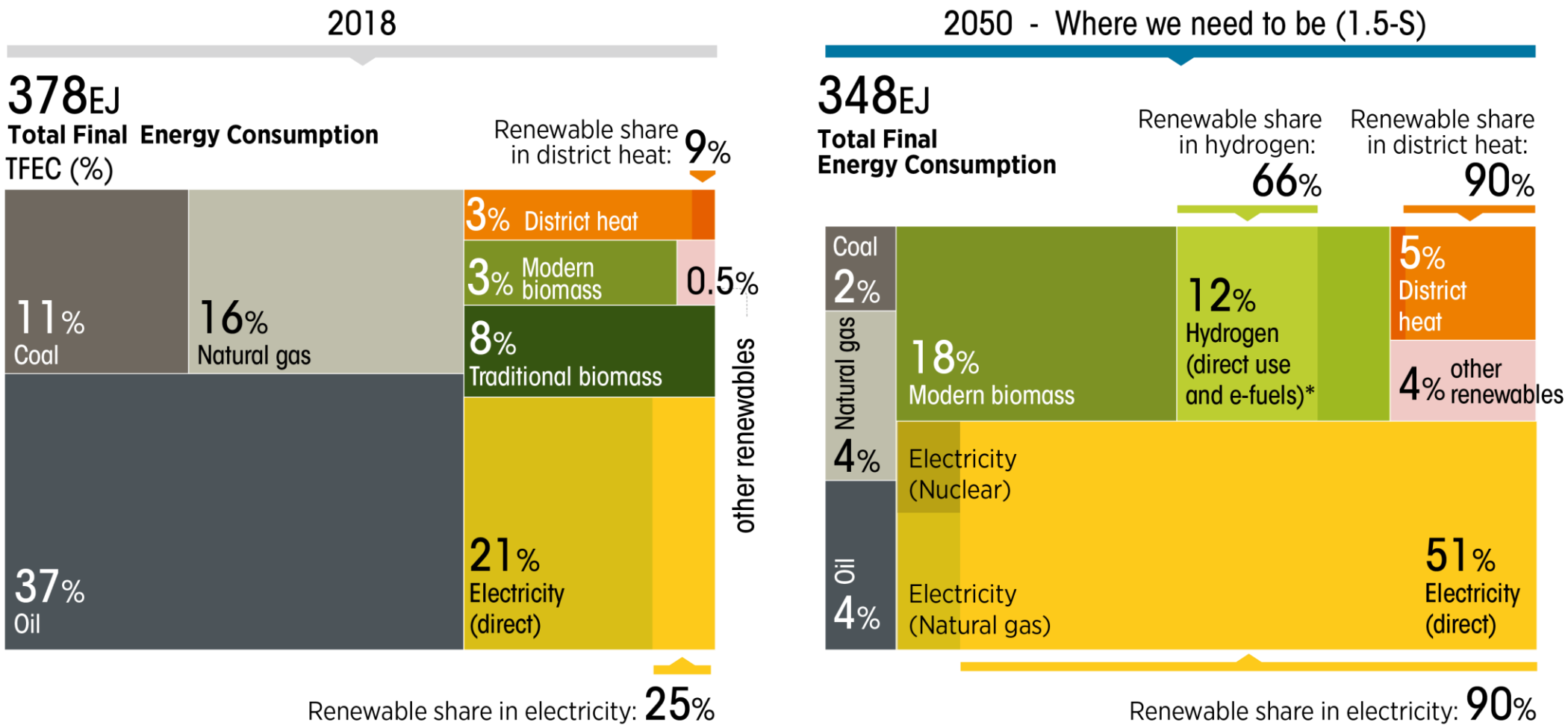

90% of total electricity needs will be supplied by renewables by 2050 and direct-use of electricity makes up over half of final energy consumption, with another 8% coming from indirect forms such as e-fuels and hydrogen.

