



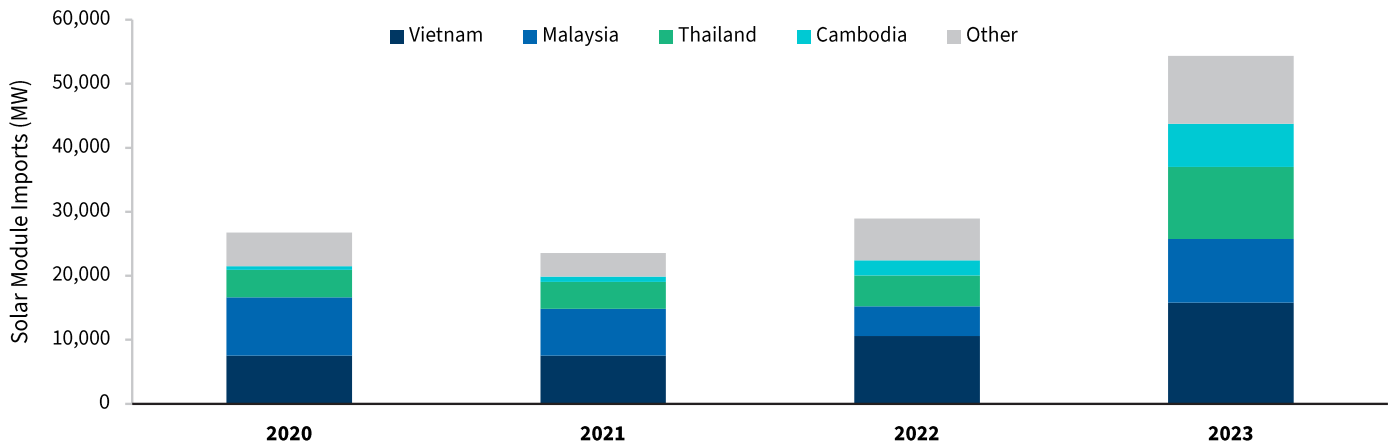
# Onshoring American Solar Equipment Manufacturing Spurs Job Creation

In August 2022, Congress made the onshoring of solar equipment manufacturing a national priority by passing of the Inflation Reduction Act (“IRA”). The IRA introduced the 45X Advanced Manufacturing Production Credit (“45X”), providing a per unit tax credit for certain components used in key parts of renewable energy plants, with the goal of incentivizing the localization of supply chains. The act also extended a pair of tax credits — the Production Tax Credit (“PTC”) and the Investment Tax Credit (“ITC”) — and created bonus tax credits that provide incremental credit for either building the project in an energy community<sup>1</sup> or using a certain percentage of domestic content in the project’s construction.

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These tax incentives decrease the overall cost of domestic production, helping American manufacturers compete with the rest of the world. The job creation potential of incentivizing domestic production in the renewable energy sector can already be seen, with more than 115 new or expanded renewable energy manufacturing facilities announced since the passing of the IRA — 75 of which are dedicated to solar energy production.<sup>2</sup> Additionally, the National Renewable Energy Laboratory (“NREL”) projects significant growth in the utility-scale solar sector in the coming years.<sup>3</sup>

