

# World Energy Outlook 2018



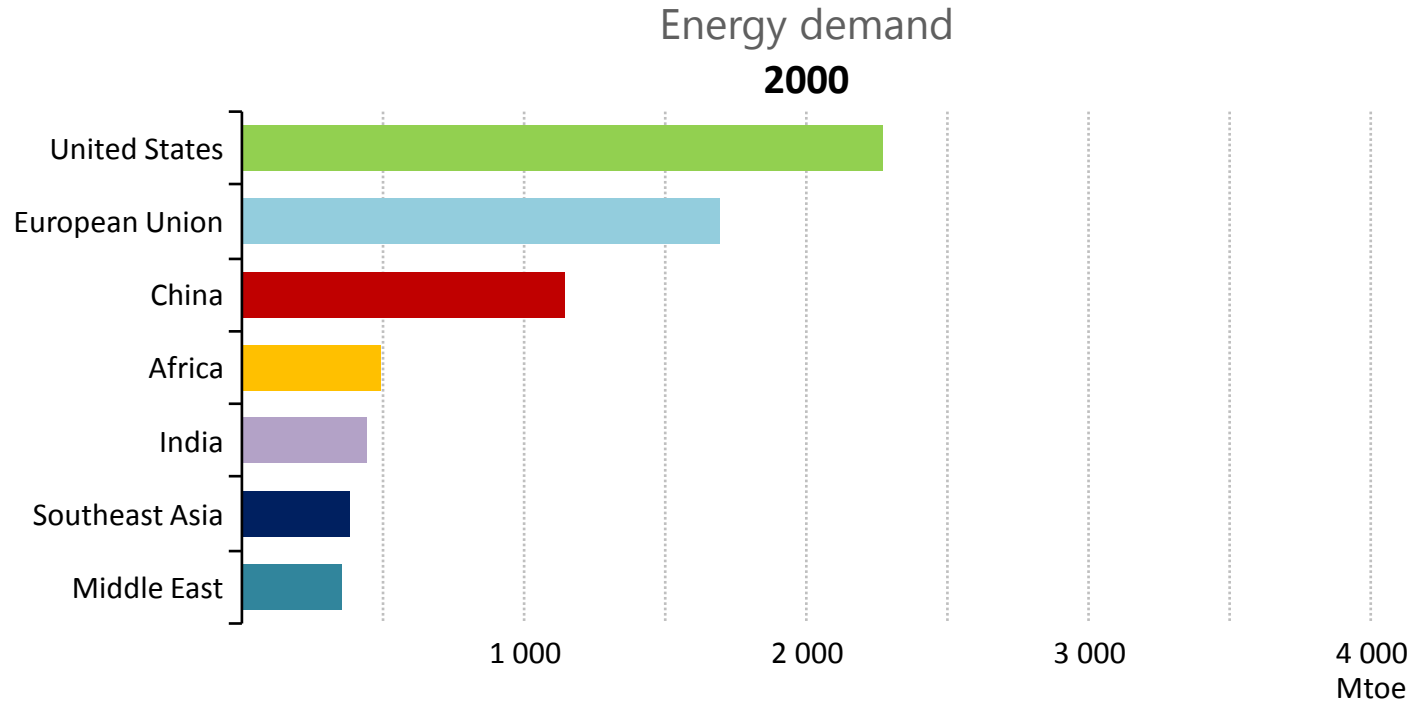
**ALPS Symposium**  
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**Insights on electricity transitions  
from the World Energy Outlook 2018**

**Yasmine Aرسالane, IEA**

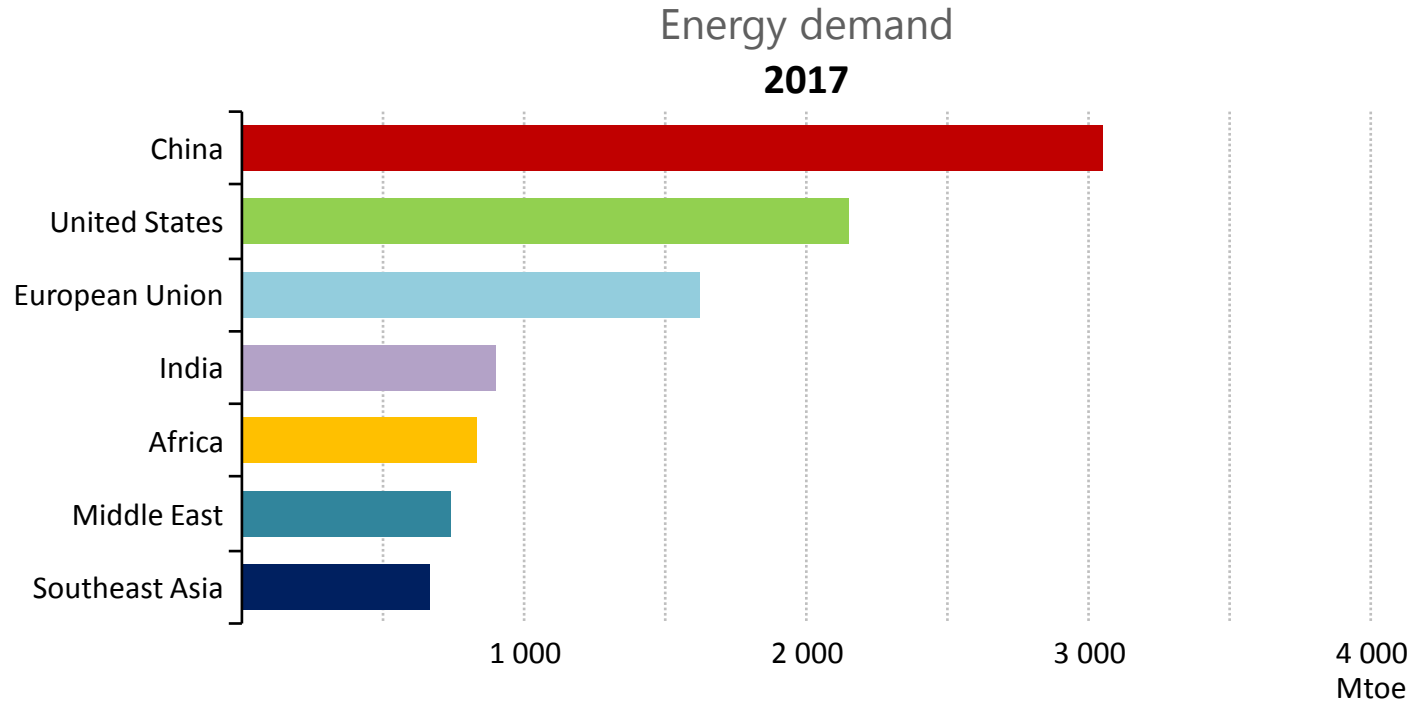
- Electricity is increasingly important in the modern world, to date:
  - **Electricity demand** has been growing twice as fast as total energy demand
  - **Investment** in the power sector is larger than that in the oil and gas sector
  - The rise of **solar PV and wind** power is transforming electricity supply
  - Overall energy-related **CO<sub>2</sub> emissions** are back on a rising trend in 2018
  - For the first time, the global **population without access to electricity fell below 1 billion**
- Policy makers need well-grounded insights about different possible futures & how they come about. The *WEO* provides two key scenarios:
  - New Policies Scenario
  - Sustainable Development Scenario
- The Future is Electric Scenario was introduced to explore the implications of more rapid electrification of end uses and the digitalization of the economy

