



THE CONTEXT FOR OUR STRATEGY THE ENERGY TRANSFORMATION SCENARIOS

BUSINESS ENVIRONMENT OVERVIEW

2015 2025 2035 2045 2055
2020 2030 2040 2050 2060

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#ShellScenarios



Warning: Uncertainties Ahead

Shell's scenarios are not intended to be projections or forecasts of the future. Shell's scenarios, including the scenarios outlined in this presentation, are not Shell's strategy or business plan. When developing Shell's strategy, our scenarios are based on many variables that we consider. Ultimately, whether society meets its goals to decarbonise is not within Shell's control. We intend to travel this journey in step with society, only governments can create the framework for success. The Sky 1.5 scenario starts with data from Shell's Sky scenario, but there are important updates. First, the outlook uses the most recent modelling for the impact and recovery from COVID-19 consistent with a Sky 1.5 scenario narrative. Second, it blends this projection into existing Sky (2018) energy system data by around 2030. Third, the extensive scale of nature-based solutions is brought into the core scenario, which benefits from extensive new modelling of that scale. (In 2018, nature-based solutions required to achieve 1.5°C above pre-industrial levels by the end of this century were analysed as a sensitivity to Sky. This analysis was also reviewed and included in the IPCC Special Report on Global Warming of 1.5°C (SR15).) Fourth, our new oil and natural gas supply modelling, with an outlook consistent with Sky 1.5 narrative and demand, is presented for the first time. Fifth, the Sky 1.5 scenario draws on the latest historical data and estimates to 2020 from various sources, particularly the extensive International Energy Agency energy statistics. As with Sky, this scenario assumes that society achieves the 1.5°C stretch goal of the Paris Agreement. It is rooted in stretching but realistic development dynamics today, but explores a goal-oriented way to achieve that ambition. We worked back in designing how this could occur, considering the reality of the situation today and taking into account realistic timescales for change. Of course, there is a range of possible paths in detail that society could take to achieve this goal. Although achieving the goal of the Paris Agreement and the route depicted in Sky 1.5 while maintaining a growing global economy will be extremely challenging, today it is still a technically possible path. However, we believe the window for success is quickly closing.

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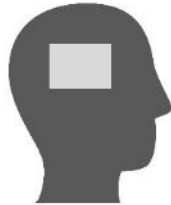
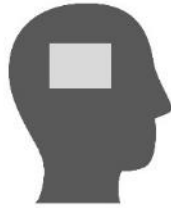
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Why scenarios?

Stretch mindsets for better-informed decisions

Help to improve judgment in the face of radical uncertainties

The Present



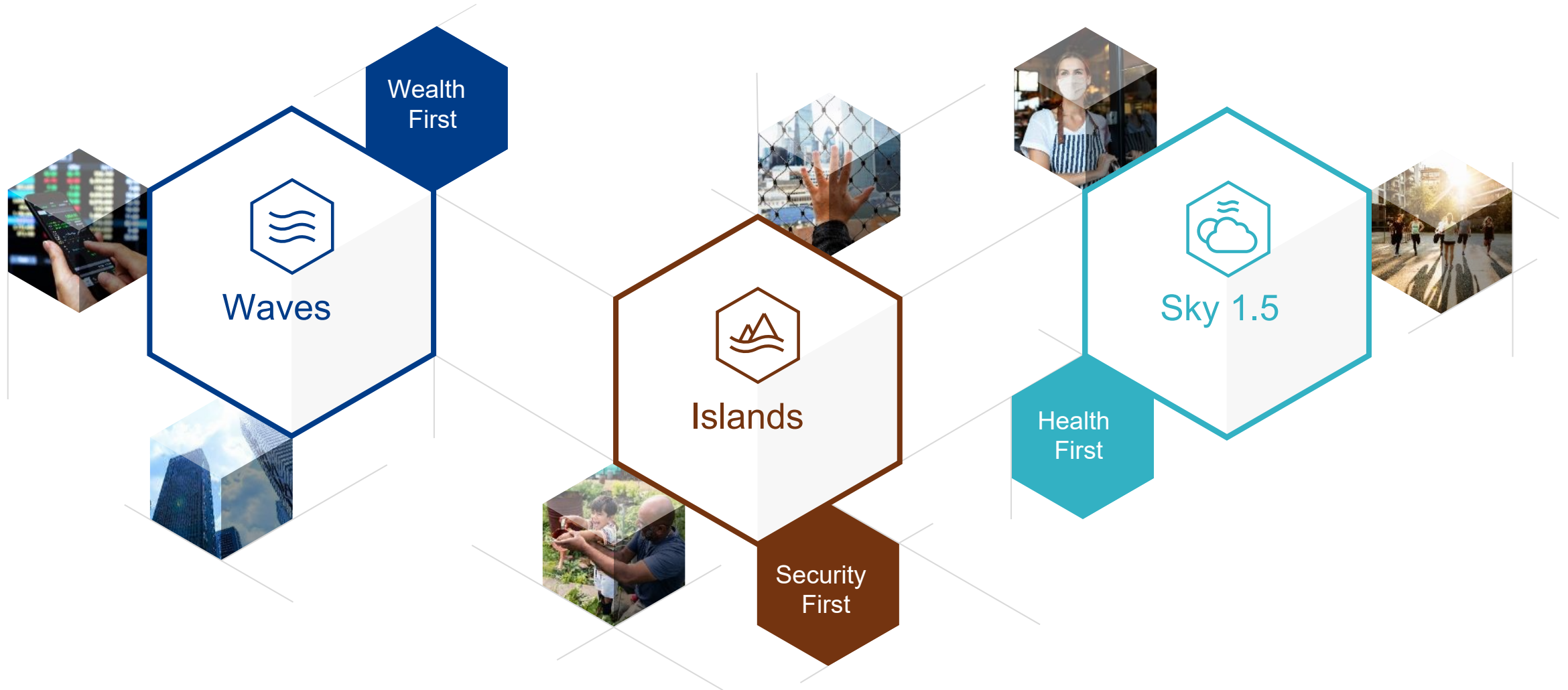
The Path



The Future



The Energy Transformation Scenarios



Waves Late, but fast decarbonisation



- Wealth first – repair the economy
- Surge in energy use and emissions
- Growing inequality and more frequent and extreme weather events
- Social pressures; issues intensify
- Backlash forces rapid policy-driven reductions in fossil fuels
- 2.3° C above pre-industrial levels by the end of this century

