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ENERGY RESEARCH

The Kraftwerkssicherheitsgesetz and the future of gas power plants in Germany

Public report

October 2024

Agenda

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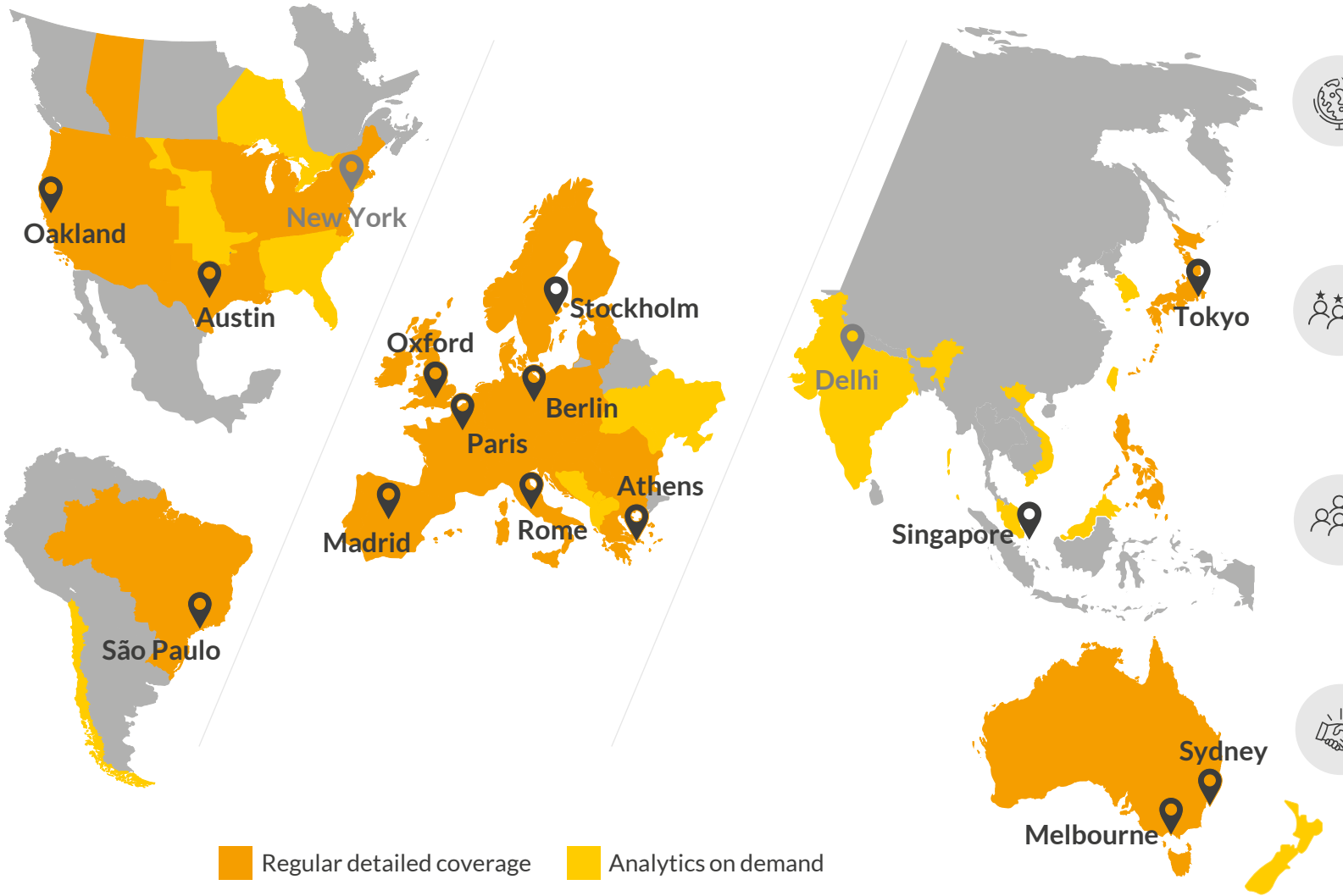

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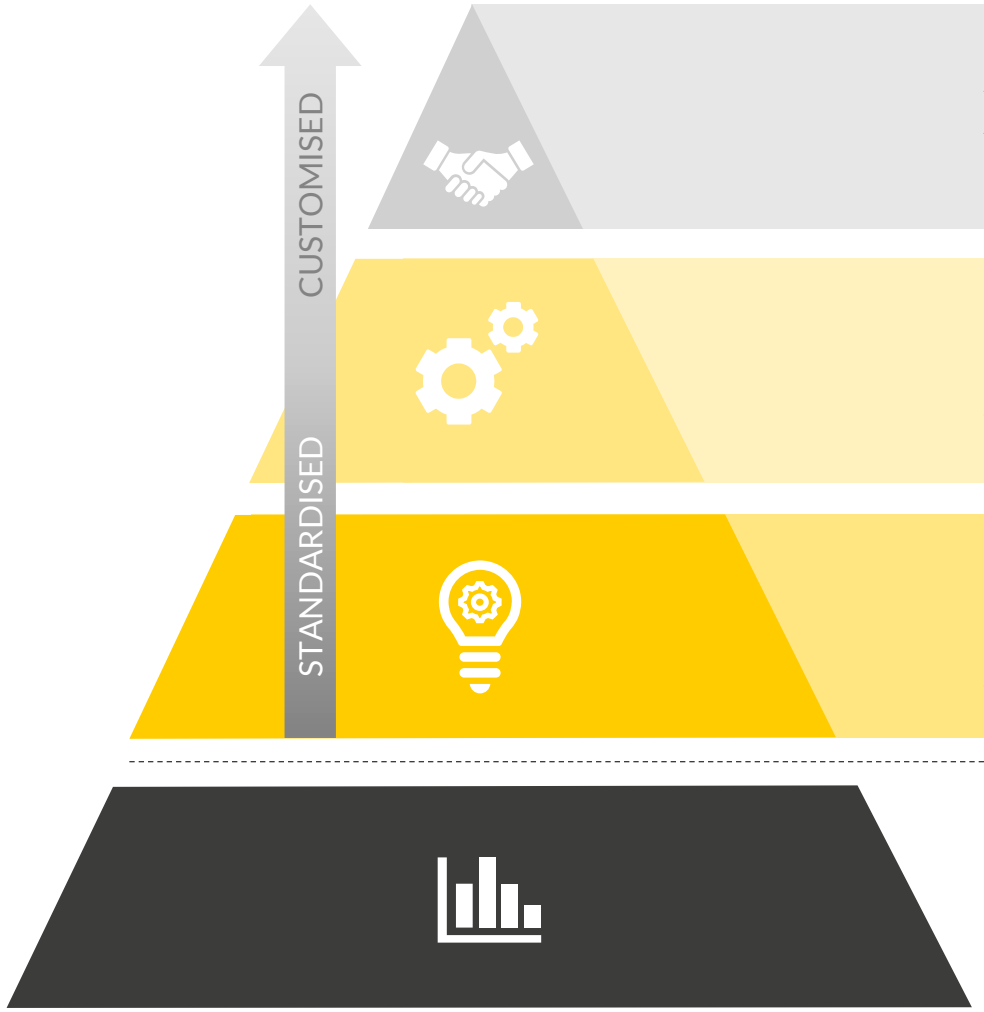

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Dr Casimir Lorenz

Head of Advisory
Central Europe

Nico Leicht

Project Leader
Advisory

Daniel Böhmer

Associate
Advisory

Levente Molnar

Associate
Advisory

Roni Bishop

Graduate
Analyst

Source: Aurora Energy Research

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I. Introduction

II. The Kraftwerkssicherheitsgesetz and its design parameters

III. Implications for asset economics

IV. System-impact of the Kraftwerkssicherheitsgesetz

V. Summary of findings

Without new builds, the coal exit and rising demand lead to a 22GW gap between peak residual demand and dispatchable capacity by 2035