# The new geography of energy



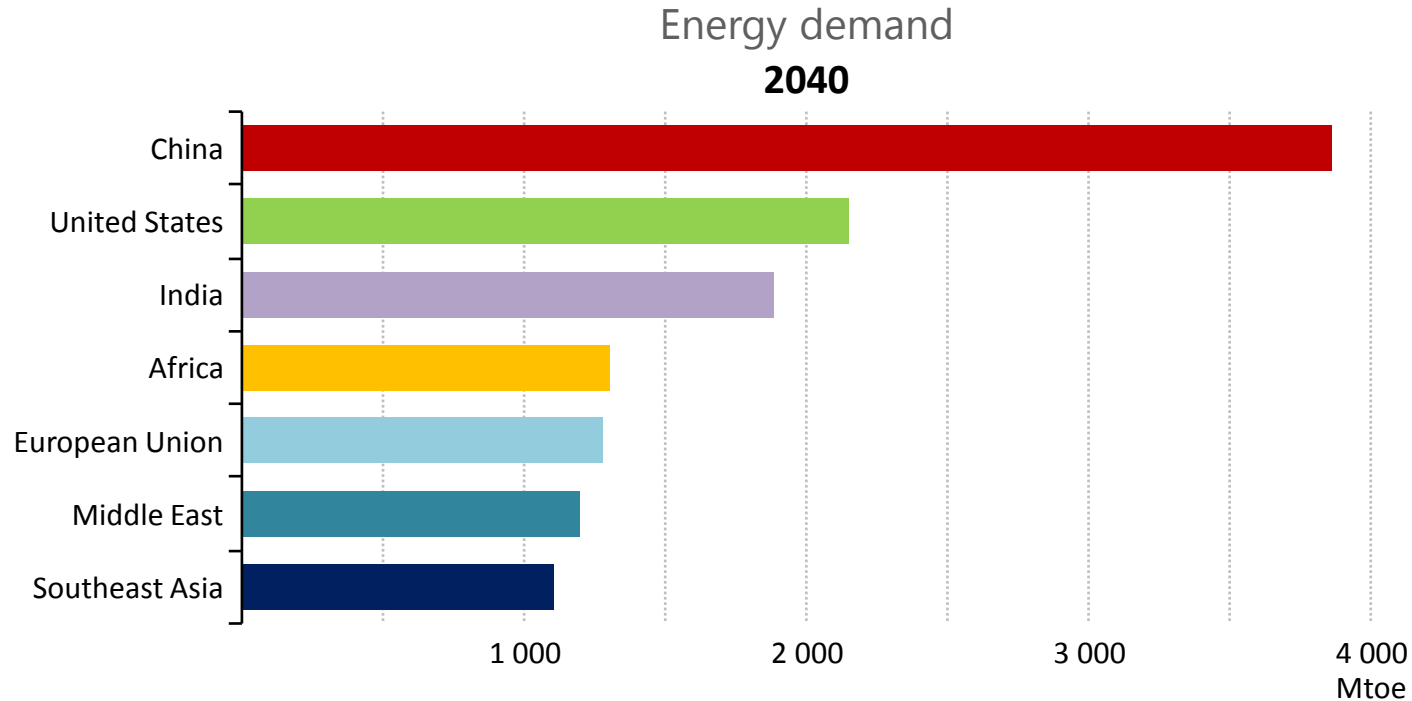
*In 2000, more than 40% of global demand was in Europe & North America and some 20% in developing economies in Asia. By 2040, this situation is completely reversed.*

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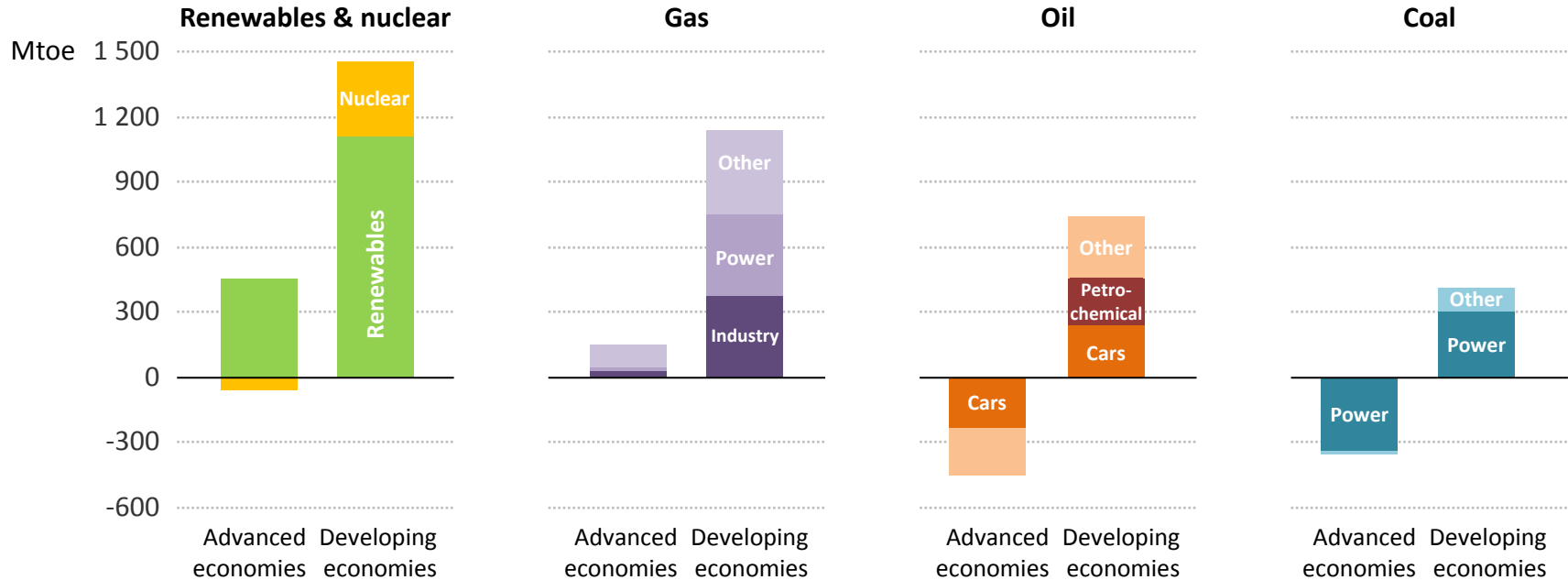
# The new geography of energy



