

BNEF PV MODULE MAKER TIER 1 LIST, Q4 2016

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Bloomberg New Energy Finance has developed a tiering system for PV module makers based on bankability, to create a transparent differentiation between the hundreds of manufacturers of solar modules on the market. This basic categorisation has been used as an advertisement by certain manufacturers, but should never replace a proper due diligence process in product selection.

1. WHY DIVIDE THE PV MARKET INTO TIERS?

Bloomberg New Energy Finance is frequently requested by clients for a list of 'major' or 'bankable' suppliers - in common industry parlance, tier 1 suppliers - for use in manufacturing forecasts, preliminary competitor analysis, and other internal comparisons. It is very common for industry players to refer to 'tier 1' players, but these terms are seldom defined or described, which is unhelpful for firms outside the solar industry trying to get a basic overview.

We strongly recommend that module purchasers and banks do not use this list as a measure of quality, but instead consult a technical due diligence firm such as **Edif ERA (formerly OST Energy), Sgurr Energy, DNV GL, Black & Veatch, TUV, E3, STS Certified, Clean Energy Associates, Solarbuyer, Enertis or Leidos Engineering**. These would usually consider what factory the module comes from, as well as the brand, and give an informed opinion on whether the modules will perform as expected.

2. DEFINITIONS

'Bankability' - whether projects using the solar products are likely to be offered non-recourse debt financing by banks - is the key criterion for tiering. Banks, and their technical due diligence providers, are extremely unwilling to disclose their whitelists of acceptable products. Bloomberg New Energy Finance therefore bases its criteria in what deals have been closed in the past, as tracked by our database -14,900 photovoltaic financings worldwide as of November 2016.

We only tier manufacturers which actually own production facilities and sell under their own brands. Companies which outsource production under brand names are not tiered. We do not publish a tier 2 or 3 list.

3. TIER 1

Tier 1 module manufacturers are those which have provided own-brand, own-manufacture products to **five** different projects, which have been financed non-recourse by **five** different (non-development) banks, in the past two years. From Q1 2017 this will increase to **six**.

These 1.5MW+ deals must be tracked by our database, ie the project location (sufficiently to identify the project uniquely), capacity, developer, bank and module maker must be in the public domain. One exception is manufacturers which have filed for bankruptcy or a form of insolvency protection, or experienced a major default on bond payments; these are removed from the tier 1 list until further notice.

This classification is purely a measure of industry acceptance, and there are many documented examples of quality issues or bankruptcy of tier 1 manufacturers.

BNEF Solar Tiering Team
Contact by email only
solartiering@bloomberg.net

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4. CAN I SHARE THIS LIST ON THE INTERNET?

No. If you are a BNEF Solar Insight client, you can share with selected business partners who will not release it further. Pirate copies on the internet may be doctored and are published without BNEF's permission and against our terms and conditions.

5. TIER 1 MODULE MAKER LIST, Q4 2016

Company/ brand	In-house module capacity (MW/year)
Jinko Solar	6,500
GCL	6,000
Trina	6,000
JA Solar	5,500
Canadian Solar	5,000
Hanwha Q Cells	4,800
First Solar	3,200
Risen Energy	3,100
Talesun	2,800
Suntech/ Shunfeng	2,400
Seraphim	2,100
Chint/ Astronergy	2,000
Hareon	2,000
SunPower	1,800
ZNShine	1,600
SolarWorld	1,500
Renesola	1,500
China Sunergy	1,450
REC Solar	1,300
HT-SAAE	1,200
LG	1,100
Solar Frontier	1,050
Phono Solar*	1,000
ET Solar	1,000
BYD	1,000
Hyundai Heavy	600
S-Energy	530
Waaree	500
Tata	500
AU Optronics	435
Aleo Solar	250
Anjitek	170
Winaico	150
Total	70,035

Source: Bloomberg New Energy Finance Note: Methodology [here](#). Brands that do not own their own manufacturing capacity are not included here.

Subscription details

SOLAR INSIGHT

sales.bnef@bloomberg.net

Contact details

BNEF Solar Tiering Team	solartiering@bloomberg.net
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