Islands Late and slow decarbonisation



- Security first – growing nationalism
- Frictions in collaboration and trade
- Economies stagnate; growth in energy demand stalls
- Global climate action slows
- Cleaner technology makes slow progress
- 2.5° C above pre-industrial levels by 2100, and still rising



Sky 1.5 Accelerated decarbonisation now



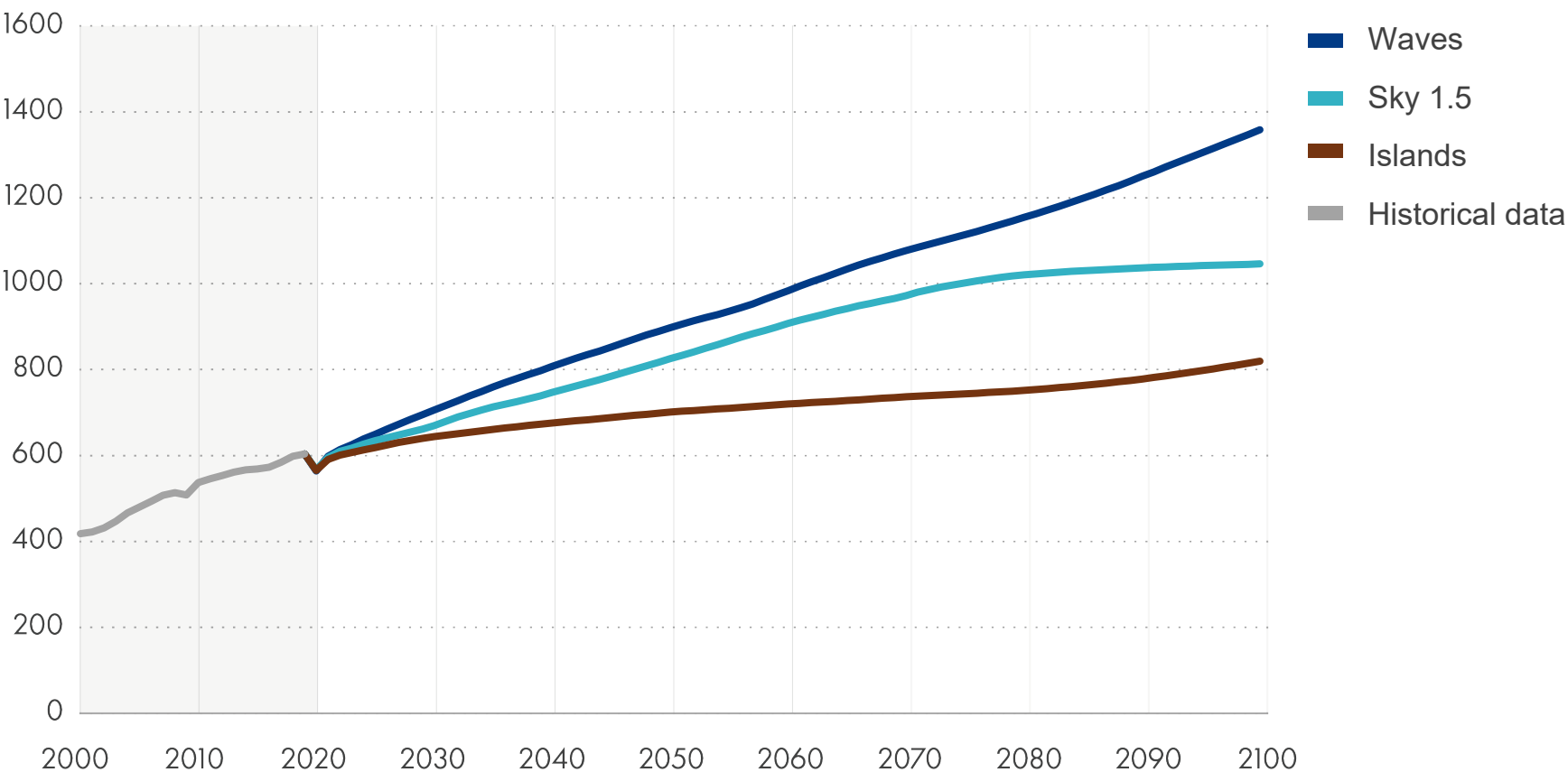
- Health first – well-being is the priority
- People proceed cautiously, economies reopen slowly but steadily
- Recognition of value in alignments
- Green investment reshapes energy system
- Deep structural changes lower emissions
- 1.5° C above pre-industrial levels this century, in line with Paris goal



Energy demand rises in all scenarios

Total primary energy

EJ/year



Source: Shell analysis based on data from the IEA (2020) World Energy Balances ([Link](#)), all rights reserved