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# Fuelling the demand for energy

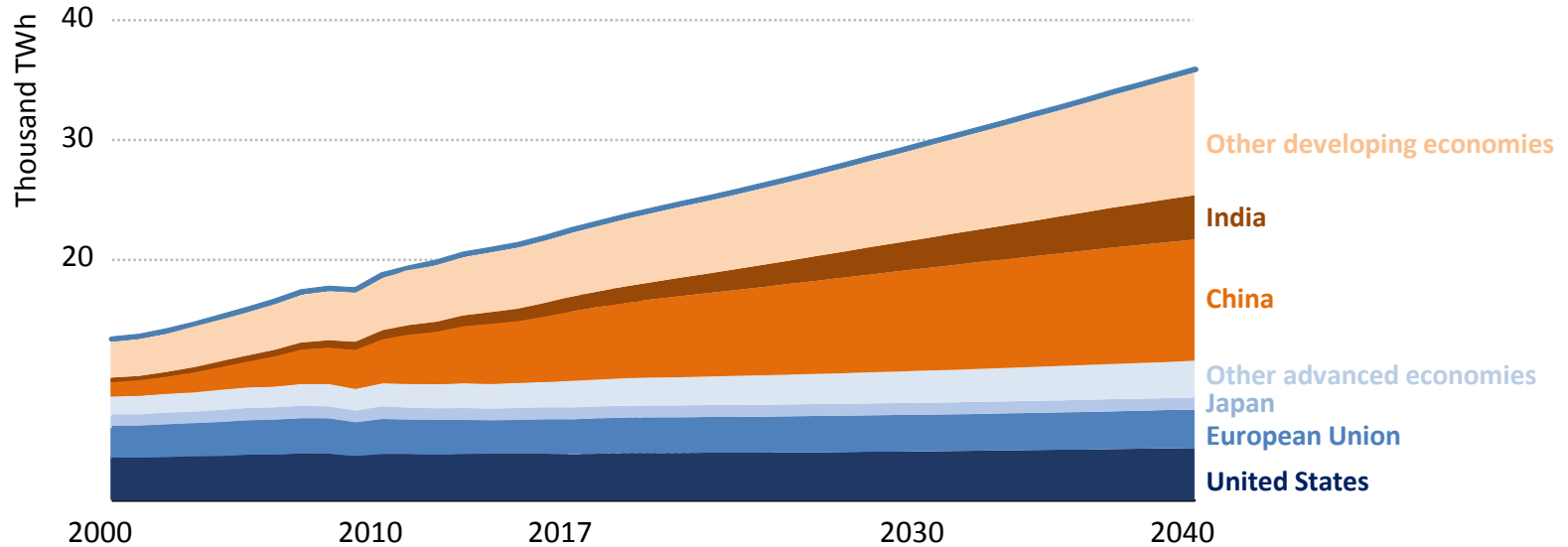
Change in global energy demand, 2017-2040



*The increase in demand would be twice as large without continued improvements in energy efficiency, a powerful tool to address energy security & sustainability concerns*

# Electricity, the fastest growing “fuel”

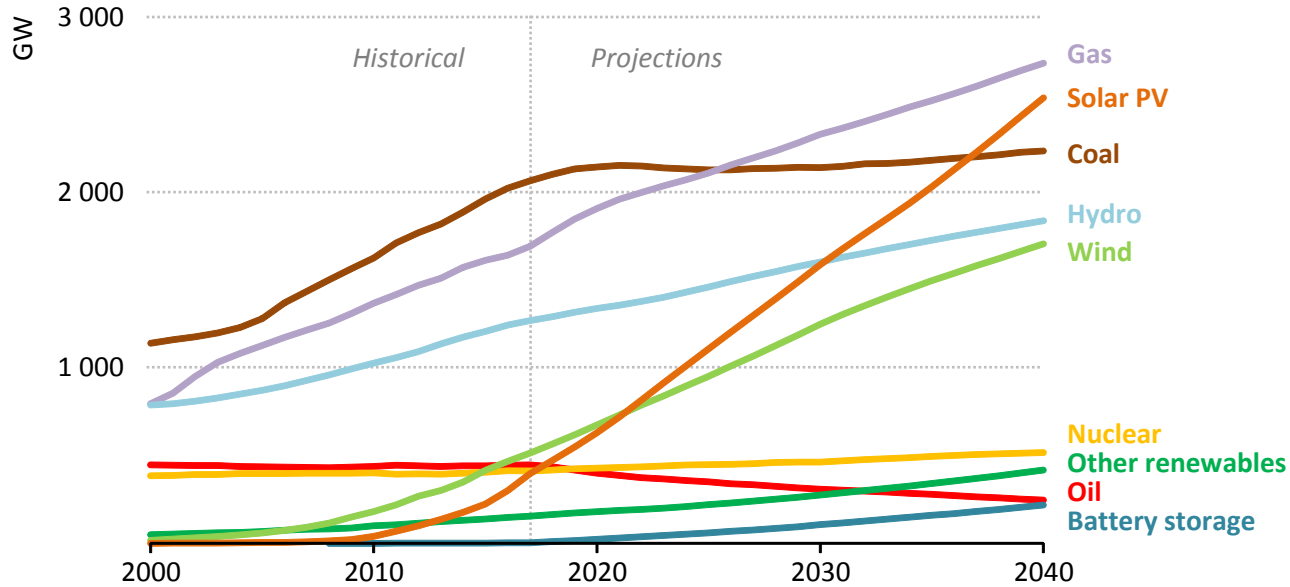
Global electricity demand by region



*In 2000, developing economies accounted for one-third of electricity demand, by 2040, their share doubles as they account for most of the electricity growth*

