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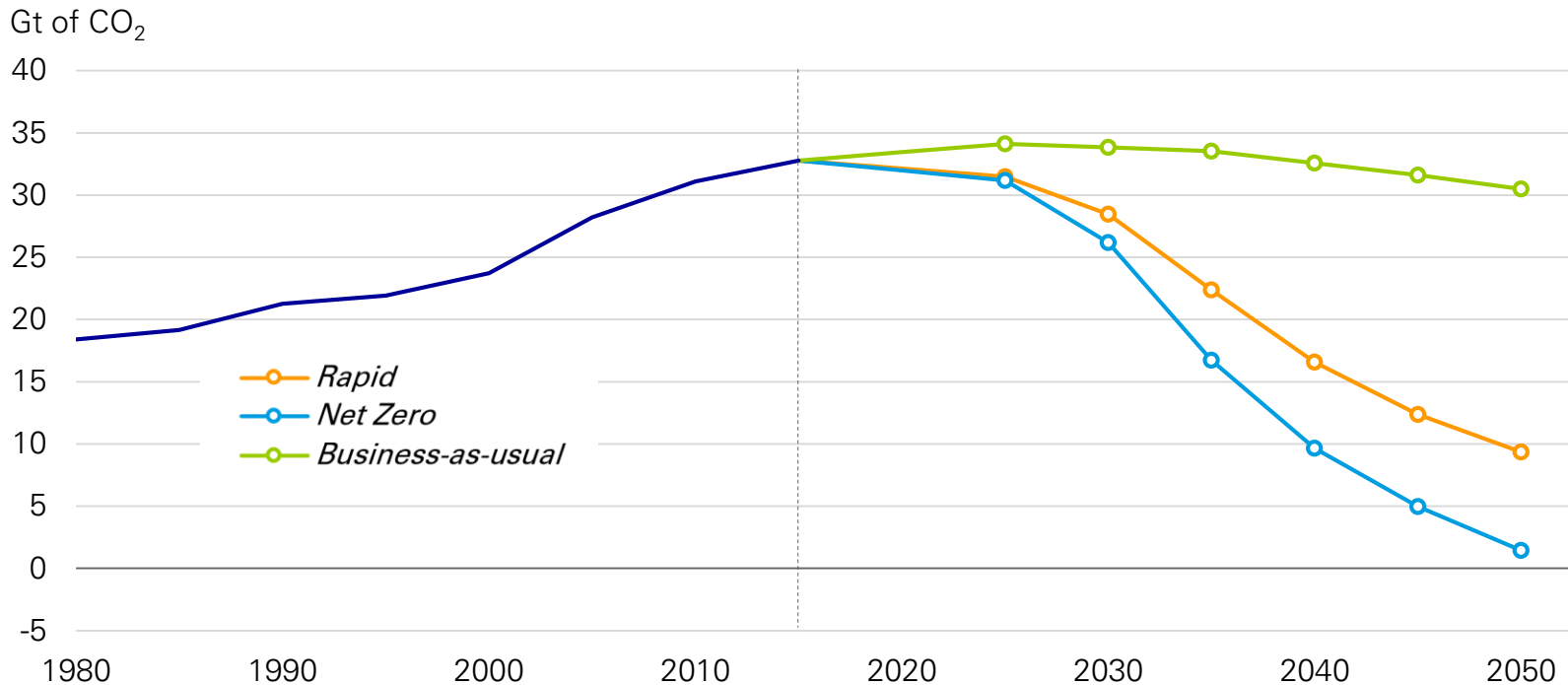
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2020 edition

