

# In Conversation with BloombergNEF

A Deep Dive into 1H 2023 European PPA Prices

# Agenda

- Introduction
- PPA Pricing Dynamics
- 1H 2023 Pricing
- Macro-Level Trends
- Q&A

# Presenters



Helen Dewhurst

**Senior Associate at BloombergNEF**

Helen helps corporate sustainability teams transition to a low carbon economy. Her analysis covers the fundamentals of power markets, power purchase agreements, green certificates and the role of energy policies and renewable energy economics in influencing corporate renewable purchasing decisions.



Meghan McIntyre

**Senior Energy Analyst at Zeigo Power**

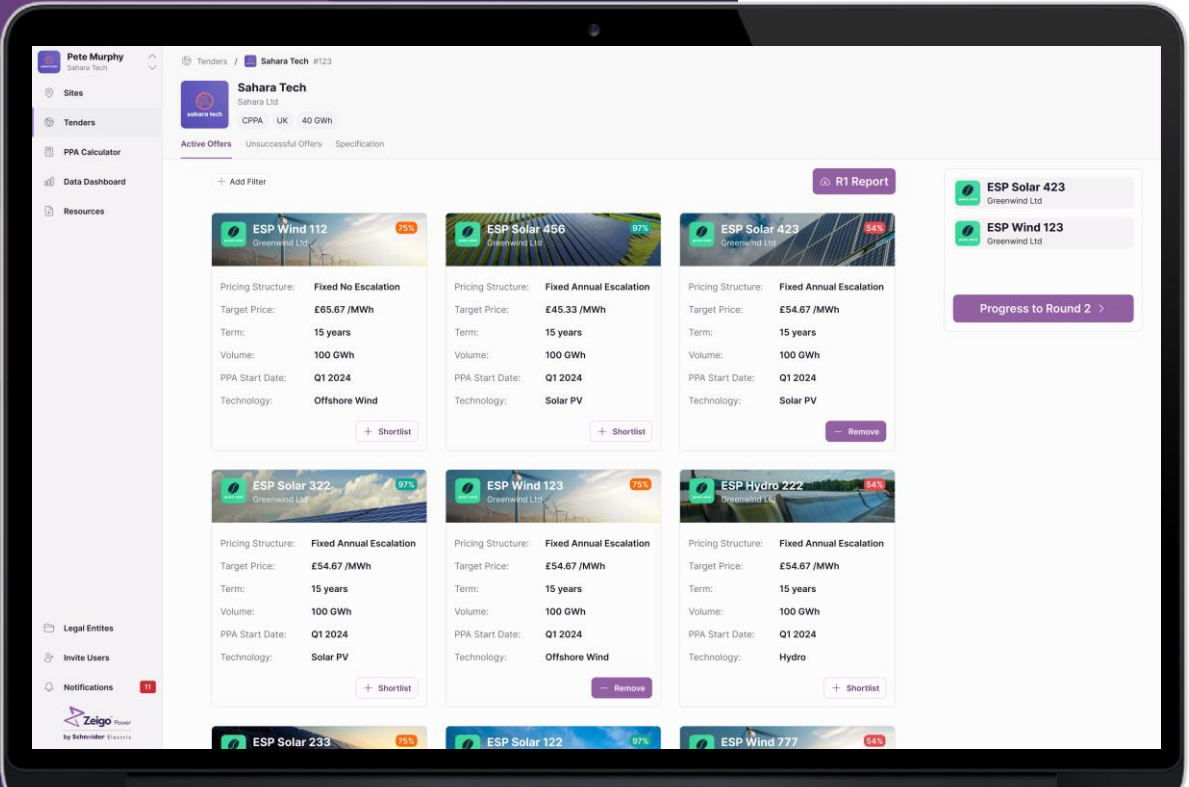
Meghan is an experienced market analyst with a background in energy policy, business strategy and software solutions.

# Zeigo Power

Transparent

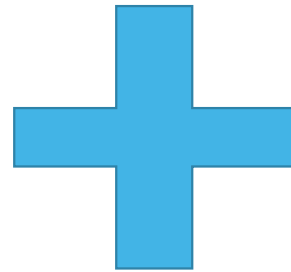
Streamlined

Competitive



About this survey

# BloombergNEF



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**by Schneider** Electric

# PPA pricing dynamics

What to look for when negotiating a deal

# Characteristics of an attractive PPA market

## Human and natural resources



- Good solar, hydro and wind resources: naturally high capacity factors
- (Affordable) land area available for construction
- Availability of human resources: technical and professional expertise

## Energy market conditions



- Renewable energy levelized costs competitive with wholesale prices
- Hedging needed to offset a rising or volatile wholesale power price
- High carbon prices

## Policy environment



- Limited government subsidy drives developers to PPA market
- Long-term national renewable energy targets
- No legal barriers
- Affordable grid fees and straightforward permitting

## Commercial environment

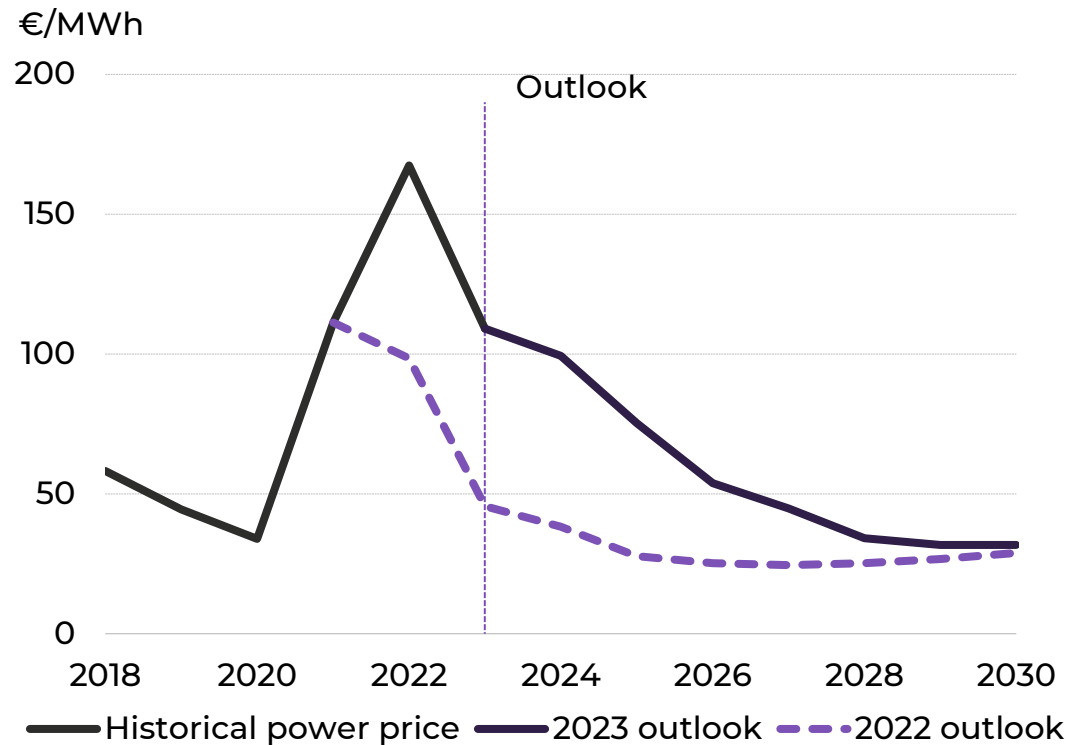


- Ways to address counter-party credit risk
- Level of risk appetite: market liquidity and investor confidence
- Utilities with good balancing capabilities
- Sustainability high on the agenda - renewable energy demand from corporate offtakers

Source: BloombergNEF. Note: <sup>1</sup>A virtual PPA whereby green attributes can be set against a company's power demand in another European country.

