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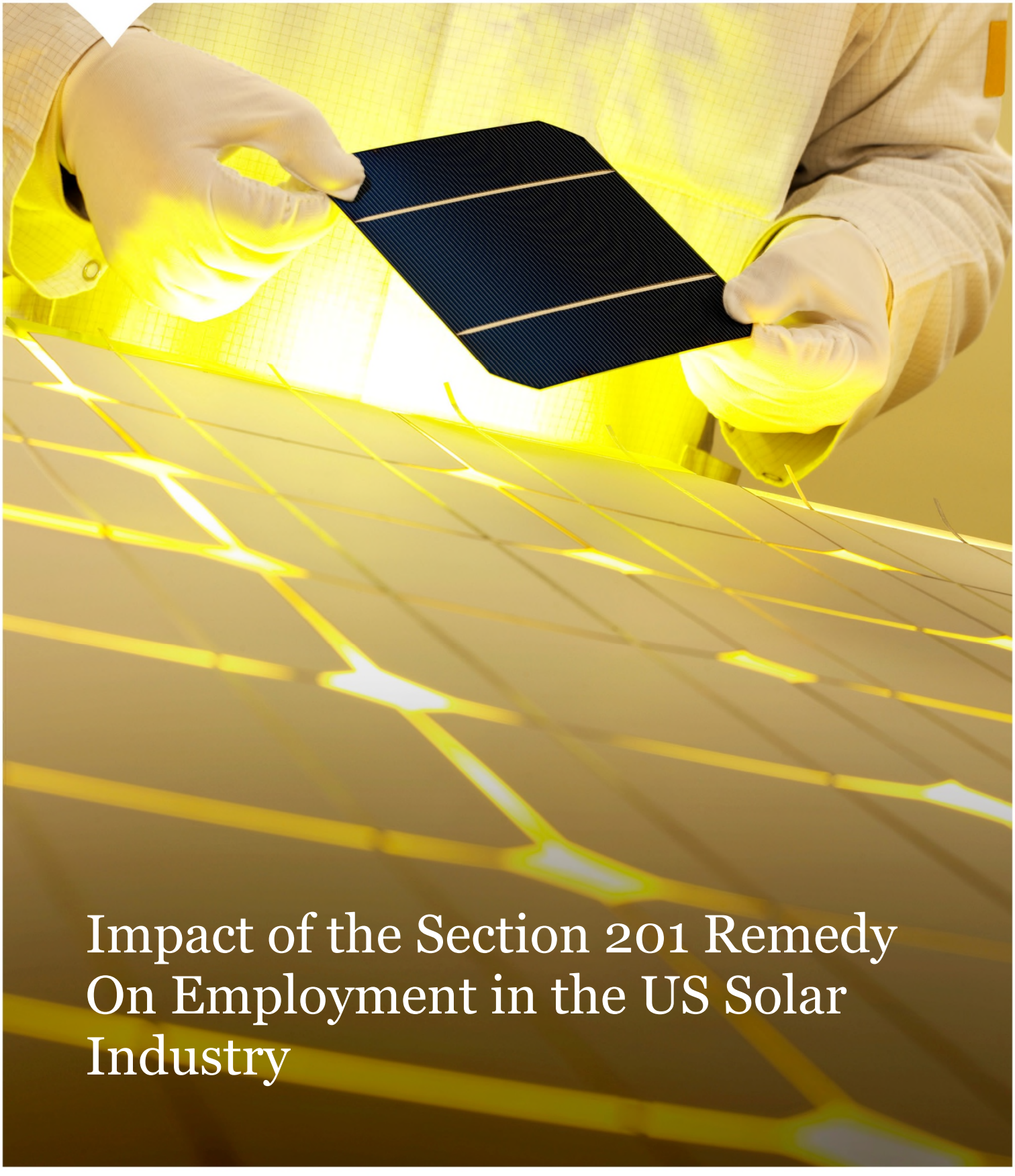


Impact of the Section 201 Remedy On Employment in the US Solar Industry

Net Increase of Between at least 115,000 and 144,000 Jobs Across Entire US Solar Industry.