**William Zimmern**  
Lead economist energy  
transition



# Three scenarios to explore the energy transition

## CO<sub>2</sub> emissions from energy use

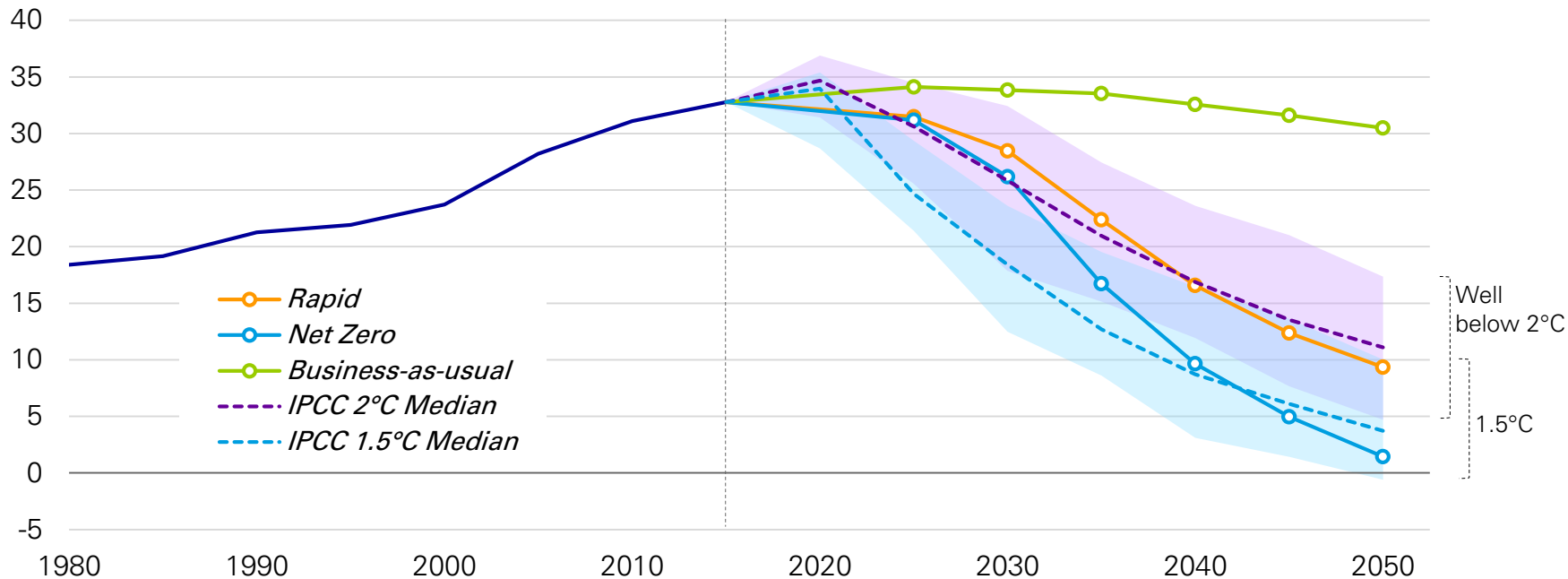




# Three scenarios to explore the energy transition

## CO<sub>2</sub> emissions from energy use

Gt of CO<sub>2</sub>

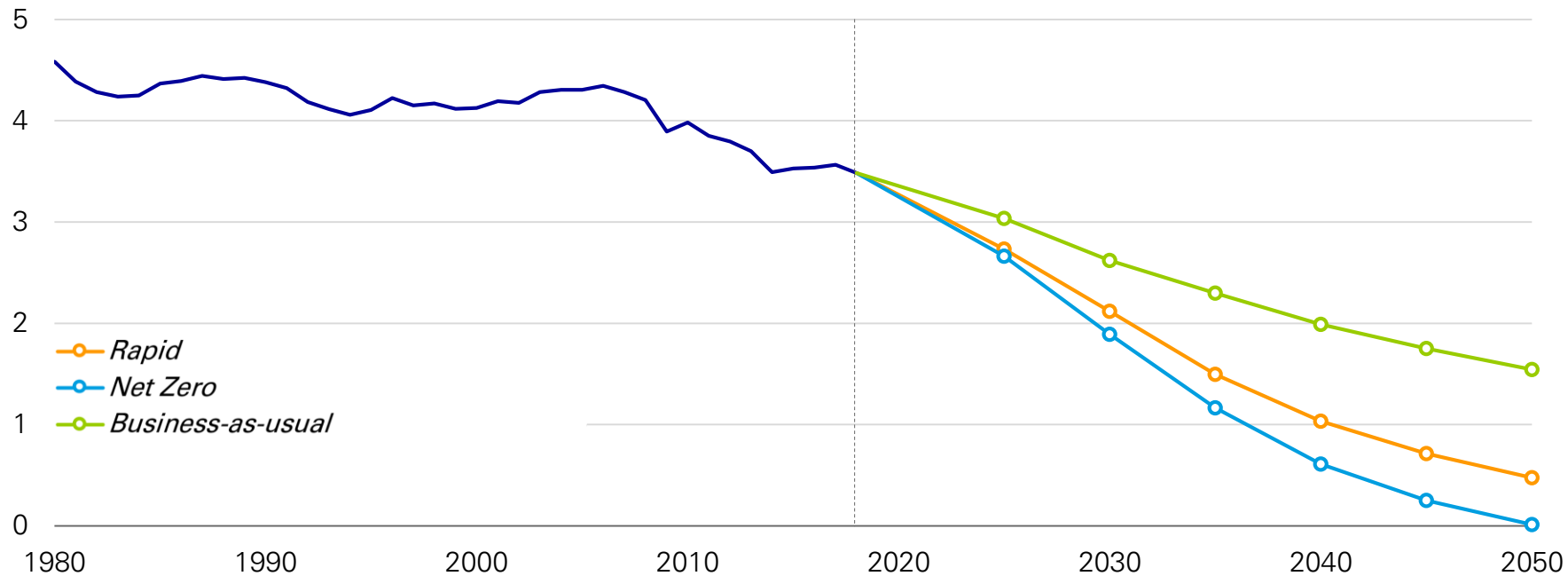




# Three scenarios: EU carbon emissions

## EU carbon emissions

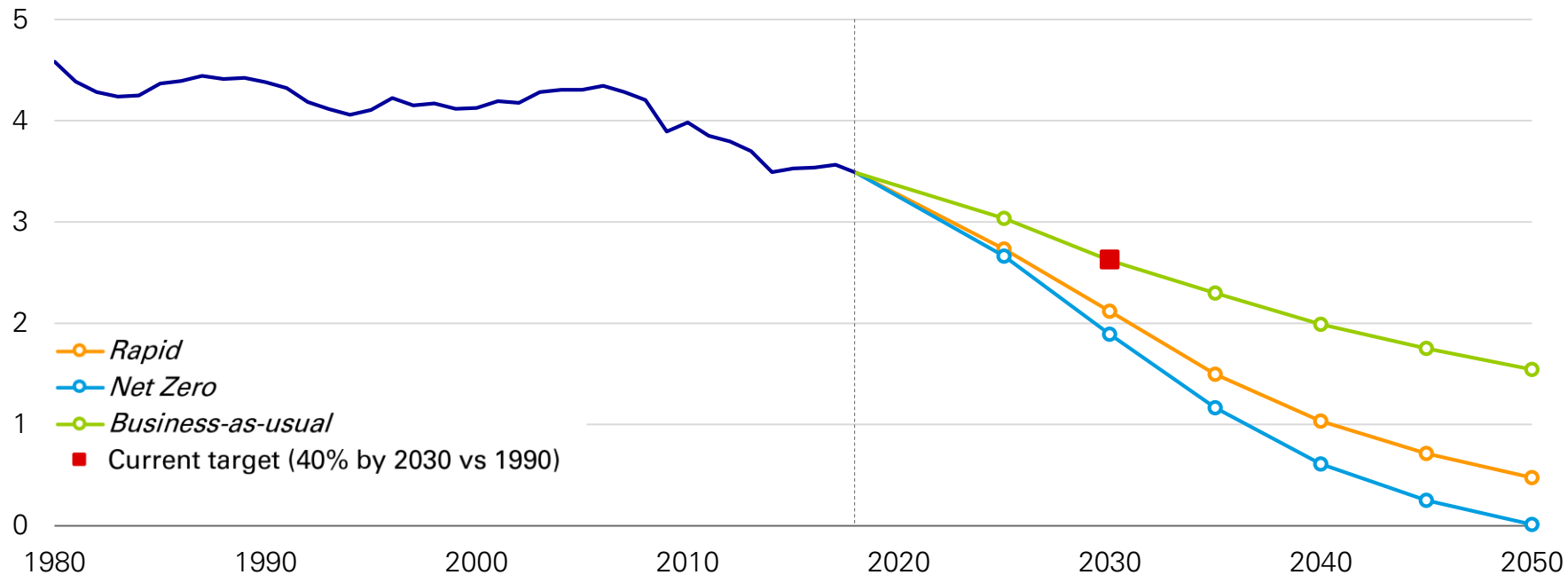
Gt of CO<sub>2</sub>



# Three scenarios: EU carbon emissions

## EU carbon emissions

Gt of CO<sub>2</sub>

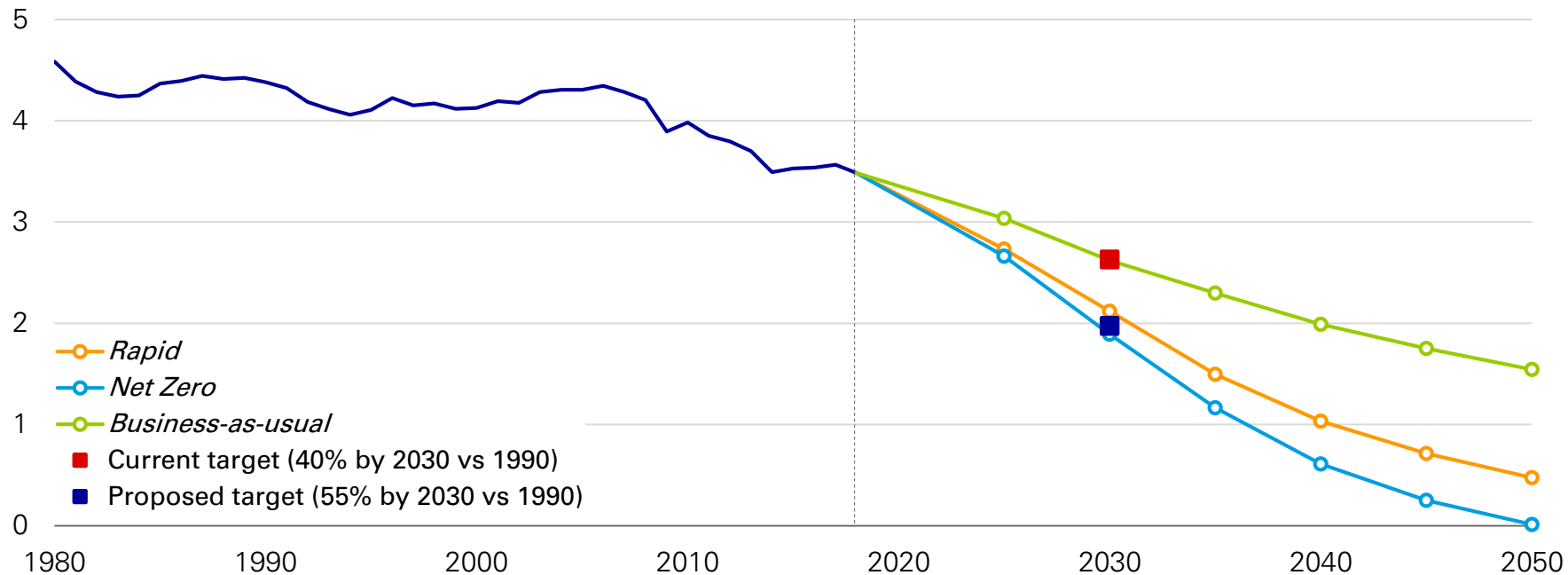




# Three scenarios: EU carbon emissions

## EU carbon emissions

Gt of CO<sub>2</sub>



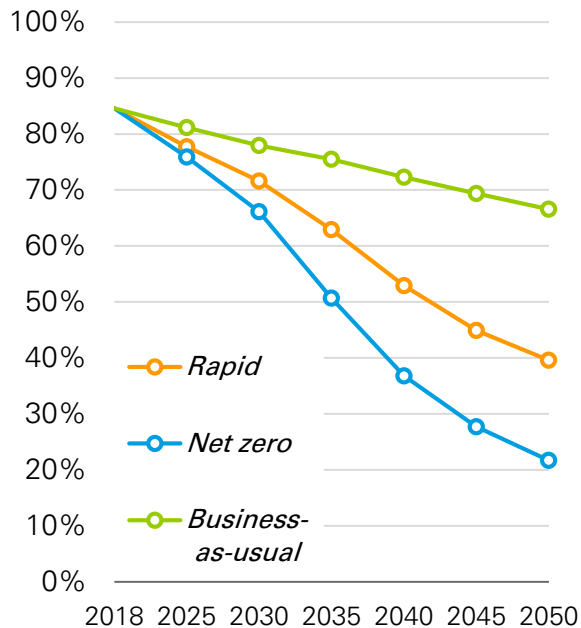
# Key questions

1. What DO we know?
2. Outlook for oil demand?
3. What role could natural gas play in the energy transition?
4. What role for hydrogen?

