equinor

Energy Perspectives 2019

Long-term macro and market outlook

Eirik Wærness,
Senior vice president and Chief economist
Oslo, June 2019

In which direction is the energy world moving?

Recent signposts show diverging paths, in terms of:

- Economic growth
- Energy efficiency
- Technology development
- Market regulations
- Geopolitics

- Energy demand up over 2% in 2018
- Gas is the fastest growing fossil fuel
- Renewable costs dropping

- More efficient carbon pricing
- Booming EV sales
- Record solar and wind capacity additions

- CO_2 emissions up 2% in 2018
- Coal demand up
- US-China trade tensions
- Multiple conflicts in the Middle East

Two scenarios that capture where the world is currently heading ...

Reform

- Market and technology drive
- Current policy momentum
- Geopolitics characterized by competition and cooperation

Rivalry

- Geopolitical uncertainty and volatility
- Focus on energy security
- Patchy climate policies

… and one where it needs to go

Renewal

- Consistent with well below 2° target
- Immediate and coordinated policy action
- Benign geopolitical environment

The Energy World in 2050

2.0-2.2 x
Size of the global economy, compared to 2018

29-49 %
Share of solar and wind in global electricity generation, up from 7% in 2018

3,200-4,800 bcm
Global gas demand, compared to 3,900 bcm in 2018

10-36 Gt
Global energy-related CO_2 emissions, compared to 33.1 Gt in 2018

0.6-1.3 bn
Electric vehicles on the road, equivalent to 30% - 90% of the total LDV fleet

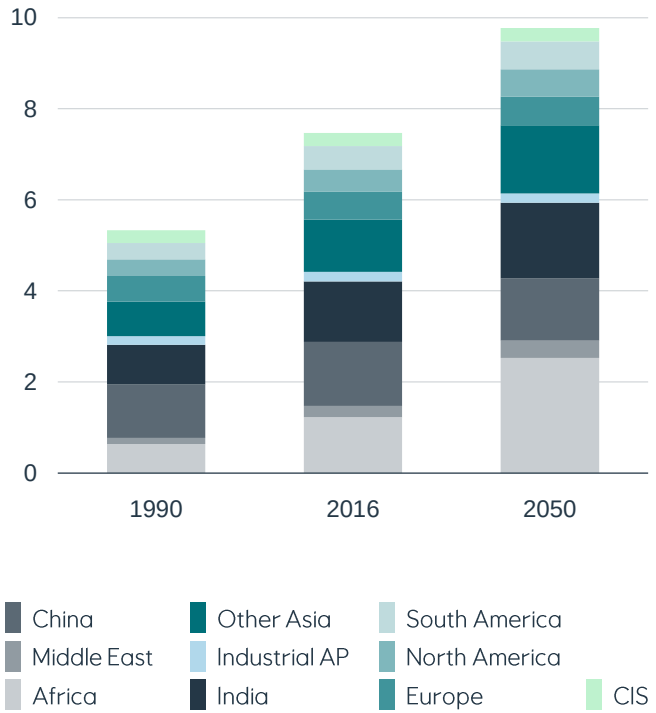
52-118 mbd
Global oil demand, compared to 99 mbd in 2018

The energy transition is part of a bigger sustainability picture

Population increase, economic growth, equity, 17 partly interdependent Sustainable Development Goals

Global population by region

Billion

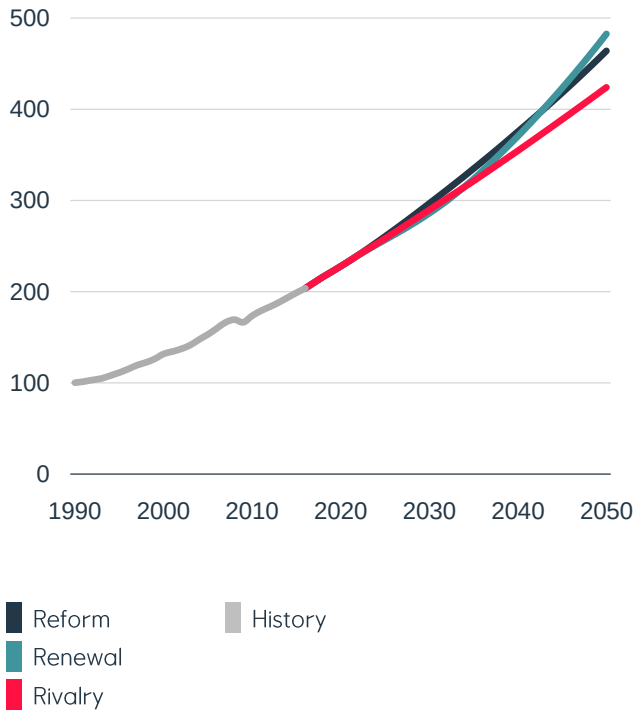


Source: United Nations

Source: United Nations

World GDP by scenario

Index, 1990=100



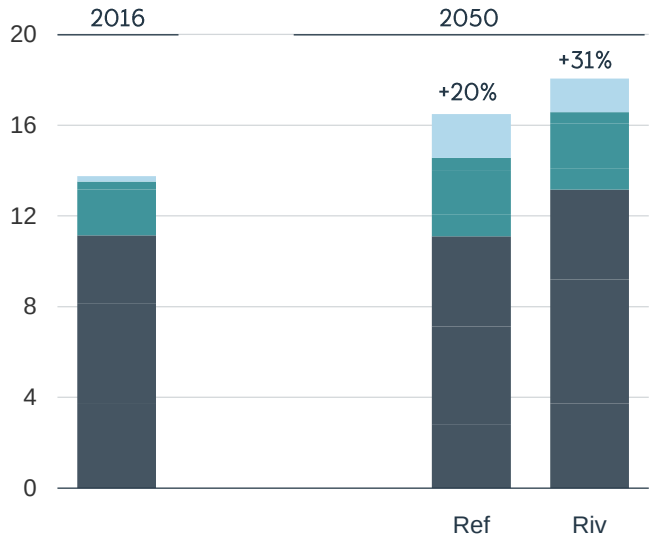
Source: IEA (history), Equinor (projections)

Where are energy markets moving today? Rivalry and Reform

Large changes, but far from a 2° world. Fossil fuels lose share, but grow in absolute terms. Massive growth in renewable electricity.

