2024

Energy Perspectives

Global macroeconomic and energy market outlook

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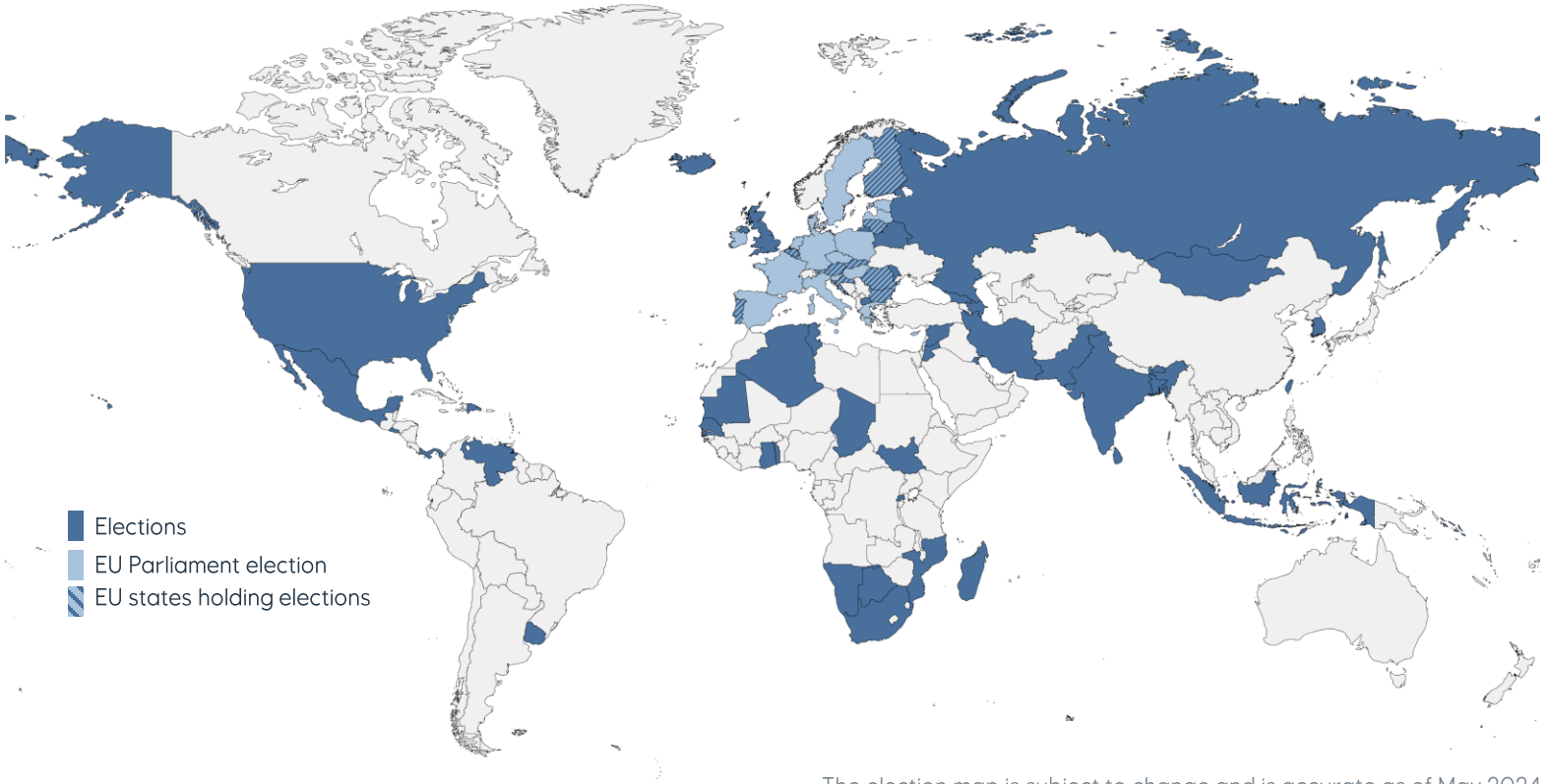
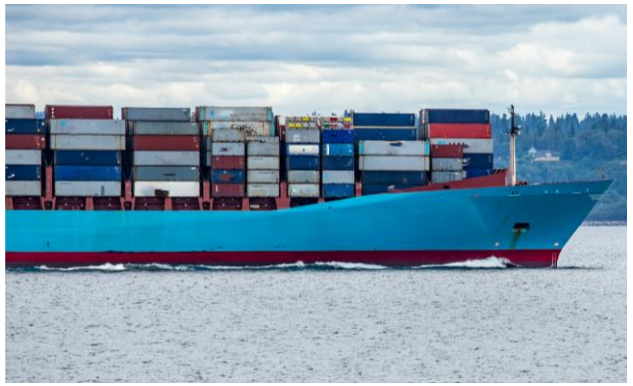
2024 – a year of elections

... in a polarised world...

- Policy instability
- Conflicts and unrest
- Lack of trust
- Economic nationalism
- Bottlenecks and imbalances
- Extreme weather events

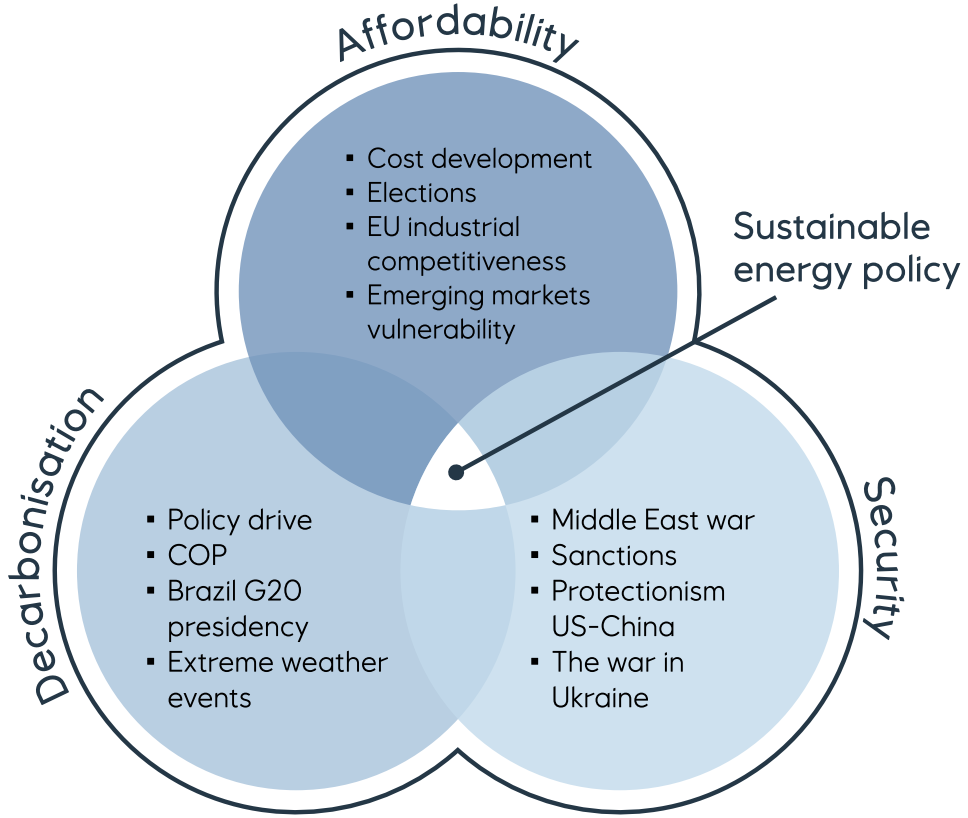


The election map is subject to change and is accurate as of May 2024



The energy trilemma is playing out and affected by events

Sustainability requires a balanced approach, also with a view to global inequalities and just transition