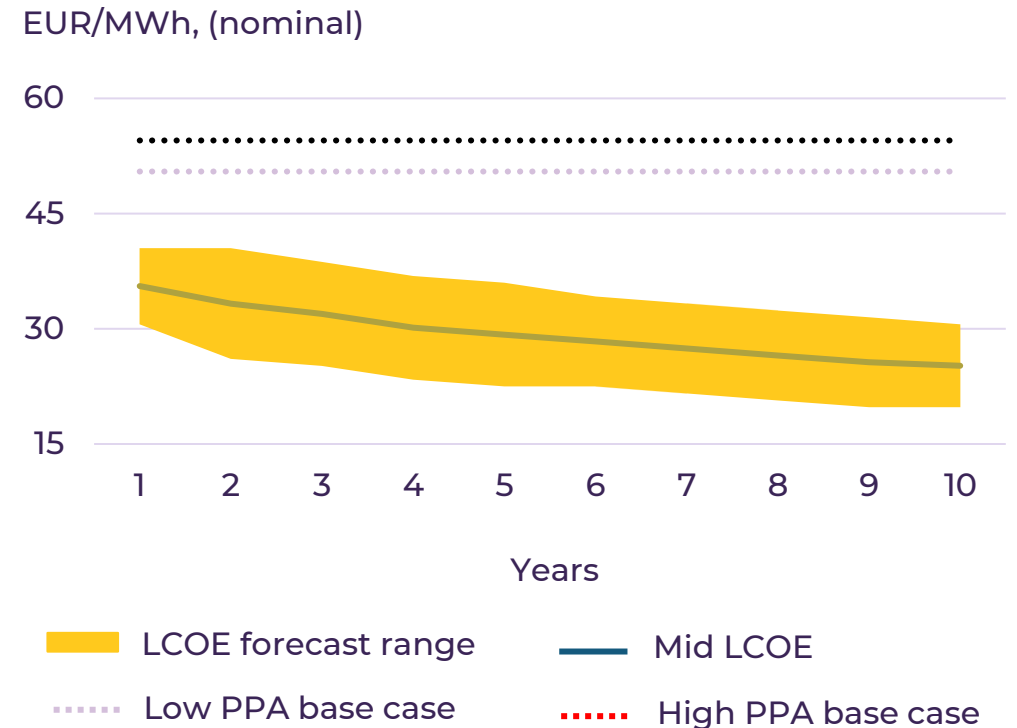
# Settling on a price: market and cost considerations

## Spain power price outlook: top-down approach



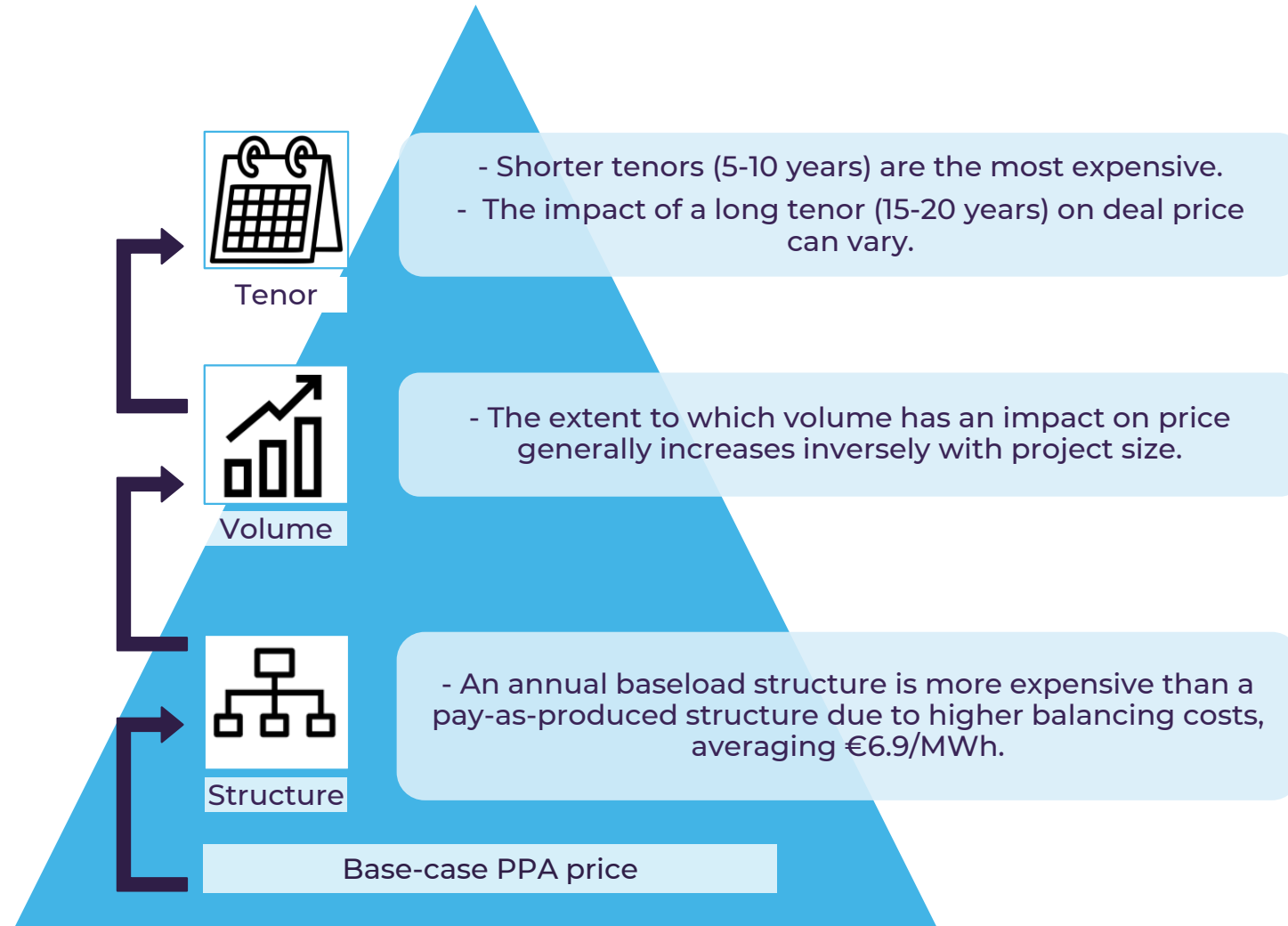
Source: BloombergNEF. Note: The NECP scenario models the impact of Spain's 2030 policy targets as laid out in its National Energy and Climate Plan on power prices.

## Levelized cost of electricity for solar in Spain: bottom-up approach



Source: BloombergNEF, Note: Data through July 2023. LCOE ranges exclude subsidies or tax-credits. They have been converted from dollars to euros for consistency.