World energy demand

Billion toe

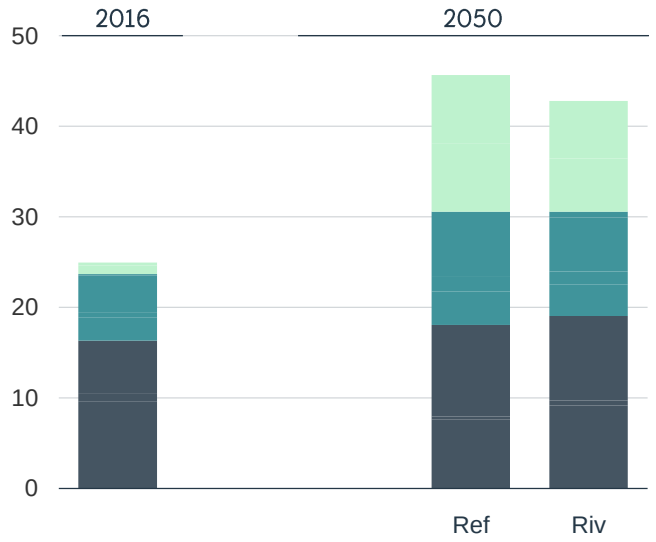


New renewables
Other
Fossil fuels

Source: IEA (history), Equinor (projections)

Electricity generation

Thousand TWh

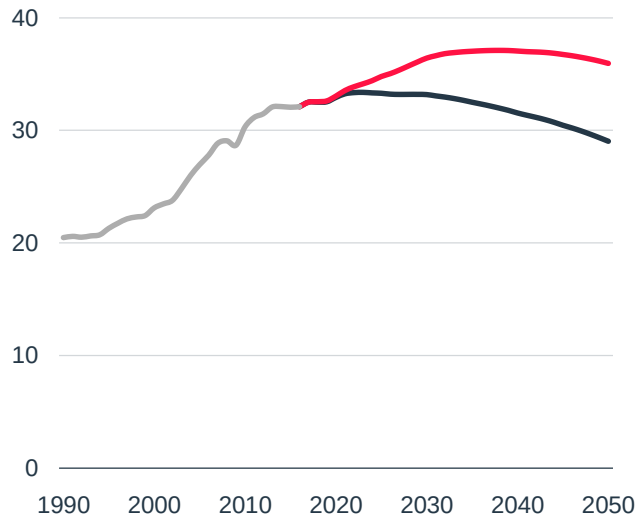


Solar & Wind
Other
Fossil fuels

Source: IEA (history), Equinor (projections)

World energy-related CO_2 emissions

Billion tonnes



Reform
History
Rivalry

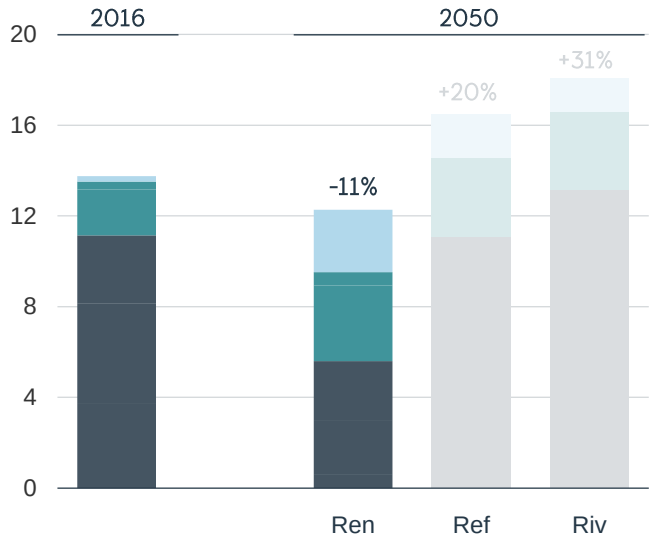
Source: IEA (history), Equinor (projections)

Renewal – where the world needs to go

Global energy-related CO_2 emissions need to be reduced by over 60% by 2050 – satisfying growing energy demand, much less fossil fuels

World energy demand

Billion toe

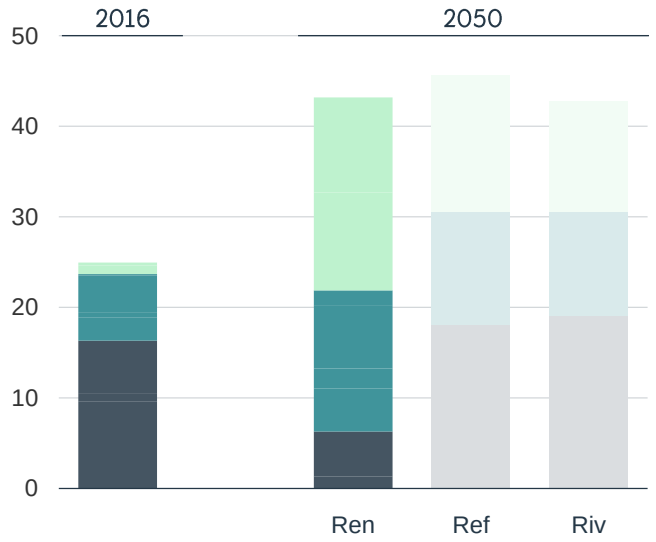


New renewables
Other
Fossil fuels

Source: IEA (history), Equinor (projections)

