Poland's power market revenue cap – what does it hold for power generation assets?

Slides from public webinar

28 November 2022

Poland: New energy price caps in 2023

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Long-term market design

New considerations following 2021 crisis

- **Regulatory Assistance Project – shock absorber approach – temporary cap on marginal price setting**
- **Greek Government non-paper of July 2022 – decoupling electricity prices from gas prices**
  - A two-stage DAM: The first stage performs the acceptance and aggregation of the volume-based offers by the *resources that operate when available and not on demand.*
  - The second stage performs market-clearing of the net load (after subtracting the accepted volumes from the load) using the bids of *the on-demand resources.*

Energy crisis

Coordinated EU response

- **Demand reduction (1)** – 10% total monthly gross electricity consumption – recommended
- **Demand reduction (2)** – 5% on average per hour during no less than 10% peaking hours – mandatory
  - From 1 December 2022 through 31 March 2023
- **Mandatory cap on market revenues for generators**
  - From 1 December 2022 through 30 June 2023
- **Regulated prices available to SMEs**
- **Regulated prices below cost – against compensation**
- **Solidarity contribution** – crude petroleum, natural gas, coal and refinery sectors
  - Fiscal year 2022 and/or 2023
  - At least a 33% rate on profits in excess of a 20% increase compared to reference years 2018-2021

Photo by Laurenz Heymann on Unsplash

Regardless of the contractual form in which the trade of electricity may take place, the cap on market revenues should apply to realised market revenues only. This is necessary to **avoid harming producers who do not actually benefit from the current high electricity prices due to having hedged their revenues against fluctuations** in the wholesale electricity market.

STATE OF THE UNION 2022

To the extent that existing or future contractual obligations, such as renewable power purchase agreements and other types of power purchase agreements or forward hedges, lead to market revenues from the production of electricity up to the level of the cap on market revenues, **such revenues should remain unaffected by this Regulation**.

STATE OF THE UNION 2022

Options for Member States to cap prices

Attempt to preserve overall welfare

- The level at which the cap on market revenues is set **should not jeopardise the ability of the producers** to which it is applied, including renewable energy producers, **to recover their investment and operating costs** and should preserve and incentivise future investments in the capacity needed for a decarbonised and reliable electricity system.

- Member States may maintain or introduce **measures that further limit the market revenues** of producers including the possibility to **differentiate between technologies**, as well as the market revenues of other market participants, including those active in electricity trading.

Polish emergency measures capping revenue

Draft law 14 October
– No public consultations – work in progress
– Voted in the Polish parliament on 20 October – discussion

Price cap law – amended and finally adopted on 27 October
– Failed to incorporate expert opinions
– Extended price cap application till 31 December 2023
– Published on 3 November, in force from 4 November 2022

Council of Ministers price cap regulation
– Again, no public consultation
– Leaked on 8 November and promulgated on 9 November

Polish emergency measures capping revenue

The good and …

Regulated prices for households in 2023

→ Supplement earlier measures (preferential pricing and volume caps)

Regulated prices for SME, municipalities, other vulnerable offtakers in 2023

→ Ambiguous wording and lack of market outlook leads to discrimination

Retroactive settlements on delivery prices set after 23 February 2022

Compensation Fund (first created to cover regulated prices adopted for 2019)

Polish emergency measures capping revenue

… and the new normal… and…

Some common principles retained

- Cap applies to all material technologies **except biogas**
- Separate subcaps for thermal coal, lignite, gas
- *Units up to 1 MW excluded** (all technologies)
- Volumes reported for the purpose of RES auction settlements excluded