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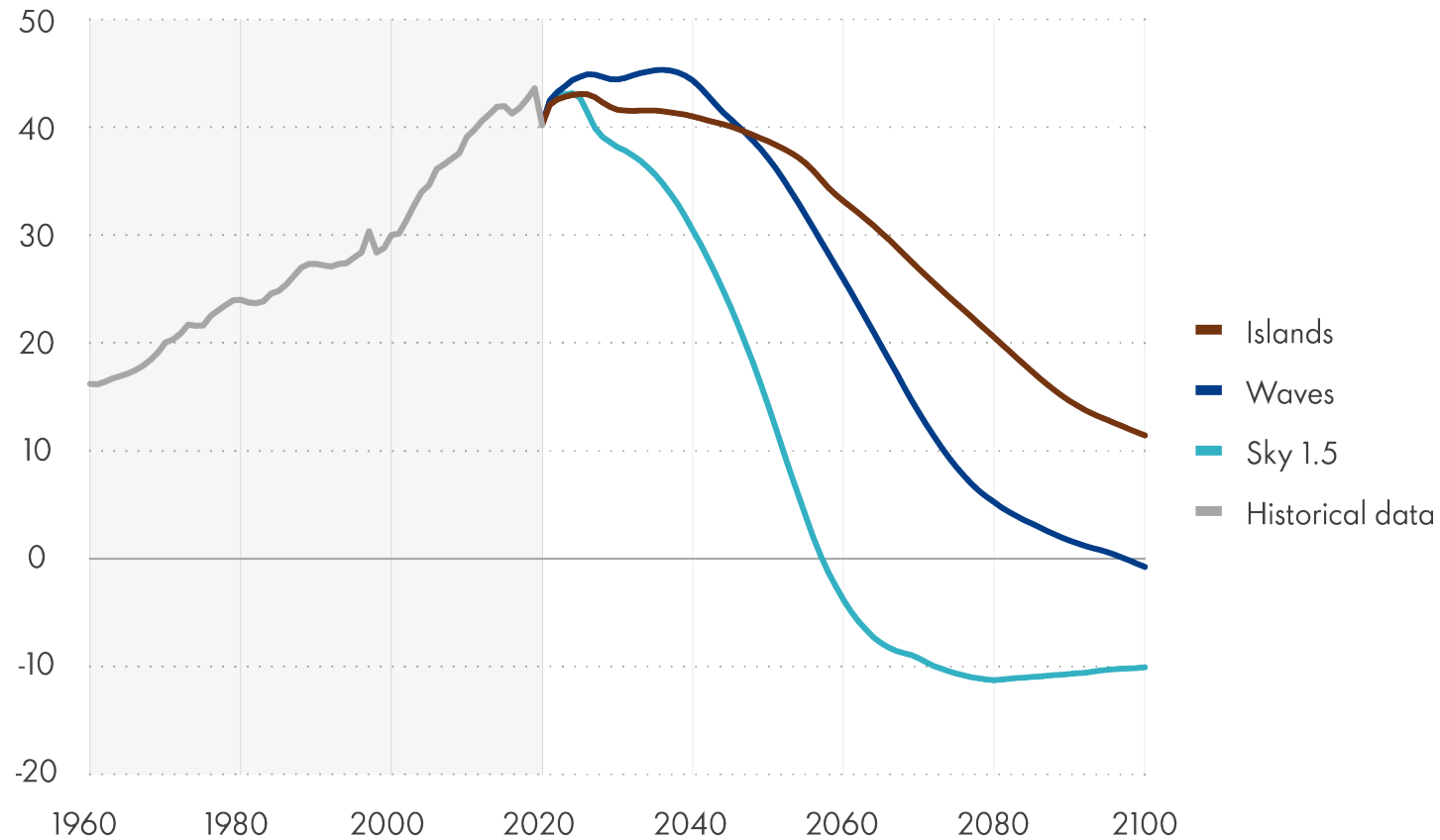
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Achieving net -zero CO₂ emissions is in the 2050's at the earliest