# Solar PV growth outpaces all other technologies

Installed power generation capacity by source in the New Policies Scenario

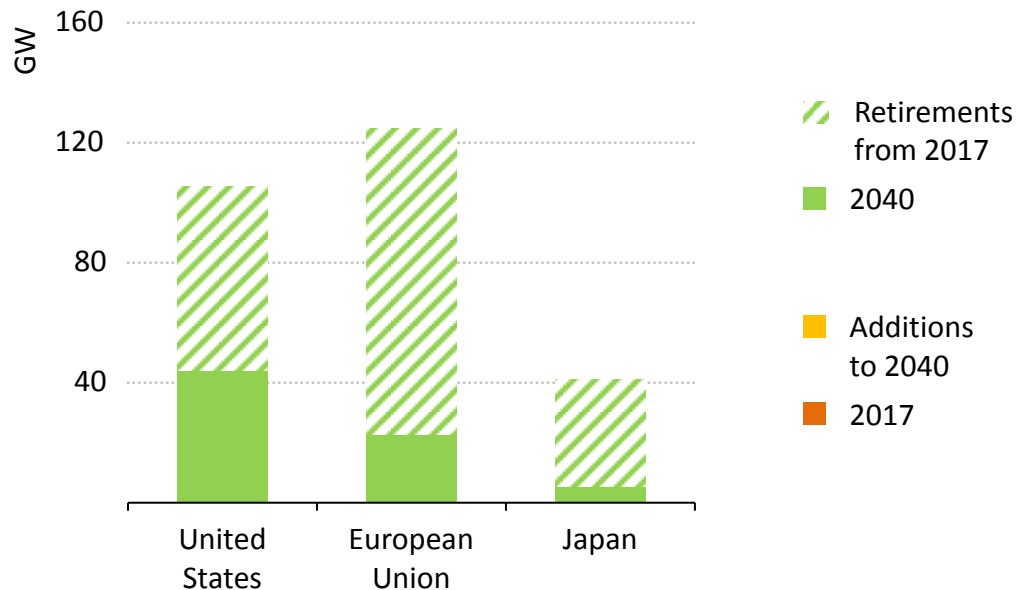


*Renewables make up two-thirds of all capacity additions worldwide to 2040, capturing 70% of power plant investment*

