

SSX Morning Ray

Every Thursday

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1 EUR = 1.20USD ■ 1 USD = 105.23JPY ■ 1 USD = 6.46CNY ■ 1 USD = 72.95 INR

(29 Jan – 04 Feb 2021)

MARKET HIGHLIGHTS

Polysilicon: This week, the polysilicon prices in China domestic market went up again to **RMB92/Kg** for **mono-Si** and **RMB53/Kg** for **multi-Si**. This represents an increase of **2.80%** and **3.92%** respectively WoW.

Wafer: The average market prices stand at **RMB3.20/Pc** for **mono G1** and **RMB3.30/pc** for **mono M6**, an average growth of around **1.55%** WoW. The **multi wafer** price stays at **RMB1.30/pc** without any change this week.

Cell: The cells prices this week remain stable. **Multi cells** price stayed at **\$0.074/wp**, while **Mono Perc G1** and **M6** prices have also stabilised at **\$0.129/wp** and **\$0.121/wp** respectively.

Module: The FOB prices have not changed. **Mono PERC** is at **USD0.222/wp** and **poly panels** at **USD0.179/wp**. The Lunar New Year is approaching, the panel segment has the lowest utilize rate among the whole solar manufacturing chain in the past, however, we've heard a portion of factories will continue the production line running during the holiday week.

SSX Spot & Forward Pricing

Forecasts are based on Industry players' market sentiment.

PLM** - Polysilicon Marker	8.913	USD/kg	
Price change WoW	0.125	1.422%	▲
Price change (Since Jan 2021)	0.473	5.598%	▲
Average Mono grade in China	92.000	RMB/kg	
Price change WoW	2.500	2.793%	▲
Price change (Since Jan 2021)	4.825	5.535%	▲
Average Multi grade in China	53.000	RMB/kg	
Price change WoW	2.000	3.922%	▲
Price change (Since Jan 2021)	3.775	7.669%	▲
CMM* - Chinese Module Marker	0.213	USD/wp	
Price change WoW	0.000	0.00%	-
Price change (Since Jan 2021)	0.000	0.00%	-

**Average price of Non-Chinese polysilicon (3:1 weight for Non-US polysilicon volumes not subjected to the Chinese AD)

*Average Price of Multi and Mono Perc modules prices FOB China (20:80 weightage based on multi and mono modules estimated market share)

Polysilicon	High	Low	Average	Change	Next week	Next Month	In 3 months
PLM (USD/kg)	13.000	5.500	8.913	+0.125	▲	▲	▼
China Multi Grade (RMB/kg)	58.00	30.00	53.00	+2.000	▲	▲	-
China Mono Grade (RMB/kg)	88.00	78.00	92.00	+2.500	▲	▲	-
Wafers (USD/pc)	High	Low	Average	Change	Next week	Next Month	In 3 months
Multi	0.210	0.120	0.159	0.000	-	-	▼
Mono G1	0.425	0.395	0.420	+0.010	-	▲	-
Mono M6	0.440	0.415	0.430	+0.005	-	-	▼
N-type	0.460	0.420	0.450	0.000	-	-	-
Cells (USD/wp)	High	Low	Average	Change	Next week	Next Month	In 3 months
Multi	0.080	0.065	0.074	0.000	-	-	▼
Mono Perc G1	0.138	0.123	0.129	0.000	-	-	-
Mono Perc M6	0.140	0.120	0.121	0.000	-	▼	▼
Modules	High	Low	Average	Change	Next week	Next Month	In 3 months
Multi (USD/wp)	0.187	0.170	0.179	0.000	-	▼	▼
Multi (RMB/wp)	0.137	1.270	1.330	0.000	-	▼	▼
Mono Perc (USD/wp)	0.235	0.208	0.222	0.000	-	▼	▼
Mono Perc (RMB/wp)	1.670	1.500	1.650	0.000	-	▼	▼

*Overseas polysilicon not submitted to Chinese Anti-Dumping.

Prices in RMB include VAT but exclude the 4% import duty since these are domestic polysilicon production.

A grade based.

Multi High Cell eff: > 18.7% (> 4.67w) Mono PERC High Cell eff: >21.9% (>5.50 w)

Modules prices incoterms: RoW FOB China

Multi Module output: 335wp / Mono PERC Module output: 435wp

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COMMENTARY

Polysilicon:

This week, the polysilicon prices in China domestic market went up again to RMB92/Kg for **mono-Si** and RMB53/Kg for **multi-Si**. This represents an increase of 2.80% and 3.92% respectively WoW.

Recently, SSX have heard two different voices about the prediction of the polysilicon market in 2021.

Firstly, there is a strong sentiment that the market now sees a huge overhang of demand against supply in the polysilicon segment globally. Thus explaining why the polysilicon price remains high at this point of time. This view insists that the polysilicon will keep a constant upward price trend in 2021.

Another opinion is that the 2021 polysilicon market will not see a long-term price surge trend. In terms of end-user demand, the forecast of polysilicon global output in 2021 can meet the demand from **200GW** of installation. However, according to IHS and BNEF's analysis, the 2021 global installation is expected to be in a range of **158GW-194GW**.

An insider commented: "The polysilicon output can meet the installation demand in general. However, since the long-term purchase agreements signed between the polysilicon and wafer companies have locked **above 80%** of the total polysilicon capacity, there will be a lack of spot supply. As a result, the polysilicon price may be raised to a very high level at the end of each quarter, when the projects are in a rush for installation and the wafer makers and traders to bid for the spot polysilicon."

We are looking forward to witnessing an extraordinary year of polysilicon in 2021.

Wafers:

Just for today, Zhonghuan announced a price increment for its mono wafers to RMB 3.25/pc for mono G1 wafer, RMB3.35/pc for mono M6 wafer and RMB5.60/pc for mono G12 wafer, representing an average MoM increase of around 3%.

The average market prices stand at RMB3.20/pc for **mono G1** and RMB3.30/pc for **mono M6** when we take into account of small and medium-scale wafer makers' pricing, an average growth of around **1.55% WoW**. The **multi wafer** price stays at RMB1.30/pc without any change this week.

Some insiders disclosed that the price increase is due to the continuous rise of polysilicon price.

SSX anticipates that the G1 wafer price might go up again in March, as the result of the continuous production expansion for M6 and M10 size and the further decline in output of G1. On the other hand, the H1 2021 G1 price is expected to be stable as prices are supported by strong demand outside of China.

Cells:

The cells prices this week remain stable. **Multi cells** price stayed at \$0.074/wp, while **Mono Perc G1** and **M6** prices have also stabilised at \$0.129/wp and \$0.121/wp respectively.

SSX feels that the pricing is not clear for post CNY. It could go both ways. However, SSX trading desk feels that pricing for April onwards may drop slightly before picking up again in May to early June.

A large mono cells maker commented that "it seems the G1 price has reached its peak and has been stabilised. However, there is still a possibility that the G1 cells price will fluctuate again in March due to the tight supply."

The manufacturers, in general, are expecting a strong demand until mid-March, both in mono and multi orders.

Modules:

On the solar panel front, the **FOB prices** have not changed this week. The Lunar New Year is approaching, the panel segment has the lowest utilize rate among the whole solar manufacturing chain in the past, however, we've heard a portion of factories will continue the production line running during the holiday week.

Meanwhile in the US, the strong demand has stabilized the panel prices at ~\$0.34/wp for **mono perc** according to the market watchers. Regarding the heated topic of "Xinjiang forced labour bill", Roth Capital mentioned in their latest report: "We have conducted a meaningful number of checks with procurement managers of developers and EPCs and have not been able to identify in their outlook a plan to buy [First Solar] because of that risk. [...] Some have recently noted that they are becoming increasingly more interested, but [First Solar]'s pricing appears too high. Mono-PERC modules are being priced between 25-28c/W in 2022. We'll see if FSLR can come close to this pricing."

Looking ahead, all the Chinese panel makers we talked to are optimistic about the Q2 market, though it is usually considered as the quietest season of the year. The industry expects that the postponed projects and the hesitant customers should start to act in Q2, provided that the ocean freight is back to the "normal" level. "The competition will get further fierce between the top Chinese brands this year, for the market share (182 vs 210), prices and shipment volume". a manufacturer added.

