



World Energy Transitions – 1.5C Pathway

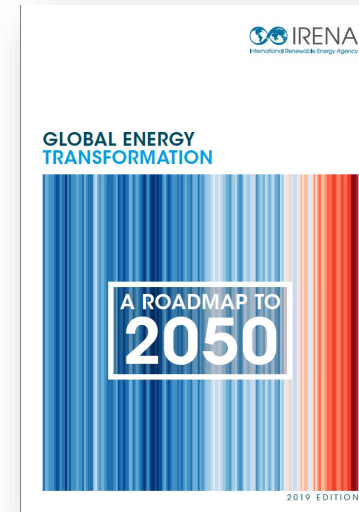
Dolf Gielen

Director, Innovation and Technology, IRENA

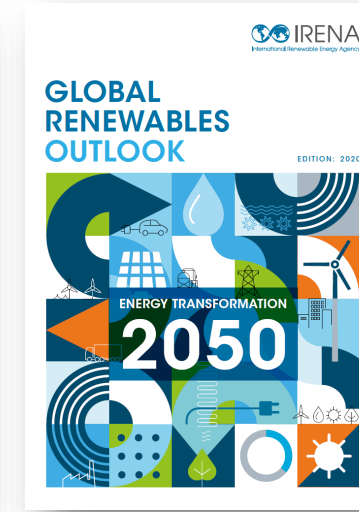
Energy Community Athens Forum, 10 June 2021

The world knows what is needed for energy transition

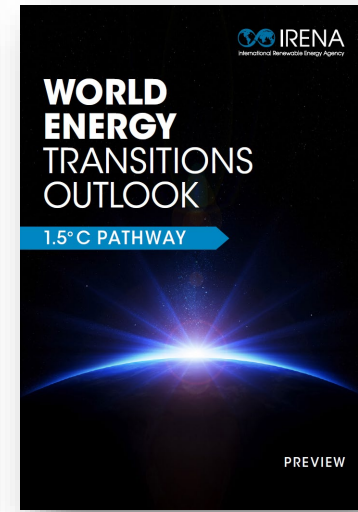
- Phase out coal power rapidly
- Accelerate deployment of renewable power significantly
- Enhance the flexibility of power systems to enable higher solar and wind shares
- Electrify transport & heating
- Use clean hydrogen where direct electrification is not possible
- Deploy bioenergy
- Apply CCS for remaining emissions including CDR/BECCS
- Use energy wisely and efficiently
- *There is a general agreement on these principles amongst experts*



