



World Energy Outlook 2020

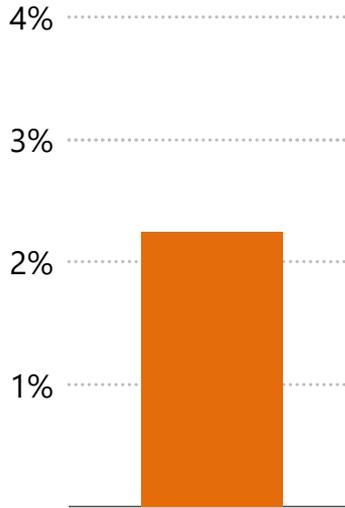
BIEE, 4 November 2020

Covid-19 and the energy outlook

- In an extraordinary year, 2 key questions:
 - How might the pandemic (and its aftermath) **reshape the energy sector**?
 - Does this disruption help, or hinder, the **prospects for rapid clean energy transitions**?
- Focus on pathways out of today's crisis over the next 10 years, amid 2 key uncertainties
 - **Duration and severity of the pandemic** and its economic impacts
 - **Response from energy policy makers** and the sustainability of the recovery
- Scenario-based approach more important than ever, to examine:
 - The **direction we are heading**, depending on the outlook for public health & the economy
 - What would be required to **reach net-zero emissions**

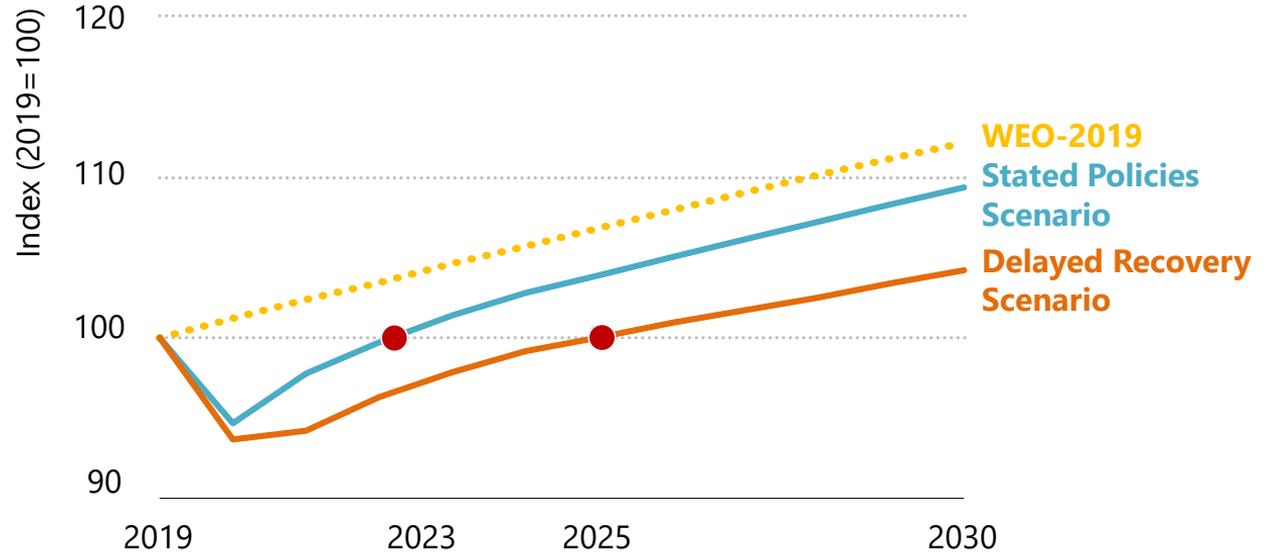
A shock to the energy system

Average annual GDP growth
(2019-30)