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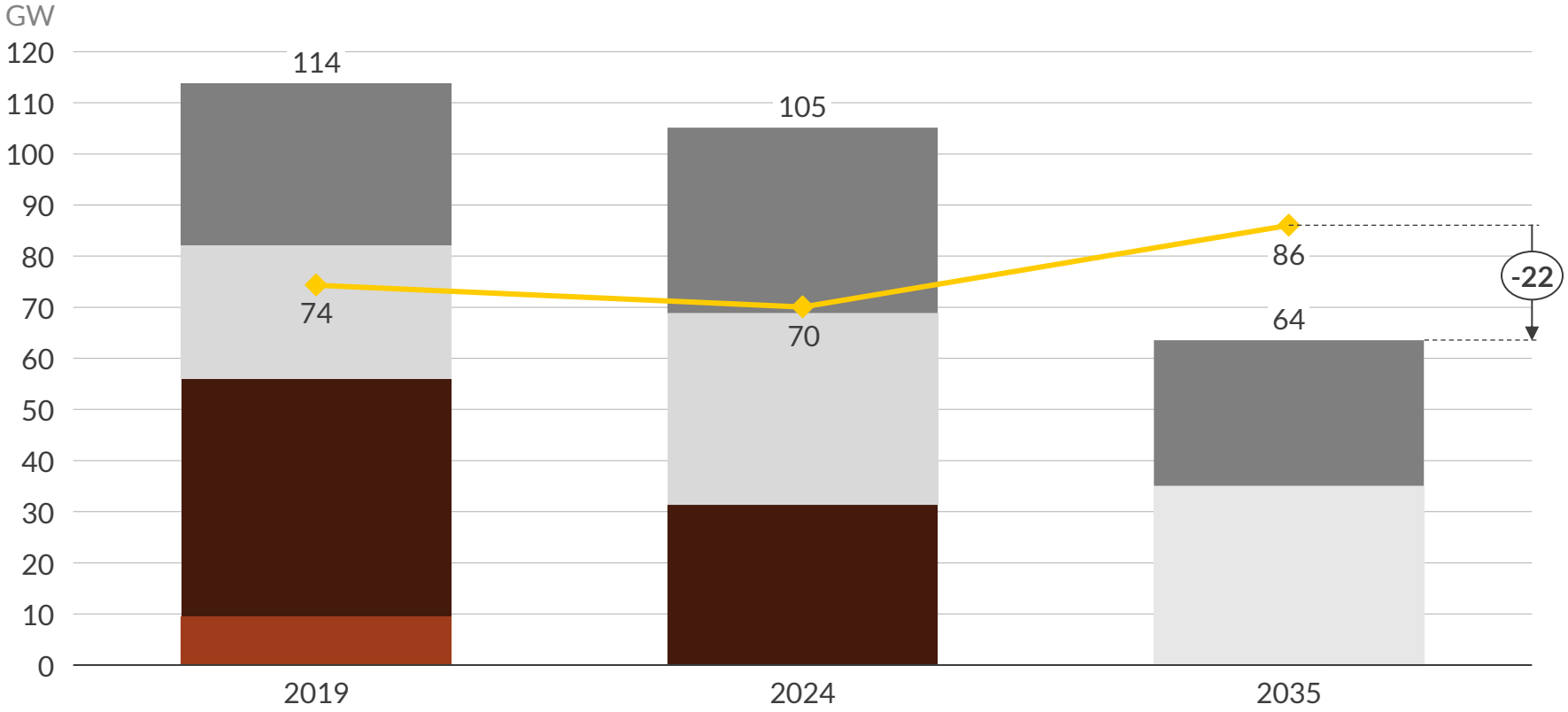
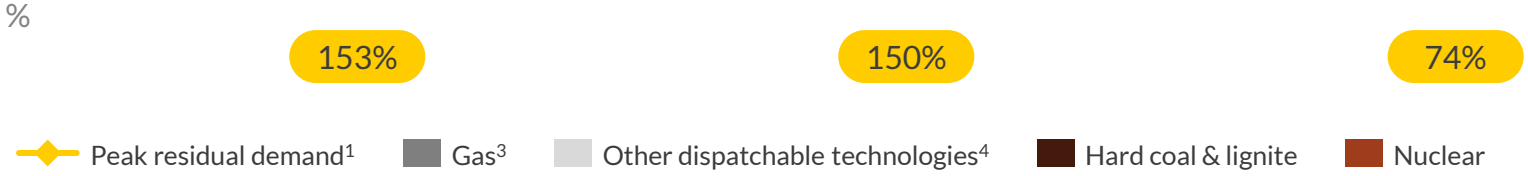
Peak residual demand[1] and dispatchable capacity without new builds[2]



Share of peak residual demand[1] covered by dispatchable capacity



1) Peak residual demand refers to total net demand minus wind and solar generation. 2) Based on the Aurora Central scenario, but no buildout of non-CHP power plants is assumed. 3) Includes gas CCGTs and peakers. 4) Includes hydro, biomass, pumped storage, battery, and other thermal (i.e., waste plants and on-site industrial thermal power plants).

Sources: Aurora Energy Research, BNetzA

- In the past, the German power system was characterised by overcapacity, with dispatchable capacity significantly exceeding peak residual demand.
- Due to the coal exit, 40% of the currently installed dispatchable capacity (i.e. 31GW of hard coal and lignite) is expected to leave the system by the early 2030s.
- Simultaneously, increasing electrification of industry, transport, and heat as well as the domestic production of green H_2 drive up peak residual demand by 23% (16GW) between now and 2035.
- Significant buildout of new dispatchable capacity is needed to reduce this gap and ensure security of supply. At the same time, these new assets need to be able to decarbonise swiftly to not jeopardise climate targets.

The consultation on the Kraftwerkssicherheitsgesetz has been started by the BMWK, with 13 GW of power plant capacity and LDES

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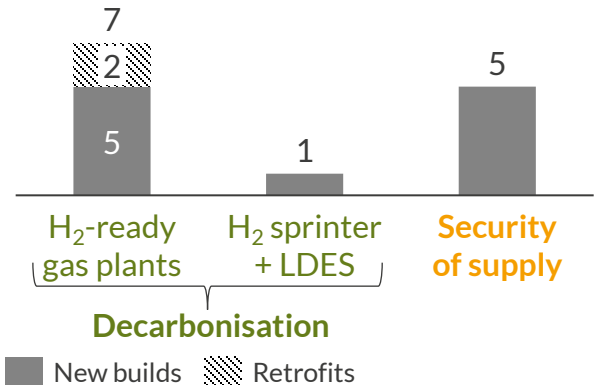
10 GW of new gas plants and 2 GW of plant retrofits form the core of the measure + **1 GW of H_2 sprinter plants and LDES**

Capacity by objective
GW



1 **Pillar 1:** 5 GW newbuild + 2 GW retrofitted gas plant capacity to be supported via the **decarbonization** objective of state aid

2 **Pillar 2:** 5 GW newbuild capacity backed as a **security of supply** measure.[1]

A **Geographic distribution**: Plants shall be predominantly built in the South, incentivised by the "South Bonus".

500 MW of gas-fired power plants that need to be operated with hydrogen from the start (H_2 sprinter plants).

- Support design yet unclear with two options for consultation.

500 MW long duration energy storage (LDES) technologies.

- Supported by using auctions and granting investment support over 10 years.

2024

5 July: BMWK press release

11 September: Stakeholder consultation
Stakeholders have 6 weeks to submit replies until 23 October

Fall/Winter 2024
Final approval of the *Kraftwerkssicherheitsgesetz*

Beginning of 2025: First auctions
Decarbonisation capacity is auctioned in 2025-2027, while security of supply capacity, H_2 sprinter plants, and LDES are scheduled for 2025 and 2026

2028
Targeted launch for a capacity mechanism

Fuel conversion to H_2
8 years after plant COD / modernisation, likely starting in the late 2030s

1) The subsidies required approval under the EU guidelines on state aid for climate, environmental protection and energy (CEEAG). The CEEAG contain multiple objectives that governments can use to justify state aid. Each objective is tied to a different set of requirements that need to be fulfilled.

Sources: Aurora Energy Research, BMWK

The merit order in the auctions for H_2-ready plants is influenced by two characteristics: North vs. South and Newbuild vs. Modernisation

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A Bonus for Southern plants applies for both auction pillars with slightly different applications

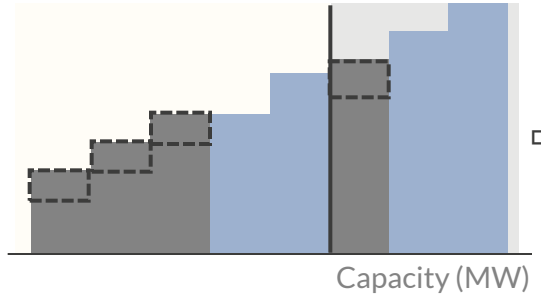
- A bonus of 200-300 €/kW will be applied to bids from Southern plants ("Südbonus").[1]
- The bonus is supposed to only change the ranking in the merit order, but not the payments to Southern plants.
- It applies to up to 2/3 of auctioned capacity for Southern plants in each Decarbonization auction and across all SoS auctions.
- The final Southern plant exceeding this cap will still receive the full Southern bonus, despite surpassing the 2/3 limit.

For the decarbonisation auction, bids are categorized in two merit orders in order to reserve capacity for newbuild plants

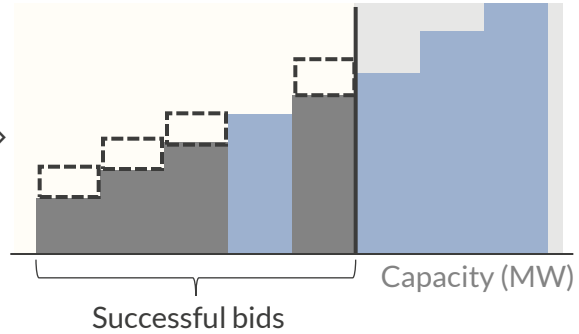
1. After submission of all bids, at least 70% of auctioned capacity[2] is awarded in the first merit order, that is reserved for newbuilds.
2. In the second merit order, all remaining bids compete, including both retrofits and newbuilds that were not awarded in the first merit order.

Whether the South Bonus is applicable in the second merit order depends on whether the 2/3 of capacity for which the bonus applies has been fully taken up by Southern newbuilds in the first merit order.