# Changing structure of global energy demand

## Fossil fuels

Shares of primary energy

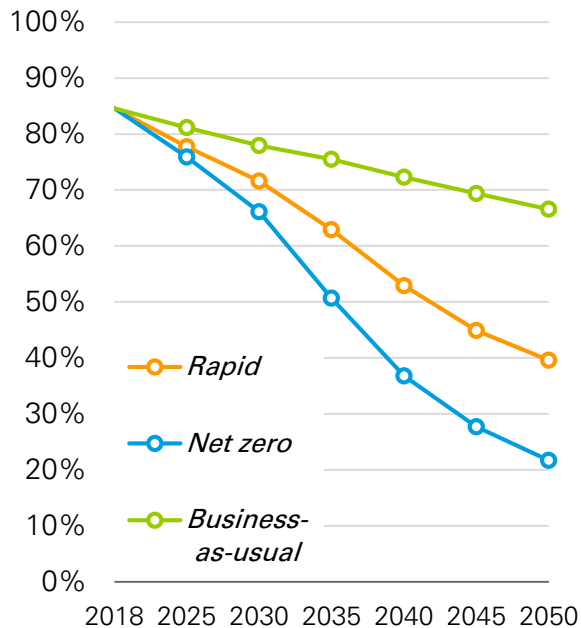




# Changing structure of global energy demand

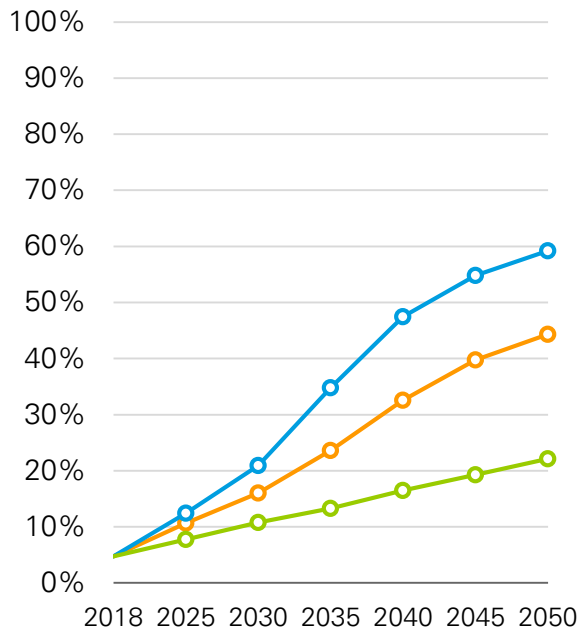
## Fossil fuels

Shares of primary energy



## Renewables

Shares of primary energy

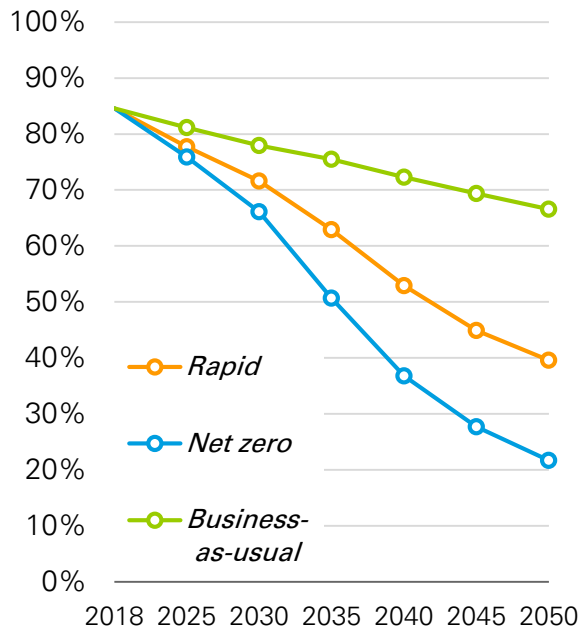




# Changing structure of global energy demand

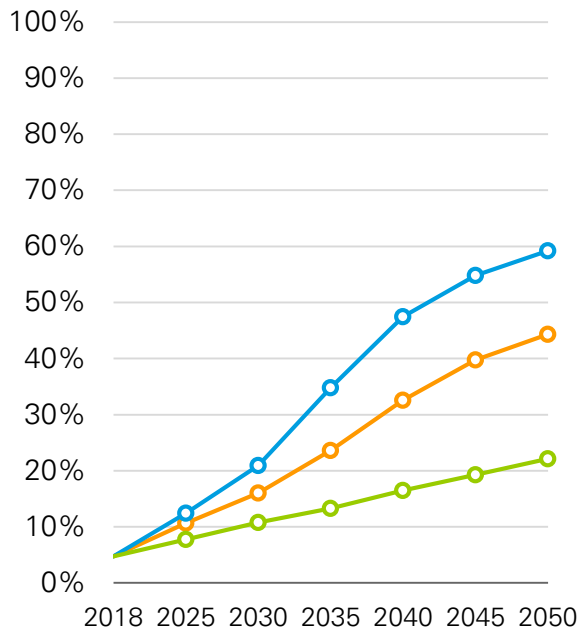
## Fossil fuels

Shares of primary energy



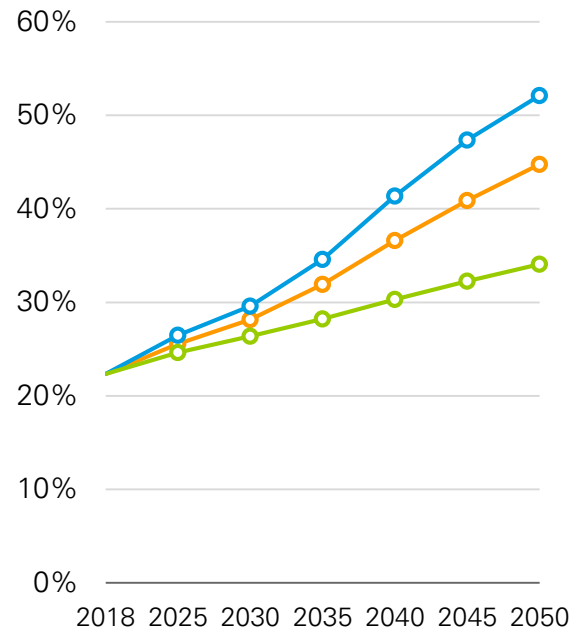
## Renewables

Shares of primary energy



## Electricity

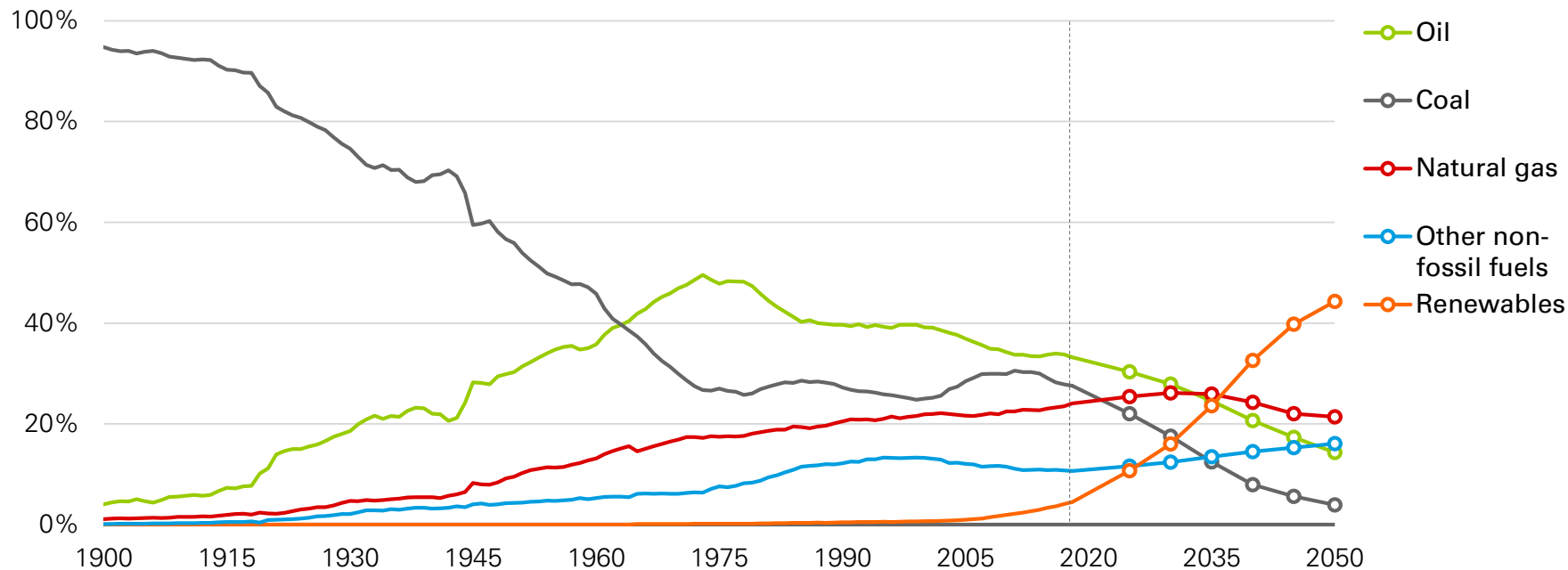
Share of total final consumption



# Changing structure of global energy system



Shares of primary energy in *Rapid*

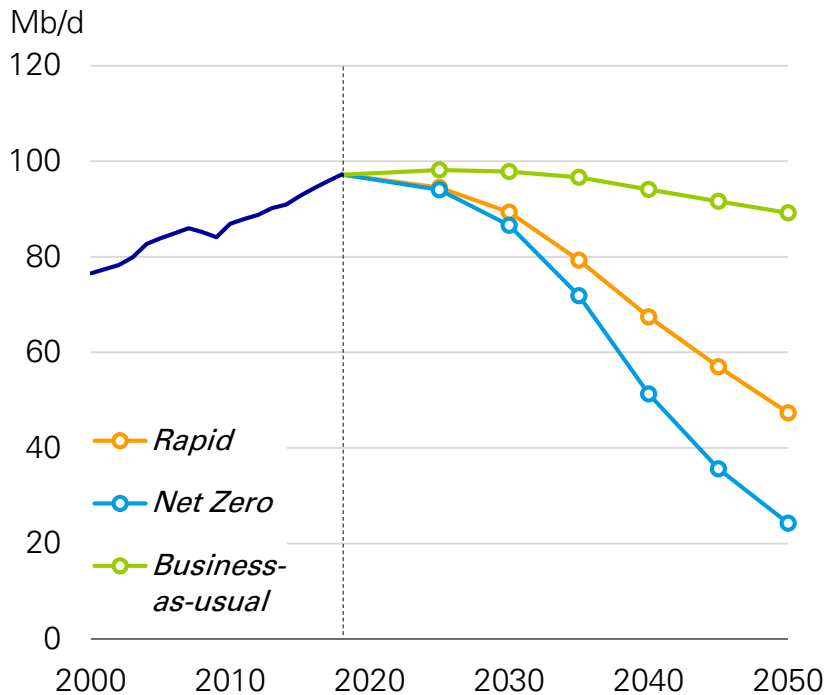


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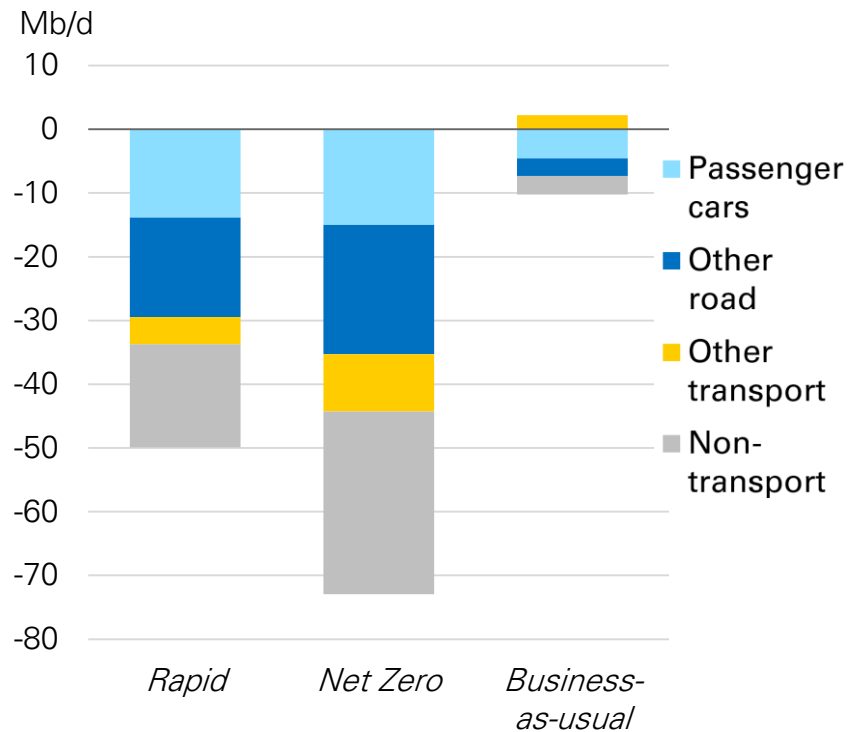
# Outlook for oil demand

