European Market Outlook
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Pietro Radoia
Solar Analyst, Bloomberg NEF
The European PV market outlook

SolarPower Summit

Pietro Radoia

March 6, 2019
Wind and solar reached 1,000GW (one terawatt) in June 2018

Global wind and solar installations, cumulative to June 30, 2018

Source: Bloomberg NEF
PV installation history and short term forecast

Source: BloombergNEF Note: A quartiling method is used to derive global conservative and optimistic from country extremes. 2018 figures for many countries are still not certain.
Global investments in PV new-build

Source: BloombergNEF
PV Capacity additions in Europe

By country

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<th>Year</th>
<th>Spain</th>
<th>Germany</th>
<th>Netherlands</th>
<th>France</th>
<th>Ukraine</th>
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By segment

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<th>Utility-scale (&gt;1MW)</th>
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Source: BloombergNEF
Cumulative PV capacity installed in Europe

By country

By segment

Source: BloombergNEF
Solar as % of total electricity generation in 2017

Source: BNEF, RED Eléctrica, BDEW. Note: solar generation in Spain breaks down as 3.2% PV and 2.2% solar thermal generation.
Italy: reverse power flow in substations and PV capacity

Average daily electricity demand and supply breakdown in south Italy, May 2014 (GW)

Frequency of reverse power flows in Italy

Percentage of substations

Source: BloombergNEF, Enel Distribuzione.
Summer power prices in the largest PV markets

Italy average summer power prices, 2010-2018

Germany average summer power prices, 2010-2018

Source: Bloomberg terminal
Average wholesale electricity prices by hour of day, PPA price range and PV LCOEs

Source: Bloomberg Terminal, BloombergNEF  Note: Average yearly prices by the hour. The PPA range is a result of conversation with solar developers opting for a 10-15 year hedge product. The PV LCOE range is for a 1-axis tracking project in Southern Europe. Capex assumed: 700-850k Euros/MW, opex at 10-15k/MW/Year, capacity factor: 23.5-25% (DC), unlevered IRR 7-8%. PPA range is a result of interviews and information disclosed on public press releases. The Iberian market is well integrated: Spain and Portugal had same spot prices for most of the time in 2017.
Signed PV PPAs in Europe (MW)

Total = 4,174 MW

- Spain, 2301
- Portugal, 909
- Northern Ireland, 300
- Italy, 538
- Germany, 85
- UK, 41

Source: BloombergNEF, company filings and press releases  Note: As of 5 March 2019
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José Donoso
General Director, UNEF
SOLAR POWER SUMMIT

EUROPEAN MARKET OUTLOOK
- PV SPANISH MARKET 2019 -

6th March, 2019
PV SPANISH MARKET 2019

MARKET NICHES

➢ Tenders
   Waiting for the new Government

➢ P.P.A.
   ▪ More of 2.000MW of P.P.A. signed in less than one year

➢ Merchant
   ▪ Growing-up

➢ Self-consumption
   ▪ Elimination of barriers
   ▪ Growing-up

MAIN FIGURES

✓ Target RES 2030: 42%
✓ Target Electricity RES 2030: 74%
✓ New PV installed capacity 2020-30: 28.000MW
✓ Forecast PV to be installed 2019: + 4.000MW
✓ Forecast PV SC to be installed 2019: 400MW
Jaap Baarsma
President, Holland Solar
Installed capacity 2010-2018 & pipeline in the Netherlands

Installed capacity and pipeline-projects MW

- Installed
- Total installed
- Pipeline
Trine Kopstad Berentsen
CEO, Norwegian Solar Energy Cluster
Norway

- Small PV market - big potential
- Electricity: 100% renewable
- Cars sold: 45% electric
- Smart homes, EV & sustainability
- From oil industry to floating solar
Ruud Kempener
Policy Officer, DG ENERGY, European Commission
European market outlook