Irregularities defy purpose

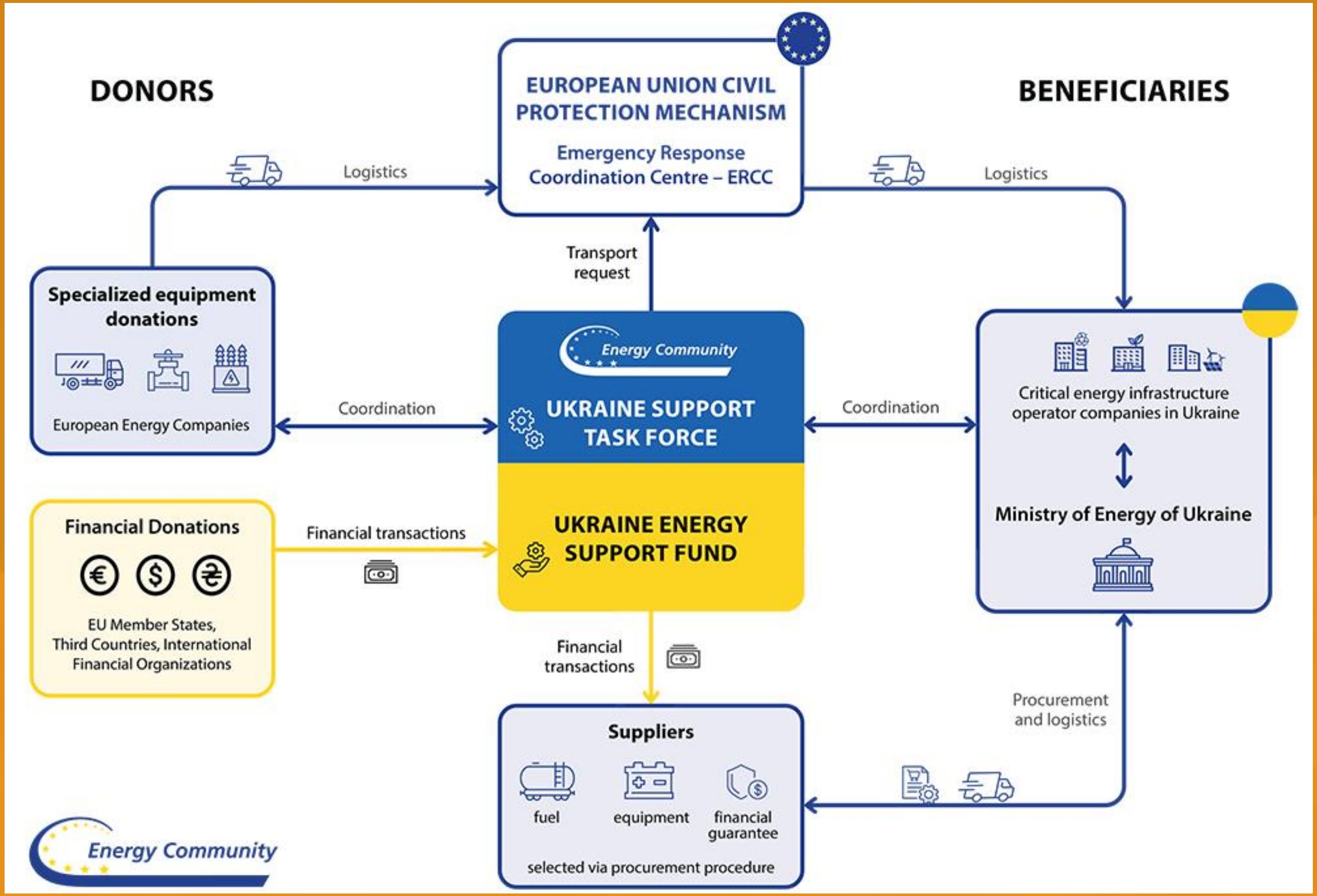
- **Cap based on selling price – not on realised market revenue**
- **Extended by six months through 31 December 2023**
- **Physical corporate PPAs ignored**
- **Synthetic corporate PPAs spotted**
- **Daily calculation, monthly contribution to the Fund**
- **Traders capped based on margin**

Polish emergency measures capping revenue

… and next steps

- ❑ Like in 2019, work on amendments already launched
- ❑ Daily settlements not sustainable
- ❑ Physical CPPAs potentially recognised
- ❑ First Q&A by Zarządca Rozliczeń S.A.
- ❑ URE needs an open mind when handling disputes
- ❑ Auctioned projects need to align business plans with additional activities

Ukraine Energy Support Fund



https://www.energy-community.org/regionalinitiatives/Ukraine.html

Thank you!