## Oil consumption



# Outlook for oil demand

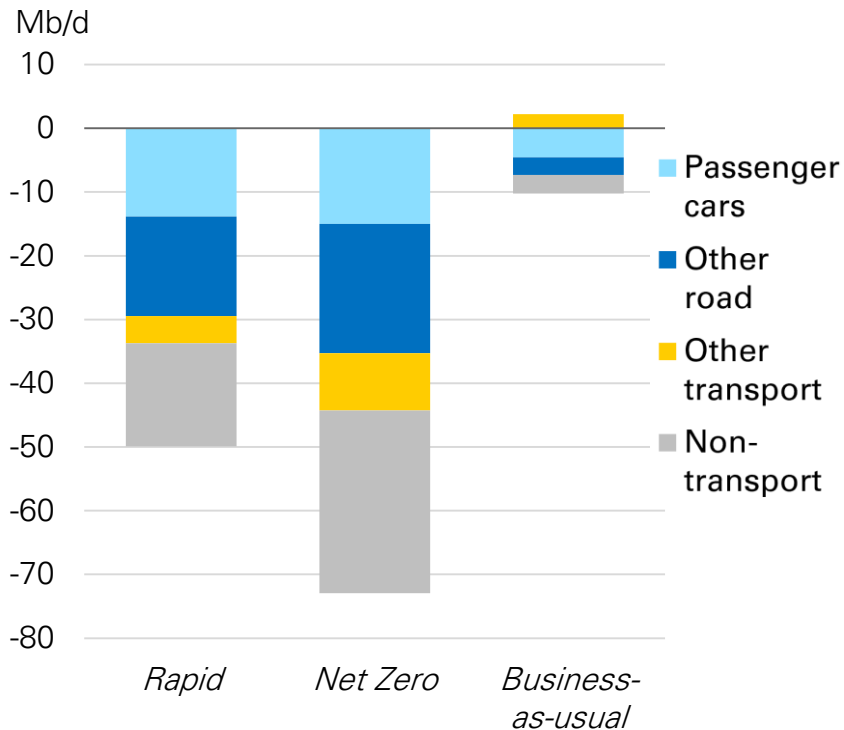
## Change in oil demand, 2018-2050



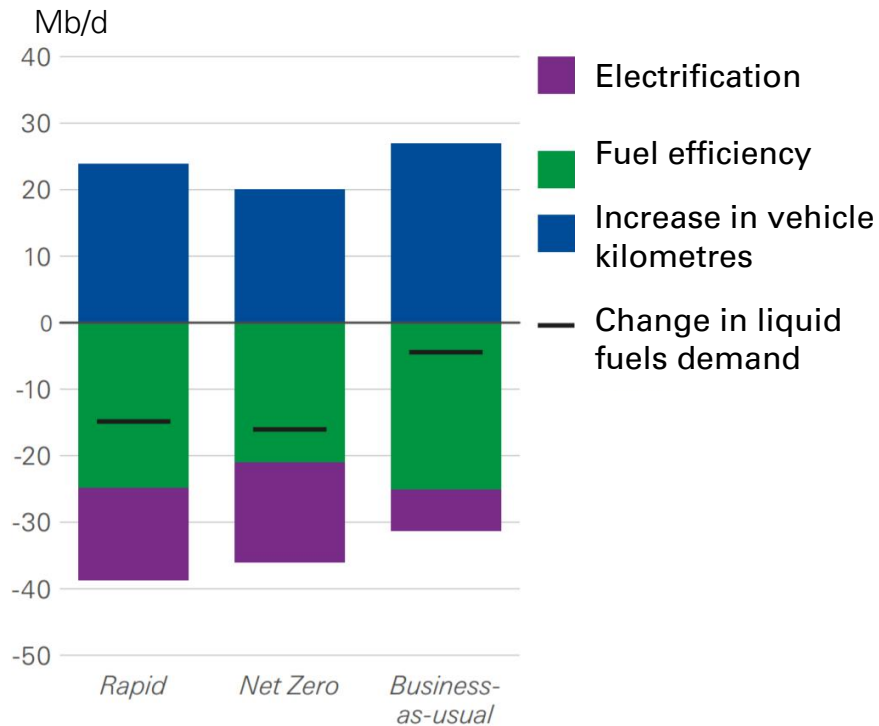


# Outlook for oil demand

## Change in oil demand, 2018-2050



## Factors impacting passenger car liquid demand 2018-2050



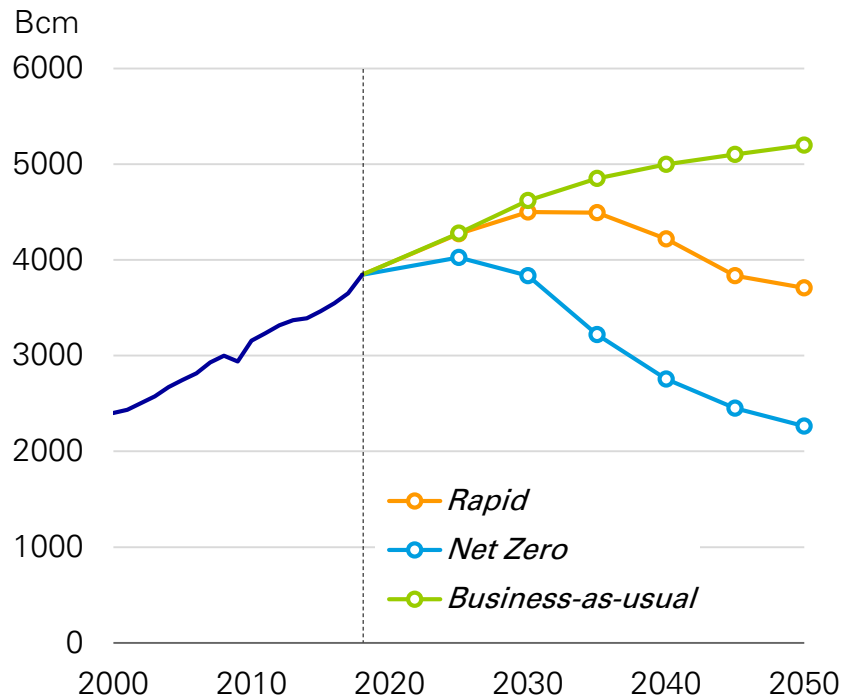
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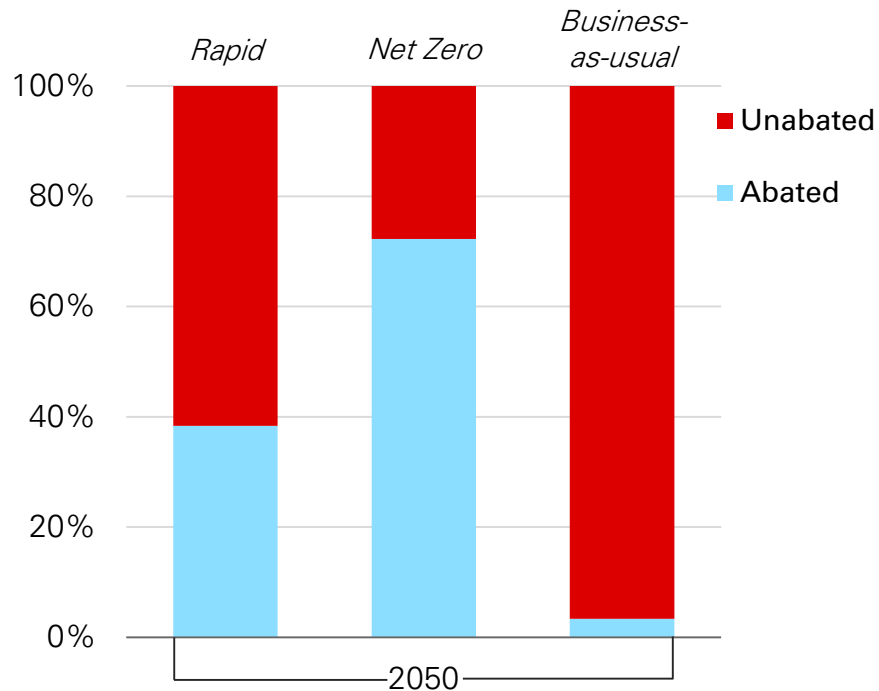