Electricity generation

Thousand TWh

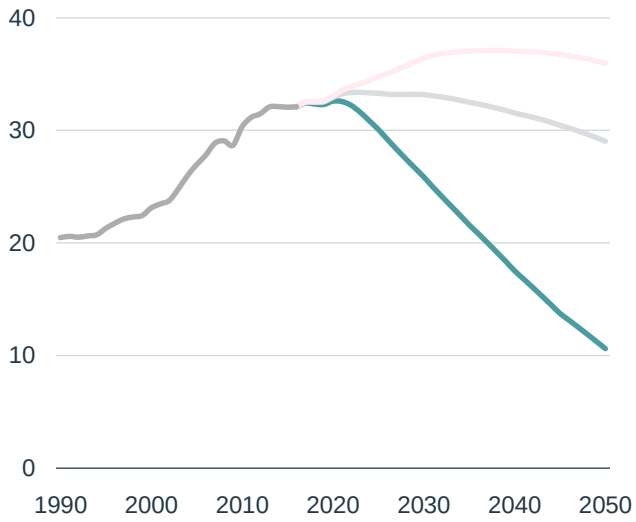


Solar & Wind
Other
Fossil fuels

Source: IEA (history), Equinor (projections)

World energy-related CO_2 emissions

Billion tonnes



Reform
Renewal
Rivalry
History

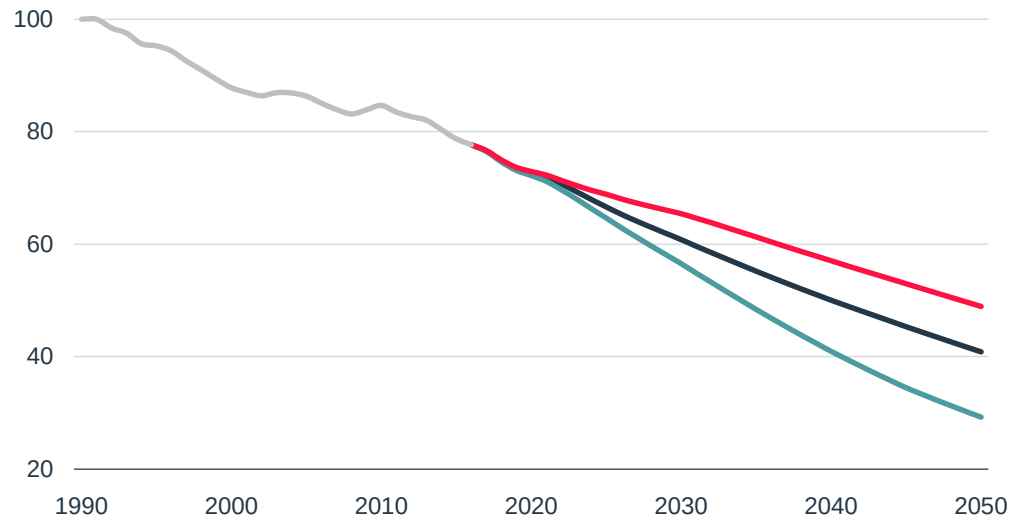
Source: IEA (history), Equinor (projections)

Energy efficiency needs to improve at 3x historical speed

Electrification is a key measure to improve efficiency and decarbonise

Energy intensity

Index, 1990=100

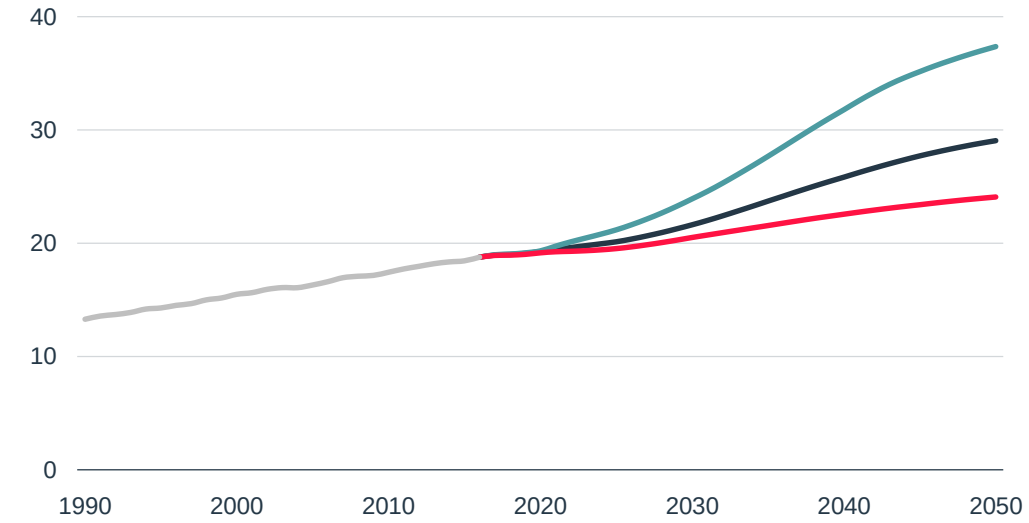


Reform
Renewal
Rivalry
History

Source: IEA (history), Equinor (projections)

Electricity share of Total Final Energy Consumption (TFC)

Percent



Reform
Renewal
Rivalry
History

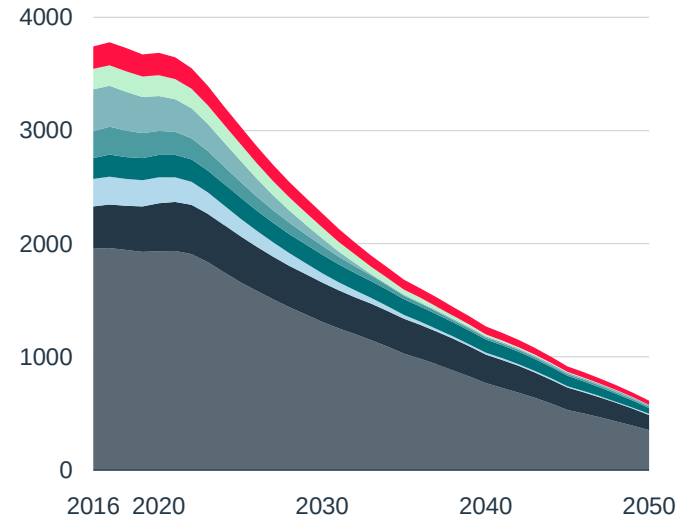
Source: IEA (history), Equinor (projections)