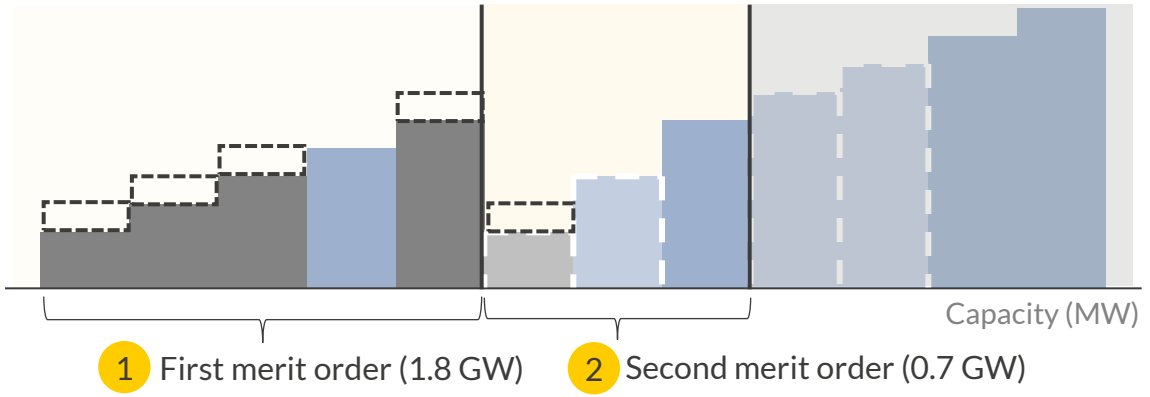
Merit order without South bonus



Merit order with South bonus



Merit order for auctions in the decarbonisation pillar



Newbuild, South | Newbuild, North | Retrofitted, South | Retrofitted, North | Bonus

1) The South includes Baden-Württemberg, Bavaria, Hesse, North Rhine-Westphalia, Rhineland-Palatinate and Saarland. 2) In the first two auctions 1.8 GW of 2.5 GW is reserved for newbuild (72%). In the third auction, 1.4 GW of 2.0 GW is reserved for newbuilds (70%).

Sources: Aurora Energy Research, BMWK

The coal exit will have a greater impact in the South where load centres are located, while more renewables are installed in the North

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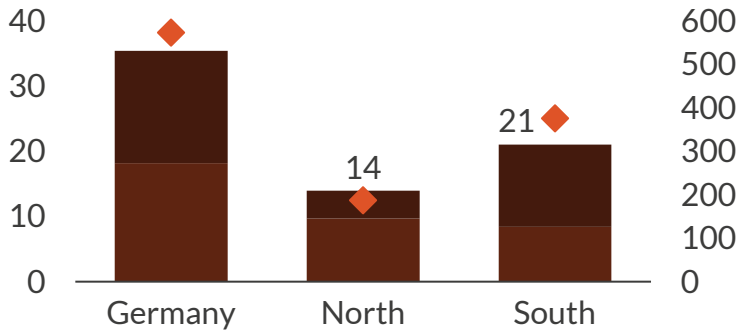
Installed capacity 2023 GW

Net Total Power Demand 2023 TWh

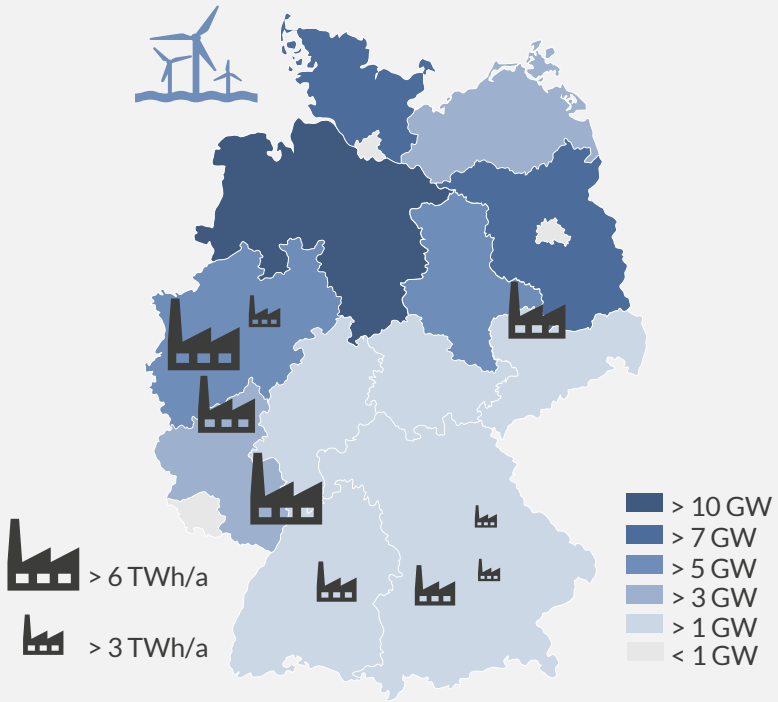


Share of total coal capacity %	40	60

- All of Germany will be affected by the coal exit, with >30 GW coal capacity still to leave the market.
- Nearly 60% of these plants are located in the South, corresponding to current demand patterns.
  - As of 2023, two thirds of net annual power was recorded in the Southern states.
- Current split of coal capacity and power demand seem to have motivated the choice of the ministry to introduce a bonus for southern plants.

Installed wind capacity by federal state[1] and industrial consumption centres

GW, TWh/a



Resulting obstacles for the German energy transition

Generation demand mismatch

- Generators have no incentive to build close to consumption centres.

Grid congestion

- Electricity cannot always be transported to load centres - resulting redispatch increases system costs, overhead, and CO_2 emissions.

Curtailment of renewables

- Renewables generation is wasted & compensating generators is costly.

Larger grid buildout requirements

- Inefficient location of consumers and generators increases grid requirements, increasing costs and complications.

Lignite Hard Coal Demand

Source: Aurora Energy Research

Southern Newbuilds might secure most of the capacity due to the South Bonus, while this bonus could also introduce the risk of strategic bidding

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Newbuild units in the South are expected to be the most successful, followed by Northern newbuild and then by retrofitted units

Southern newbuilds: Most competitive due to the South bonus.

- With a significant advantage from the Bonus, Southern newbuilds are expected to secure up to 2/3 of auctioned capacity in each round.
- Bonus benefits Southern units for 2/3 of awarded capacity across both auctions, meaning that **first auction could award capacity to Southern newbuilds only**.

Northern newbuilds: Less competitive than Southern newbuilds.

- Slight advantage over retrofits, as at least some capacity is reserved for them (because at least 70% of capacity is reserved for newbuilds but South Bonus only applies for 2/3) .
- Will most likely secure more capacity in SoS auctions, where 1/3 of the capacity (1.7GW) is auctioned for newbuilds without South bonus.

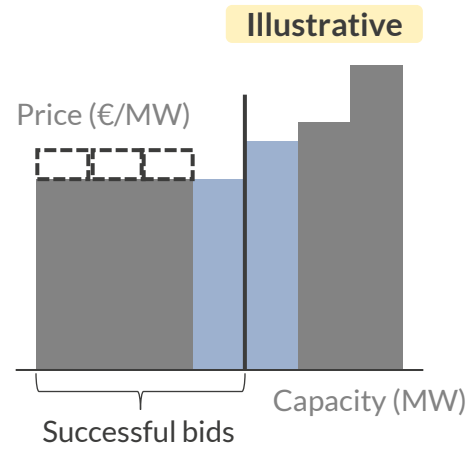
Retrofits: Least competitive due to reserved capacity for newbuilds.

- The subsidy design tries to achieve bid parity between retrofits and newbuilds, requiring them to place bids competitively.[1]
- Northern retrofits may only succeed if the South Bonus does not apply to Southern retrofits in the second merit order.[2]

Newbuild, South | Newbuild, North | Bonus

The South Bonus could introduce a risk of strategic bidding depending on the participation level of Southern plant operators

- The South Bonus could encourage strategic bidding by Southern operators; **particularly in a pay-as-bid auction design**.
- If they anticipate total bid volume from Southern plants to make up less than 2/3 of auction capacity, they may inflate bids by factoring in the bonus.
- In the security of supply auctions, the risk for strategic bids could be higher, as the South Bonus applies across the two auctions.



A pay-as cleared auction design would mitigate the strategic bidding risk

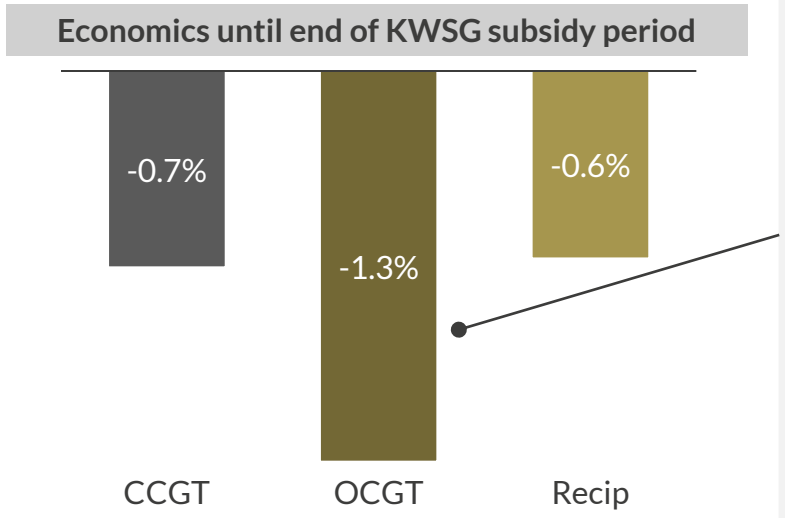
- In a pay-as-cleared auction, the **subsidy payment secured in the auction is not dependent on an operator's individual bid** but on the project with the highest bid level that is still awarded.
  - In the case that a plant in the North sets the price, Southern operators would receive the same subsidy payment, regardless of whether they have priced in the South bonus or not.
- Therefore, **operators have no incentive to inflate their bids**.

