



# MARC

**Malaysian Rating Corporation Berhad**

199501035601 (364803-V)

## SECTOR OUTLOOK

### SOLAR POWER

#### **Contacts:**

Lee Chi Han  
+603-2717 2939  
chihan@marc.com.my

Sharidan Salleh  
+603-2717 2954  
sharidan@marc.com.my

December 2021



*Image by American Public Power Association/ Unsplash*

---

## **In a nutshell**

---

- The domestic solar power industry has remained resilient in 2021, driven by supportive government policy on renewable energy (RE) and low operational risk.
- Some solar power projects which were targeted for completion by end-2021 have been delayed due to the impact of pandemic-induced restrictions and unfavourable weather conditions. In 2022, the delayed solar power projects from large-scale solar (LSS) 2 and LSS3 are expected to be completed.
- New solar schemes awarded in 2021 include LSS4 projects (ranged from 10MW to 50MW) with a total capacity of 823MW to 30 bidders, and net energy metering 3.0 (NEM 3.0) projects of up to 500MW. These will add to the solar energy capacity expansion in the next two years.
- The bidding prices for the LSS4 project were relatively lower than previous LSS projects, mainly reflecting the continued lower cost of producing electricity from solar photovoltaic (PV) modules due to the improved solar PV competitiveness.
- The recent increase in solar PV module prices since 2H2020 is not expected to impact existing solar projects in MARC's universe as these projects are in operational mode; for one nearing construction completion, the procurement has been completed.
- MARC's rated solar power projects have generally been performing broadly in line with projections. MARC maintains a stable outlook on domestic solar power projects.

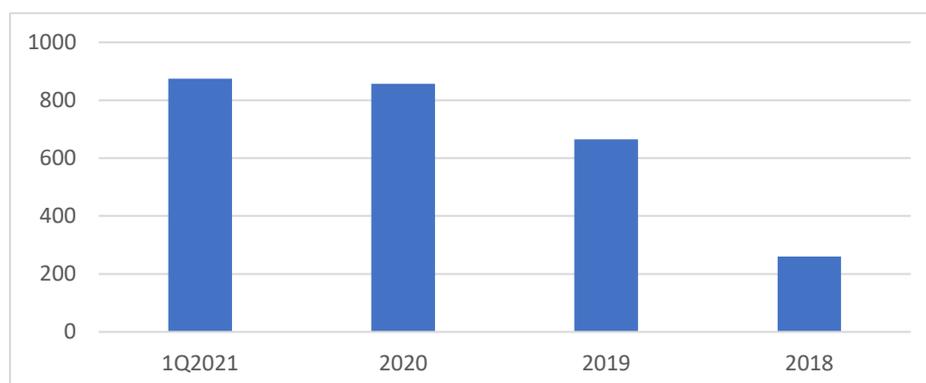
## Strong domestic solar power industry fundamentals

The domestic solar power’s industry fundamentals are underpinned by the established tariff framework under which access to the grid at certain prices for a period is guaranteed. This ensures the viability of solar power projects and helps to preserve investors’ confidence for long-term investments in the projects. Two solar power schemes - LSS and NEM - were introduced by the government in 2016 and have contributed to the expansion of solar energy capacity.

A conducive local climate for harnessing abundant sunshine, where solar irradiance ranges from 1470kWh/m<sup>2</sup> to 1900kWh/m<sup>2</sup> nationwide, has supported solar power project viability. In MARC’s rating universe, the operational solar power projects have been able to meet the forecast P90 energy generation as at date. (A P90 estimate informs of a 90% probability that the actual irradiance will exceed the given estimate.) While the energy generation tends to fall below forecast during monsoon season, the overall full year performance has been within the projections.