Massive transition needed to deliver on Renewal

Coal demand decline, growth in new renewables, significant CCUS development

Global coal demand

Million toe

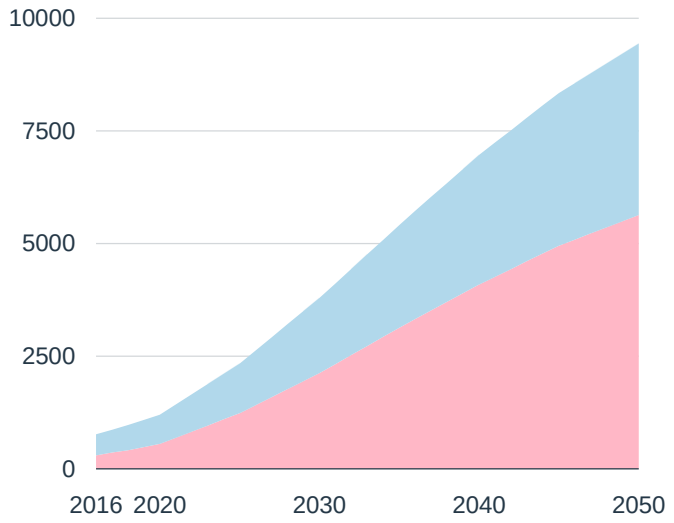


Industrial AP
India
China
North America
Europe
Other Asia
Rest of the world
CIS

Source: IEA (history), Equinor (projections)

Global installed solar PV and wind capacity

GW

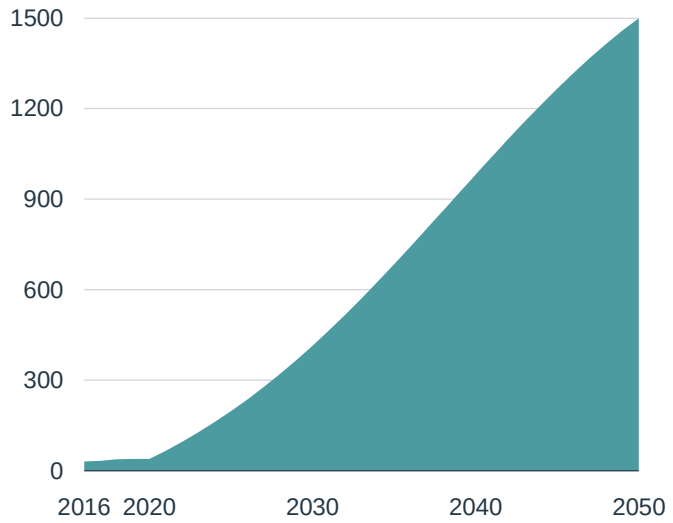


Wind
Solar PV

Source: IEA (history), Equinor (projections)

Global carbon capture, utilization and storage

Million tonnes

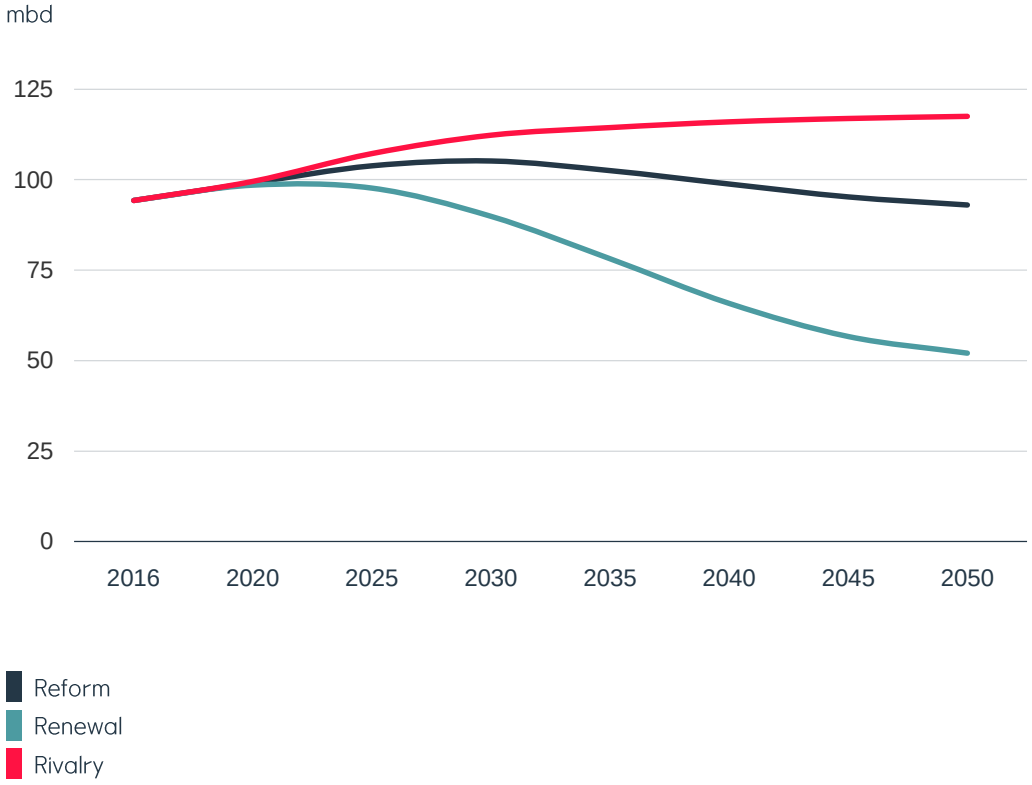


Source: Global CCS Institute (history), Equinor (projections)