CO₂ emissions

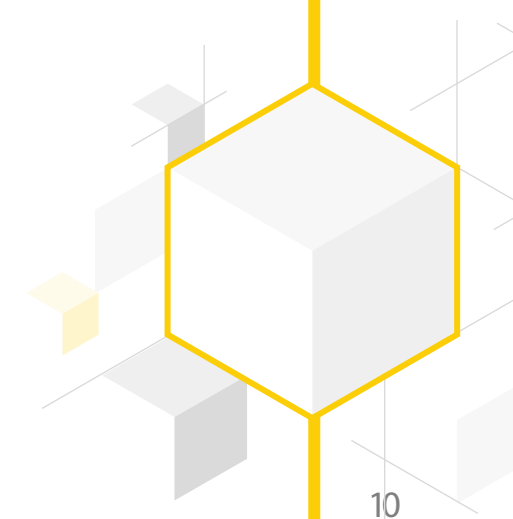
Gt CO₂/year



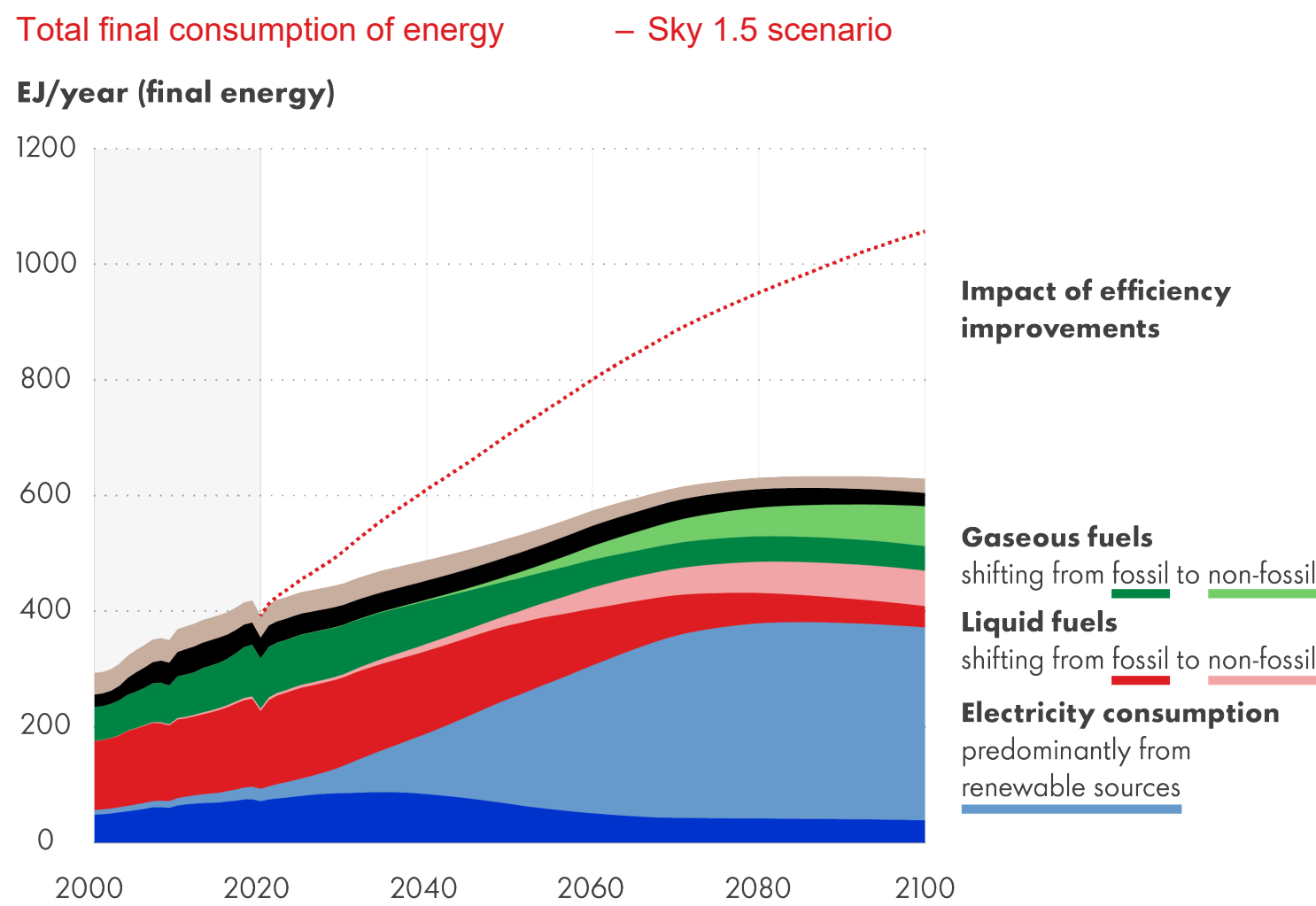
Source: Shell analysis based on data from Global Carbon Project (2020) and the IEA (2020) World Energy Balances ([Link](#)), all rights reserved

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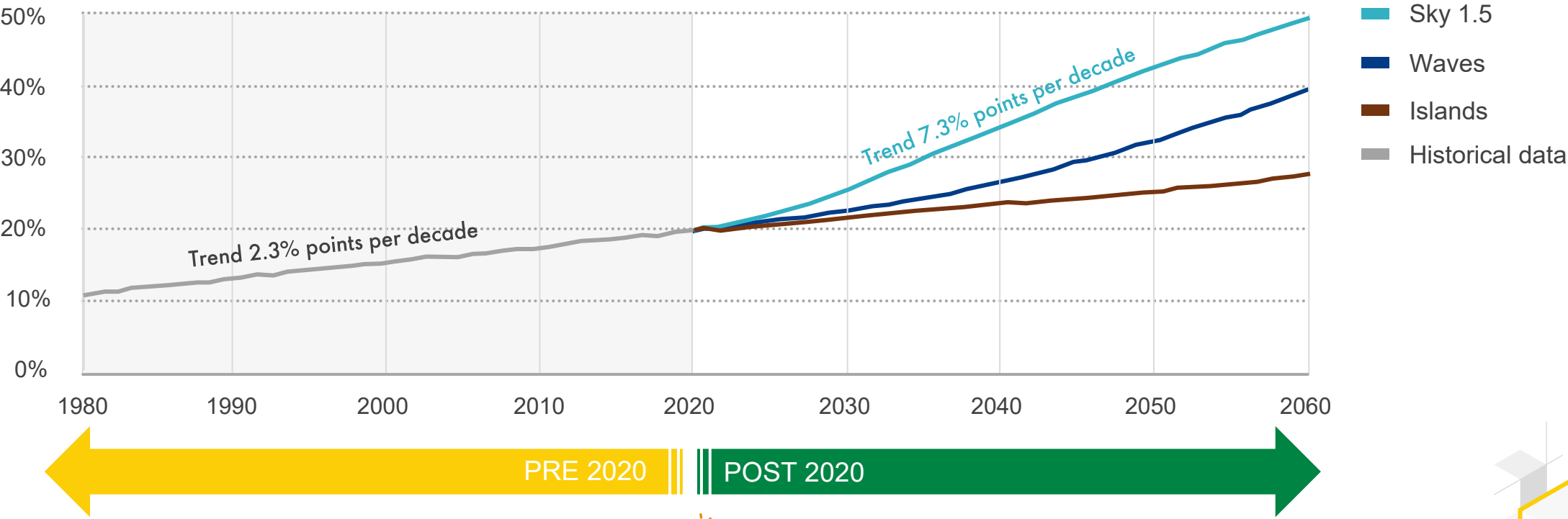



Efficiency gains and system decarbonization are vital





Electrification will grow in all scenarios, but particularly Sky 1.5

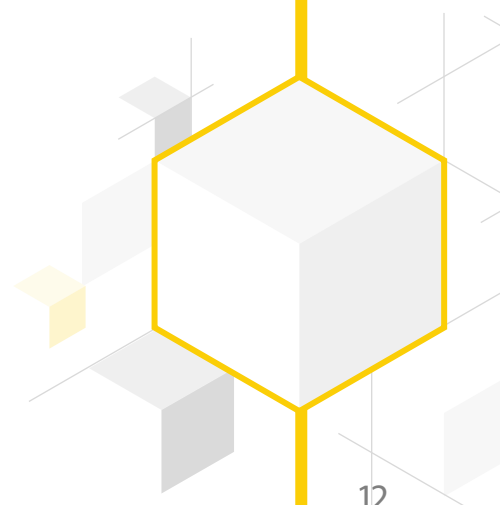
Share of electricity in final energy



600 GW of solar installed in 2010s  3000 GW of solar installed in 2020s

~150,000 3 MW turbines built during the 2010s, mainly onshore  70,000 10 MW turbines during the 2020s, offshore focus