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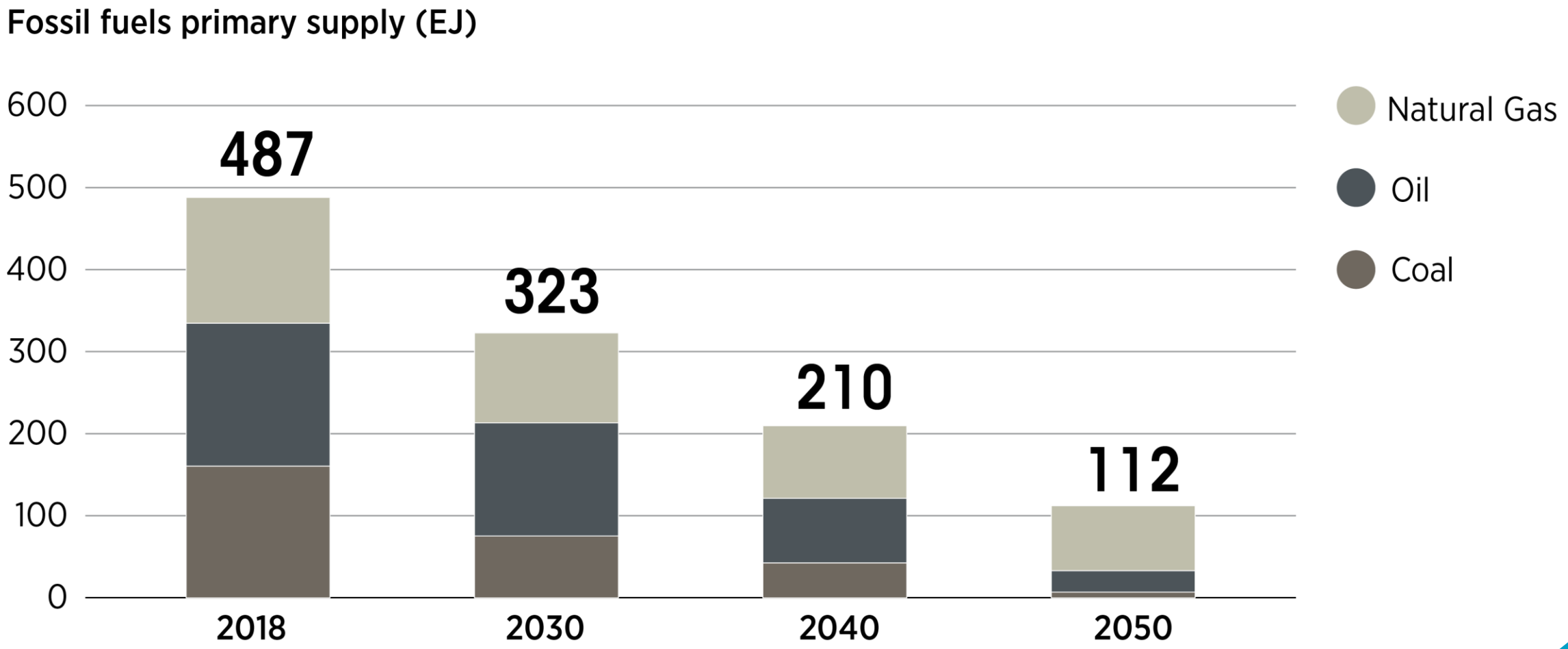
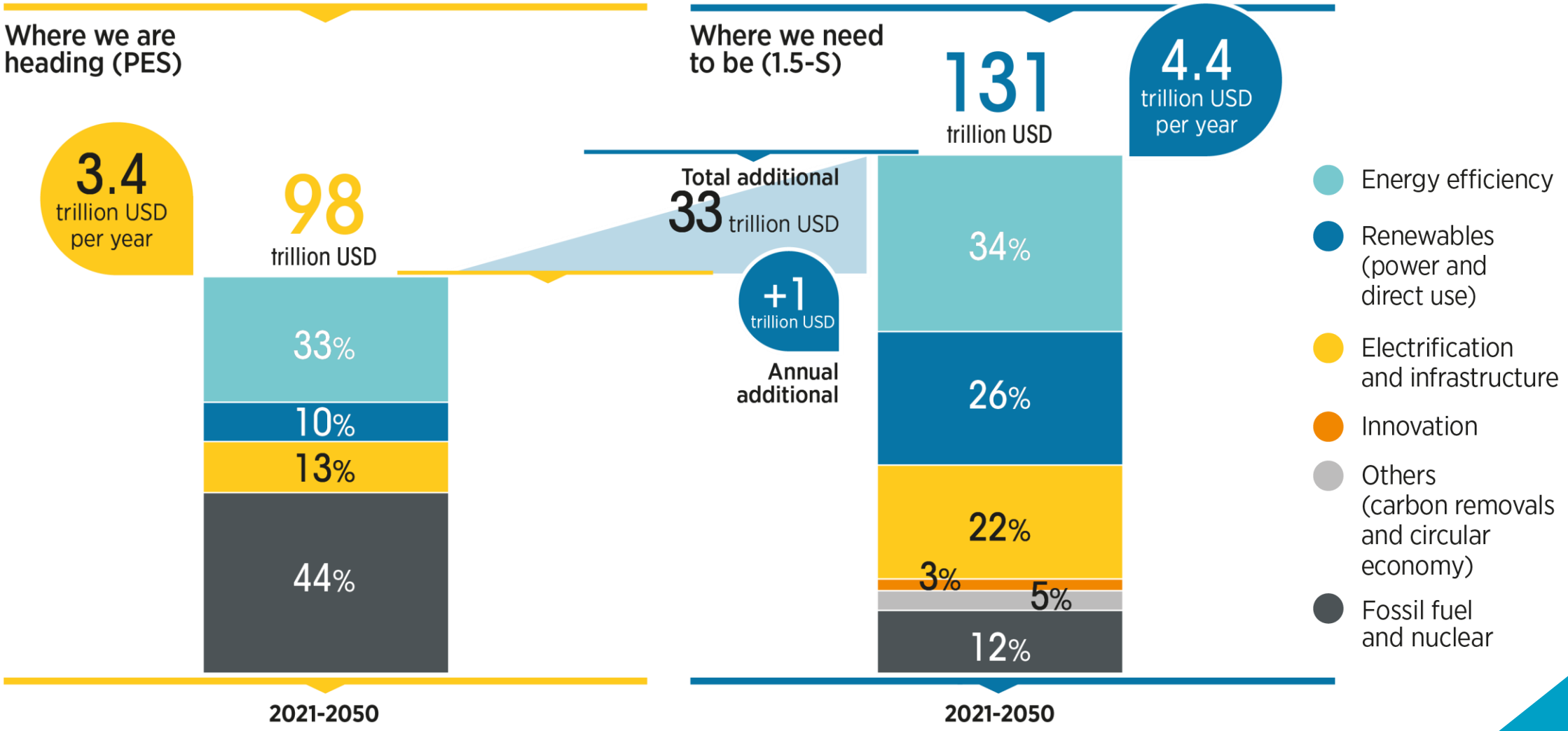
Declining importance of fossil fuels



Fossil fuel use could decline by more than 75% by 2050, with coal use almost entirely phased out by 2050, and most oil demand as well, leaving natural gas with demand a little over half of today's level.