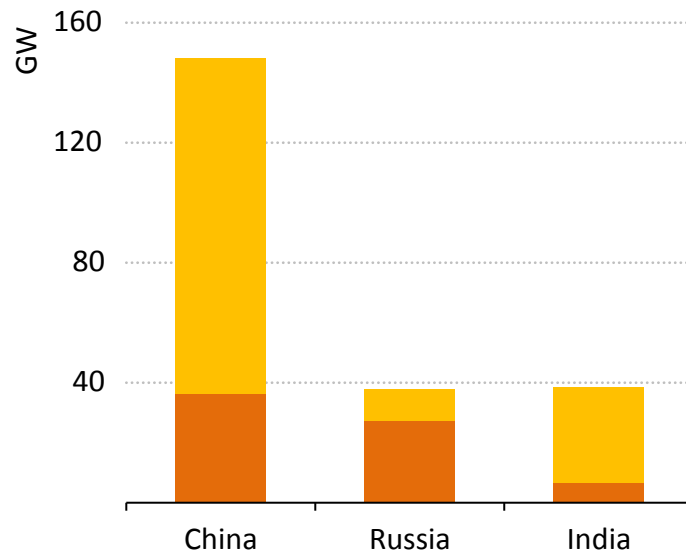


# Two directions for nuclear power

## Without policy changes



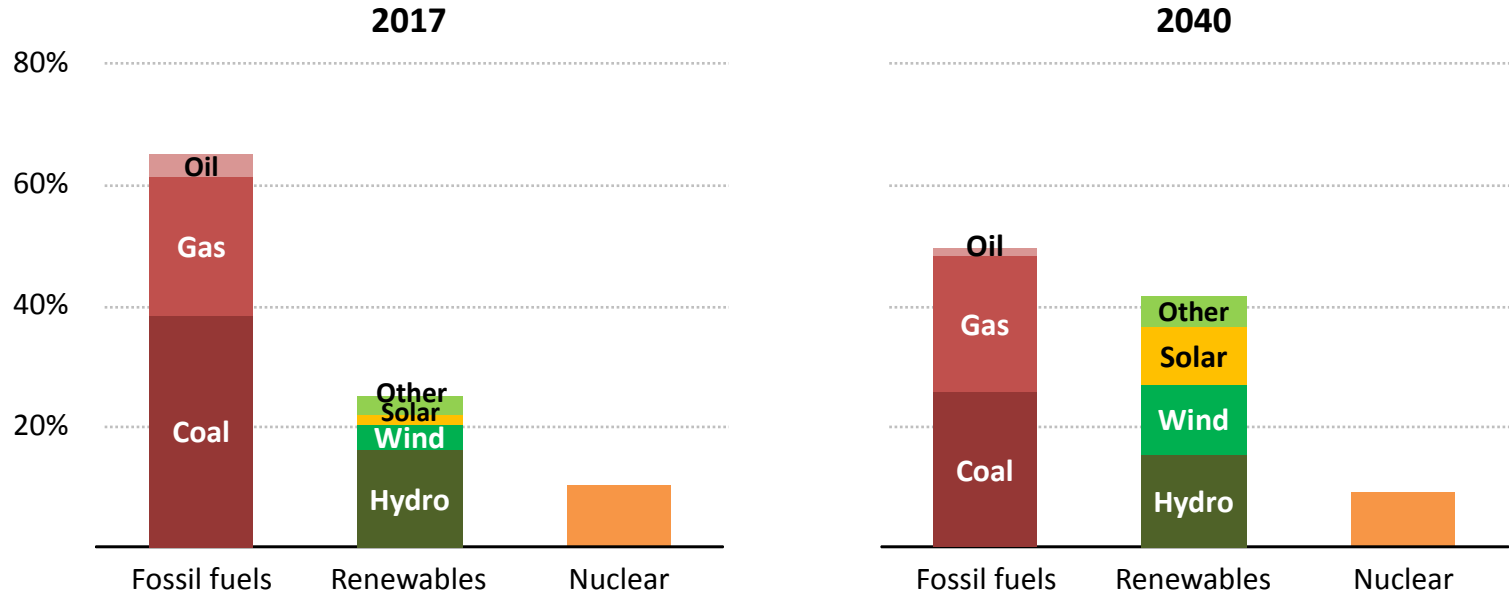
## Growth markets



*The contribution of nuclear power could decline substantially in leading markets, while large growth is coming, as China takes first position within a decade*

# The electricity landscape is transforming

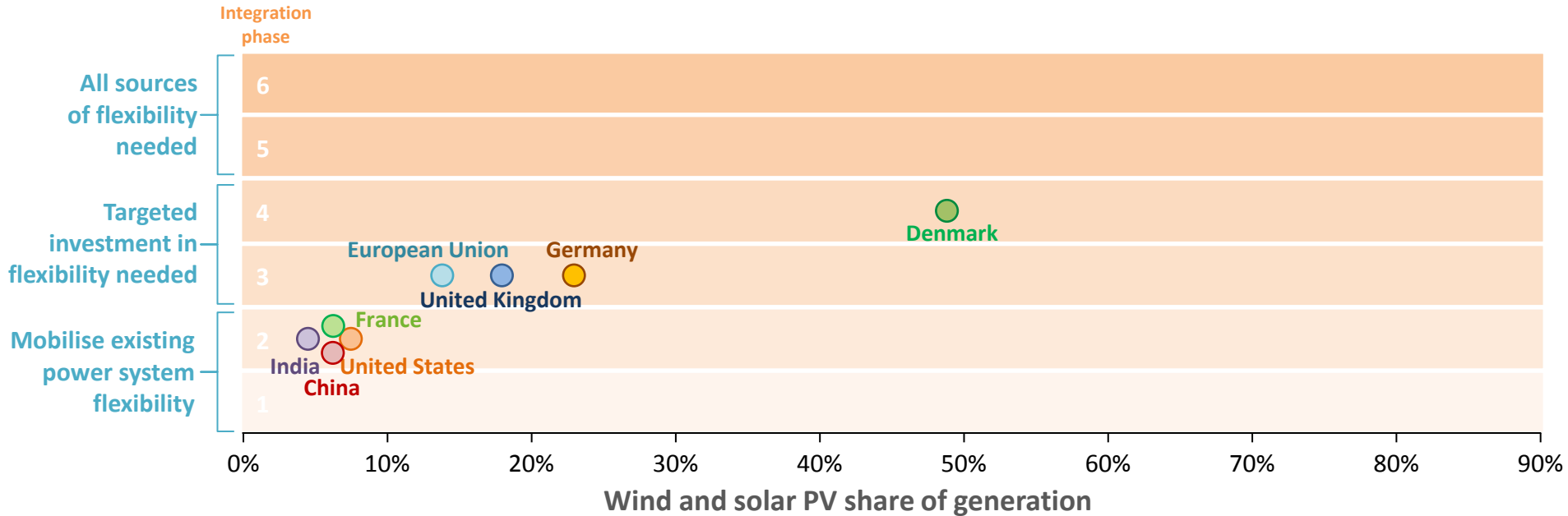
World electricity generation mix by source



*Coal and renewables switch roles by 2040, mainly driven by policy support and accelerated by the improving competitiveness of renewables*

# Flexibility: the cornerstone of tomorrow's power systems

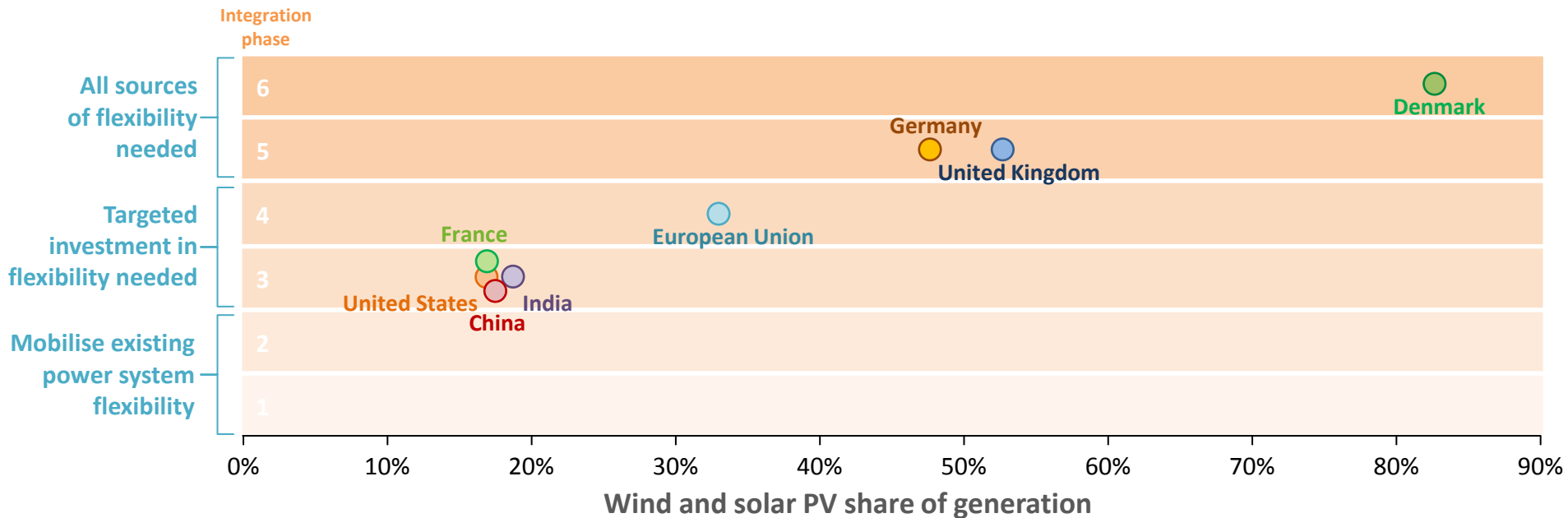
Phases of integration with variable renewables share, 2017