Source: Equinor

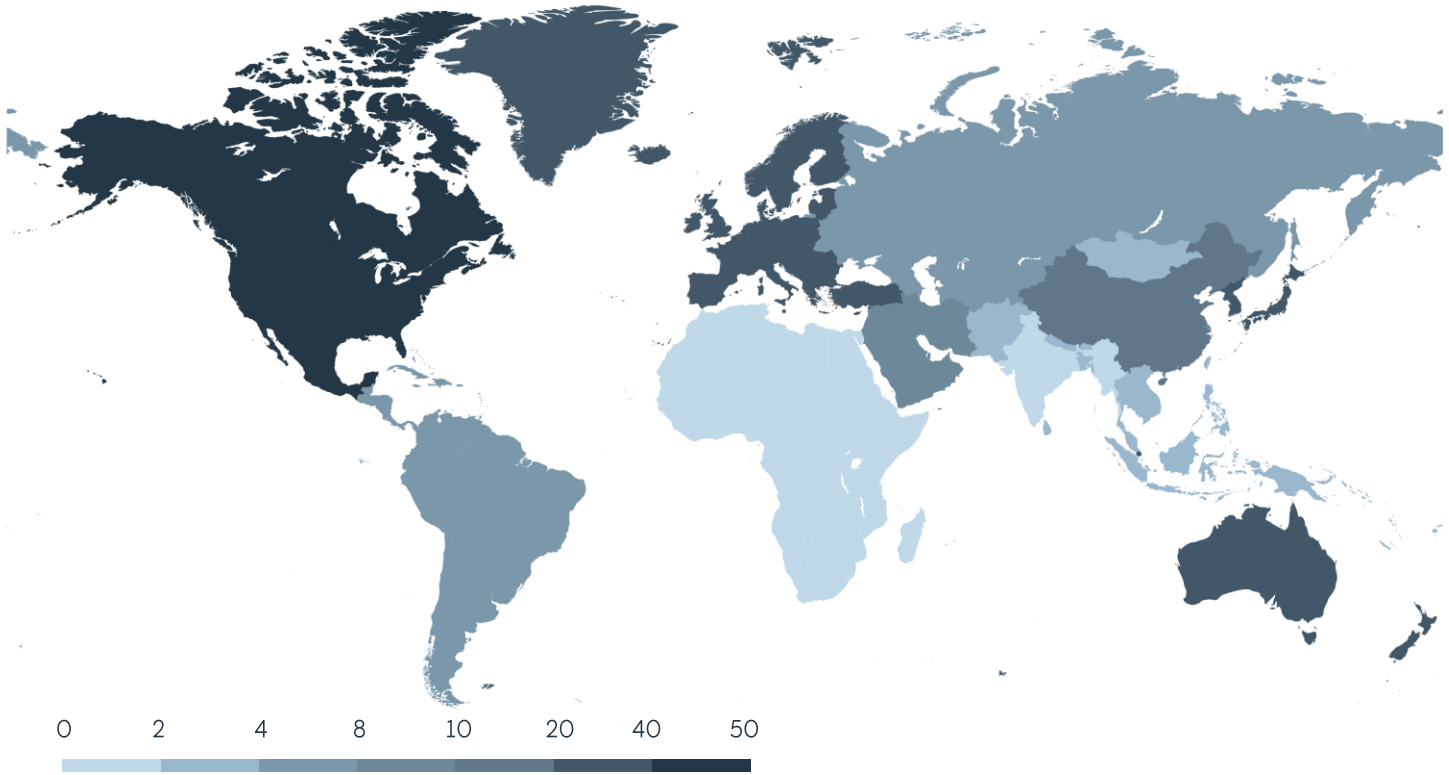
Source: United Nations

The impossible dilemma – reducing income differences while reducing emissions

Emerging economies are less energy efficient than industrialised countries – transfer of wealth will increase energy use and emissions

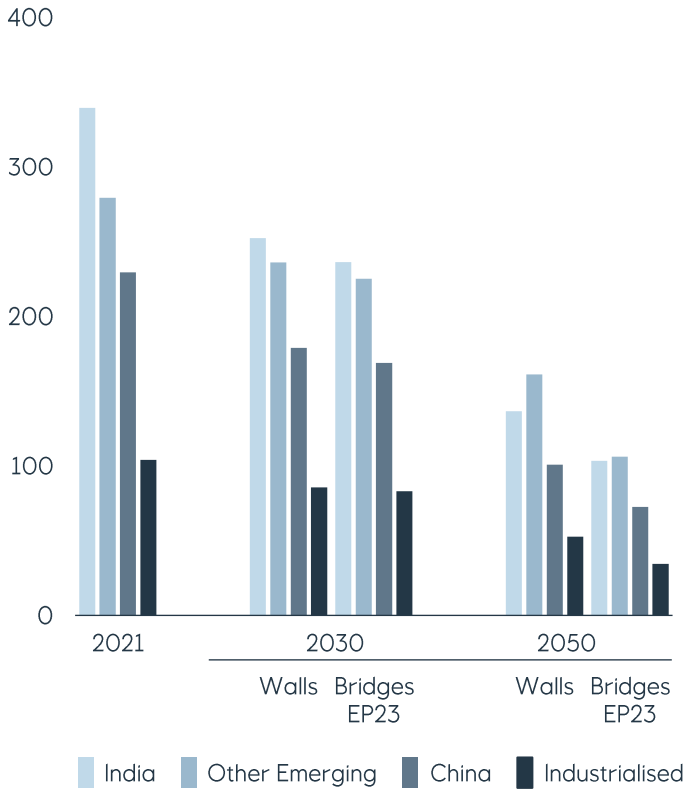
GDP per capita, 2020

Real thousand USD at market exchange rate



Energy Intensity

toe/million USD



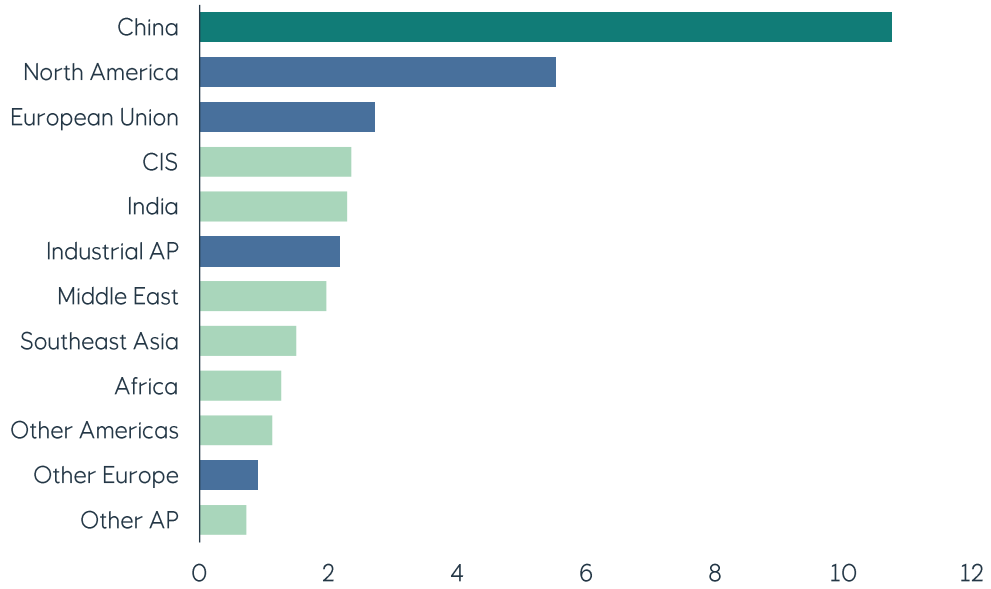
Source: © Oxford Economics Limited 2023 (history), UN (population), MapChart

Large variation in carbon emissions across regions

Accentuates discussions on just transition

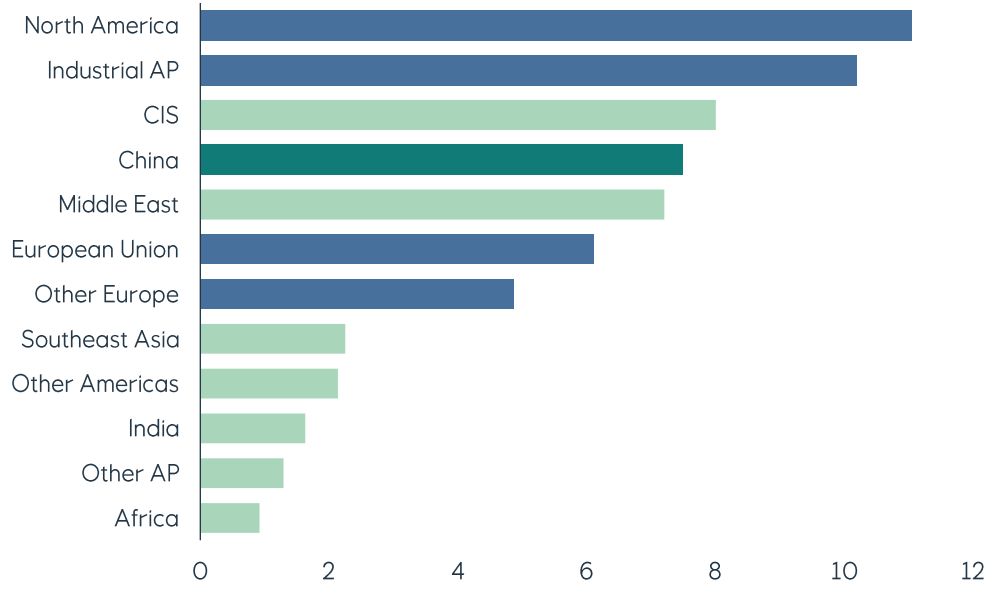
Carbon emissions in 2021

Gt CO_2



Carbon emissions pr capita

tonnes CO_2 per capita



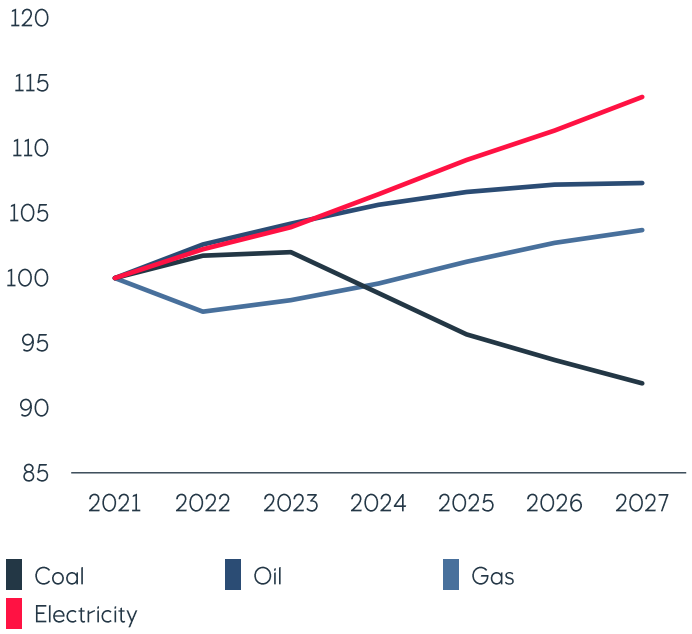
Source: IEA (Carbon emissions, UN (population),