1) The award for retrofitted plants depends on the modernization depth, with funding granted based on the ratio of actual retrofit costs to the cost of building a comparable new plant. 2) This is the case if the 2/3 Southern capacity is reached in the first merit order.

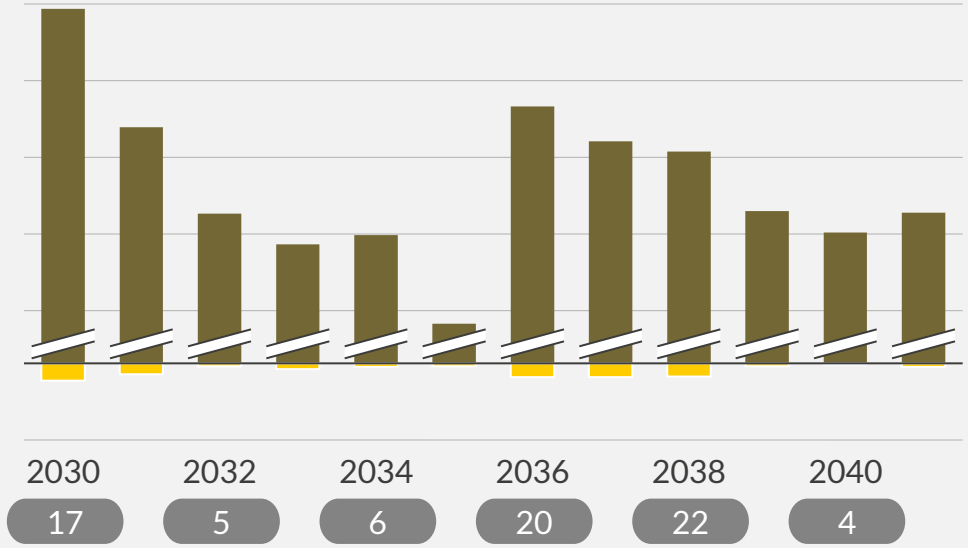
Sources: Aurora Energy Research, BMWK

The clawback mechanism will have a small impact on gross margins even if the minimum threshold of 430 €/MWh applies

Impact of the clawback on total gross margins[1]
%



Annual total gross margins incl. clawback[1] for an OCGT with COD 2030
k€/MW (real 2023)



Design of the clawback mechanism

- The clawback threshold is determined by the sum of a 300 €/MWh fixed component and the SRMC of a gas-fired power plant.
- It has a minimum value of 430 €/MWh.
- 70% of revenues above the threshold will be skimmed during the KWSG subsidy period.

There are other externalities to be aware of

- The clawback mechanism creates a **complication for long-term power trading** because it is difficult to hedge spot-market based clawbacks with forward transactions.
- The clawback mechanism creates an **administrative burden** for both producers and the regulator.

Total gross margins | Margins skimmed by clawback mechanism | Hours affected by clawback mechanism

1) Assuming a constant 430 €/MWh (nominal) clawback threshold.

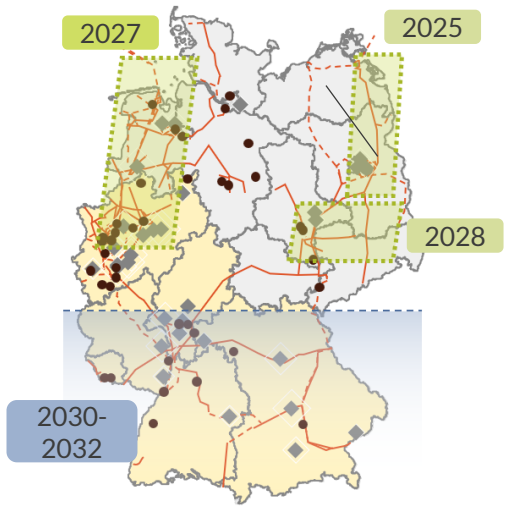
Source: Aurora Energy Research

Comments

- The BMWK intends to implement a a clawback mechanism during the KWSG subsidy period for thermal assets, restricting revenues in the highest price hours.
- Assuming a constant clawback threshold of 430 €/MWh (nominal) gives an upper estimate of the affected margins, as the actual clawback price can exceed this value.
- Under this assumption, the impact on thermal plants under the KWSG is minimal.
- OCGTs are most impacted by the clawback mechanism since they dispatch in the highest priced hours and receive lower overall gross margins.
  - Still, the impact is small with 1.3% of total margins skimmed across the whole KWSG subsidy period.

The consultation paper does not foresee a full protection against the risk of delays in the H_2 core network

Hydrogen core grid plan



H_2 supply is secured if grid proceeds as planned…

- Many existing gas and coal-fired power plants are within 20km of the planned pipelines making these sites suited for H_2-ready newbuilds or retrofits.
- Planned completion of most of the core network by 2032 is in line with anticipated fuel switch of plants in the late 2030s.
- Further, it is acknowledged in the consultation paper that plants should get a connection to the H_2 grid 11 years after the date.[1]

…but operators bear the risk in case it does not.

- **Delays in the H2 core grid plan could occur**, with some pipelines pushed to 2037 and the Southern grid last to complete
- **If a power plant cannot be supplied with H2 in time, operators are still not allowed to continue to operate on gas.**
- Instead, the consultation paper suggests alternative options that might not be sufficient to fully cushion the risk:
  - Using 100% other renewable fuels[2]
  - Applying CCS for 90% of emissions[2]
  - Moving plant to capacity reserve
  - Mothballing till access is provided[3]

Recent developments

April 2024

- **5 April:** Governing coalition announced agreement on financing mechanism of H2 core network, that implies backdating of grid finalisation from 2030 to 2032; and for specific projects to 2037.
- **12 April:** 2nd amendment of ENWG passed by parliament
- **26 April:** ENWG passed by federal assembly
- **21 June:** European Commission approves 3bn € German subsidies for core grid[5]
- **22 July:** Gas network operators submitted application at Federal Network Agency (FNA) for H2 core grid[4]
- **28 August:** Cabinet approves Hydrogen Acceleration Act[6] to speed up grid buildout
- **22 October**: FNA approval of the hydrogen core grid.

South | North | 20xx Major retrofits completed by | Gas | Coal and lignite | Retrofit | New build

1) Assuming 4 years for realization and 7 years of gas-fired operation. 2) Need to switch back to H2 once access provided, otherwise all subsidies need to be paid back. 3) Pauses capex payments until connection can be achieved. 4) 12.3bn for newbuilds (3561km), 3.2bn for retrofits (ca. 5000km). 5) Aid is granted as a state guarantee, allowing TSOs to secure cheaper loans during early ramp-up phase. 6) German: „Wasserstoffbeschleunigungsgesetz". The hearing will take place in parliament in autumn 2024.

Sources: Tagesspiegel Background, Aurora Energy Research, Reiner Lemoine Institut

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Expectations on future capacity market revenues are a key uncertainty to navigate for the auction participation

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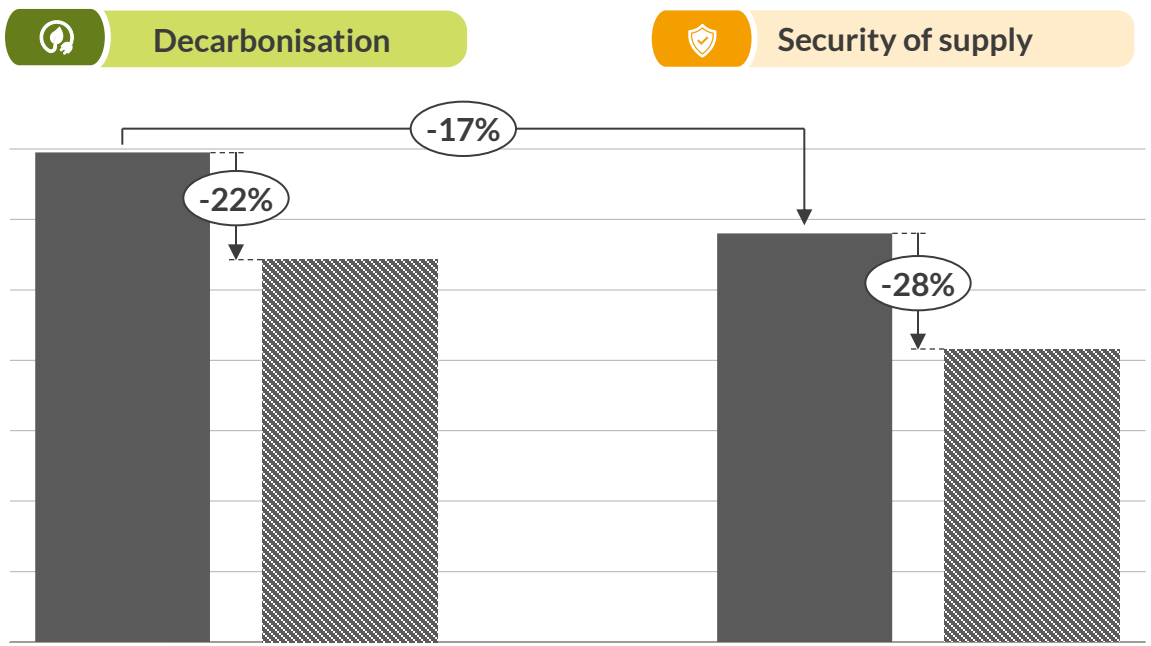
Base case

Gap to profitability for a new-build CCGT with COD 2030
k€/MW (real 2023), Target IRR of 9% (pre-tax)



Relevance of capacity market design expectations

- It is still unclear **when** the KWSG power plants will be transferred to a CM and **how** they will be integrated.
- We assume the **plants to transition to the CM after the end of the KWSG subsidy** payment period (12 years for the decarbonisation pillar, 15 years for the security of supply pillar).
- Regarding the **CM design**, we calculate results for **2 options**:
  - **Existing and new-build power plants participate in the same tenders**, hence existing power plants (such as the KWSG plants) could benefit from **higher prices and revenues**.
  - **Existing power plants participate in a separate tender** which would lead to **lower CM prices and revenues.**
- In the **first option**, the **gap to profitability of the KWSG plants decreases** during the remaining lifetime after the end of the KWSG subsidy period; in the **second option**, the remaining lifetime is assumed to be **NPV neutral**.