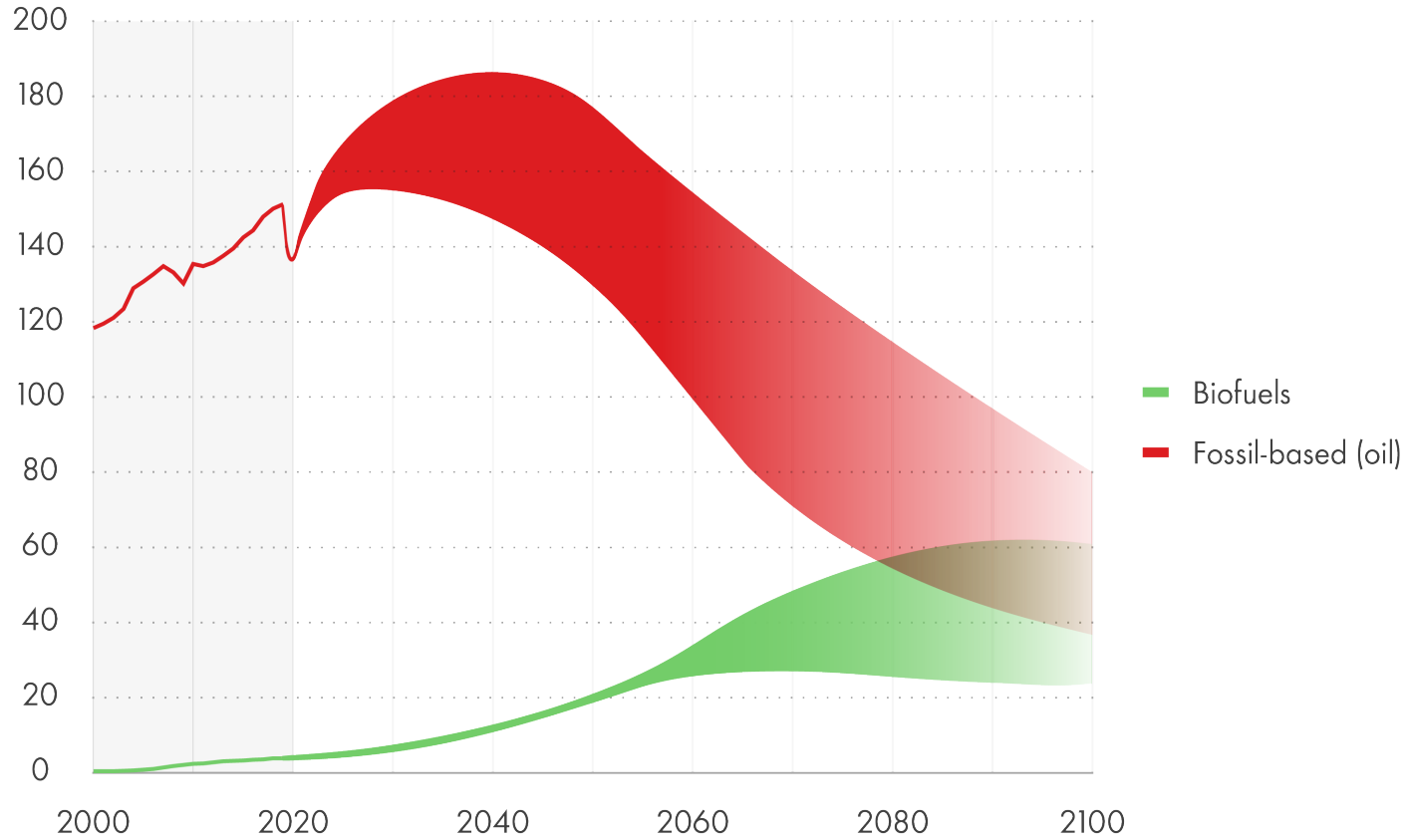
No real growth since the turn of the century  Increase by a third in the coming decade and double by 2040.



Oil demand will peak in the next two decades, but demand persists

Liquid fuels demand

EJ/year

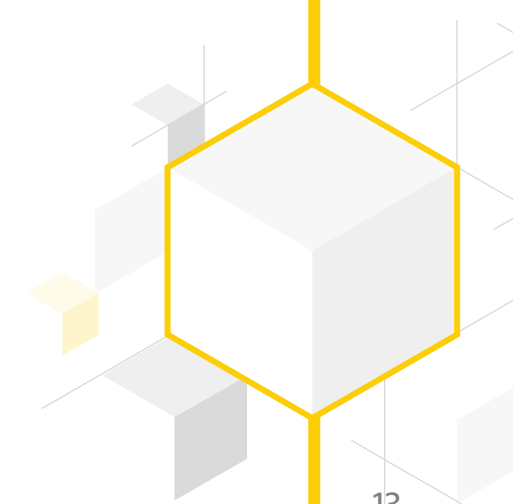


*Oil includes condensate and natural gas liquids

Source: Scenario ranges from Shell analysis based on data from the IEA (2020) World Energy Balances ([Link](#)), all rights reserved