## Capacity expansion affected by pandemic-induced shutdowns

Exhibit 1: Installed capacity of LSS power projects in Malaysia

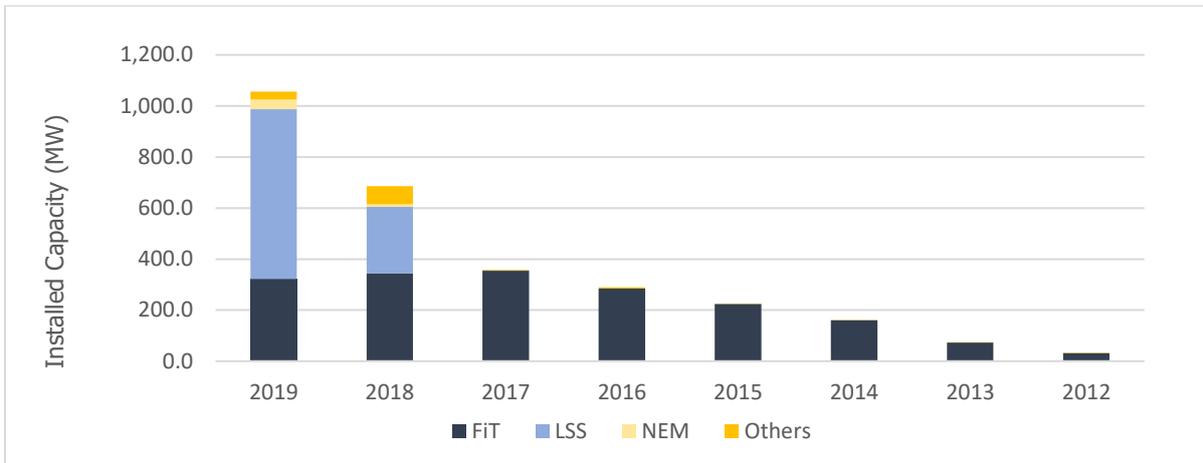


Sources: Energy Commission, MARC

The total awarded capacity of LSS stood at 1,634 MW as at end-March 2021. Of this capacity amount, a total LSS capacity of 759.67MW was still under construction and was supposed to be completed by end-2021. In March 2021, the government awarded 10MW - 50MW LSS4 projects to 30 successful bidders with total capacity of 823MW. Target completion for these projects is by end-2023. Unlike LSS3 projects which have foreign counterparties, the successful bidders in LSS4 were solely local companies from various sectors.

The LSS schemes have had a major impact on solar energy generation given their capacity to generate more power. Installed capacity rose to 664.9MW in 2019, constituting 62.3% of total solar installed capacity. However, the movement restrictions during 2020 and 2021, which impacted construction works, led to slower growth. In 2020, energy capacity from LSS rose by 191.9MW to 856.8MW, and by only 17.79MW to 874.5MW in 1Q2021. Capacity expansion in the near to medium term will come from the ongoing construction of existing projects and new solar schemes announced by the government.

Exhibit 2: Total installed capacity of all solar power projects in Malaysia



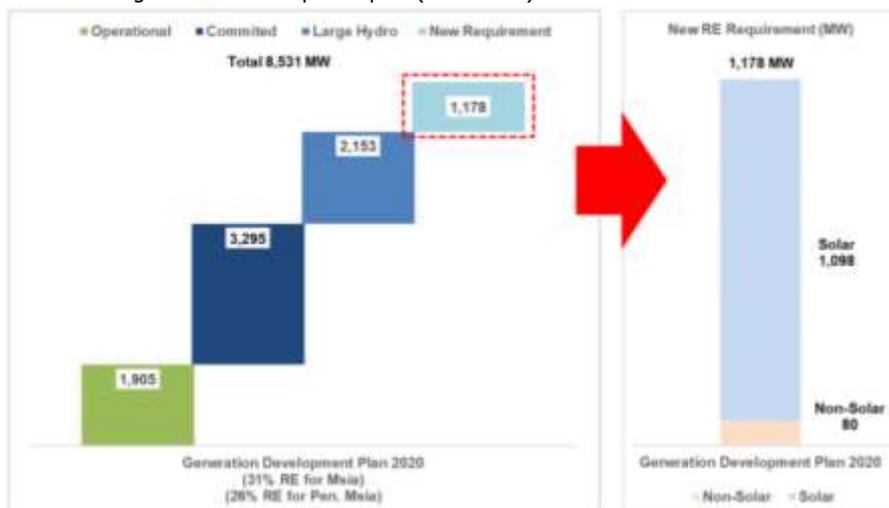
Note: 1) Others include solar capacity from self-generation.  
 2) Feed-in Tariff (FIT) scheme for solar PV was discontinued in 2015 (commercial and industrial) and 2016 (residential), and replaced by NEM.  
 Sources: Energy Commission, MARC

