

## BloombergNEF Tier 1 PV Module Maker List, 1Q 2023

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.

The full name of HT-SAAE has been corrected to Shanghai Aerospace Automotive Electrical on page 3. Haitai Solar has been added to the list on page 2 and the total capacity corrected.

### 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 (now part of Intertek), 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 – 39,000 new build photovoltaic financings worldwide as of November 2022.

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 We do not publish a tier 2 or 3 list.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 (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?

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Table 1 shows the module makers which, as of 1Q 2023, meet our criteria of supplying projects with non-recourse financing from six different commercial banks in the last two years, as tracked by our database.

**Table 1: Photovoltaic module manufacturers meeting BloombergNEF's Tier 1 criteria as of 1Q 2023**

Firm/ brand	Annual module capacity, MW/year	Firm/ brand	Annual module capacity, MW/year
ZNShine*	10,000	Leapton Energy	2,000
Yingli*†	11,650	Jolywood*	3,000
Waaree*	9,000	Jinneng/ Jinery	4,000
VSUN Solar*	3,800	Jinko*†	70,000
Ulica Solar	3,000	Jetion	2,500
Trina*†	60,000	JA Solar*†	51,000
Tongwei	14,000	Heliene*†	950
Suntech	15,000	Hanwha Q-Cells*†	12,400
Sunpro Power	2,000	Hansol Technics	600
Sumec/ Phono Solar*	4,000	Haitai Solar	8,000
Solar-Fabrik	50	First Solar*†	11,200
Sharp	210	Exiom Group	700
Seraphim	7,750	ET Solar Inc*	2,000
Risen Energy*	25,000	Eging*	10,000
Renesola	3,000	DMEGC*	7,500
Recom†	1,200	Chint/ Astronergy*†	22,000
Neo Solar Power/ URE	1,800	Canadian Solar	31,400
Maxeon*	10,100	Boviet Solar*	1,500
Luxen Solar	2,200	Anhui Huasun*	2,700
Longi*†	80,000	AE Solar*	1,600
		<b>Total</b>	<b>508,810</b>

Source: BloombergNEF Note: Methodology [here](#). \* denotes a company for which technical due diligence reports are available from PV Evolution Labs, PVEL. Contact [Tristan.erion-lorico@pvel.com](mailto:Tristan.erion-lorico@pvel.com). † denotes manufacturers upon which RETC has recently conducted or is conducting technical due diligence. Contact [info@retc-ca.com](mailto:info@retc-ca.com) for details. Brands are shown in reverse alphabetical order to avoid giving the impression that position in the list is significant. Companies can download the dataset of financings [here](#).

We also exclude firms who are in default of significant financial obligations. Relevant documents (in Chinese) can be found on [the public platform where defaulters' information](#) is released.

Talesun meets the 6-bank criterion but has a debt record under 江苏中利集团股份有限公司. [An application for restructuring](#) of Jiangsu Zhongli Group (002309 CH), Talesun's parent company, has been submitted to the court by creditors. Jiangsu Zhongli Group is currently selecting an agency for restructuring, according to [announcement from local government](#).

GCL System (002506 CH) meets the 6-bank criterion but has debt records under parent company Golden Concord Group Ltd as 协鑫集团有限公司 and 协鑫集团有限公司 (Golden Concord Group Limited). GCL System and Talesun have therefore both been excluded.

New companies on this list include Chinese Anhui Huasun.

Dropping off the list this quarter due to not meeting the six-bank-two-year criterion are Jiangsu Akcome and Shanghai Aerospace Automotive Electrical (HT-SAAE).

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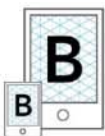
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