# Sprinkling Over with Some Project-Level Features



Source: BloombergNEF



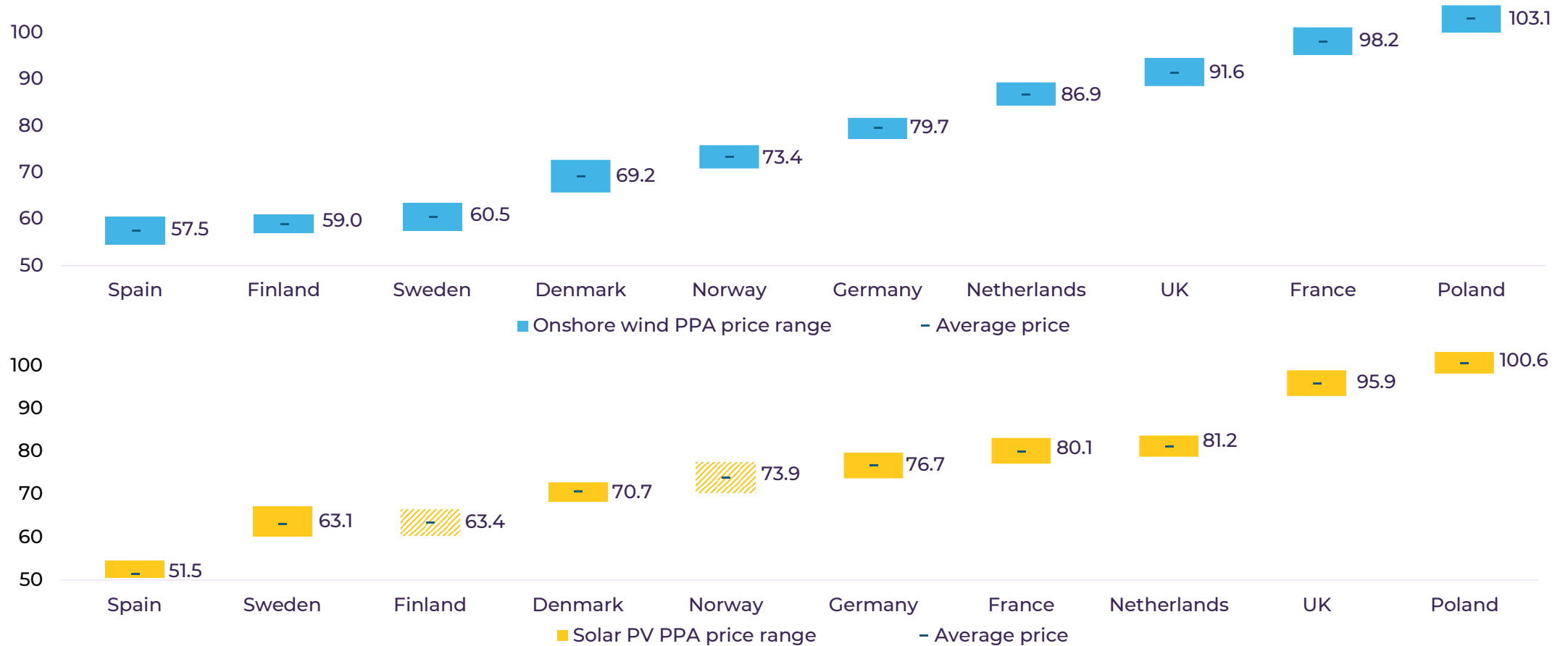
# Solar and onshore wind pricing in 1H 2023

High level trends

# No Market was Immune to High Prices in 1H 2023

## Onshore wind and solar PPA pricing for the base case compared

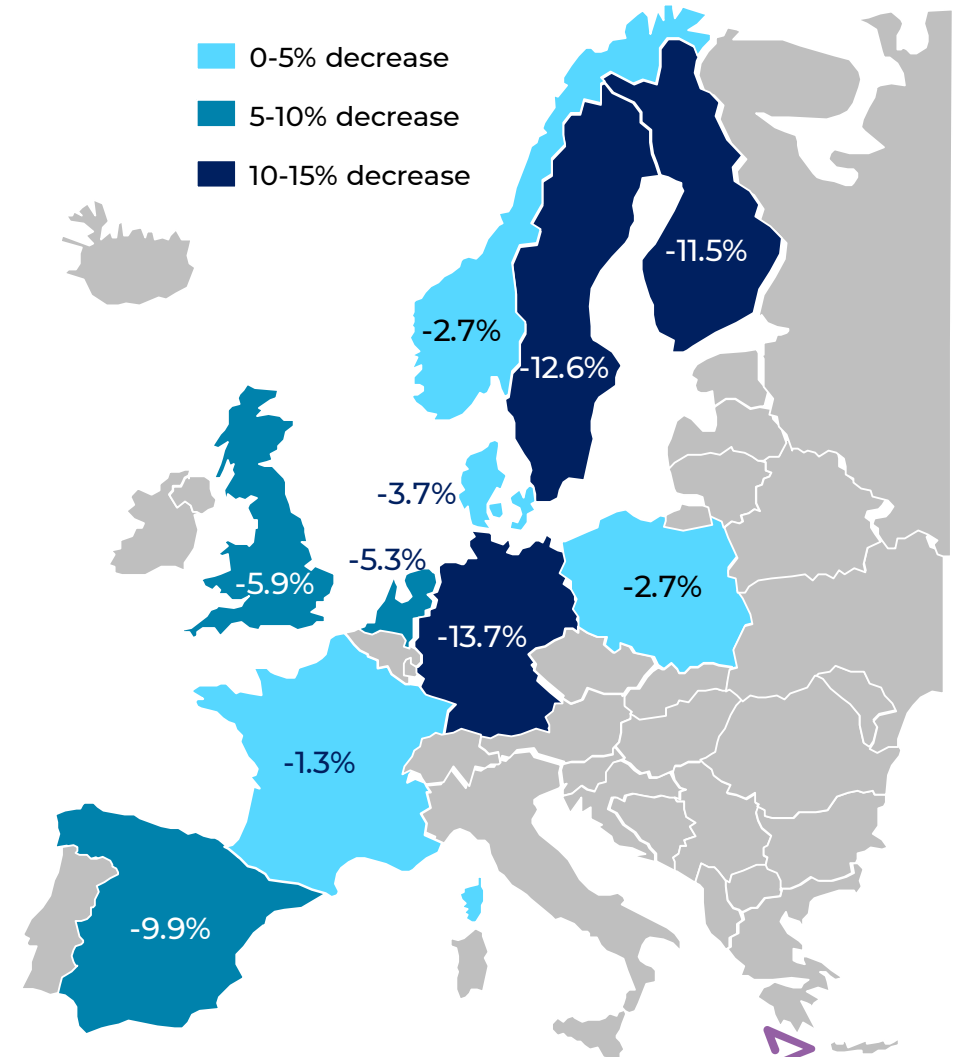
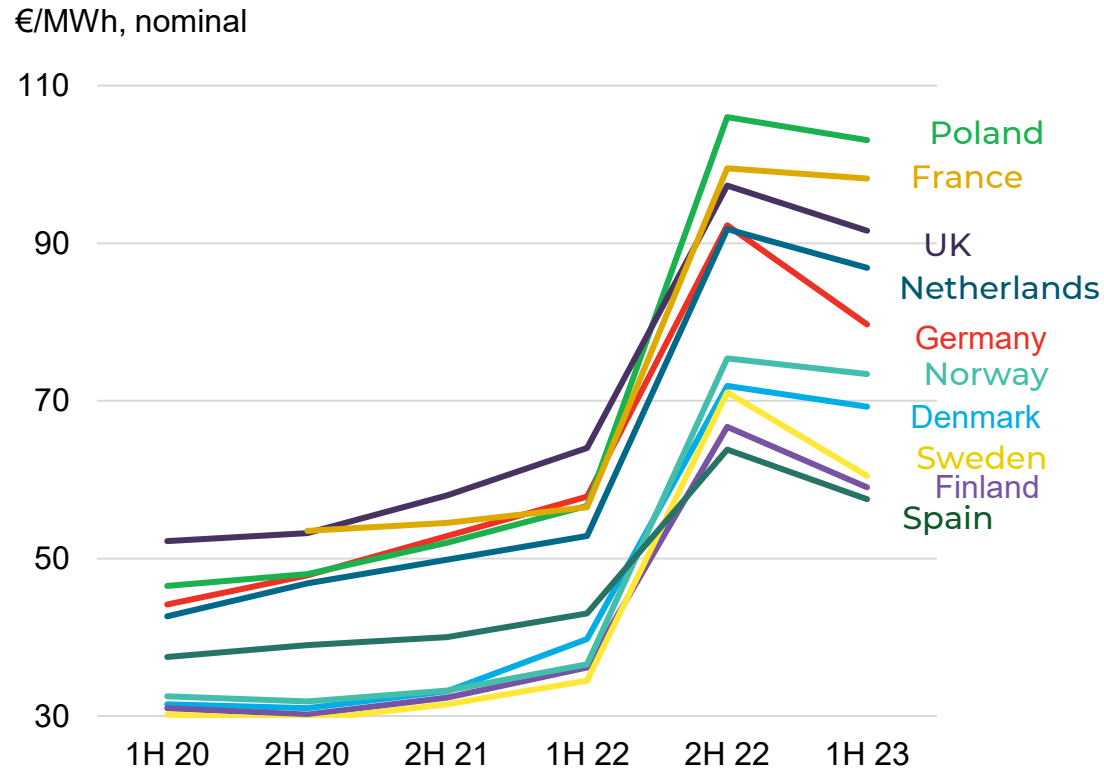
€/MWh (nominal)



Source: BloombergNEF, Zeigo Power, survey participants. Note: Data were collected from April-July 2023. Hatched infill indicates that no solar PPAs have been announced to date, so these represent bid or estimate prices.