*Higher shares of variable renewables raise flexibility needs and call for reforms to deliver investment in power plants, grids & energy storage, and unlock demand-side response*

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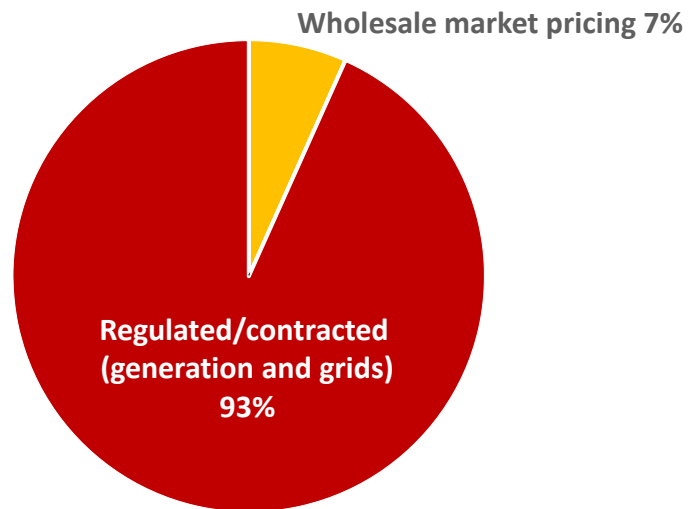
Phases of integration with variable renewables share, 2030



*Higher shares of variable renewables raise flexibility needs and call for reforms to deliver investment in power plants, grids & energy storage, and unlock demand-side response*

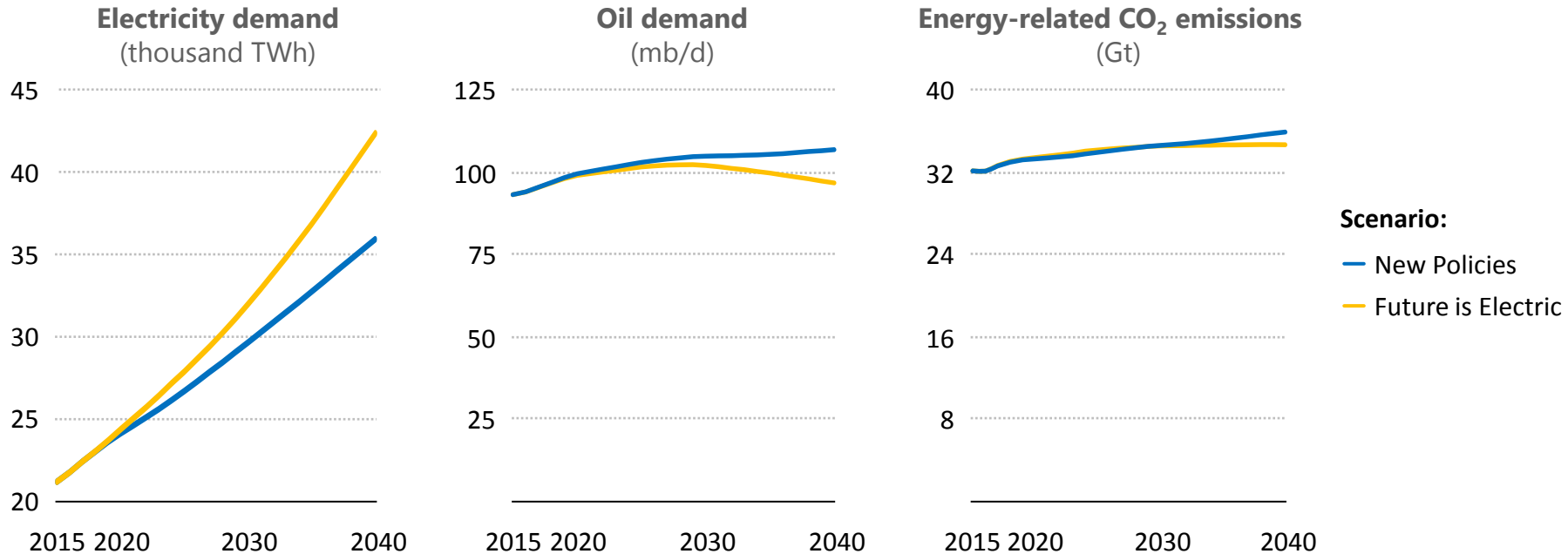
# Our energy destiny lies with governments

Power sector investment to 2040  
**\$20 trillion**



*Power sector investment continues to be driven by regulated market frameworks*

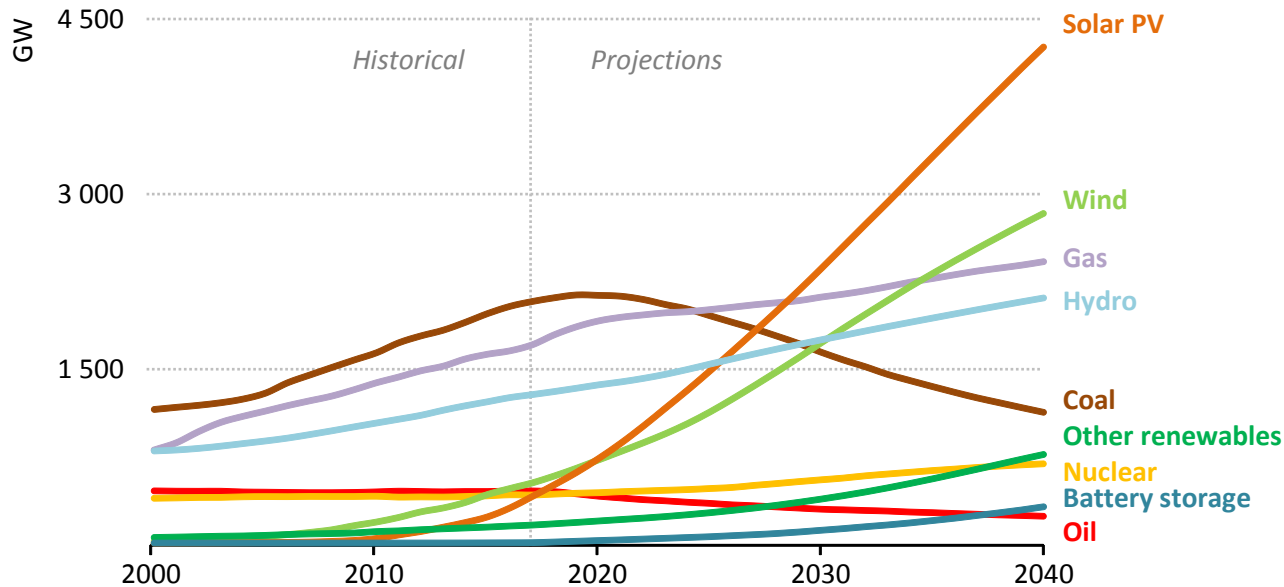
# What if the future is electric?