2019
2 degrees scenario
Emissions -70% by 2050



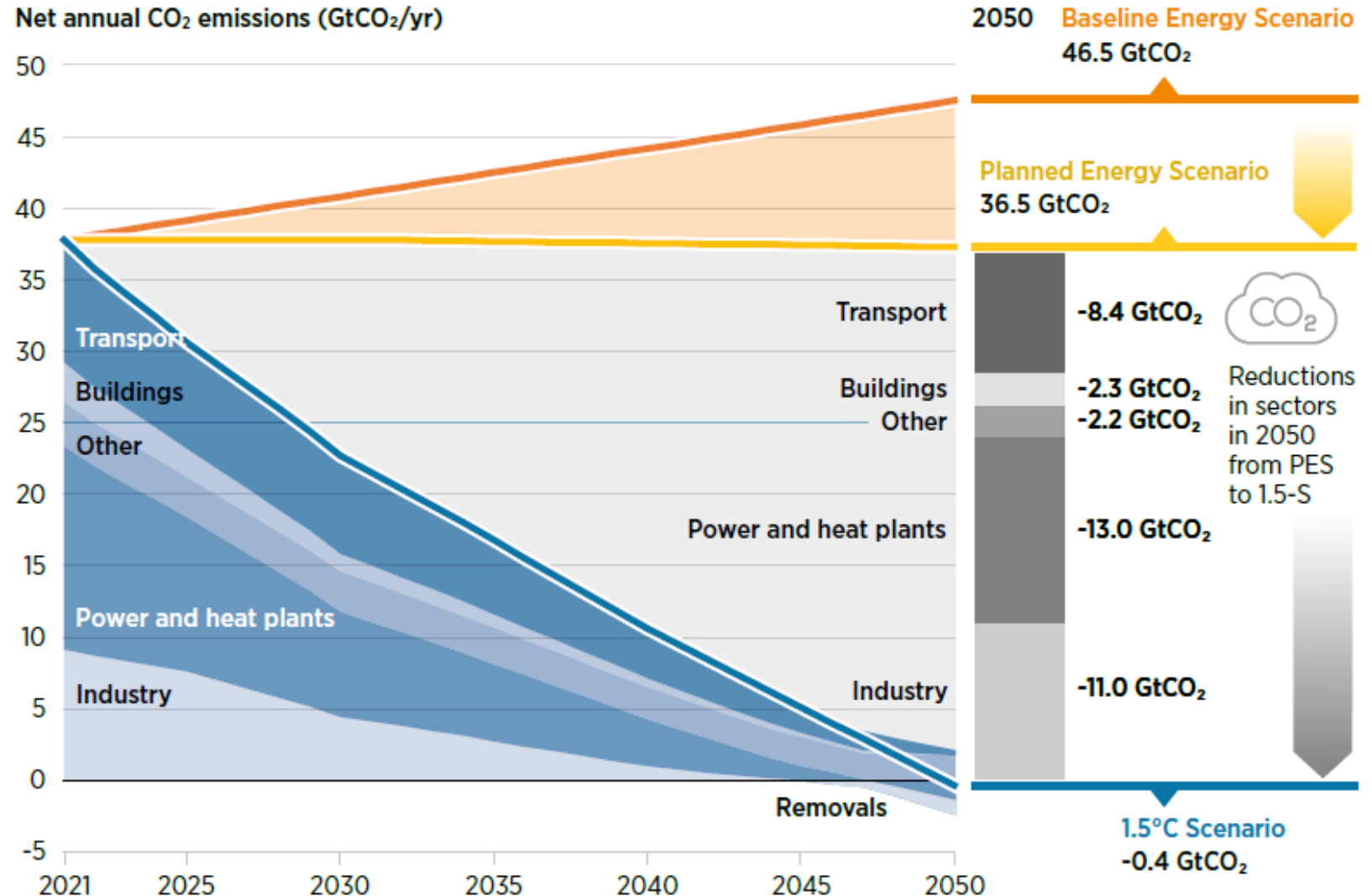
2020
2 degrees scenario
Emissions -70% by 2050



