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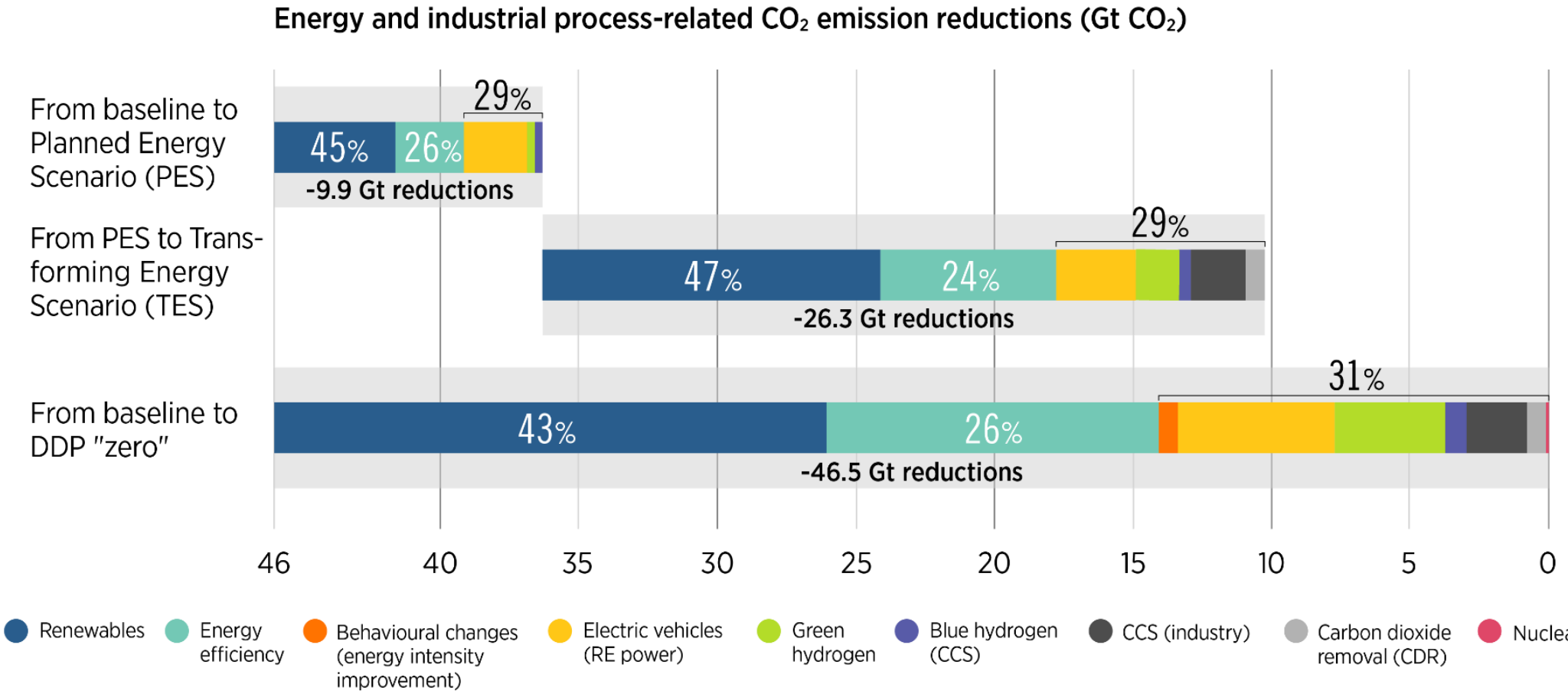
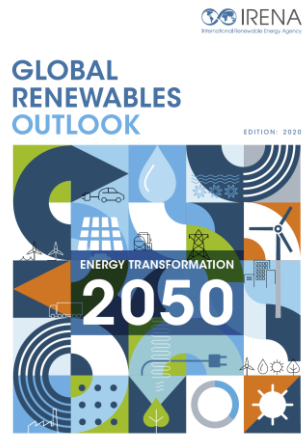
The Nexus between Resource Use and Climate Change

The Role of the Energy Transition

Francesco La Camera
Director-General, International Renewable Energy Agency (IRENA)
European Resources Forum, 3 November, 2020

The imperative for a resilient energy system





Annual energy-related CO_2 emissions would need to decline by at least 70% below today's level by 2050. End-use electrification, green hydrogen and synthetic fuels will play a crucial role to reach zero emissions.

