

SSX Morning Ray

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1 EUR = 1.13 USD | 1 USD = 114.16 JPY | 1 USD = 6.37 CNY | 1 USD = 76.26 INR

Market Highlights:

PLM** -Polysilicon Marker	27.900	USD/kg	
Price change WoW	-0.600	-2.105%	▼
Price change (Since Jan 2021)	19.460	230.569%	▲
CMM* -Chinese Module Marker	0.255	USD/wp	
Price change WoW	-0.001	-0.391%	▼
Price change (Since Jan 2021)	0.042	19.72%	▲

**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	% Change	Next week	Next Month	In 3 months
PLM (USD/kg)	32	21	27.9	-0.6	-2.11			
China Multi Grade (RMB/kg)	115	85	103	-5	-4.63			
China Mono Grade (RMB/kg)	260	240	244	-15	-5.79			
Wafers (USD/pc, 1USD:6.37RMB)	High	Low	Average	Change	% Change	Next week	Next Month	In 3 months
Multi	0.3	0.258	0.263	-0.023	-8.04			
Mono G1	0.72	0.698	0.701	-0.002	-0.28			
Mono M6	0.71	0.691	0.694	-0.003	-0.43			
Mono M10	0.82	0.764	0.805	-0.045	-5.29			
Mono G12	1.17	1.115	1.125	-0.046	-3.93			
Cells (USD/wp, 1USD:6.37RMB)	High	Low	Average	Change	% Change	Next week	Next Month	In 3 months
Multi	0.105	0.099	0.099	-0.003	-2.94			
Mono Perc G1	0.157	0.150	0.150	-0.002	-1.32			
Mono Perc M6	0.152	0.142	0.146	0	0			
Mono Perc M10	0.162	0.151	0.150	-0.002	-1.31			
Mono Perc G12	0.155	0.145	0.145	-0.005	-3.33			
Modules	High	Low	Average	Change	% Change	Next week	Next Month	In 3 months
Multi (USD/wp)	0.237	0.229	0.231	-0.003	-1.28			
Multi (RMB/wp)	1.710	1.630	1.660	-0.020	-1.19			
Mono Perc (USD/wp)	0.264	0.255	0.261	0	0			
Mono Perc (RMB/wp)	1.900	1.830	1.870	0	0			

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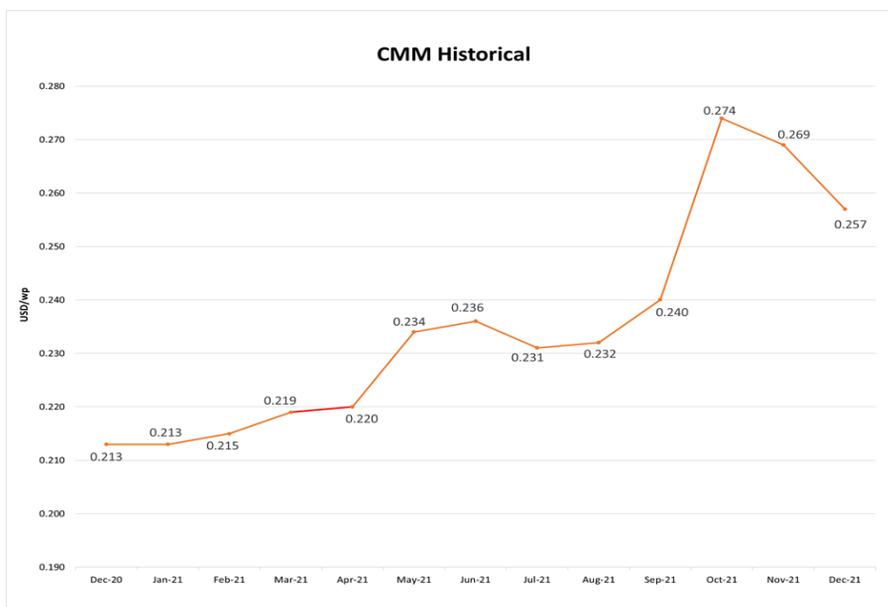
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*Overseas polysilicon not submitted to Chinese Anti-Dumping
Prices in RMB incl VAT but excl 4% import duty (domestic polysilicon production)

