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BloombergNEF Tier 1 PV Module Maker List, 1Q 2021

BloombergNEF 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.

This list was corrected to include Kyocera.

1. Why divide the PV market into tiers?

BloombergNEF 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), Wood Plc, PVEL, RETC LLC, Black & Veatch, TUV, E3, ATA Renewables, STS Certified, Clean Energy Associates, PI Berlin, Pvbuyer, Enertis, Oravia 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.

BloombergNEF therefore bases its criteria in what deals have been closed in the past, as tracked by our database – 31,751 new build photovoltaic financings worldwide as of February 2021.

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 We do not publish a tier 2 or 3 list.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 **six** different projects, which have been financed non-recourse by **six** different (non-development) banks, in the past two years. 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. Full methodology [here](#).

In China, India, Turkey and some other markets, non-recourse finance is rare and cannot be assumed. From 2Q 2017, we will therefore require additional evidence that a deal is non-recourse

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(public disclosure or a copy of the agreement with a bank) to include a financing in our database and therefore count it for tiering.

4. Can I share this list on the internet?

No. If you have accessed this through your BloombergNEF subscription, 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.

Table 1: Photovoltaic module manufacturers meeting BloombergNEF's tier 1 criteria as of 1Q 2021

Firm/ brand	Annual module capacity, MW/year	Firm/ brand	Annual module capacity, MW/year
ZNShine	6,000	Leapton Energy	600
Waaree*	2,000	Kyocera	600
VSUN Solar*	2,600	Jollywood*	3,000
Vikram Solar*	1,200	Jinneng/ Jinergy	2,700
Ulica Solar	1,000	Jinko*	30,000
Trina Solar*	21,500	Jetion	2,500
Talesun*	10,000	JA Solar*	23,200
Swelect	140	HT-SAAE*	2,000
Suntech*	10,000	Heliene	390
SunPower/ Maxison*	2,800	Hanwha Q Cells*	10,700
Sumec/ Phono Solar*	2,000	Hansol Technics	600
Shinsung	300	Haitai New Energy	5,000
Sharp	210	First Solar*	6,500
Seraphim / SEG*	5,500	ET Solar*	1,600
S-Energy	530	Eging	5,200
Risen Energy*	14,000	Chint/ Astronergy*	5,000
Renesola Yixing	1,500	Canadian Solar	16,100
Recom	460	BYD	2,400
REC Group*	1,800	Boviet*	1,500
Neo Solar Power/ URE	1,800	AE Solar	2,025
Longi*	45,000	Adani/Mundra*	1,500
		Total	253,455

Source: BloombergNEF Note: Methodology [here](#). Note: * denotes a company for which technical due diligence reports are available from PV Evolution Labs, PVEL. Contact Tara.Doyle@pvel.com for details. Brands are shown in reverse alphabetical order to avoid giving the impression that position in the list is significant.

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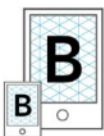
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