AURORA ENERGY RESEARCH

Level10 Energy

The future of Italy's PPA market

Webinar
12 April 2021

Introducing Aurora's Italian team

AURORA

Matteo Coriglioni
Market Lead, Italy
Matteo.Coriglioni@auroraer.com

Carlotta Piantieri
Senior Analyst
Carlotta.Piantieri@auroraer.com

Michele Scolaro
Senior Analyst
Michele.Scolaro@auroraer.com

Deborah Scaggion
Commercial Associate, Italy
Deborah.Scaggion@auroraer.com

Italian Power and Renewables Service: Key market analyses and forecasts for all participants in the Italian power market

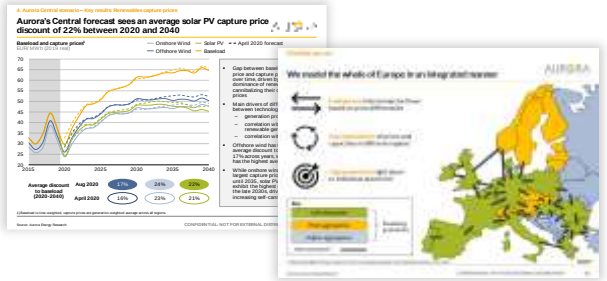
AURORA

Quarterly data and market reports

- **Forecasts of wholesale market prices along three scenarios (Central, High, Low)** until 2050
- **Yearly forecast of capacity payments** until 2050
- **Price distributions**, capture spark spreads, peak prices
- **Capacity development**, generation mix, interconnector capacity, capacity buildout, exports
- Fully integrated modelling of capacity decisions reflecting **grid constraints and price zone separation**
- **Capture prices** and load factors of onshore & solar
- **EU-ETS carbon price** forecasts

Group meetings and Strategic Insight Reports

- **In-depth thematic reports** on topical issues
- **Two multi-client roundtable discussions** per year in Milan/Rome with other market actors, incl. utilities, investors, developers, banks, TSOs and regulation
- Future topics include
  - *Net zero and the role of hydrogen in Italy*
  - *The Italian balancing market (MSD): opportunities for flexible assets and implications for renewables*



Interaction through workshops and ongoing support

- **Bilateral workshops** in your office to discuss specific issues on the energy market
- **Ongoing availability** (calls, access to market experts, modellers) to address any questions across European power markets
- Discounted invitations to Aurora's annual **Spring Forum**

All intelligence for a successful business, based on bankable price forecasts

For more information, please contact
Deborah Scaggion, Commercial Associate Italy

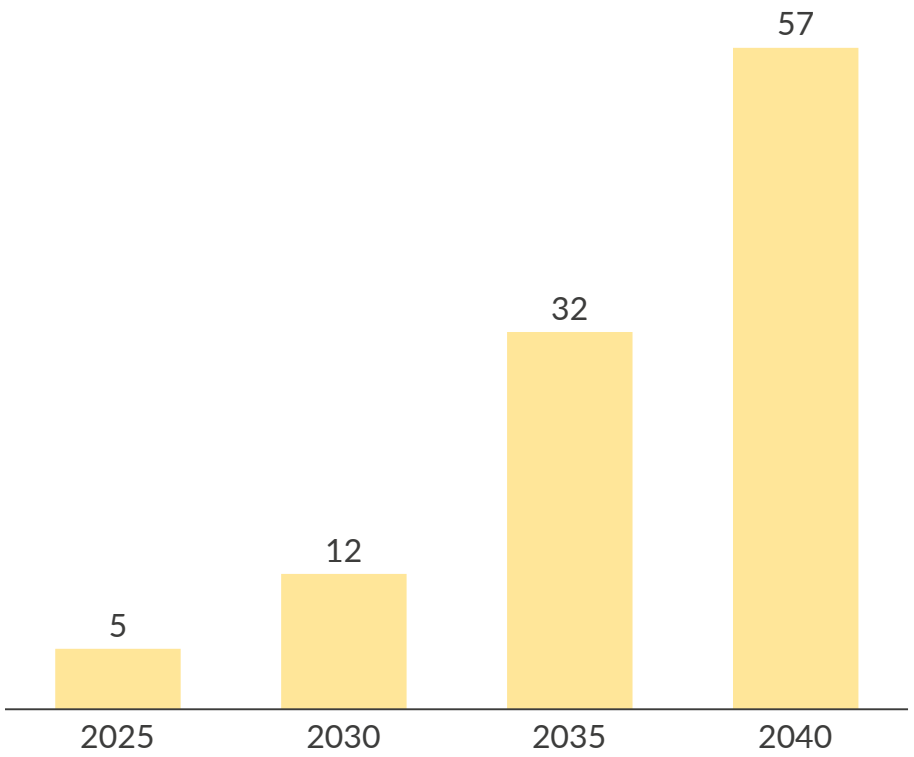
✉ **Deborah.Scaggion@auroraer.com**
☎ **+39 338 7794090**

Solar merchant capacities will increase substantially by 2050, bringing significant market risks into operators' portfolios