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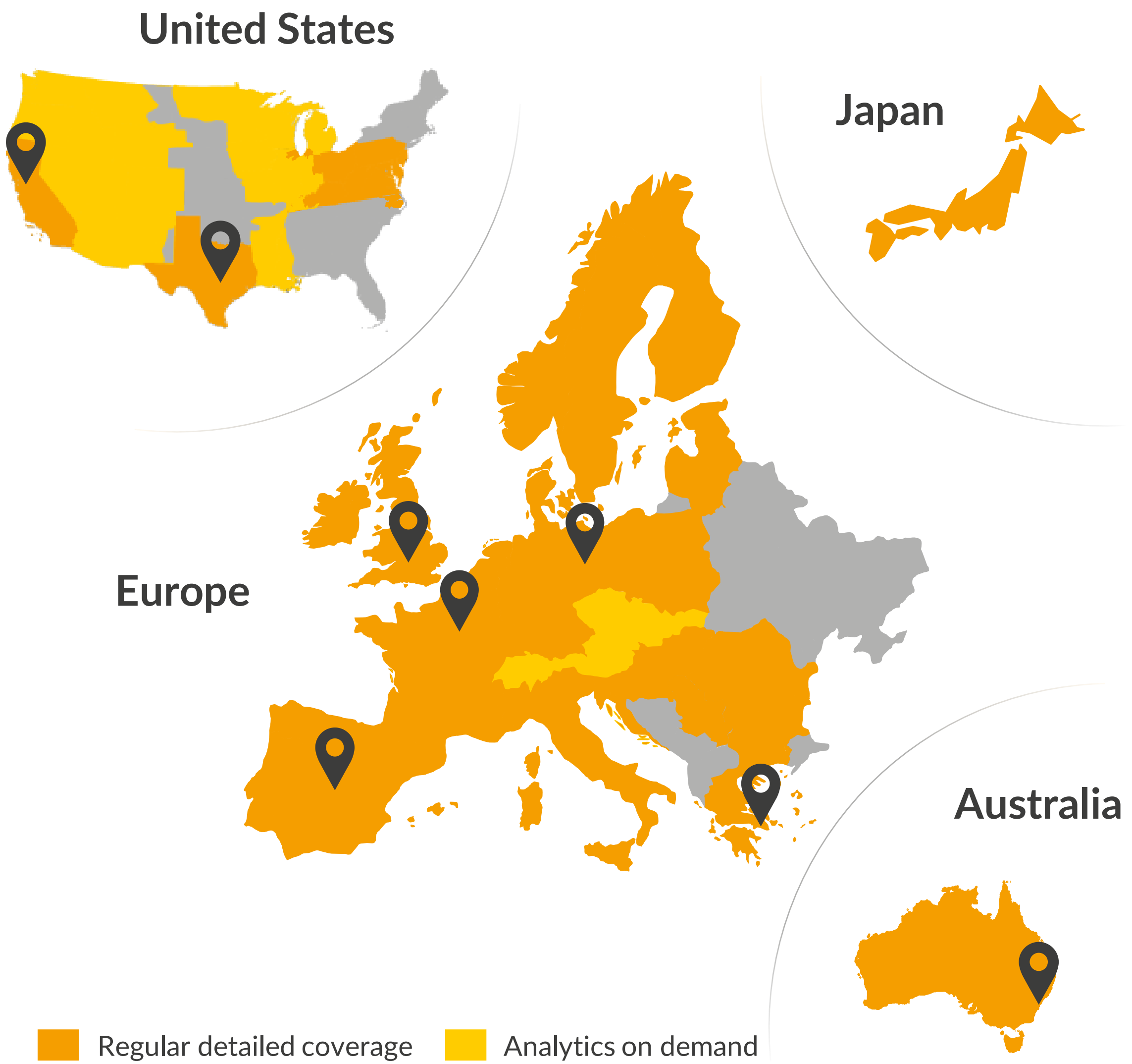

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Source: Aurora Energy Research

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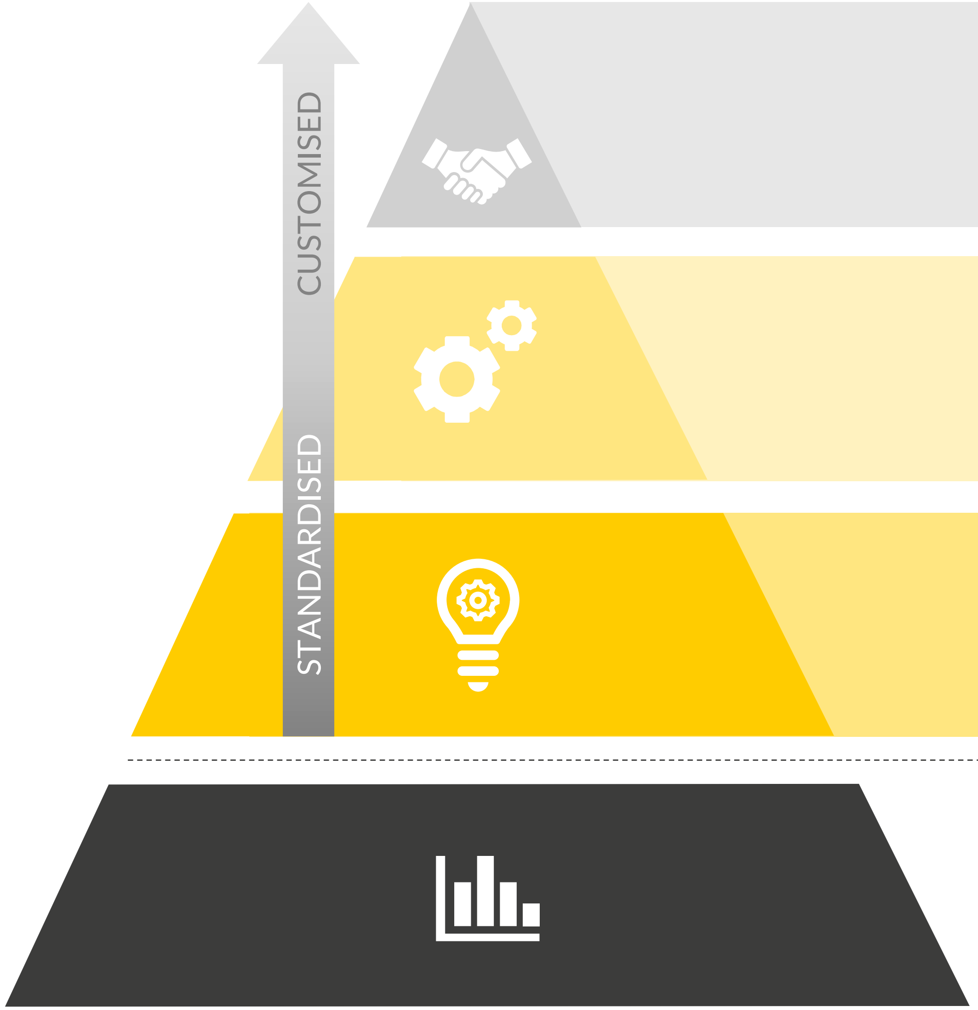