In Europe, the price reported at EUR ~0.20 DDP, 440wp and May delivery (MW + scale). The insight from a senior procurement executive in Europe, "[we] as most other developers in EU - decided exclusively with M6 and M10 formats and exclude M12. Only reason is that competition while tendering is much higher instead of M12". And he predicted that M12 size will take the lead to reduce its price in Q2 in order to attract the market interests, and the rest will follow in June by the latest.

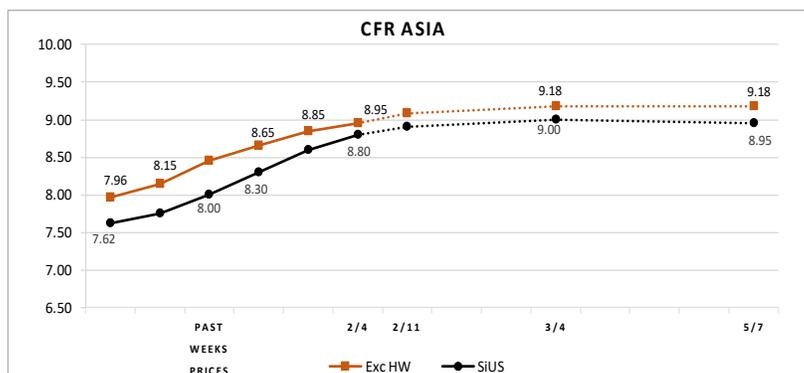
POLYSILICON HISTORICAL AND FORWARD PRICING TRENDS

CFR Asia excluding Hemlock and Wacker-US (USD/kg) Non SiUS - Polysilicon not subjected to AD in China

High	Low	Average	Price change
13.000	6.500	8.950	0.100

CFR Asia Hemlock and Wacker-US (SiUs) (USD/kg) SiUS - Polysilicon subjected to AD in China

High	Low	Average	Price change
13.000	5.500	8.800	0.200



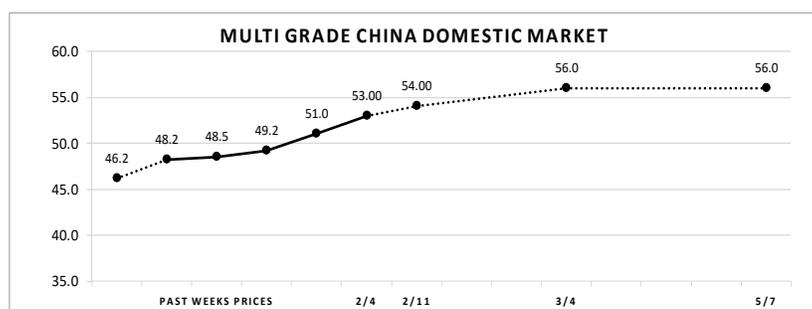
Mono grade China domestic market (RMB/kg)

High	Low	Average	Price change
95.000	78.000	92.000	2.500



Multi grade China domestic market (RMB/kg)

High	Low	Average	Price change
58.000	30.000	53.000	2.000



Solid line represents historical prices and dotted line represents forward pricing.

Source: SSX Survey

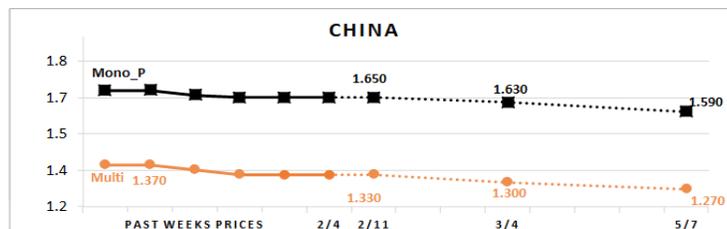
MODULES HISTORICAL AND FORWARD PRICING TRENDS

CHINA

RMB/wp, EXW

Category	High	Low	Average	Price change
Multi	1.370	1.270	1.330	0.000
Mono Perc	1.670	1.500	1.650	0.000

China prices are VAT-inclusive.

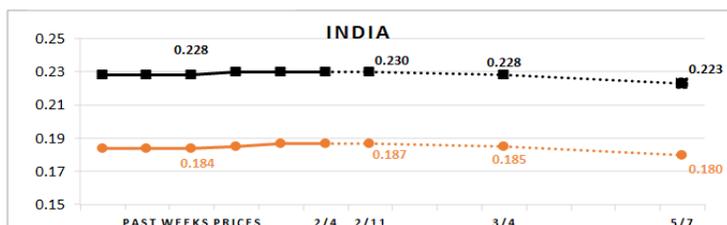


INDIA

USD/wp, CIF

Category	High	Low	Average	Price change
Multi	0.195	0.180	0.187	0.000
Mono Perc	0.240	0.217	0.230	0.000

*Prices are not inclusive of the 15% Safeguard Duty applied to developed countries, China and Malaysia.

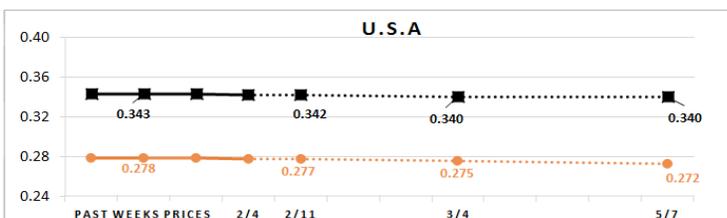


U.S.A

USD/wp, CIF

Category	High	Low	Average	Price change
Multi	0.283	0.270	0.277	-0.001
Mono Perc	0.346	0.330	0.342	-0.001

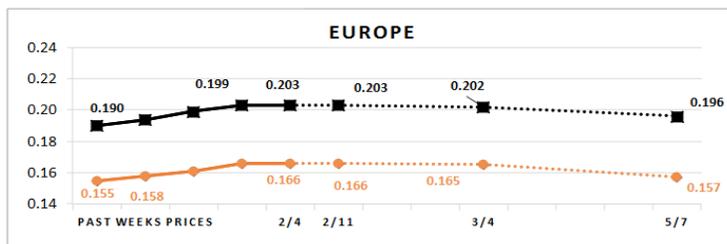
Prices are inclusive of the Section 201 Tariff.



EUROPE

EURO/wp, CIF

Category	High	Low	Average	Price change
Multi	0.174	0.158	0.166	0.000
Mono Perc	0.216	0.195	0.203	0.000



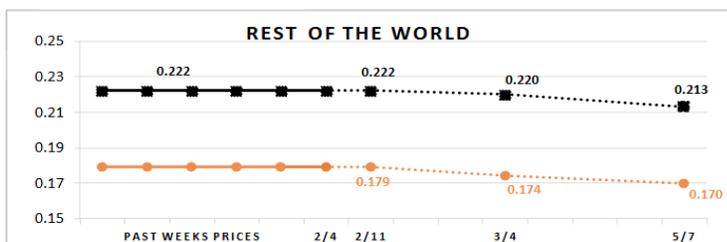
REST OF THE WORLD

USD/wp, FOB

Category	High	Low	Average	Price change
Multi	0.187	0.170	0.179	0.000
Mono Perc	0.235	0.208	0.222	0.000

The ROW refers to FOB China prices for following regions:

South East Asia, Australia Latin America, and the Middle East.