# Outlook for natural gas

## Natural gas consumption



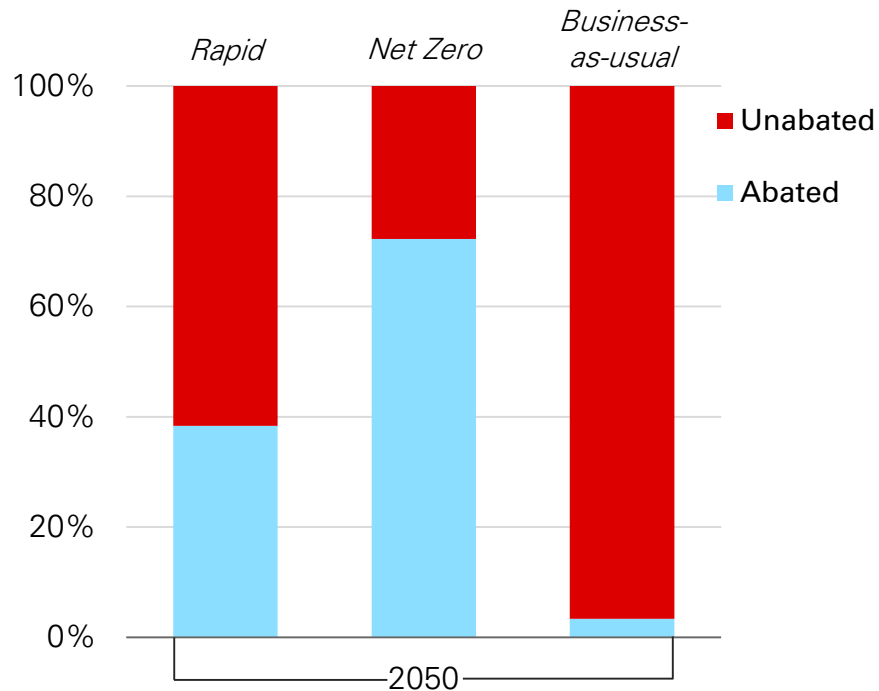
# Natural gas as a source of near-zero carbon energy

Share of natural gas abated and unabated

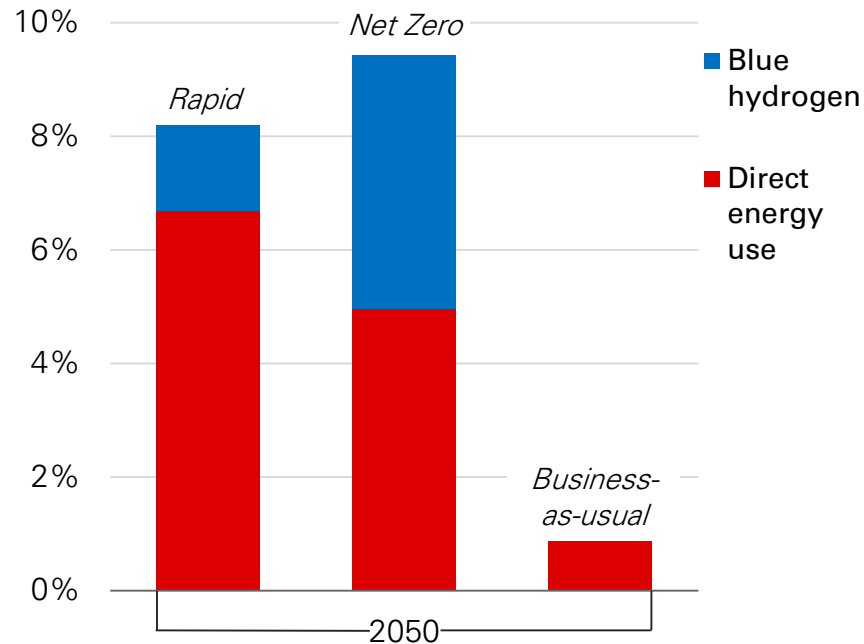


# Natural gas as a source of near-zero carbon energy

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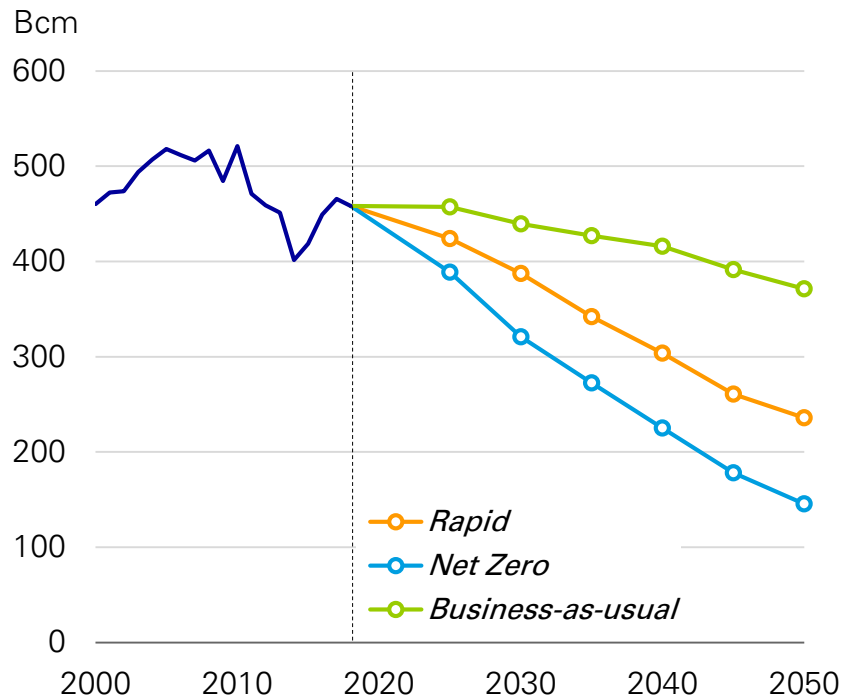