Our outlook to 2027 – moderate economic growth and decline in emissions

Dealing with the aftermath of Covid and energy crisis, supply bottlenecks and re-globalisation

Coal, oil, gas and electricity demand

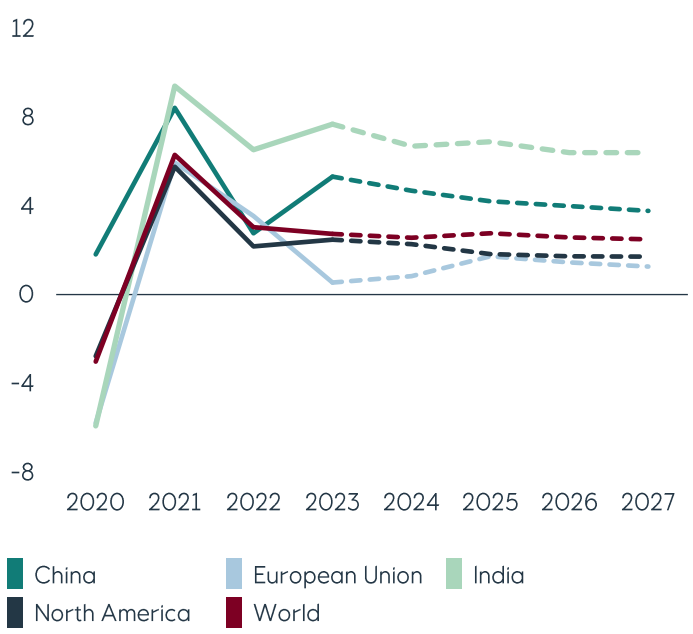
Indexed, 2021 = 100



Source: IEA (history), Equinor (projections)

GDP growth

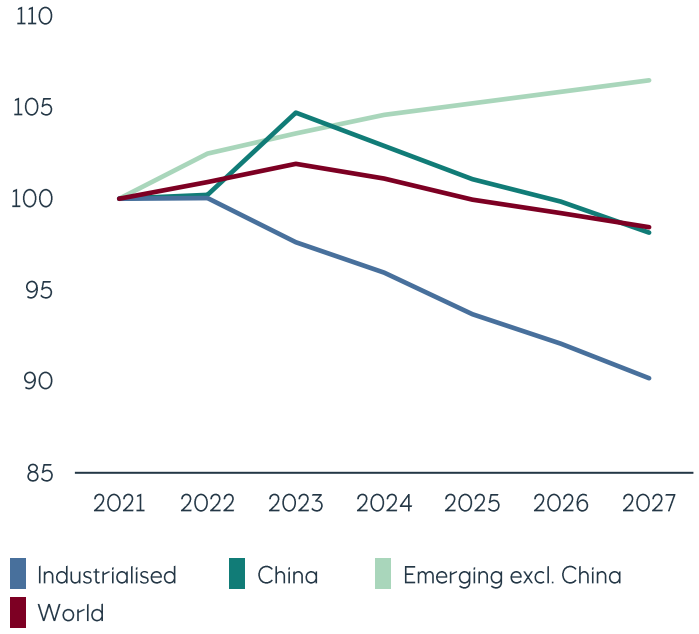
% change y/y



Source: © Oxford Economics Limited 2024 (history), Equinor (forecast from April 2024)

Energy-related CO_2 emissions

Indexed, 2021 = 100



Source: IEA (history), Equinor (projections)

Walls protect but also divide

Walls

- Builds on current market trends, policy developments and policy signals
- The war in Ukraine, crisis in the Middle East, and continued geopolitical tensions are obstacles for global cooperation
- Energy security is very important in the short-to-medium term
- Regional differences in speed and scale of the energy transition

Bridges connect and enable

Bridges

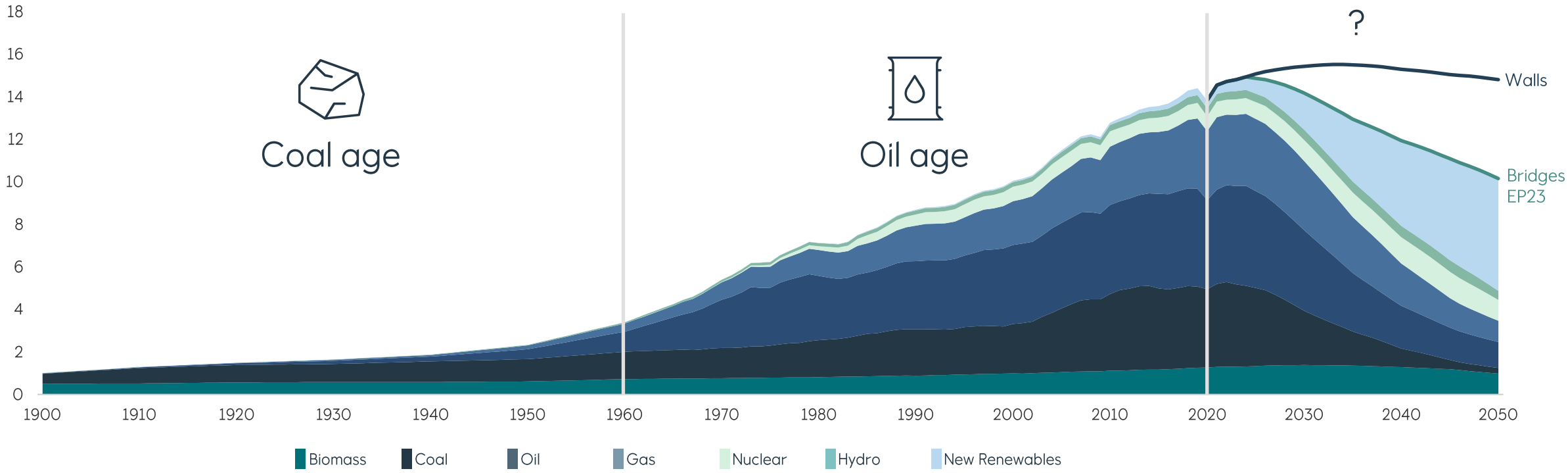
- A benchmark consistent with a 1.5°C temperature rise
- Immediate and coordinated international action needed
- Illustrates the challenges of meeting the ambition in the Paris agreement
- Developed in Energy Perspectives 2023

What does the energy transition hold?

A sustainable future requires an unprecedented transition, and the avoidance of further demand additions

Total primary energy demand

Gtoe



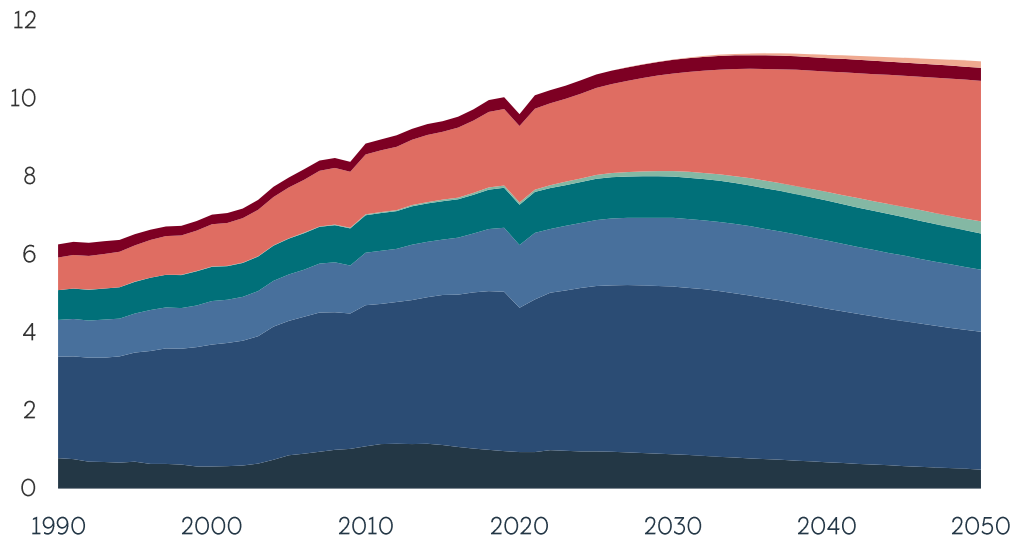
Source: Our World in Data, IEA (history), Equinor (projections)

Energy consumption and power generation in Walls

Declining oil and gas demand trend driven by electrification and increased energy efficiency