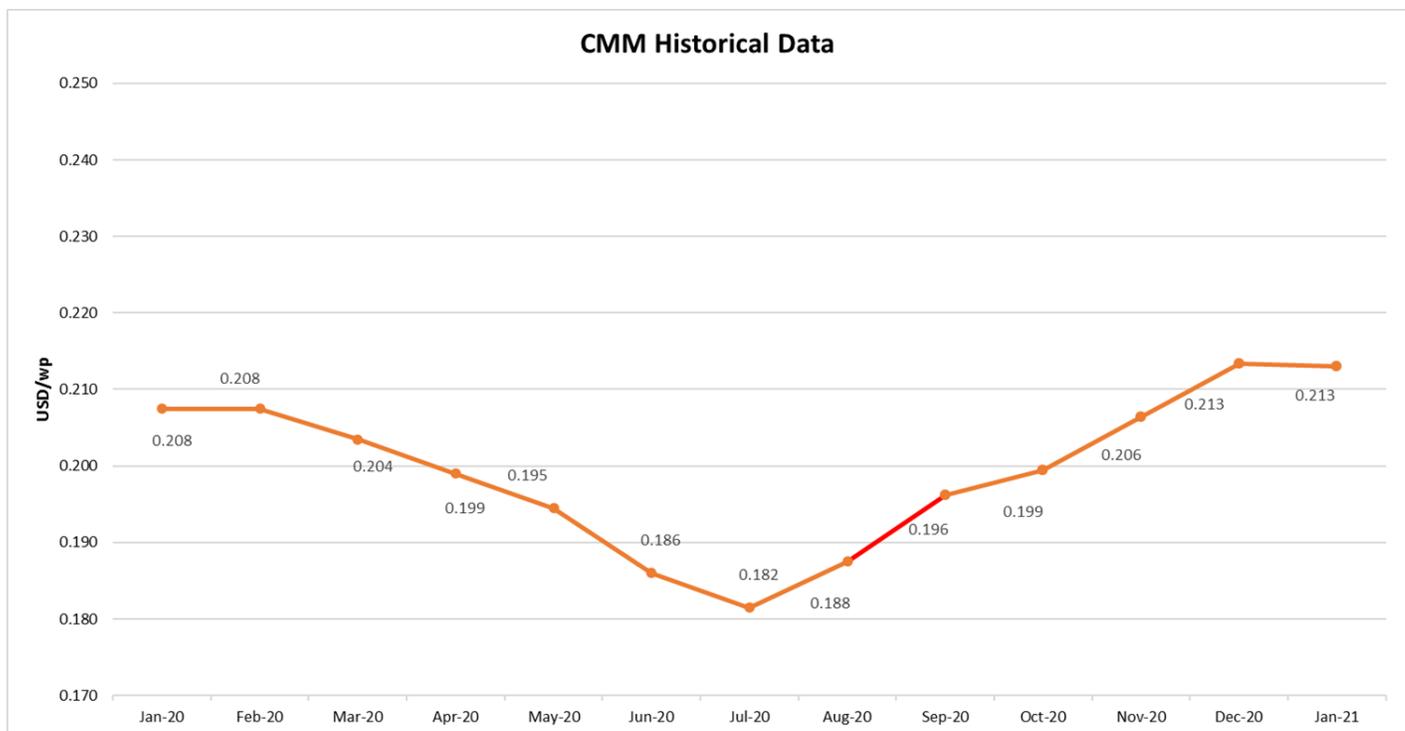
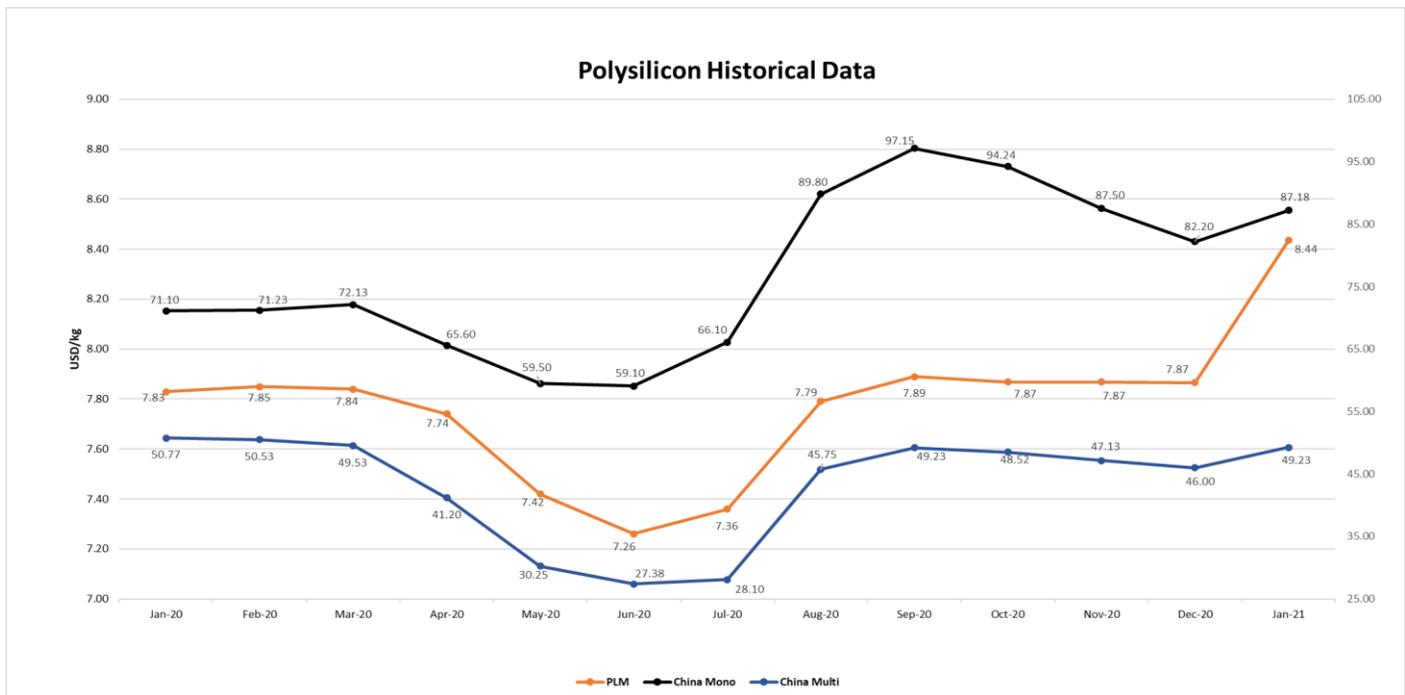
— Multi-Si — Mono PERC

Solid line represents historical prices and dotted line represents forward pricing

Volume: 1MW and above

Source: SSX Survey

CMM AND POLYSILICON ONE-YEAR HISTORICAL DATA



Average Price of Multi and Mono Perc modules prices FOB China
(Adjustment has been made in Sep 2020, 20:80 weightage based on multi and mono modules estimated market share)

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Market Information

Polysilicon prices flat after hike in inventories

[03 Feb] Polysilicon prices steadied as rising inventory cases of Chinese suppliers and doubts over demand strength tempered markets' upbeat mood, while players were also cautious ahead of the post-long-holiday's review later in the month. Mono wafer prices steadied ahead of China's long holidays when cell production utilization rates are expected to sustain. Mono PERC cell prices fell as the rising supply resulting from the increasing capacity forced suppliers to cut their price quotes; Prices were mainly dragged down by 166mm and 210mm ones this week. Mono PERC module prices were hemmed into a narrow range in slow holiday trading, as players weighed the impact from a surge of China production reduction against prospects for the demand weakness in China that could reignite worries about oversupply; M6 mono PERC module steadied as the markets were torn between pessimism about demand recovery.

<http://pvinsights.com/Report/WReportDisplay.php>

France awards 191.3 MW in rooftop PV tender, prices fall again

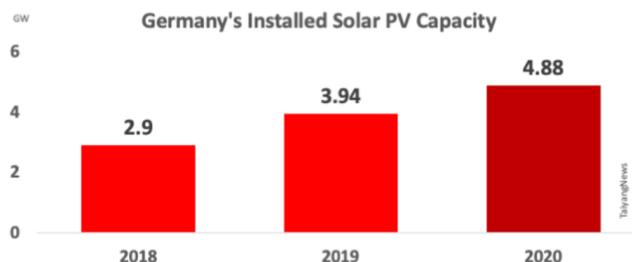
[03 Feb] France has selected projects totalling 191.3 MW in its latest tender for commercial and industrial rooftop solar systems at lower prices than in the previous four such competitions. This is the 11th round of the tender programme for PV installations atop buildings, parking lots and agricultural facilities. It targets commercial and industrial projects with capacities of between 100 kW and 8 MW, split into two categories. The latest round ended with 405 winning projects, the Ministry of Ecological and Solidarity Transition said on Tuesday. The first bidding window, which was open for proposals of between 100 kW and 500 kW, attracted bids with a final average price of EUR 91.16 (USD 109.76) per MWh, down from EUR 93.98/MWh in the previous round. The average price for 500 kW-8 MW installations, meanwhile, declined to EUR 79.83/MWh from EUR 83.06/MWh.