Security of supply assets require 17% less subsidies as a later fuel switch results in additional revenues due to higher full load hours operating on gas (we assume SoS plants to run on natural gas for 15 years; compared to 8 (+4)[1] years for plants in the decarbonisation pillar).

Investors with an optimistic view on future CM payments could lower their bids for a new-build CCGT by 22-28% compared to investors who determine the bid based on the economics until the end of the KWSG subsidy period, or assume lower CM payments.

KWSG subsidy period or total lifetime with assumption of profit-neutral CM payments | Total lifetime with optimistic view on CM payments

1) 4 years in which the decarbonisation pillar plant receives the fuel CfD subsidy for 800 full-load hours.

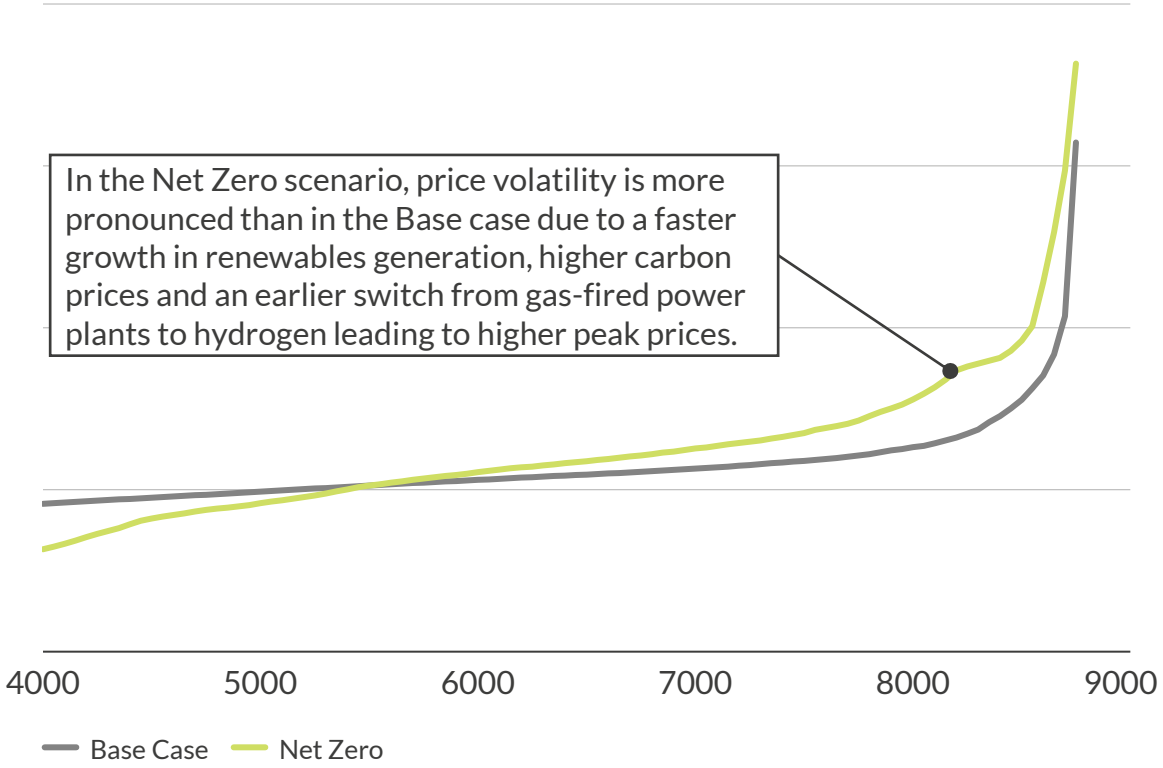
Source: Aurora Energy Research

Higher and more spikey prices could drive investors to place up to 18% lower bids in a Net Zero market scenario

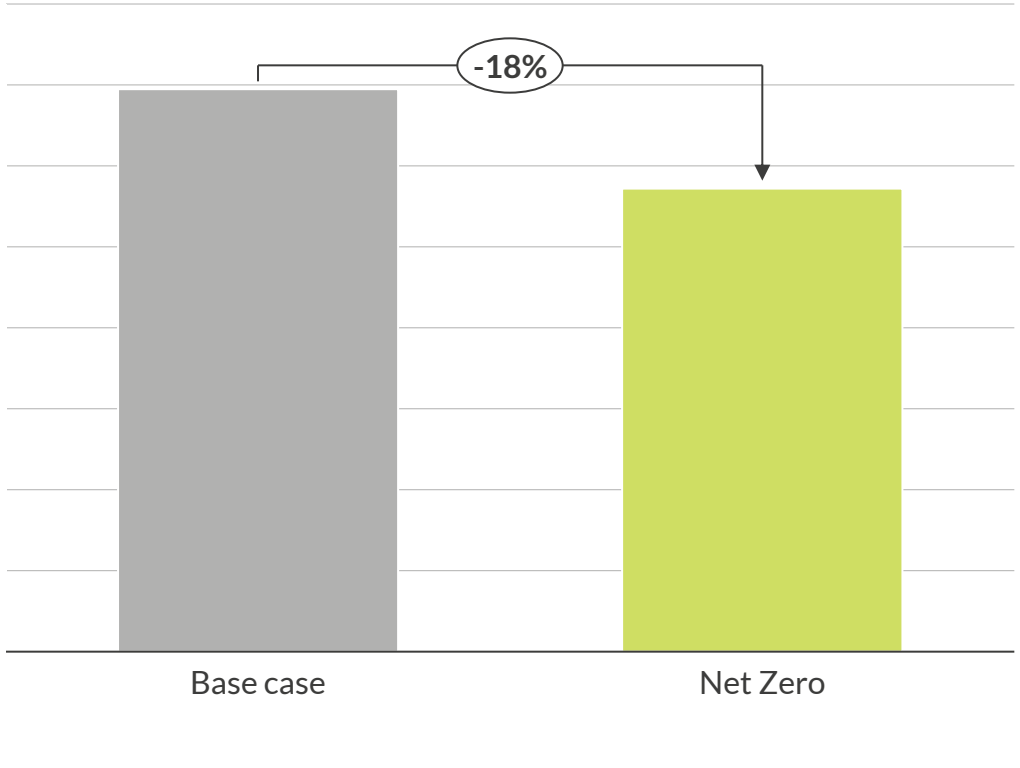
Investors who believe in a Net Zero Scenario with its **earlier H_2 switch for all new-build gas plants and higher carbon prices** could place **up to 18% lower bids in the auctions than investors with a more conservative power market transition outlook.**

- A CCGT can benefit from the higher price hours and generate higher margins, leading to a lower gap to profitability compared to the Base case.

Price duration curve of the Day-ahead price, 2035
€/MWh (real 2023)



Required CAPEX subsidy for a new-built CCGT[1]
k€/MW (real 2023)



1) COD 2030, economics until end of the KWSG subsidy period (2041). Assuming 9% IRR (pre-tax).

Source: Aurora Energy Research

To incentivise a fast construction of the plants, a fixed time frame for the gas-fired operation tied to the auction date could be beneficial