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Source: Aurora Energy Research

The Polish government has introduced stricter revenue caps and for a longer period of time than those foreseen by the EU

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Revenue cap overview

- Starting from December 2022, Polish technology-specific caps will be applied to day-ahead market revenues of all power generating assets with capacity over 1 MW[1], excluding energy storage units
- The framework for the caps was introduced under the Emergency Measures Act in October, whereas the specific cap levels were introduced under a regulatory ordinance in November
- The regulatory ordinance can be easily updated by the Ministry of Climate and Environment, however changes to the framework published under the Act would need to pass Parliament
- The caps apply to capture prices calculated daily. Profits beyond the price cap level are to be paid into a fund managed by the Energy Regulator monthly
- Caps are based on:
  1. the CfD reference price for merchant renewables, without CPI indexing
  2. the plant-specific clean fuel price for fuel-fired technologies
- CfD and PPA-backed renewable assets are arranged under separate rules

Timeline

2022

October 2022
- Emergency Measures for 2023 Act passes

November 2022
- Regulatory ordinance for the revenue caps published

1st December 2022
- Polish revenue caps come into force

1st December 2022
- European revenue caps come into force

March 2022
- European revenue caps review, timeline may be extended

30th June 2023
- European revenue caps end

31st December 2023
- Polish revenue caps end

2024

— Poland-specific — EU-specific

1) All hydro plants with capacity under 2.5 MW are also excluded from the revenue caps.

Source: Aurora Energy Research, Ministry of Climate and Environment

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The Polish revenue caps are based on CfD reference prices for renewables and clean fuel prices for fuel-fired plants

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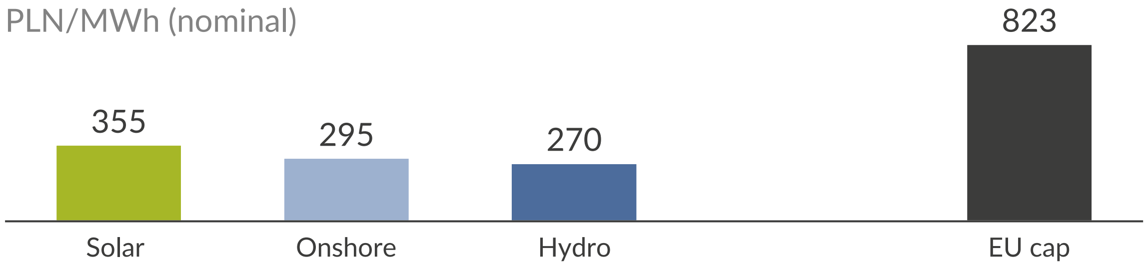
1 Revenue cap for renewables

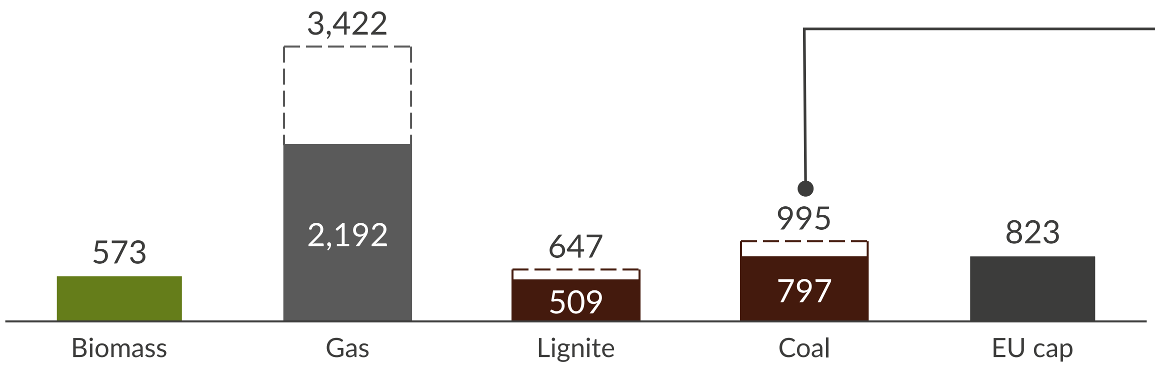
Solar, onshore wind, and hydro have revenue caps set at their respective CfD reference prices, with exceptions made for CfD or PPA-backed projects