Natural gas with CCUS as a share of primary energy



# Outlook for EU gas

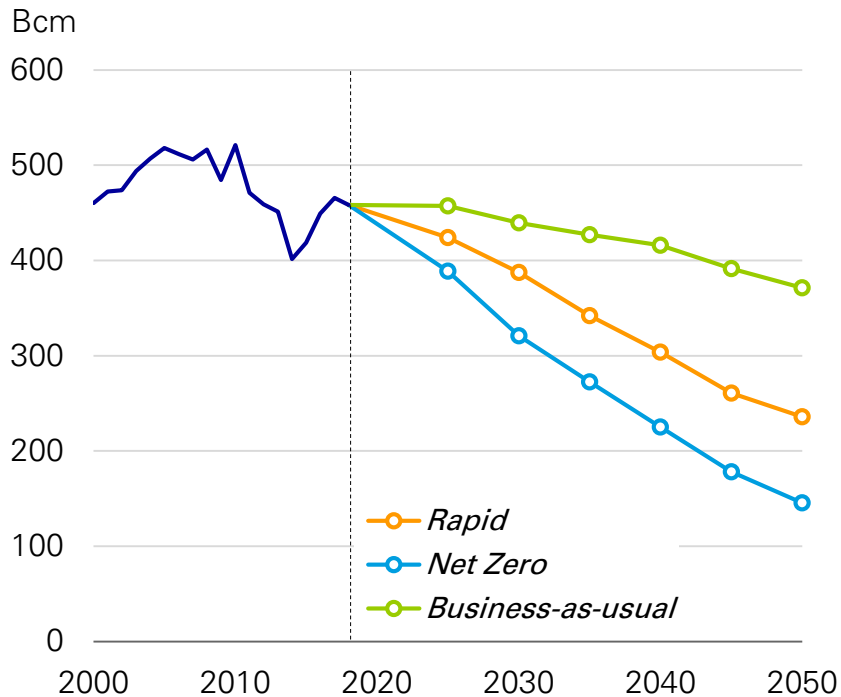
## Gas consumption



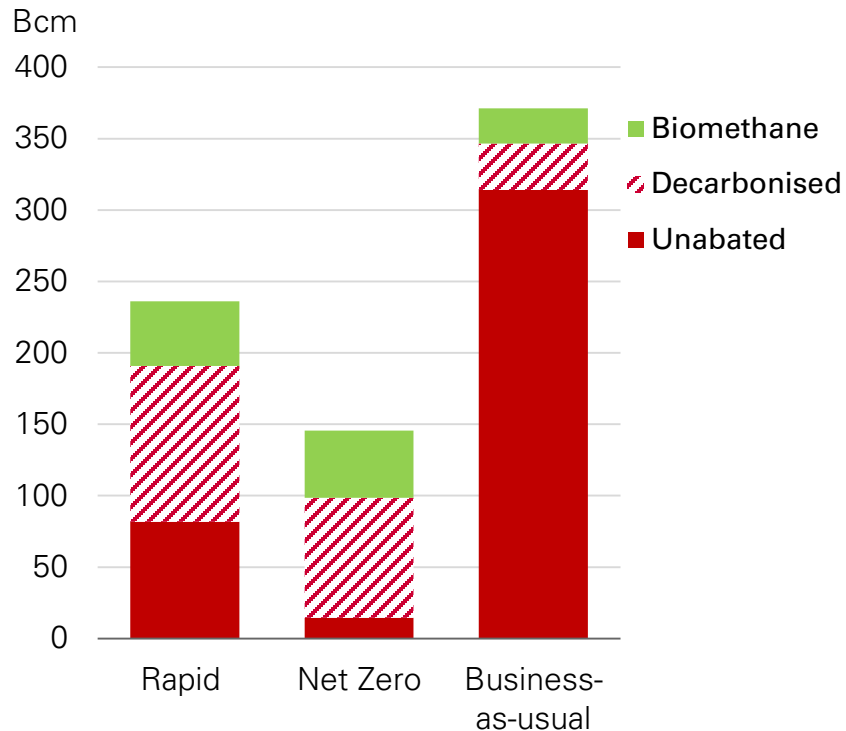


# Outlook for EU gas

## Gas consumption



## Gas demand, 2050

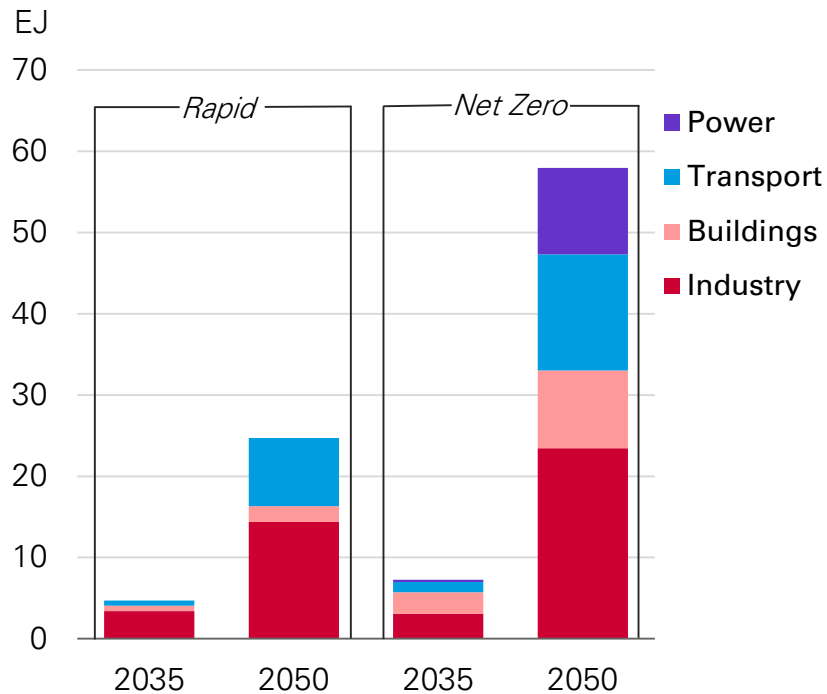


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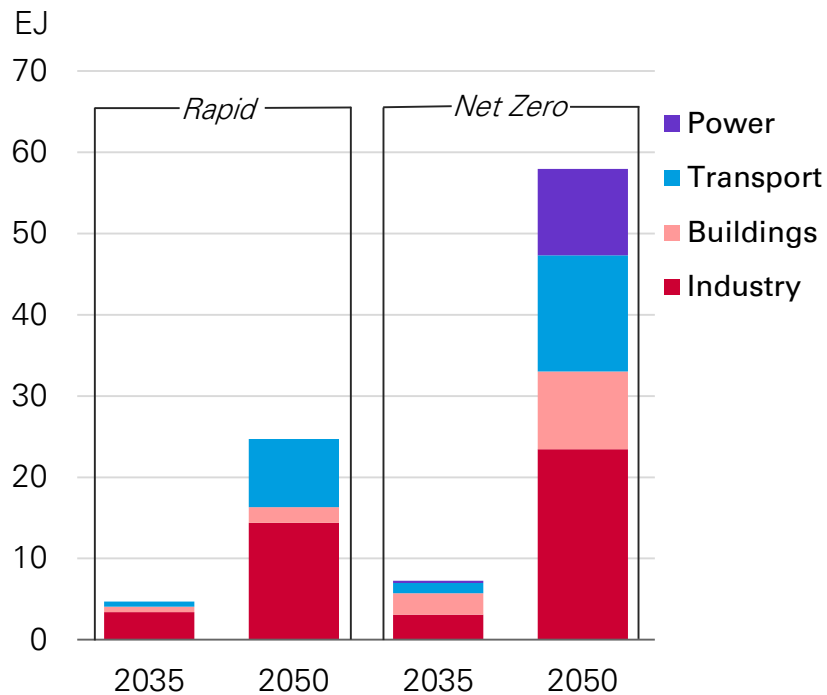
# Consumption and production of hydrogen