<https://renewablesnow.com/news/france-awards-1913-mw-in-rooftop-pv-tender-prices-fall-again-730008/>

Germany Exited 2020 With 4.88 GW New Solar Installed

[02 Feb] Germany officially breached the 4 GW milestone for the year 2020 and nearly even touched the 5 GW level. Its total installed solar PV capacity for the year reached 4.88 GW, according to the country's regulator Bundesnetzagentur. This is well above 1 GW additional capacity the country has reported after closing 2019 with 3.94. December 2020 turned out to be the month with the largest installations reported for any month during the year with 525.4 MW added, compared to 339.4 MW installed in December 2019. In November 2020, the PV additions were earlier reported to be 481 MW, and later adjusted by Bundesnetzagentur to 453.43 MW. Pointing at the 27.6% annual increase in 2020 solar installations in the country, German Solar Industry Association said this reflects the growing interest of homeowners in rooftop solar driven by increased environmental awareness, declining prices of solar PV technology and the increasing switch to electromobility.

<http://taiyangnews.info/markets/germany-exited-2020-with-4-88-gw-new-solar-installed/>



Spain posts 30% increase in self-consumption solar PV installs

[28 Jan] Rising domestic demand for solar helped Spain reach 596MW of new self-consumption PV installations last year, according to data from trade association UNEF. This figure represents a 30% increase on 2019, as both local incentives for new installations and a reduction in administrative barriers helped drive the growth of distributed solar in the country. Of the new installations, it is estimated that just 2% are not connected to Spain's grid. While the majority of the self-consumption PV capacity installs, 56%, came from the industrial sector and 23% from the commercial sector, it was the domestic segment that saw "unprecedented growth" last year, reaching 19% of self-consumption installs - up nine percentage points from figures posted in 2019.

<https://www.pv-tech.org/news/spain-posts-30-increase-in-self-consumption-solar-pv-installs>

Intersolar Europe postponed by six weeks

[01 Feb] Intersolar Europe, the continent's largest solar PV exhibition, has been postponed by six weeks. Exhibition organisers Solar Promotion GmbH confirmed in a statement today that the Smarter E Europe exhibition, which comprises Intersolar Europe, ees Europe, Power2Drive Europe and EM-Power Europe, is to be pushed back by six weeks and will now take place from 21 – 23 July 2021. The exhibition will remain at Messe München. Markus Elsässer, chief executive officer at Solar Promotion, said the decision had been taken after coordinating with exhibitors, stating that a "clear majority" of exhibitors were in favour of the postponement. "Six weeks can make a big difference in the current situation," he added.

<https://www.pv-tech.org/news/intersolar-europe-postponed-by-six-weeks>



Image: Messe Munchen

Policy / Incentives

[India] SECI to Tender for 1785 MW of Solar PV Projects in Rajasthan Soon

[03 Feb] SECI has informed that it intends to procure solar power for an aggregate capacity of 1785 MW on behalf of the Discoms of Rajasthan. In line with which the nodal agency will soon be issuing a tender for the development of 1.785 GW solar projects in the state, for which it will sign a 25-year PPA with the successful bidders/ developers. The tranche-IV of the tenders will follow up on a highly successful tranche-III which saw SECI receive the lowest tariffs for utility-scale solar projects in the country. SECI's auction for its 1070 MW solar tender for projects being set up in Rajasthan (Tranche-III) had received two bids (L1) at the new lowest of Rs 2 per kWh. <https://www.saurenergy.com/solar-energy-news/seci-to-tender-for-1785-mw-of-solar-pv-projects-in-rajasthan-soon>

Fitch: Taiwan to install 20.4GW of solar and wind by 2030, offsetting coal shutdowns

[29 Jan] More than 20GW of non-hydro capacity is expected to come online in Taiwan by 2030, according to a new report, driven by solar installations and offshore wind. Although a nascent market in within Asia, Taiwanese clean energy initiatives received US\$6 billion of investment into energy transition initiatives, a spokesperson disclosed. Roughly US\$2.3 billion of this was in solar capacity. The government has targeted a 25% renewables energy supply by 2025, with 27% coal by 2025. Fitch's report predicts that ministers will seek to "accelerate" the clean energy goals over the next few years. Strong government support has translated into robust investor interests and the project pipeline has strengthened. <https://list.solar/news/fitch-taiwan/>

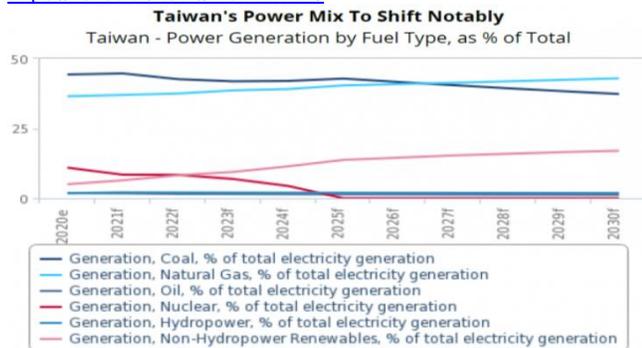


Image: EIA, IRENA, National Sources, Fitch Solutions

Saudi energy ministry says solar PV systems 'ready' to produce electricity

[03 Feb] Saudi Ministry of Energy announced that small-scale solar PV systems are ready to produce electricity for consumers' houses and enterprises, to be later connected to the Kingdom's grid. The economic feasibility of installing the small-scale solar PV systems will be studied, while determining the estimated costs and the measures related to the safe connection to the grid, in addition to the related applicable specifications. The ministry also indicated that qualified companies and contractors, which will be responsible for installing and connecting these systems to the Kingdom's grid, will be shortlisted according to firm criteria. <https://www.arabnews.com/node/1802831/business-economy>

French retroactive solar tariff cuts and the remedies available to developers

[02 Feb] French is proposing to retroactively cut subsidies awarded to certain large PV power contracts. France's 2021 Finance Act will impose tariff cuts on 800 such contracts based on tariff decrees published between 2006 and 2010, which the government now considers to be excessive due to the collapse in the price of PV cells. The government expects the measure to save it €350-400 million annually. Although lawmakers have included a 'safeguard' clause in the 2021 Finance Act to preserve the position of existing projects, additional legal and regulatory remedies are available to investors and lenders to mitigate the consequences of the FITs cuts. <https://www.pv-tech.org/guest-blog/french-retroactive-solar-tariff-cuts-and-the-remedies-available-to-developers>

Portugal to add significant solar PV capacity during 2021-2030

[28 Jan] Portugal, as part of the EU, is a signatory to the Paris Agreement and is required to contribute to the bloc-wide overall targets of reducing GHG emissions by 40% below 2005 levels and increasing the share of renewable energy to 32% of gross final consumption. Portugal is estimated to add 9.2 GW of new power capacity during 2021-2030. Over 80% of this capacity is set to come from new solar PV installations allotted through the auction mechanism. More rounds of auctions are set to be held during 2021-2030 in order to achieve the desired capacity. <https://www.power-technology.com/comment/portugal-solar-pv-capacity/>

Solar PV Market, Portugal, Annual Capacity Addition (MW), 2021-2030

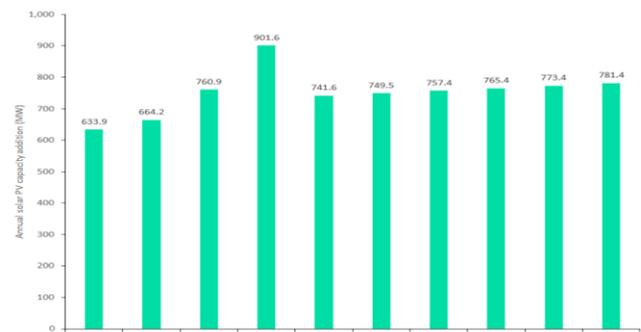


Image: GlobalData Power Database

Israeli government wants to boost development of agrivoltaics

[01 Feb] Israel is a small country, only 20% of which is arable land, and with an increasing need for new power generation capacity. For this reason, the Israeli Ministry of Energy and the Ministry of Agriculture have joined forces to explore whether agrivoltaic projects can become a feasible solution in the domestic energy market, and have decided to finance, with ILS3.5 million (\$1 million) six different studies on how to combine agriculture and solar power generation. "The dual use of land, for agriculture and the production of solar electricity, is an important step for us," said Minister of Energy Yuval Steinitz, adding that the commitment to agrivoltaics will be part of the government plan to add 15 GW of PV by 2030. <https://www.pv-magazine.com/2021/02/01/israeli-government-wants-to-boost-development-of-agrivoltaics/>

Company News

LONGi and GCL-Poly Sign Massive Polysilicon Purchase Agreement

[03 Feb] According to the announcement, the contracted purchase amount is to be no less than 91,400 tonnes, and the specific order price will be negotiated monthly. According to the current market price, the total amount of the contract is about 7.328 billion yuan. The total contract amount accounts for approximately 31.33% of LONGi's audited operating costs in 2019, and the average annual contract value accounts for approximately 10.44% of the company's audited operating costs for 2019. LONGi said that in accordance with the strategic planning and business needs, seven of its mono ingot/wafers producing subsidiaries are set to acquire a stable supply of polysilicon materials from GCL-Poly Energy Holdings from March of 2021 through the end of 2023.