*Increased electrification leads to a peak in oil demand, avoids 2 million air pollution-related premature deaths, but does not necessarily lead to large CO<sub>2</sub> emissions reductions*

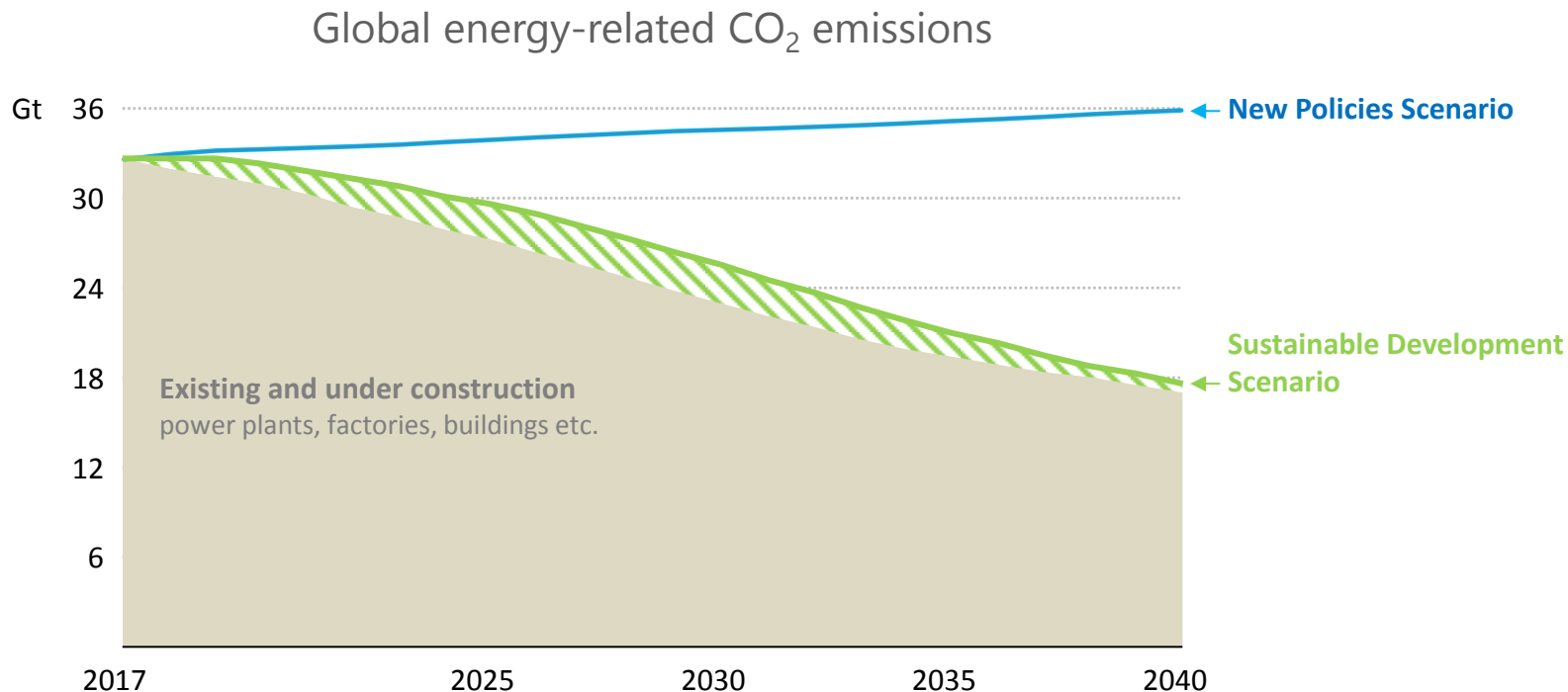
# Accelerating action in power is key to the energy transition

Installed power generation capacity by source in the Sustainable Development Scenario



*Coal-fired power capacity without CCUS declines by two-thirds to 2040, while solar and wind power move in front, reaching half of total installed capacity*