Effective revenue cap for renewables
PLN/MWh (nominal)



2 Revenue cap for fuel-fired technologies

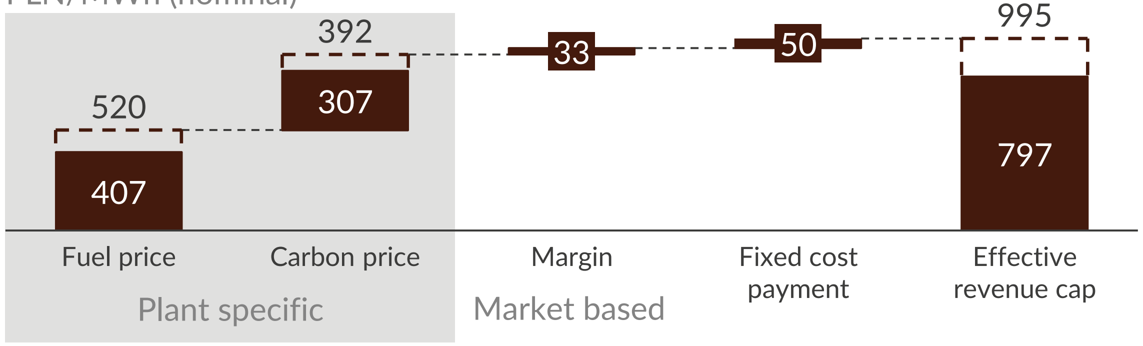
Effective average revenue cap for fuel-fired technologies[2]
PLN/MWh (nominal)



Revenue cap calculation for fuel-fired technologies

- The revenue cap calculation for biomass, gas, coal, and lignite assets is based on 4 elements:
  - The plant-specific[3] daily fuel price
  - The plant-specific[3] daily carbon cost
  - A margin of 3% of the daily average wholesale price[4]
  - A 50 PLN/MWh fixed cost payment

Exemplary revenue cap calculation for coal[5]
PLN/MWh (nominal)



- Our calculations present the average revenue cap prices for the year based on the Aurora Central scenario, however these prices can vary greatly depending on the plant-specific inputs, for example if the plant has hedged fuel prices
- The regulation does not explicitly address other variable O&M costs[6] that these plants can face, therefore the plant profitability is highly dependent on the relative size of the additional margin and fixed cost payment

1) CfD reference prices are the max. CfD bid prices. 2) Assuming a lignite price of 28.1 PLN/MWh (regulation max. of 7.8 PLN/GJ), a gas price of 1253 PLN/MWh, and a biomass price of 181 PLN/MWh. 3) Under the regulation, fuel and carbon costs will be taken from the asset's own reporting.4) 80% of TGeBase and 20% TGePeak. 5) Assuming price of 53.2 PLN/GJ and of 82.1 EUR/tonne for coal and carbon respectively. Ranges estimated for plant efficiency. 6) Trading costs, imbalance, maintenance, etc.
Source: Aurora Energy Research

Renewables under PPAs are protected from double payment, while renewables under the CfD are capped at their CfD strike price

Caps for PPA-backed assets

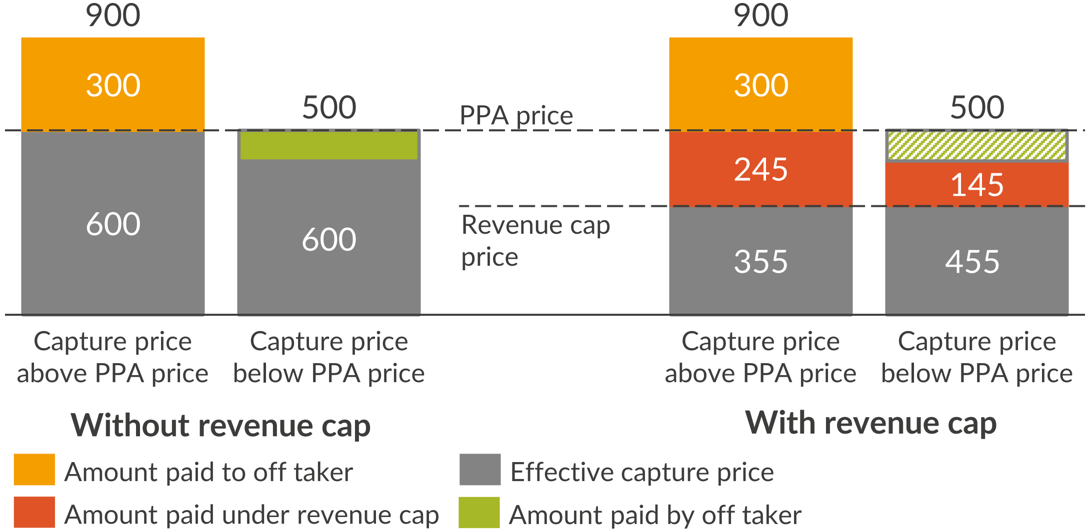
- PPA-backed assets have caps set at the CfD reference price for their technology plus the average amount due to the off taker under the PPA
- Assets with physical PPA contracts have returns at either the revenue cap, when it is below the PPA price, or at the PPA price, if the revenue cap is above the PPA price. In the first case, the difference between the cap and the PPA price is returned to the Regulator
- The rules about assets with virtual PPA contracts are more ambiguous; currently payments from the off taker to the generator are not covered by the revenue cap, but this may change if the regulation is altered