Multi High Cell eff: > 18.8% (> 4.62w) / Mono PERC High Cell eff: >22.2% (>5.59 w)
Modules prices incoterms: RoW FOB China
Average Module output: 335wp (Multi) / 435wp (Mono Perc)



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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Commentary

Polysilicon:

In the China domestic market, polysilicon prices continued to fall this week, albeit at a rate not sufficient to stimulate the demand from the wafer segment. The Mono-Si average spot price declined to RMB244/kg, representing a decrease of 5.79% WoW. The Multi-Si average spot price dropped to RMB103/kg on a WoW decline of 4.63%.

Seemingly unfazed by the sluggish pace of procurement by wafer makers, polysilicon producers appear to be in no hurry to slash prices to seal deals. One reason, of course, is that inventories sitting in the polysilicon manufacturers' factories are still at a relatively manageable level.

Moreover, our source revealed that the wafer inventories have been effectively consumed, and wafer makers are no longer aggressively pushing their products. As a result, even if wafer makers are expected to purchase some polysilicon to maintain minimal wafer production, the currently high polysilicon price would limit how much they are willing to purchase. Consequently, before the new expansion capacity of polysilicon comes online, polysilicon producers still have the opportunity to continue their price-based tug-of-war with wafer makers.

In addition, we heard that a 100kt polysilicon expansion project of a large Chinese polysilicon producer has not yet passed the local energy consumption assessment. "We cannot guarantee that the project will pass the energy consumption assessment smoothly," the company disclosed. This may extend the time for new polysilicon capacity to reach production.

Of course, things may not go exactly as expected. The new policy that was recently announced in China states that the newly added renewable energy and its raw material production is not included in the energy consumption restrictions, which means that the newly added polysilicon production capacity might not be limited by the power use in the future.

Although the specific implementation timing and applicable fields of the policy have not been fully disclosed, some insiders regard it as a favourable policy for new energy. "This new regulation may ensure that the new polysilicon capacity will come online timely and smoothly in H2 next year."

In the short term, we expect the polysilicon price to continue on a decline at a gentle pace. But one nagging question remains at the back of the market's collective mind - WHEN, if ever, will the polysilicon price fall to RMB210/kg? Only then can wafer manufacturing finally be profitable again.

Wafers:

This week, we witnessed the continued slide in wafer prices in the China domestic market:

The Multi wafer average market price was registered at USD0.263/pc this week, falling by 8.04% WoW.

The average market price for Mono G1 and M6 wafers slipped slightly further to USD0.701/pc and USD0.690/pc, marginal dips of 0.28% and 0.43% WoW respectively.

Compared to the price drop of the small-sized Mono wafers, the price decline in large-sized wafers is more noticeable due to their relatively larger production capacity and inventories. The prices of Mono M10 and G12 wafers fell further this week to USD0.805/pc and USD1.125/pc, with a WoW dip of 5.29% and 3.93% respectively.

Although the wafer prices fell again this week, the downward price trend of wafers may have ended for now...

Cells:

Cell prices sustained their downward trend this week, save for the M6-size.

Multi cells dropped further to \$0.099/wp, down by 2.94% WoW (-\$0.003/wp);

Mono G1 cell price revised down to \$0.150/wp, down by 1.32% WoW (-\$0.002/wp);

Mono M6 maintained at \$0.146/wp, no change WoW; and

Mono M10 price dropped marginally to \$0.150/wp, down by 1.31% WoW (-\$0.002/wp).