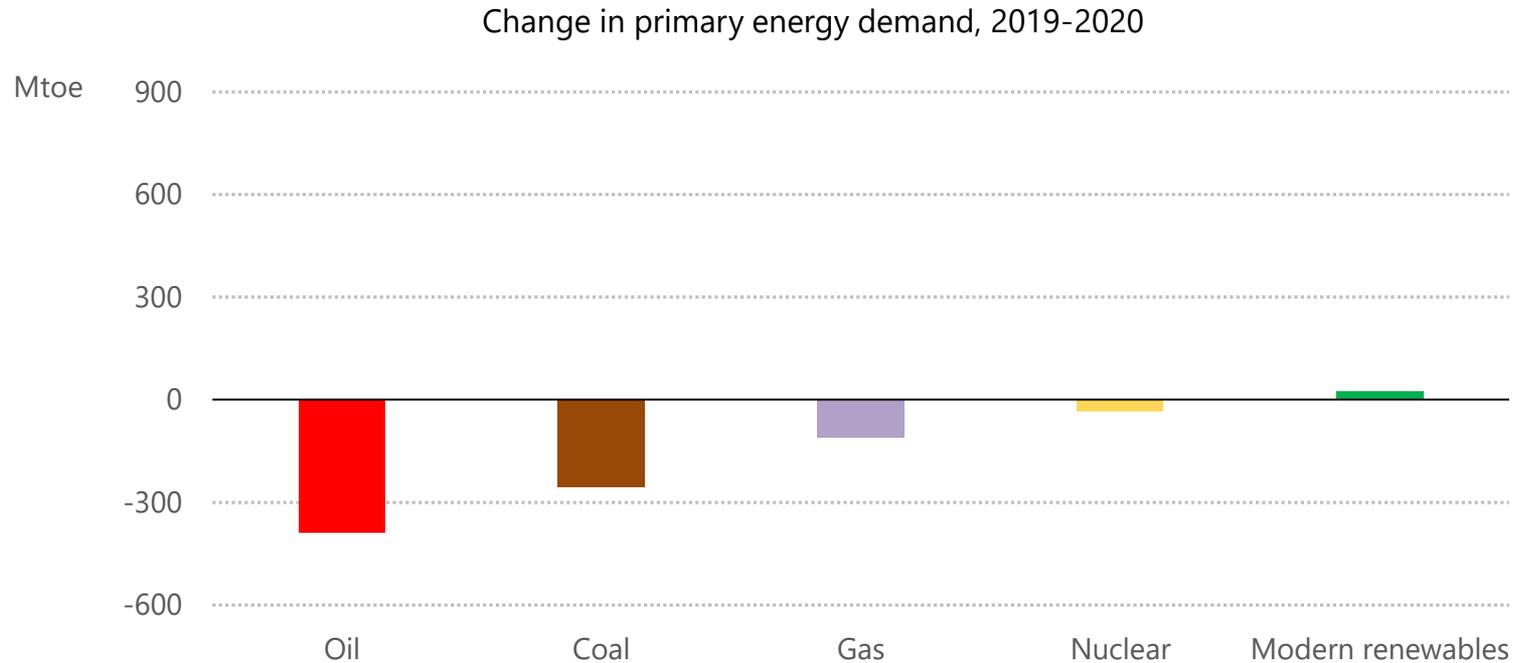
Delayed Recovery Scenario

Energy demand



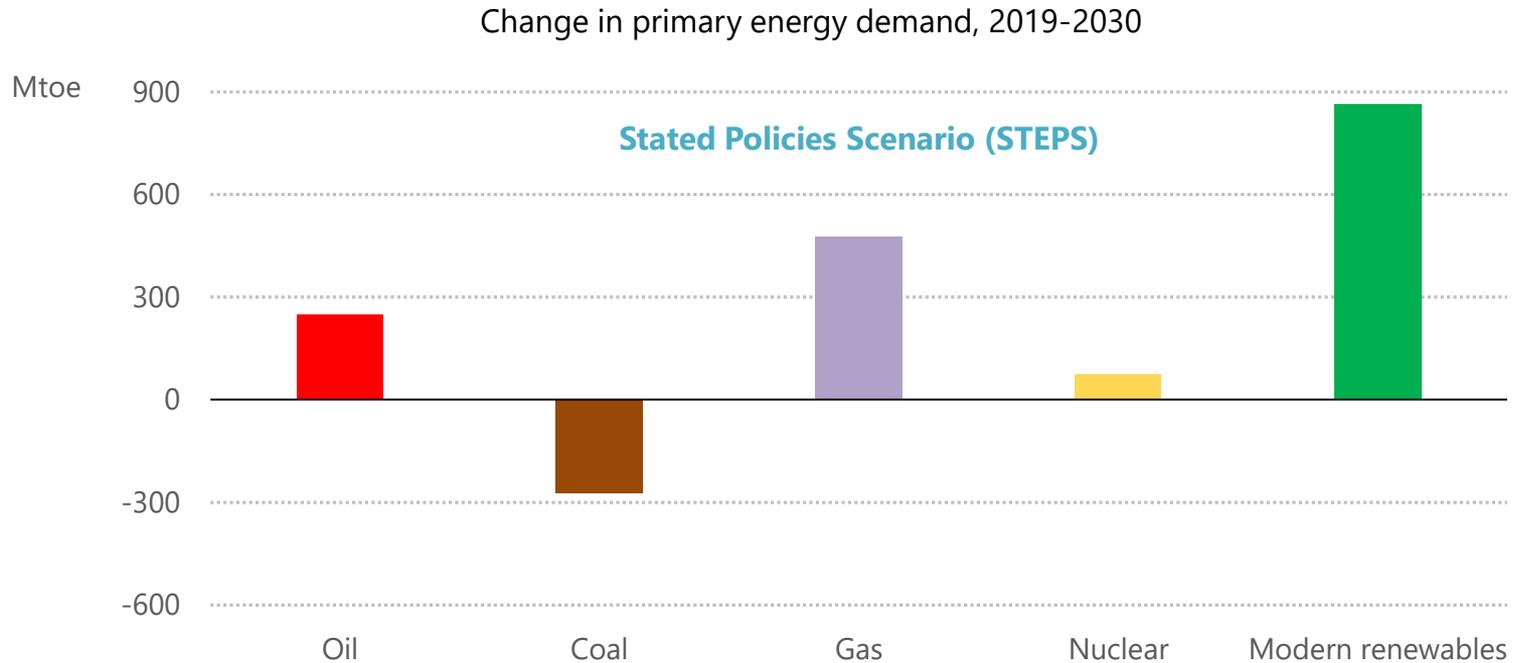
Bringing the pandemic under control in 2021 would allow energy demand to return to pre-crisis levels by early 2023. A longer pandemic would usher in the slowest decade of energy demand growth for a century