The government has also introduced the NEM 3.0 scheme with quota allocation of 500MW, and offered to the market for take up between February 2021 and December 2023. These new projects could increase the current capacity by more than double by end-2023 if successfully implemented.

NEM is predominantly comprised of small-scale rooftop solar projects that export unconsumed electricity to the grid. NEM, which replaced FIT scheme in 2016, has attracted interest from industry players after the government revised the scheme in 2019 to allow excess energy generated to be exported back to the grid on a 'one-on-one' offset basis; each unit of electricity consumed from the grid will be offset by an equal unit against same unit of electricity exported to the grid. The capacity expansion from the NEM scheme has been gradual due to its small-scale installation.

## Proactive government policy on RE

Exhibit 3: RE generation development plan (2021-2025)

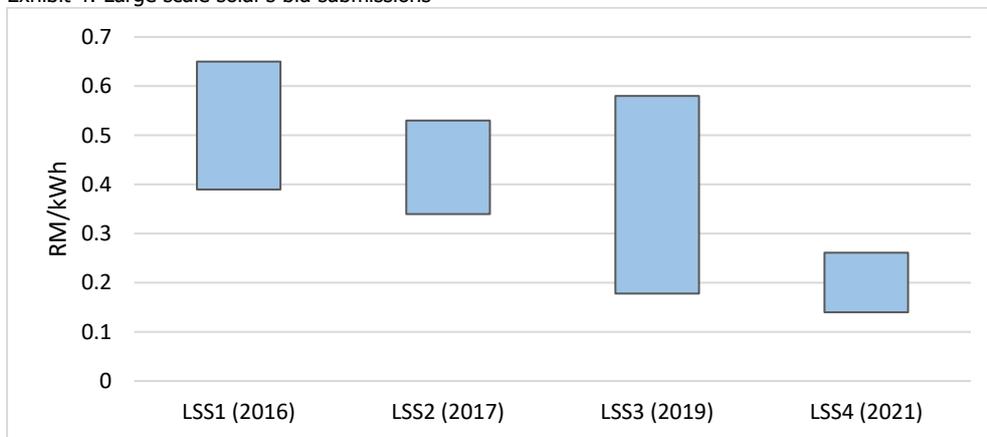


Source: Energy Commission

In 2021, the government revised its national RE capacity mix target from 20% to 31%, or 8,531MW by 2025 to support its aim of meeting the Sustainable Development Goals (SDG) targets. The new RE requirement is expected to be met from solar power energy. Participation from the private sector will be a key factor to successfully achieve the government’s RE target. Towards this end, the government has provided various incentives and promoted measures to support the growth of RE-oriented projects. This includes green investment tax allowance for purchasing green technology assets and green income tax exemption, both of which have been extended to 2023 in the Budget 2020. The government also launched the RM2.0 billion Green Technology Financing Scheme 3.0 (GTFS 3.0) in Budget 2021.

