Clean Energy Auctions

European experience and challenges

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October 16, 2018
EU 2020 RES target to be extended to 2030

The EU’s 2020 objectives are met

Share of renewables in electricity consumption

2005 2010 2015 2020

Source: Bloomberg New Energy Finance
New EU renewables investment
1Q 2005 – 1Q 2018

The “Golden Age”
The hard landing

First burst
Lower steady state

Four quarter running average

Source: Bloomberg New Energy Finance

Version WF18.04
All values nominal
EU 2030 RES target

Share of renewables in electricity consumption

High ambition for 2030 the most likely following latest negotiation results

Source: Eurostat, Bloomberg NEF
Global auctioned and announced renewables capacity

Source: Bloomberg NEF. Note: Plant level data used for Latin American auctions where support is awarded for generation, excludes renewables subsidy auctions in the Netherlands.
EU renewables auctions volumes growing rapidly

Source: Bloomberg NEF. Note: auction results and announcements as of 11 July 2018.
EDF commits to deliver 30GW by 2035

“

It is time (for EDF) to participate in a major change of scale. Solar is where the potential is the largest.

Jean Berarnd Lévy
EDF CEO
One Planet Summit, 2018
TOTAL purchases Direct Energie

“Through this transaction, Total is actively pursuing its development in electricity and gas generation and distribution in France and Belgium…”

Patrick Pouyanné
TOTAL CEO
Press release, 2018
Onshore wind turbulences

Source: Bloomberg NEF
Brazil onshore wind auction results (nominal exchange rate)

Auctions bring competitive shock to the market

Local content target and economic jitters increase cost of finance and cost of equipment

No new auctions during recession and period of oversupply

Market reopens

Source: Bloomberg NEF. Note: exchange rate at time of auction result announcement.
Zero-subsidy renewable projects in Europe

<table>
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<tr>
<th>Offshore wind</th>
<th>Onshore wind</th>
<th>Solar PV</th>
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<td>~2.8GW</td>
<td>~9.2GW</td>
<td>~700MW</td>
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- **Offshore wind**: ~2.8GW by 2025
- **Onshore wind**: ~9.2GW installed and pipeline capacity
- **Solar PV**: ~700MW installed or under construction

Source: Bloomberg NEF. Note: right-hand figure is subsidy-free PV built or under construction in EU as of 1Q 2018.
Corporate PPA capacity (MW) signed in Europe as of 1H 2018

Source: Bloomberg NEF
EU carbon prices have more than quadrupled since May 2017

Reform finalized; Financials enter market on expectations of future scarcity.
0-subsidy renewables

"I don't get the impression that there are lots of people out there gearing themselves up to invest a lot of money in those sorts of assets."

Mark Muldowney, BNP Paribas MD Energy & Infra
Financial Times, 2017
Germany’s negative pricing weekend, October 2017

Source: Bloomberg New Energy Finance.
Germany intraday generation: typical spring day

Source: Bloomberg NEF
Germany intraday generation: typical spring day

Generation (GW)

Source: Bloomberg NEF
Germany intraday generation: typical spring day

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Germany intraday generation: typical spring day

Generation (GW)

Curtail
Charging
Discharging
Solar
Wind
Peaker
Dispatchable
Nuclear
Demand

Source: Bloomberg NEF
Germany intraday generation: typical spring day

Source: Bloomberg NEF
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