## Hydrogen use by sector

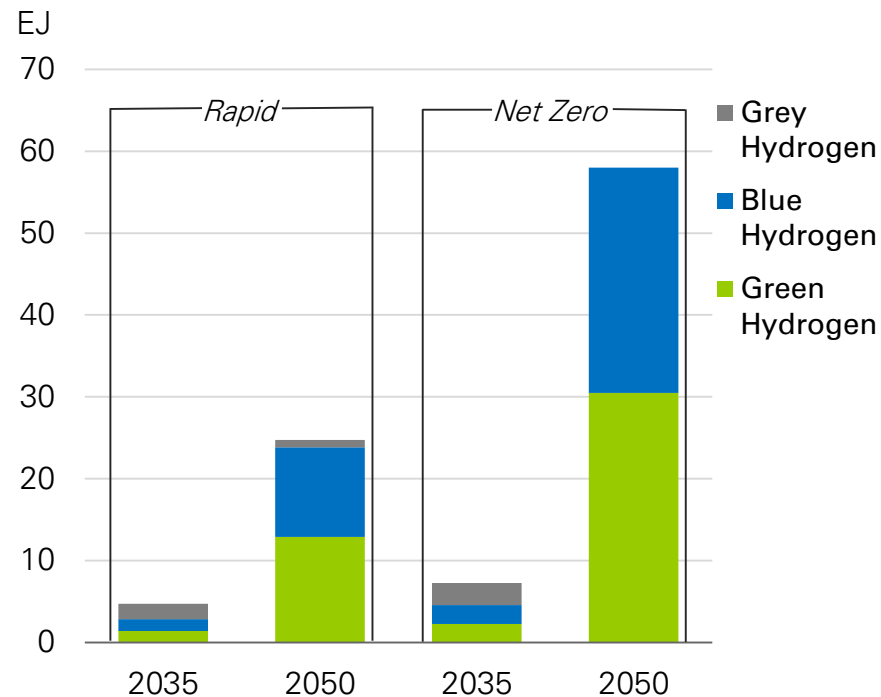


# Consumption and production of hydrogen

## Hydrogen use by sector



## Hydrogen production by type

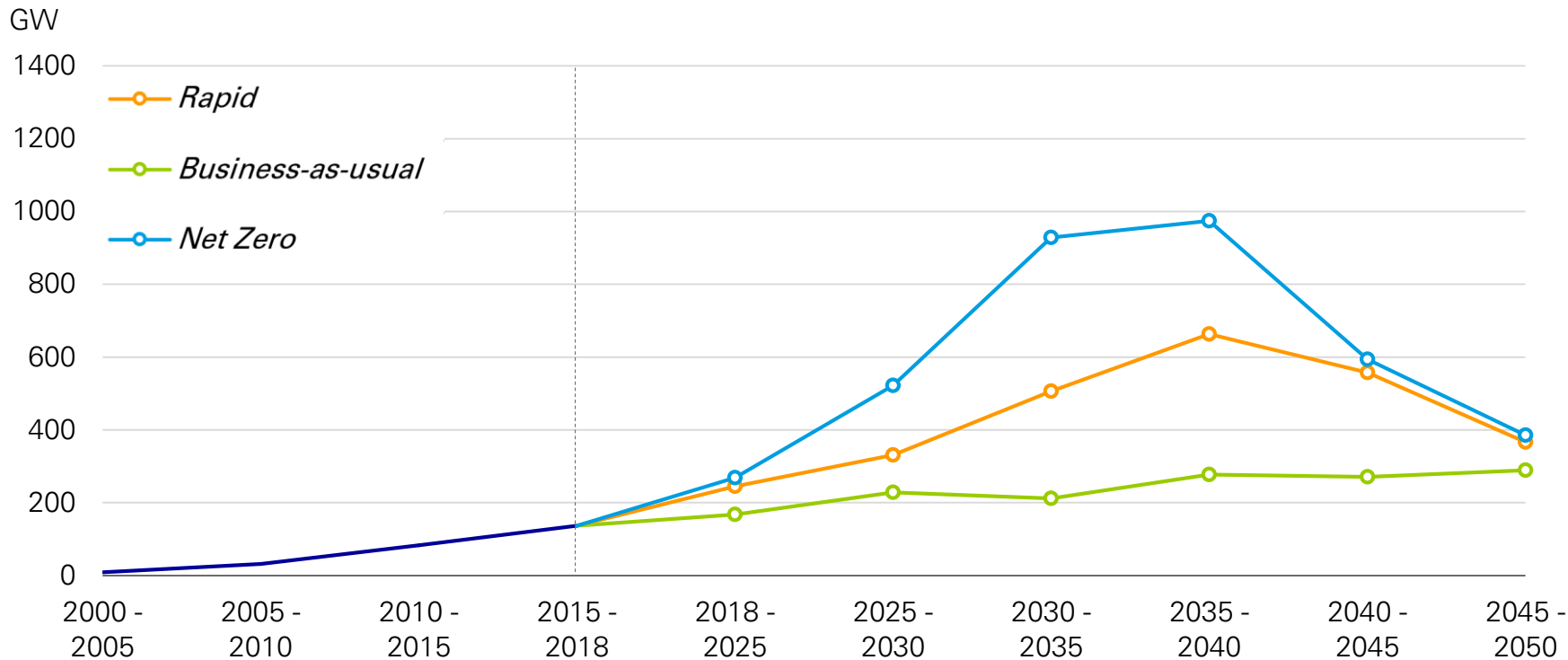






# Wind and solar capacity

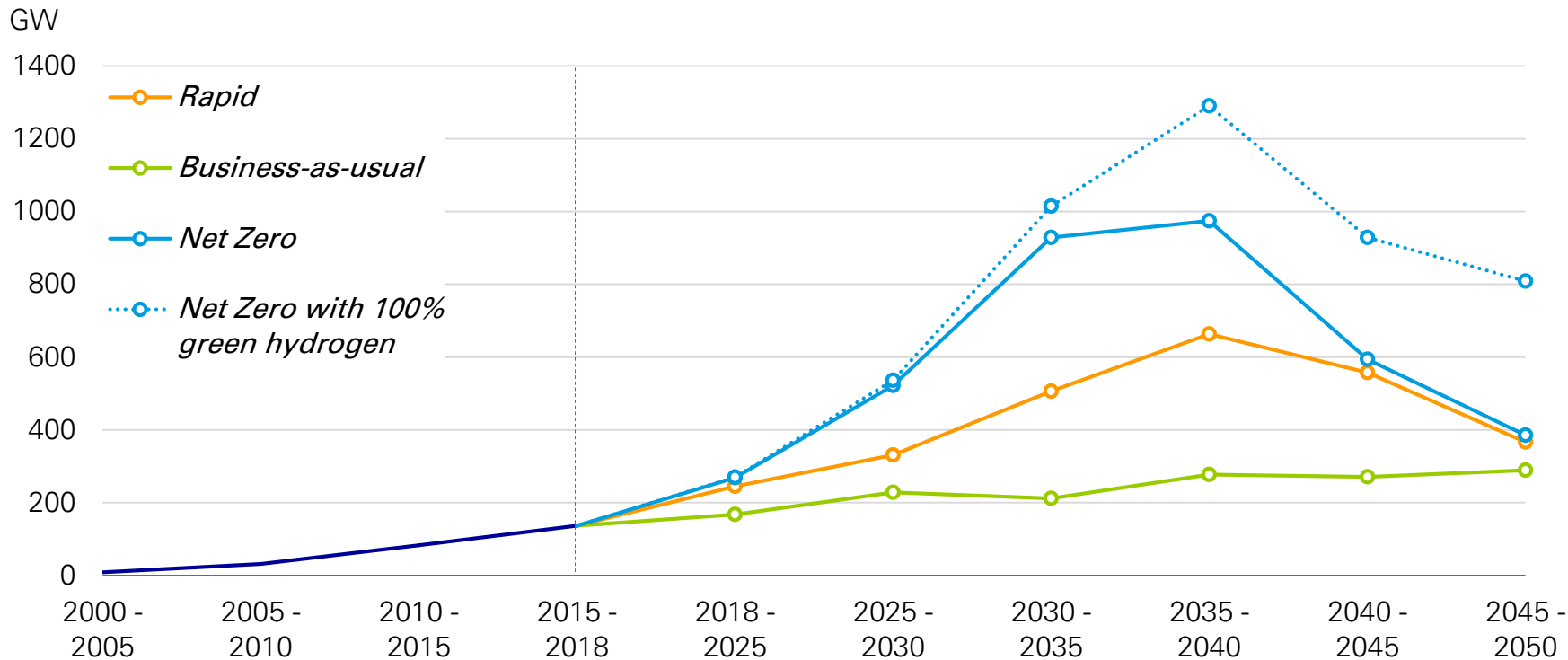
Annual average increase in wind and solar capacity

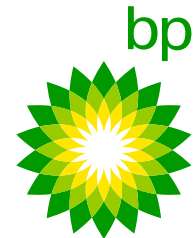




# Wind and solar capacity

Annual average increase in wind and solar capacity



A large, circular cutout in the center of the page reveals a vibrant, busy street scene at night. The street is filled with people, motorcycles, and colorful lights from shops and street vendors. The scene is illuminated by warm yellow and orange lights, creating a lively atmosphere. The cutout is set against a dark background that shows more of the same street scene, but with a different perspective or lighting.

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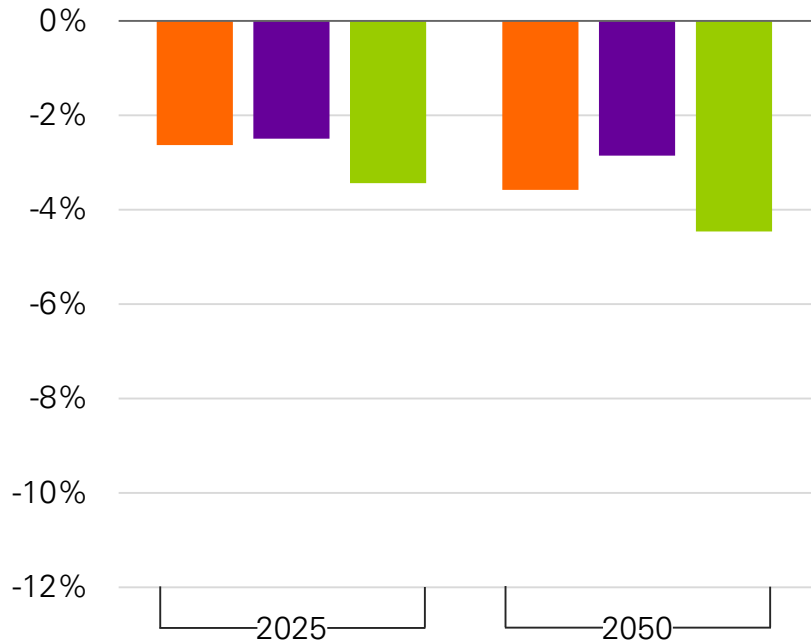
**William Zimmern**  
Lead economist energy  
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# Annex