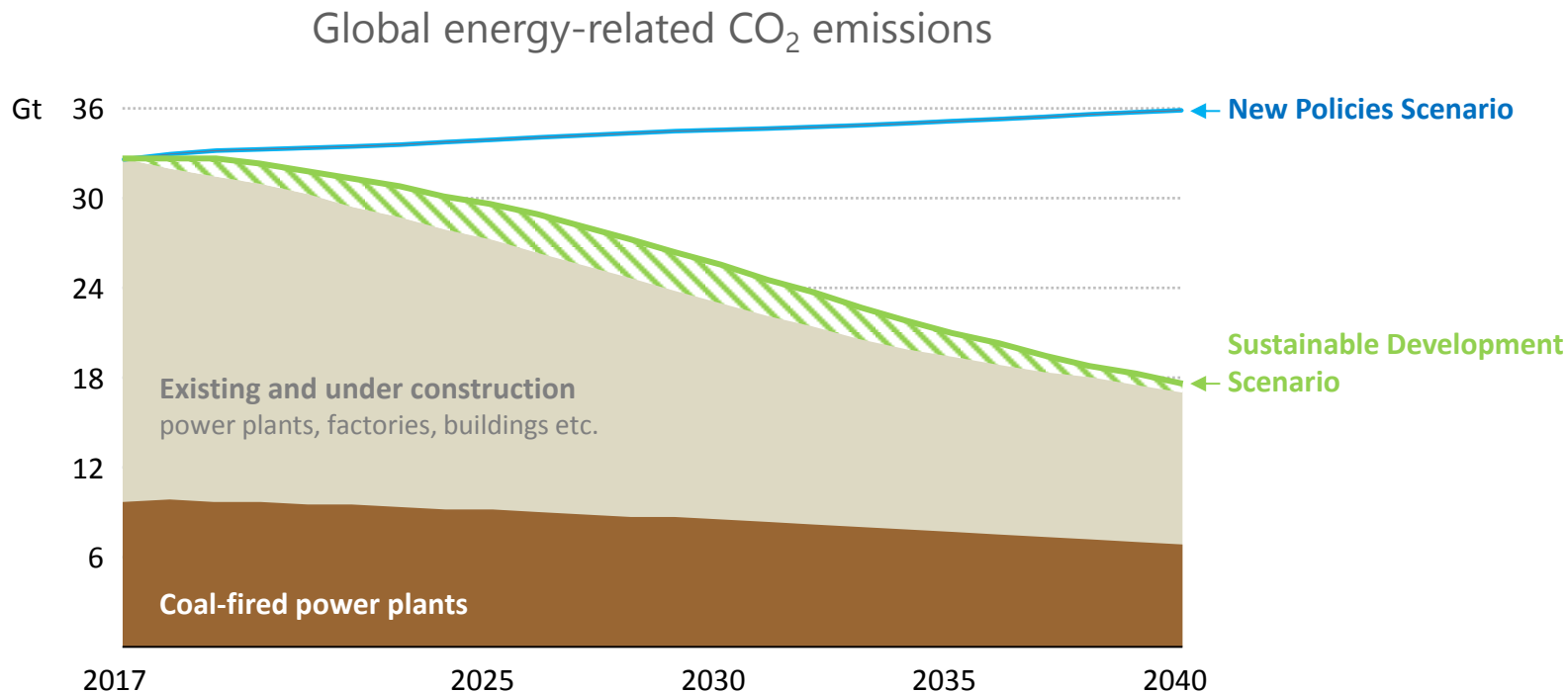
# Can we unlock a different energy future?



*Coal plants make up one-third of CO<sub>2</sub> emissions today and half are less than 15 years old; policies are needed to support CCUS, efficient operations and technology innovation*

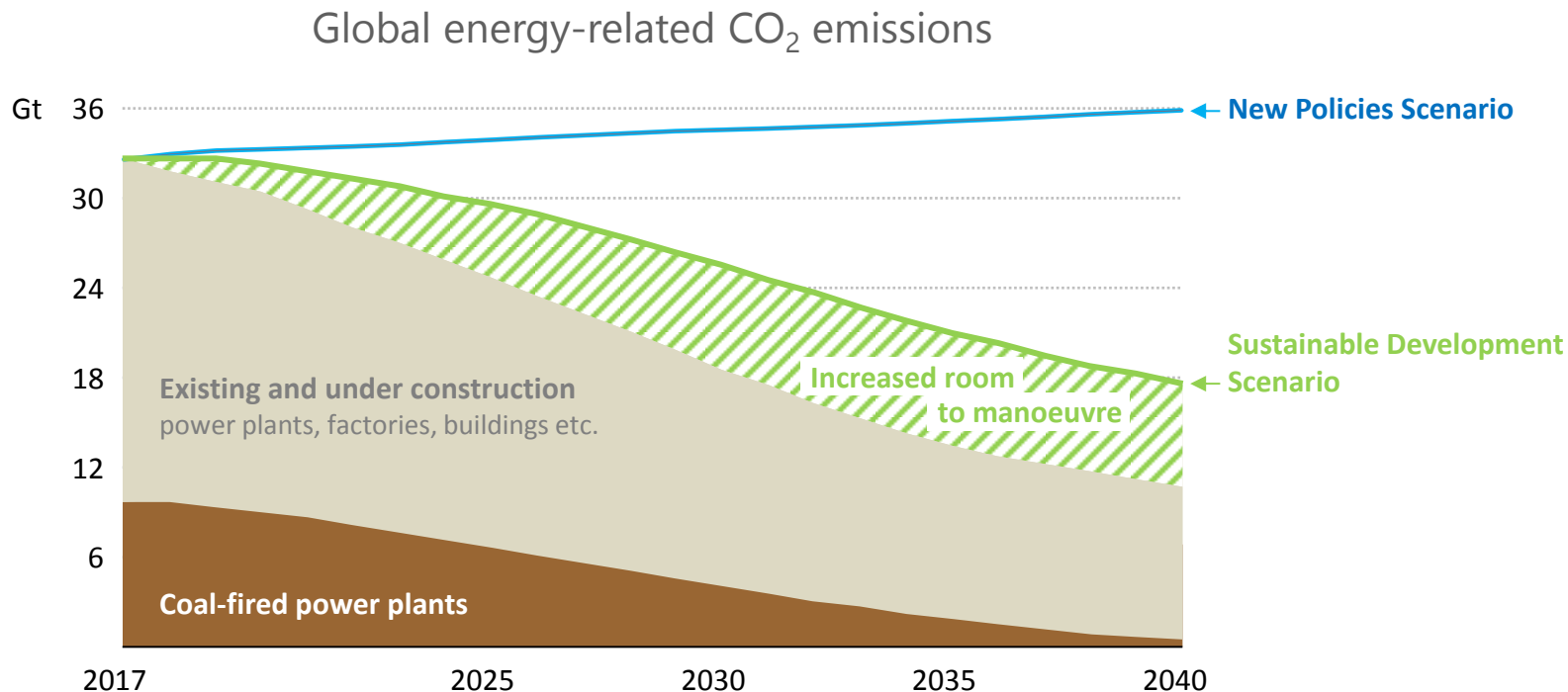


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- The rapid growth of electricity brings huge opportunities; but market designs need to deliver both electricity *and* flexibility to keep the lights on
- A comprehensive strategy to electrify end uses and decarbonise the power sector is needed to achieve environmental goals
- There is no single solution to turn emissions around: renewables, efficiency & a host of innovative technologies, including storage, CCUS & hydrogen, are all required
- Achieving energy for all is essential for achieving the Sustainable Development Goals, especially for improving livelihoods, health, gender equality and education
- The future pathway for energy is open: governments will determine where our energy destiny lies

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