Emission Reductions: From Baseline Emissions in 2050 to ZERO

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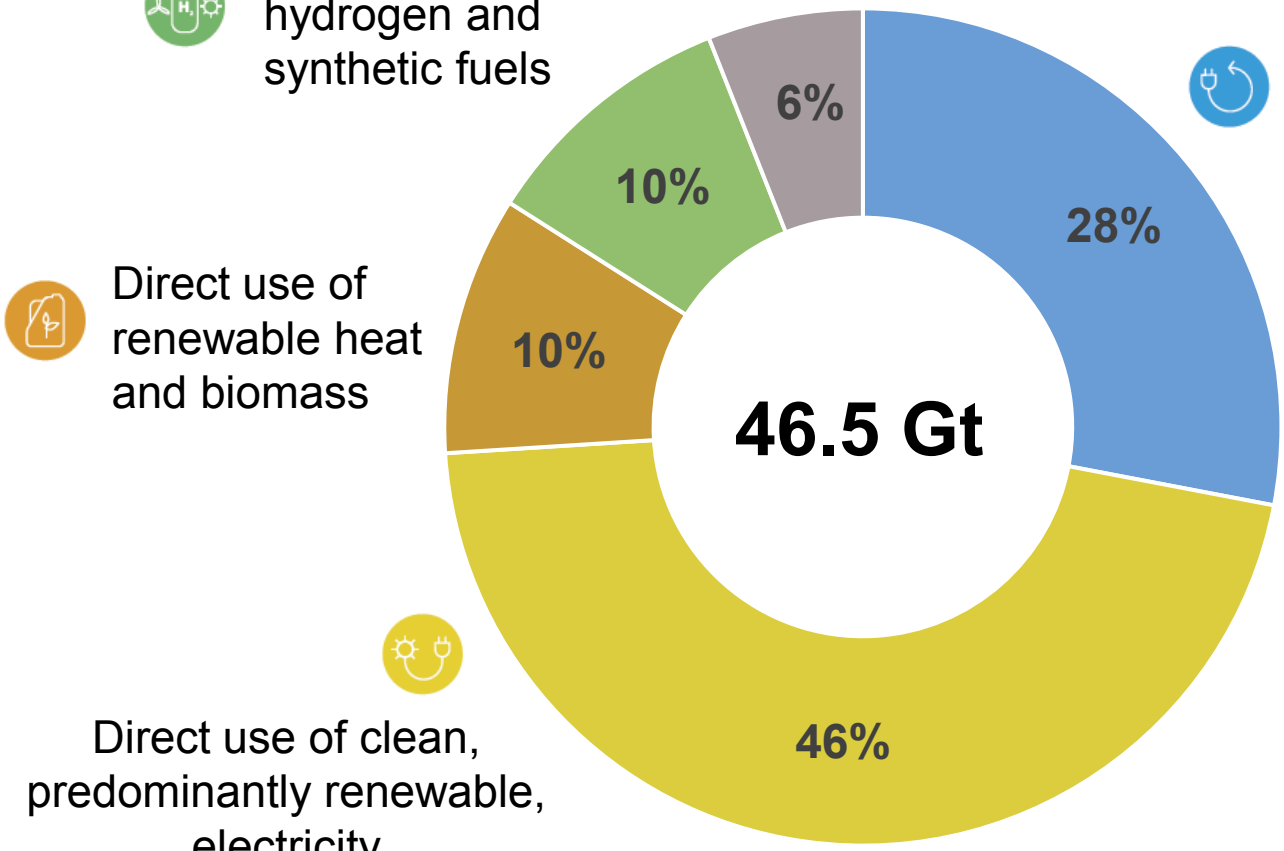
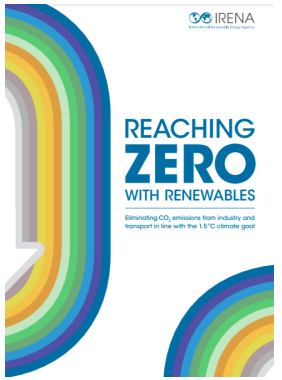
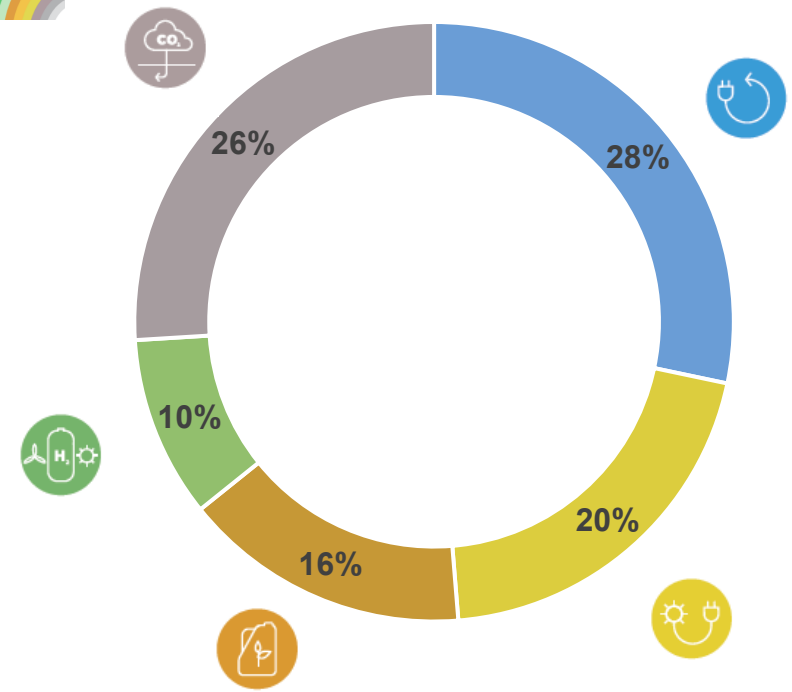
Total emissions