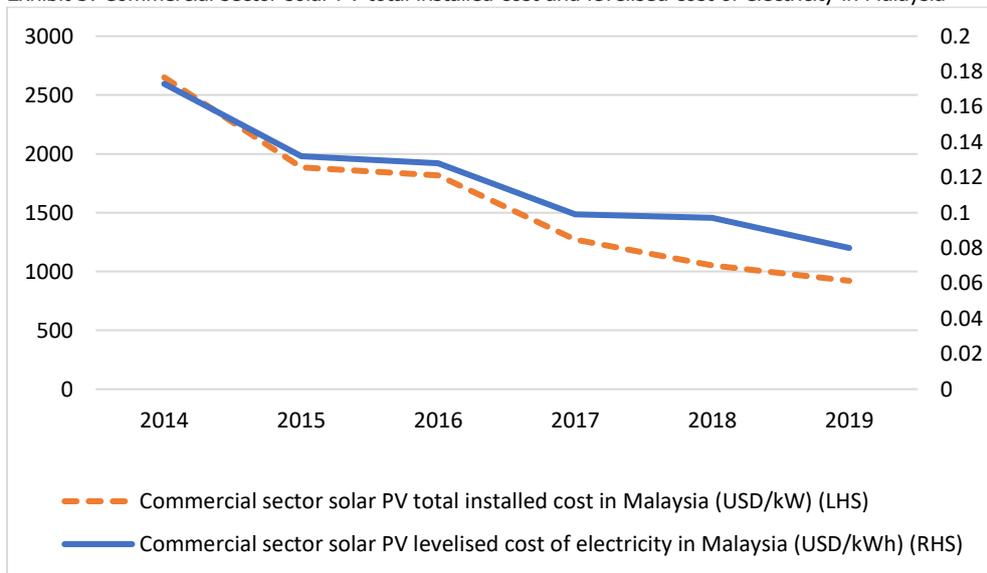
## Declining cost of electricity from solar

Exhibit 4: Large scale solar’s bid submissions



Sources: Energy Commission, MARC

Exhibit 5: Commercial sector solar PV total installed cost and levelised cost of electricity in Malaysia



Source: International Renewable Energy Agency (IRENA)

The cost of PV installation in Malaysia has been on a declining trend over the years, which has led to lower solar PV levelised cost of electricity. The cost has fallen from about 17 US cents/kWh to about 7 US cents/kWh between 2014 and 2019, according to IRENA. As a consequence, the bidding prices for the LSS4 projects were relatively lower than previous LSS awards. This will continue to lower the cost of producing electricity from a solar PV system and enhance solar PV competitiveness.

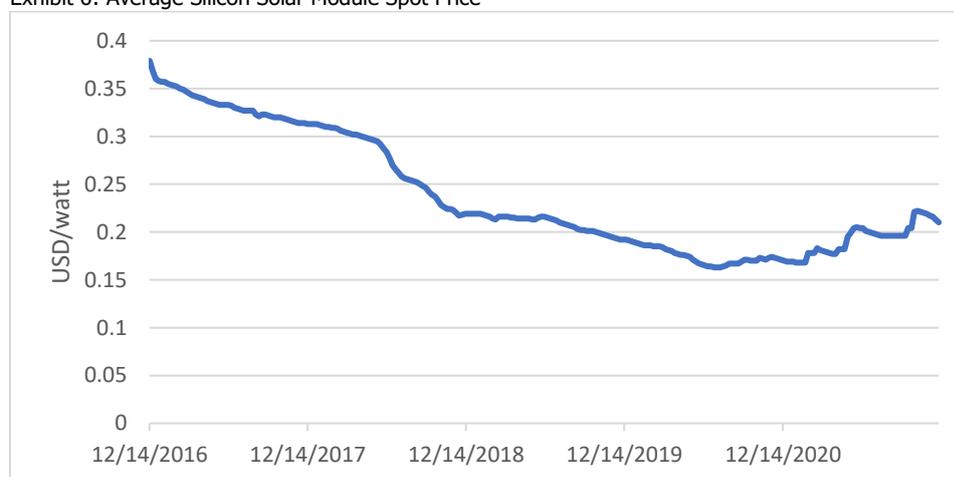
Based on some findings on Engineering, Procurement, Construction, and Commissioning (EPCC) for LSS4 projects, we note that the EPCC cost is less than RM3,000 per MW (assuming the installed capacity is 30% higher than plant capacity). This is lower than the EPC cost per MW of MARC’s rated LSS2 projects which ranged between RM3,400 and RM3,700 per MW.