<http://www.pvtime.org/longi-and-gcl-poly-sign-massive-polysilicon-purchase-agreement/>

Zhonghuan Semiconductor to Expand G12 Wafer Capacity by 50GW With 12 Billion Yuan Investment

[02 Feb] The strategic cooperation agreement signed between Zhonghuan Semiconductor and The People's Government of Ningxia Hui Autonomous Region this time will see Zhonghuan investing a total of 12 billion yuan to develop its first project in Ningxia. Zhonghuan expressed that the cooperation will help the PV market better meet its future needs for new energy materials. The project will continue to support the development of the 210mm PV industry chain, provide high-quality production capacity, and improve the PV industry during the global energy transition. After the project is put into production, the total mono production capacity of Zhonghuan Semiconductor will exceed 135GW.

<http://www.pvtime.org/zhonghuan-semiconductor-to-expand-g12-wafer-capacity-by-50gw-with-12-billion-yuan-investment/>

Shangji Automation and Tongwei sign silicon wafer order

[02 Feb] In an announcement, Shangji Automation said its wholly owned subsidiary Hongyuan New Materials (Baotou) Co., Ltd. and solar cell and polysilicon manufacturer Tongwei Solar (Chengdu) Co., Ltd. have signed a long-term sales contract for the sale of mono wafers. The subsidiary intends to sell 272 million mono polysilicon wafers to Tongwei in 2021. With reference to InfoLink's latest price and production scheduling estimates, the sales amount in 2021 will be RMB 1.306 billion (\$0.2 billion). According to PV InfoLink, Tongwei was ranked first in 2020 global solar cell shipments.

<http://taiyangnews.info/markets/china-pv-news-snippets-shangji-arctech-shanghai-new-materials/>

Longi Unveils 66c Hi-MO 4m Solar Panels

[03 Feb] Longi has added another variant to its Hi-MO 4m line-up – the 66-cell 66c. The new 66c slots, with Longi stating it can be “can be widely used on rooftops in residential, industrial and commercial applications”. Longi provides the following basic specifications for the 66c.

Capacities: 410 – 420W; Module efficiency: 20.5% – 21.0%
 Dimensions: 1924 x 1038mm; Weight: 22kg

It looks like the 66c will be available in Australia, but it's not clear when.

<https://www.solarquotes.com.au/blog/longi-4m-66c-mb1865/>

Trina Solar launches smaller, lighter, more efficient Vertex S on Australian market

[02 Feb] Trina Solar has announced that its dense, high-efficiency Vertex S solar panels will be available in Australia's residential and small and mid-sized markets (SME) from April. The 390-405 W Vertex S is a smaller and lighter model than its Vertex counterpart utilised by solar farms. According to Trina's senior country sales manager, Govind Kant, Australia's residential solar market grew 15% in 2020 and “we anticipate Australia's residential solar market to continue to grow by 8-10% this year.”

<https://www.pv-magazine-australia.com/2021/02/02/trina-solar-launches-smaller-lighter-more-efficient-vertex-s-on-australian-market/>

Vikram Solar commissions 140 MW PV project for NTPC

[29 Jan] Module manufacturer and EPC Vikram Solar has announced that its 140 MW solar plant for state-owned power producer National Thermal Power Corporation Limited in the Indian State of Uttar Pradesh is now operational. The plant, situated at Bilhaur in the Kanpur district, is spread across 700 acres and includes a 33/132 kV switchyard. The plant—the largest-capacity solar plant commissioned so far in Uttar Pradesh—is estimated to generate 319 million units of electricity per year and power 1,45,662 houses per year.

<https://www.energetica-india.net/news/vikram-solar-commissions-140-mw-solar-project-for-ntpc->

AE Solar Building 1 GW Solar Module Fab In Turkey

[02 Feb] At the end of April 2021, German solar module producer AE Solar plans to bring online a new facility in Turkey whose capacity by the end of 2021 will exceed 1 GW. It is building this new facility in Kayseri region of Turkey under a JV with US based energy firm Energate Corp. A report by Vietnamese newspaper Thanh Niên claimed the new fab by AE Solar will roll out high efficiency solar modules using 166mm, 182mm and 210mm sized solar cells. Highly automated equipment will produce 5BB and 12BB solar panels here. The company is eyeing the US and Turkey as the target markets for these modules and later may expand their reach to other regions as well.

<http://taiyangnews.info/business/ae-solar-building-1-gw-solar-module-fab-in-turkey/>

Eclipsed by Chinese rivals, Panasonic quits solar cells and panels Kpower

[31 Jan] Panasonic will withdraw from solar cells and panel production, as it now faces fierce competition from Chinese rivals that can produce the items at a lower cost. Panasonic will procure solar panels from other manufacturers to stay in the power industry through such businesses as installing generation systems for residential use. After ending solar panel manufacturing, the Shimane factory will concentrate on the production of power conditioners that convert electricity extracted from solar cell panels from direct current to alternating current. With the withdrawal of Panasonic, Kyocera and Sharp will be the only major companies in Japan that produce solar batteries and panels.

<https://asia.nikkei.com/Business/Electronics/Eclipsed-by-Chinese-rivals-Panasonic-quits-solar-cells-and-panels#:~:text=Panasonic%20will%20quit%20manufacturing%20as,produced%20solar%20cells%20last%20year>

Hartree, AGP and NaGa Solar to form 4-GW European PV venture

[01 Feb] Global merchant commodities firm Hartree Partners LP has formed a JV with asset manager AGP Group and NaGa Solar Holding BV to develop not less than 4 GW of solar projects in Europe. The JV, called Ampyr Solar Europe (ASE), is a continuation of Hartree's existing partnership with AGP in the UK where they are developing 1.5 GW of onshore wind, solar PV and battery energy storage through the vehicle Ampyr Energy UK. The solar portion of these assets will be combined with the PV projects developed by NaGa in the Netherlands and Germany to form the JV. Hartree noted that this alliance will provide institutional investors with the opportunity to deploy over EUR 1 billion (USD 1.2bn) of capital and generate long-term income.

<https://renewablesnow.com/news/hartree-agp-and-naga-solar-to-form-4-gw-european-pv-venture-729823/>

Non-Crystalline/Science/Technology

Sci-fi inspired space-based solar stations could send constant solar power to UK

[03 Feb] Each year we tap more of the renewable resources available to us, while commercial nuclear fusion seems closer and closer. That question and many more could be answered by an ambitious project from the government, which has commissioned Frazer-Nash Consultancy to research space-based solar power (SBSP) systems. Such systems would use very large satellites to collect solar energy before converting it to high-frequency radio waves and beaming it to ground-based receivers connected to the grid. The Liverpool project, which is not linked to the government scheme, hopes to print them onto solar sails made of materials such as Mylar and Kapton, which harness photon energy for movement.

<https://www.imeche.org/news/news-article/sci-fi-inspired-space-based-solar-stations-could-send-constant-solar-power-to-uk>

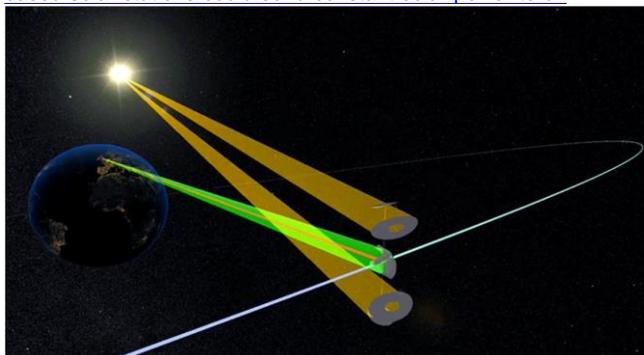


Image: Frazer-Nash Consultancy

Tiny 3D structures enhance solar cell efficiency

[02 Feb] A new method for constructing special solar cells could significantly increase their efficiency. Not only are the cells made up of thin layers, but they also consist of specifically arranged nanoblocks. This has been shown in a new study by an international research team led by the Martin Luther University Halle-Wittenberg (MLU), which was published in the scientific journal Nano Letters.