# In Spite of Modest Price Declines in Onshore Wind

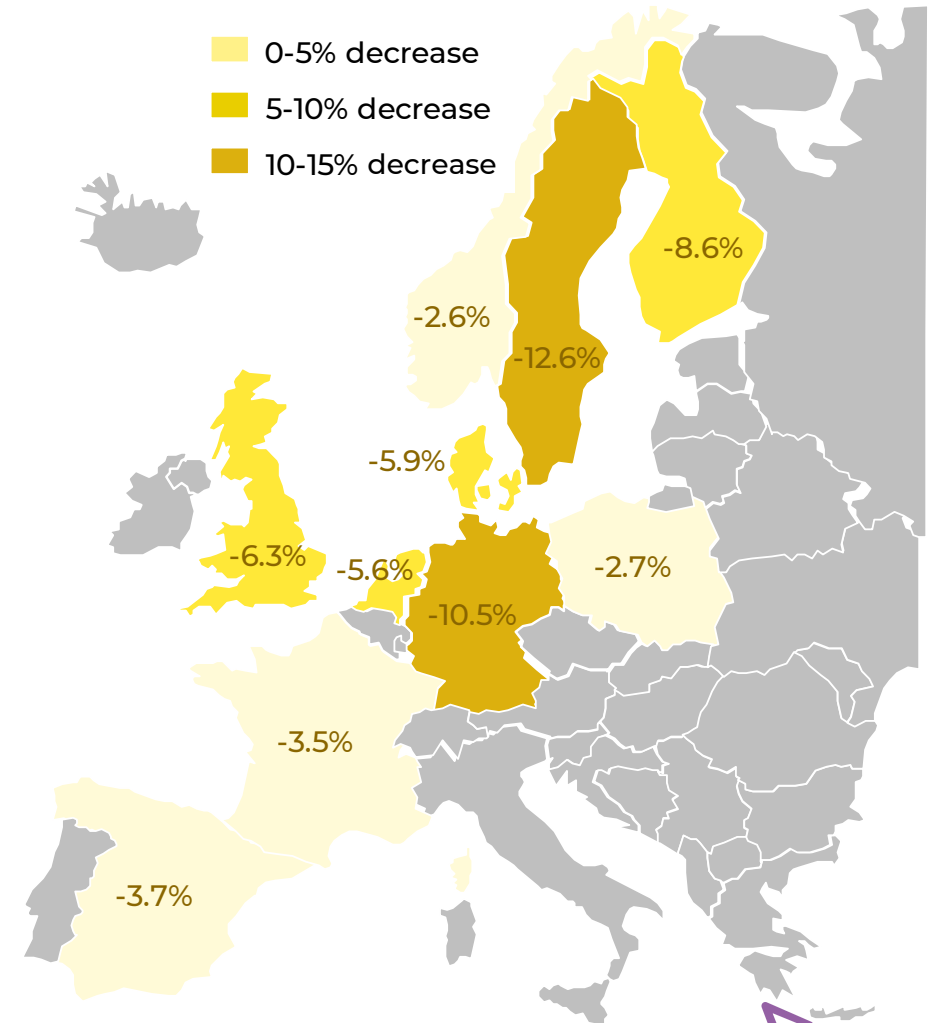
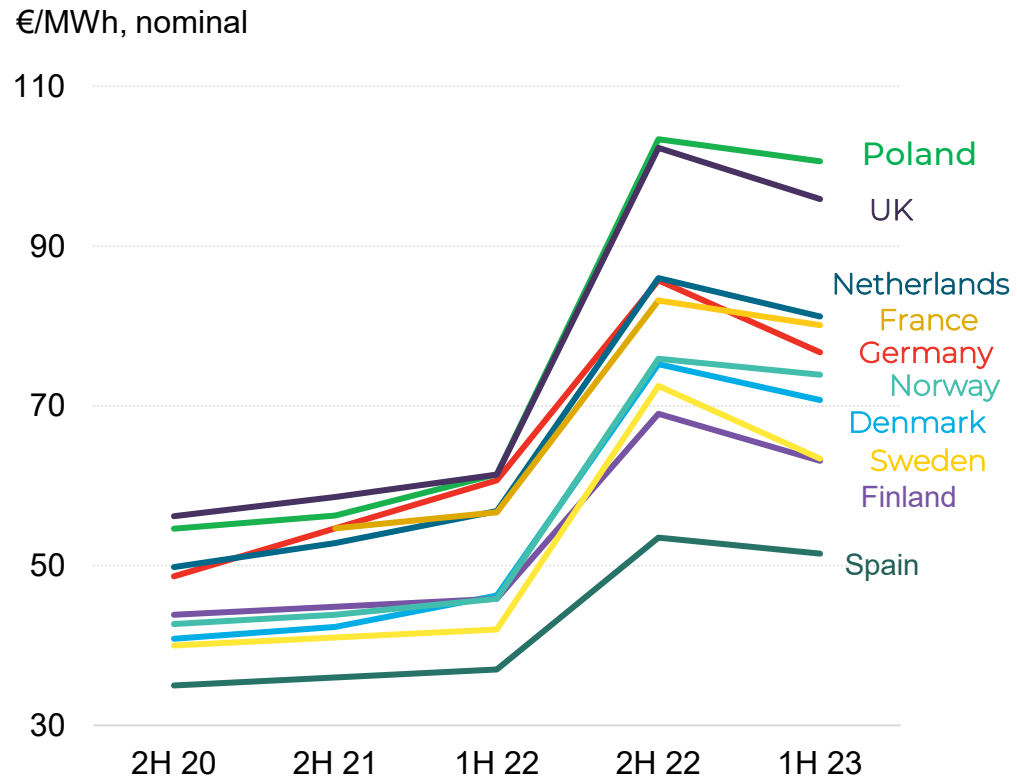
PPA price change 1H 2020 – 1H 2023, onshore wind



Source: BloombergNEF, Zeigo Power, survey participants.. Note: Map decreases shown since 2H 2022.