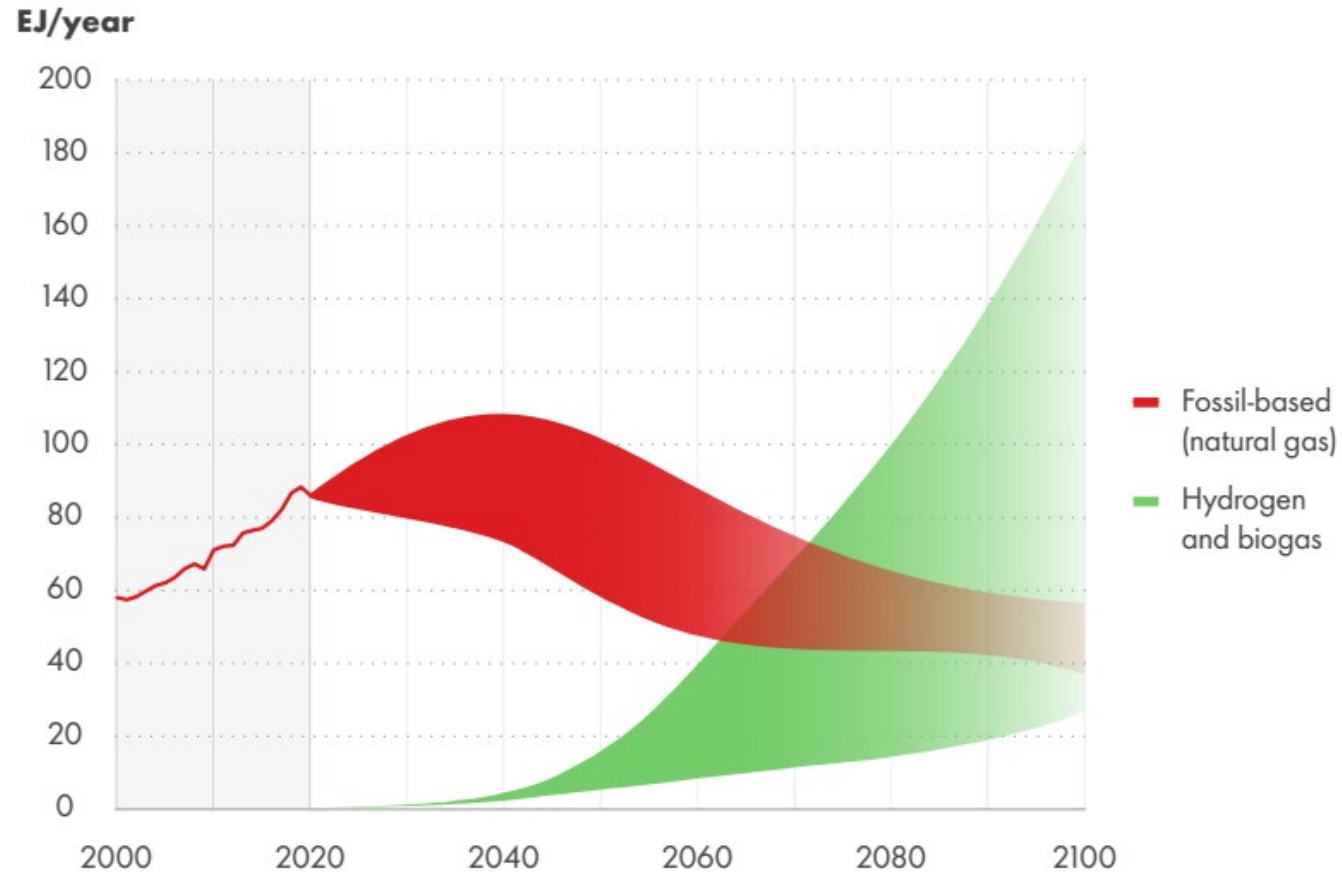
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Gas demand persists longer, but H2 and biogas could grow beyond 2050

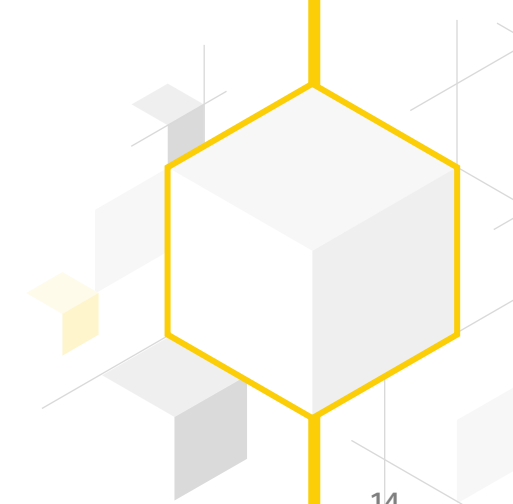
Gaseous fuels demand



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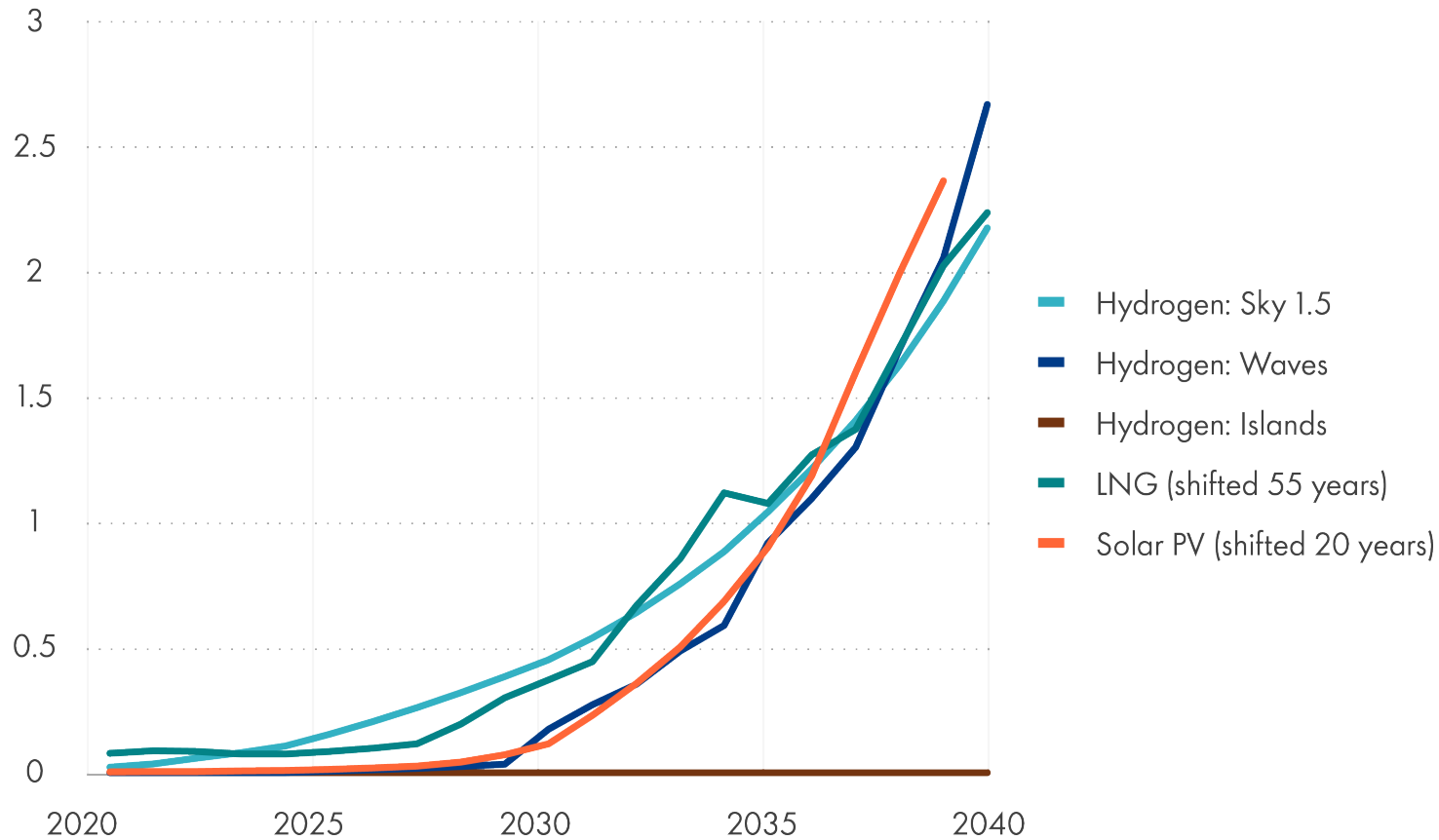
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Comparing outlooks for hydrogen demand with the experience from two successful emerging energy technologies: LNG and solar PV

