

Fact Sheet

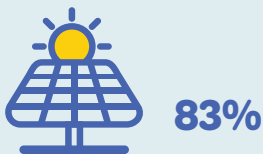
Race for the Trillion-dollar Renewables Investment Opportunities in the Asia Pacific

On a delivered project basis, the combined solar photovoltaic (PV) and offshore wind market exceeds **US\$1.1 trillion** in investment value from 2025 to 2050.

This estimate covers the markets of Japan, South Korea, Malaysia, Taiwan, Vietnam, Philippines, and Indonesia.

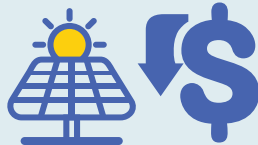
75% of investment value in solar and offshore wind projects come from balance of system supply chain elements, and not from making solar PV panels and wind turbines.

Seeking to domestically manufacture solar PV panels or offshore wind turbines is likely to be a costly proposition. China dominates the supply of PV panels and turbines, and its high vertical integration and overcapacity in manufacturing leads to intense competition with sinking prices and narrow margins.

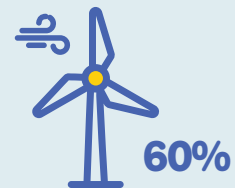


83%

China controls 83% of the global solar PV module supply chain and currently has PV manufacturing capacity more than double that of projected global demand.



China's over-capacity creates cutthroat domestic competition that slashes prices. PV module prices dropped over 50% in 2023, and continue to fall in 2024. This excess manufacturing capacity is likely to remain well after 2030.



60%

China manufactures over 60% of the world's wind turbines. Domestic competition is driving prices lower for offshore turbines of an ever-growing scale. The largest Chinese-made units now exceed 20MW each.



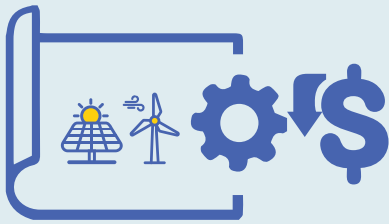
Outside of China, there are only a handful of wind turbine producers, all of whom are currently struggling to turn profits in a highly competitive market environment.



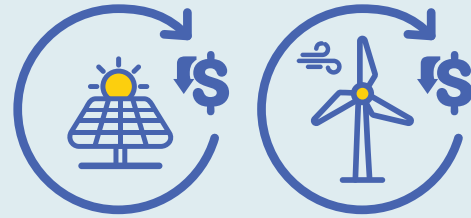
To compete with these low prices and over-capacity, a country would need to subsidize the cost of making panels or turbines, up to 200% above Chinese prices, which would undercut the low-cost-of-energy proposition solar and wind offers.

Balance of systems is where the opportunity resides.

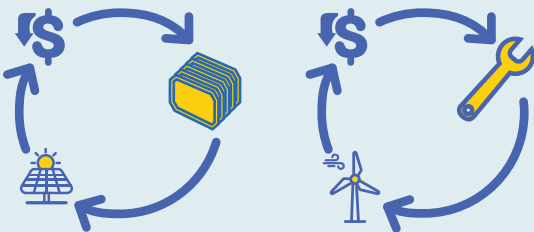
There is, however, a significant opportunity for domestic manufacturers and service providers in the Asia Pacific to supply the balance of system components to projects beyond panels and turbines:



Solar panels and wind turbines are the most hyper cost-competitive portions of renewable energy projects, and their falling prices mean that they represent a shrinking part of project value.



However, low prices for key equipment mean that project developers can deliver low lifecycle cost solar and wind farms, helping grow demand for these systems.



Meanwhile regional or domestic supply chain manufacturing and service market participants can coattail on these low prices to increase demand for their complementary outputs.



The massive scale requirements of the transition to renewables creates incredible economic development opportunities for industry and labor, domestically and regionally.

To retain the most value from renewable energy projects domestically, countries should encourage the manufacturing and fabrication of non-panel, non-turbine value added supply chain components, along with the provision of construction, installation and maintenance services.



Size of the Balance of Systems, Fabrication and Support Services Opportunity

Between 2025 and 2050, IEEFA estimates that the balance of systems supply and services exceeds US\$721 billion (bn) across solar PV projects and offshore wind farms, based on currently announced national decarbonization plans.

Here is how IEEFA estimates break out between solar and offshore wind based on current price trends and balance of systems supply chain localization potential in aggregate across the study countries:

Total Investment potential 2025 to 2050

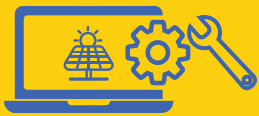


The regional solar PV market presents a **US\$394 bn** opportunity to 2050 creating **634 gigawatts (GW)** of solar generation.

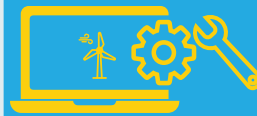


The regional offshore wind market is a **US\$621 bn** opportunity to 2050 enabling **239 GW** of offshore generation capacity.

Balance of systems opportunity



US\$296 bn or **75%** is associated with **non-panel, balance of systems investment**.



US\$419 bn or **68%** is associated with **non-turbine, supply, fabrication, logistics, and services markets**.

For offshore wind, additional investment in specialty marine vessels are needed



US\$75 to US\$97 bn of shipbuilding is required to meet Asia Pacific's offshore wind farm construction and servicing needs.

Localization potential



Over time, over **US\$346 bn** or **88% can be localized** in the country where the solar projects are being built.



While some components may still need to be sourced globally, **US\$364 bn can be eventually localized** to the market in which offshore wind farms are being built.

Over time, as scale within each country grows, a shift will likely move ex-Asia Pacific components into the region, and regional fabricators-producers into more local supply roles.

Based on the modest capacity additions most countries are projecting, the numbers indicated here represent only a base starting point.



Success in solar and wind does not necessarily mean manufacturing PV panels and turbines. There is tremendous value to be created and capitalized upon from the myriad of other components and services in the project supply chain.

Grant Hauber, Strategic Energy Finance Advisor, Asia



Recommendations



Seize project-level opportunity where the majority of value resides:

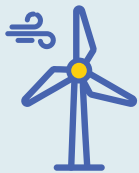
Focus on **balance of system (BOS)**, which indicates all the costs and components beyond the solar panel:

Domestic production of racking, tracking, fastening systems, cabling systems, controls and substation infrastructure, as appropriate and competitive

Project development services

Construction and installation services – civil, electrical, mechanical

Operation and maintenance services



Develop port infrastructure to support wind farm component fabrication and logistics needs:

Assemble big components including foundations, anchoring, and tower elements close to where they are to be installed.

Look to fabrication of turbine blades, transmission cabling systems, and component integration services where there is competitive advantage.



Invest in specialty vessels used to install and maintain offshore windfarms:

The traditional maritime industries of the Asia Pacific are well-positioned to supply wind farm needs regionally and beyond.

There is currently an acute shortage of specialty vessels of the size and configuration necessary to install the next generation of offshore wind turbines.

All of these new vessels will require berthing, crewing, operation and maintenance services that Asia Pacific economies are uniquely positioned to support.



Opportunities for domestic investment and national benefit present themselves in both solar PV and offshore wind in nearly all parts of the supply chain, as long as the demand for them is established.

Grant Hauber, Strategic Energy Finance Advisor, Asia