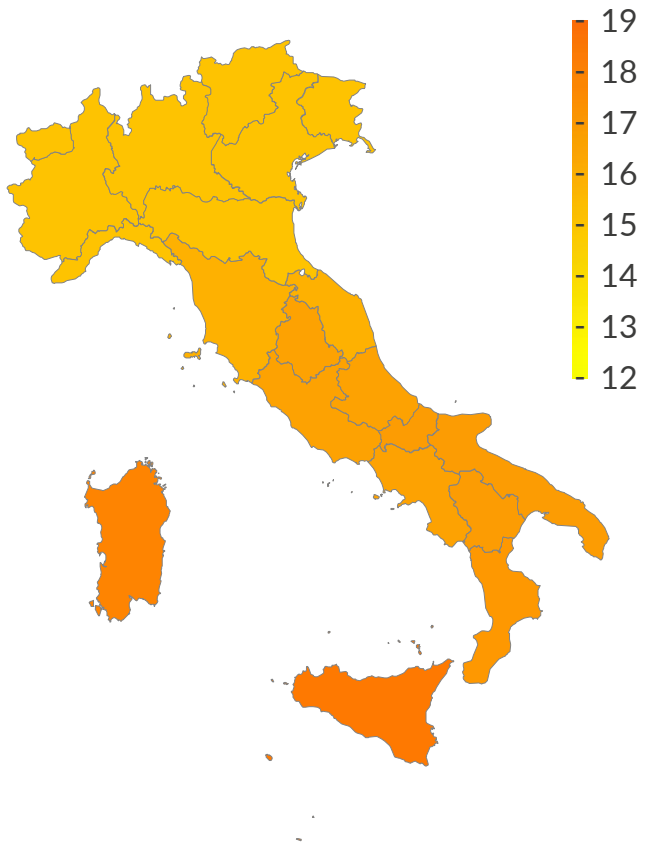
PV developers are increasingly switching their focus to market parity projects, due to the current challenges to receive subsidies for assets built on agricultural land, uncertainty on the future of subsidies and improved economics of solar PV.

Nevertheless, the geographical mismatch between renewable resources and power demand, coupled with grid transmission constraints, will lead to higher cannibalization in the southern zones, which are rich of resources, but have low demand.

New merchant Solar PV capacity
GW



Solar PV load factor
% avg. across new merchant fleet



High power demand

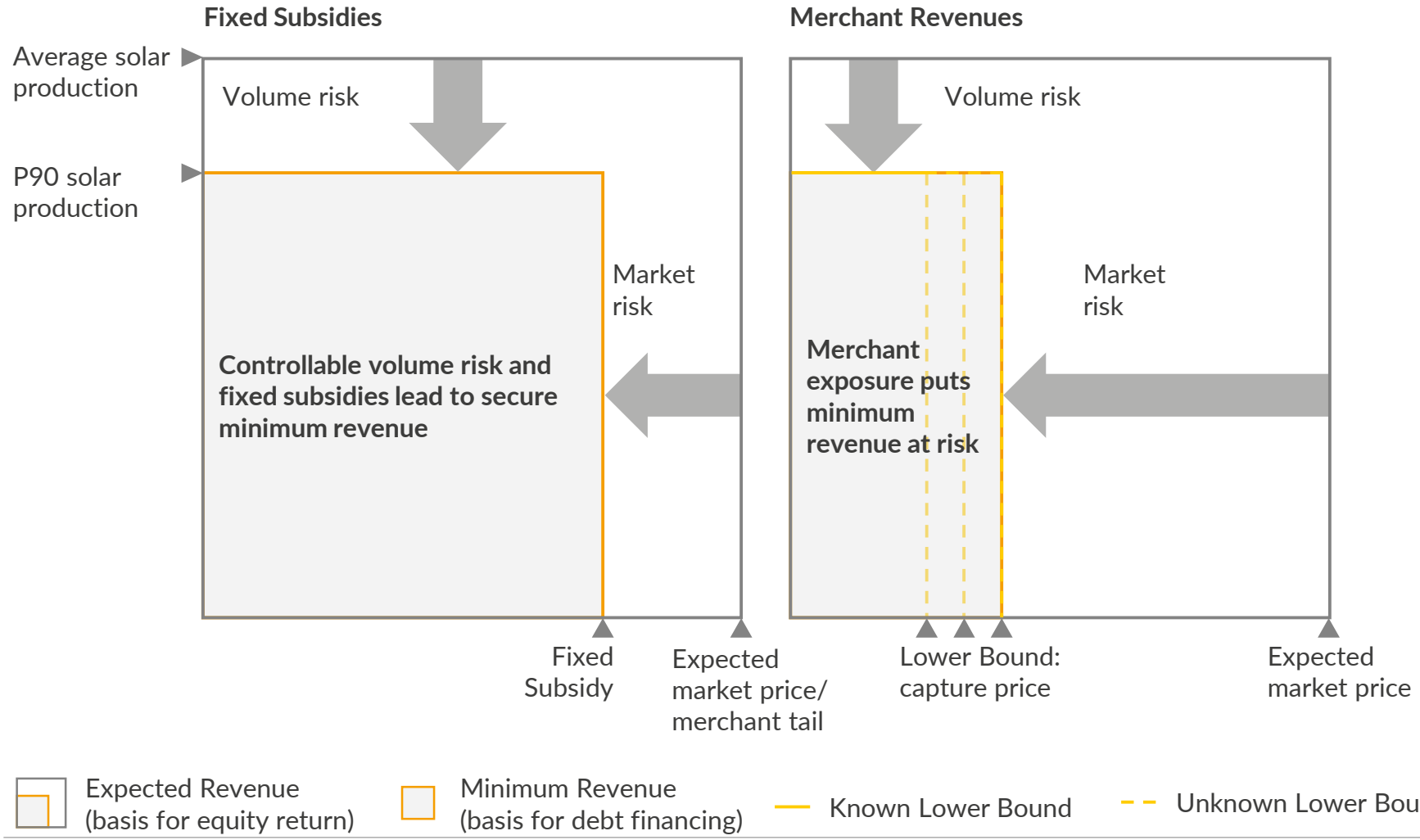
- 1/2 of demand is in the North
- Cross-zonal transmission grid capacity is limited and will negatively affect capture prices of assets in the South/Islands in the medium- to long-term