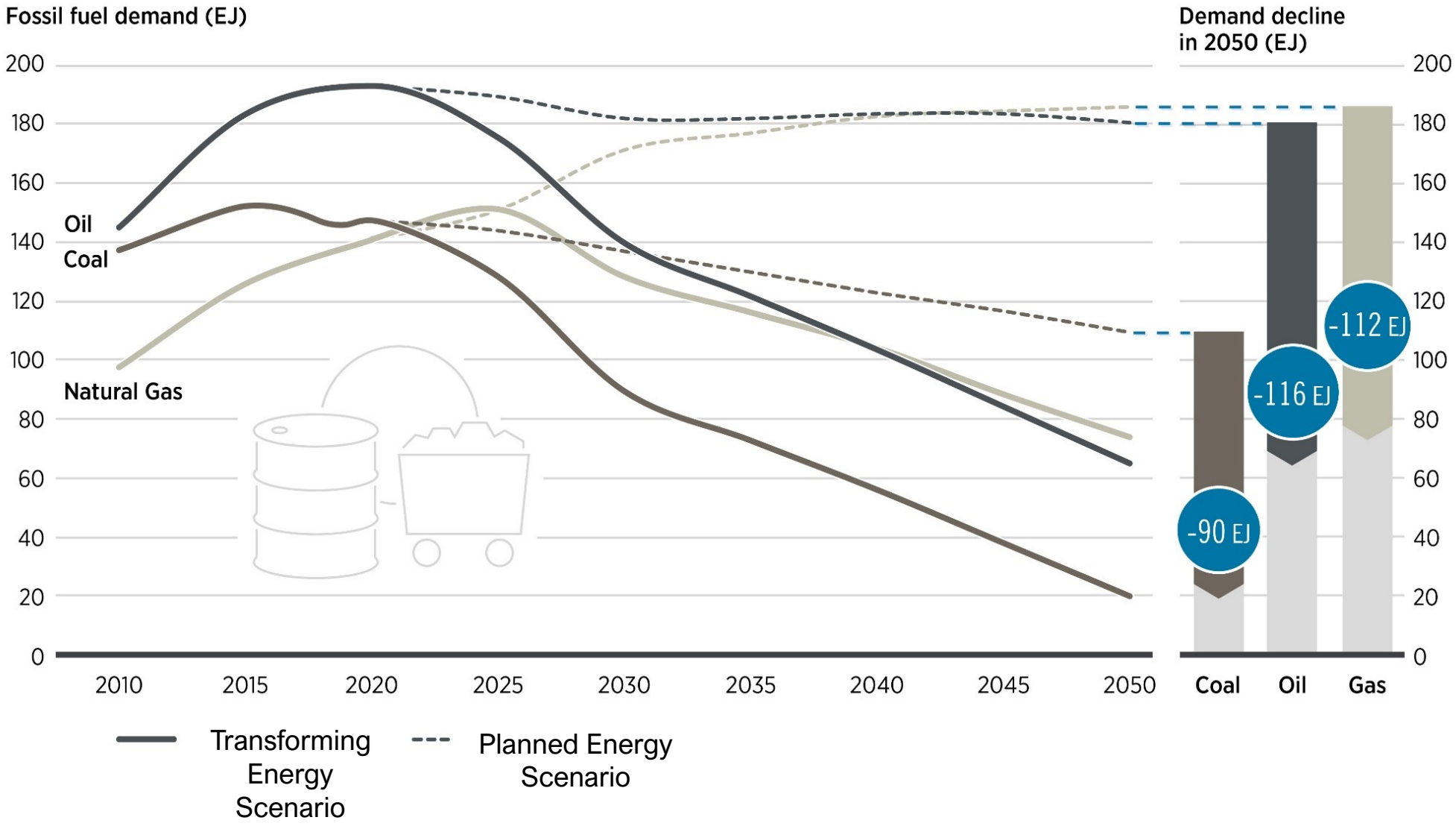


Industry



The declining importance of fossil fuels

Fossil fuel use (left, PJ/yr), 2015-2050; decline in fossil fuel usage by sector REmap Case relative to Reference Case (right, in 2050)



