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The Impact of Solar Tariffs on US Manufacturing

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The introduction of new solar import tariffs at a January 23, 2018, signing ceremony came with talk of a revival in US solar panel manufacturing.[1] Indeed, a number of foreign solar manufacturers openly explored the possibility of setting up facilities in the United States while awaiting the tariff decision. Now, two groups have publicly stated such intentions:

- Chinese manufacturer Jinko Solar will "finalize planning" for a facility in the United States, reportedly in Jacksonville, Florida.
- A newly merged trio of Taiwanese solar cell manufacturers intends to build a large panel manufacturing facility, but details remain sparse.

These plants may indeed move forward. Jinko Solar in particular has clearly done its homework and received board approval to proceed. However, the development of two facilities does not a renaissance make. Without additional, sustained policy support, the promise of a major wave of new US solar manufacturing will likely prove to be a mirage.

Many manufacturers will certainly explore building manufacturing capacity in the United States, but a combination of timing, market factors, and the tariffs themselves will put an end to most of these schemes.

There are two main reasons solar companies will think twice before investing tens, or hundreds, of millions of dollars into new US solar panel manufacturing industry.

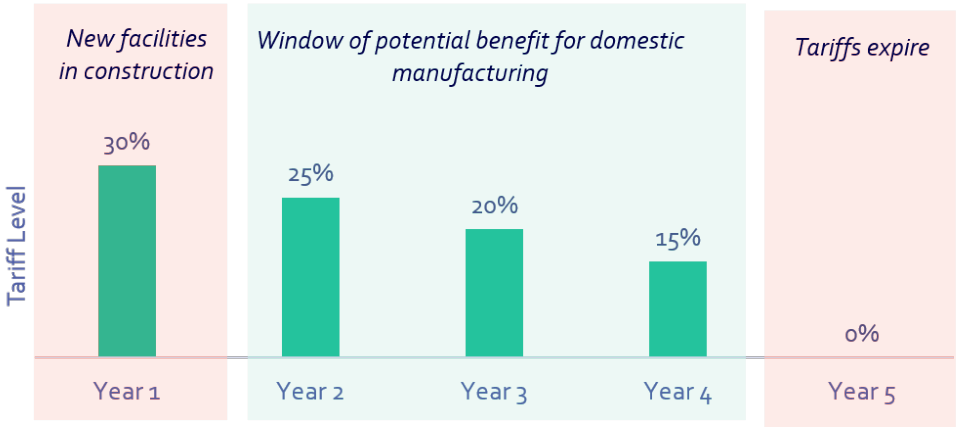
1. The benefit of domestic manufacturing will be short lived

By default, the tariffs announced last week will take effect almost immediately and decline annually over the course of four years before disappearing in 2022 (figure 1).[2] This presents a significant challenge for manufacturers. A new solar cell / module manufacturing facility typically takes at least 9–18 months to construct and begin operation at scale. Even if foreign suppliers have already done

[1] At the signing ceremony, President Trump said, "We'll be making solar products now much more so in the United States," adding, "Our companies have been decimated, and those companies are going to be coming back strong." See "Remarks by President Trump at Signing of Section 201 Actions," January 23, 2018, https://www.whitehouse.gov/briefings-statements/remarks-president-trump-signing-section-201-actions/.
[2] President Trump elected to impose tariffs for a four-year period, the maximum initial period allowed under Section 201 of the Trade Act of 1974. Remedies can later be extended for up to an additional four years following further ITC proceedings.

their homework and can pull the trigger right away, their new facility will likely receive a maximum of three years' worth of advantage thanks to the tariffs.

Figure 1: Section 201 Solar Tariff Timeline



Source: US Trade Representative Section 201 Solar Fact Sheet

And even that window is uncertain. On one hand, the tariffs may be extended up to an additional four years at the discretion of the White House (and whoever occupies it in four years). However, it is just as likely that the tariffs ultimately last *less than* four years.

Historically, when the United States has imposed so-called safeguard measures, such as tariffs under Section 201 of the Trade Act of 1974, other countries have successfully petitioned against those measures at the World Trade Organization.[3] This has then led to the threat of retaliatory punitive tariffs, which pushed the United States to allow its tariffs to sunset early.

Prior to this year, the United States had imposed safeguard remedies 19 times. In 12 of those 19 cases, the measures lasted less than 4 years. The average tenure across all safeguards was 3.6 years. Since 1990, the average tenure has only been 2.3 years.