High capacity factors

- Natural resources are highest in the southern zones and islands
- High capacity factors and capture prices have been attracting most of project developers' interest

Source: Aurora Energy Research

Financing merchant buildout requires estimating investment risks through a realistic low scenario and addressing them via PPAs



The quantification of market risk is critical for developers that want to realise merchant projects

- Robust Low Scenario analysis of power prices

Reducing risk exposure is necessary for developers in order to secure financing

- Long-term PPAs contracts

Source: Aurora Energy Research

To calculate a robust downside scenario, we account for the main risks, their correlation and impact on power prices

AURORA

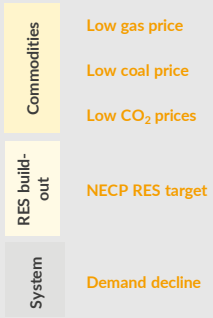
Method

Identify key power price drivers → **Estimate P90 for drivers and impact on power and capture prices** → **Assess correlation between drivers to identify P90 combinations** → **Model impact of P90 combined scenarios**

Take Aways

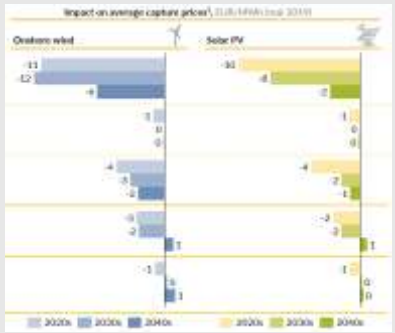
Downside impact by

- Low gas prices
- Low coal prices
- Low CO_2 prices
- NECP RES targets
- Demand decline



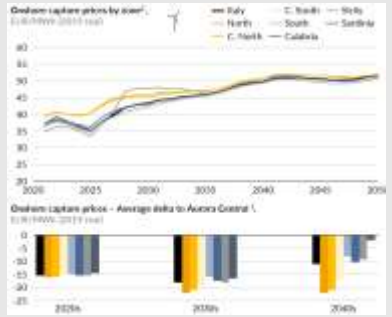
Analysis on lower bound of individual drivers, e.g.

- Gas price limited by marginal LNG cost
- RES build-out in line with full achievement of government RES targets



- Low power price hampers economics of unsubsidised RES
- Low power price increases cost of subsidies
- Positive correlation of low gas with low CO_2 prices

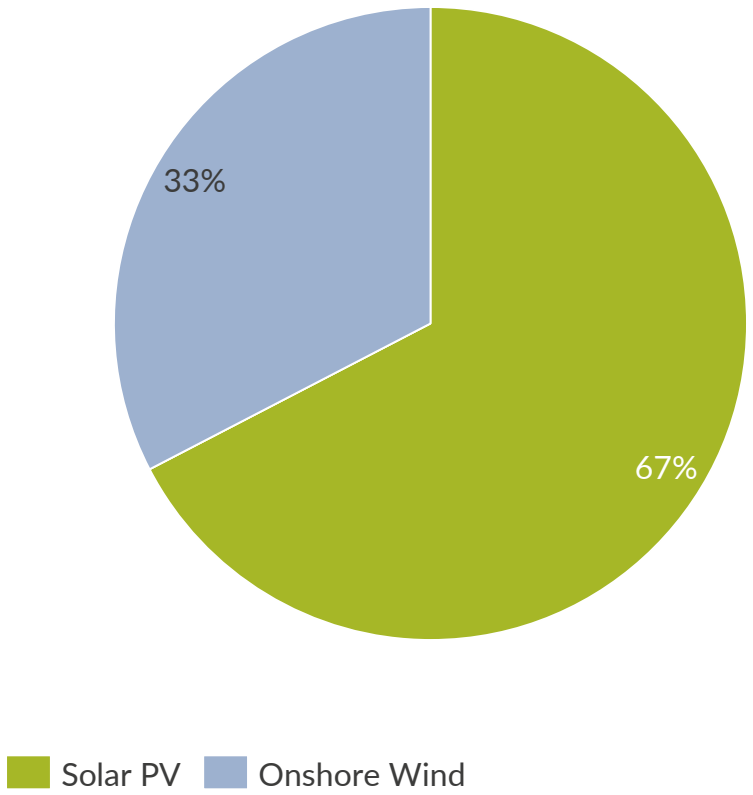
- Lowest P90 case is a low gas, low CO_2 and low demand environment
- Other low cases are higher RES build-out to reach the NECP RES targets



