APRICUM

THE CLEANTECH ADVISORY.

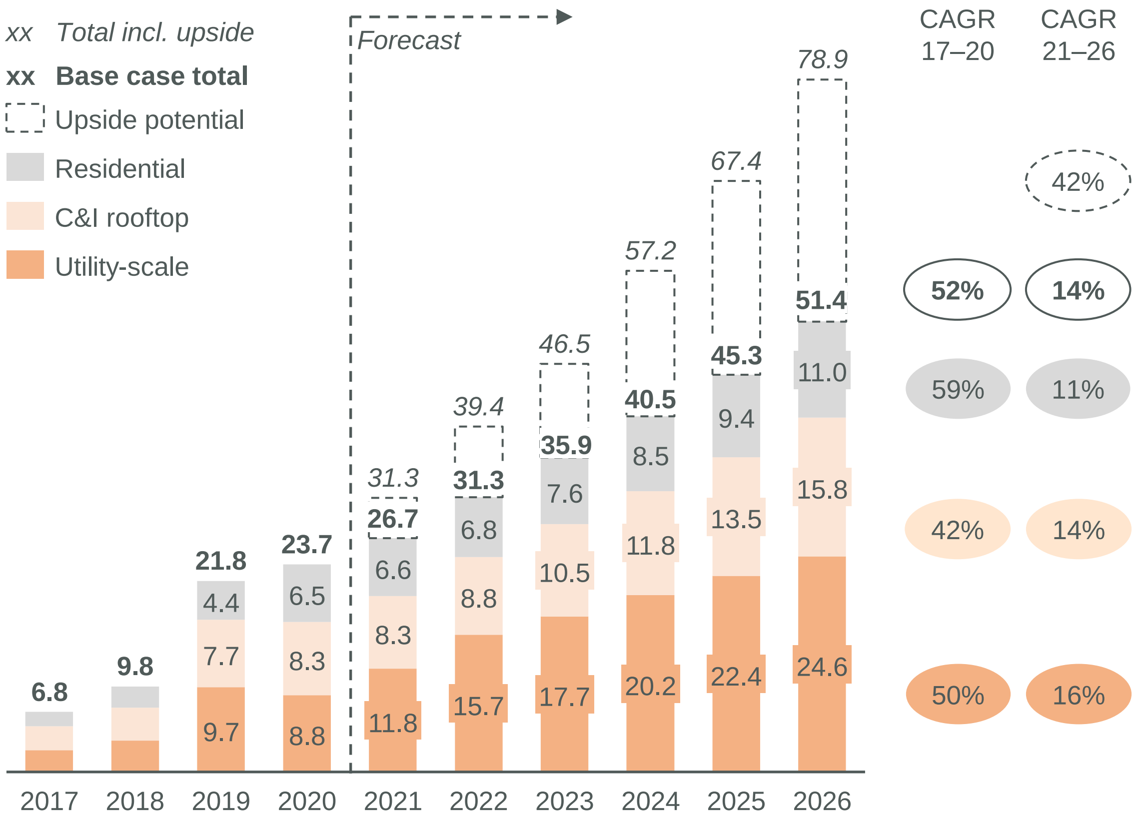
PV manufacturing in Europe

Interview insights on market and local manufacturers

December 14, 2021

European PV market to grow to 51 GWp by 2026 with upside potential to ~80 GWp, partly driven by EU ‘Fit for 55’ package.

European[1] PV market forecast [GWp p.a.]



Residential

- Current market shaped by GWp markets Germany, Netherlands, Poland and Belgium, driven by strong incentive schemes[2]
- Future growth based on continued growth of German and Dutch market to multiple GWp and catch-up of Spanish and Italian market to multiple hundred MWp based on continuation of favorable incentive schemes, relatively high electricity prices and ongoing electrification

Commercial & Industry (C&I) rooftop

- Germany and the Netherlands constitute ~50% of current market due to successful tender schemes for large rooftop projects and reasonable feed-in tariffs for small roofs in Germany
- Increasing volumes in tenders in France, Germany, the Netherlands and Poland and net-metering or direct incentives for energy communities and collective self-consumption in Italy and Spain drive future growth

Utility-scale

Spain, Germany and France drive utility-segment market growth through multiple GWp ground-mounted tender volumes to reach pledged PV expansion targets

Upside potential

Successful and largely unamended passing of EU ‘Fit for 55’ package (draft communicated by EU commission in July 2021) through formal trialogue legislative process[3] could trigger higher ambition for solar PV deployment and respective incentive schemes/tender volumes of EU Member States (e.g., obligatory solar PV for new roofs in Germany)

Source: Apricum analysis; 1) Includes all countries that are geographically in Europe, incl. Russia but excl. Turkey; 2) Germany: Feed-in tariff, Italy: 110% income tax break, Netherlands: Net-metering, Poland: Net-metering plus cash subsidy; 3) Review, negotiations, amendments by EU Commission, Council of the European Union, European Parliament

European module production capacity amounts to ~8 GWp and relies on cell imports – multiple recent expansions or plans identified.

PV manufacturing existing capacities in Europe as of 2021 [MWp]

Recent expansion/upgrade identified
Expansion plans announced

MG- and Polysilicon, ingots/wafers and cells

MG- and polysilicon[1]

26,667	Wacker
13,333	ELKEM
10,667	pcc SE
7,667	Stakksberg
<100	Silicon Products

Ingots/wafer

200	EDF Photowatt[2]
450	NorSun
500	Norwegian Crystals[3]

Cell

400	Meyer Burger
340	Hevel Solar[2]
200	EDF Photowatt
200	Enel Green Power[2]
110	Solitek/Valoe[2]
100	Oxford PV
100	Ecosolifer

Modules

120	Bruk-Bet
110	Solitek/Valoe
140	Solsonica
130	Solvis
150	Altius solar[5]
150	Peimar
200	JAHA
200	Kness Group[4]
200	Enel Green Power /3 Sun
200	Eclipse
200	EDF Photowatt
200	Voltec solar
200	Soluxtec[4]
200	Kioto
200	Solarfabrik[5]
200-300	ExaSun
250	Bisol
300	RECOM-SILLIA
300	Aleo
340	Hevel Solar
344	Atersa
400	Meyer Burger
525	CS Wismar[6]
550	Solarwatt
600	Energetica
800	Heckert

100	Energyra
100	Sunerg Solar
100	Hanplast
80	Megasol
75	Open Renewables
70	AxSun
65	UAB
65	Xdisc
60	Hermes solar
60	Solaico
50	Akuoenergy
40	Systovi
30	Danish Solar Energy
20	Issol
20	Pikcell Group
16-18	Karax Solar
0	Maxeon
<100	Bauer Solartechnik
	Luxor Solar
	JBG PV
	Axitec
	Selfa
	Reden Solar

- 59 PV manufacturers identified from which 49 players produce modules
- Capacities in Europe
  - Poly- and Mg-Si: ~58 GW
  - Ingot/wafer: ~1.2 GW
  - Cell capacity: ~1.5 GW
  - Module capacity: ~8.1 GW[7]
- Majority of the metallurgical and polysilicon products are exported to China as ingots/wafer and cells production capacity lack in EU
- European module manufacturers then import cells mainly from China to produce modules

Source: Apricum analysis; 1) 3g Si per Wp assumed; 2) Same capacity as module capacity assumed; 3) Produce only ingots; 4) Unclear status of expansion implementation; 5) Operation status unclear (doubts shed from expert interviews); 6) Sonnenstromfabrik; 7) Including assumed capacities (ExaSun – 250MW, Karax – 17 MW, 50MW for less than 100 MW capacities)

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