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German Renewables Week

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Industrial decarbonisation: The role of green power procurement and hydrogen

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Osborne Clarke | uniper | FORESIGHT Climate & Energy | TAGESSPIEGEL ENERGIE & KLIMA BACKGROUND

Around 40% of net zero power demand today comes from industry

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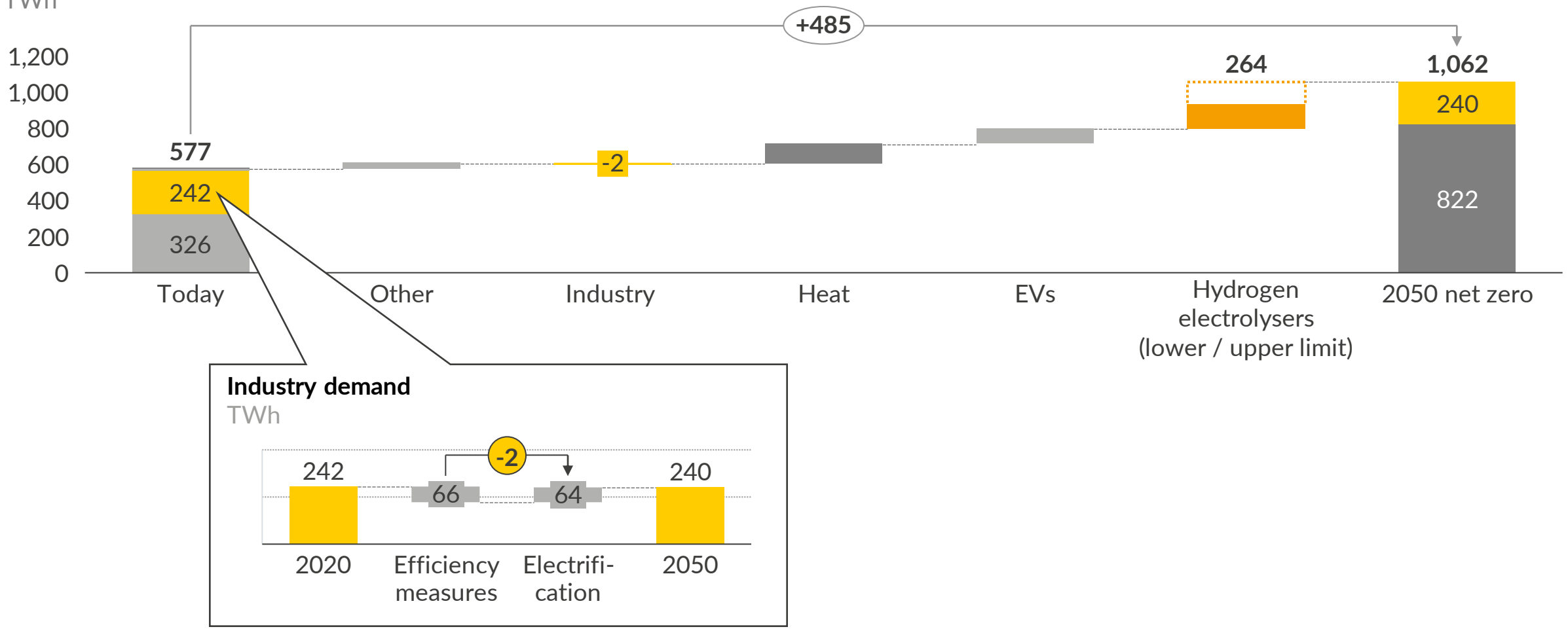
Total power demand in the net zero scenario

TWh



Source: Aurora Energy Research

Green power procurement and hydrogen are key pillars of decarbonisation efforts

	Effects on power demand	Ease of implementation	Time frame	Impact on decarbonisation
Energy efficiency		★★★★☆	Mid term	High
Green power procurement		★★★☆☆	Mid - long term	High
Hydrogen		★★☆☆☆	Long term	Case specific applicability
Electrification		★★☆☆☆	Long term	Case specific applicability
Carbon offsetting		★★★★☆	Short term	Small - None