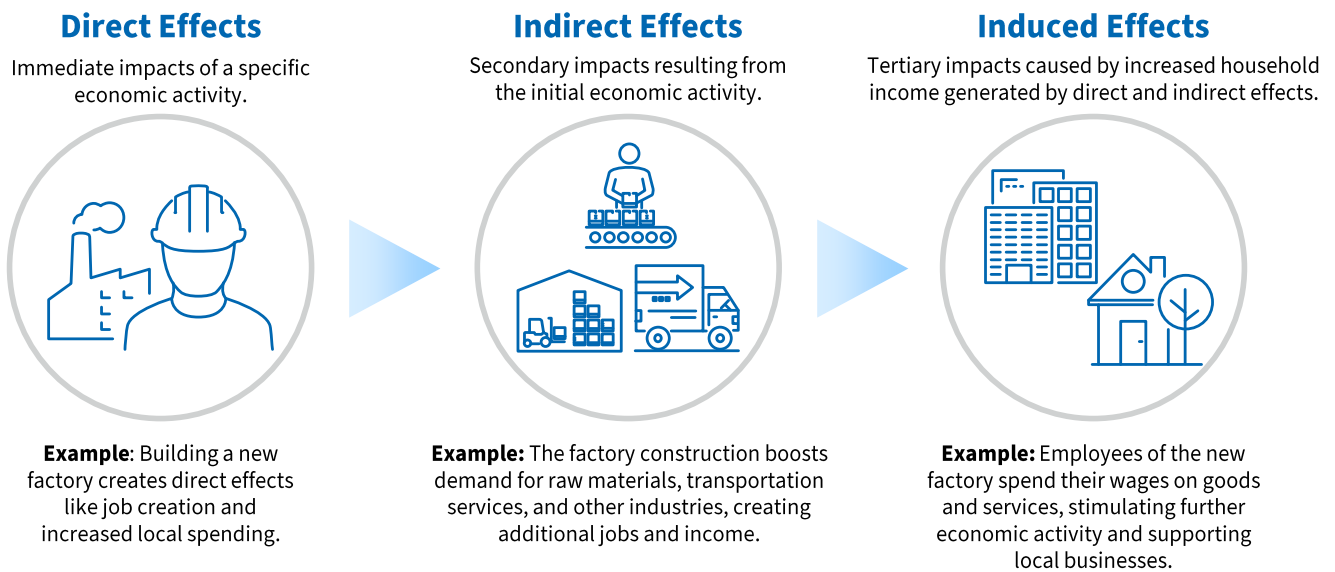
Figure 1 – U.S. Solar module imports by year and country of origin



To analyze the impact onshoring solar equipment manufacturing could have on the U.S. economy and job market, FTI Consulting modeled the economic and fiscal impacts of a typical solar plant using the NREL’s market price analysis of a 100 megawatt (“MW”) utility-scale solar plant without energy storage.<sup>4</sup>

NREL provides a detailed breakdown of solar plant development and construction costs by seven major categories: module, inverter, structural balance of system, electrical balance of system, fieldwork, office work and other.<sup>5</sup> Our experts mapped each item provided in NREL’s breakdown to an economic sector and utilized the IMPLAN model — an input-output (“IO”) model capable of illustrating how an initial additional unit of employment or spending affects the rest of the economy through direct, indirect and induced effects, described in Figure 2 — to estimate the total impact across various economic metrics (employment, output, GDP, labor income, federal taxes and state and local taxes) that results from developing and constructing a 100 MW solar plant.

Figure 2 – IMPLAN Process



We created two scenarios, comparing the business-as-usual (“BAU”) state of domestic solar manufacturing — in which at least half of all solar panels installed are made in Southeast Asia using Chinese solar cells — with an “All-American” (“AA”) scenario that contains 100% domestic content. **Our findings demonstrate that American-made solar energy leads to more jobs, higher GDP and increased labor income and tax revenue.**

### BAU Scenario

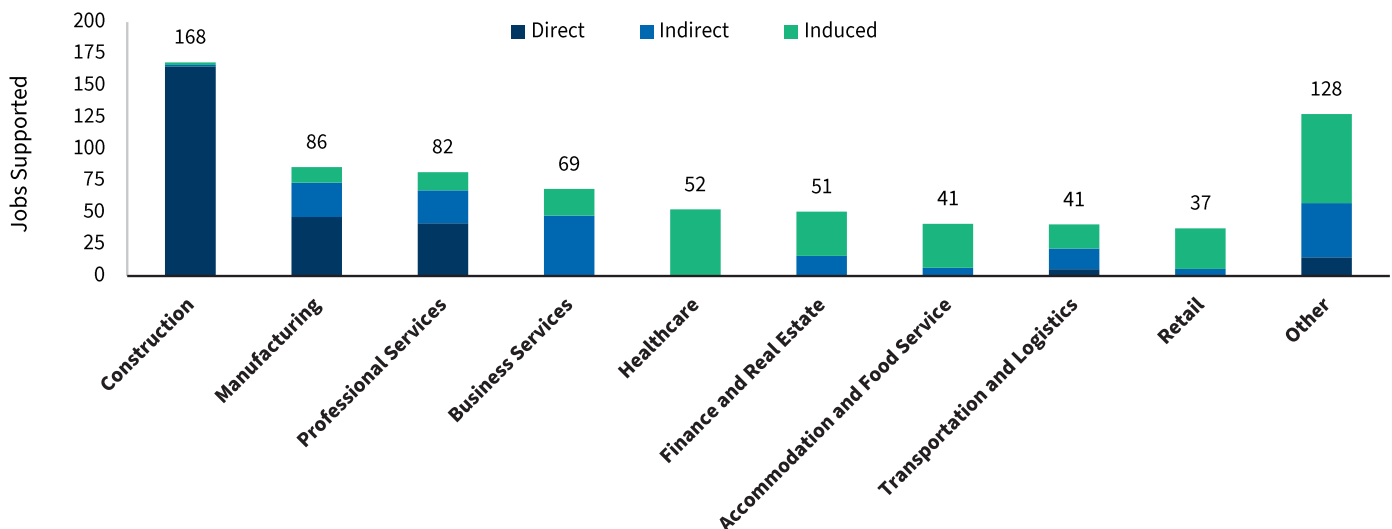
Of the approximately \$116.1 million investment required for the construction phase of a typical 100 MW solar plant, the BAU scenario sees \$75.5 million spent domestically, with the remaining \$40.6 million spent internationally. Development and construction of each solar plant supports an estimated 754 jobs across the United States, with roughly 36% of those jobs supported directly, 25% of them supported by the supply chain (“indirect jobs”) and 39% induced via direct and indirect employee spending (“induced jobs”). In this scenario, the development and construction of each plant would support approximately \$191.7 million in economic output, \$115.2 million in GDP and \$75 million in labor income. In total, spending per job supported totals nearing \$154,000. In addition, for every dollar spent on the construction of a solar plant in the BAU scenario, there is an increase in economic output of approximately \$1.65, \$0.99 in GDP and \$0.65 in labor income. Each dollar spent also generates \$0.20 in combined federal and state and local tax revenues.