In this case, with this administration, it is entirely possible that the tariffs will last the full four years, regardless of a WTO challenge. But that's a big risk for a solar manufacturing company to take when considering a major investment.

Moreover, there is evidence that the benefits of manufacturing in the United States will erode quickly after the tariffs subside. A 2013 Georgetown University study of three previous Section 201 trade cases found that "none of the three industries achieved sustained competitiveness after safeguards terminated."

[3] The United States has lost every Section 201 safeguard action that received a WTO challenge, most recently in the steel industry. In that case, remedies ultimately lasted only 1.7 years. See Pickard and Kimble for more detail on WTO challenges of safeguard remedies.

2. The economic advantage may never materialize

Even if manufacturers are comfortable with the short benefit window, they may find the economic benefit provided by these new tariffs elusive.

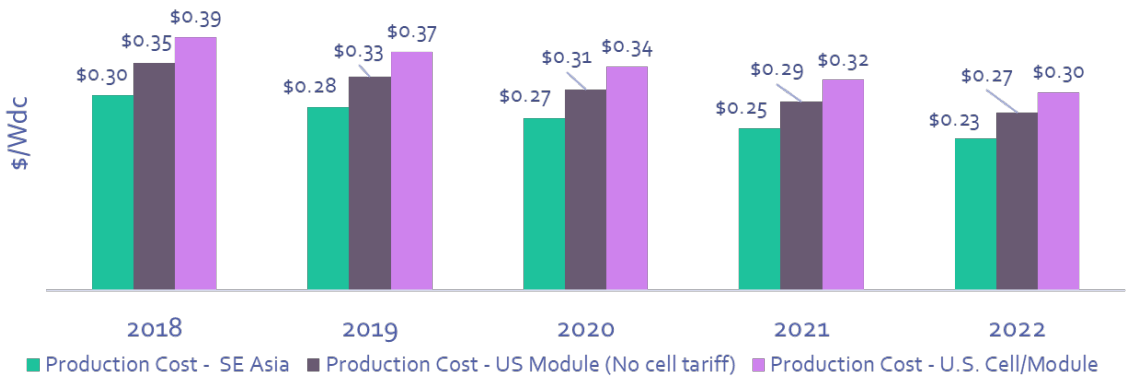
Let's consider three imaginary solar manufacturing scenarios, all of which are producing the same type of solar module (multicrystalline PERC silicon):

- A scaled-up, integrated cell/module facility in Southeast Asia, shipping to the United States and paying the tariffs
- A US module assembly facility, shipping cells from Southeast Asia under the 2.5 GW exemption included in the tariff decision (which is discussed more later)
- A scaled-up, integrated cell/module manufacturing facility entirely in the United States

Although manufacturing-cost data is scarce, one estimate from GTM Research estimates that at today's costs, the Southeast Asian facility will produce modules for $0.30/W, as compared to $0.35/W for the US module assembly and $0.39/W for the all-US option.[4]

Further, let's assume that manufacturing costs for all three options decline at 6 percent per year through 2022—which compresses the cost difference as time goes on.

All-In Production Cost, 2018–2022

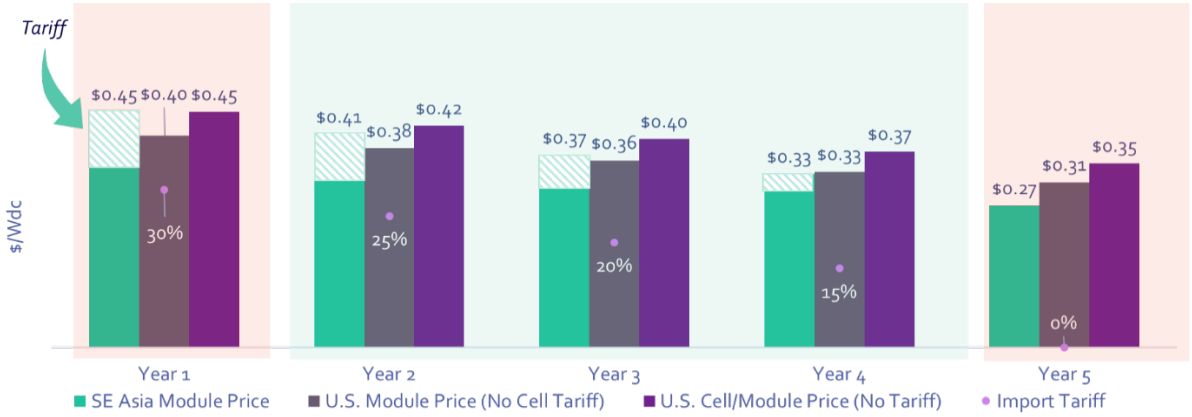


Source: GTM Research

[4] Another estimate comes from Seraphim Solar, a China-based solar module manufacturer with experience producing in both Asia and the United States. Seraphim estimates that the module assembly production cost in Vietnam is $0.06/W–$0.07/W lower than it would be in the United States. In order to remain conservative, this analysis assumes a $0.05/W differential for module assembly.