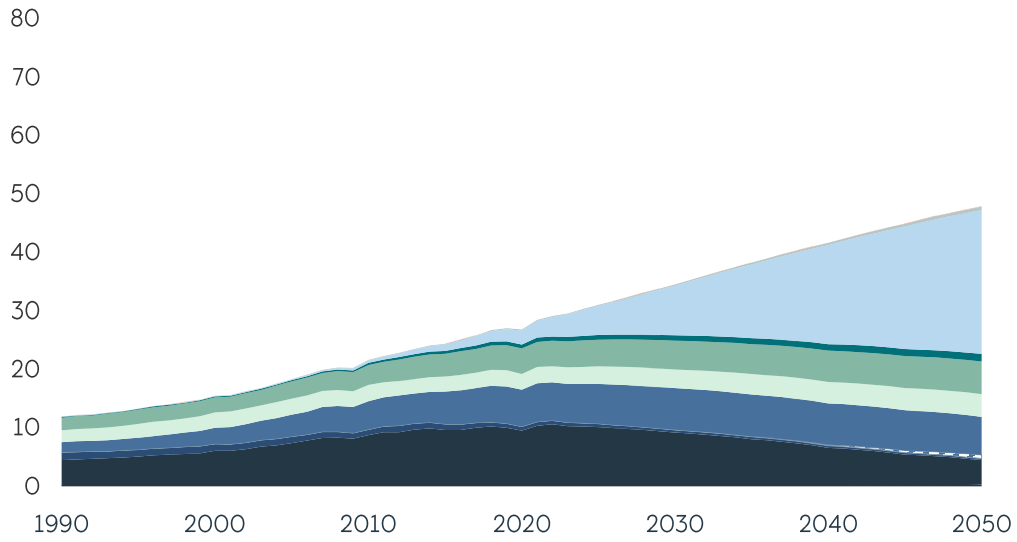
Total final consumption

Gtoe



Power generation

Thousand TWh



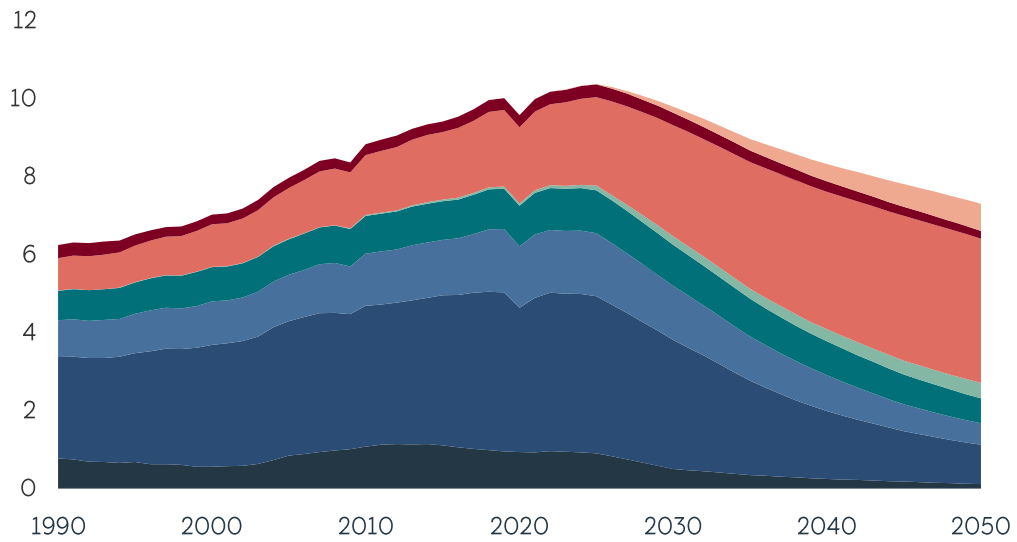
Source: IEA (history), Equinor (projections)

Energy consumption and power generation in Bridges

Little change in fuel mix over preceding 30 years, then massive change in Bridges EP23

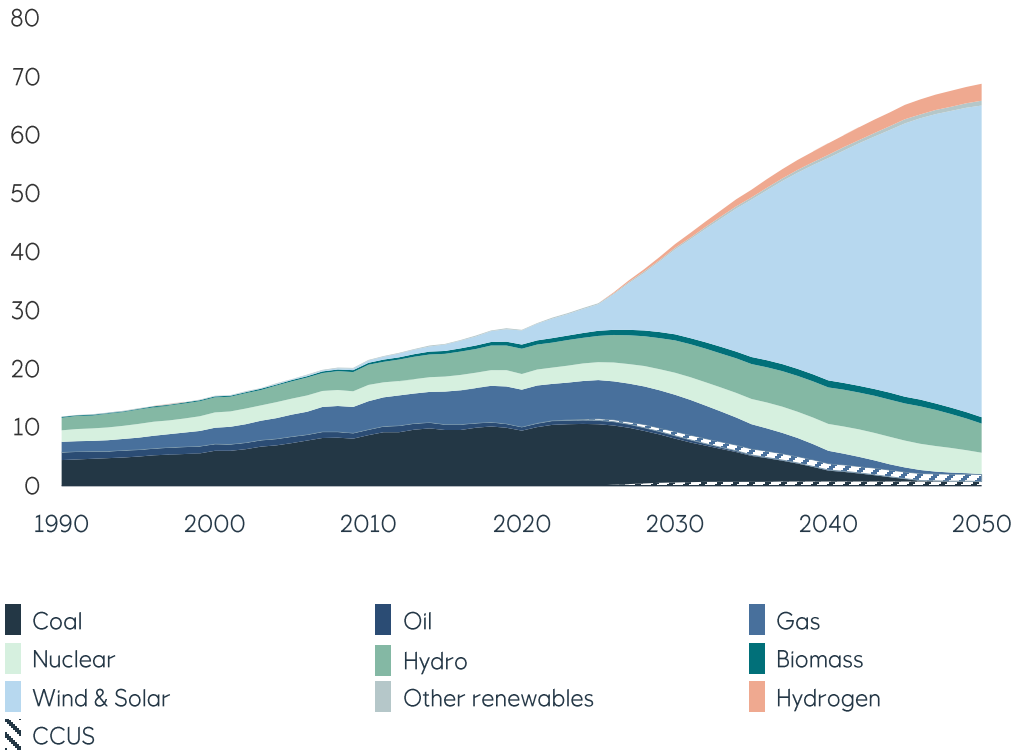
Total final consumption

Gtoe



Power generation

Thousand TWh



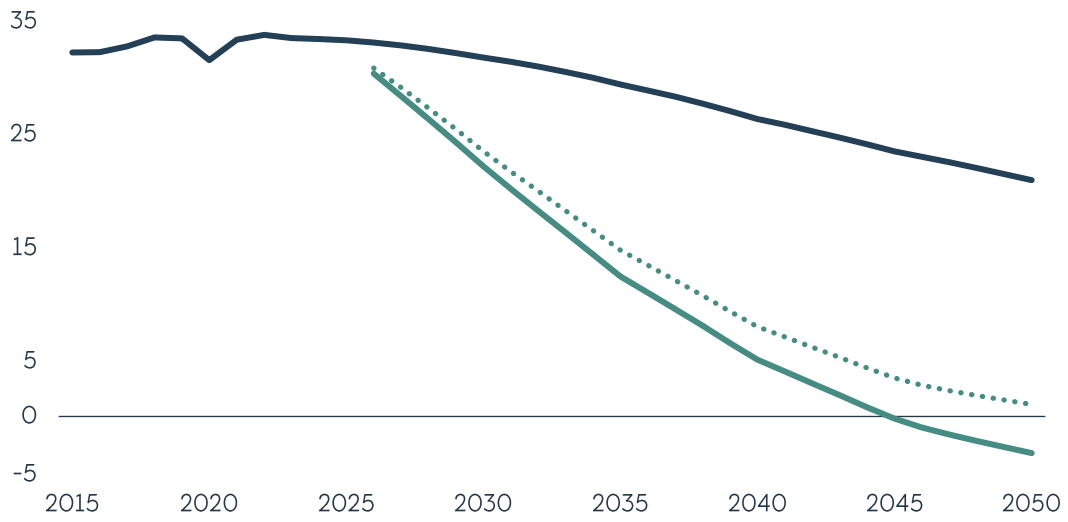
Source: IEA (history), Equinor (projections)

Emissions in Walls and Bridges decline, but at very different speeds

The challenge of staying within the 1.5°C carbon budget is growing, and impossible without carbon removal technologies

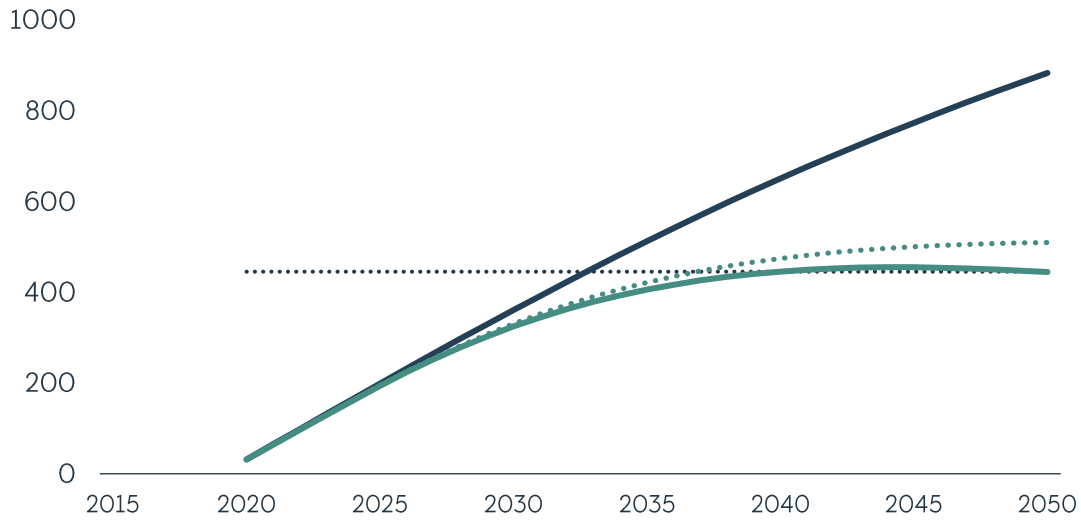
Annual energy-related emissions

Gt CO_2



Cumulative energy-related emissions

Gt CO_2



Source: IEA (history), Equinor (projections)