Table 1 - BAU Scenario Economic and Fiscal Impacts (per 100 MW Facility)

IMPACT	UNITS	DIRECT	INDIRECT	INDUCED	TOTAL
Employment	Jobs (#)	273	189	293	754
Output	2024 \$ millions	\$73.2	\$56.6	\$62.0	\$191.7
GDP	2024 \$ millions	\$38.4	\$38.4	\$38.4	\$115.2
Labor Income	2024 \$ millions	\$25.0	\$25.0	\$25.0	\$75.0
Federal Taxes	2024 \$ millions	\$6.0	\$4.1	\$4.8	\$15.0
State and Local Taxes	2024 \$ millions	\$2.1	\$2.4	\$3.5	\$8.0

As shown in Figure 3, the construction sector would experience the largest employment increase from the development and construction of a 100 MW solar plant, with 168 jobs supported — nearly all of them direct jobs. This is followed by the “other” category, which includes direct impacts to the equipment rental sector, indirect impacts to the wholesale trade and other sectors, and induced impacts to consumer-driven sectors, with an estimated 128 jobs supported. There is also a significant number of jobs supported in the manufacturing and professional services sectors, with a substantial portion of the jobs supported directly.

Figure 3 - BAU Scenario Job Impacts by Sector (per 100 MW Facility)





## AA Scenario

Table 2 presents the AA scenario, which illustrates the economic and fiscal impacts of completely localizing supply chains, wherein all components are manufactured domestically. Due to onshoring, the construction of a 100 MW plant with 100% domestic content is projected to have a considerable impact on employment above and beyond the BAU scenario, as it would support approximately 1,023 total jobs, 32% of which are direct jobs, 28% indirect jobs and 40% induced jobs. The sizable increase in domestic manufacturing associated with onshoring stimulates upstream suppliers, and strong wages associated with these jobs support additional downstream impacts.