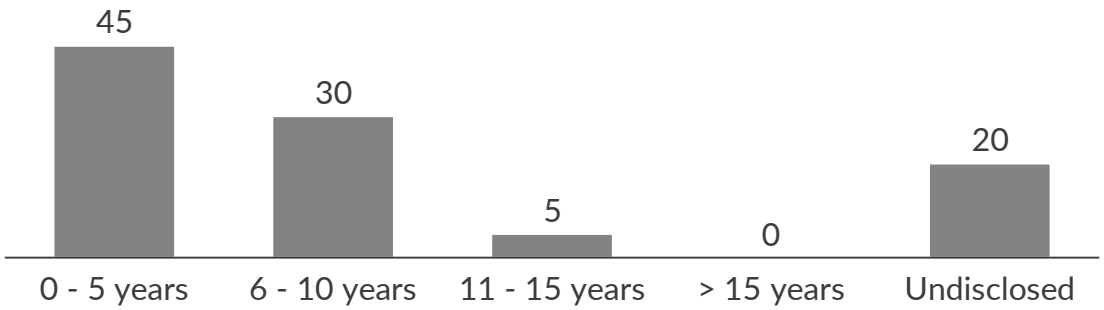
Source: Aurora Energy Research

Most existing PPAs in Italy are from solar PV, have short tenures and follow fixed price structures

Technology Share PPAs in Italy
% of installed capacity



Tenor
%, in years



Price clauses in Italy

Price clause	Occurrence today
Fixed price	High
Indexed	Low
Collared	Low

Source: Aurora Energy Research – PPA database

Different contractual clauses can be used to allocate commercial risks between PPAs generators and offtakers

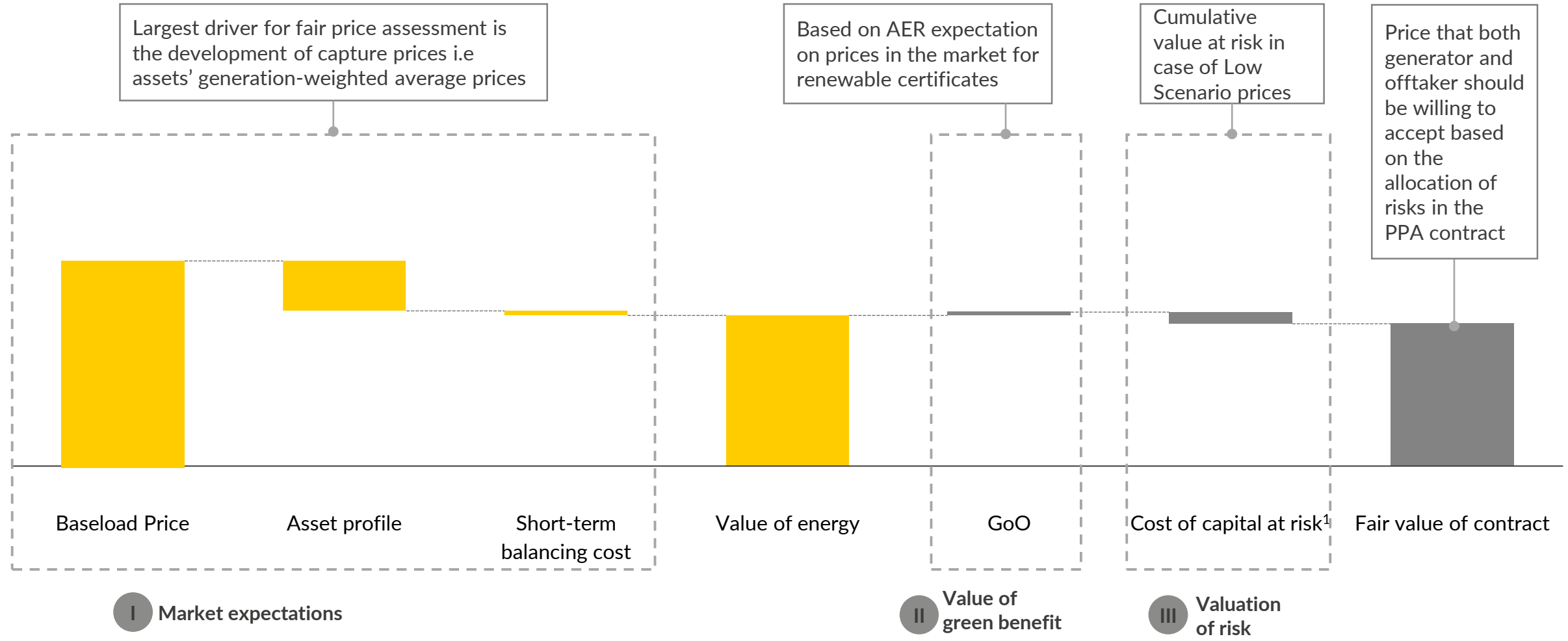
Commercial clause		Description	Who holds the risk? Offtaker ... Developer
Price clauses			
Fixed price	common	Fixed long-term price, offtaker takes on full price risk	
Collar	uncommon	Price follows capture price, contract guarantees a max/min price	
Floating/Indexed price	uncommon	Price linked to baseload index, offtaker only takes on capture price cannibalisation risk	
Tenor clauses			
Short term (<=5 years)	uncommon	Not suitable for price hedging, suitable if no debt financing required e.g. post-subsidy assets	
Medium term (6-10 years)	uncommon	Allows debt financing for smaller new build projects e.g. solar and onshore merchant	
Long term (>10 years)	common	Allows for highly debt-leveraged finance required for high risk projects, e.g. offshore wind	
Volume clauses			
As produced	common	Offtaker receives asset generation profile	
Baseload	uncommon	Asset(s) guarantees firmed baseload profile	
Fixed pattern/as consumed	uncommon	Asset delivers power at a pre-agreed fixed pattern	

common uncommon

Source: Aurora Energy Research

The fair market value of a PPA depends on market expectations, the value of green benefits and valuation of risk