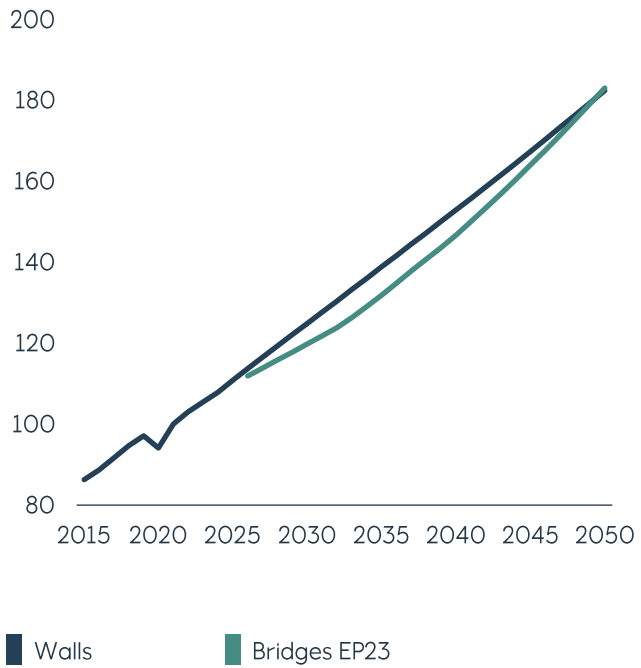
Source: Equinor (projections)

The global economy continues to grow and becomes more energy efficient

A much larger global economy with massive improvements in energy efficiency, especially in emerging economies

Global GDP

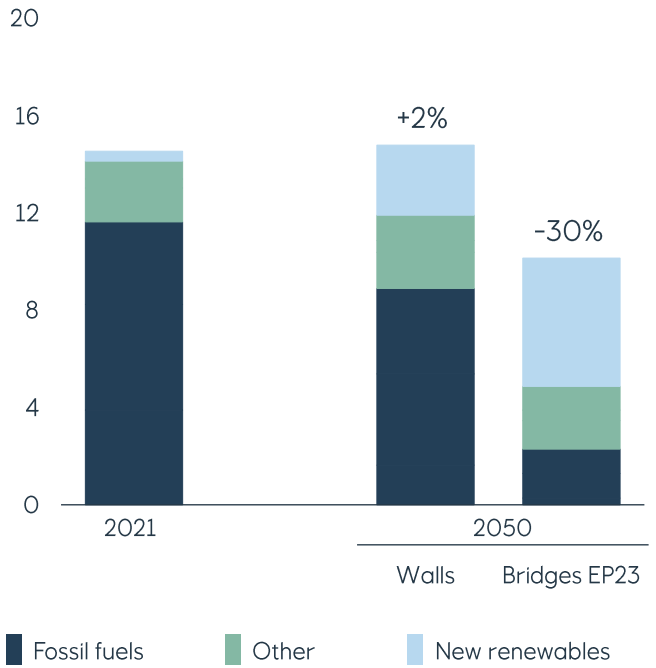
Indexed to 100 in 2021, constant USD



Source: IEA and © Oxford Economics Limited 2024 (history), Equinor (projections)

Total primary energy demand

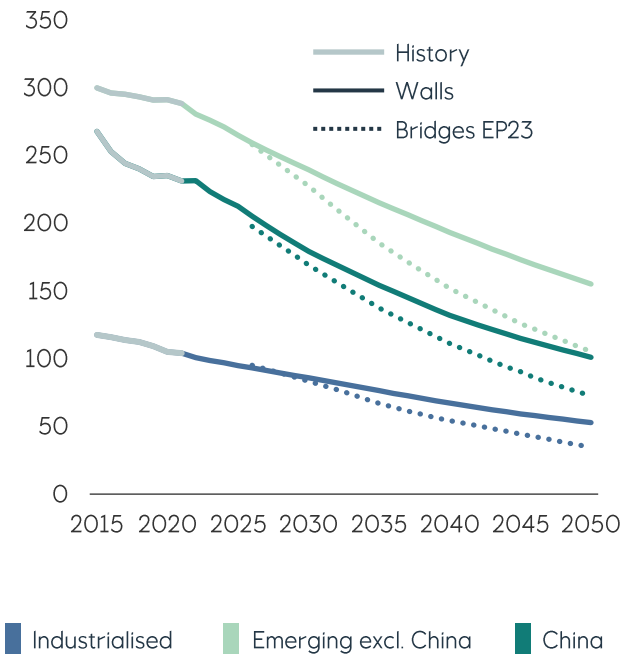
Gtoe



Source: IEA (history), Equinor (projections)

Energy intensity

toe per million USD



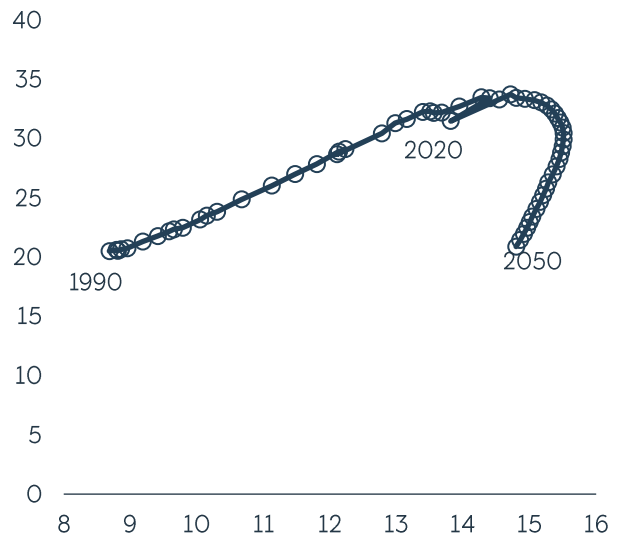
Source: IEA (history), Equinor (projections)

Walls is NOT BAU, but a 2.2°C scenario with significant energy transition…

Energy efficiency, electrification, decarbonisation, decline in fossil fuel demand

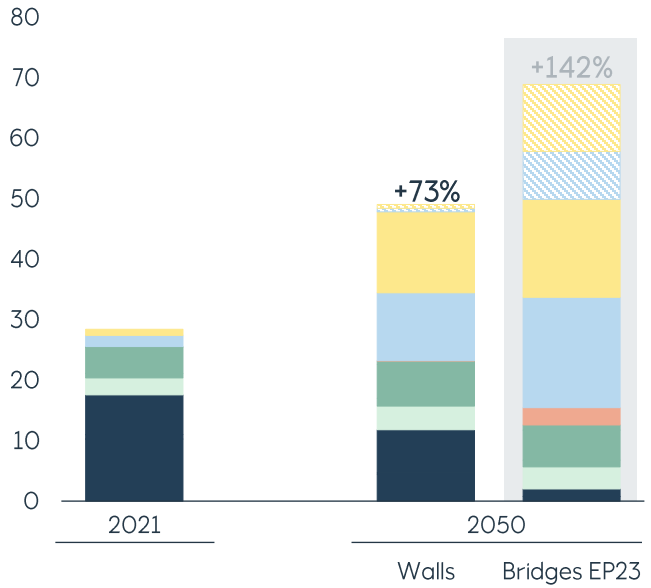
Total emissions vs total primary energy demand

Gt CO_2 (y) Gtoe (x)



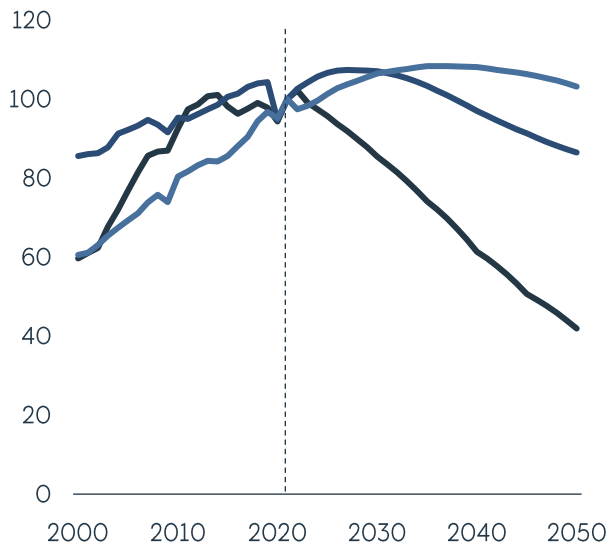
Electricity generation

Thousand TWh



Fossil fuel demand

Indexed to 100 in 2021



Walls

Fossil fuels | Nuclear | Other | Hydrogen | Wind | Solar | Wind to H_2 | Solar to H_2