US Solar Manufacturing Employment Could Grow by 45,000 New Jobs

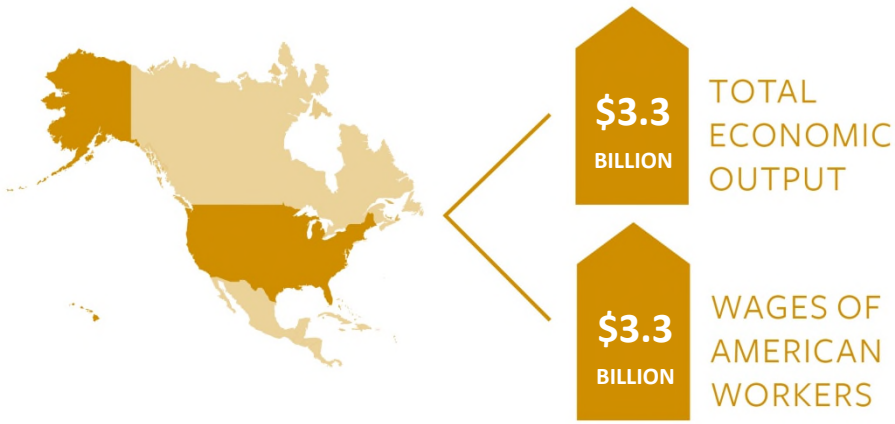
144,000 US SOLAR INDUSTRY JOBS

45,000 MANUFACTURING JOBS

Summary

An affirmative finding by the US International Trade Commission and the imposition of effective remedies in its Section 201 investigation on imports of solar cells and modules would result in a net gain in employment of at least between 114,796 and 144,298 jobs for the US solar industry, including the upstream industries that manufacture critical components used in the production of solar cells and modules over the next five years. This job growth includes as many as 45,000 US manufacturing jobs in the solar cell and module manufacturing segment and the upstream sectors that cell and module manufacturing supports. It also includes an increase of 98,020 US non-manufacturing jobs, including 65,830 US installer jobs.[1]

Estimates that include the restoration of existing manufacturing capacity, plus the likelihood of at least 2 GW of new US production capacity to come online in the US would increase US solar cell and module manufacturing employment by between 37,500 and 45,500 and increase economic output and wages paid by $2.5 billion and $3.3 billion each. Further, the imposition of effective remedies would ensure American companies continue and increase R&D and capital investment in the US, which would generate significant economic benefits that are not captured in the job and economic output estimates noted above.



[1] These estimates differ from analysis released by the Solar Energy Industry Association (SEIA) because of a difference in baselines. SEIA's analysis compared projected jobs without a remedy and without including the impact of lost manufacturing jobs to projected jobs with a remedy imposed. Thus, SEIA's analysis compares two projections with no reference to actual jobs. This analysis uses actual job levels in 2015 as its baseline. 2015 employment data represent the latest data available from the National Solar Jobs Census.

Background

The global surge in low priced imports has caused US Solar cell and module manufacturers to shut down and lay off thousands of Americans from good paying, full time jobs. The surge in imports is the result of massive overcapacity, particularly in Asia and driven first by significant, illegal subsidization of Chinese producers as well as subsequent efforts by Chinese producers to develop manufacturing capacity in third-countries, such as Malaysia, Vietnam and Thailand, as a means of avoiding trade measures imposed to level the playing field for US manufactures and remedy the dumping of subsidized imports from China. This growth in production capacity has resulted in a massive and growing global overcapacity.[2]

The global surge in imports has decimated the US solar manufacturing sector even as demand in the US for solar power has grown significantly. The negative impact on the US solar sector is widespread. As noted by Greentech Media "[T]he brutal year for many businesses: Public solar companies are getting thrashed, module oversupply is causing severe financial pain for manufacturers, and even downstream companies who've benefited from cheaper equipment and growing demand have struggled."[3] Since 2010, installed solar capacity in the United States has grown from 929 MW in 2010 to 14.8 GW in 2016.[4] Yet at the same time, US solar manufacturing jobs and production has been decimated. The strong increase in US demand has been met overwhelmingly by imports. In 2010, the Solar Foundation estimated that there were 24,916 jobs in the solar manufacturing sector.[5] Had the US manufacturing sector captured a proportional share of the increase in demand, then US employment in the solar manufacturing sector should have nearly doubled to 40,418 jobs in 2016. Instead, employment in the US solar manufacturing sector has been slashed as the surge in low-priced imports has filled demand.

Imposition of effective remedies under the Section 201 investigation can restore the US market to an economically rational state, allow US manufacturers to compete on a level playing field against imports and restore and increase American manufacturing jobs, while continuing to grow jobs in the downstream installation segment, and related financing, development and complementary manufacturing segments.