# Matched by a Similar Trends for Solar Deals

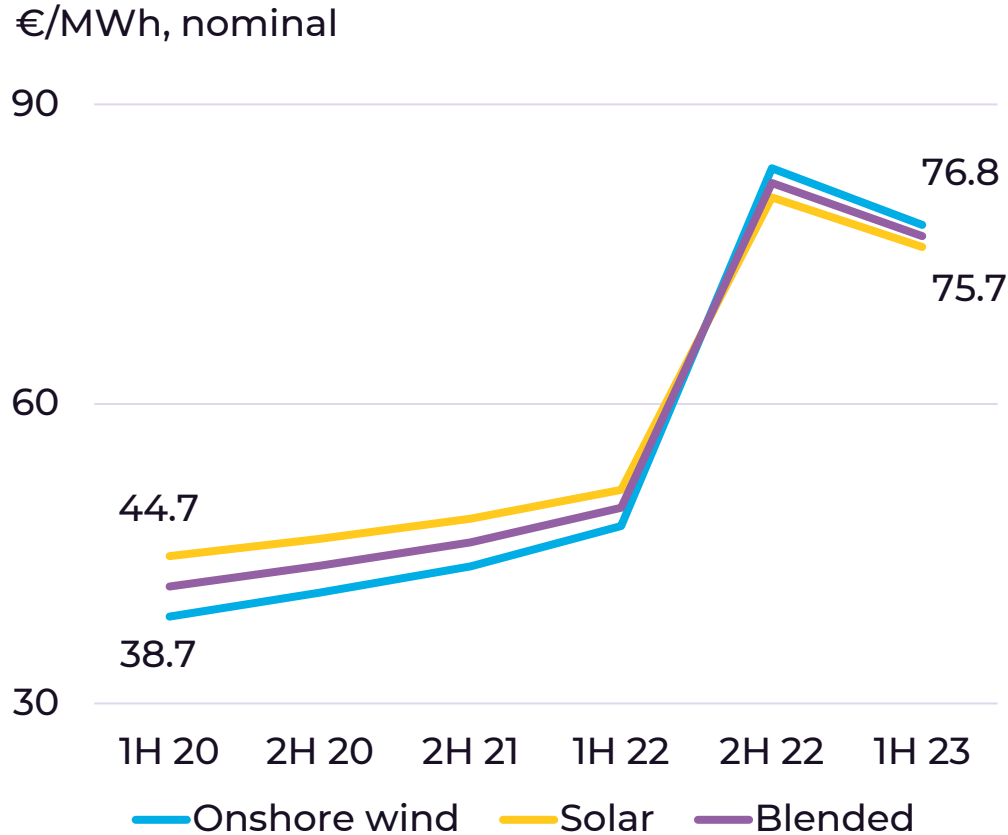
PPA price change 1H 2020 – 1H 2023, onshore wind



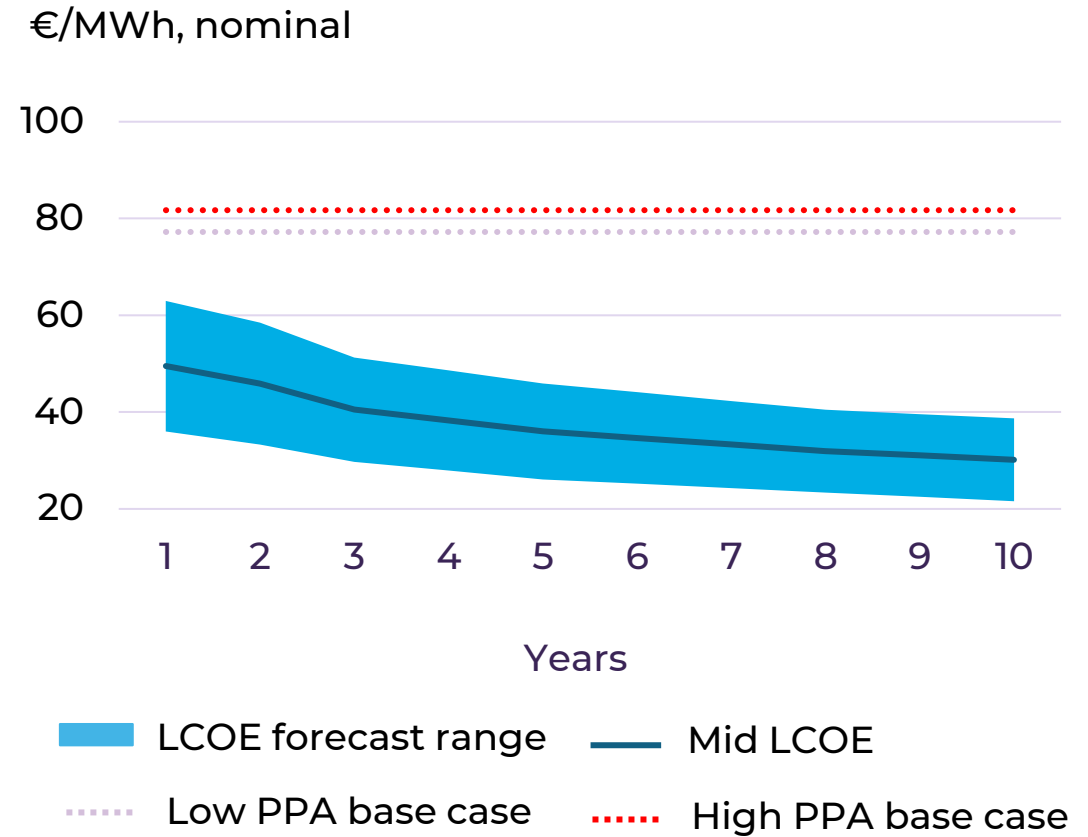
Source: BloombergNEF, Zeigo Power, survey participants.. Note: Map decreases shown since 2H 2022.

# Key takeaway 1: These High Prices Have Become the New Normal

## Average PPA prices



## Levelized cost of electricity for onshore wind in Spain

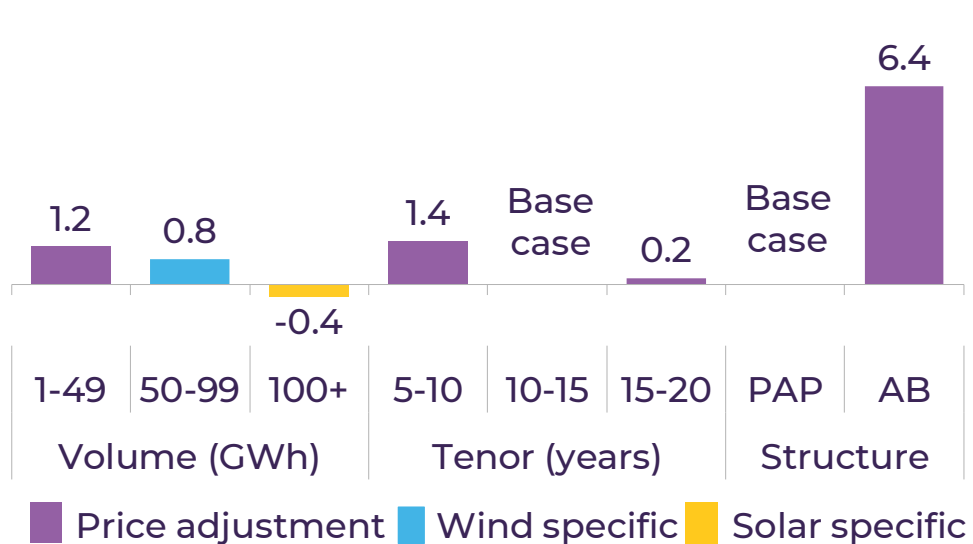


Source: BloombergNEF, Zeigo Power, survey participants.