New investment priorities: renewables, efficiency and electrification



A climate-safe future calls for the scale-up and redirection of investments towards energy transition technologies, away from fossil fuels.

Integrated innovation for the decarbonisation of the global energy system

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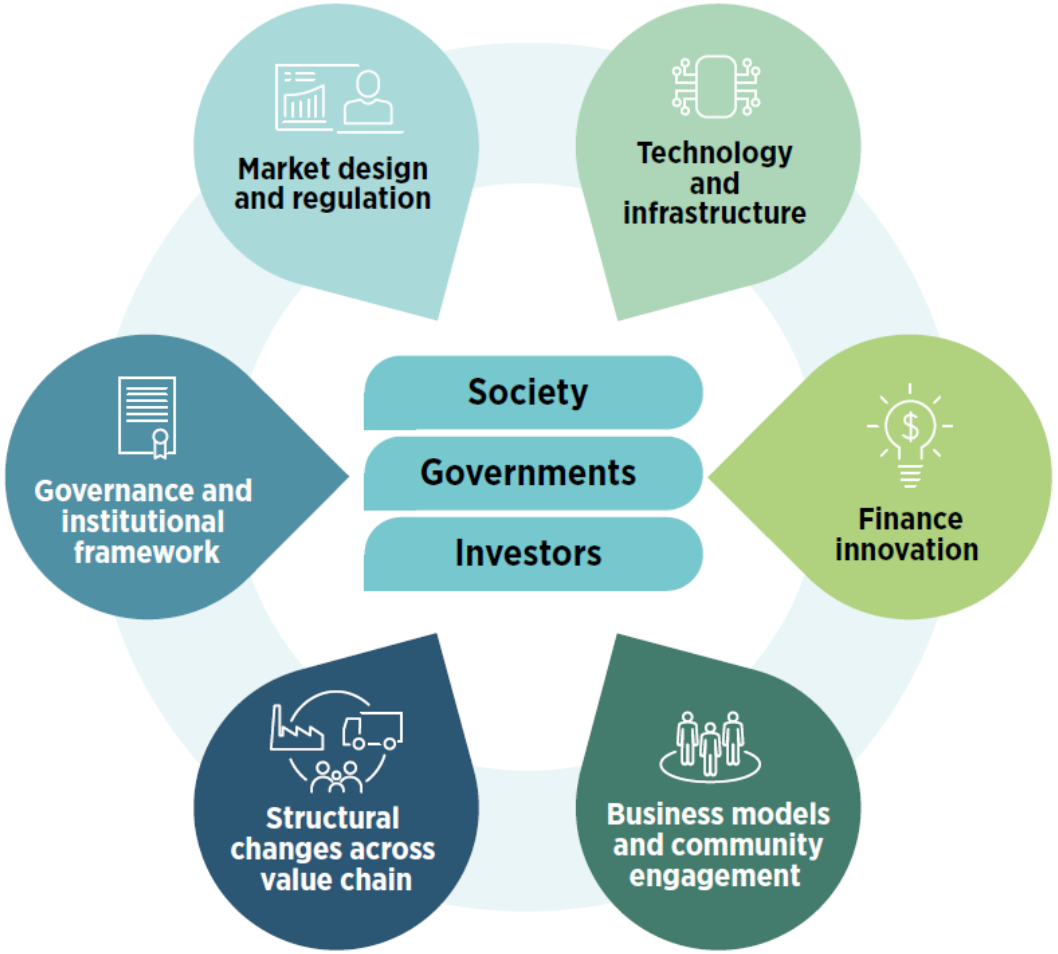
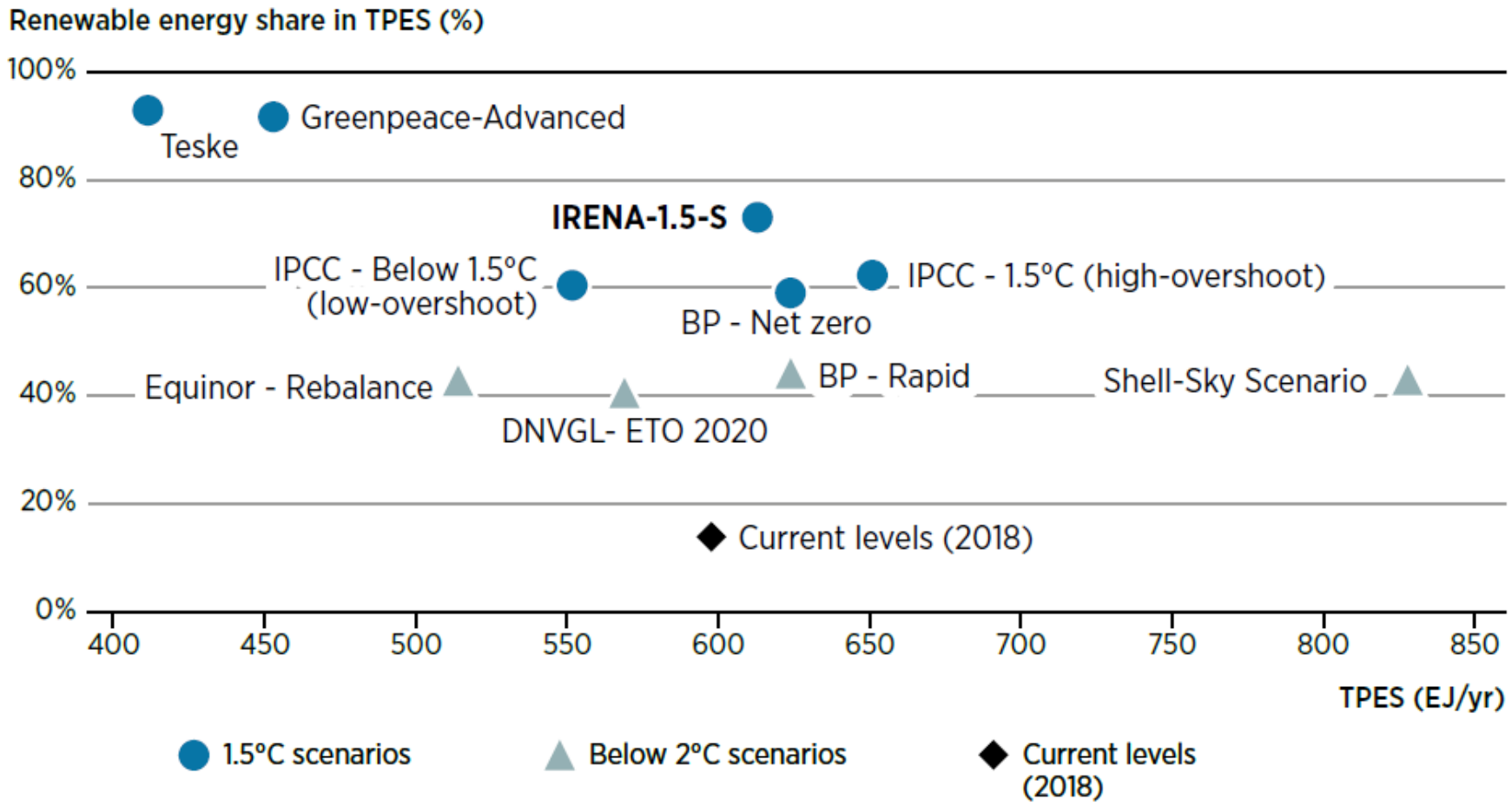