The mood was mixed this week: the general consensus about a continuous price decline was interrupted by rumours starting Wednesday morning that wafer makers may raise their price slightly in the coming weeks (see wafer commentary), prompting some cell makers to ...

Modules:

This week the module prices were stable with not much talking points, compared to their upstream counterparts.

Multi module are assessed this week at USD0.231/wp, a nominal dip of USD0.003 or -1.28% WoW. Mono PERC M10 size are remained flat WoW at USD0.261/wp.

"Price is currently kind of stabilized we expect not too much change until January" summarised a manufacturer. A market insider shared that...

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- An expert's opinion

#13: CPS Glass – Solar with a Clear Conscience

This week, we sat down for a chat with Glenn Leroux, President & CEO of Canadian Premium Sand (CPS).

CPS is poised to fill a void in the North American solar supply chain.



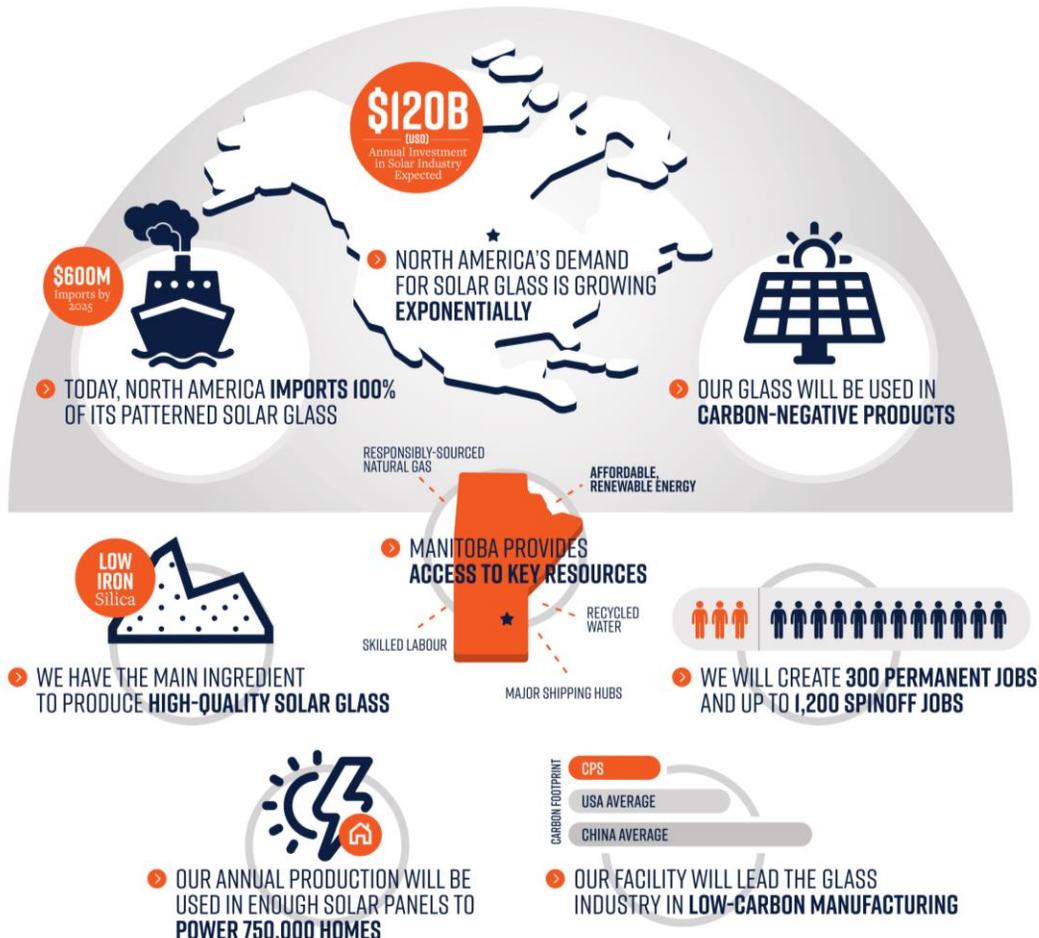
Hi, Glenn! Can you tell us a little more about CPS?