Coal | Oil | Gas

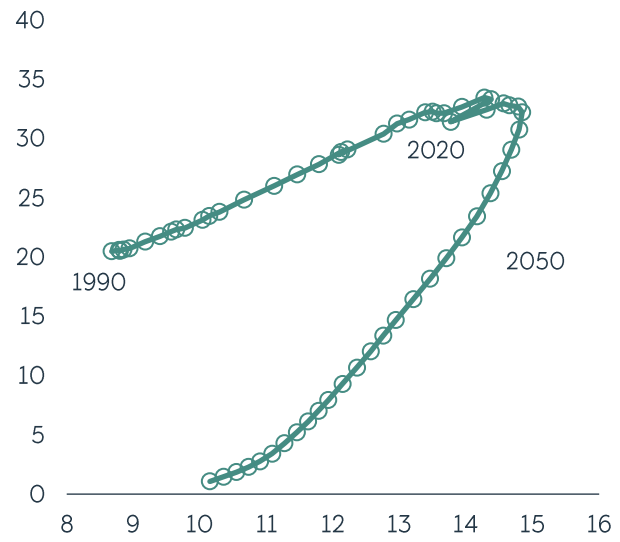
Source: IEA (history), Equinor (projections)

Bridges requires a complete transformation of the world we see today

Energy efficiency, electrification, decarbonisation, decline in fossil fuel demand

Total emissions vs total primary energy demand

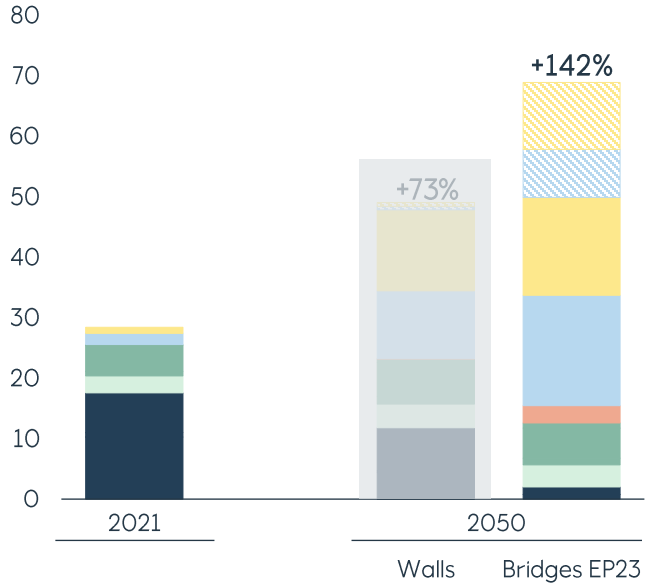
Gt CO_2 (y) , Gtoe (x)



Bridges EP23

Electricity generation

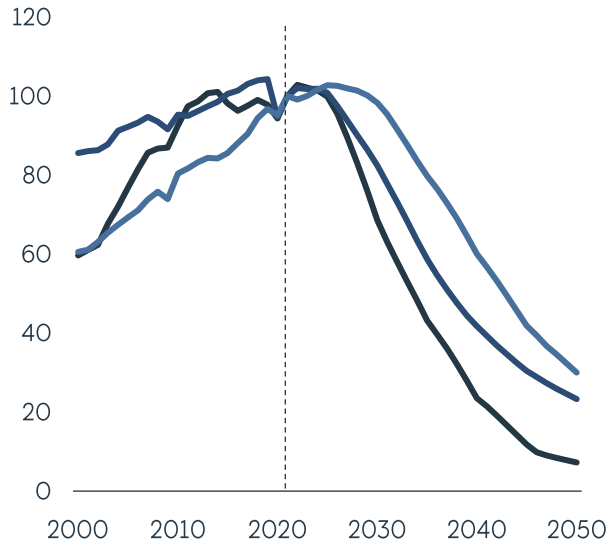
Thousand TWh



Fossil fuels | Nuclear | Other | Hydrogen | Wind | Solar | Wind to H_2 | Solar to H_2

Fossil fuel demand

Indexed to 100 in 2021



Coal | Oil | Gas

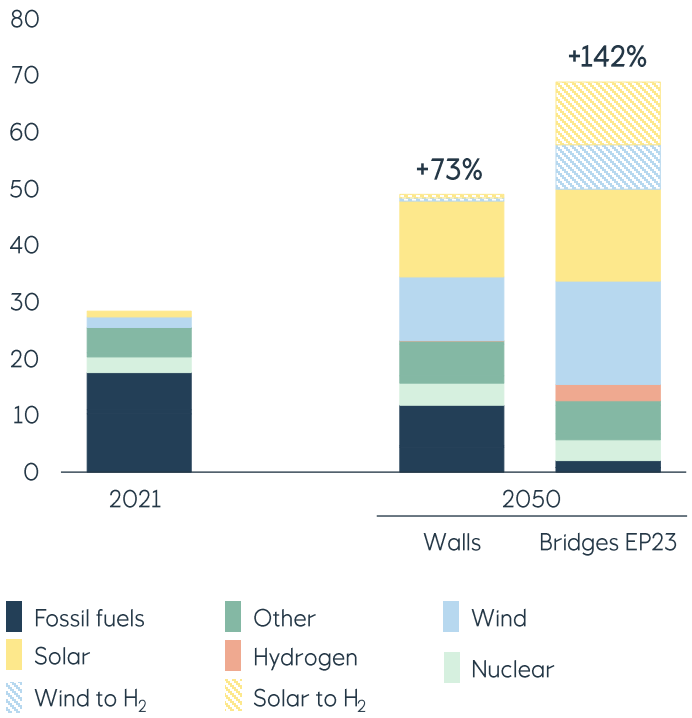
Source: IEA (history), Equinor (projections)

Massive changes in different parts of the energy system

Electrification is the key element of the energy transition, and a major factor in efficiency improvements