# Key takeaway 2: With Baseload Premiums Higher than Ever

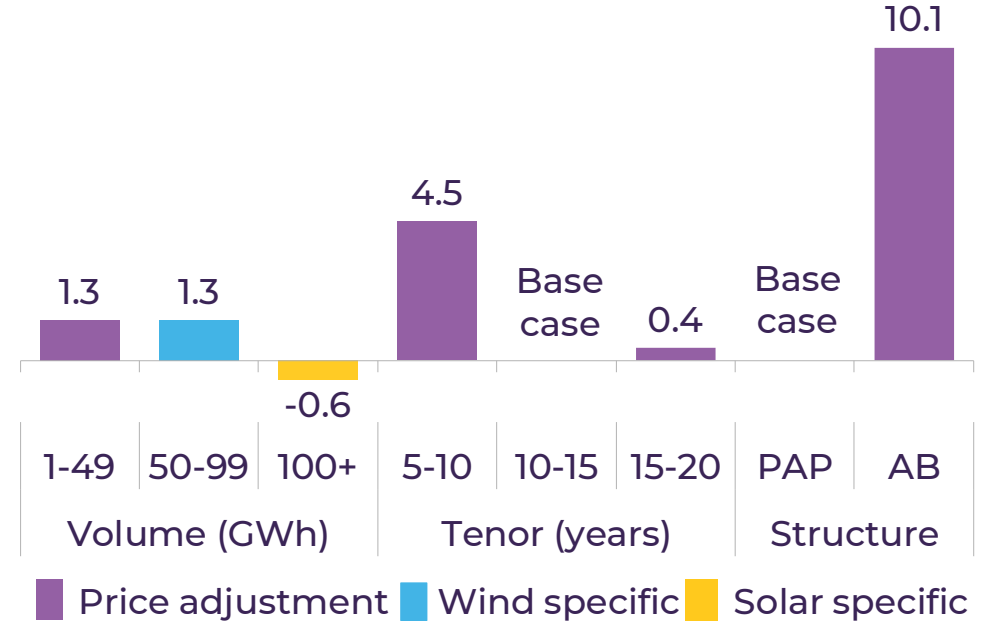
Price adjustment factors: UK  
1H 2022

€/MWh (nominal)



Price adjustment factors: UK  
1H 2023

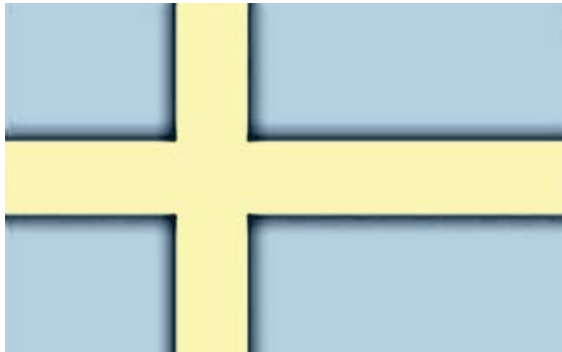
€/MWh (nominal)



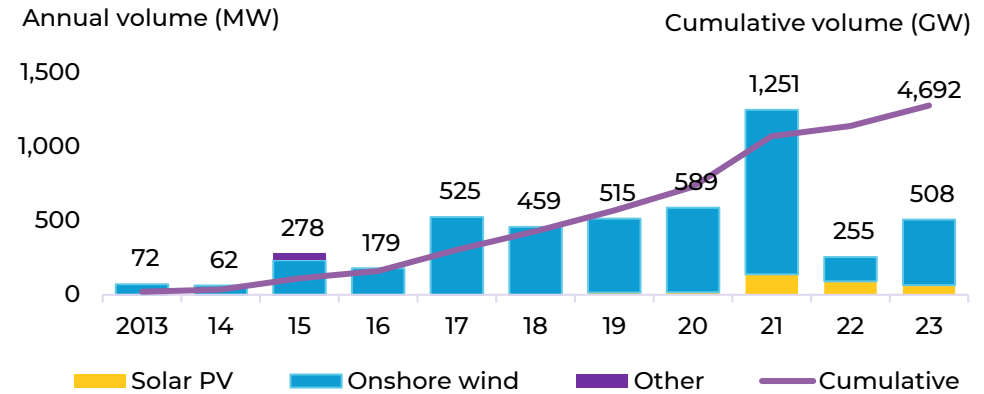
Source: BloombergNEF, Zeigo Power, survey participants. Note: Assumes all else remains equal according to the 'base case'. PAP = pay as produced; AB = annual baseload.

# Key takeaway 3: The Nordics No Longer Provide an Easy Solution

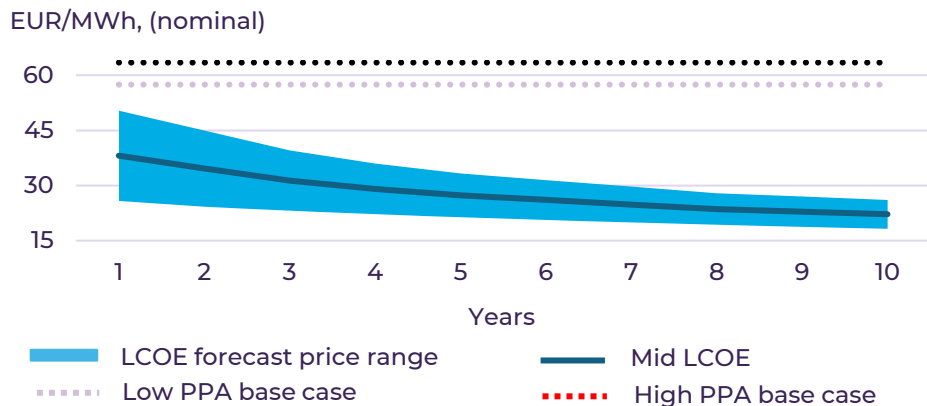
## Case study: Sweden



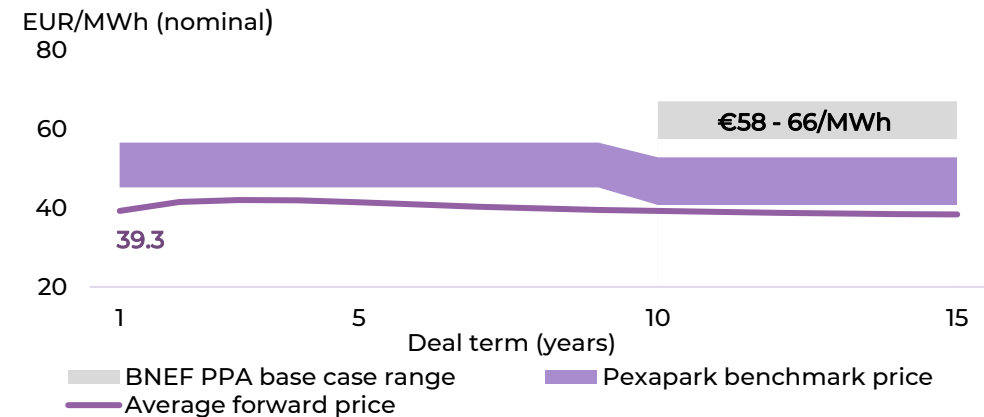
## PPA volumes, by technology



## Levelized cost of electricity, onshore wind



## Market value PPA comparison



Source: BloombergNEF, Pexapark. Note: Forward price calculated from available traded futures (taken October 2, 2023) and averaged for the contract duration. Base case combines solar and wind. Pexapark data are extrapolated for years 1-5 and 10-15.