Caps for CfD-backed assets

- CfD-backed assets have caps set at their specific CfD strike price, regardless of whether they sell their generation under or out of the CfD system
- The generation sold under the CfD is remunerated using the two-way CfD system based on the average daily baseload price, while the generation sold outside of the CfD is remunerated under the revenue cap (one-way system based on the asset capture price)
- Overall, the revenue caps for CfD assets remove the ability to sell partial volume at the wholesale market price, but maintain the CfD system, thereby exposing CfD assets to the CfD discount

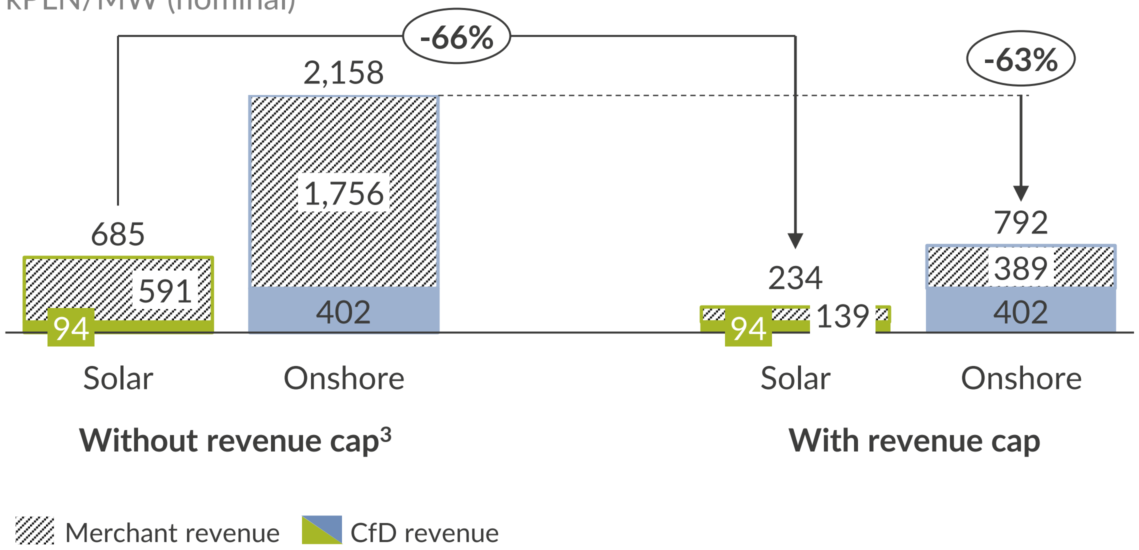
Exemplary capture prices for a virtual (financial) PPA-backed project[1]

PLN/MWh



Exemplary revenue for a CfD-backed project in 2023[2]

kPLN/MW (nominal)