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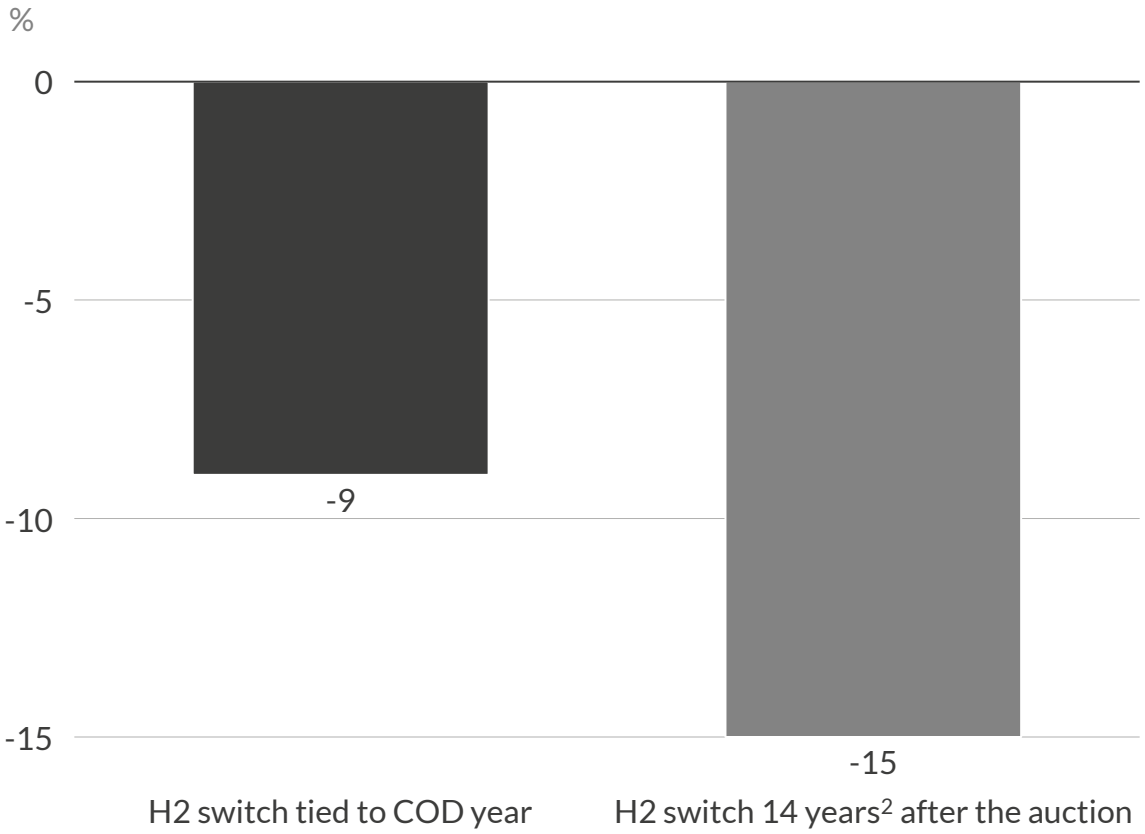
H2-ready power plants need to **switch to H_2 8 years after COD**. This means that they **cannot prolong the profitable gas-fired period with a fast project realisation time**. An **alternative mechanism** in which the **H_2 fuel switch requirement is tied to the auction year** could provide a **better incentive for early COD and save subsidy costs**.

Impact of a 2-year earlier COD on the gap to profitability of a new-built CCGT[1]



- Under **current rules**, operators already have an economic incentive to achieve an early COD because of a lower expected gap to profitability.
  - This is due to the expectation of higher returns in the early 2030s which outweigh the margin downside from an earlier fuel switch.
- However, an **earlier fuel switch also increases the risk** of the unavailability of the infrastructure and technology required for the operation with H_2.

- If the **fuel conversion date was tied to a period after the auction**, operators would have a **higher incentive to achieve a fast project realisation time:**
  - the **additional gross margins** in the early years can be captured **without the economic downside** of an earlier fuel switch.
  - The **risks associated with the H_2 fuel switch are not affected.**

EU approval of a change to the fuel switch rule is uncertain.

- The current fuel switch mechanism has received approval by the European Commission.
- It is unclear whether a change of the rule to a fixed period would be accepted.

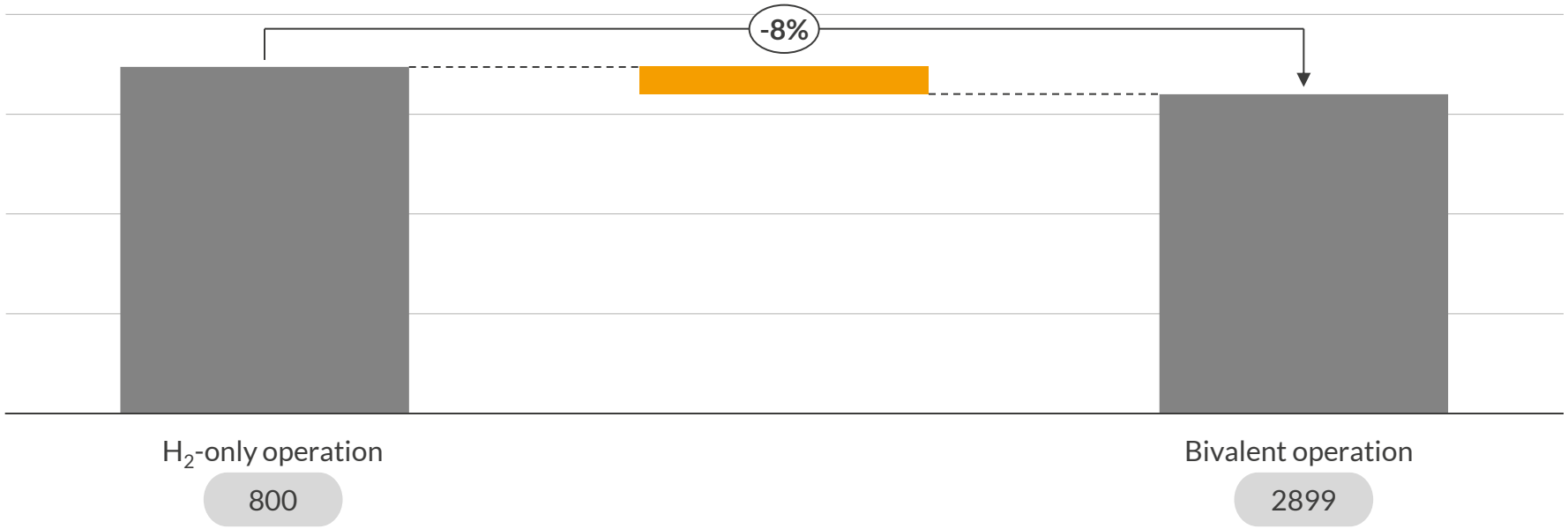
1) COD 2032 vs. COD 2030; results shown for the economics until the end of the KWSG subsidy period for a plant in the decarbonisation pillar of the KWSG. 2) 14 years was assumed for this example because it represents the sum of the maximum construction time (6 years) and the period before the fuel switch (8 years) according to the consultation paper.

Source: Aurora Energy Research

Allowing bivalent operation of the H_2-ready plants during the OPEX subsidy period could result in a 8% decrease in missing money

Missing money for a new-built CCGT with COD in 2030
NPV assuming 9% WACC (pre-tax), k€/MW (real 2023)

Economics until end of KWSG subsidy period



- **H_2-only operation**: CCGT can only run on H_2 during KWSG subsidy period, fuel CfD subsidy is limited to 800 full-load hours.
- **Bivalent operation**: The CCGT can run additional hours on top of the 800 full-load hours running on H_2, during the KWSG subsidy period.

Gross margin upside Required CAPEX subsidy
Average annual full load hours during KWSG subsidy period

- By allowing thermal assets in the decarbonisation pillar to run bivalently on H_2 and gas, they can generate higher revenues.
- The revenue increase would result in a lower gap to profitability for the decarbonisation assets.

Source: Aurora Energy Research

The required subsidy might exceed the 80% of CAPEX limit defined in the consultation paper, driven by additional costs due to auction requirements

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The currently foreseen **auction rules for the decarbonisation pillar require that the bids cannot exceed 80% of the CAPEX of a reference asset**. To enable a profitable business case within this limit, it is **important that costs that are not part of the core components of the power plant are also sufficiently reflected** in the reference costs.

Relevant cost components in addition to CAPEX for the power plant

Grid services

- Operators must install additional technology to provide reactive power and inertia when the plant is not running.
- The technology is **costly** and currently **not available for large CCGT plants over 350 MW**, which adds a **technological risk** and effectively **excludes the most efficient power generation systems**.

H_2 fuel switch and grid

- Assets must be within 20 km of the H_2 core grid, leading to construction costs for up to 20 km of hydrogen pipeline
- Uncertainties around the **technological readiness of the H_2 combustion technology, H_2 supply, and H_2 infrastructure** (core grid and storage) can lead to additional **risk premia**.

Cost of capital

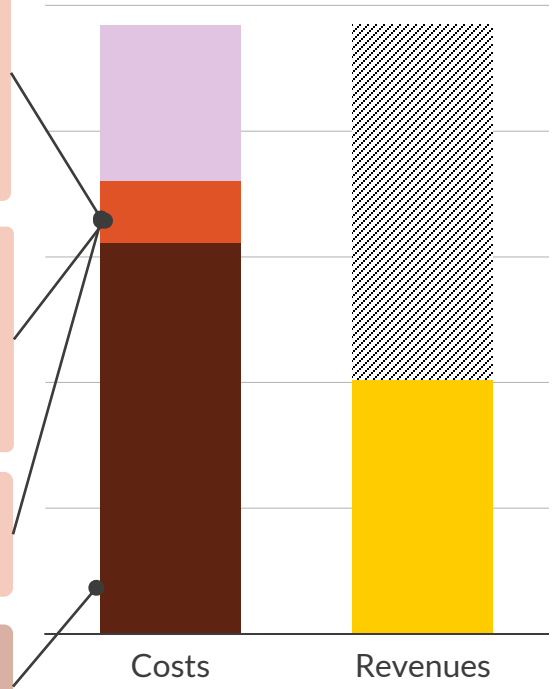
- Operators bear cost of capital for financing the investment because subsidy is only fully received after 10-15 years.

Cost increases

- Rising prices for turbines and components may cause actual costs to exceed pre-determined reference costs.