Sources: Aurora Energy Research

PPAs have low market maturity in Germany

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Green power procurement options	Guarantees of Origin (GoOs)	Power purchasing agreements (PPAs)	Own renewable assets
Additionality			
Market maturity	★★½☆☆	★★☆☆☆	★★★★☆
Capital requirements	★☆☆☆☆	★★½☆☆	★★★★☆
Price hedge	unfavourable	neutral	favourable
Capability building	★☆☆☆☆	★★½☆☆	★★★★☆

Sources: Aurora Energy Research

Most existing PPAs in Germany are from solar PV

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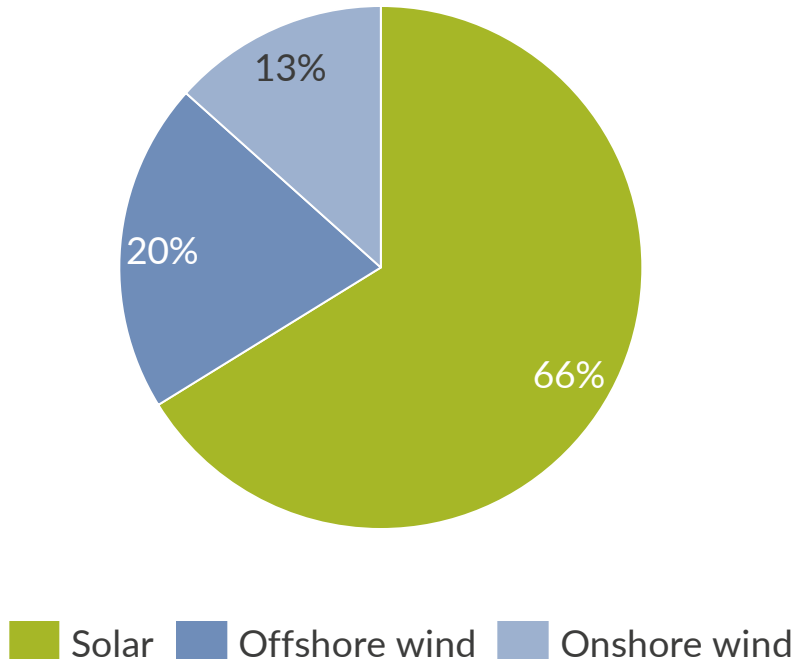
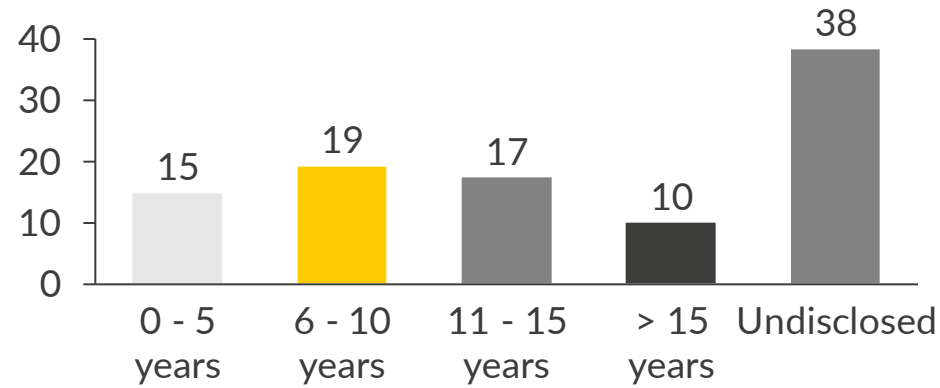
Technology Share PPAs in Germany
% of installed capacity



Tenor
%, in years



Price clauses in Germany

Price clause	Occurrence today
Fixed price	High
Indexed	Low
Collared	Low - Medium

Sources: Aurora Energy Research

Strong industrial demand and corporates seeking green image suggest a strong demand for PPAs in Germany