<https://www.sciencedaily.com/releases/2021/02/210202085453.htm>

Support

India raises basic customs duty on solar inverters to 20%, omits modules from changes

[02 Feb] India's government has increased the basic customs duty (BCD) on solar inverters as part of efforts to bolster domestic manufacturing but has excluded modules from any changes. Presenting the country's budget for 2021-2022 yesterday, finance minister Nirmala Sitharaman said the government is raising the duty on solar inverters from 5% to 20%, with the change coming into effect today. It was also announced that an exemption of customs duty on all items of machinery, instruments, appliances, components or auxiliary equipment for the setting up of solar projects "is being rescinded". Sitharaman said the customs duty policy has the dual objective of promoting domestic manufacturing and increasing the country's export potential. "The thrust now has to be on easy access to raw materials and exports of value-added products," she added.

<https://www.pv-tech.org/news/india-raises-basic-customs-duty-on-solar-inverters-omits-modules-from-changes>

Global glass shortage sparks warning for Australian solar industry

[29 Jan] After successfully negotiating the economic challenges of COVID-19 in 2020, Australia's solar industry faces a new threat in 2021 with module manufacturer Sunman warning of an imminent world-wide glass shortage. Sunman founder Dr Zhengrong Shi said he expects PV glass output to be 20%-30% short of global demand in 2021 and the shortage of supply risks having a knock-on effect in Australia with price increases and reduction of supply very real possibilities. China is the world's biggest manufacturer of PV products, responsible for an estimated 80% of the world's solar module production capacity. The government however has previously imposed limitations on the production of glass and concerns are growing now that demand is outpacing production capacity. While it is anticipated that new capacity will come online, it is expected there will be a shortage of large panels throughout 2021 as production capacity will not be able to keep up with the increasing demand for modules.

<https://www.pv-magazine-australia.com/2021/01/29/global-glass-shortage-sparks-warning-for-australian-solar-industry/>

Redditors Targeting Silver Poised to Propel Solar-Panel Costs

[02 Feb] Silver's Reddit-inspired surge to a nearly eight-year high could reverberate across supply chains from solar manufacturing to coin-minting if it holds. Surging prices of the precious metal threatens to boost costs for solar-panel producers that use a silver paste for electrical contacts on photovoltaic equipment. At current prices, the metal accounts for about 4.7% of the cost of a panel, according to Jenny Chase, solar analyst for BloombergNEF. Panel manufacturing accounts for about 10% of global silver demand.

"If you're looking to buy solar panels, it might be wise to wait until the second quarter," Chase said.

<https://www.bloomberg.com/news/articles/2021-02-01/reddit-targeting-silver-poised-to-propel-solar-panel-costs>

Finance

KPower, Public Islamic Bank ink deal on solar PV systems

[29 Jan] KPOWER Bhd's wholly-owned subsidiary KPower Engineering Sdn Bhd (KPEng) has signed an agreement with Public Islamic Bank Bhd (PIBB) to finance and instal the solar PV systems to PIBB customers in relation to the net energy metering (NEM) scheme. Under the agreement, KPEng will carry out the installation works and provide technical support to PIBB relating to the securing of the solar installation contracts for potential customers, while PIBB will promote KPEng as one of the suppliers and contractors for solar installation works and provide financing. The agreement's tenure will be 24 months with the promotion and marketing joint efforts to be targeted at NEM 3.0 initiatives. The group aims to secure up to 50MW of NEM projects of 10% of the quota under the scheme.

<https://themalaysianreserve.com/2021/01/29/kpower-public-islamic-bank-ink-deal-on-solar-pv-systems/>

EIB to back expansion of Burkina Faso PV park to 50 MW

[28 Jan] EU lender the European Investment Bank (EIB) today announced plans to finance the expansion of a grid scale solar plant in Burkina Faso and to deepen renewable energy work with the Croatian government. The EIB will provide a €38.5 million long-term loan towards the cost of a €70.5 million project to expand the generation capacity of the first solar plant installed by Burkina Faso's national electric utility, from its current 37 MW to 50 MW. The solar farm was built by Société Nationale d'électricité du Burkina Faso (Sonabel). The EIB also announced the signing of a memorandum to work more closely with Croatia's Ministry of Economy and Sustainable Development on matters including clean energy generation and transmission infrastructure, green mobility and moving to a circular economy.

<https://renewablesnow.com/news/eib-to-back-expansion-of-burkina-faso-pv-park-to-50-mw-729475/>

Power Generation /Installations /Corp.PPA

Planning deal signed for massive Australia-Singapore solar power link

[29 Jan] The government of Australia's Northern Territory has signed a key planning agreement for a power link project that will enable electricity exports to Singapore from a 10-GW solar-plus-storage project. The so-called Australia-ASEAN Power Link (AAPL) power link project was proposed by Singapore's Sun Cable Pty Ltd and envisages building a solar PV complex, coupled with about 30 GWh of energy storage, and exporting power via a 3,750-km undersea transmission cable. The project development agreement will help finalise the required land tenure and commercial arrangements for the AUD-22-billion (USD 16.8m/EUR 13.9m) project before it achieves financial close in October 2023. Annual power supplies worth AUD 1 billion will be exported and cover up to 20% of Singapore's electricity needs, according to the plan.

<https://renewablesnow.com/news/planning-deal-signed-for-massive-australia-singapore-solar-power-link-729489/>

CHANDRA ASRI PARTNERS WITH TOTAL SOLAR DG TO INSTALL SOLAR POWER ITS CILEGON PLANT

[02 Feb] PT Chandra Asri Petrochemical Tbk continues its partnership with Total Solar DG to build the second solar panel or PV installation in the Cilegon plant in Indonesia. The rooftop PV installation will power Chandra Asri's warehouses, laboratory building and charging station for electrical forklifts, reducing up to 438 ton of CO2 emission. It is set to produce an addition of 554 MWh of solar-powered electricity. The project follows successful commissioning of Chandra Asri's first solar-power system, which was built by Total Solar DG in 2019 and has been able to produce 935 MWh of energy to power Chandra Asri's office buildings in Cilegon.

<https://www.chemengonline.com/chandra-asri-partners-with-total-solar-dg-to-install-solar-power-its-cilegon-plant/?printmode=1>

EDF Renewables switches on 214 MW of solar + storage in Southern California

[29 Jan] EDF Renewables North America completed and reached commercial operation of the Desert Harvest 1 (114 MWdc) and Desert Harvest 2 (100 MWdc) Solar Projects. Desert Harvest 1 provides electricity to MCE under a 20-year PPA, while Desert Harvest 2 supplies energy and renewable attributes to Southern California Public Power Authority (SCPPA) under a 25-year renewable energy credit and index structure contract. Both projects consist of horizontal single-axis tracking solar PV technology. Desert Harvest 2 includes a 35-MW, 4-hour ESS. The coupling of storage and solar demonstrates EDF Renewables' ability to address specific challenges posed by the California "duck curve."

<https://www.solarpowerworldonline.com/2021/01/edf-renewables-switches-on-solar-storage-in-southern-california/>

BayWa r.e. signs first solar corporate PPA in Poland

[28 Jan] Renewables group BayWa r.e. has signed a PPA with construction company HiedelbergCement for what it claims is Poland's first subsidy-free solar park. BayWa r.e. is in the final stages of building what it claims is Poland's largest solar farm to date in Witnica, close to the German border between Poznań and Berlin. The project, which was built with 405-400Wp Mono PERC half-cell modules from JinkoSolar, Huawei string inverters and Siemens MV transformers, is due to come online in the first half of 2021.

<https://www.baywa-re.com/en/news/details/baywa-re-signs-first-solar-corporate-ppa-in-poland/>



Image: BayWa r.e.