Innovation will help drive the energy transition process and decarbonise the energy sector.

Emerging consensus on the role of renewables and electrification



A significant difference exist between achieving the 1.5°C target versus net zero emissions.

Key take-aways: IRENA's 1.5C pathway

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- **Stabilised energy demand** through increased energy efficiency and circular economy measures while maintaining economic growth
- **Decarbonised power systems** with supply dominated by renewables to meet growing needs
- **Electrification of end-use sectors**, with the increased use of electricity in buildings, industry and transport
- **Expanded production and use of green hydrogen**, synthetic fuels and feedstocks to pursue indirect electrification
- **Targeted use of sustainably sourced biomass**, particularly in place of high-energy-density fuels such as those used in aviation and other transport modes, or in greening gas grids.
- **Greatly diminished but remaining role for fossil fuels**, namely natural gas

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Q & A
10 min

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The role of direct and indirect electrification via hydrogen and other e-fuels

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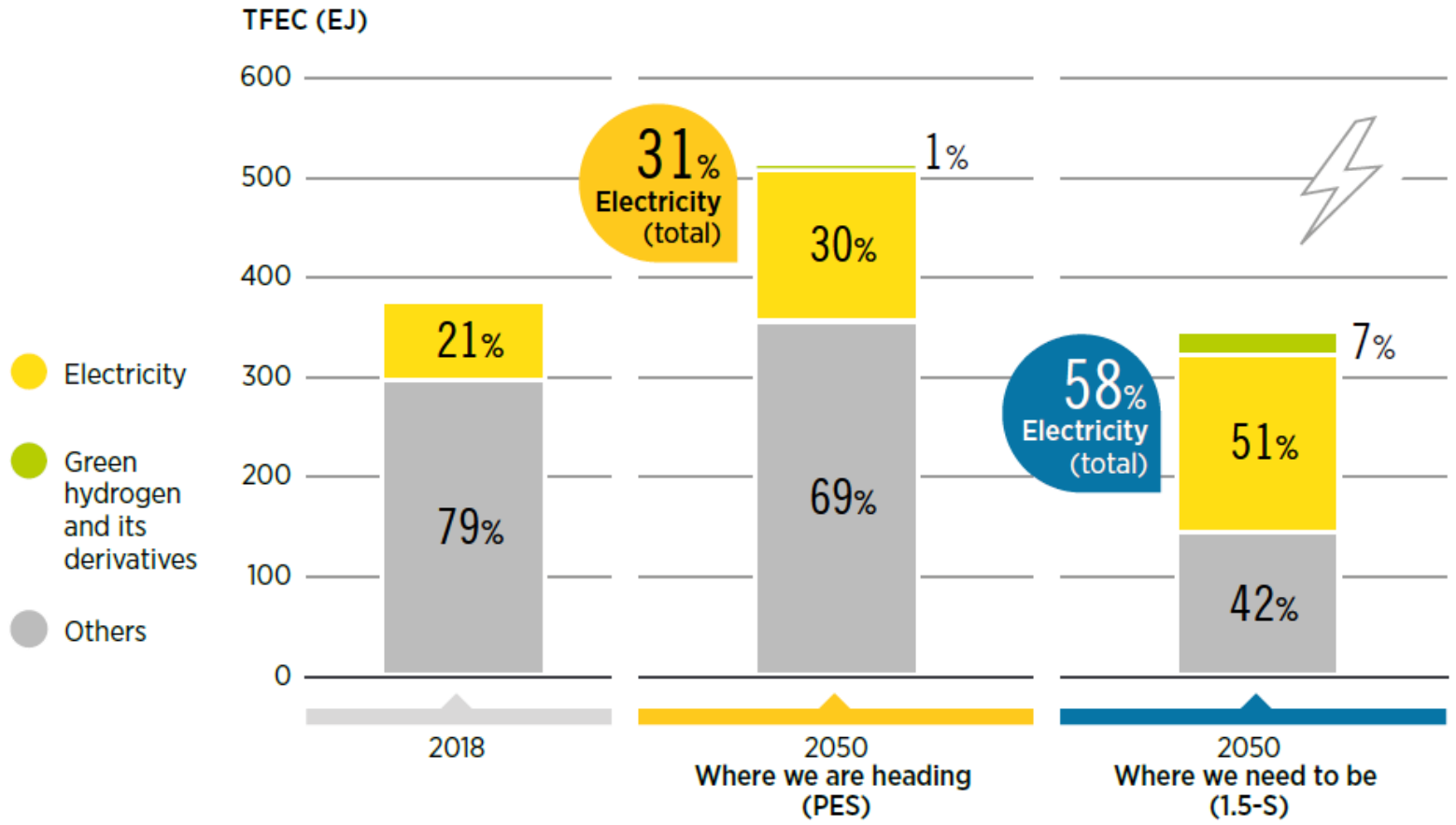

By 2050, around 58% of final energy consumption in 2050 is electricity (direct), green hydrogen and its derivatives.