---

## High solar panel cost is expected to be temporary

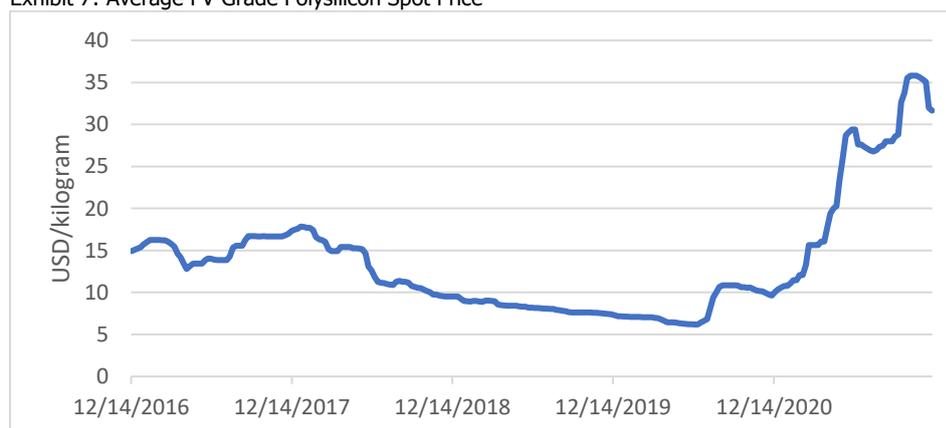
---

Exhibit 6: Average Silicon Solar Module Spot Price



Source: Bloomberg

Exhibit 7: Average PV Grade Polysilicon Spot Price



Source: Bloomberg

The price of polysilicon, which is a key raw material in the production of solar PV modules, has increased since 2H2020. The energy crisis in China which caused polysilicon manufacturers to operate at lower capacity, shipping delays and bottlenecks due to the pandemic, and higher demand from solar projects

in China, have resulted in the increased polysilicon prices. The average PV grade polysilicon spot price rose by more than 200% to USD35.08 per kg in November 2021 from USD10.57 per kg as at end-2020.

Accordingly, the average silicon solar module spot price increased by 29% to USD0.22 per watt in November 2021 from USD0.17 per watt at end-December 2020.

The high solar module prices are expected to be temporary as measures to mitigate the causes have been put in place, moderating the risk of solar project cost escalation. In 2020, polysilicon manufacturers in China including Tongwei, Daqo and Asia Silicon, announced plans for plant capacity expansion. The expansion is expected to come online by 2022 which will then mitigate supply shortage and reduce raw material prices.

---

## Potential impact on domestic solar power projects

---

The impact of higher solar PV module prices could be felt mostly by LSS4 projects which were awarded in March 2021. The bidding process took place from May to September 2020. When LSS4 was awarded in March 2021, the average solar module price rose slightly by about 5% compared to the average price in September 2020 when the bidding process was closed.

Solar power projects with signed fixed price turnkey contracts with EPCC contractors would not be impacted by the higher solar PV module prices. The EPCC contractors would have locked in the price with solar module suppliers. MARC also understands that some projects have locked in the project cost during the bidding process. For projects that have not signed EPCC contracts, procurement is expected to be delayed until module prices normalise.

At the current solar module prices, the project cost could be higher than forecast which in turn could affect project margin. Furthermore, the sponsor may have to fork out more money to fund the higher project cost as lenders typically fund up to 80% or on an 80:20 basis.

---

## Conclusion

---

In MARC's ratings universe, all solar power projects are fully operational except for one which is nearing construction completion. As such, these projects will not be affected by the current challenges posed by high solar module prices as compared to those that are under construction. Most of MARC's rated solar power projects are performing broadly in line with projections, supported by good weather conditions and low operational risk. MARC maintains a stable outlook on domestic solar power projects.