Impacts vary widely by fuel & technology



After a 5% drop in energy demand in 2020, renewables lead the rebound while coal never gets back to pre-crisis levels

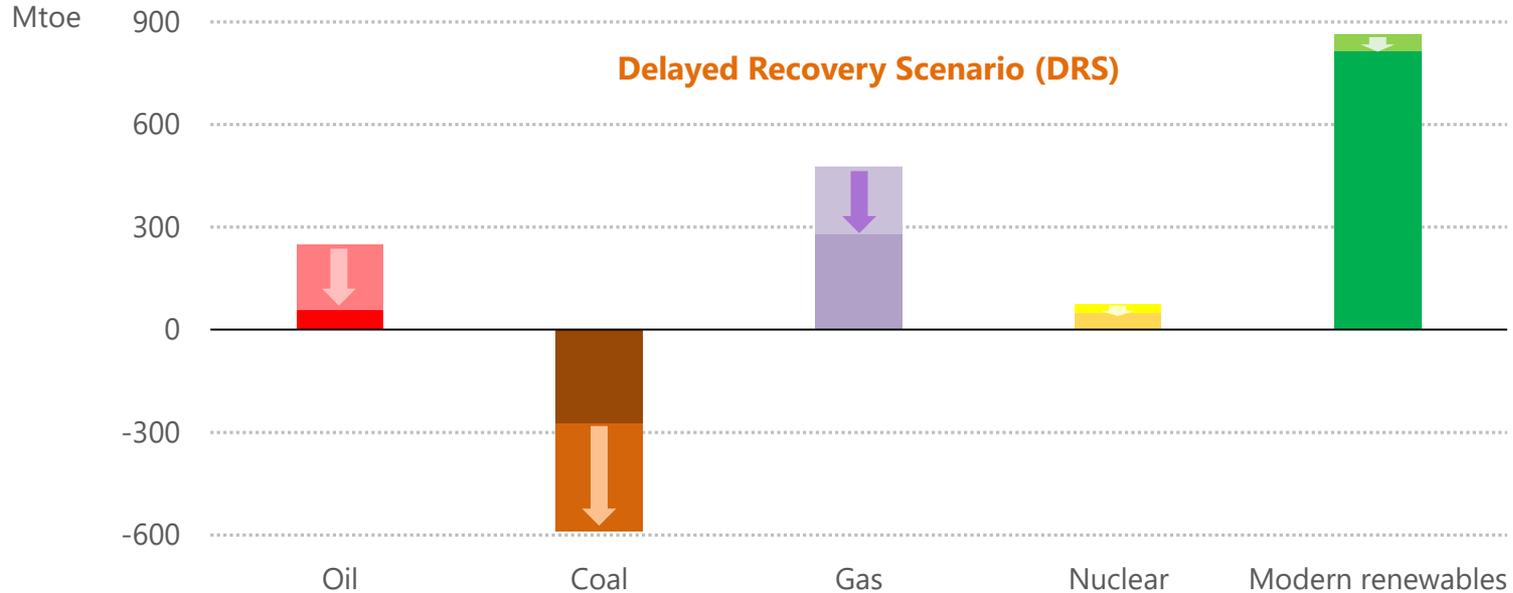
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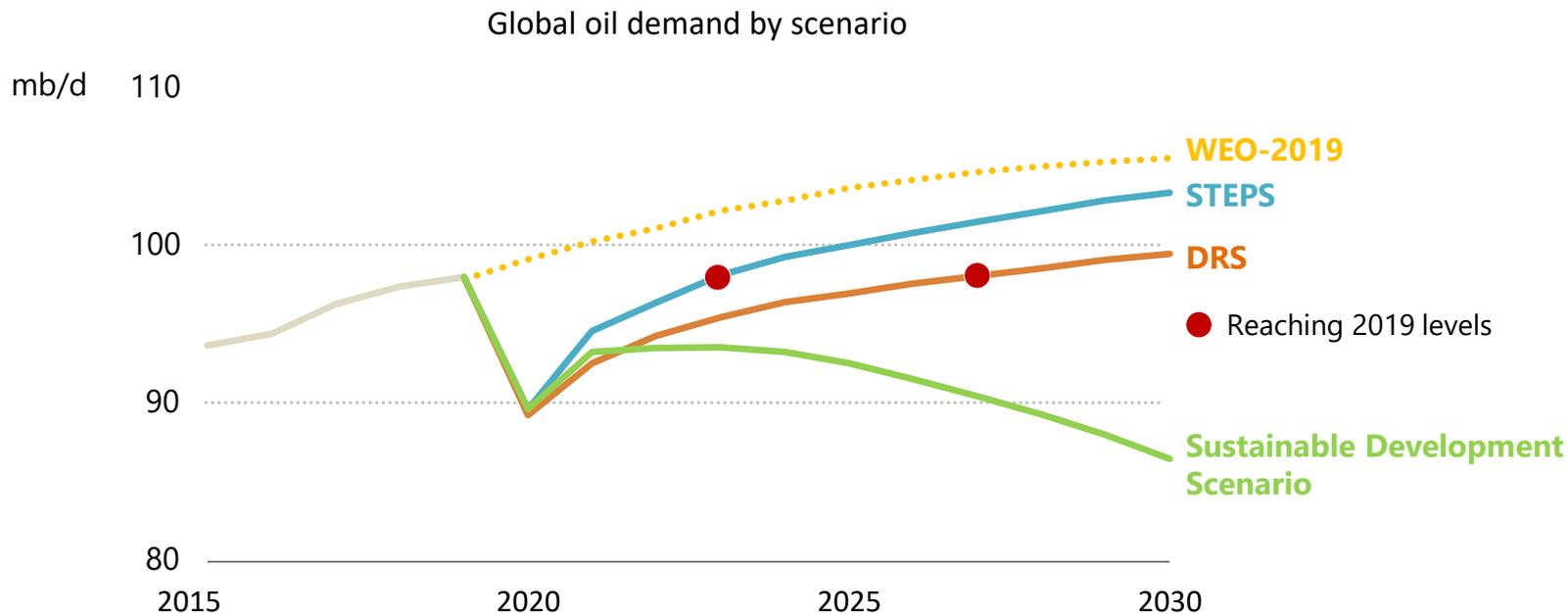
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Change in primary energy demand, 2019-2030