CPS is setting up an **integrated facility** to manufacture high-quality patterned solar glass right here in Canada. We wanted to leverage our position; as the name says we already have the right raw materials in hand to provide the market with what it needs, especially a growing market.

North America is seeing **exponential growth in solar installations** and solar is increasingly the renewable of choice for new projects.

We investigated both the architectural glass market and the solar glass market and it became obvious that solar was the best fit for our high purity sand and provided the best commercial opportunity. Currently about 80% of solar panels manufactured in North America use **high-spec ultra-clear patterned glass**, and yet all of the patterned glass is imported. Why should it continue to be imported when the raw material and energy exist here?

We have done our lab work on the sand and we know what we need to do to produce solar patterned glass with **high transmissivity**. We have no issues matching the high standards set by a competitive industry.



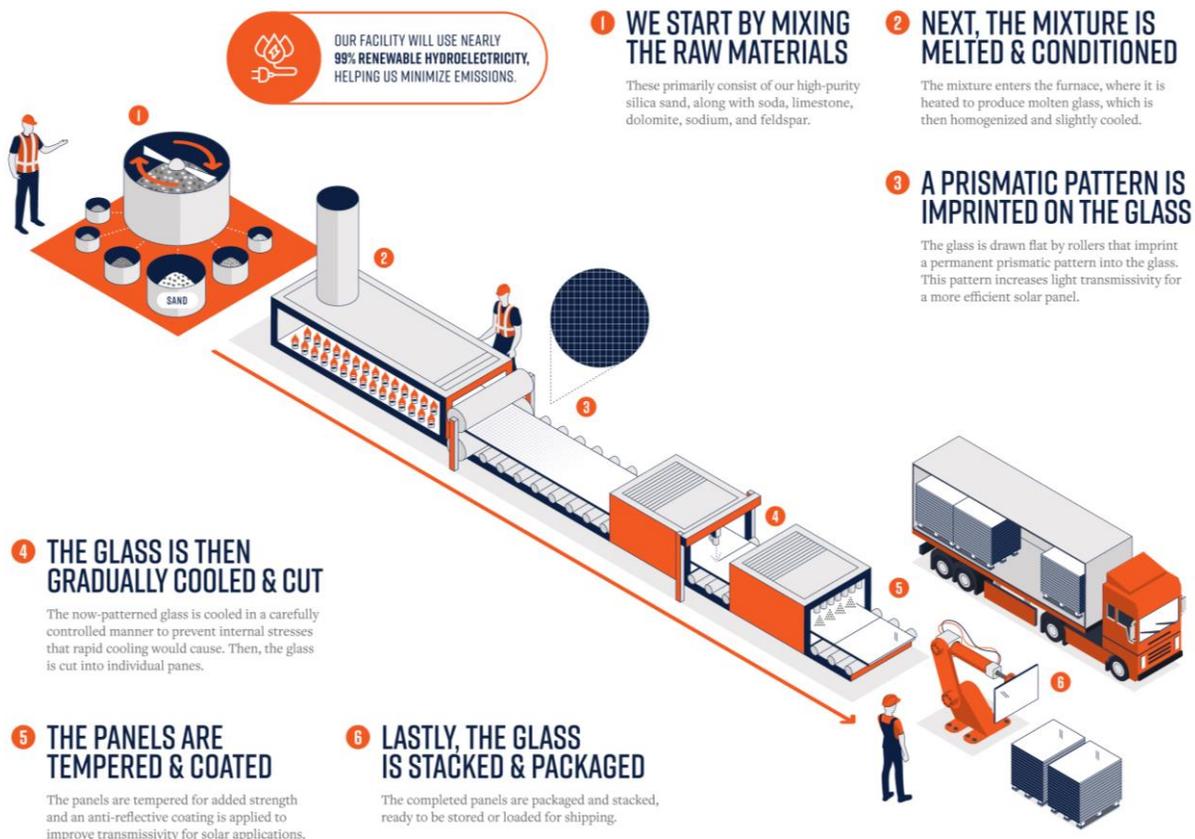
- An expert's opinion

How is CPS competing with current solar glass manufacturers in the market?