Hydrogen growth vs historical trends

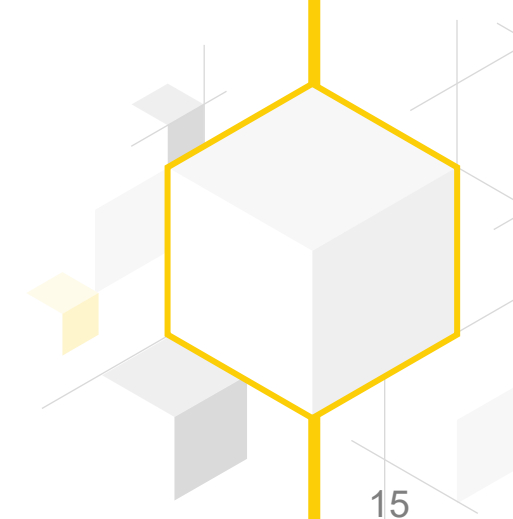
EJ/year



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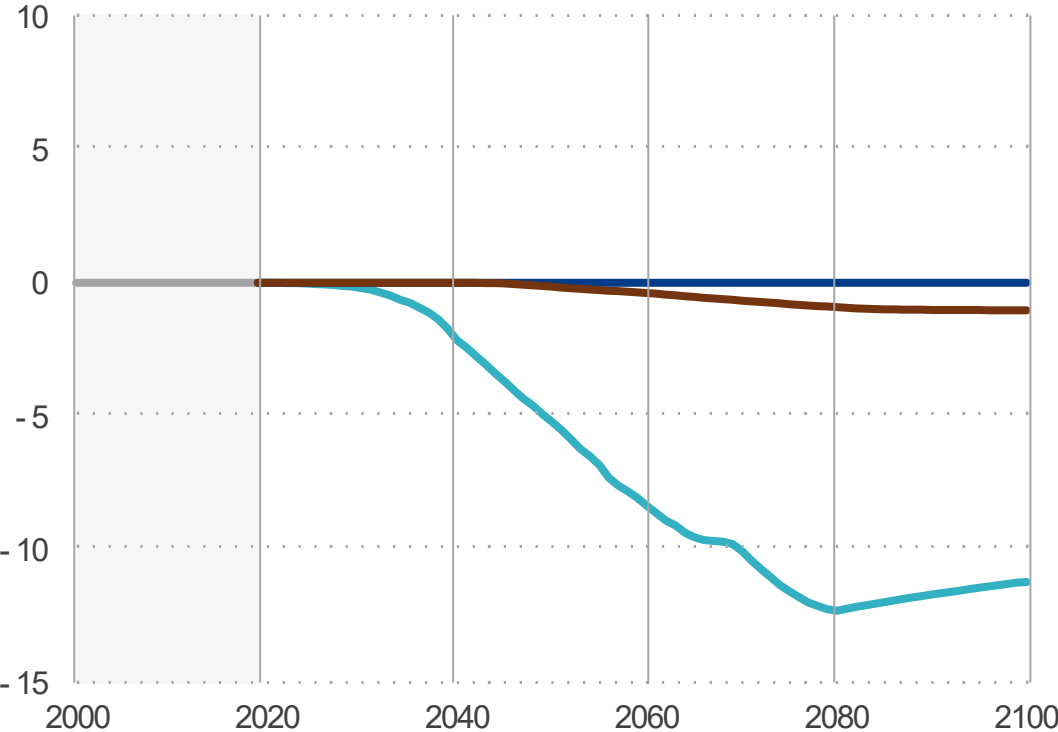