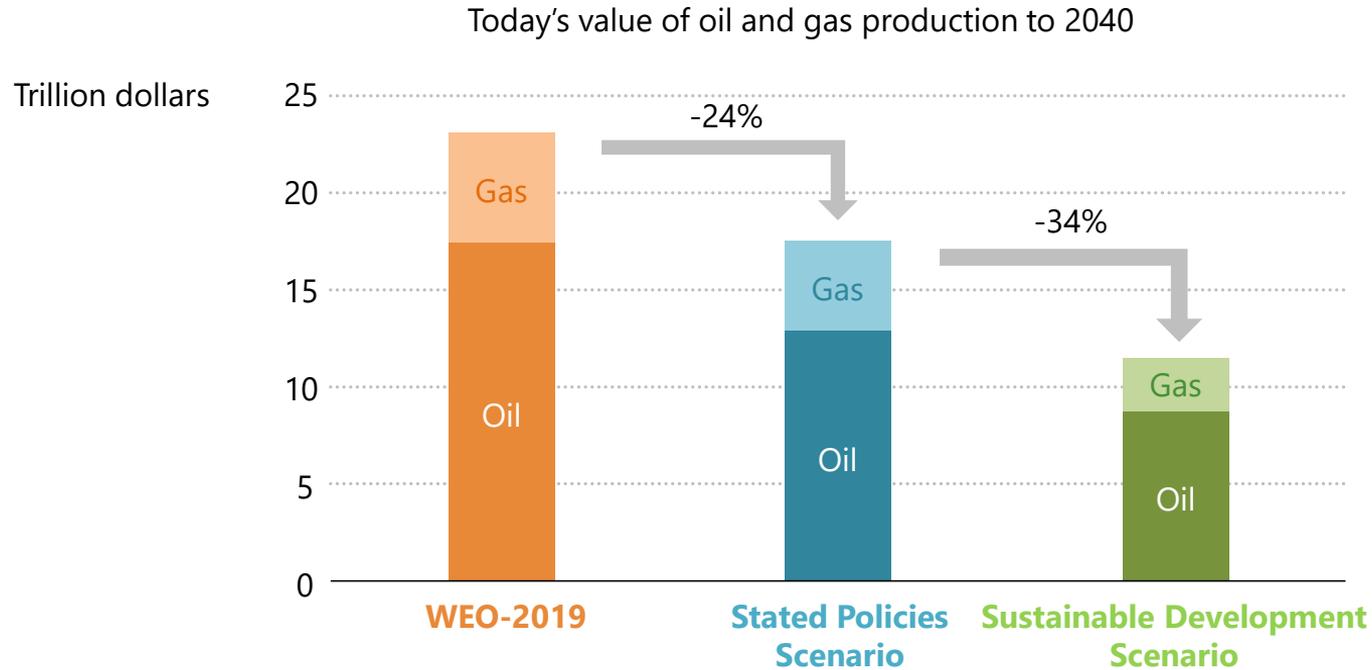
After a 5% drop in energy demand in 2020, renewables lead the rebound while coal never gets back to pre-crisis levels; a delayed recovery puts energy into slow motion, prolonging today's overhang of supply

Without a larger shift in policies, no rapid decline in oil



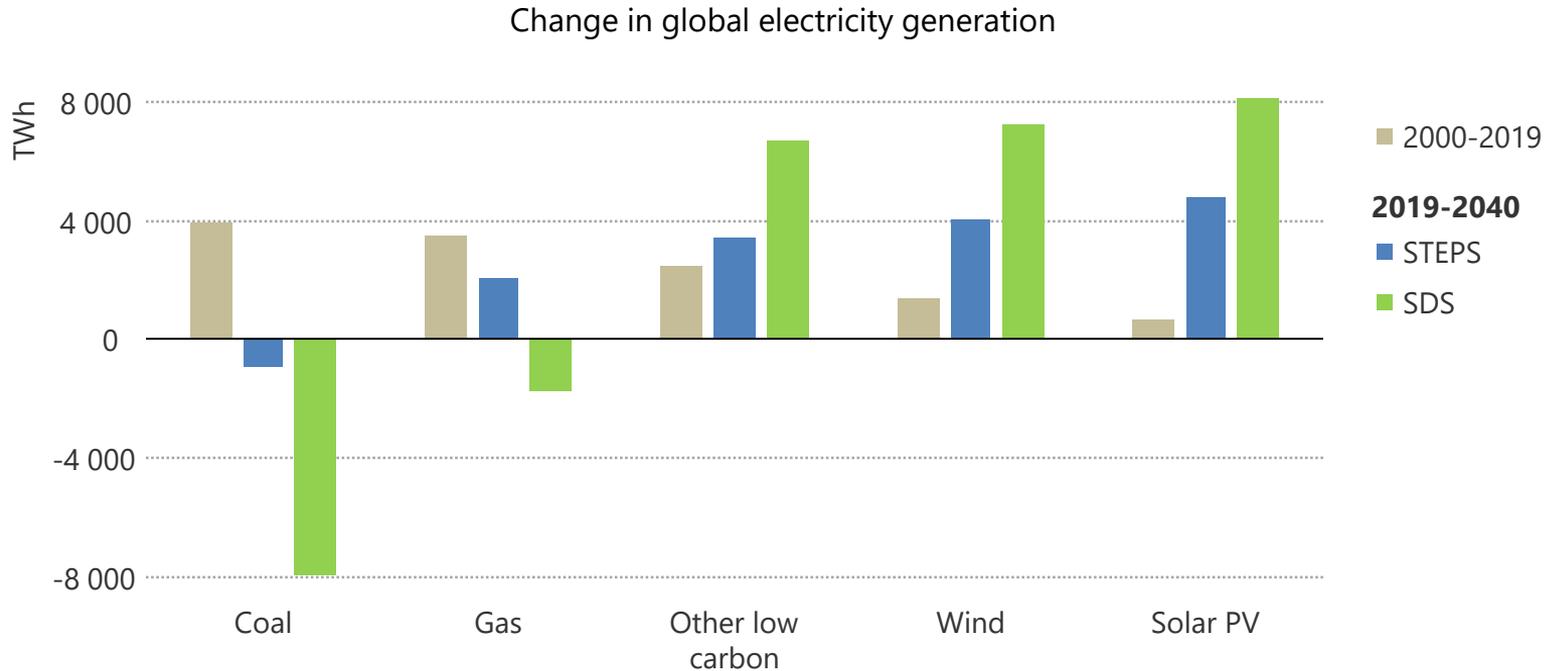
In the STEPS & the DRS, oil demand reaches a plateau in the 2030s as transport fuels are no longer a reliable engine for growth; a stronger push for efficiency, electrification and recycling will be needed for oil use to fall