Solar project	Sukuk	Rating
Quantum Solar Park Malaysia Sdn Bhd	RM1.0 billion Sukuk Murabahah Green SRI Sukuk	AA- <i>JS</i>
Sinar Kamiri Sdn Bhd	RM245.0 million Green SRI Sukuk Wakalah	AA- <i>JS</i>
UITM Solar Power Sdn Bhd	RM240.0 million Sukuk Murabahah	AA- <i>JS</i>
UiTM Solar Power Dua Sdn Bhd	RM100.0 million Green SRI Sukuk	AA- <i>JS</i>
Leader Energy Sdn Bhd	RM260.0 million ASEAN Green Islamic Medium-Term Notes Programme	AA- <i>JS</i>
Sparks Energy 1 Sdn Bhd	Up to RM220.0 million ASEAN Green SRI Sukuk	AA- <i>JS</i>

-----  
Disclaimer  
-----

Copyright © 2021 Malaysian Rating Corporation Berhad and any of its subsidiaries or affiliates ("MARC") have exclusive proprietary rights in the data or information provided herein. This document is the property of MARC and is protected by Malaysian and international copyright laws and conventions. The data and information shall only be used for intended purposes and not for any improper or unauthorised purpose. All information contained herein shall not be copied or otherwise reproduced, repackaged, transmitted, transferred, disseminated, redistributed or resold for any purpose, in whole or in part, in any form or manner, or by any means or person without MARC's prior written consent.

Ratings are solely statements of opinion and therefore shall not be taken as a statement of fact under any circumstance. The information which MARC relies upon to assign its ratings includes publicly available and confidentially provided information obtained from issuers and its advisers including third-party reports and/or professional opinions which MARC reasonably believes to be reliable. MARC assumes no obligation to undertake independent verification of any information it receives and does not guarantee the accuracy, completeness and timeliness of such information. MARC OR ITS AFFILIATES, SUBSIDIARIES AND EMPLOYEES DISCLAIM ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY AS TO THE ACCURACY OR COMPLETENESS, MERCHANTABILITY OR FITNESS OF ANY INFORMATION CONTAINED HEREIN FOR ANY PARTICULAR PURPOSE AND SHALL NOT IN ANY EVENT BE HELD RESPONSIBLE FOR ANY DAMAGES, DIRECT OR INDIRECT, CONSEQUENTIAL OR COMPENSATORY, ARISING OUT OF THE USE OF SUCH INFORMATION. Any person making use of and/or relying on any credit analysis report produced by MARC and information contained therein solely assumes the risk in making use of and/or relying on such reports and all information contained therein and acknowledges that this disclaimer has been read and understood and agrees to be bound by it.

A credit rating is not a recommendation to buy, sell or hold any security and/or investment. Any user of this report should not rely solely on the credit rating and analysis contained in this report to make an investment decision in as much as it does not address non-credit risks, the adequacy of market price, suitability of any security for a particular investor, or the tax-exempt nature or taxability of payments made in respect to any security concerned.

Ratings may be changed, placed on MARCWatch, suspended or withdrawn at any time for any reason at the sole discretion of MARC. MARC may make modifications to and/or amendments in credit analysis reports including information contained therein at any time after publication as it deems appropriate.

MARC receives fees from its ratees and has structured reporting lines and compensation arrangements for its analytical members in a manner designed to promote the integrity of its rating process, and to eliminate and/or manage actual and/or potential conflicts of interest.

-----

**© 2021 Malaysian Rating Corporation Berhad**

Published by:

**MALAYSIAN RATING CORPORATION BERHAD** 199501035601 (364803-V)  
19-07, Level 19, Q Sentral, 2A Jalan Stesen Sentral 2, Kuala Lumpur Sentral, 50470 KUALA LUMPUR  
Tel: [603] 2717 2900 Fax: [603] 2717 2920  
Email: marc@marc.com.my Website: www.marc.com.my