Fair price calculation – Approach overview
Fixed price structure EUR/MWh

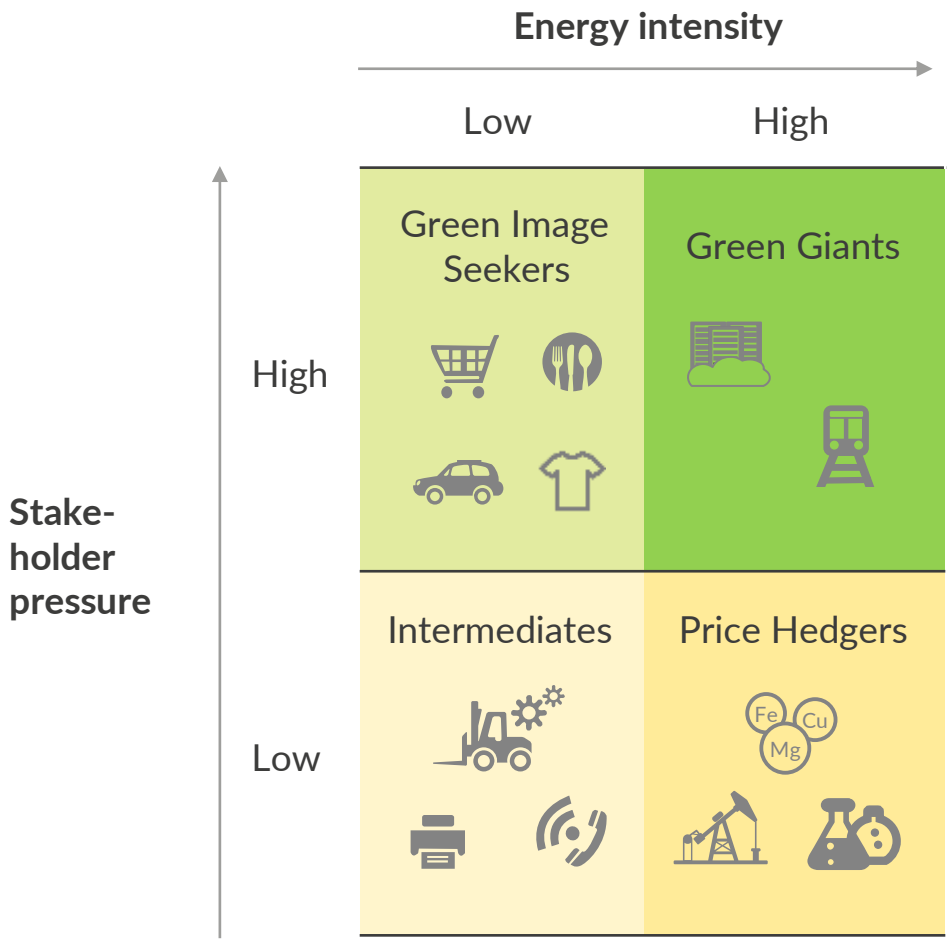


1) Cost of capital at risk: Cost of holding capital to cover expected cumulative value-at-risk i.e. the contract value risk between Central (P50) and Low (P90) price forecasts.