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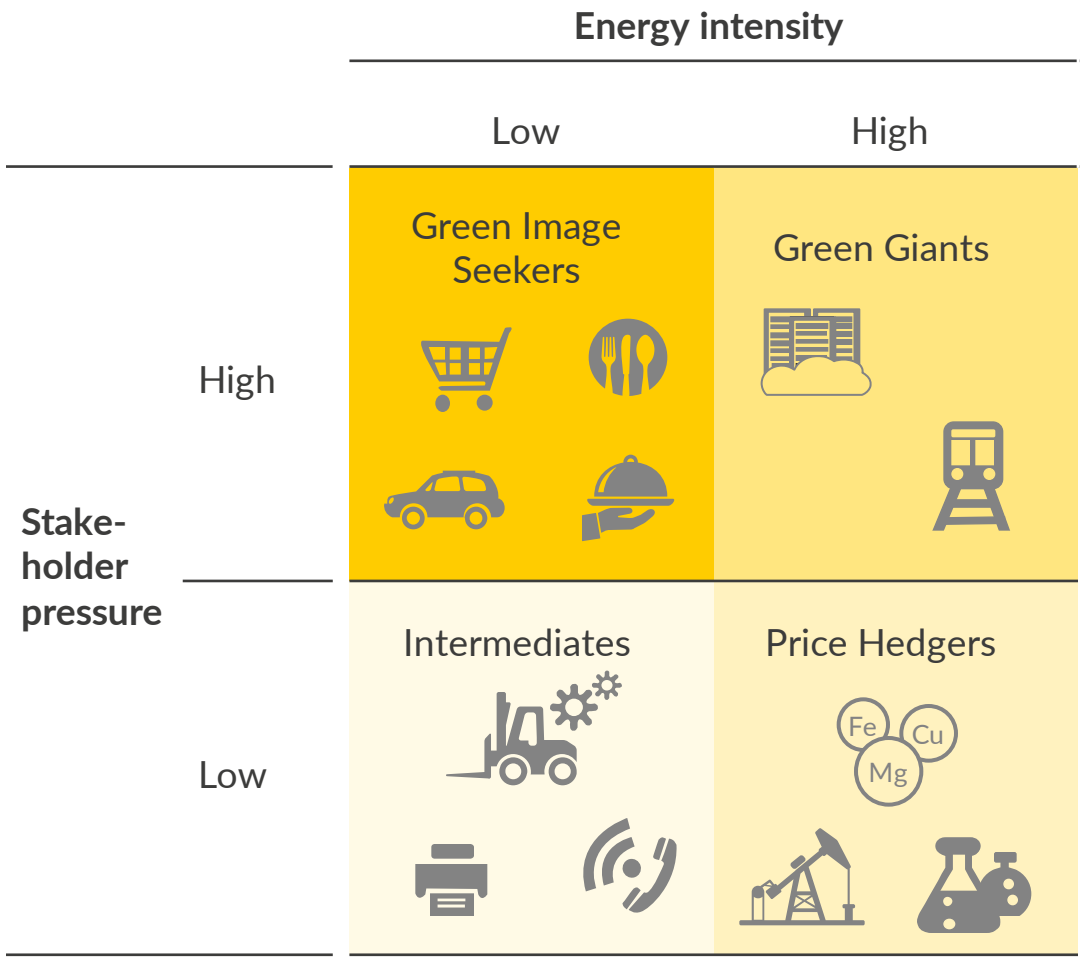