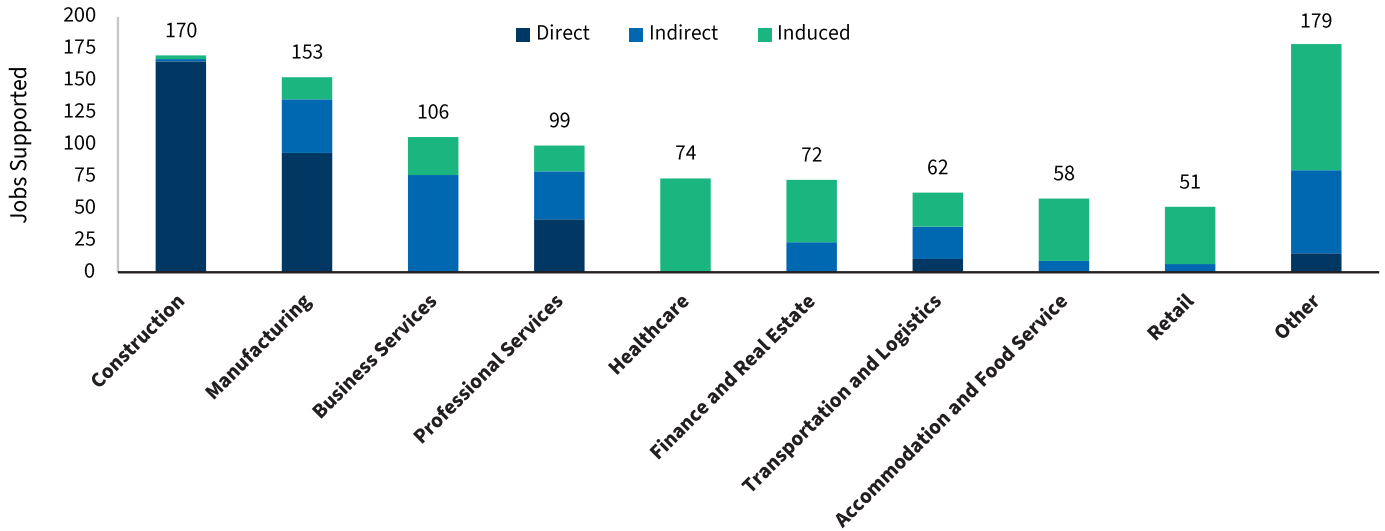
*Table 2 - All-American Scenario Economic and Fiscal Impacts (per 100 MW Facility)*

IMPACT	UNITS	DIRECT	INDIRECT	INDUCED	TOTAL
Employment	Jobs (#)	326	287	411	1,023
Output	2024 \$ millions	\$105.1	\$88.0	\$87.0	\$280.1
GDP	2024 \$ millions	\$50.4	\$50.4	\$50.4	\$151.2
Labor Income	2024 \$ millions	\$32.6	\$32.6	\$32.6	\$97.7
Federal Taxes	2024 \$ millions	\$7.9	\$6.4	\$6.8	\$21.1
State and Local Taxes	2024 \$ millions	\$2.8	\$3.6	\$4.9	\$11.3

Under the AA scenario, each 100MW solar plant is expected to produce \$280.1 million in economic output, \$151.2 million in GDP and \$97.7 million in labor income. In addition, this scenario would support \$21.1 million and \$11.3 million in federal and state and local tax revenues, respectively. In total, spending per job supported totals nearing \$113,000 — a major decrease from the BAU scenario — highlighting the fact that more of the solar plant investment stays in the United States. Additionally, for every dollar spent on the construction of a solar plant in the AA scenario, FTI Consulting’s analysis estimates an increase in economic output of approximately \$2.41, \$1.30 in GDP and \$0.84 in labor income.

As shown in Figure 4, the plant utilizing 100% domestic content supports an estimated 36% more jobs during construction than the BAU plant. Much of this increase is from the manufacturing sector, where the number of jobs supported increases by nearly 80%. This increase in manufacturing activity also bolsters upstream supply chain and downstream induced impacts, leading to a sizeable increase in jobs in the other category, which includes sectors like wholesale trade and entertainment. Other important categories include direct impacts from the construction sector, indirect impacts from business services and induced impacts primarily driven by consumer spending in areas like healthcare, food service and finance and real estate.

Figure 4 - All-American Scenario Job Impacts by Sector (per 100 MW Facility)