Source: Aurora Energy Research

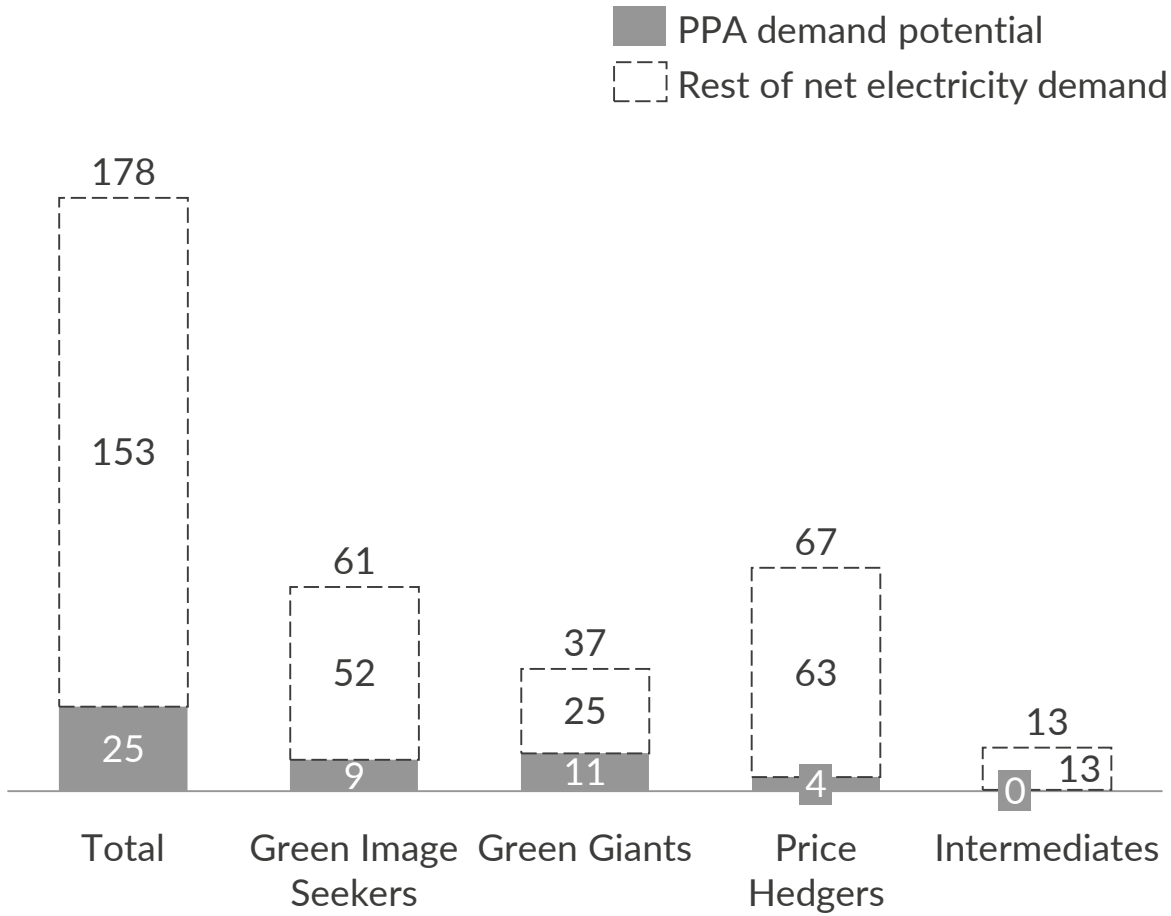
Energy intensity and stakeholder pressure of Green Giants and Image Seekers will be key drivers for corporate PPA demand in Italy

Corporate PPA demand segmentation



Net Commercial & Industrial electricity demand (2030 estimate)[1]

TWh



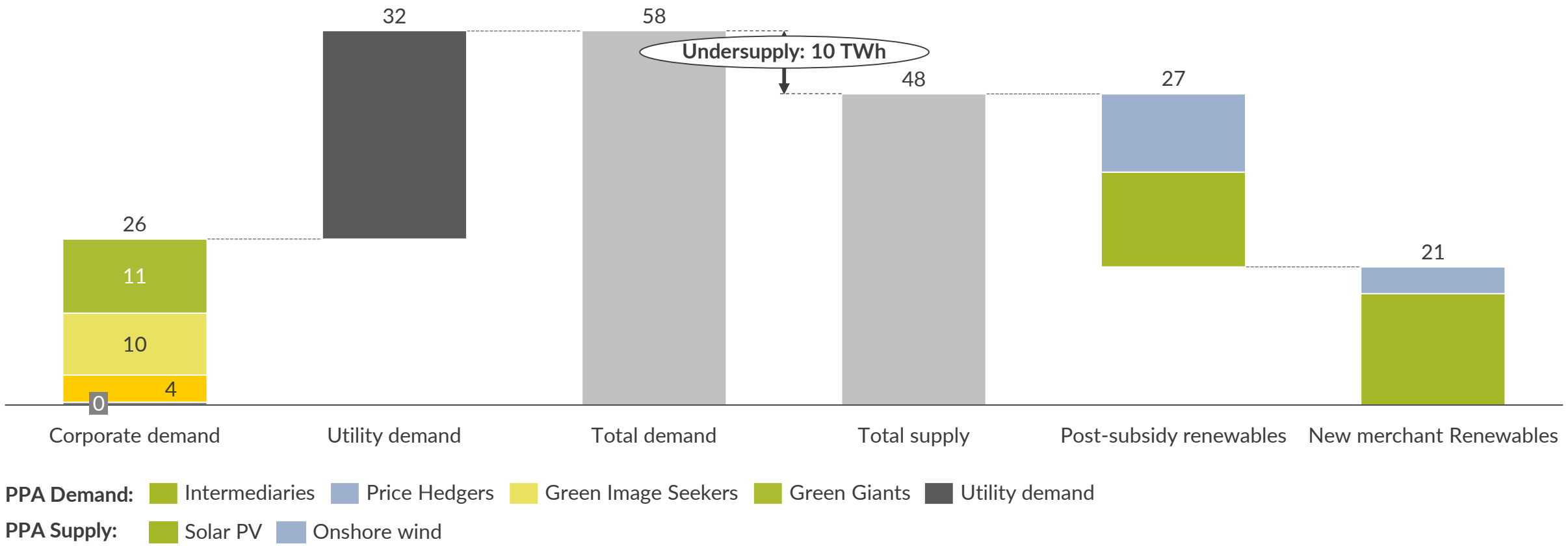
1) Excluding minor service and industry that could not be categorized in these segments.