Wide outcome space for oil demand

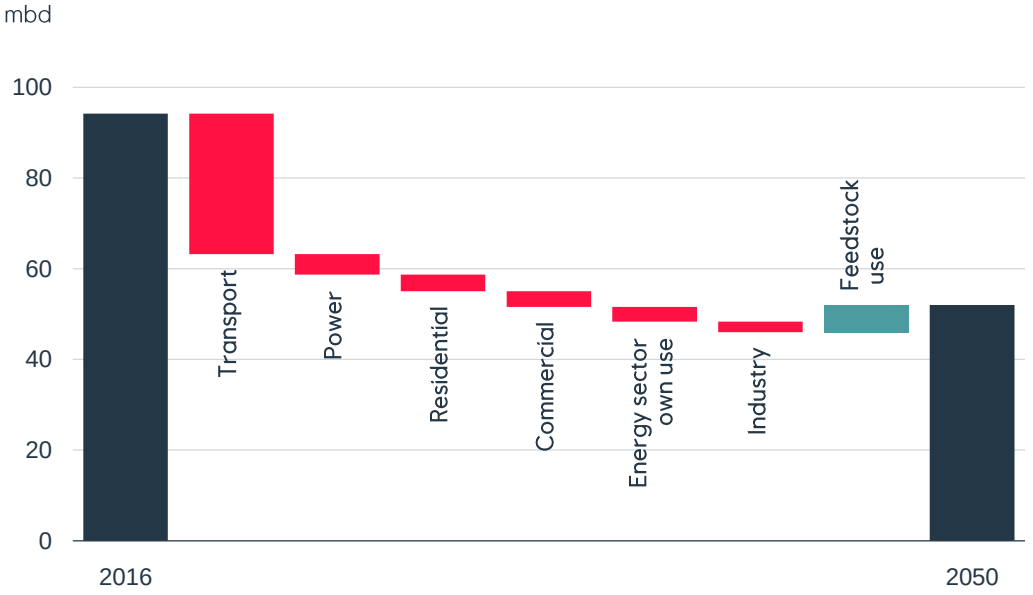
Transport is the key sector for long-term oil demand

Oil demand by scenario
2016-2050



Source: IEA (history), Equinor (projections)

Change in global oil demand by sector in Renewal
2016-2050



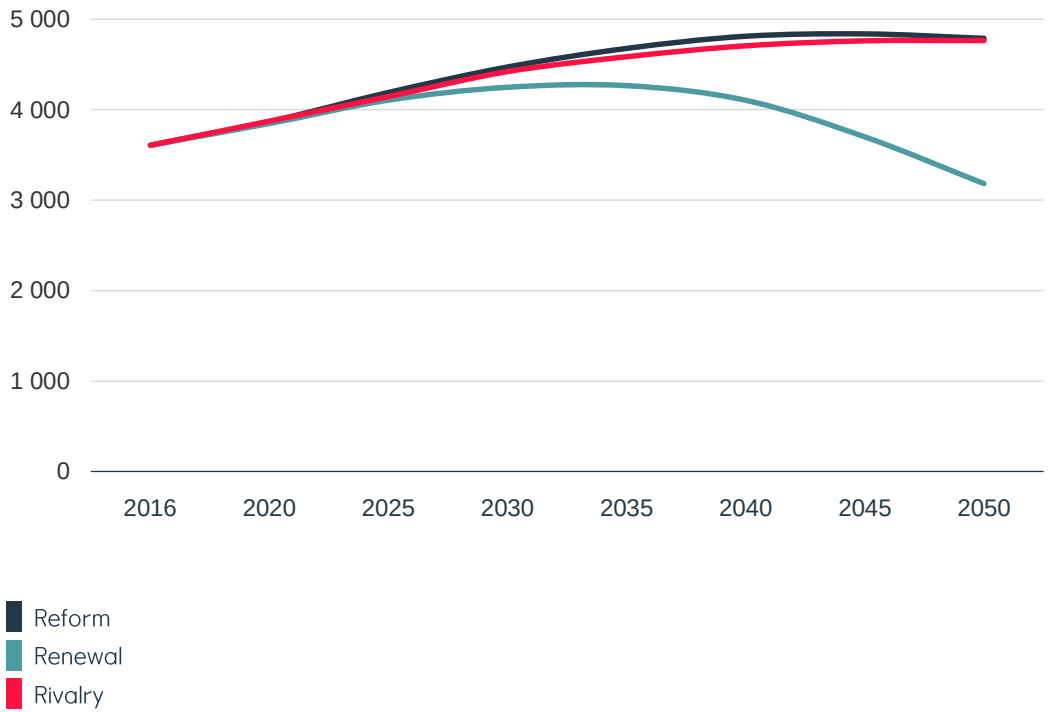
Source: IEA (history), Equinor (projections)

Natural gas – robust development until mid-30s

China and India key regions in Renewal – gas supports coal phase-out

Change in gas demand by scenario 2016-2050

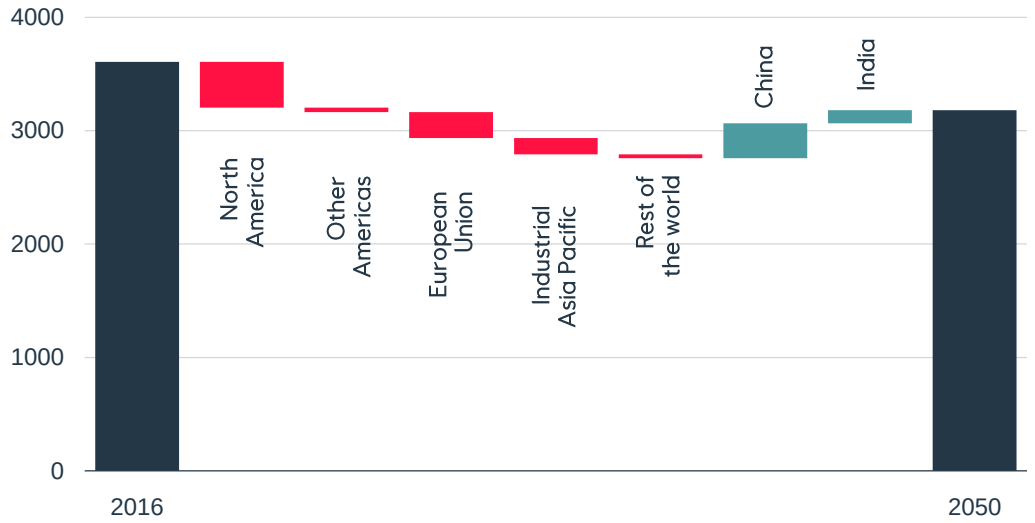
Bcm



Source: IEA (history), Equinor (projections)