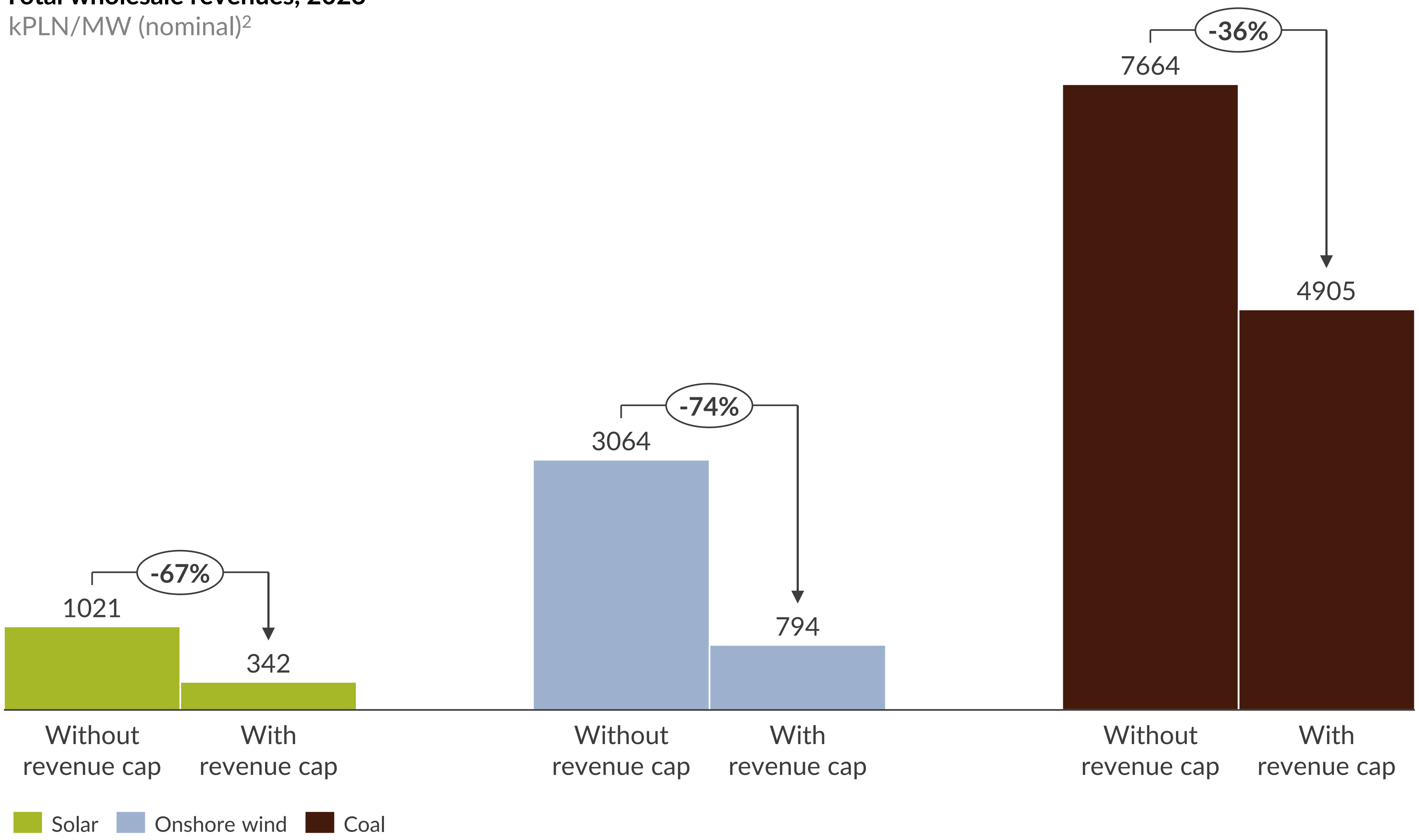


1) Prices are illustrative and not estimated. 2) Based on Aurora October 2022 Central. 3) Assuming an optimized timeline with 51% share of generation under the CfD and a nominal strike price of 295 PLN/MWh (equal to 228 PLN/MWh in real 2021 PLN which was the average CfD strike price in Dec 2021).

Source: Aurora Energy Research

Due to the revenue cap, merchant revenues decrease by more than 60% for renewables, whereas coal assets are less affected

Total wholesale revenues, 2023[1]
kPLN/MW (nominal)[2]



1) Based on Aurora October 2022 Central scenario. Looking at exemplary plant merchant revenues, not including CfD projects. The cap also impacts December 2022, this month has been excluded from the calculation for comparative reasons. 2) Taking the National Bank of Poland assumption of 14.5% and 13.1% CPI growth in 2022 and 2023 year-on-year, respectively.
Source: Aurora Energy Research

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- Renewables are significantly affected by the introduction of revenue caps with the largest impact seen for onshore wind revenues as the onshore wind cap is set at a lower level than the solar cap
- Solar revenues decrease by 67% under the revenue caps for Dec 1st 2022 to Dec 31st 2023, while onshore revenues decrease by 74%
- Coal wholesale revenues are less affected on a relative basis by the introduction of revenue caps as the caps for fuel-fired technologies are higher and based on clean fuel prices
- Nevertheless, as the fuel-fired technology caps are based on an estimated variable O&M cost, the impact on gross margins may be significant, depending on the asset

The introduction of revenue caps significantly impacts long term project profitability and will likely lead to a delay in new investments