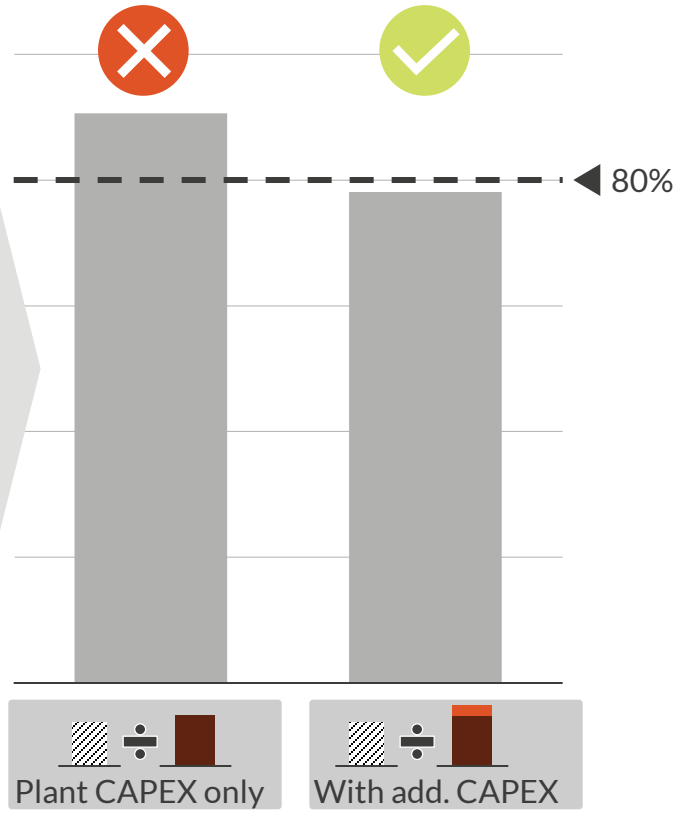
Business case of a new-built CCGT[1]

k€/MW (real 2023) **Illustrative**



Ratio of required subsidy to CAPEX

%



OPEX and other costs | Additional CAPEX | Plant CAPEX | Required investment cost subsidy to achieve profitability | Wholesale and flexibility market margins[2]

1) COD 2030, economics until end of the KWSG subsidy period (2041). Assuming 9% IRR (pre-tax). 2) inclusive of fuel CfD subsidy

Source: Aurora Energy Research

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The fuel CfD will slightly reduce the arbitrage potential for other flexible assets by lowering price spreads

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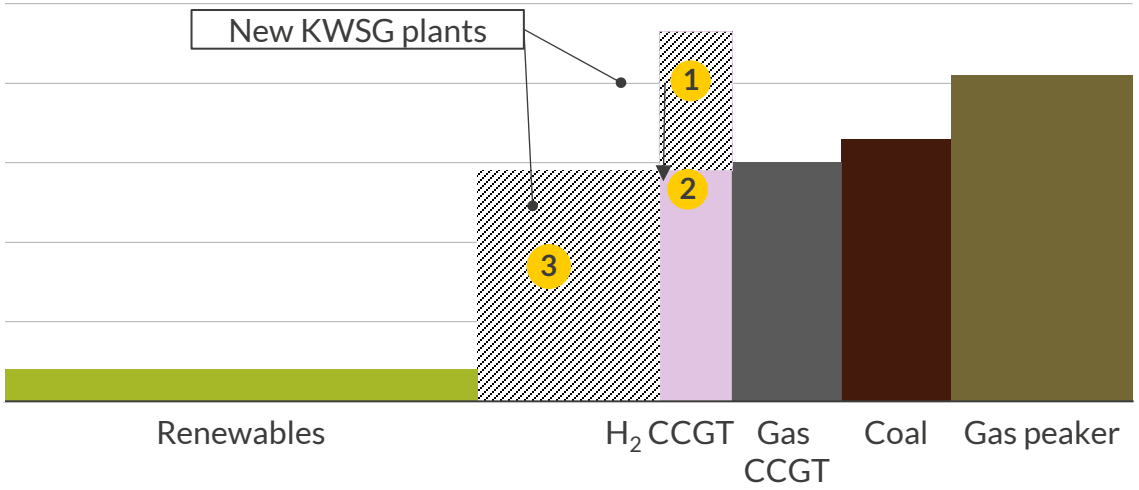
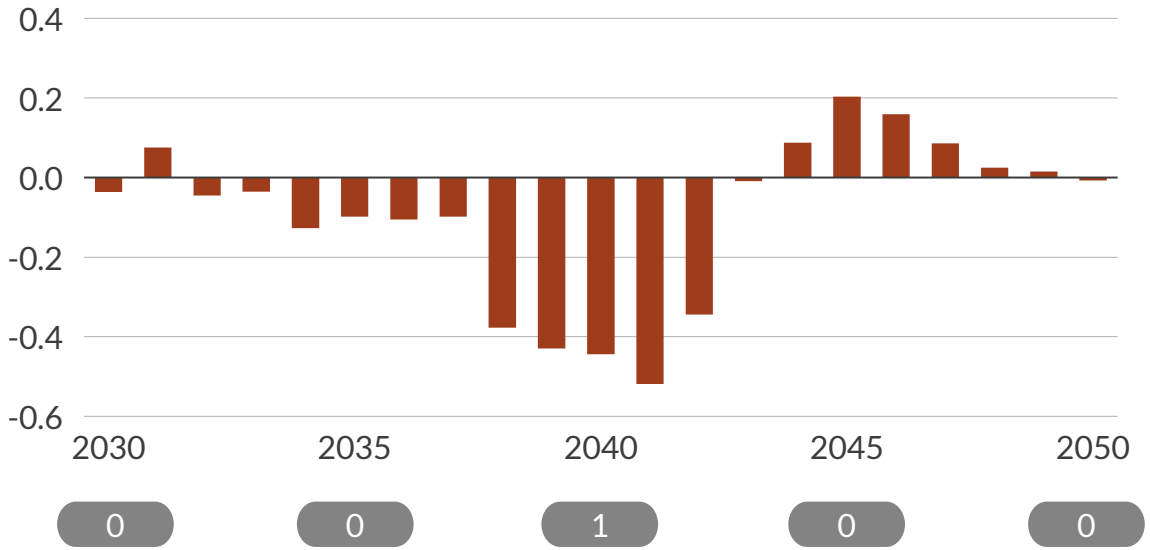
Exemplary merit-order with fuel CfD support from KWSG
€/MWh



Impact of OPEX subsidies on daily price spreads (delta of day-ahead spreads)
€/MWh



1. Without subsidies, hydrogen plants' marginal costs are substantially above those of their natural gas counterparts.
2. OPEX subsidies for hydrogen plants reduce their marginal costs and lead to a decrease in day-ahead electricity prices.
3. Efficiency advantages of the new *Kraftwerkssicherheitsgesetz* plants could lead to preferential dispatch over existing gas-fired power plants.

- The Kraftwerkssicherheitsgesetz might endanger necessary buildout of other flexibility sources, such as batteries, LDES or DSR.
- Price signals for other flexible assets are slightly distorted, as daily price spreads are reduced by ~1% (0.5 €/MWh) at most during the support phase of the KWSG plants.
- Reduction in spread is mostly limited to the years when OPEX subsidies are paid to H_2-ready assets after conversion (2038 – 2043).

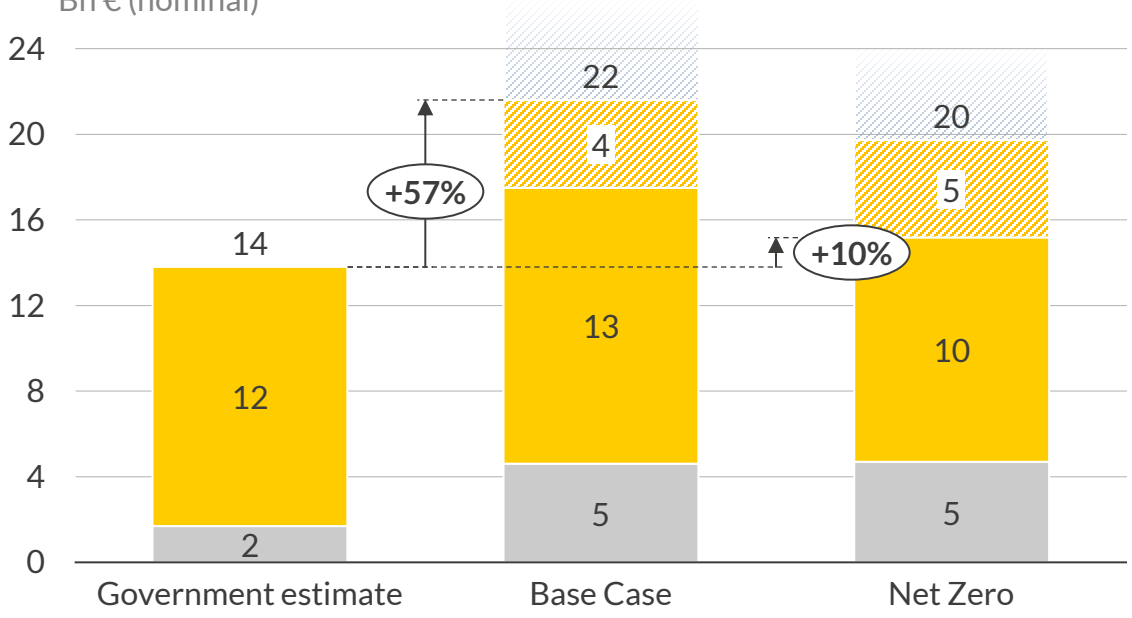
Delta % deviation of daily spreads

Source: Aurora Energy Research

The government seems to expect accelerated decarbonisation as the published cost of subsidy is closer to Aurora's estimate under a Net Zero scenario

Estimate for the total budget required to fund the KWSG[1]

Bn € (nominal)



To estimate total subsidy requirement, we compute the CAPEX and OPEX subsidy need for three technologies and scale it to 12 GW, assuming a technology mix of 60% CCGT, 30% OCGT, and 10% reciprocating engines.[2]

Disclaimer: We only apply a WACC[3] discount factor of 9% after the COD (2030) in our asset profitability calculations. **Total subsidy cost would be higher when considering WACC already during the construction phase**.