Change in global gas demand by region in Renewal 2016-2050

Bcm

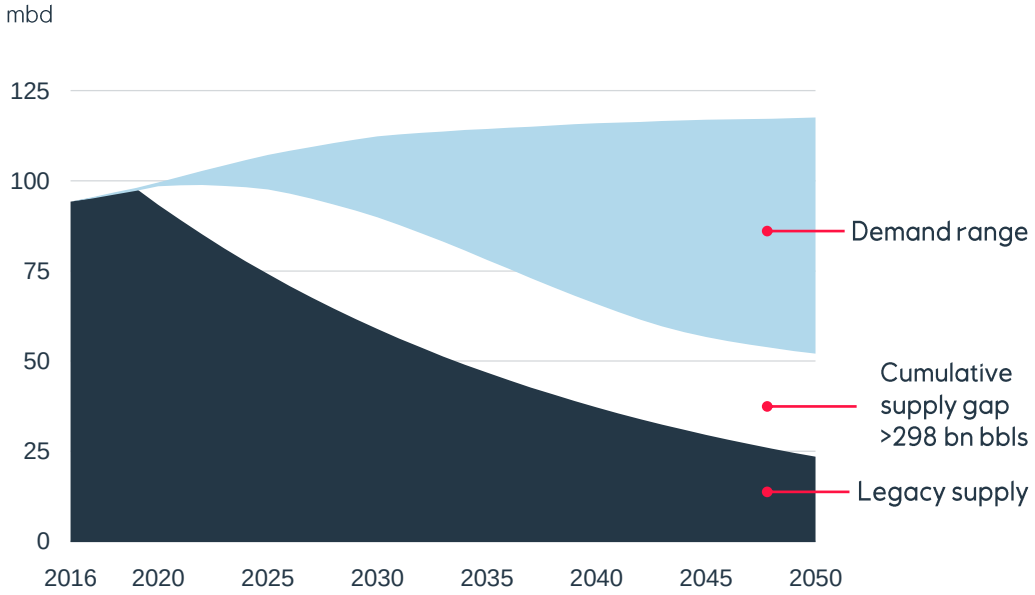


Source: IEA (history), Equinor (projections)

What is the need for new oil and gas investments?

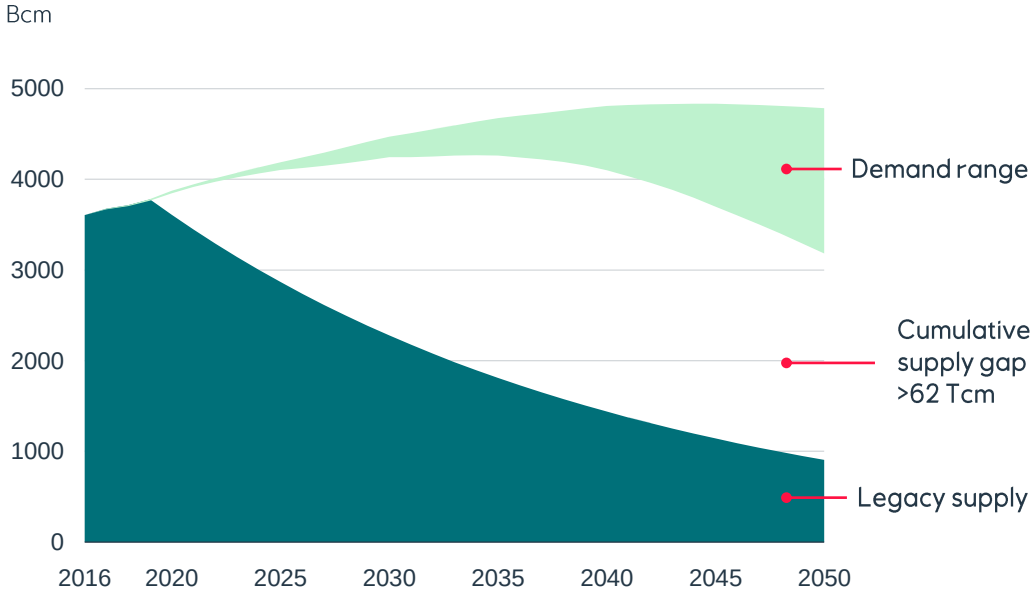
Large oil and gas investments in all scenarios, although significantly less in Renewal

Oil demand and supply from existing fields



Source: IEA (history), Equinor (projections)

Gas demand and supply from existing fields



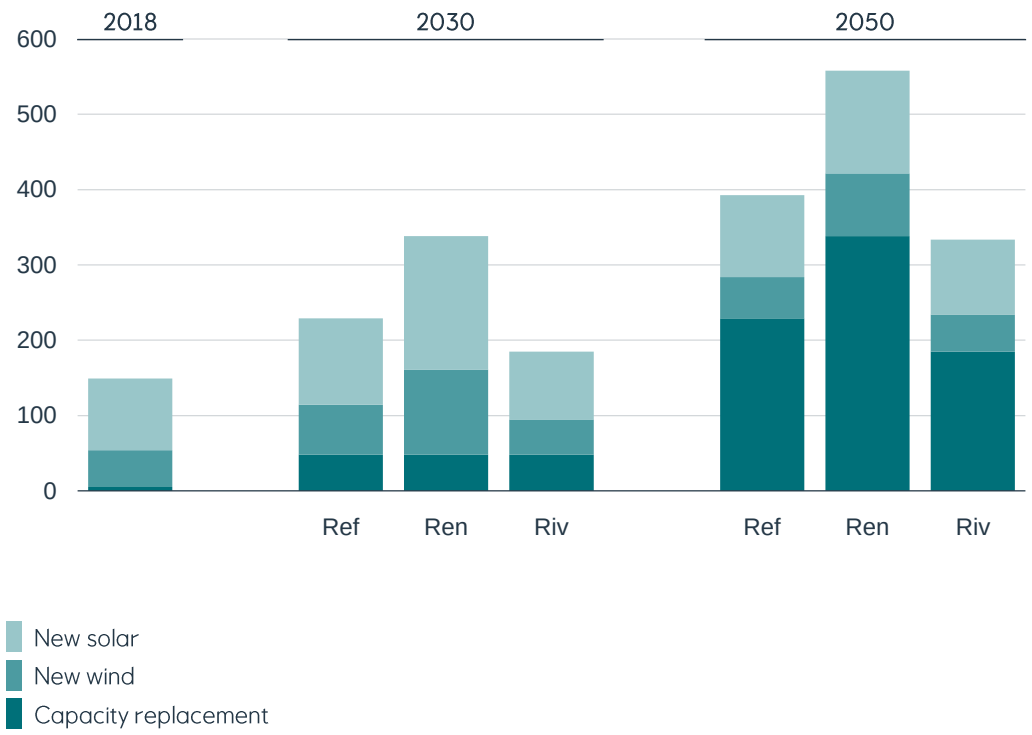
Source: IEA (history), Equinor (projections)