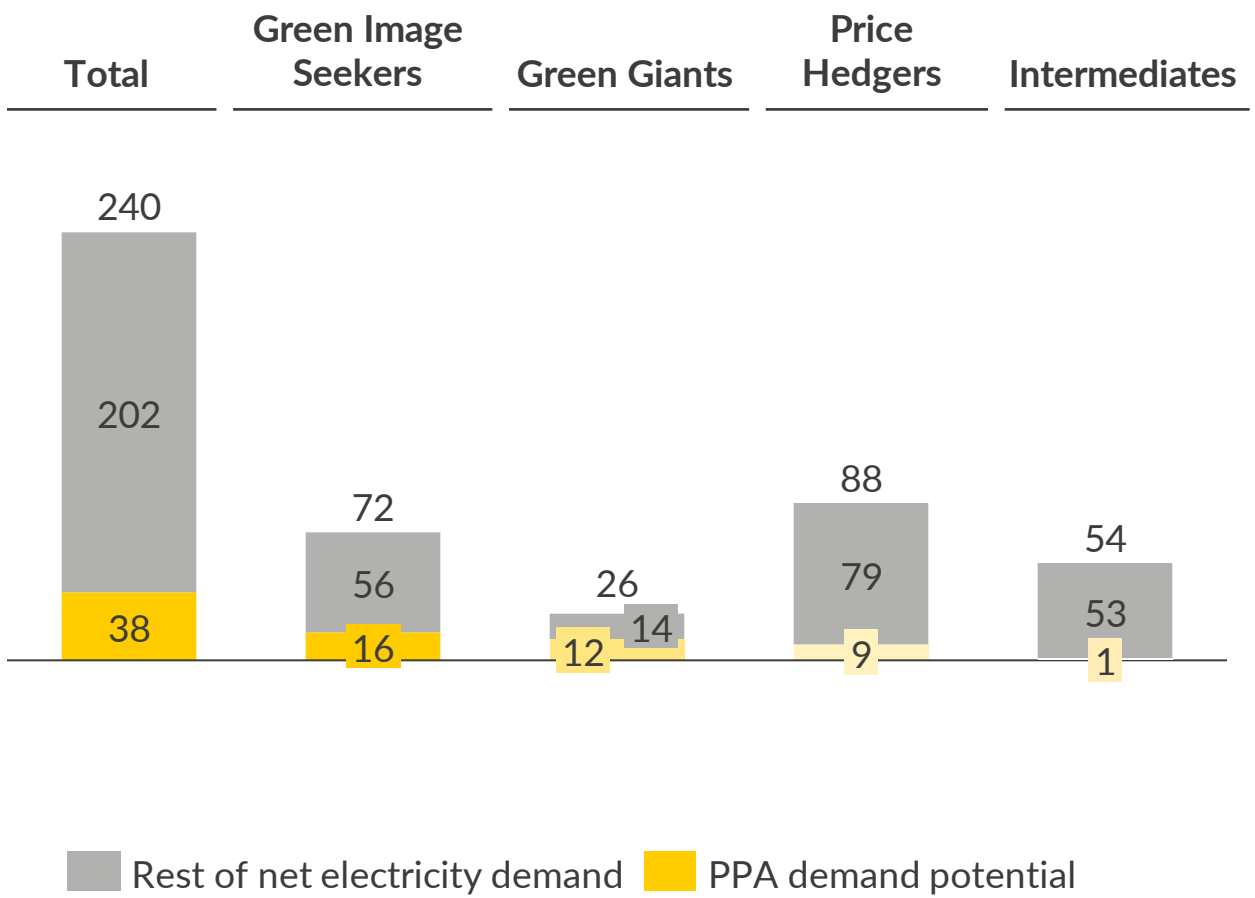
Corporate PPA demand segmentation