# Macro-level trends in 1H 2023

Interaction with external market factors

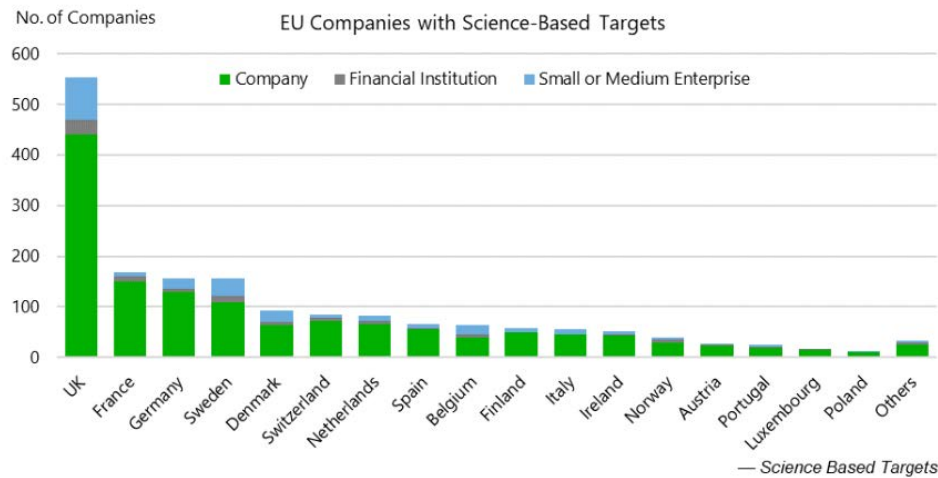




Impact on PPA prices

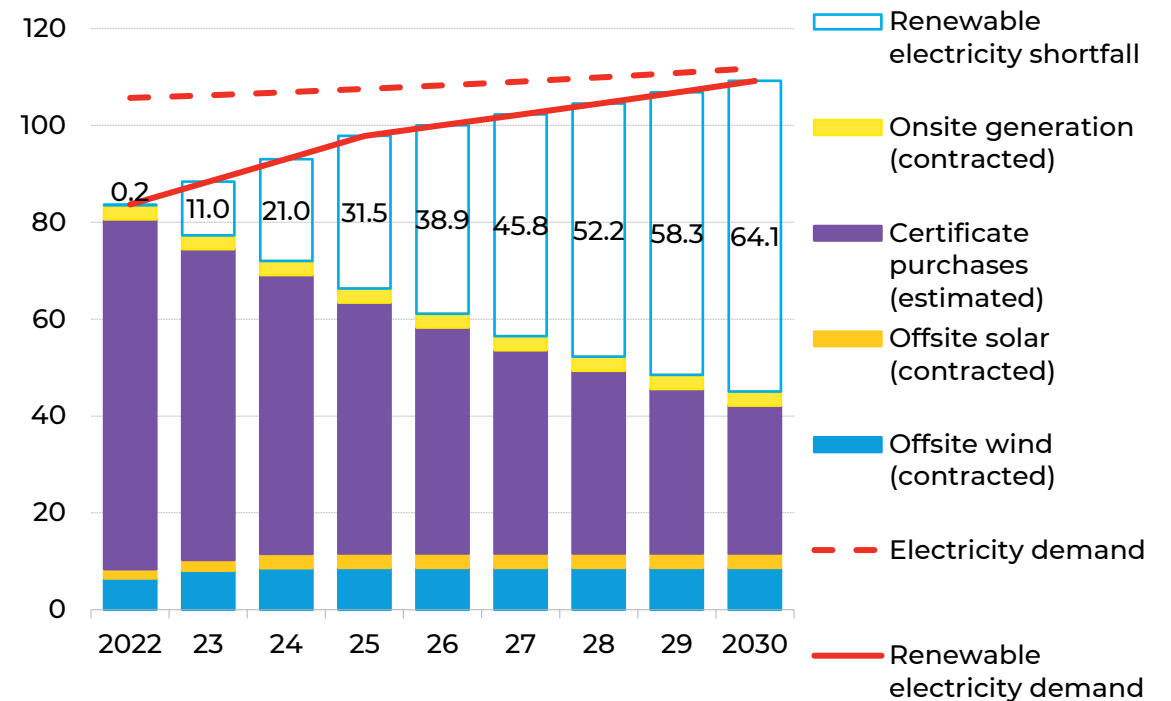
# Trend 1: Corporations Remain Keen, Despite the High Prices

## European renewable auction volume and PPA market potential, 2030



Source: Zeigo Power. Note: Countries ordered by largest to smallest by wind and solar targets.

## Projected renewable shortfall for selected RE100 members, Europe

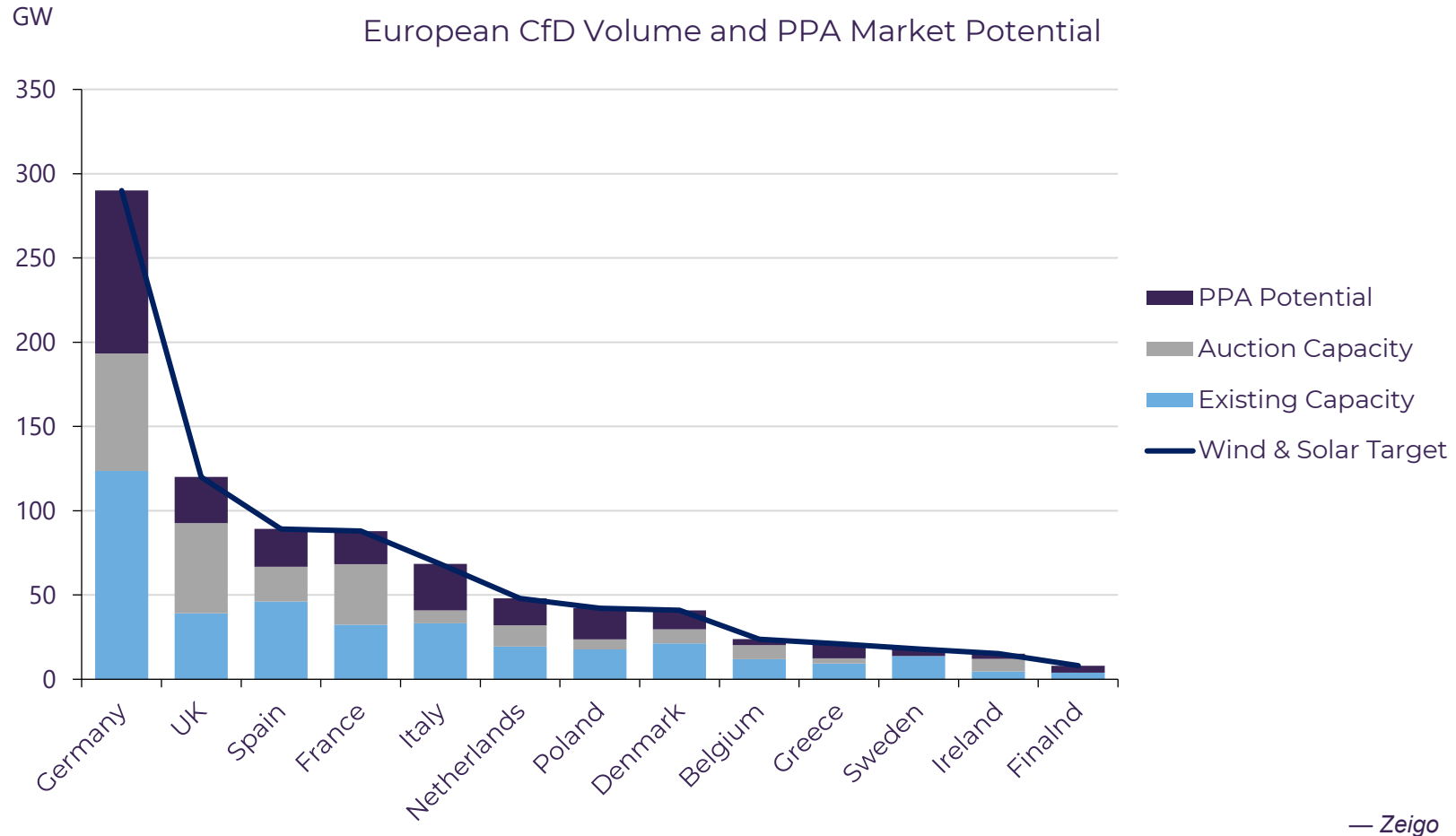


Source: Company filings. Note: \*Based on an unlevered basis, except for FSFL.

# Trend 2... And Tight Competition for a Limited Project Supply



Impact on PPA prices



Source: Zeigo Power. Note: Countries ordered by largest to smallest by wind and solar targets.