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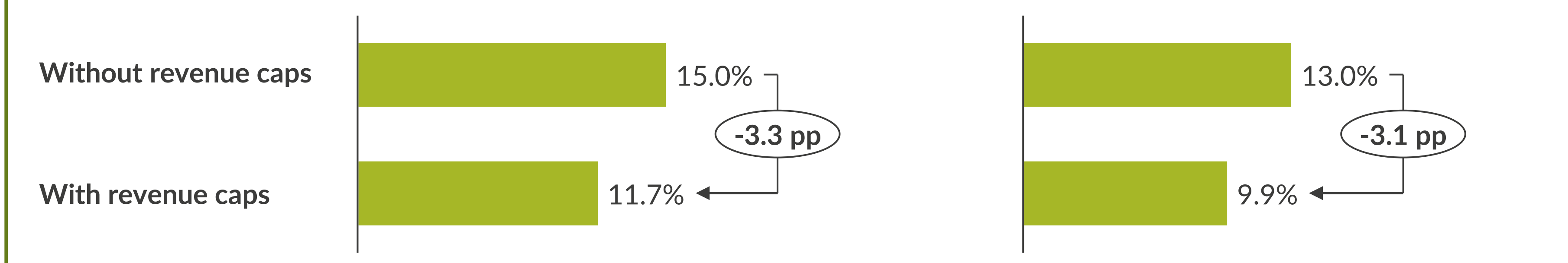
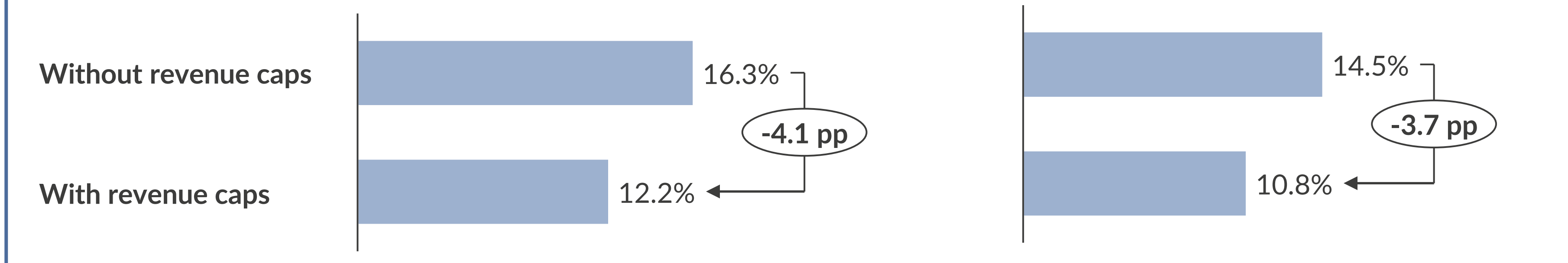
Technology | **Internal rate of return of an existing asset with COD 01/01/2022** % (pre-tax real) | **Internal rate of return of a new asset with COD 01/01/2023** % (pre-tax real)

Exemplary merchant solar[1]



CAPEX assumption 2731 PLN/kW (2021 real)

Exemplary merchant onshore wind[2]



CAPEX assumption 7331 PLN/kW (2021 real)

1) Based on Aurora October 2022 Central. Assuming a 30 year lifetime, 1 year build time and a 9% WACC. 2) Based on Aurora October 2022 Central. Assuming a 27 year lifetime, 2 year build time, and a 9% WACC.
Source: Aurora Energy Research

- For solar projects, the introduction of revenue caps leads to about a 3 percentage point drop in IRRs, depending on the commercial operation date
- Onshore wind projects are even more affected, dropping between 4-5 percentage points, as onshore cap levels are lower than those for solar
- While at these CAPEX assumptions renewables still see a strong business case in Poland, the introduction of the caps will likely lead to a delay in many new investments until 2024…
- … nevertheless, a rise in CAPEX can affect exact economics
- The sudden revenue cap introduction may also impact investor estimations of regulatory risk

Key take-aways

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- Poland has introduced caps for power market revenues in order to refinance financial support for end consumers. Deviating from the EU framework, the government has set the **revenue caps at a level below 180 EUR/MWh and made them technology-specific**. The caps are expected to apply to all power producers, except for assets smaller than 1 MW and energy storage units, **between 1st December 2022 and 31st December 2023**. Many details of the intervention still have to be clarified.
- In the **short term, we expect the revenue cap to cause significant reductions in revenues for affected technologies**. Between 1st December 2022 and 31st December 2023, merchant renewables assets see a decline in revenues of 74% for onshore wind and 67% for solar.
- For coal assets, short-term revenue impacts are smaller, accounting for a 36% decrease as cap levels are higher. However, as caps for fuel-fired assets are primarily set at the clean fuel price, any **additional variable costs for fuel-fired assets will need to be covered by the margin of 3% of the wholesale price and a 50 PLN/MWh fixed cost payment**.
- The **proposed revenue cap significantly affects long-term asset profitability for assets COD in 2022 and 2023**, lowering solar and onshore wind IRRs by about 3 and 4 percentage points, respectively.
- While the long-term economic impact of the revenue cap is moderate when considering the measure in isolation, **such unprecedented intervention in the power market creates significant uncertainty.** Market actors are already facing considerable uncertainty caused by volatile power and commodity prices as well as regulatory risk in light of EU plans for a major reform of the European power market design in 2023.
- Further uncertainty around the design of a revenue cap and the risk of a possible extension might **further increase reluctance to invest, which could slow down the development of renewables** in a time where buildout is urgently needed to reduce the dependency on fossil fuel imports and drive decarbonisation.

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Details and disclaimer

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Poland's power market revenue cap — what does it hold for power generation assets?

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