However, the tariffs also decline each year, eroding the advantage of domestic manufacturing. If all three facilities aim to attain the same 15 percent gross margin on their sales, here are the final prices at which they could sell into the US market over the next five years.

Average Selling Price (ASP) During and After Tariffs



Source: GTM Research

The results are striking.

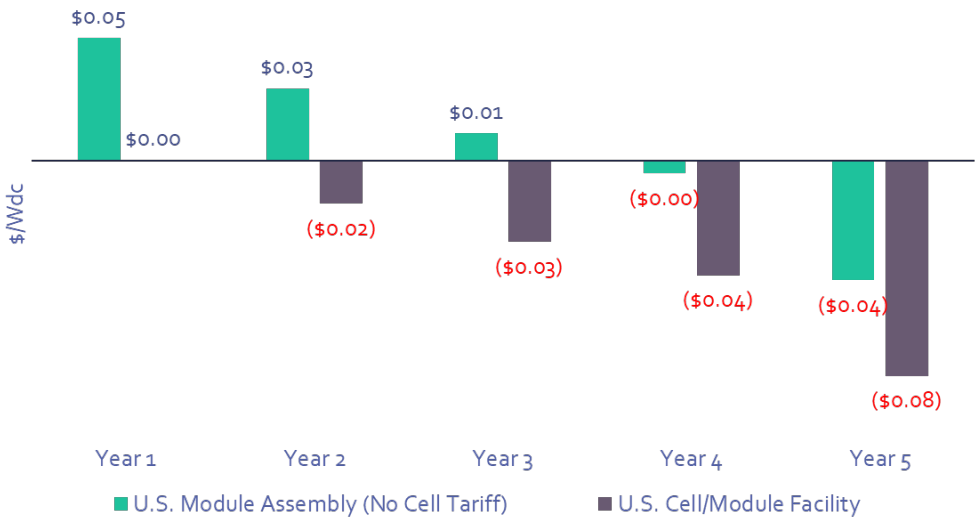
- Given the difference in manufacturing cost, a US cell/module facility may already be uncompetitive with solar panels coming from Southeast Asia by the time it begins operation in year two.

- Focusing exclusively on module assembly (and shipping under the 2.5 GW cell exemption) does provide a slight advantage, but even that disappears in year three.[5] Additionally, this exemption will support, at most, roughly one gigawatt of new module assembly. There are already nearly two gigawatts of US module capacity in operation that will likely operate at full steam thanks to the tariff decision, leaving little room for new entrants.

[5] This analysis is consistent with Goldman Sachs, which has estimated that Jinko Solar's planned module assembly facility would need to achieve costs below $0.375/W with 7.5 percent annual declines, or sustain pricing over $0.35/W for the next five years, in order to achieve an attractive return. Goldman Sachs views both scenarios as "unlikely."

Here is the domestic pricing advantage compared to Southeast Asian panels over time:

Domestic Manufacturing Price Advantage During and After Tariffs



Source: GTM Research

Given these prices, it is difficult to imagine a wave of new entrants. The tariffs are simply too short lived and too small, and if manufacturing does not return to the country, the impact of the tariffs will largely just be higher prices and fewer installations over the next four years.

What Might Actually Drive Manufacturing Growth

President Trump's solar tariffs will not be enough to drive a new manufacturing renaissance in the United States. But now that they're a reality, they could supplement other actions that would more directly improve the value proposition of making solar panels in America.

Before the president's announcement, the authors identified six tariff alternatives that could support US solar manufacturing. Generate Capital president Jigar Shah recently expanded upon one of these suggestions, arguing that the United States should direct the money collected from previously existing solar tariffs to directly subsidize a domestic solar "gigafactory."

So far, the additional efforts have been paltry. The US Department of Energy announced a new "American-Made Solar Prize" to accelerate US manufacturing but will only award $3 million through the program—not nearly enough to move the needle on a single manufacturing facility, let alone many of them.

If the United States is serious about bringing solar panel manufacturing home, the policy options abound, but it is unlikely that the newly imposed import tariffs will be effective on their own.

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