Firstly, there is currently no patterned glass manufacturer in North America; most of the manufacturers supplying the market are based in Asia, mainly in China. Because of proximity, we will be able to supply the North American solar market with one of the essential components in solar panels, **door to door in under 3 days**. We know that the solar supply chain has been plagued by freight costs and logistics issues, so being on the same continent means we can supply to domestic panel makers at the **shortest time and lowest total cost**.

Secondly, we have another tremendous cost advantage; we **own the main resource** in the manufacturing process – the high purity silica sand. Our sand quarry is only about **160km from our manufacturing facility** in Selkirk, Manitoba. And not having to rely on external resources also means we can better manage uncertainties that manufacturers normally face with raw materials supply like quality and cost.

Another edge we have over our competition will be sustainability. We can beat other current manufacturers hands down because of our low carbon footprint. In fact, it will be lowest in the world at our factory gate. We will rely on **natural gas for our furnace** and **100% renewable hydropower**; so no coal! With this, we will be able to offer our customers and the end-users the ESG-compliance they are seeking to take them closer to net zero goals.



- An expert's opinion

Recently WeChat-based GlobalPV made an analysis in their **article about the future of solar glass.*

What do you make of their forecast of an oversupply of PV glass in 2022? Do you think it will affect your plans?

While there is certainly potential for Asian solar glass manufacturing to continue its fast pace of expansions, we see **significant growth** as well in solar glass demand in the Asian Pacific markets as a result of net **zero commitments and decarbonization targets**.

North America typically makes up approximately 5% of patterned solar glass sales for Asia Pacific manufacturers and as a result is **considered a premium market for sales**. In addition, majority of glass capacity expansions will have a **barrier to entry** in the North American markets due to tariffs placed on imports from certain regions including China, not to mention the need to transport that glass a significant distance.

Lastly, with a typical lead time of 18 to 24 months for building a glass manufacturing facility, **future additional capacity will likely track solar installation growth closely** to achieve a balance in the long-term. Our facility is expected to be in operation by Q4 of 2024 and is expected to supply approximately 20% of the fast growing market in North America.

And so what are CPS' plans now moving forward?

We are currently targeting **Q4 2024 for the start of production**. We have 12 months to secure all financing and regulatory approvals, followed by about 18 months of construction of the quarry and manufacturing facility. Thereafter there should be 4-6 months of standard testing before we go to market. Stay tuned!

**GlobalPV article: <https://mp.weixin.qq.com/s/KP0caml7bJXriq6DIKbflw>*

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Should you have any feedback and/or comments, OR if you or your organisation wish to be featured, please drop us a line at Farahdian.Aziz@ssx.com.sg. We hope you have enjoyed the read!

Newsletter

HEADLINES

Market Information

- [T] China polysilicon prices dip steeper WoW
- [T] China Cells segment operating at 64.3%, as of mid-Dec
- Some companies suspend production in Zhejiang, as China's Covid-19 cases rise
- 'Opposing dynamics': growing supply chain woes cloud US solar power progress
- India seeks its own solar industry to counter China

Policy / Incentives

- China urges solar giants to fight against trade restrictions
- [T] China Central Economic Work Conference: Newly added renewable energy raw material production can be excluded from the calculation of the total energy consumption control
- California proposes reducing incentives for rooftop solar
- Plan for solar module gigafactory unveiled in France
- Bahrain plans to open bids for rooftop solar plants next week
- Serbia to develop 11.3 GW of solar and wind energy projects