Danish Developer Signs Seven-year PPA to Deploy 34 MW Solar Plant

[02 Feb] Danish renewable energy developer Better Energy has secured a seven-year PPA for a 34 MW solar power plant it will build in the Guldborgsund Municipality, in southern Denmark. The company said the solar park will be grid-connected within the next 12 months. Danish pharmaceutical company Lundbeck will buy the electricity generated by the solar park at an undisclosed price. "The agreement is a hedge against rising electricity costs as it entails a low fixed cost of electricity for the next seven years," Better Energy said in a statement.

<https://theelectricityhub.com/danish-developer-signs-seven-year-ppa-to-deploy-34-mw-solar-plant/>

Enel targets PPAs for just 'small part' of European mix

[29 Jan] Italian utility Enel Green Power plans to use long-term PPAs for just a "small part" of its European electricity mix, as it counts on other options to finance its renewable project pipeline in the region, chief executive Salvatore Bernabei said today. "If you consider our portfolio in the next 3 years, we are hedged for more than 70pc of our total production, and it is a mix of PPAs, local auctions and bilateral contracts. And then for the residual merchant exposure, we can count on the integration with our retail portfolio. So, for us, PPAs are not needed in all countries. It is something that we use only when it creates value compared with other alternatives — definitely in the US, but in Europe — in just a small part of the mix."

<https://www.argusmedia.com/en/news/2182124-enel-targets-ppas-for-just-small-part-of-european-mix>

University of Richmond matches its energy needs with solar

[28 Jan] The University of Richmond has become the second higher education institution in the country, alongside Massachusetts' Hampshire College, to match its electricity usage with a single solar power source, with the completion of the Spider Solar project. Built by sPower, which merged with AES' clean energy business early this year, Spider Solar is a 20 MW installation in Spotsylvania County, Virginia. The 47,000-panel array began operating at the end of 2020. The university it will offset up to 60% of the institution's greenhouse gas emissions. Energy generated by Spider is acquired by the university through a PPA with sPower.

<https://pv-magazine-usa.com/2021/01/28/university-of-richmond-goes-100-solar/>



Image: Oleg Brovko

Floating PV

Potential of floating solar PV in Africa vastly underrated

[02 Feb] The installation of floating PV (FPV) in existing hydropower reservoirs could provide solar electricity to help compensate for hydropower production losses during dry periods. It would also reduce evaporation losses while helping to sustainably satisfy the current and future needs of the fast-growing African population. A new study, Assessment of floating solar PV potential in existing hydropower reservoirs in Africa, published in the scientific journal Renewable Energy, provides a comprehensive analysis of the potential of FPV installations in Africa. It draws on water surface data of the largest 146 hydropower reservoirs on the continent. The report authors point out the excellent solar potential in Africa means the diversification of the continent's energy portfolio is feasible. "The introduction of FPV in the existing hydropower reservoirs can reduce risk and support the provision of reliable power services. This increases Africa's resilient to climate change and its ability to respond to extreme events without taking hard measure and/or redesigning existing infrastructure."

<https://www.esi-africa.com/industry-sectors/generation/solar/potential-of-floating-solar-pv-in-africa-vastly-underrated/>

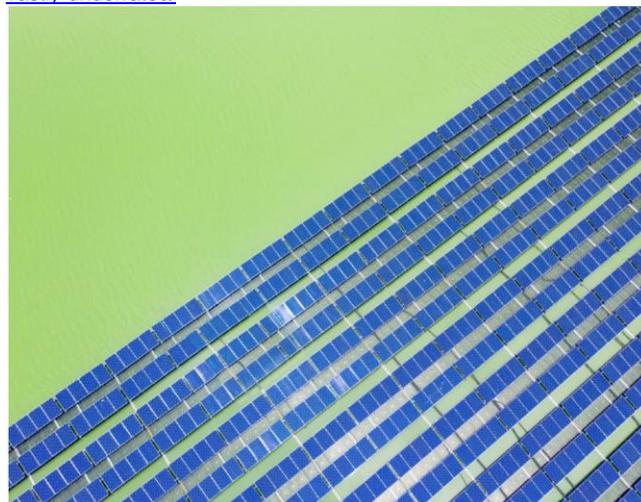


Image: Shao-Chun Wang © 123RF.com

EDF Renewables Starts Construction of its First Floating Solar Facility in France

[03 Feb] EDF Renouvelables, the renewable energy unit of French energy company EDF, has begun construction of its first floating photovoltaic power plant in France, on a water reservoir at the Lazer hydroelectric plant in the southwestern department of Hautes-Alpes. The facility will cover an area of 24.5ha, which corresponds approximately to two-thirds of the surface of the water reservoir, for a total capacity of 20 MWp. The project is expected to be commissioned in the spring of 2022 and will double the production capacity of the hydropower plant.

<https://solarquarter.com/2021/02/03/edf-renewables-starts-construction-of-its-first-floating-solar-facility-in-france/>

Storage / Battery

PV industry group calls for storage-specific auctions after batteries miss out in Spain tender

[01 Feb] Calls have been made to tweak future auctions to support smaller-scale projects as well as encourage the participation of bids with energy storage. While bids were allowed to include storage, the technology didn't feature. The rules specified that dispatchable solar and wind tariffs would have a 25% market exposure, but winning storage plants would be limited to charging from the renewable project they are paired with, excluding the possibility of charging energy from the grid. "These two constraints combined with the very short timeline to submit bids and the absence of a dedicated remuneration scheme makes it unsurprising that no storage was awarded," said Poirot. "If the real purpose of the Spanish government was to make a significant step towards its 2.5GW battery storage target, I would say the auction is quite a fiasco." The analyst said it is likely that the auction rules will be altered by the end of the year to allow for a more competitive participation of energy storage.

<https://www.energy-storage.news/news/pv-industry-group-calls-for-storage-specific-auctions-after-batteries-miss>



Image: Solaria

Foresight unveils co-located utility-scale battery storage ambitions

[28 Jan] Foresight Solar Fund is looking to diversify its portfolio with the addition of utility-scale battery storage systems. If approved by shareholders, up to 10% of the company's Gross Asset Value could be invested into the technology. The company pointed to how the renewable technology markets in which it operates have continued to grow since it launched in 2013, supported by worldwide commitments to decarbonise and the falling cost of solar. This trend is expected to create an attractive environment for further investments into both UK and international solar through support mechanisms and subsidy-free developments. The increase in renewables will create a need for more flexibility, with battery storage expected to have a significant role in the energy transition.

https://www.solarpowerportal.co.uk/news/foresight_unveils_co_located_utility_scale_battery_storage_ambitions

Interesting News / Comments

Seaweed animal feed and solar panels made from waste fruit: The best green innovations of January 2021

[01 Feb] In this round-up, edie outlines five of the most promising green innovation stories from January 2021.

Wind-harnessing ship sails: The company BAR Technologies has developed large, solid wing sails that can be fitted to the deck of bulk cargo ships to capture wind energy and improve aerodynamics.

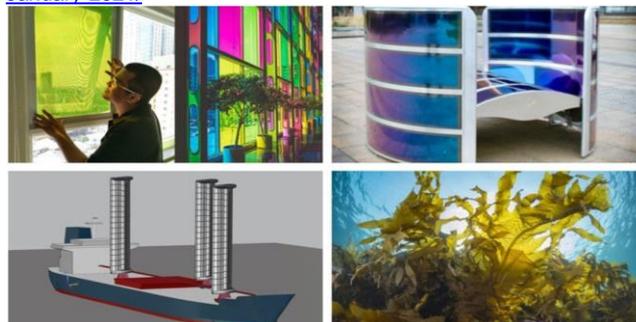
Solar 'arcs': Solivus develops lightweight, thin-film solar panels that are designed with organic materials. As such, they are lower carbon to manufacture and easier to dispose of than traditional PV panels.

Solar panels made from crop waste: AuREUS has developed a technology that uses materials synthesized from agricultural waste in systems that absorb UV light from sunlight and convert it into electricity.

'Smart' satellite mapping for commodity crops: Quantis launched GeoFootprint - a tool that combines satellite imaging of commodity supply chains with environmental metrics.

Seaweed-based cattle feed: Carbon Kapture claims that kelp grows up to 30 times faster than trees. It sheds a lot of its biomass out into the deep sea, making for natural carbon storage. The firm is planning to set up eight kelp farms in February and a further 50 in October.