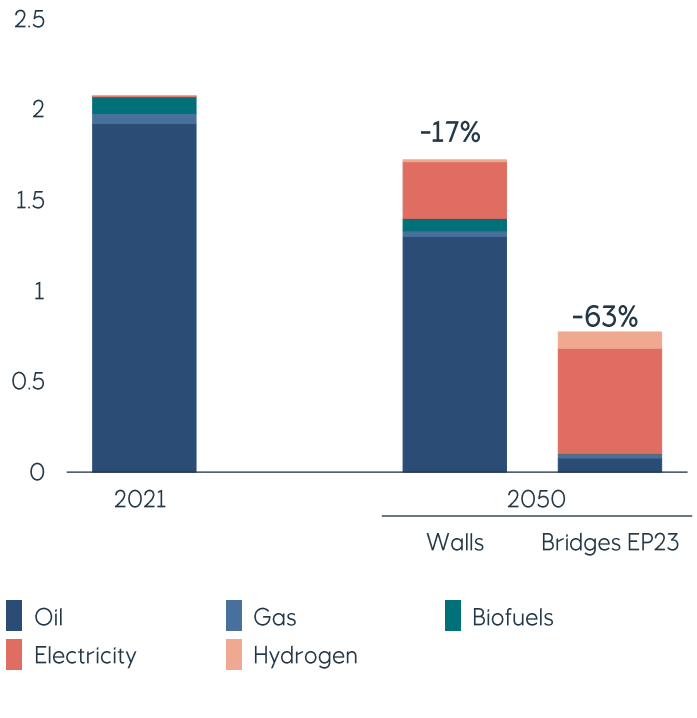
Electricity generation

Thousand TWh



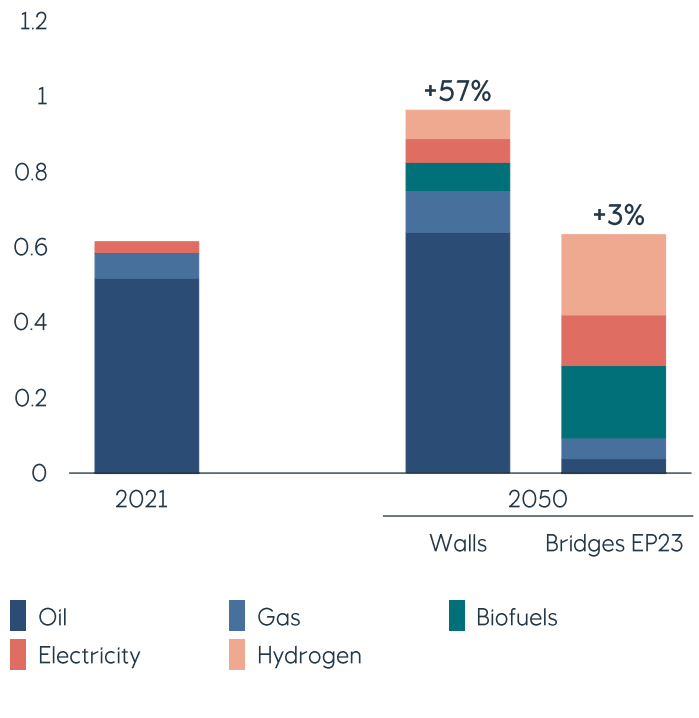
Road transport fuel demand

Gtoe



Non-road transport fuel demand

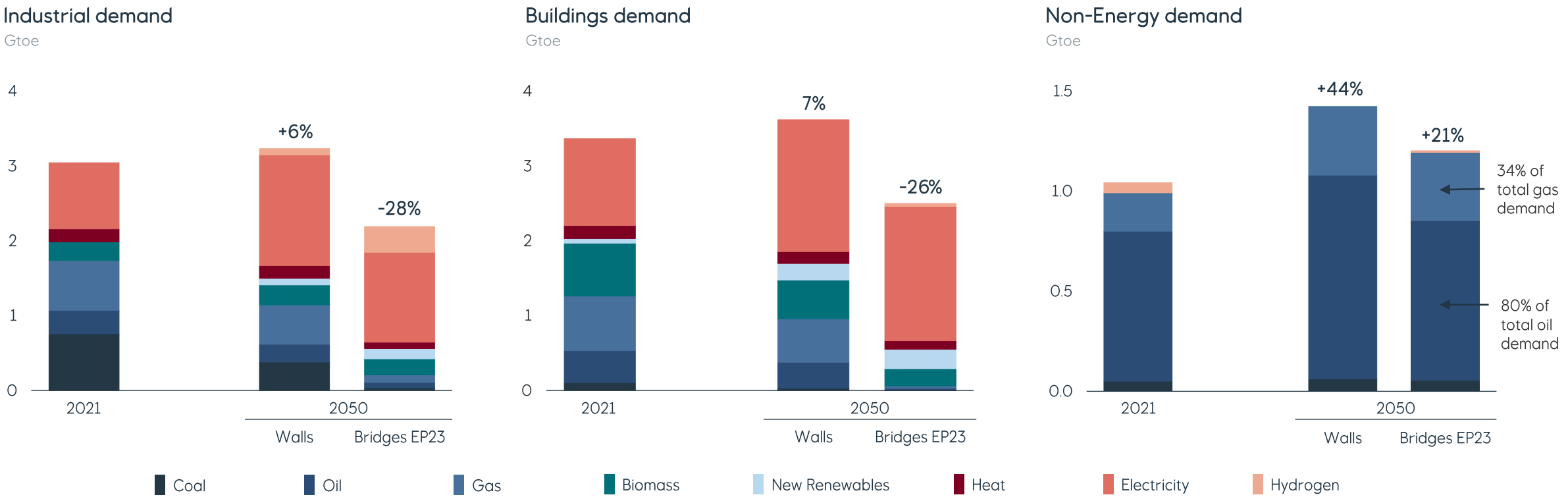
Gtoe



Source: IEA (history), Equinor (projections)

Electrification and efficiency improvements are keys in other sectors

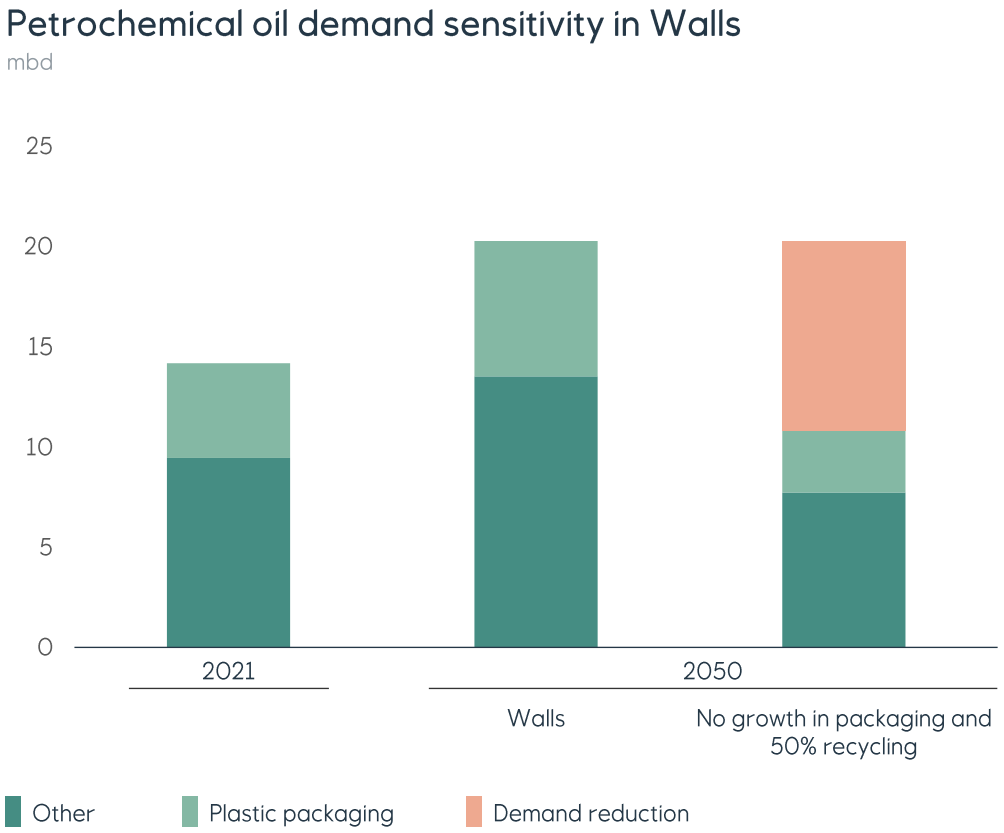
Fossil fuels still needed as feedstock



Source: IEA (history), Equinor (projections)

The petrochemical sector is essential to many societal functions

… but the sector will need to find a way to balance its growing fossil fuel demand with the need to decarbonise



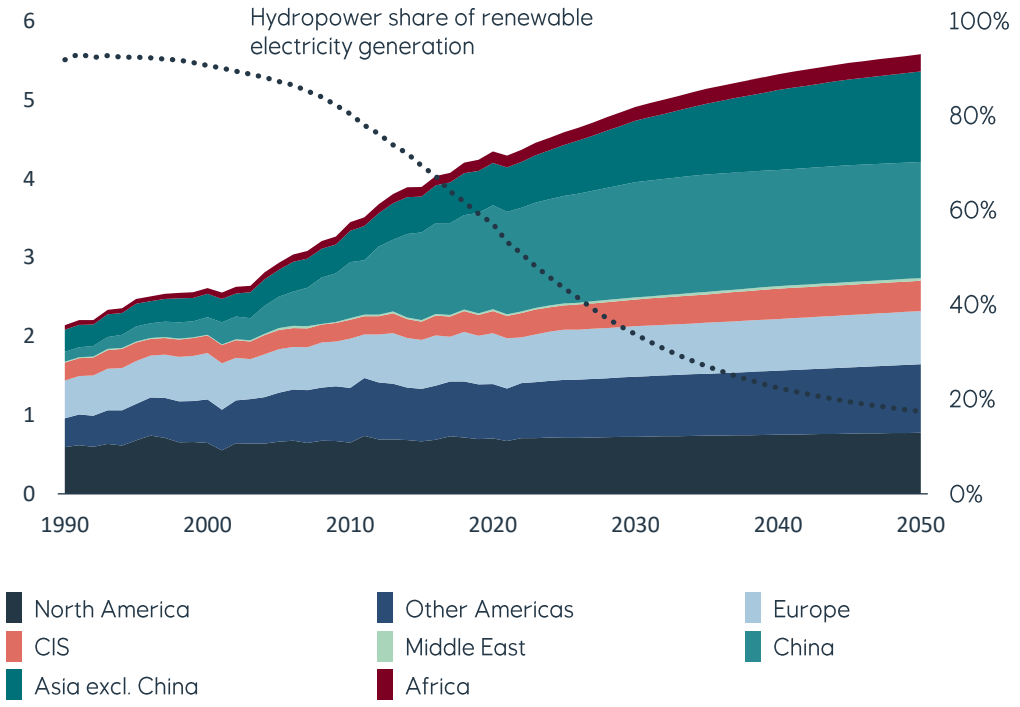
Source: IEA (history), Equinor(projections)

Water-related challenges a growing concern in several dimensions

Hydropower remains the biggest renewable source of electricity until 2030

Hydropower generation by region

Thousand TWh

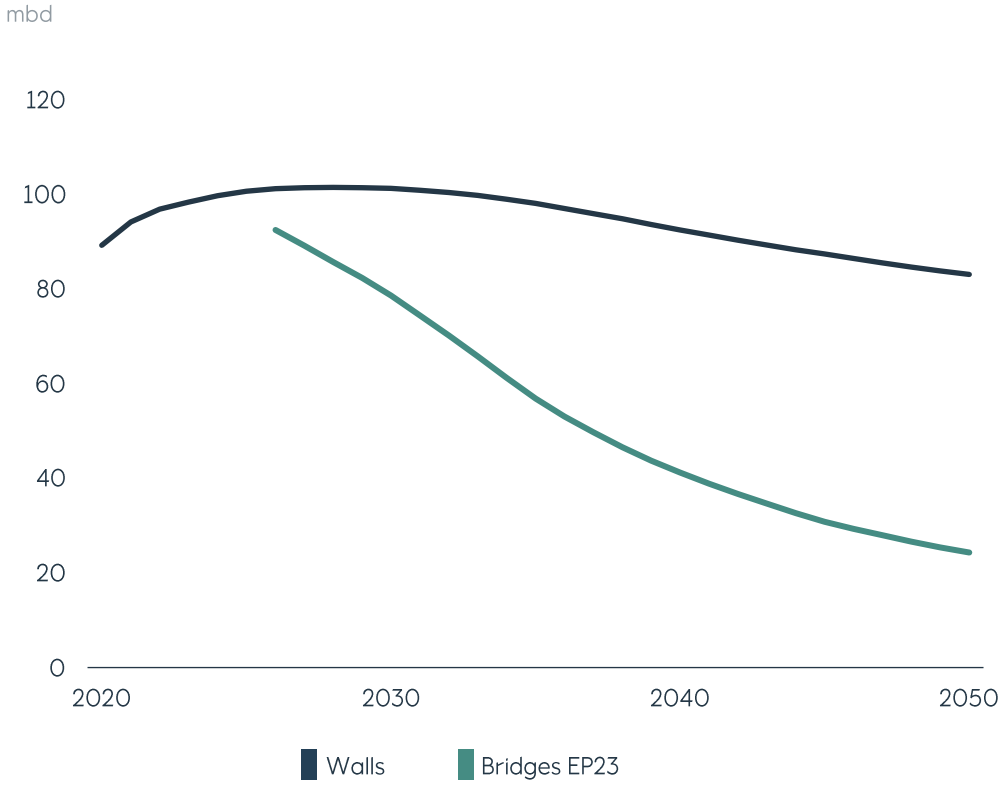


Source: IEA (history), Equinor (projections)