Diversification: the critical watchword for oil and gas producers



A lower price and demand outlook, due in the near term to Covid-19, adds to the strains on countries that rely on oil & gas revenues. The pressure for changes in strategies & business models is even stronger in the SDS

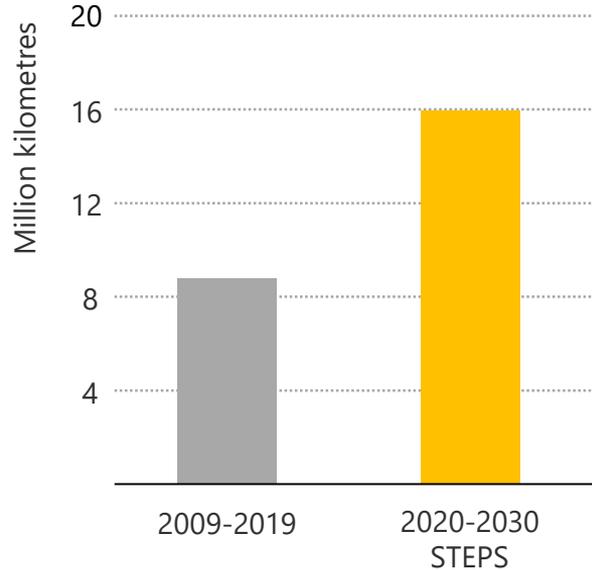
Solar PV is becoming the 'new king' of electricity



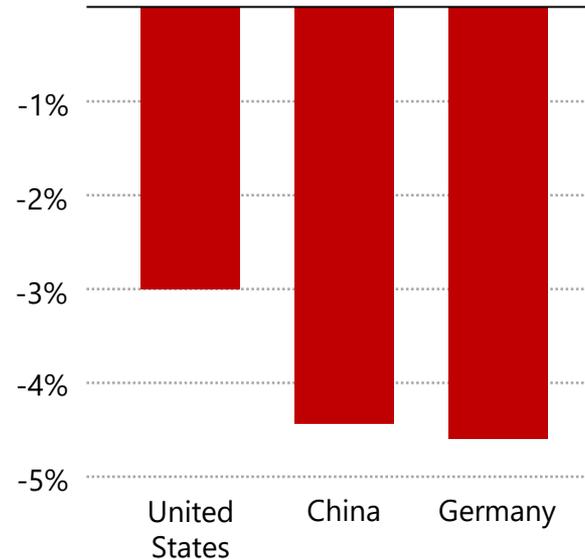
Solar PV is now the cheapest source of electricity in most countries in part due to low cost financing and is set to triple before 2030 under current and proposed policies, with the potential to grow much faster