Enormous investments needed in solar, wind and batteries

Large investments to grow and maintain solar/wind capacity; battery market to expand by up to 20 times by 2030

Solar and wind annual capacity additions

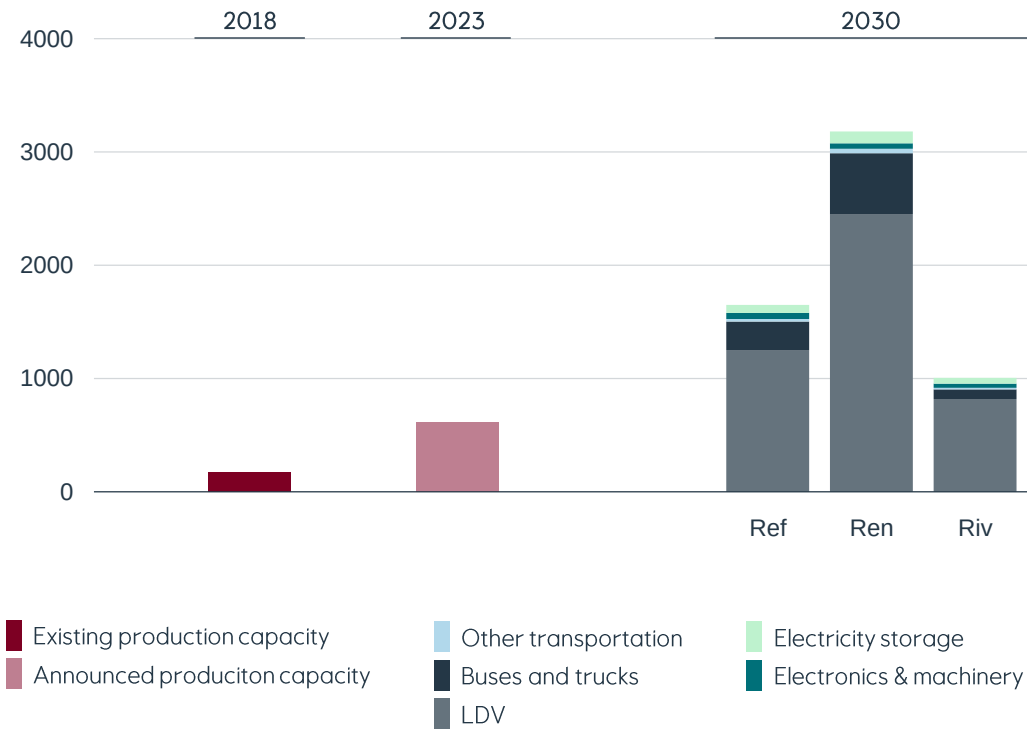
GW



Source: Various sources (history), Equinor (projections)

Annual battery production capacity and demand

GWh



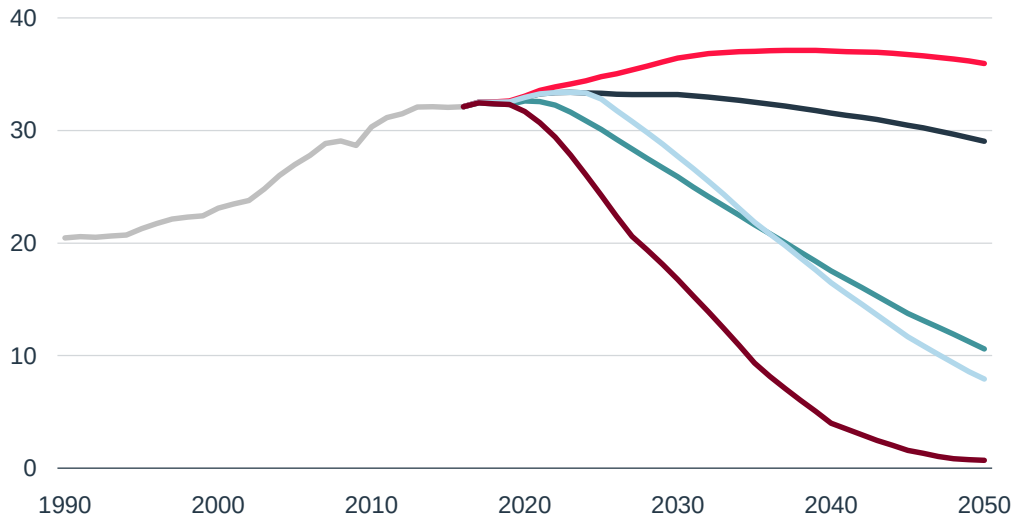
Source: PIRA, Equinor (projections)

What if Renewal is delayed, and what about the 1.5° ambition?