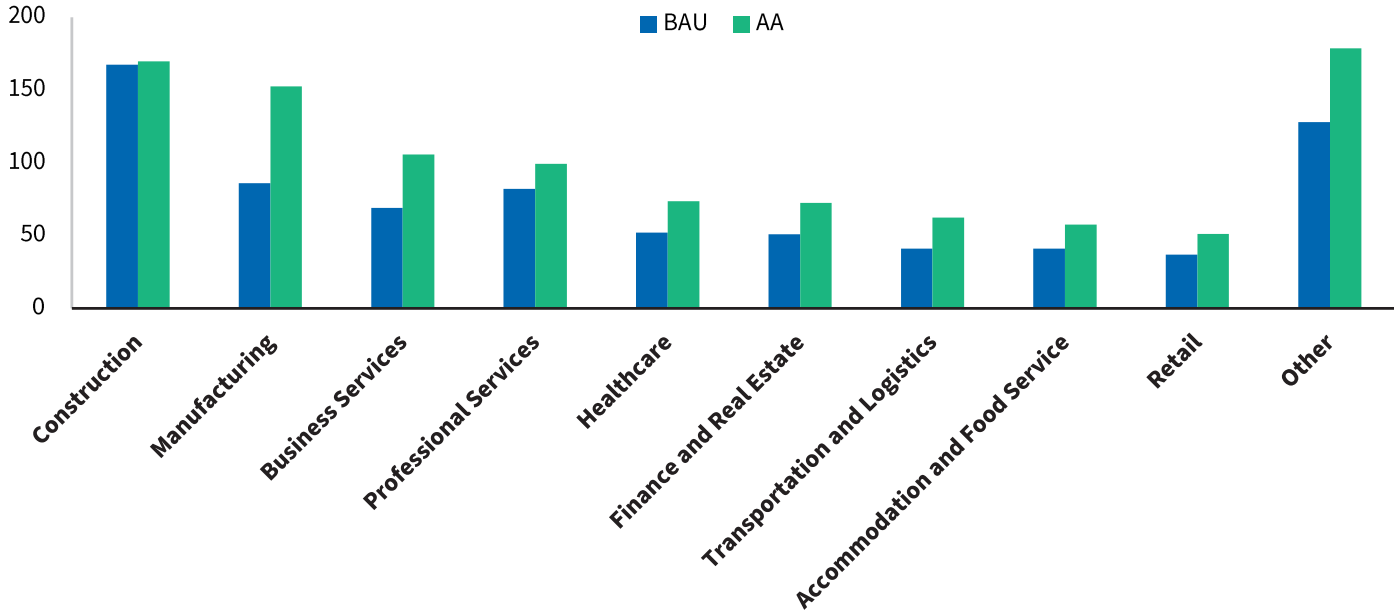
**Conclusion**

Assuming the same costs for domestic and imported components, FTI Consulting’s findings suggest that American-made solar energy leads to more jobs, greater contributions to GDP and increased labor income and tax revenue, as well as highlighting how federal tax incentives can nurture domestic economic growth.

Compared to the BAU scenario, the AA scenario increases the number of jobs supported by a domestic supply chain for a 100MW solar plant by 36%. This growth is particularly evident in manufacturing, where the number of jobs increases by nearly 80%. Similar differences were observed for the other economic indicators. In the AA scenario, the economic output from developing and constructing each plant increases by nearly \$88 million, or 46%, and GDP increases by approximately \$36 million, or 31%. Likewise, labor income increases by 30%, from nearly \$75 million to \$97.7 million.

Under the BAU scenario, only 65% of the \$116.1 million invested in a typical 100 MW solar plant stays in the United States. By onshoring this investment, the AA scenario prevents the “leakage” of these funds. Projected federal tax revenues experience an increase of nearly 41%, or \$6.1 million, in the AA scenario compared to the BAU scenario, while state and local tax revenues also increase by 41%, or \$3.3 million.

Figure 5 - All-American versus Business As Usual Jobs Impact



Finally, the implementation of tax incentives such as 45X and the domestic content bonus of the PTC and ITC support domestic manufacturing and increase revenues for local, state and federal governments. The manufacturing sector benefits the most from this hypothetical onshoring because most solar components are currently produced overseas. Construction, in contrast, already occurs locally and sees only a small positive, indirect impact.

By incentivizing solar manufacturers to invest in local production and encouraging solar developers to source domestically made components, such policies represent a win-win scenario, boosting the resilience of our supply chains resilience while also creating jobs.

- 1 Energy communities, less relevant to the analysis presented here, are defined as brownfields, former coal communities, or statistical areas with a relatively high share of employment from fossil fuel industries. See: <https://energycommunities.gov/energy-community-tax-credit-bonus/>.
- 2 American Clean Power Association. Available at: <https://cleanpower.org/investing-in-america/>.
- 3 <https://www.nrel.gov/analysis/standard-scenarios.html>.
- 4 “U.S. Solar Photovoltaic System and Energy Storage Cost Benchmarks, With Minimum Sustainable Price Analysis: Q1 2023.” Available at: <https://www.nrel.gov/docs/fy23osti/87303.pdf>.
- 5 Available at: <https://data.nrel.gov/submissions/221>.

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