In order to estimate the total increase in jobs and economic benefits from the imposition of effective remedies this analysis starts with a review of the impact of the remedies proposed in the petition on market prices and installations. This is then supplemented with an analysis on the upstream industries that support the US solar manufacturing sector using the Regional Input-Output Modeling System (RIMS II), developed and maintained by the Bureau of Economic Analysis (BEA), Department of Commerce.

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[2] See, PV Tech, "Global solar PV manufacturing capacity expansion plans rebound in Q1" (Apr. 12, 2017).

[3] A Journey to the Center of the Solar Industry, Podcast by Stephen Lacey, June 7, 2017, GTM, available at https://www.greentechmedia.com/articles/read/a-journey-through-the-solar-industry.

[4] 2016 National Solar Jobs Census, The Solar Foundation, p. 7, available at http://www.thesolarfoundation.org/national/

[5] 2010 National Solar Jobs Census, The Solar Foundation, p 11, available at http://www.thesolarfoundation.org/national/

Estimate of Solar Installations and Non-Manufacturing Jobs

GTM Research has estimated that as a result of the remedies proposed in the petition market prices for installed solar systems would stabilize at late-2015/early-2016 levels and installed US solar capacity would increase by at least 36 GW over the 2018 to 2022 time period. The GTM analysis suffers from significant flaws, fails to account for the impact of any new US manufacturing growth and likely significantly understates the rate of growth in installed capacity that would occur if an effective remedy is imposed. [6] However, solely for the purposes of this analysis we have incorporated GTM's forecast knowing that this forecast likely underestimates the increase in installed capacity and therefore employment levels in the non-manufacturing segments of the industry.

GTM's projection of an additional 36 GW of new installed capacity represents an increase of 44 percent in installed capacity compared to the prior five year period (2011-15) during which approximately 25 GW of capacity was added.[7] Between 2011 and 2015, non-manufacturing jobs in the solar industry increased by 102,002 or 134 percent.[8] Of this amount, 67,428 of the new jobs were installer jobs and installer jobs increased by approximately 128 percent. Thus, an increase in installed US capacity of approximately 25 GW is associated with an increase in non-manufacturing employment in the US solar sector of approximately 100,000 jobs. Applying a similar trend analysis to the projected increase in capacity of 36 GW over the five year period 2018-22 results in an increase of 98,020 new non-manufacturing jobs over 2015 levels.[9] Of these jobs 65,830 are estimated to be installer jobs.[10]

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[6] US Solar Outlook Under Section 201: The Trade Case's Impact on US Solar Demand, GTM Research, June 2017, at Figure 1.2 p. 5, available at https://www.greentechmedia.com/research/report/us-solar-outlook-under-section-201. For example, GTM Research's worst case estimate that an additional 25 GW of new capacity would be installed between 2018 and 2022 is based on an error in its methodology where it double-counted the impact of the REMEDY PROPOSED IN THE 201 PETITION. Further, it should be noted that even GTM's projected increase of 36 GW in installed capacity is lower than prior GTM analysis. Application of 2015 price levels to prior GTM forecasts of installations result in a projected increase of installed capacity of over 37 GW.

[7] 2015 National Solar Jobs Census, The Solar Foundation, p. 20, available at http://www.thesolarfoundation.org/wp-content/uploads/2016/10/TSF-2015-National-Solar-Jobs-Census.pdf.

[8] Ibid at 11.

[9] Calculation applies ratio of the projected increase in installed capacity to the increase in capacity 2015 times the number of non-manufacturing jobs in 2015 (or (2022 net installation/2015 net installations) * 2015 jobs). There are a number of alternative methods that could be used to estimate the rate of growth in non-manufacturing jobs over the 2018-22 period. The method used here applies conservative assumptions about the relationship between installed capacity and non-manufacturing job growth. Under this method there is assumed to be no increase in non-manufacturing jobs until projected installations increase at a greater rate than 2015 installations. 2015 installation levels represent record level installations. Alternative methods, such as simply extrapolating out historical rates of growth, would result in even larger increases in non-manufacturing employment levels. Regardless of which method is applied, in every instance, non-manufacturing employment increases relative to 2015 levels.

[10] Calculation applies ratio of installer jobs to total non-manufacturing jobs for the 2011-15 period to the total of new non-manufacturing jobs projected for the 2018-22 period.