Grids are the bedrock of a clean & secure electricity future

Grids expansion

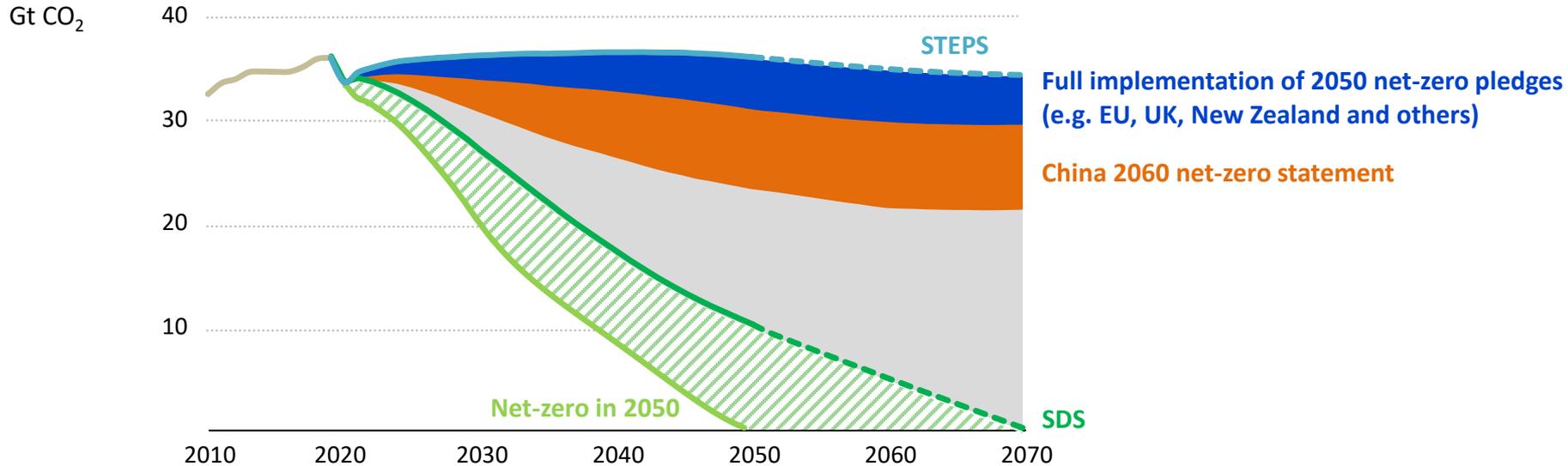


Change in grid operator revenue
First half of 2020



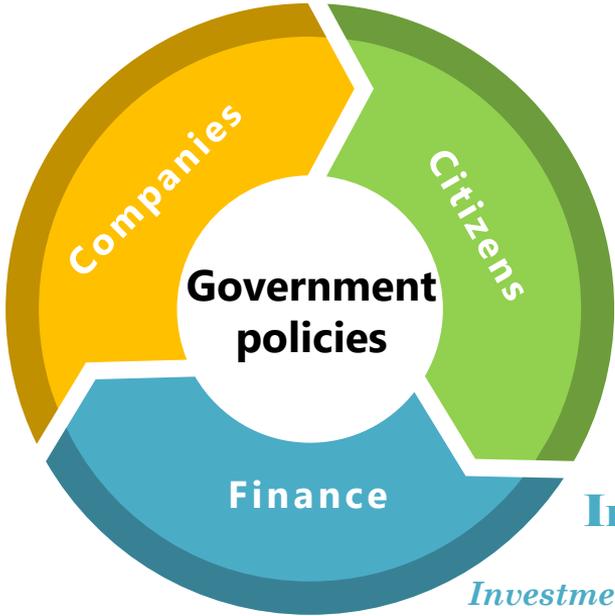
Electricity transformations require a step up in grids expansion to ensure that electricity remains reliable, affordable and secure, however depressed revenues are creating risks for timely investment

The world is still far from putting emissions into decisive decline



Global emissions are set to bounce back more slowly than after the financial crisis of 2008-2009, but the world is still a long way from a sustainable recovery

Net-zero by 2050 demands unprecedented efforts over the next decade



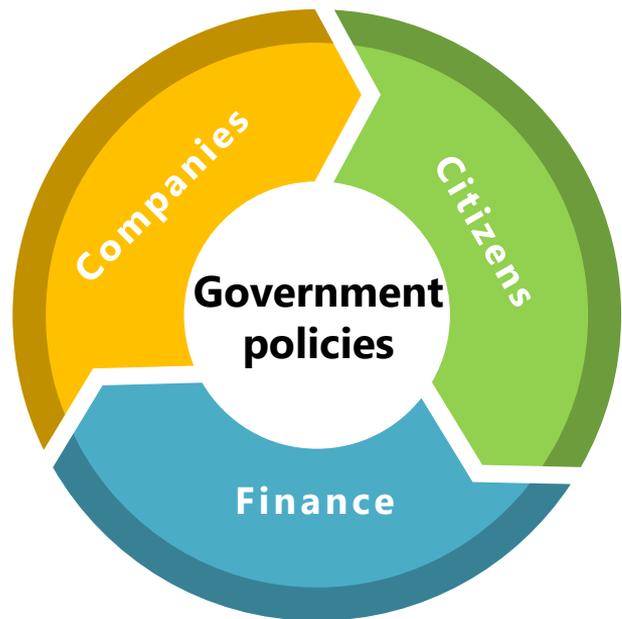
Build wind onshore and offshore *Eliminate flaring* **Improve product efficiency**
Hydrogen Equip with CCUS **Deploy solar**
 Widespread digitalisation **Fuel-cell trucks** *Low-carbon gases*
Innovation **Low-emissions shipping** **Extend and digitalise grids**
batteries & electrolyzers **Modernise hydropower**
 Advanced biofuel production *Expand nuclear power & develop SMRs*