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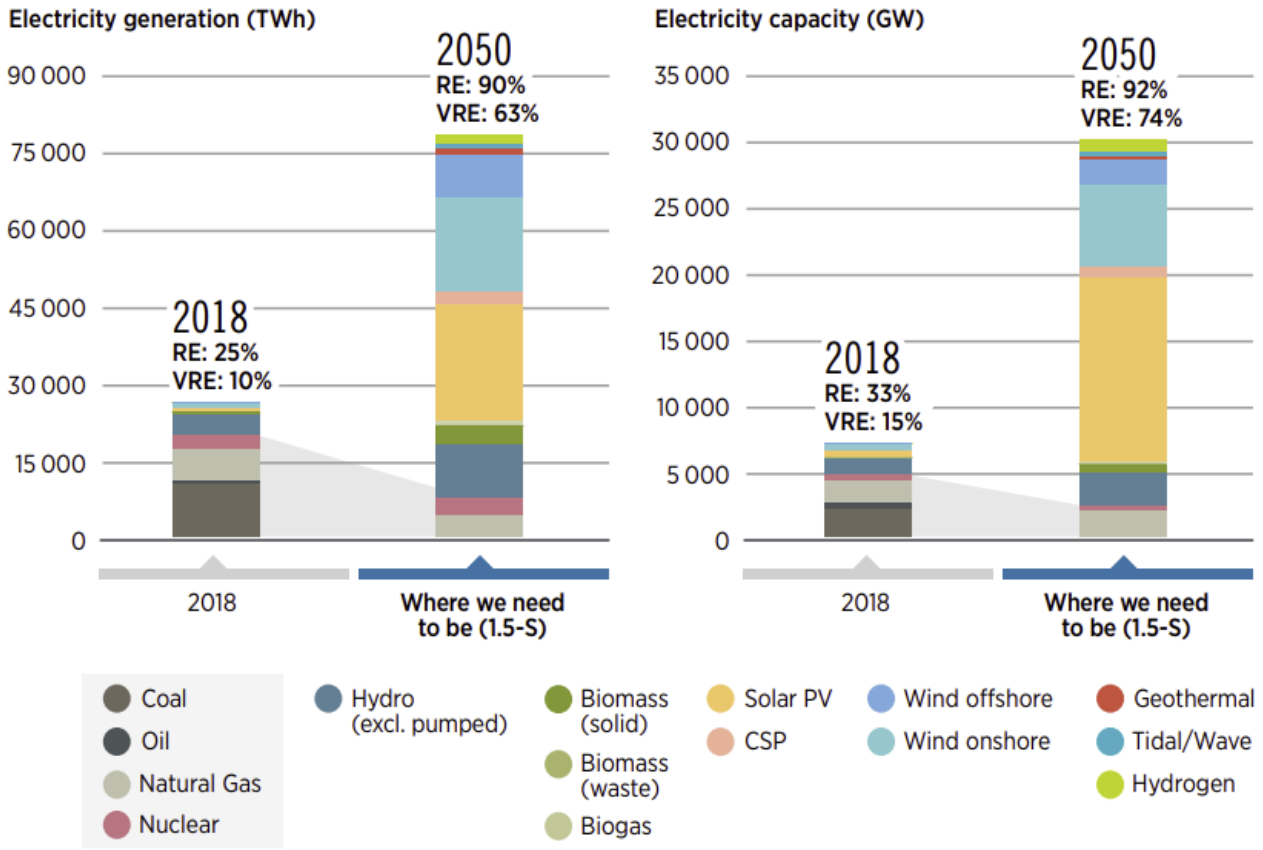
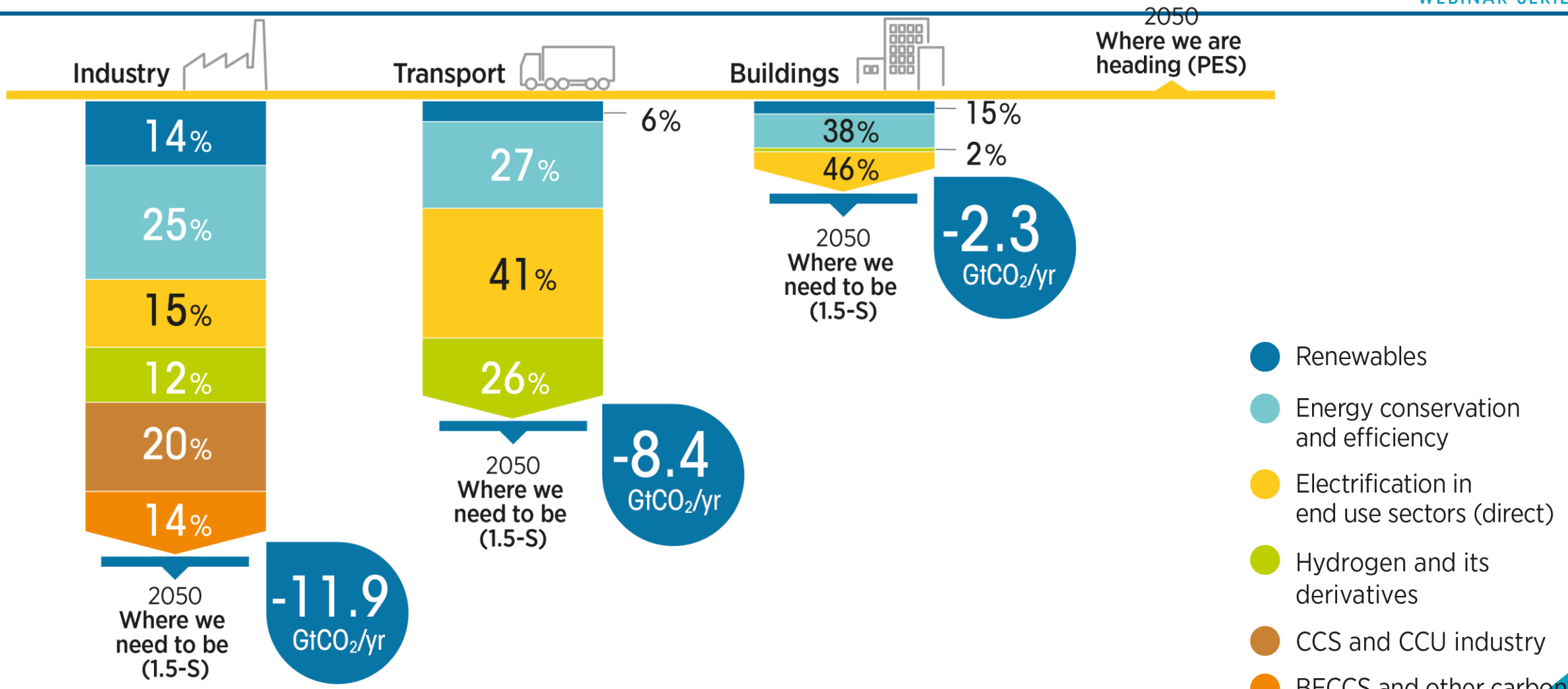
Renewables will dominate the power generation mix