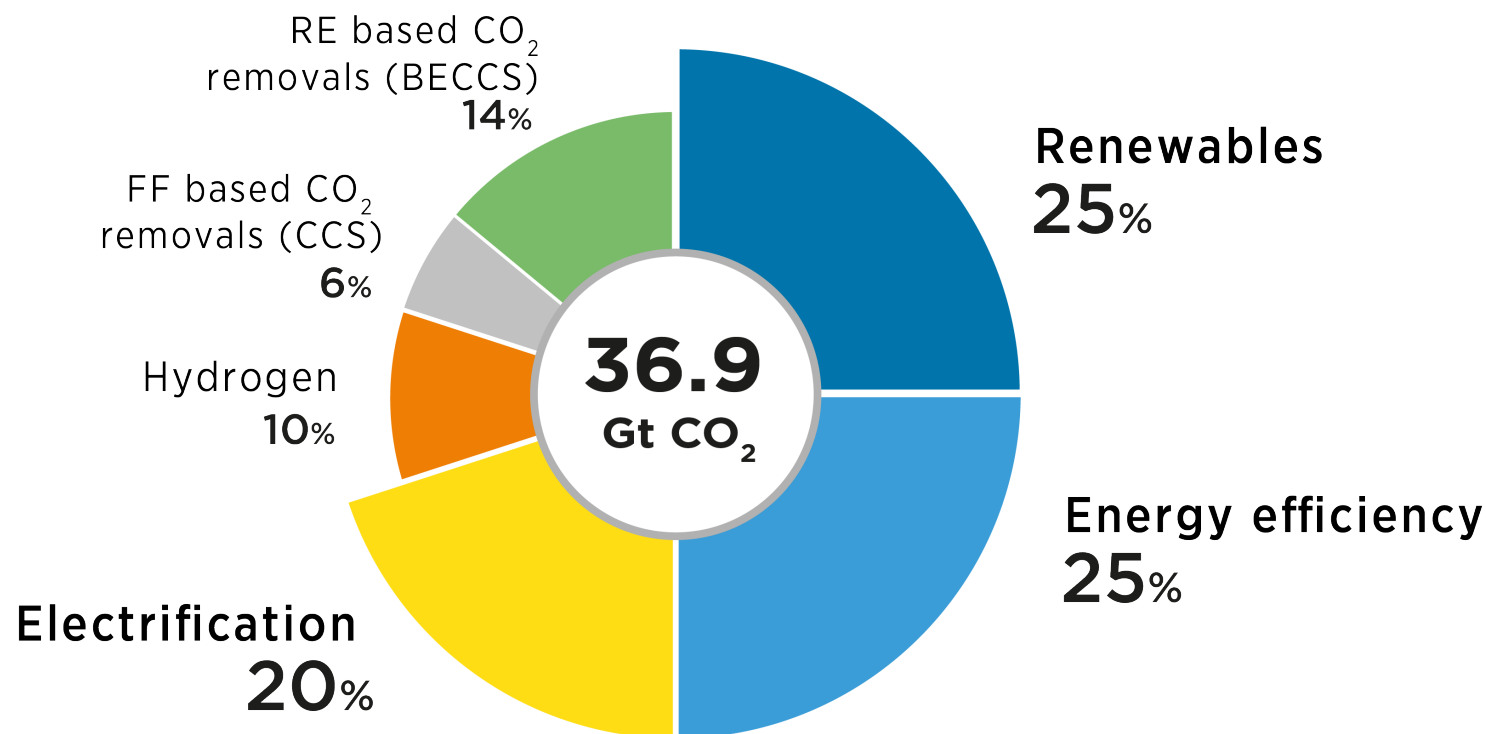
March 2021
1.5 degrees scenario
Net zero emissions by 2050

Net zero emissions by mid-century

- **Planned Energy Scenario:** Baseline emissions continue to rise, while the policies of governments result in flatlining of emissions
- **1.5C Scenario:** global CO₂ emissions need to drop to net zero by 2050
- **2020-2030 must be the decade of action:** steepest decline necessary over the next 10 years.