<https://www.edie.net/news/8/Seaweed-animal-feed-and-solar-panels-made-from-waste-fruit--The-best-green-innovations-of-January-2021/>



What Is Going On With China's Crazy Clean Energy Installation Figures?

[02 Feb] The Chinese National Energy Administration "stunned the world" when it announced total wind and solar capacity additions of 120GW, according to Wood Mackenzie senior analyst Xiaoyang Li. "Even though we don't have conclusive evidence to say the government is not telling the truth, it's just not possible," said Beijing-based BNEF analyst Jonathan Luan Dong. The most obvious explanation is that there has been a change in accounting techniques. Luan said the Chinese Wind Energy Association theorized that the official figures had included capacity installed in earlier years but not previously connected to the grid. While this may be a factor, BNEF's view is that NEA included partially completed projects in its 2020 figures. If so, some wind developers could be in for a disappointment. "Projects found to be partially installed in 2021 may be challenged and lose their subsidy qualification, despite having been counted in the 2020 tally."

<https://www.greentechmedia.com/articles/read/what-is-going-on-with-chinas-crazy-clean-energy-installation-figures>

Webinar / Conference

Webinar: Meeting the expectation of a 30+ PV project operation lifetime

 Time: 11:00PM 4th Feb - 12:00 AM 5th Feb, SGT

Organizer: pv magazine

<https://register.gotowebinar.com/register/6314531974607295245?source=scm>

Energy Storage Market Series - SimpliPhi Power

 Time: 2:00 - 3:00 AM, 10th Feb, SGT

Organizer: RENVU

https://us02web.zoom.us/webinar/register/WN_T0cyK7MgRiW8QPtmWJYqVA

Infrastructure Development and Investment Opportunities in Africa

 Time: 5:00 - 8:00 PM, 10th Feb, SGT

Organizer: SSCG Consulting

<https://www.eventbrite.co.uk/e/132033332251>

Webinar: Big data meets big brother - Modern solar monitoring systems

 Time: 10:00 - 11:00 PM, 10th Feb, SGT

Organizer: pv magazine

<https://register.gotowebinar.com/register/4417157535205186832?source=scm>

Backsheet Failure: New Technology and 360-Degree Module Management

 Time: 6:00 - 6:45 PM 17th Feb, SGT

Organizer: Above

<https://register.gotowebinar.com/register/8712359027266542608>

International Conference - Recent Advances in Renewable Energy Sources-2021

 Time: 12:30PM 26th Feb - 8:30 PM 27th Feb, SGT

Organizer: VEERESH FUSKELE

<https://www.raresgecbw.in/>

Floating Solar PV Forum

 Time: 3:00PM 5th March - 11:00 PM 6th March, SGT

Organizer: Leadvent Group

<https://leadventgrp.com/events/floating-solar-pv-forum/details>

RENEWABLE POWER GENERATION AND ENERGY STORAGE SYSTEMS

 Time: 1:00 - 3:00 AM, 14th March, SGT

Organizer: IEEE PES PERU

<https://events.vtools.ieee.org/event/register/257492>

Renewable Energy Certificates Key Markets Spot Prices

Data provided by our partners listed below - Specialists in EACs trading

 US – SRECTrade <https://www.srectrade.com/>

 Europe – Origo <http://origo-renouvelable.com/>

 Asia – Monsoon Carbon <http://monsooncarbon.com/>

 Singapore – LYS Energy <https://www.lysenergy.com/>

Region	Technology	Price/MWh						M/M
		Aug	Sep	Oct	Nov	Dec	Jan	
PA, US [SREC] (US\$)	Solar	15.00	15.00	16.50	18.00	21.00	22.50	▲
OH, US [SREC] (US\$)	Solar	8.50	9.50	10.50	11.00	10.25	10.75	▲
NJ, US [SREC] (US\$)	Solar	228.00	228.00	227.00	228.00	229.00	230.00	▲
Germany [GO] (€)	Hydro	0.68	0.70	0.66	0.65	0.65	1.45	▲
France [GO] (€)	Hydro	0.18	0.18	0.15	0.13	0.13	0.29	▲
France [GO] (€)	Wind	-	-	-	-	-	0.41	-
Netherland [GO] (€)	Wind	1.41	1.25	0.90	0.82	0.82	1.05	▲
Italy [GO] (€)	Solar	-	-	-	-	-	0.38	-
China [iREC] (US\$)	Solar	0.25	0.25	0.25	0.25	0.25	0.25	-
India [iREC] (US\$)	Solar	0.90	0.90	0.90	0.80	0.80	0.80	-
Singapore [iREC] (SGD)	Solar	25.00	25.00	25.00	25.00	25.00	25.00	-
Vietnam [iREC] (US\$)	Solar	0.40	0.40	0.40	0.40	0.40	0.40	-

Solar Average Spot Prices (USD)

PVinsights <http://pvinsights.com/>

EnergyTrend <http://pv.energytrend.com/>

PV InfoLink <https://pvinfoLink.com/>

Product (US\$)	10-Dec	17-Dec	24-Dec	31-Dec	07-Jan	14-Jan	21-Jan	28-Jan	04-Feb	w/w
Polysilicon (/kg)	9.620	10.060	10.350	10.570	10.790	10.790	11.090	11.470	11.470	-
	10.413	10.408	10.484	10.689	10.931	10.273	10.273	11.387	11.567	▲
	8.100	8.100	8.100	8.150	8.650	8.650	8.800	8.850	8.950	▲
Multi Wafer (/pc)	0.152	0.152	0.152	0.152	0.154	0.154	0.154	0.157	0.157	-
	0.194	0.194	0.194	0.194	0.193	0.193	0.193	0.193	0.193	-
	0.178	0.178	0.178	0.178	0.178	0.175	0.175	0.175	0.175	-
Mono Wafer M6/ 166mm (pc)	0.421	0.421	0.421	0.421	0.421	0.421	0.421	0.422	0.422	-
	0.435	0.435	0.435	0.435	0.435	0.435	0.438	0.438	0.438	-
	0.434	0.434	0.434	0.434	0.434	0.440	0.440	0.439	0.439	-
Multi Cell (/w)	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	-
	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073	0.073	-
	0.072	0.072	0.072	0.072	0.073	0.073	0.073	0.074	0.074	-
Mono PERC Cell M6 (/w)	0.127	0.127	0.127	0.122	0.120	0.117	0.115	0.114	0.113	▼
	0.124	0.124	0.124	0.124	0.124	0.124	0.121	0.121	0.121	-
	0.129	0.129	0.129	0.126	0.128	0.125	0.120	0.118	0.116	▼
Multi Module (/w)	0.171	0.170	0.169	0.169	0.169	0.168	0.168	0.168	0.168	-
	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	0.180	-
	0.174	0.174	0.174	0.174	0.174	0.174	0.174	0.174	0.174	-
Mono PERC Module (/w) M6 / 425-445W	0.211	0.208	0.206	0.206	0.206	0.203	0.201	0.201	0.201	-
	0.226	0.226	0.226	0.226	0.226	0.226	0.226	0.226	0.226	-
	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	0.213	-
PV Glass [3.2mm] (RMB/m2)	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	-
PV Glass [2.0mm] (RMB/m2)	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	35.00	-
Silver [Ag] (US\$/oz)	24.42	25.18	25.68	27.22	27.81	25.47	25.21	25.49	27.11	▲
Aluminium [Al] (US\$/t)	1,945	2,031	1,993	1,978	2,013	2,025	1,980	2,011	1,985	▼
Copper [Cu] (US\$/lb)	3.47	3.55	3.53	3.59	3.64	3.62	3.64	3.60	3.53	▼
Other Key Indices										
Nymex Crude Oil [Front Mth] (US\$/bbl)	45.52	47.82	48.09	47.72	50.12	52.82	53.04	52.88	55.09	▲
Coal [API2] (US\$/t)	63.20	65.75	66.15	69.35	65.00	70.25	67.50	67.60	65.55	▼
EU CO2 Credits [EUA Spot] (€/t)	29.70	31.70	31.50	33.75	33.59	33.92	32.83	32.75	36.69	▲
HSI	26,397	26,432	26,343	27,372	27,692	28,291	29,854	29,298	29,307	▲
S&P500	3,672	3,701	3,705	3,701	3,727	3,809	3,851	3,850	3,826	▼

*We started to collect prices for Wafer, Cell and Module based on M6 format from 10th Dec, 2020 due to the market trend changes.