Climate and resource efficiency - Green iron and steel

Iron and steel

In 2017:

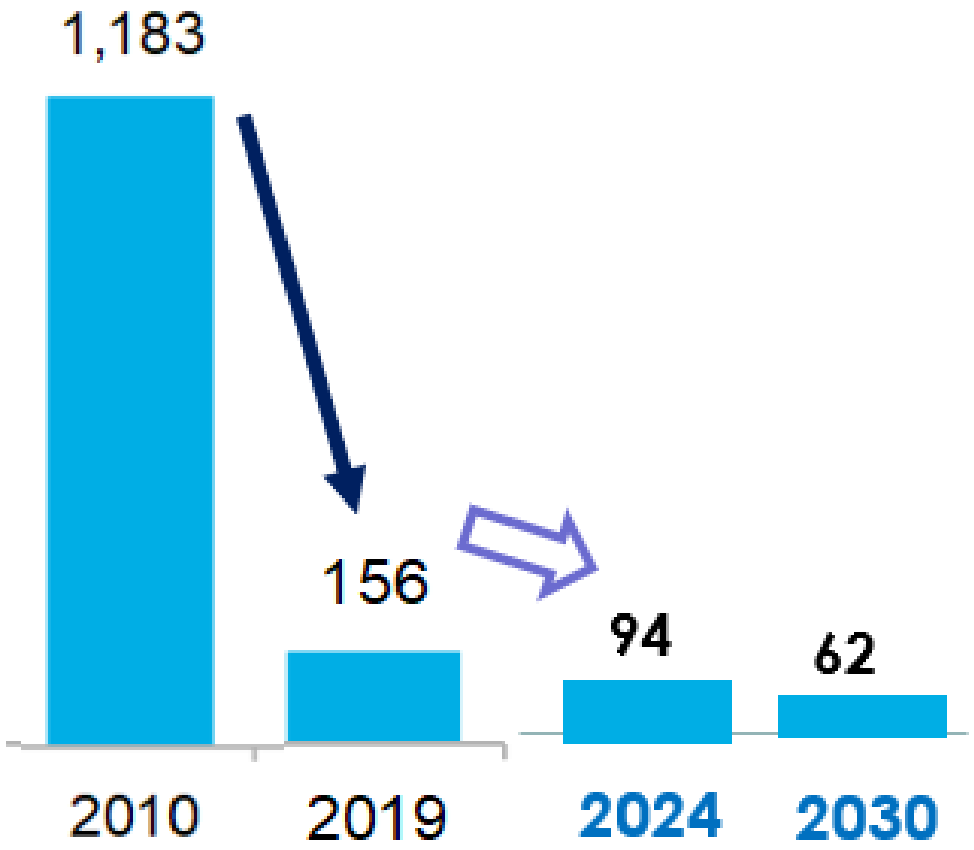
- Consumed 32 exajoules (EJ) of energy
- Only 4% was from renewables
- Emitted 3.1 gigatonnes (Gt) of CO_2