Six components of the energy transition strategy

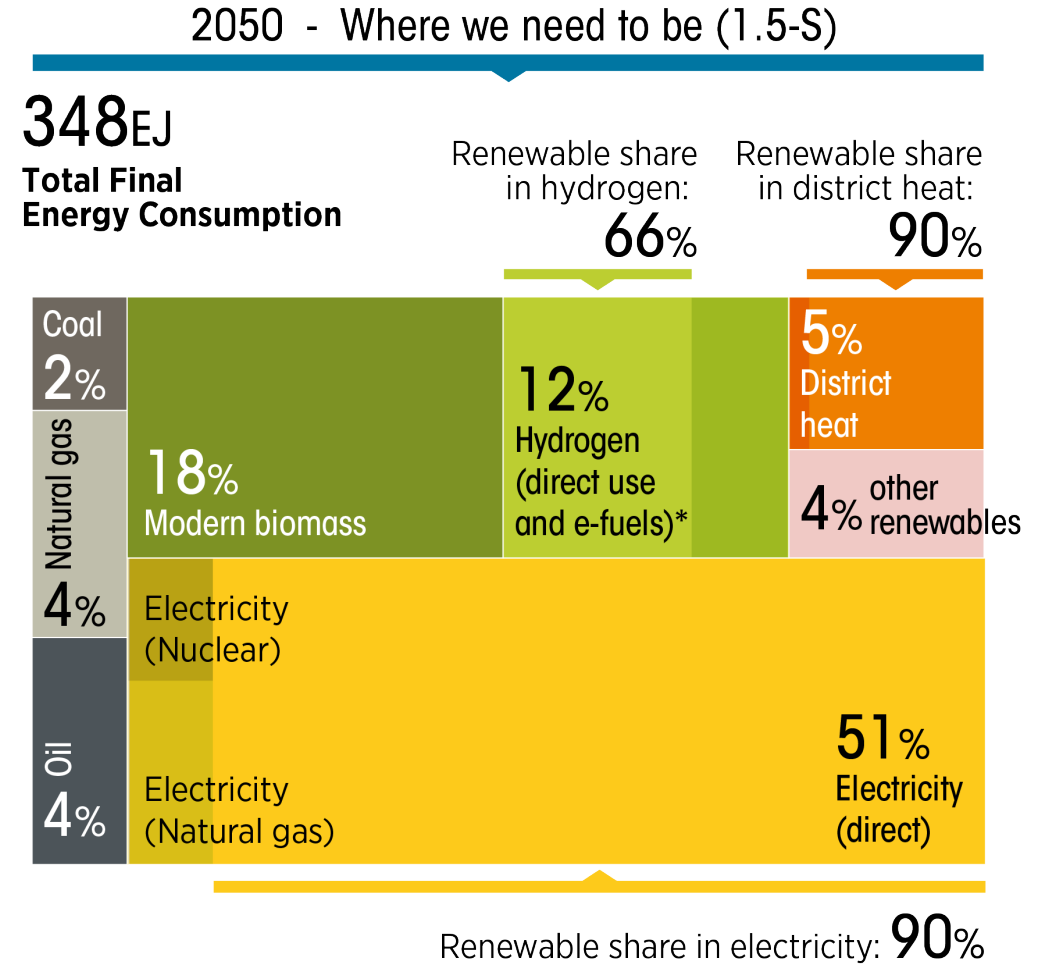
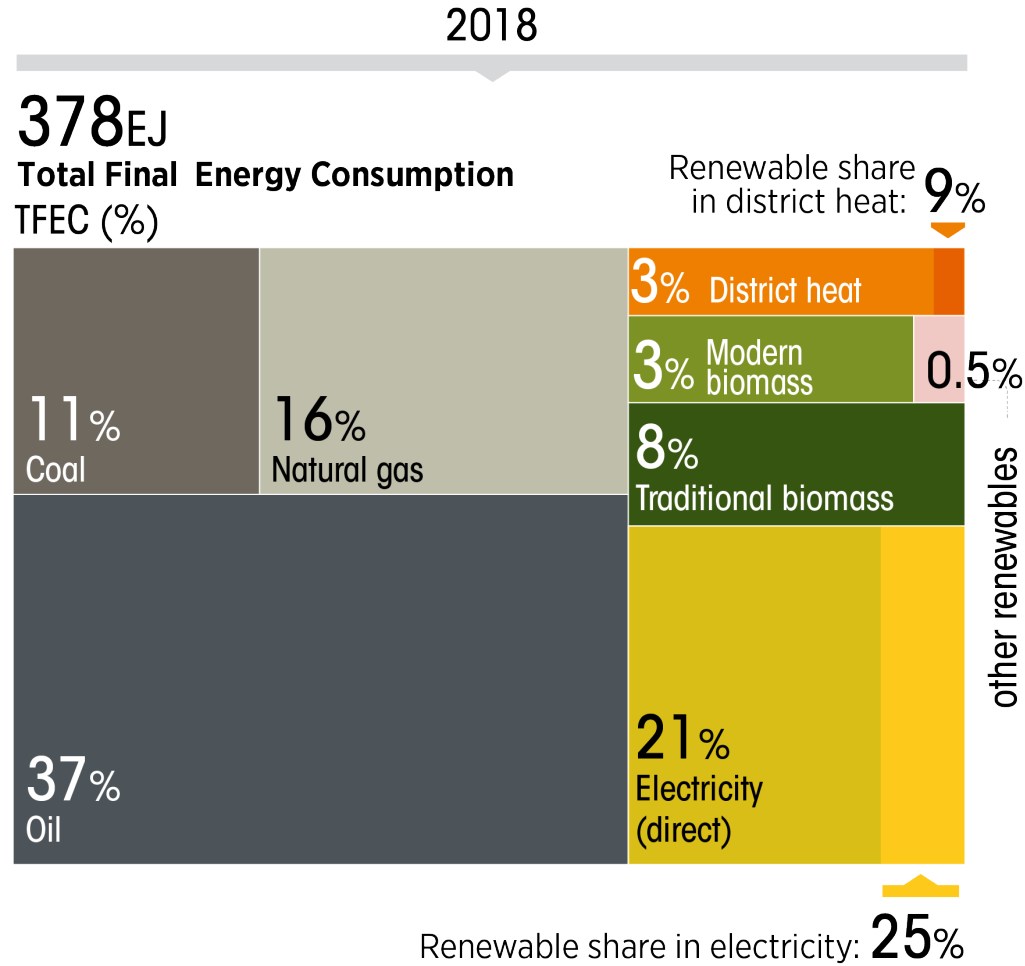