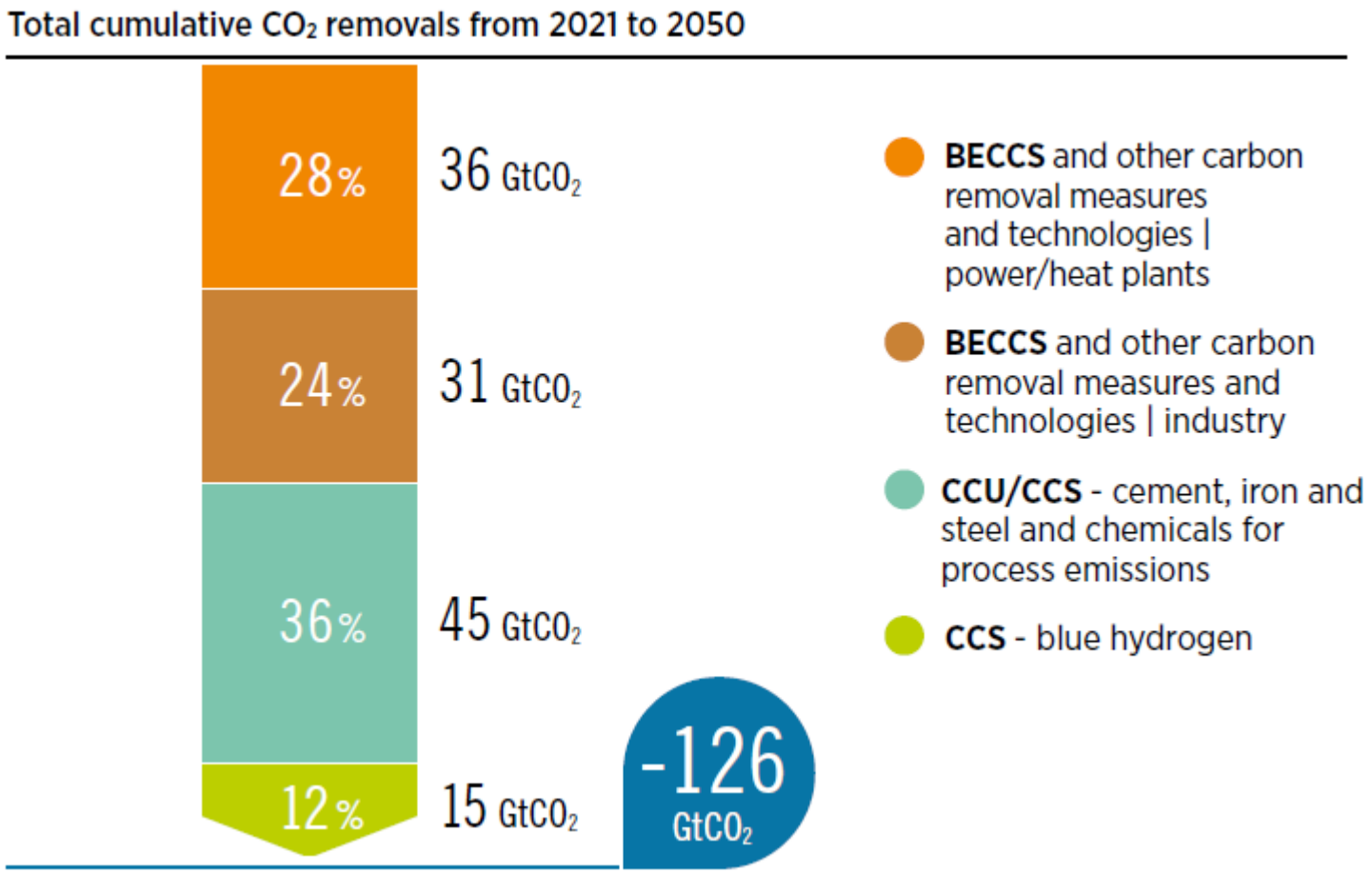
- **By 2050, power generation triples compared to today's level, and renewables supply 90% of total electricity up from 25% in 2018.**
- **Limited role for nuclear as it is not least-cost zero carbon electricity.**
- **Fossil fuels in power will be greatly diminished, but natural gas will still exist and need to be combined with CDR.**

Electrification and green hydrogen offer CO_2 reduction solutions for end-use



- In transport, two-thirds of CO_2 reductions come from electrification and hydrogen. In industry, hydrogen and electricity combined contribute to over one-quarter of emission reductions. Direct-use of renewables and energy efficiency remain important in all sectors.

The role of bioenergy with carbon capture and storage (BECCS)



- CDR will be required to meet 1.5C if no temporary overshoot is desired
- Yet the future role of fossil fuel is bleak, and would decline by more than 75% by 2050
- What remains in use will be mostly in industry and CDR will be necessary
- The importance of BECCS is also evident

Energy transition investment needs to be scaled up significantly in the coming decades