Keys:

- Produce iron and steel using green electricity and hydrogen via direct reduced iron and electric arc furnaces (DRI-EAF route)
- Relocate centres of production to locations with substantial iron ore and relatively low-cost and abundant renewable electricity sources
- Governments must encourage use of “green” steel despite higher costs in the short-term

Climate and resource efficiency - Batteries

Cost reduction li-ion batteries (USD/kWh)

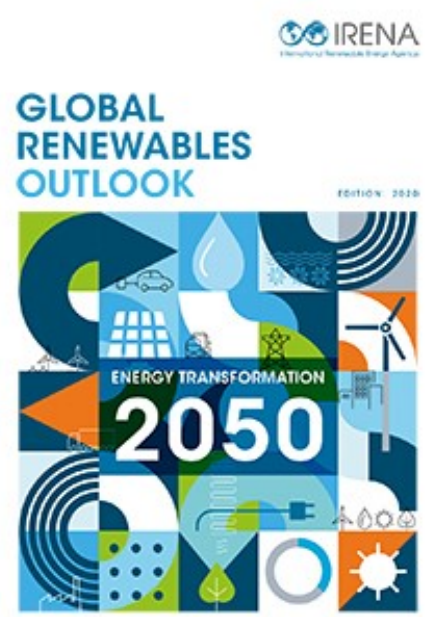


Demand growth

- Today ~ 200 GWh/yr li-ion batteries production; ~ 50% for e-mobility sector
- If 30% of HDVs in EU go electric -> additional production capacity ~ 80 GWh/yr

Source: BNEF and IRENA

Thank you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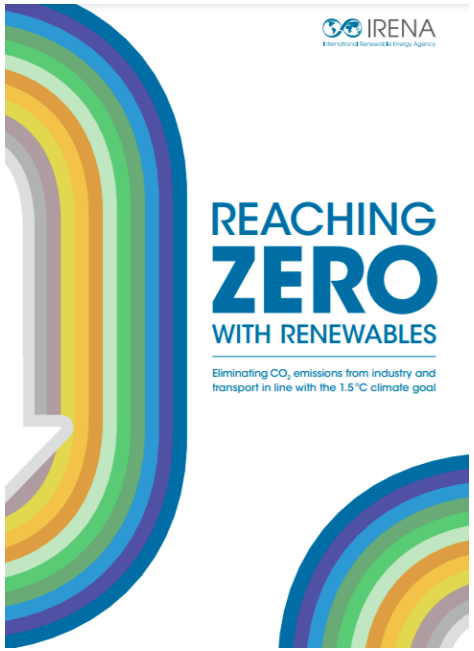
2050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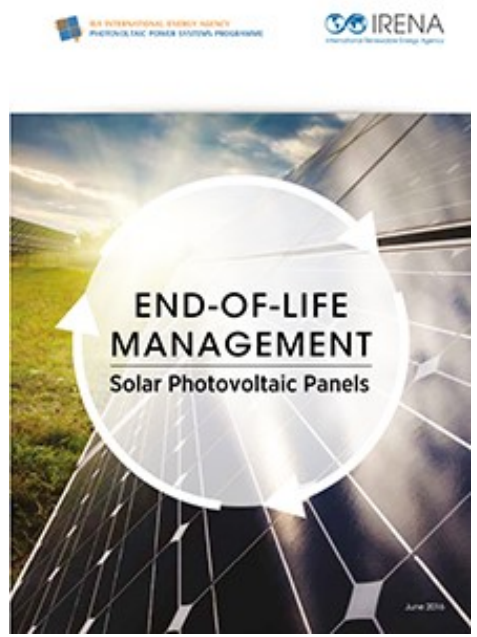
REACHING
ZERO
WITH RENEWABLES
Eliminating CO_2 emissions from industry and transport in line with the 1.5 °C climate goal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