# Trend 3: Meanwhile Certificate Pricing Continues to Bolster Prices



Impact on PPA prices

Financial Times about the news: <https://lnkd.in/eUJEnTx3> ✓

#offsetting #co2 #emissions #EU #europeanunion



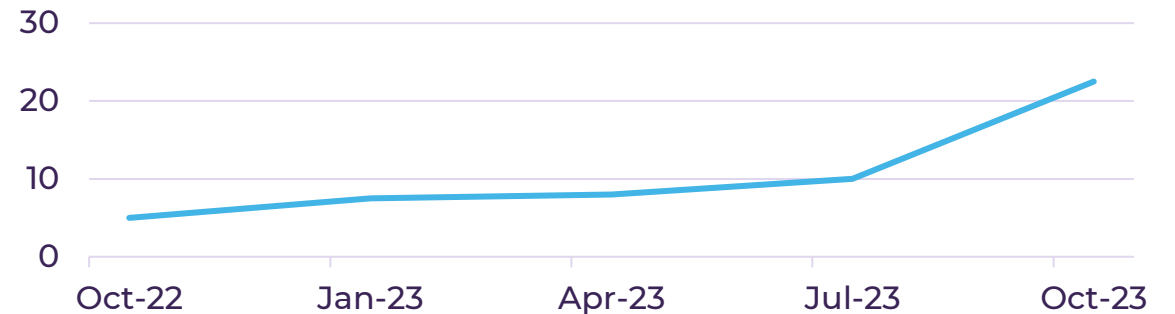
**EU to ban carbon offsetting as a basis for carbon neutral labelling**

Source: Financial Times

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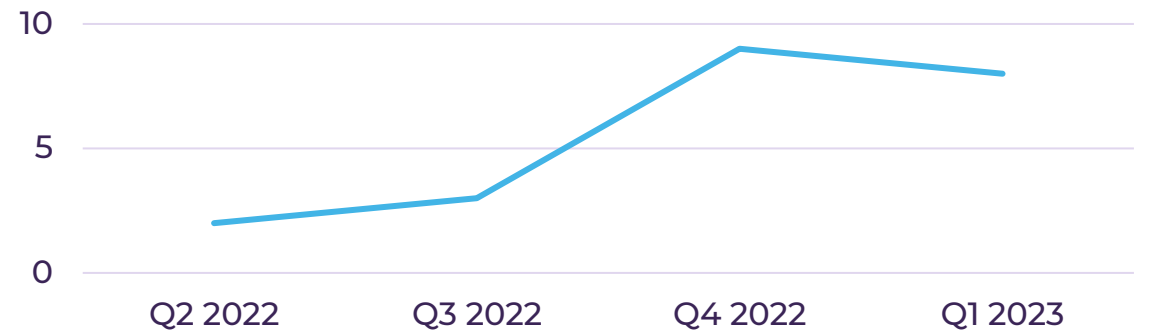
## REGOs

£/MWh, nominal



## Guarantees of Origin

€/MWh, nominal



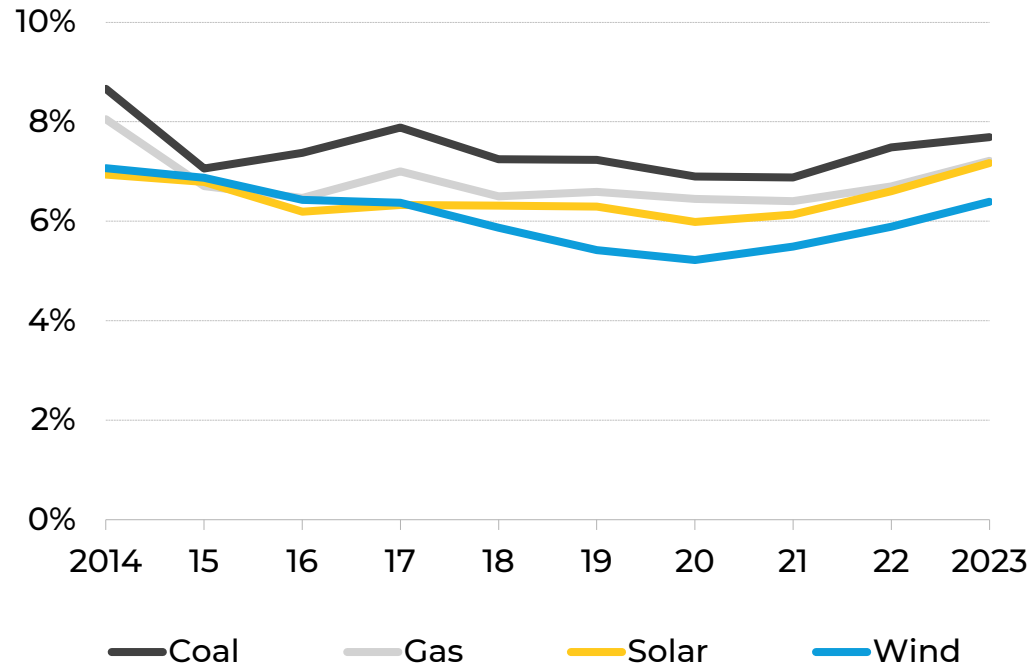
Source: BloombergNEF, S&P Capital IQ, Veyt. Note: based on average closing prices across all technologies

# Trend 4: Cemented By the Cost of Capital and Investor Expectations



## Weighted average cost of capital, 2014-2023

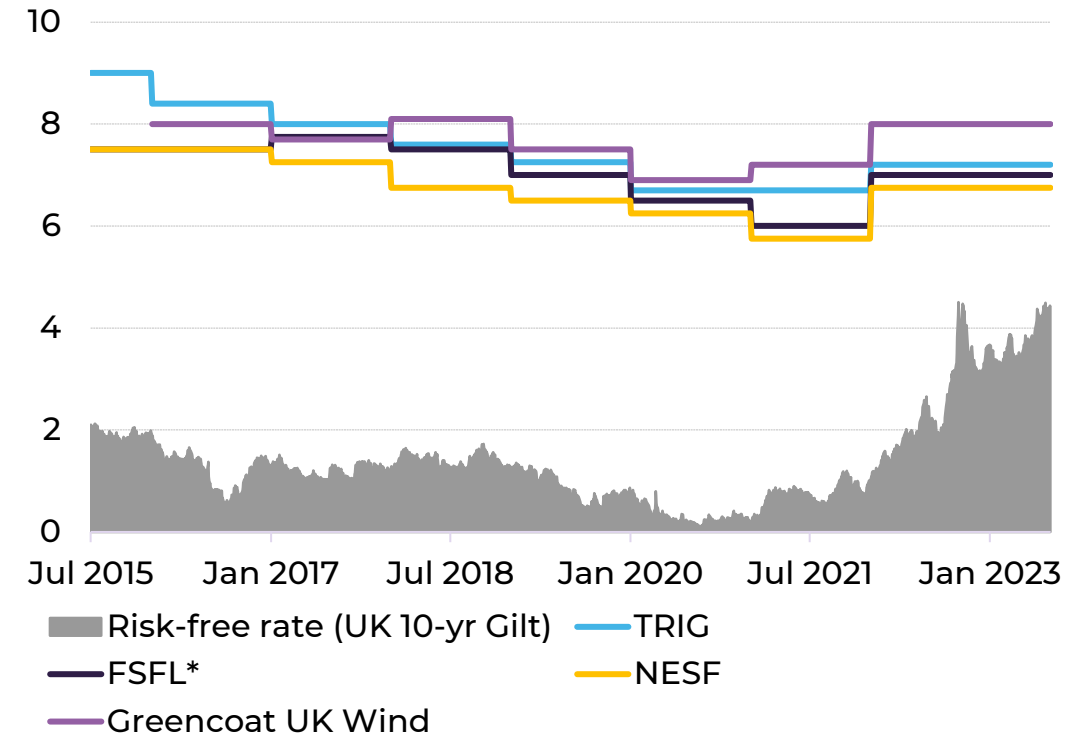
% (inc. tax, nominal)



Source: BloombergNEF, Bloomberg Terminal.

## Disclosed UK discount rates for select renewable energy funds

Yield (%)



Source: Company filings. Note: \*Based on an unlevered basis, except for FSFL.



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