Electric cars *Install batteries and solar at home*
Buy energy efficient appliances **Walk or cycle short trips**
Turn down air conditioning *Fly less often*
Work from home *Upgrade home heating to heat pumps*
Drive more slowly **Increase recycling** **Retrofit homes**

Clean electricity investment
Invest in innovation *Align portfolios with low-emissions activities*
Develop new financial tools to unlock private capital
Investment guidelines **Improve bankability of efficiency investments**
Manage risks for new technologies *Increase investment in renewables*

Net zero energy emissions in 2050 would require a set of dramatic additional actions over the next 10 years. Energy companies, citizens and investors all need to be on board – with unprecedented contributions to make

Net-zero by 2050 demands unprecedented efforts over the next decade



Hydrogen

2020 0.45 Mt

2030



40 Mt

Electric cars

2020 2.5 million

2030



50 million cars sold

Clean electricity investment

2020 380 billion \$

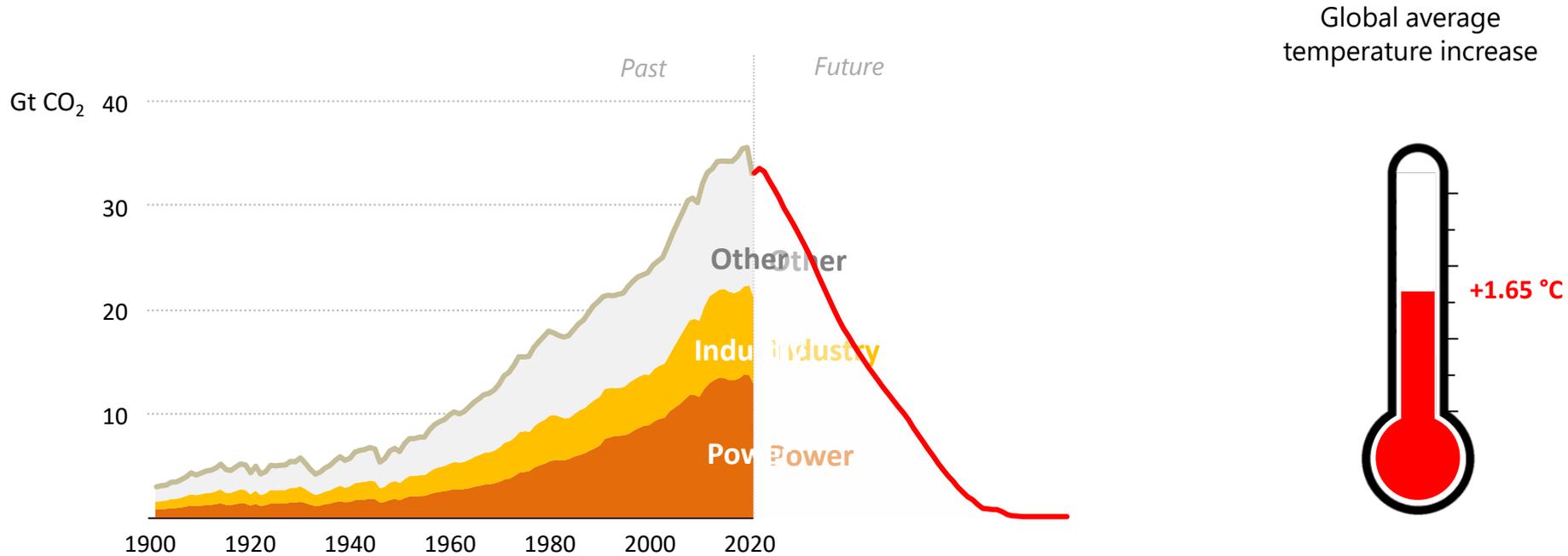
2030



1.6 trillion \$

Net zero energy emissions in 2050 would require a set of dramatic additional actions over the next 10 years. Energy companies, citizens and investors all need to be on board – with unprecedented contributions to make

Existing infrastructure alone could lead to a temperature rise of 1.65 °C



Using existing energy infrastructure as in the past would “lock in” emissions for decades to come; the associated 1.65 °C global average temperature increase would put all climate goals out of reach