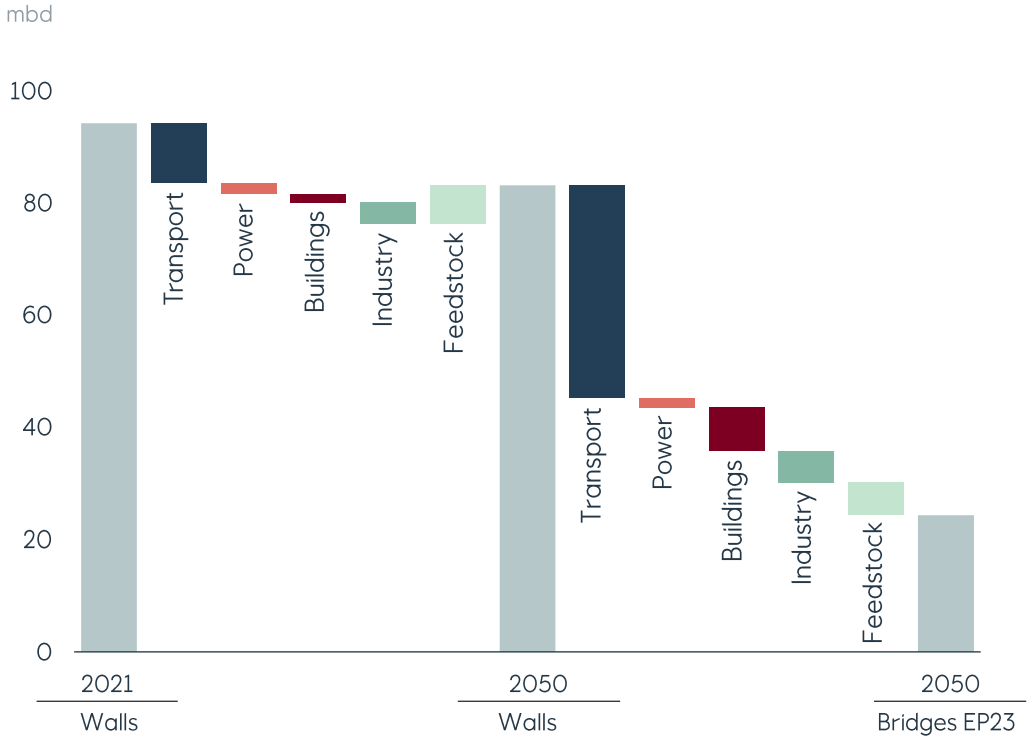
Oil demand set to decline, but at what speed?

Transport is the key sector for long-term oil demand

Oil demand



Change in global oil demand by sector, 2021-2050



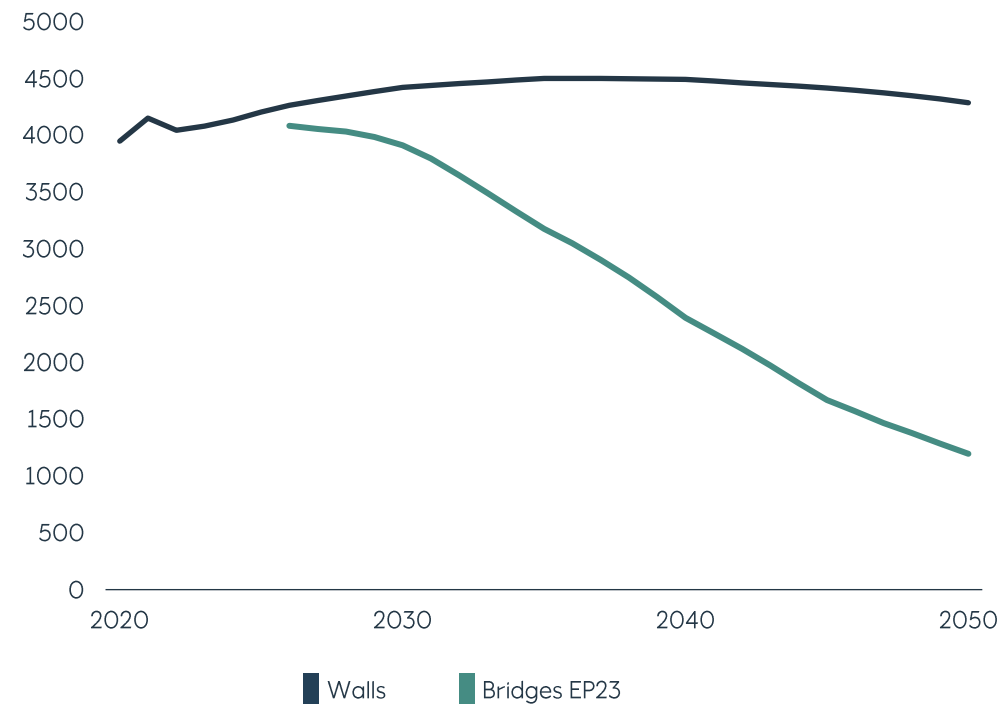
Source: IEA (history), Equinor (projections)

Gas demand to increase and plateau, but must decline significantly in Bridges

Coal-to-gas switching main driver in Walls, electrification and decarbonisation of power in Bridges

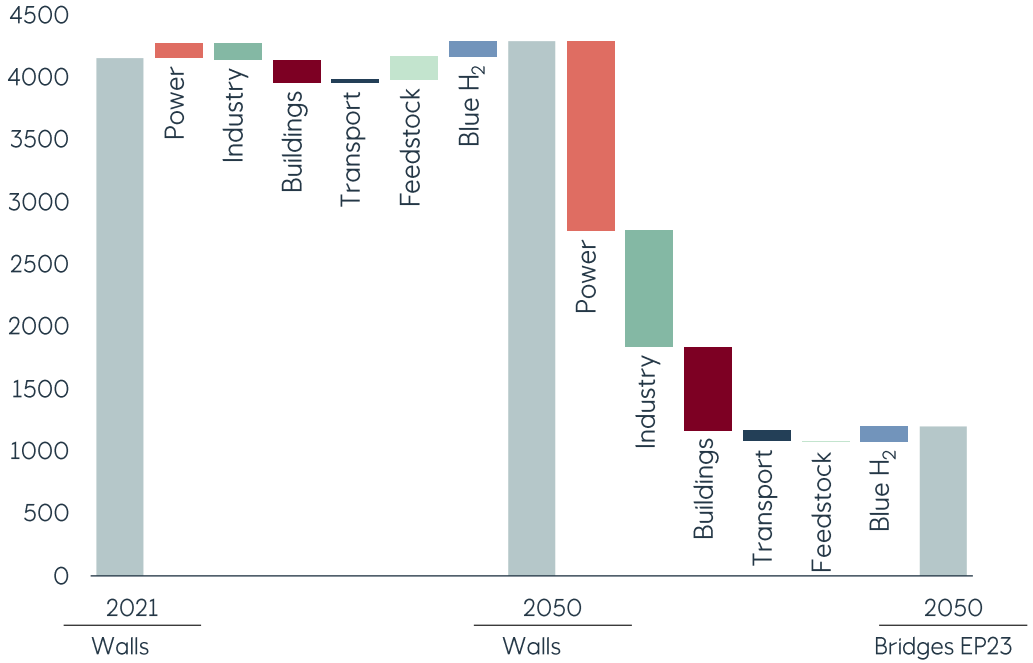
Gas demand

bcm



Change in gas demand by sector, 2021-2050

Bcm



Source: IEA (history), Equinor (projections)

A change of pace and a revolution in transforming the energy system

	History 1990 - 2021	Walls 2021 - 2050	Bridges EP23 2021 - 2050
Total primary energy demand CAGR %	1.7%	0.1%	-1.2%
Energy intensity CAGR %	-1.2%	-2.0%	-3.2%
Fossil fuel demand (Change in period - Gtoe)	4.6	-2.7	-9.1
Solar and wind in power generation (Change in period - Thousand TWh)	3	23	50

equinor

"We build
too many walls
and not enough
bridges."

- Attributed to Sir Isaac Newton