Net industry electricity demand (2030 estimate)[1]

TWh



1) Excluding minor service and industry that could not be categorised in these segments

Source: Aurora Energy Research

Corporate demand for PPAs may exceed merchant renewable supply in 2030

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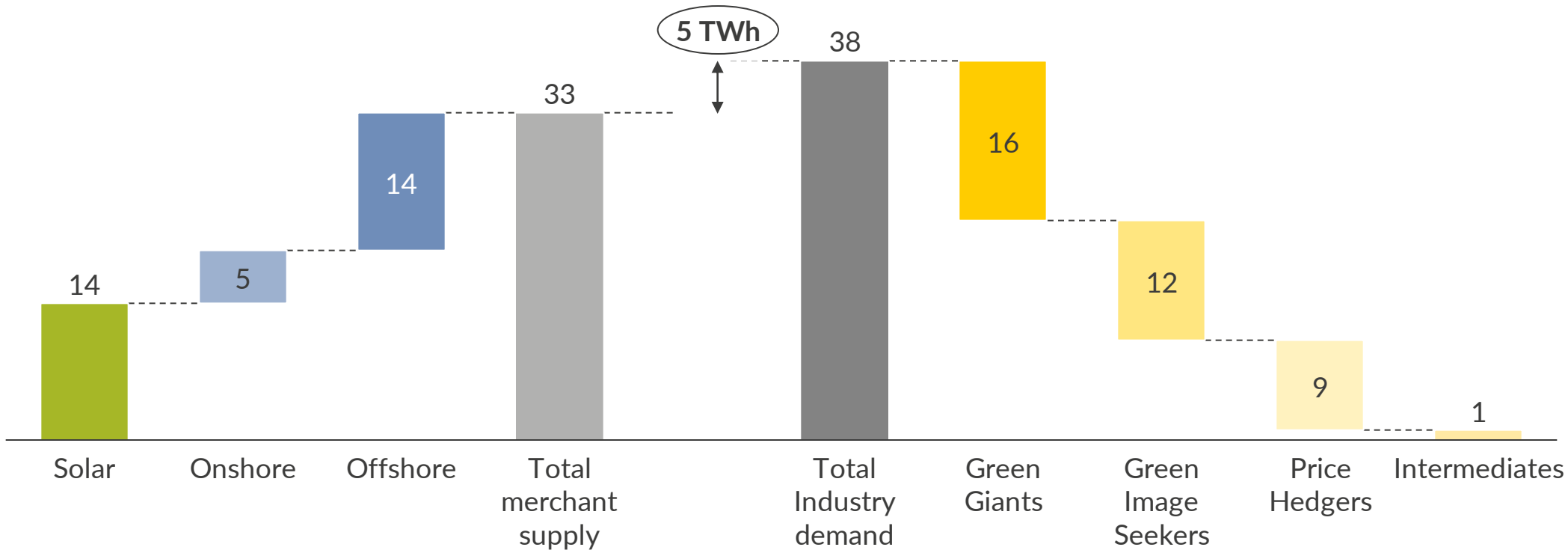
PPA supply potential (2030 estimate)[1]
TWh

Corporate PPA demand (2030 estimate)[2]
TWh



1) We assume that 20% of solar plants leaving the EEG between 2027 and 2030 will sign a PPA and supply of >20MW solar plants will grow to 10TWh by 2030, 20% of onshore parks leaving the EEG between 2027-2030 will sign a PPA, and that 20% of offshore capacity in 2030 (excluding zero bids from 17/18) will sign a PPA 2) Excluding minor service and industry that could not be categorised in these segments

Sources: Aurora Energy Research

Hydrogen is a promising emissions reduction pathway for hard-to-abate industry sectors

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Use case	Market readiness
Steel	★★☆☆☆
High-Value Chemicals	★☆☆☆☆
...	
Ammonia	★★★★★
Methanol	★★★★★
Petrochemicals	★★★★★

Industrial hydrogen demand today

Total : 55 TWh

Sources: Aurora Energy Research

By 2050, up to 80 TWh of hydrogen will be required annually for industrial processes