Estimate of US Cell and Module Manufacturing Jobs

Solar cell and module manufacturing are high value-added operations that pay high-wages to full-time employees. Solar cell and module manufacturing also support high-wage, full-time jobs in the upstream industries that support cell and module manufacturing. These sectors, including aluminum extrusions, silicon crystals, and electronic components, would benefit from the increased demand that a restored US solar manufacturing sector would generate. This results in the cell and module manufacturing sector having a high multiplier effect or the measure of the sector's impact on the broader US economy. In comparison, as noted by the Solar Foundation, installer jobs "represent the end of the solar value chain" and as a result have a much lower multiplier effect than the cell and module manufacturing sector.[11]

, it is appropriate to rely upon the methodology developed by the Bureau of Economic Analysis (BEA) of the US Department of Commerce in estimating the impact on the US economy of a restoration of US cell and module manufacturing. Specifically, the analysis uses BEA's Regional Input-Output Modeling system (RIMS II) methodology and multipliers.[12]

As a first step in the analysis, the model estimates the economic impact of restoration to full operating capacity and production of existing US cell and module production capacity, specifically 970 MW of US cell manufacturing capacity and 865 MW of US module manufacturing capacity.[13] The analysis assumes total cell production costs of between $0.22 and $0.33 per watt and module production costs of between $0.22 and $0.24 per watt.[14] BEA multipliers were used to calculate the additional economic impact that the increased demand generated by the operation of these production facilities would have on the broader US economy. [15] Thus, the BEA models report both the direct economic impact and the indirect economic impact that is derived from demand for the goods and services necessary to support the direct economic activity. The industry multipliers were taken from the BEA RIMS database.[16] In very short order, a remedy that at a minimum restores existing US solar cell and module production capacity would result in an increase of at least between 12,429 to 16,141 manufacturing jobs; [17] and as detailed below, projections show at least 2 GW of new US production capacity, and thus US solar cell and module manufacturing employment would increase by between 37,500 and 45,500.

In addition to restoration of existing capacity, it is highly likely that imposition of an effective remedy and stabilization of price levels in the US would result in substantial new investment in U. S. solar cell and module manufacturing capacity. This investment in new production capacity would create significant new US

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[11] 2016 National Solar Jobs Census, The Solar Foundation, p. 17, available at http://www.thesolarfoundation.org/national/.

[12] See generally https://blog.bea.gov/tag/rims-ii/. Model specifications and applications were derived from BEA publications: http://www.bea.gov/scb/pdf/regional/perinc/meth/rims2.pdf and http://bea.gov/regional/pdf/rims/RIMSII_User_Guide.pdf.

[13] These estimates are based on restoration of full capacity and production of Suniva facilities in Georgia and Michigan and SolarWorld facilities in Oregon as well as an estimate that an additional 50 MW of idled cell production and 115 MW of idled module production across the US are restored, or approximately 50 percent of idled capacity.

[14] These costs estimates are based on surveys of US and foreign producers, market analysis services, and US government research publications.

[15] Specifically, the BEA multipliers used are taken from the NAICS sectors 334413 and 33131B. The analysis incorporates BEA Type II multipliers as the analysis assumes the majority of the wages and benefits paid are consumed in the region.

[16] See BEA RIMS II Online Order and Delivery system, available at https://www.bea.gov/regional/rims/rimsii/

[17] These estimates assume only existing, but idled capacity is operating at full capacity and even then only a limited percentage of idled capacity is restarted.

manufacturing employment. Under an assumption that effective remedies induce sufficient additional investment to increase US cell production capacity to 3 GW and US module capacity to 2.6 GW, US cell and module manufacturing employment would increase by between 37,515 and 45,491 restored and new manufacturing jobs. Economic output and wages paid in the cell and module manufacturing sectors would increase by between $2.5 and $3.3 billion each.

Conclusion

The significant increase in installed US solar capacity, the restoration of US manufacturing and the increase in jobs and US economic output should put to rest any concerns that the 201 petition will damage the US solar market.[18] Indeed, the analysis prepared by GTM Research shows that significant increases in installed capacity would continue and non-manufacturing job growth would continue at a rapid pace, growing by over 80 percent. In addition, US cell and module manufacturing production and employment would be restored which would also benefit manufacturing jobs in the supporting upstream sectors. Therefore, the impact of the imposition effective remedies under Section 201 would restore thousands of US manufacturing jobs and would result in a net increase in US jobs, wages, and economic output.

[18] http://www.seia.org/news/seia-statement-solarworld-joining-section-201-trade-case