# Impact of Covid-19 in *Rapid*

% change as a result of Covid-19

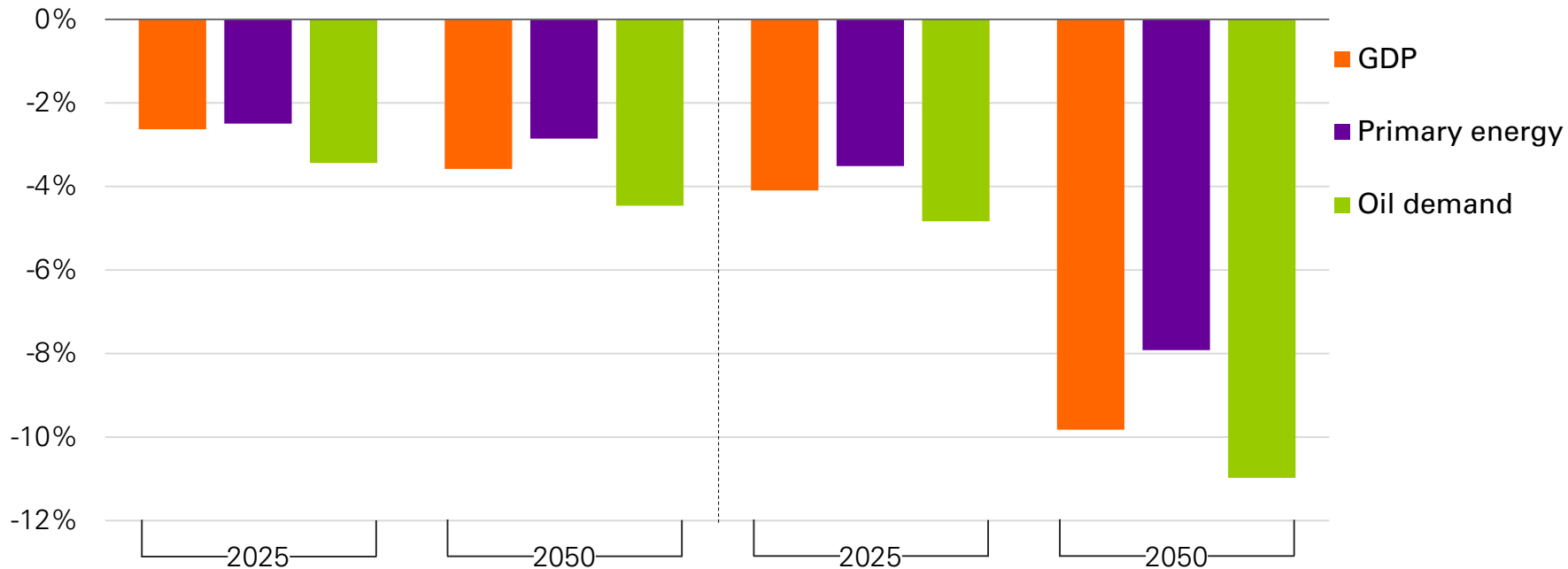


# Impact of Covid-19 in *Rapid*



Alt case: Greater impact from Covid-19

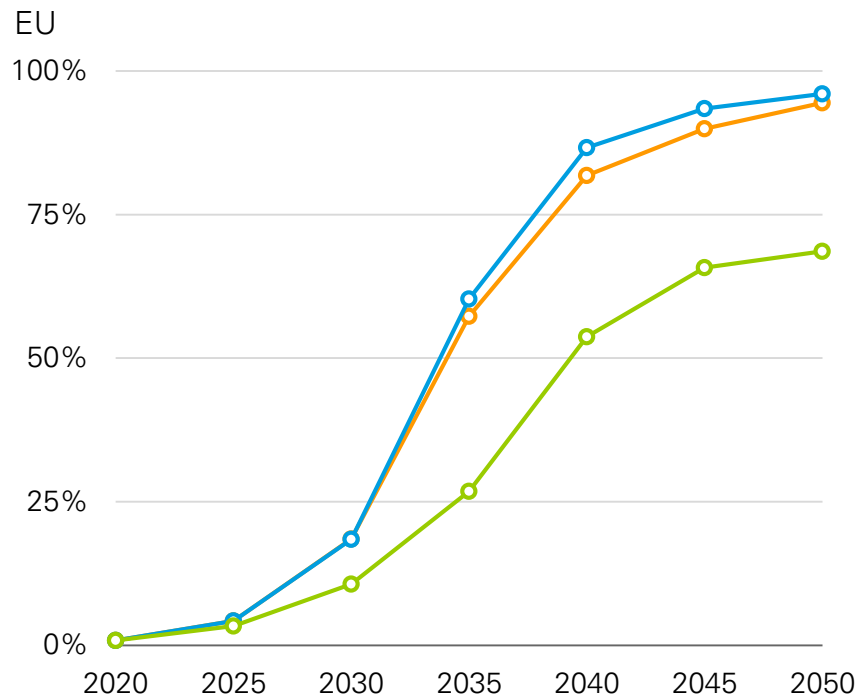
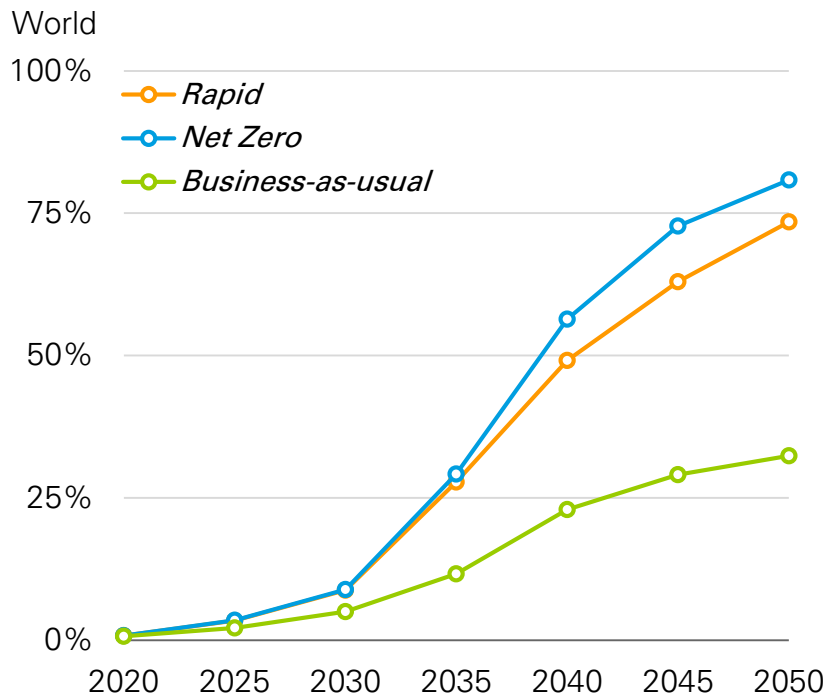
% change as a result of Covid-19



# Mobility revolution: electrification, shared-mobility and autonomy



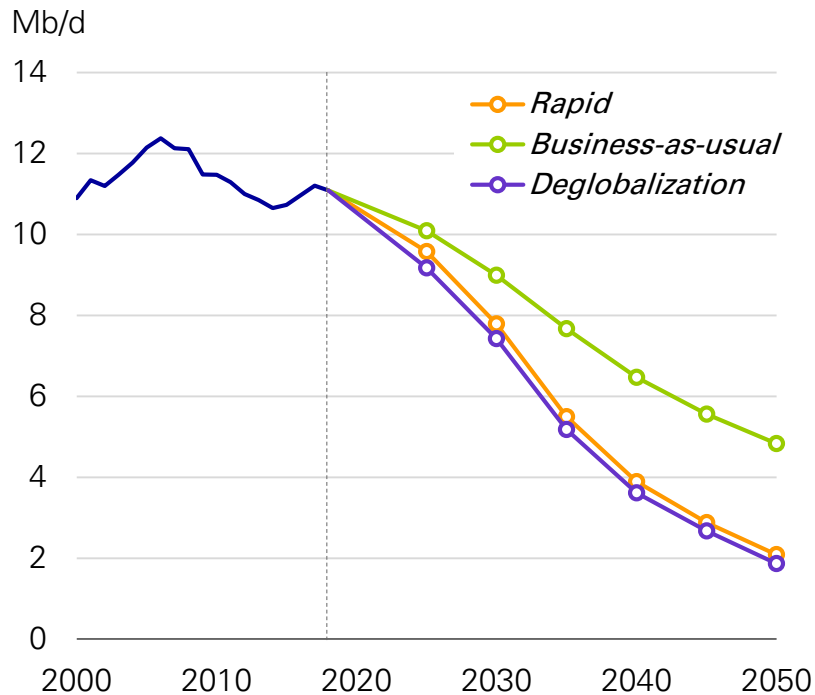
## Share of car and truck VKM electrified\*



\*includes buses

# EU net imports of oil and gas

## Oil



## Gas