90% of all decarbonisation in 2050 will involve renewable energy through direct supply of low-cost power, efficiency, electrification, bioenergy with CCS and green hydrogen.

IRENA analysis of leading scenario studies shows robustness of renewables based solutions:

<https://energypost.eu/18-energy-transition-scenarios-to-watch-where-they-agree-and-disagree/>

Electricity is the central energy carrier in future energy systems



- 90% of total electricity needs will be supplied by renewables by 2050
- Direct-use of electricity makes up over half of final energy consumption
- Hydrogen provides 12% of final energy consumption (renewable share in hydrogen: 66%)

Global power supply projections in a 1.5C scenario

Growing electricity demand for green hydrogen production

production

By 2030, coal generation would halve and eventually would be phased out by 2050.

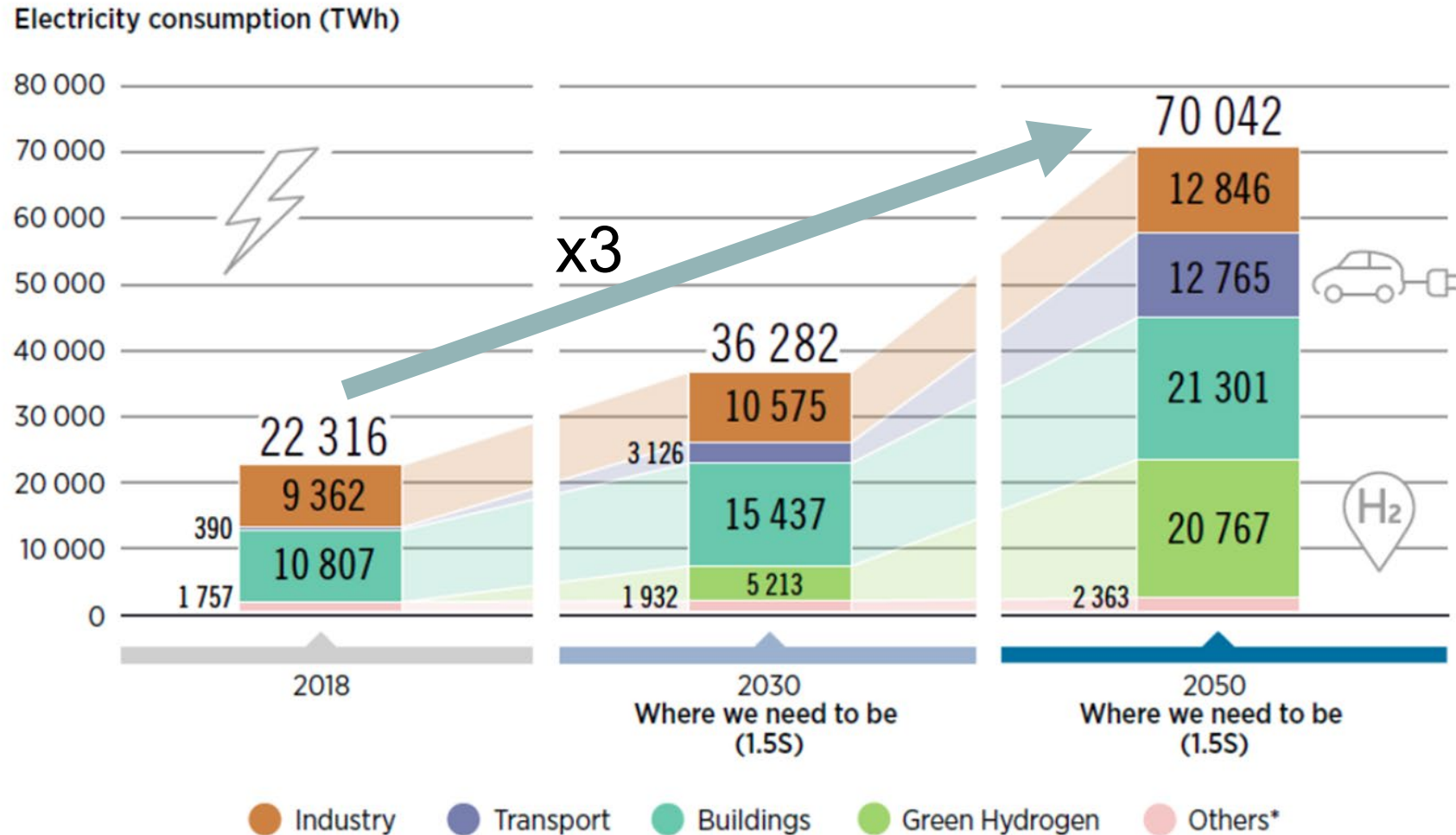
Global renewables capacity additions need to increase four-fold this decade.