Non-Crystalline/Science/Technology

- New solar materials developed by Stanford scientists could usher in ultrathin, lightweight solar panel
- Behind PID in bifacial solar cells

Support Industry

- [T] Xinyi to invest RMB23 billion in 200kt of polysilicon
- Canadian Premium Sand Inc. selects Selkirk, Manitoba for its solar glass manufacturing facility location
- GE enters U.S. residential solar inverter market
- Trina Tracker launches Trina Smart Cloud that can 'lower the LCOE' for solar PV projects

Power Generation / Installation

- TrendForce: 2022 to see 200-220GW installations
- [T] CPIA: Jan~Oct'21: 29.3GW solar installed (+34% YoY) of which distributed solar accounted for 65%
- India's solar installs jump to 11.1 GW in Jan-Nov 2021
- RWE secures 35 GWh/yr of solar power from new Enerparc project
- Adani signs solar supply pact for giant India renewables project
- Airbus inks 3.85 GWh/yr solar PPA for German plant

Finance

- Solar shares tumble after California proposes incentive cuts
- US developer Geenex Solar bags funding to advance PV and energy storage pipeline

Interesting News/Comments

- China's Inner Mongolia region aims to earn five times more from rare earths by 2025
- New \$1 billion Lego factory in Vietnam planned to be 100% powered by solar energy

*[T] denotes article translated from non-English source.

Company News

- [T] Hoshine to invest RMB35.5 billion in Urumqi for construction of integrated PV production facility
- [T] GCL-Poly raised HKD5 billion to finance FBR production expansion
- Yunnan Tongwei's 50kt poly plant started production
- [T] Zhonghuan: G12 capacity at 43.5GW up to Q3; to exceed 54GW by year end
- [T] Zhonghuan: G12 wafer cost: 14% less per watt than M10, and 27% less than M6
- [T] Construction starts at Fuxing 20GW N+ Mono wafer production facility
- [T] JA Solar sells off 3 PV power plants for RMB289M
- [T] Jolywood commissions 1.5GW TopCON cells factory in Taizhou
- [T] Akcome in JV to develop HJT cells and modules projects in Zhoushan
- [T] Jiangsu Bitai New Energy to build HJT cell and module production line in Shaanxi
- [T] DAS Solar gets investment boost from investors Yongfu Stock, Linyang Energy
- Motech showcases TOPCon solar cells at Energy Taiwan 2021
- US Linton Technologies to assist Russia's EnCORE in building 1.34GW N-type wafer factory
- JinkoSolar signs 360MW supply agreement for Tiger Neo modules
- [T] Talesun to develop 5GW module manufacturing in Hebei
- [T] Huayang New Material to build 6 plants for total 21 GW of modules in 2022
- Canadian Solar's CSI Solar subsidiary receives approval for its proposed listing by the Shanghai Stock Exchange
- Canadian Solar completes sale of 635 mwp solar photovoltaic project to VTRM in Brazil
- Saudi Arabian module manufacturer to enter US market
- Swiss Solar to build 1.5 GW PV module fab in Turkey
- France's first vertical bifacial solar power plant
- Energy giant Shell to acquire U.S.-based Savion in solar power push
- FRV plans 336-MW solar PV project with BESS in Chile
- Singapore's Keppel to acquire Shell-backed Cleantech Solar

Storage / Battery

- Sacramento company bets prototype electric storage device could spark more solar use
- Vanadium flow battery ordered for Enel Green Power Espana solar farm in Mallorca
- Ingeteam, Powin supply equipment to California solar-plus-storage and standalone battery projects

Floating PV

- Floating solar juggernaut crashes cold barrier

Webinar / Conference

- Bioenergy 2021
- Pumps & Power 2021
- PV modules in 2022: top suppliers, performance levels, technologies
- Solar Market Outlook: Nepal