Both technological and natural sinks will be critical to achieving 1.5

° C

Energy -related emissions captured by CCS

Gt CO₂/year



■ Waves ■ Islands ■ Sky 1.5 ■ Historical data

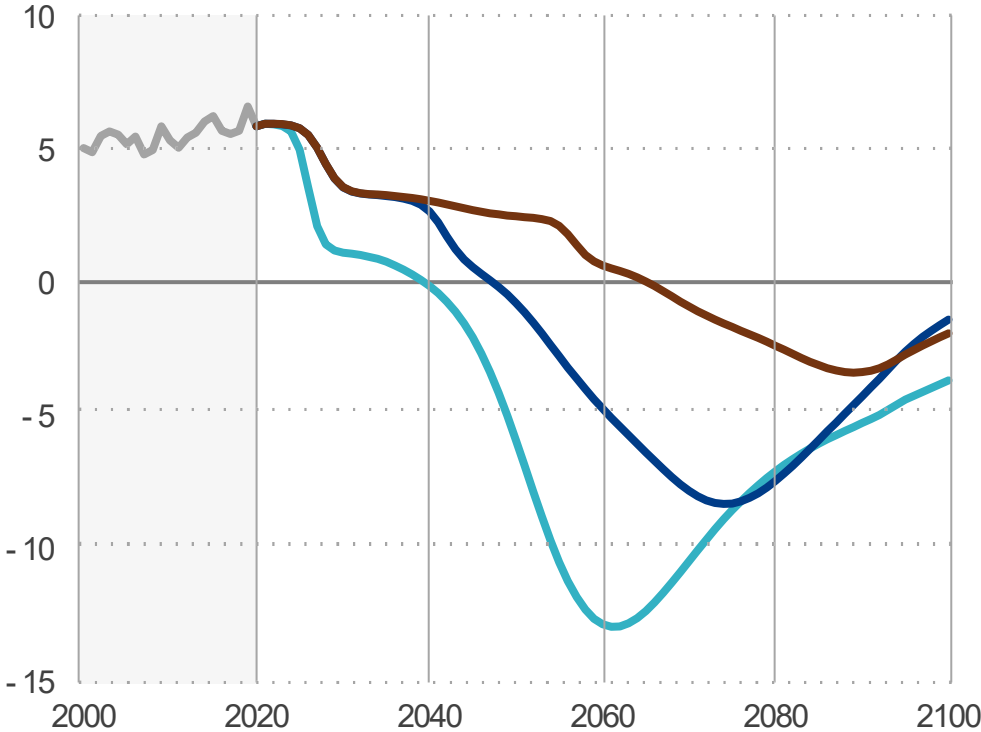
Source: Shell analysis, Global Carbon Project (2020)

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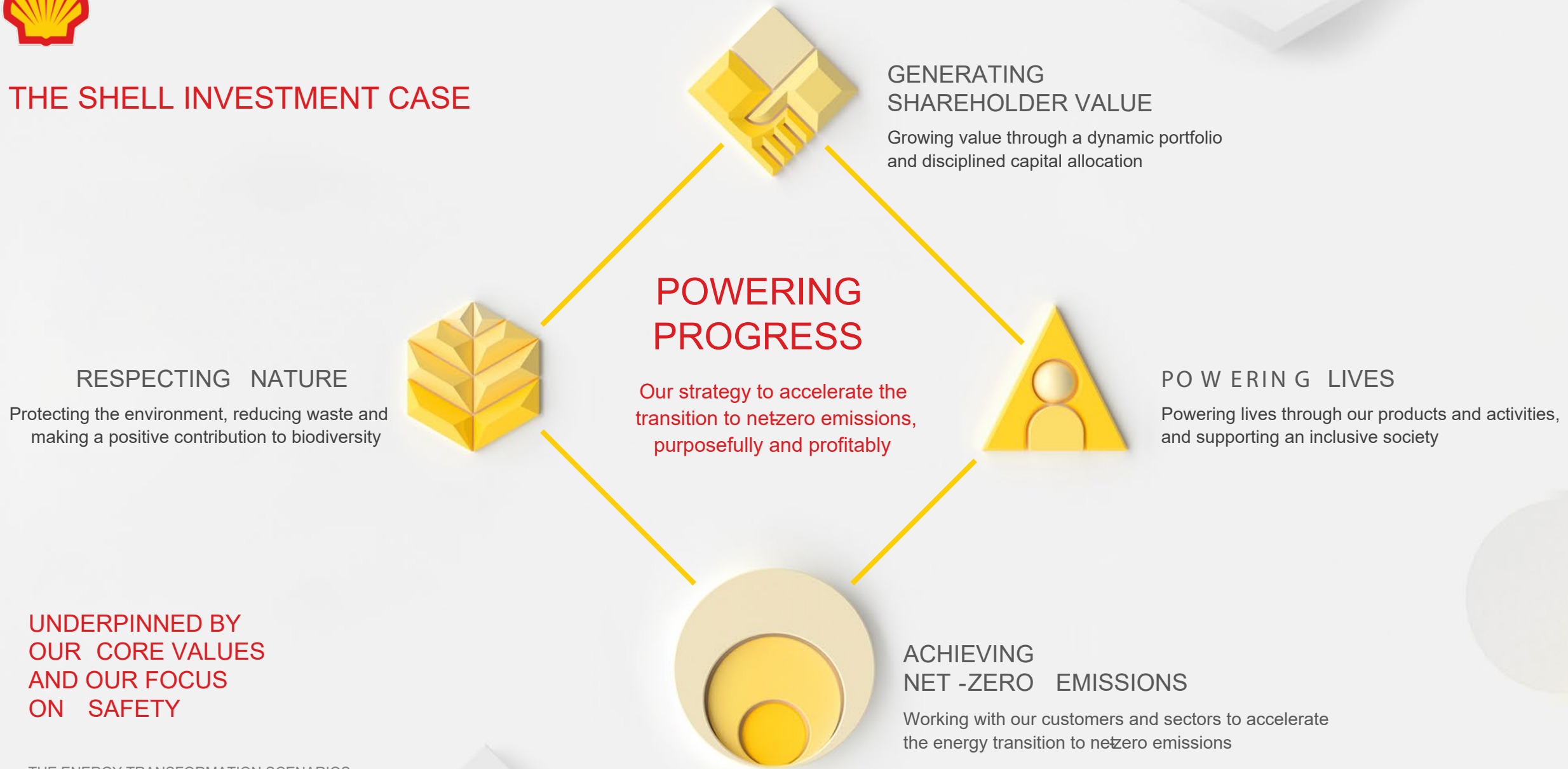
CO₂ removal using nature

Gt CO₂/year





THE SHELL INVESTMENT CASE



**UNDERPINNED BY
OUR CORE VALUES
AND OUR FOCUS
ON SAFETY**



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