Transition becomes much more challenging, in terms of need for speed, rapid fuel mix changes, challenges for growth and need for CCUS

World energy-related CO_2 emissions

Billion tonnes

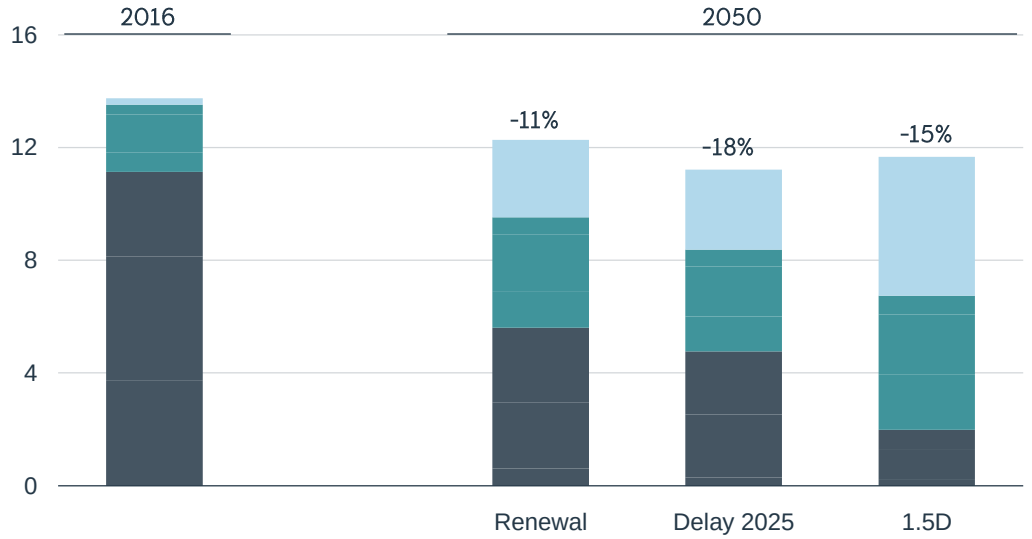


Reform
Renewal
Rivalry
History
Delay 2025
1.5 degrees

Source: IEA (history), Equinor (projections)

World energy demand

Billion toe



New renewables
Other
Fossil fuels

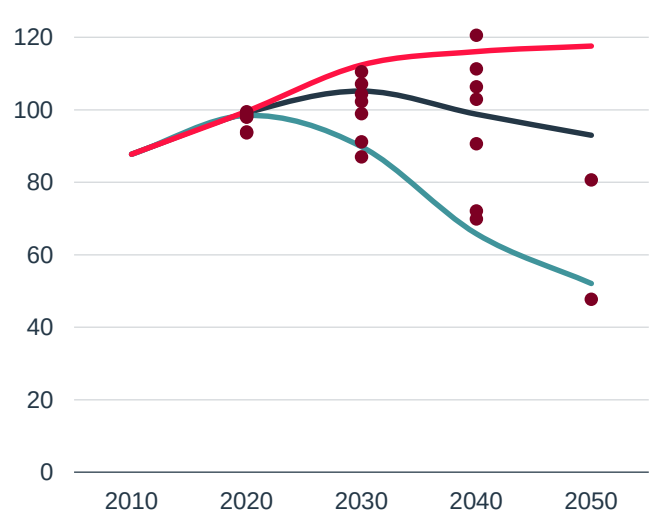
Source: IEA (history), Equinor (projections)

Benchmarking: How do Energy Perspectives scenarios compare?

Wide outcome space – illustrating use of different assumptions

Global oil demand

mbd

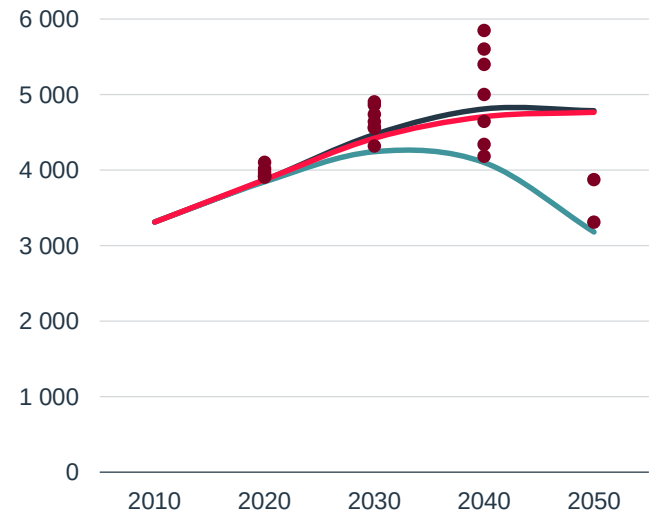


Reform
Other projections
Renewal
Rivalry

Source: Equinor, IEA, BP, Exxon, Shell, DNV GL

Global gas demand

bcm

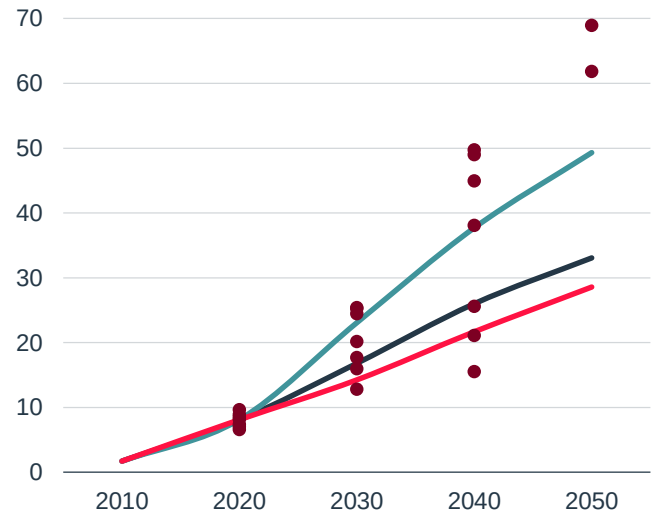


Reform
Other projections
Renewal
Rivalry

Source: Equinor, IEA, BP, Exxon, Shell, DNV GL

Solar PV and wind electricity generation share of total generation

Percentage



Reform
Other projections
Renewal
Rivalry

Source: Equinor, IEA, BP, Shell, DNV GL, Statkraft

Summary

Delivering on a sustainable energy transition is a massive challenge

- Global demand for energy dependent goods, services and activities will continue to grow
- Concerted policy change, addressing consumer choices, is key
- Multiple sustainability goals should be kept in sight during the transition
- Energy transition is happening, but too slowly, given the size, scope and sluggishness of the system
- Development in emerging economies, and in particular in Asia, will determine the outcome
- Large investments needed in the energy system – keep focus on regulation and incentives

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