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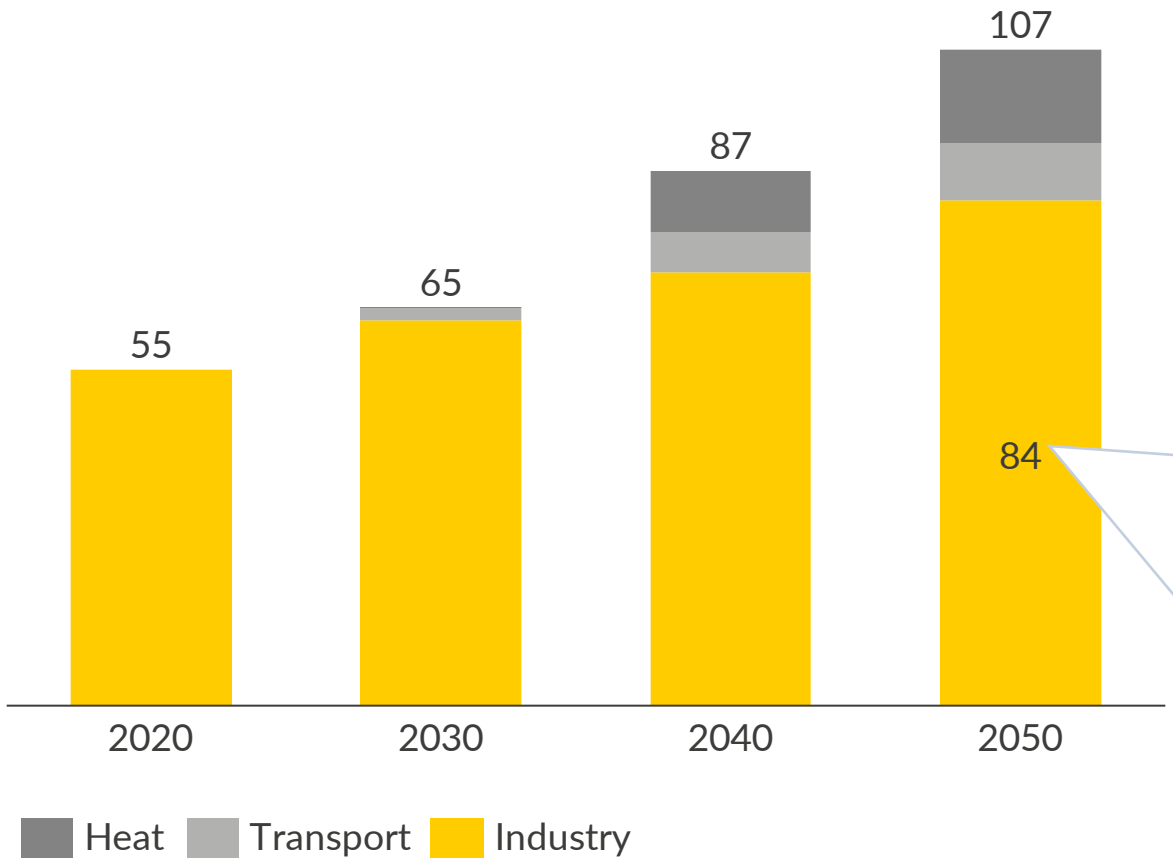
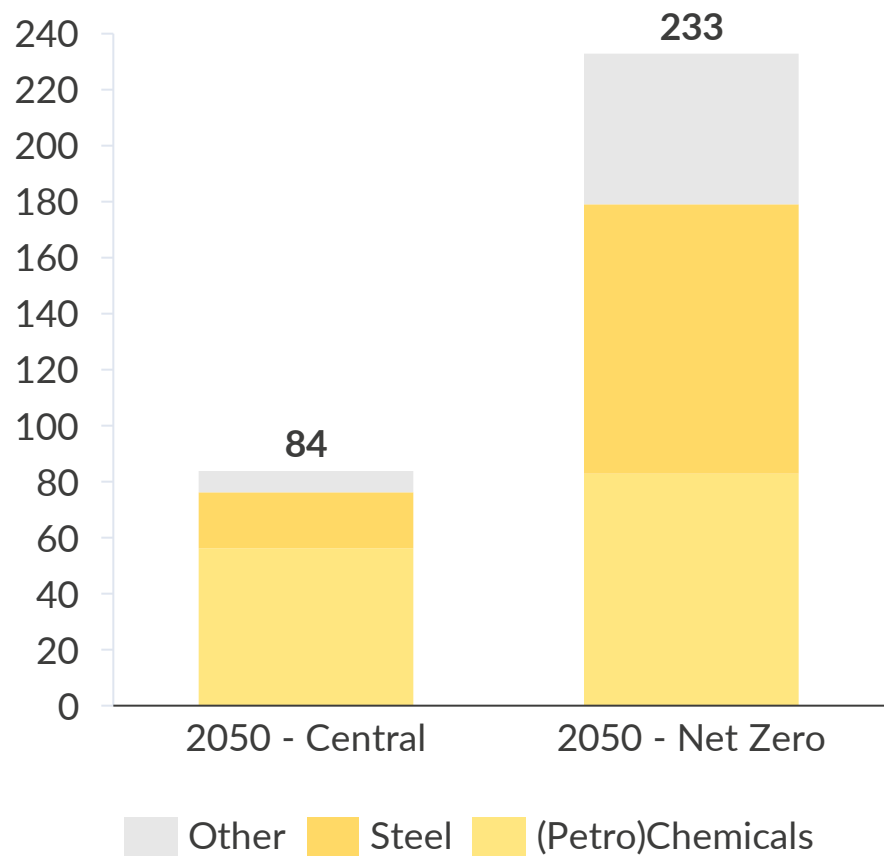
Total annual hydrogen demand by sector (Central Scenario)
TWh