Source: Aurora Energy Research

Corporate and utility PPA demand may exceed merchant renewables supply by about 10 TWh in 2030

Potential PPA demand (2030)
TWh

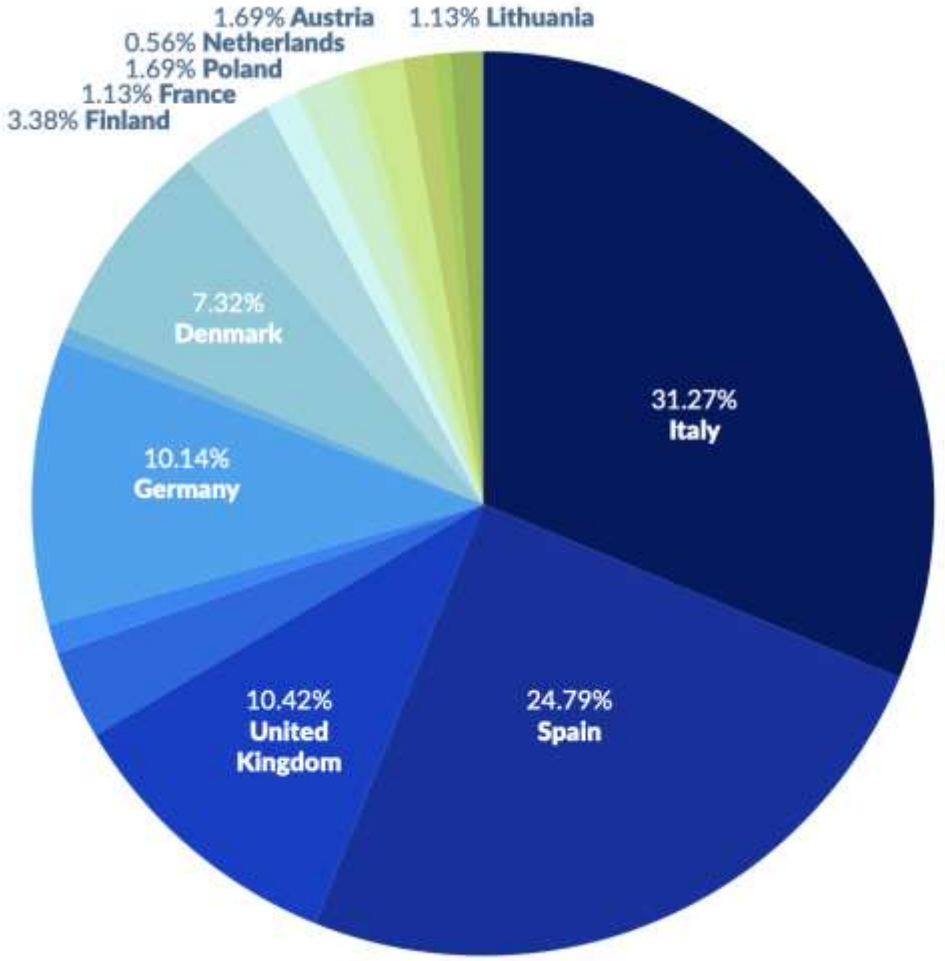
Potential PPA supply (2030)
TWh



Source: Aurora Energy Research

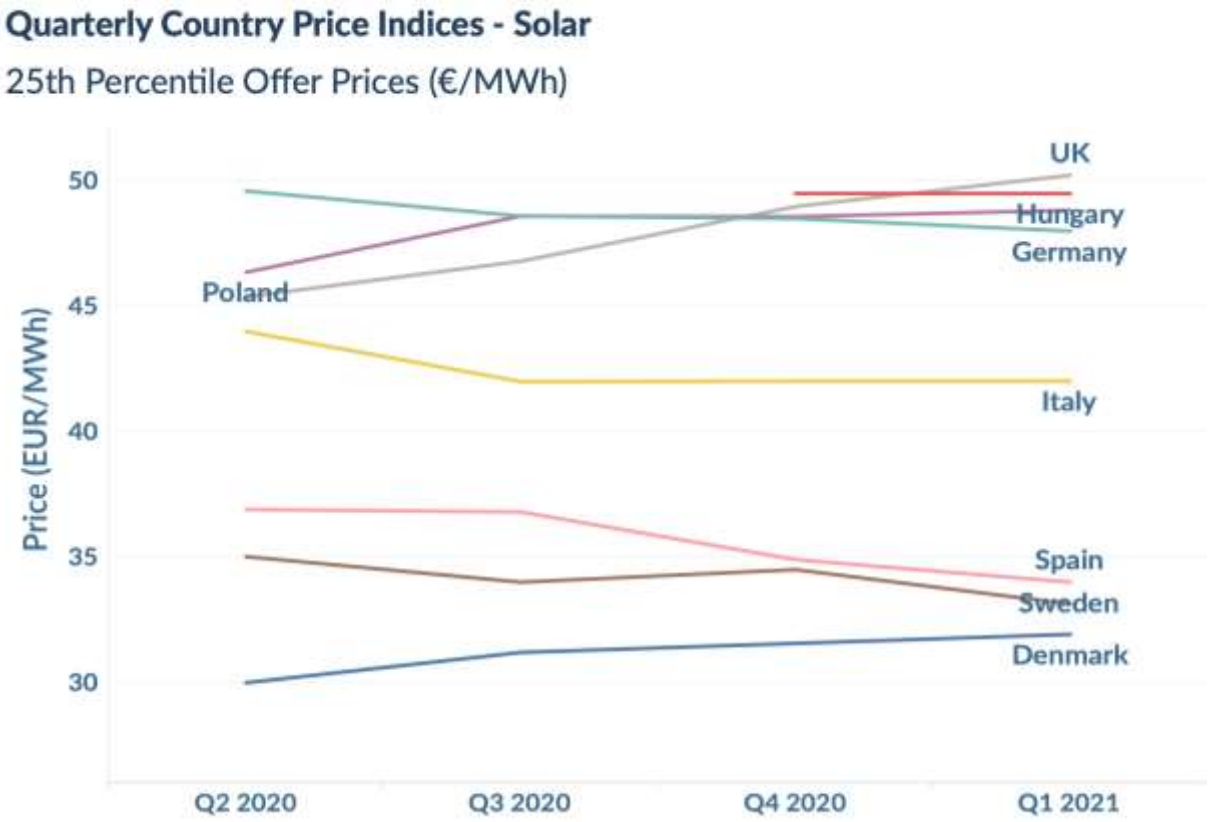
Italy's PPA Market is Booming

- Italy's share of total European PPA offers from developers on the LevelTen Marketplace rose from 11% in Q2 2020 to more than 31% in Q1 of 2021
- In Q3 of 2020, Italy surpassed Spain, Germany, and the UK to become Europe's most active PPA market in terms of % of offers, and has remained at the top through Q4 2020 and into Q1 2021
- Today, Italian offers comprise nearly one-third of LevelTen's European PPA Marketplace



Italian PPA Price Trends

- After dropping between Q2 and Q3 of 2020, Italian solar PPA prices have remained stable through Q4 2020 and Q1 2021
- Competition among developers is keeping Italian renewable PPA prices down
- As the Italian solar industry grows and supply goes up, it is possible prices may decrease further



What's Next for Italy?

- Italy's PPA market demonstrated resilience during the economic crisis of 2020, and continues to expand
- Developers continue to plan new solar projects, particularly in the country's sunny southern regions
- Corporate interest in Italian PPAs is also increasing
- However, transmitting energy from remote areas where solar capacity is built to urban regions where demand is high will likely require significant interconnection infrastructure upgrades
- A long authorization process has also been cited as a factor slowing project development and PPA signings

Q&A

Key takeaways and next steps

Key Takeaways

1. Due to improved economics and uncertainties with respect to subsidy schemes, **PV developers are increasingly switching their focus to merchant projects** – installed PV capacity from merchant projects is expected to exceed 10 GW by 2030 and 50 GW by 2040
2. The expected growth of merchant projects will make **securing a PPA an essential step for developers to mitigate merchant risk and obtain financing**
3. Due to stakeholder pressure, **corporates are increasingly interested in procuring green energy via PPAs**
4. **Corporate and utility PPA demand may reach ~60 TWh in 2030**, exceeding the generation coming from merchant and post-subsidy solar and onshore wind capacities

Next Steps

- **Aurora will publish its Power & Renewables Market Forecasts Report for Italy next week**, covering all main developments of the Italian power system and renewables economics over the coming decades
- In the coming months **Aurora will produce detailed studies (Strategic Insights reports) covering topical issues**:
  - *Net zero and the role of hydrogen in Italy*
  - *The Italian balancing market (MSD): opportunities for flexible assets and implications for renewables*