There are multiple options to reduce the KWSG subsidy costs, some of which have potential drawbacks

Option	Description & assessment
More participation options for existing locations	▪ Allowing projects for new-build power plants at sites with existing gas-fired power plants and/or the conversion of coal-fired power plants to gas-fired power plants. ▪ Both measures could increase competition in the auctions and lower costs. ▪ A potential downside is a greater advantage for incumbents compared to new market entrants.
Change of rule for date of fuel switch	▪ Tying the fuel switch to the auction date instead of COD would increase the profitability of H_2-ready plants with a fast project realisation time, lowering the required subsidy (see slide 17).
Bivalent operation during CfD subsidy period	▪ Allowing H_2-ready plants to run on natural gas in hours exceeding the 800 full-load hours of H_2 use would increase their profitability and reduce subsidy costs (see slide 18). ▪ Yet, bivalent operation might not adhere to the EU requirements for a decarbonisation measure.

Additional CAPEX Upper End | CAPEX Lower End | OPEX | Uncertainty on WACC during construction

1) The estimates for the total budget were derived without taking into account the effect of taxes. Retrofitted assets are calculated with 75% CAPEX of a new-built asset; Conversion from real to nominal by applying inflation factors and assuming the CAPEX subsidy will be spread over the subsidy period in equal yearly instalments. 3) Weighted average cost of capital

Sources: Aurora Energy Research, BMWK

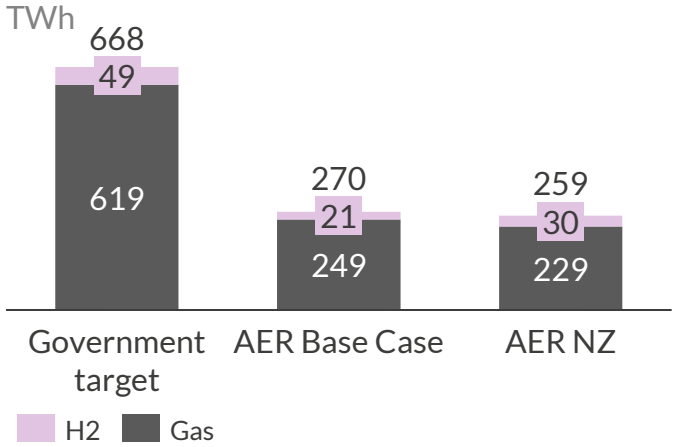
The goverment's target of avoided carbon emissions is rather ambitious as it assumes very high full load hours for the KWSG assets

To estimate the cost of avoided emissions, we first compared our modelled generation of KWSG assets to government targets.

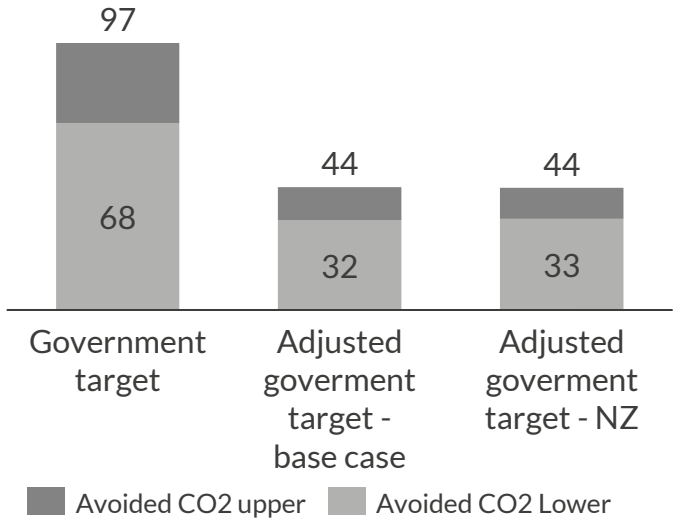
We then adjusted the government targets on avoided carbon according to average full load hours based on our modelled generation data.

Finally, we calculated the cost of carbon avoidance based on the avoided CO2 and total cost of subsidy, calculated previously.[2]

Total electricity generation by KWSG subsidised plants between 2029 and 2045

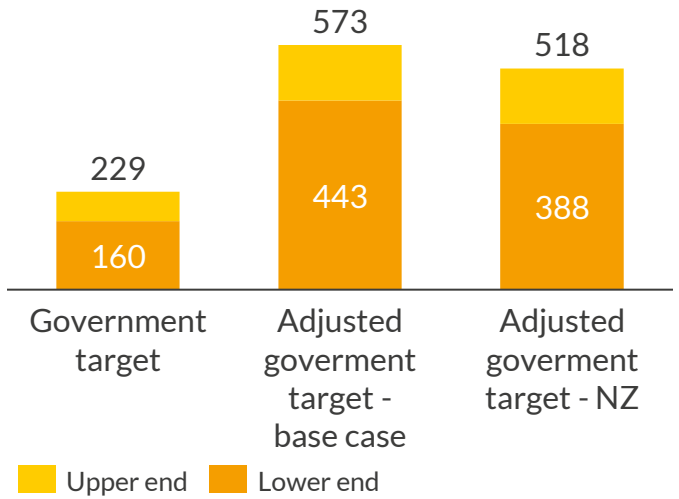


Total CO_2 avoided between 2029 and 2045



Cost of CO_2 avoidance between 2029 and 2045

€ /tCO_2 (nominal)



Key considerations

- Based on the consultation papers' projected generation, the goverment target full load hours are around **4,400 hours** per year when operating on natural gas while Aurora's base case modelling showed that the gas fired KWSG assets' yearly full load hours, are on average **1,900 hours between 2029 and 2045.**
- Aurora's KWSG fleet include around 60% CCGTs besides other technologies, such as OCGTs. As OCGTs usually operate on much less full load hours, based on the rather ambitious projections, the goverment paper likely assumes a different mix of technologies.[1]
- The cost of carbon avoidance is further driven by the expected total cost of subsidies, as the goverment forecast represents the lower end of Aurora's estimation.

1) Even with a full fleet of KWSG CCGTs it is unlikely that we see generation levels similar to the government's expectation. 2) The cost of CO2 avoidance would be higher when assuming a WACC disount factor during the construction phase of the plants as well. See disclaimer on the previous slide.

Source: Aurora Energy Research

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Key takeaways

1 A **steering of the regional distribution of the KWSG capacity is necessary** to counteract the emerging shortage of dispatchable capacity in the South. A South bonus will achieve the desired distribution; the risk of strategic bidding can be mitigated with a pay-as-clear design.

2 **Across both auction pillars, there is a significant gap to profitability** for gas-fired power plants.

- The **clawback mechanism will have a small impact on the gap to profitability** even if the minimum threshold of 430 €/MWh applies.
- **Additional costs arising from the grid stabilisation requirements and the switch to hydrogen need to be accounted for in the reference CAPEX** used for the auction bid limit, **otherwise** the **required investment cost subsidy might exceed the bid ceiling** of 80% of CAPEX defined for the auctions for H_2-ready plants in the decarbonisation pillar.
- For a CCGT in the **security of supply pillar, the gap to profitability is 17% lower than for a comparable plant in the decarbonisation pillar,** since a **longer period of operation on natural gas means higher revenues**.
- To **incentivise a fast construction of the plants**, a **fixed time frame** for the gas-fired operation tied to the auction date could be beneficial.
- The **required investment support is 22-28% lower when considering the entire 30-year asset lifetime** and **assuming a CM design in which existing plants can receive payments exceeding their missing money. More clarity on the CM would reduce uncertainty.**
- **In a Net Zero scenario, the gap to profitability is 18% lower for H_2-ready CCGTs** driven by a more volatile wholesale price pattern with higher peak prices that enable the plants to generate higher margins.

3 We find the **total budget required to finance the buildout** of 12 GW gas-fired power plants to be **higher in our Base case than indicated in the consultation papers,** but our budget **estimate in a Net Zero Scenario is closer to the projections of the BMWK**.

Interested in more?
For access to the full report of our recent study, reach out to Nicolas Leicht (nicolas.leicht@auroraer.com).

Deliverables comprise an extensive report and a databook with detailed modelling results, assumptions, asset impact and sensitivities.

Source: Aurora Energy Research

Details and disclaimer

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The Kraftwerkssicherheitsgesetz and the future of gas power plants in Germany

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Prepared by
Daniel Böhmer
(daniel.bohmer@auroraer.com)
Levente Molnar
(levente.molnar@auroraer.com)
Paul Börsting
(paul.boersting@auroraer.com)
Veronica Bishop
(roni.bishop@auroraer.com)

Approved by
Casimir Lorenz
(casimir.lorenz@auroraer.com)
Nicolas Leicht
(nicolas.leicht@auroraer.com)


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