Hydrogen demand for industry by process
TWh



Source: Aurora Energy Research

H_2 demand in 2050 will mostly be met by Steam Methane Reforming (SMR) + CCS and electrolysis

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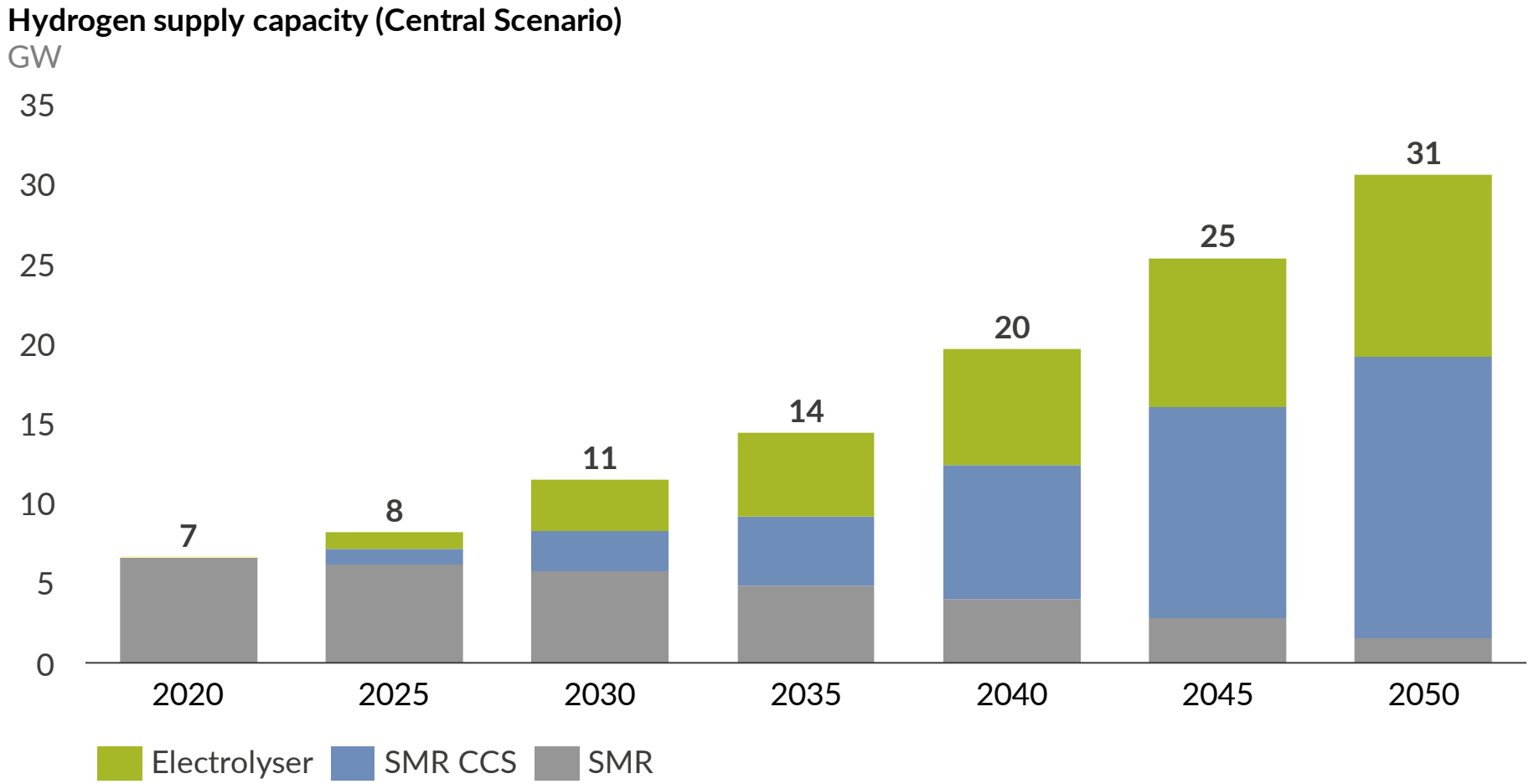

Source: Aurora Energy Research


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