Thanks to all the participants for attending today's webinar!

For all questions or comments, please reach out to Deborah Scaggion (Deborah.Scaggion@auroraer.com)

Sources: Aurora Energy Research


AURORA
ENERGY RESEARCH

Disclaimer and Copyright

AURORA

General Disclaimer

This document is provided "as is" for your information only and no representation or warranty, express or implied, is given by Aurora Energy Research Limited and its subsidiaries Aurora Energy Research GmbH and Aurora Energy Research Pty Ltd (together, "**Aurora**"), their directors, employees agents or affiliates (together, Aurora's "**Associates**") as to its accuracy, reliability or completeness. Aurora and its Associates assume no responsibility, and accept no liability for, any loss arising out of your use of this document. This document is not to be relied upon for any purpose or used in substitution for your own independent investigations and sound judgment. The information contained in this document reflects our beliefs, assumptions, intentions and expectations as of the date of this document and is subject to change. Aurora assumes no obligation, and does not intend, to update this information.

Forward-looking statements

This document contains forward-looking statements and information, which reflect Aurora's current view with respect to future events and financial performance. When used in this document, the words "believes", "expects", "plans", "may", "will", "would", "could", "should", "anticipates", "estimates", "project", "intend" or "outlook" or other variations of these words or other similar expressions are intended to identify forward-looking statements and information. Actual results may differ materially from the expectations expressed or implied in the forward-looking statements as a result of known and unknown risks and uncertainties. Known risks and uncertainties include but are not limited to: risks associated with political events in Europe and elsewhere, contractual risks, creditworthiness of customers, performance of suppliers and management of plant and personnel; risk associated with financial factors such as volatility in exchange rates, increases in interest rates, restrictions on access to capital, and swings in global financial markets; risks associated with domestic and foreign government regulation, including export controls and economic sanctions; and other risks, including litigation. The foregoing list of important factors is not exhaustive.

Copyright

This document and its content (including, but not limited to, the text, images, graphics and illustrations) is the copyright material of Aurora, unless otherwise stated.
This document is confidential and it may not be copied, reproduced, distributed or in any way used for commercial purposes without the prior written consent of Aurora.