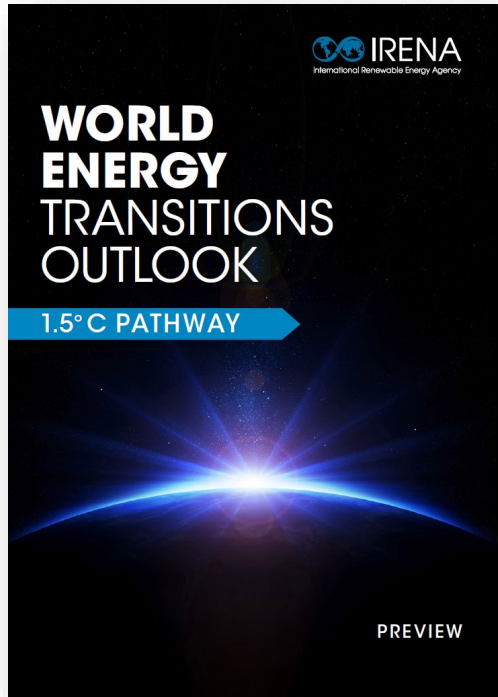
The share of renewables would grow to 90% in 2050 from 25% in 2018.

VRE like wind and solar would grow to 63% of all generation in 2050, compared to 10% in 2018.

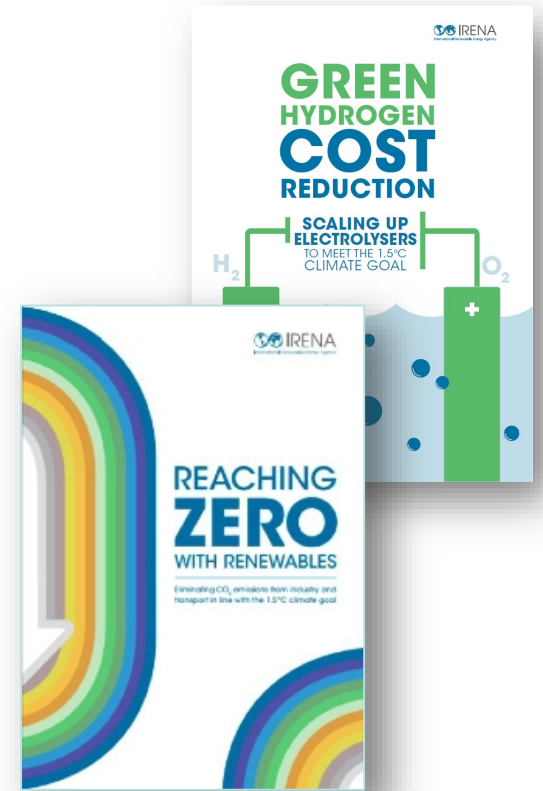
Such power systems will require increased flexibility.

Electricity consumption by sector, 2018, 2030 and 2050 (TWh/yr) in the 1.5°C Scenario





**Thanks for your
attention!**



www.irena.org



www.twitter.com/irena



www.facebook.com/irena.org



www.instagram.com/irenaimages



www.flickr.com/photos/irenaimages



www.youtube.com/user/irenaorg