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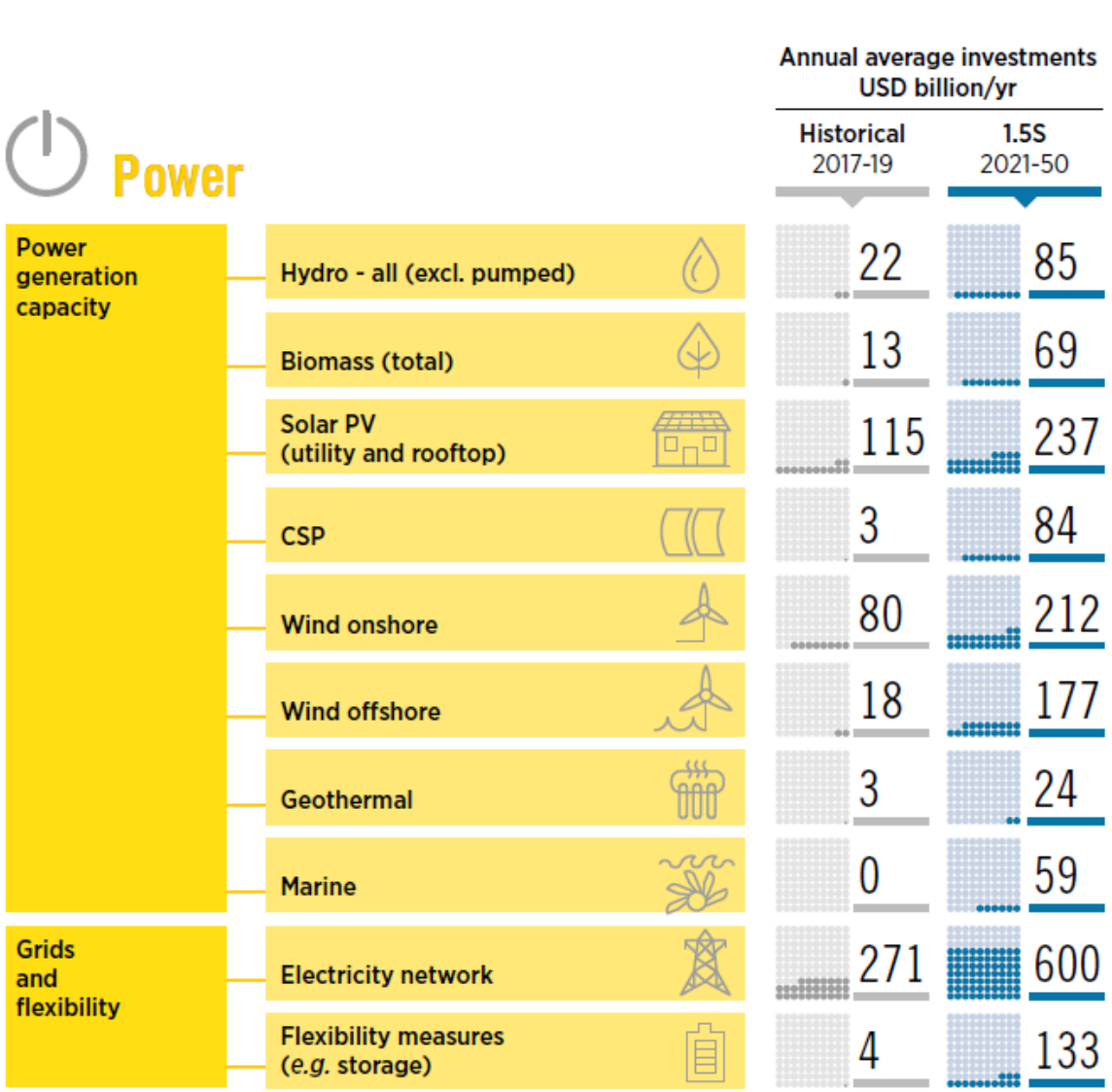

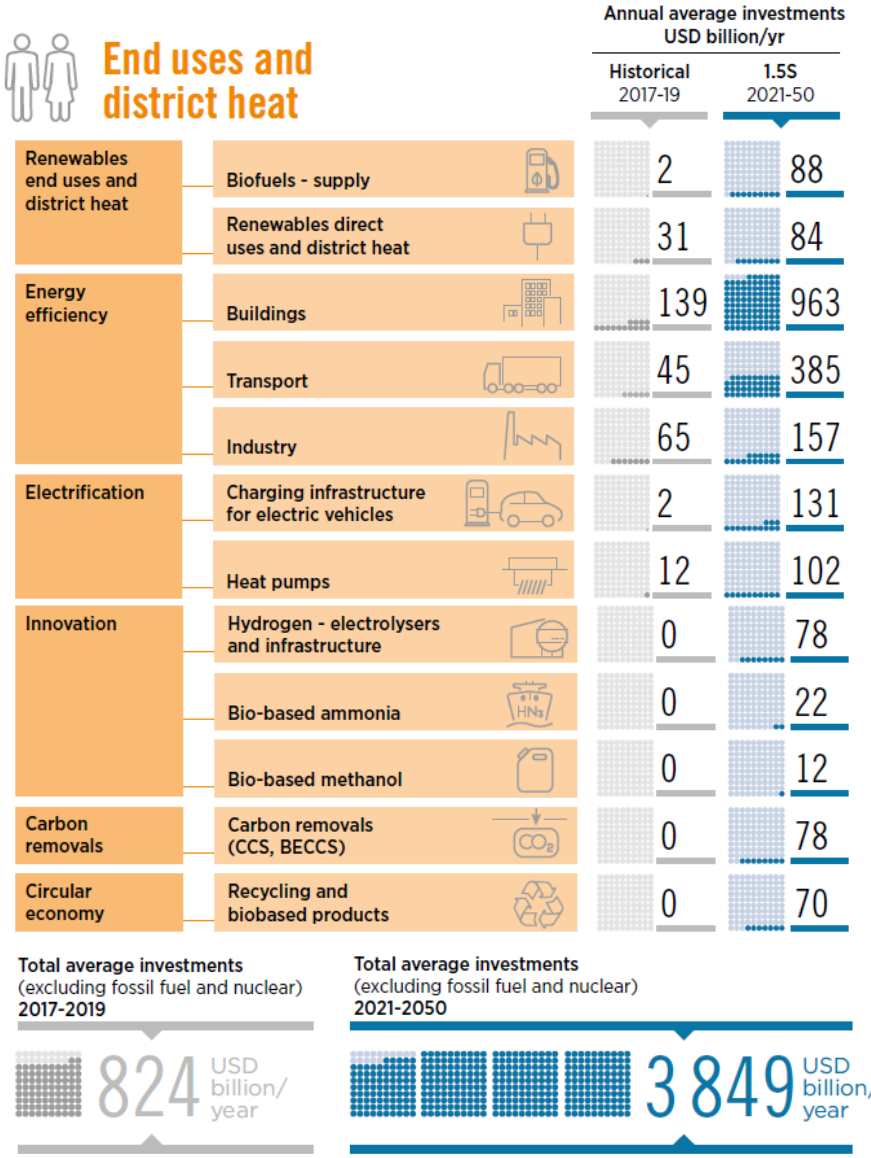

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