FIRST SOLAR: US ECONOMIC IMPACT.

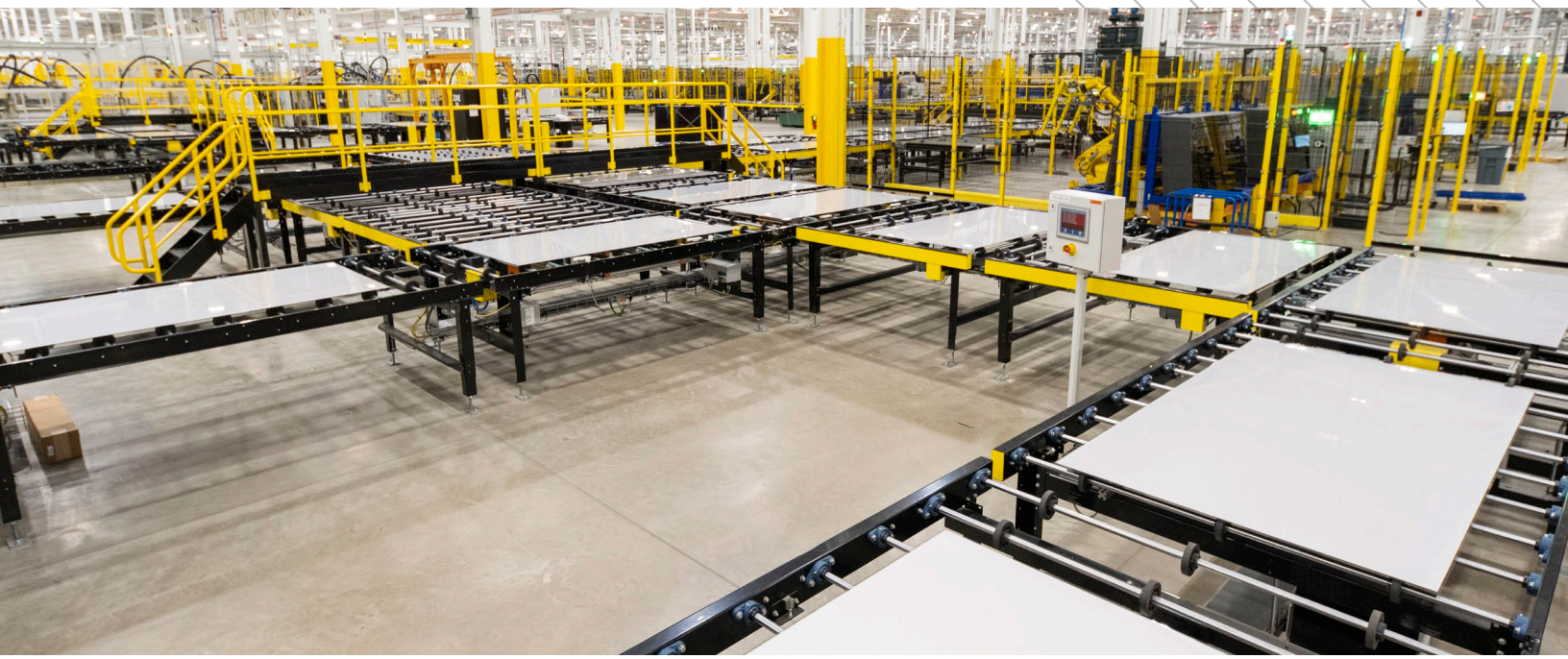
First Solar

The value of American vertically integrated solar manufacturing at scale

Commissioned by First Solar, Inc. and conducted by the Kathleen Babineaux Blanco Public Policy Center, the University of Louisiana at Lafayette

University of Louisiana Lafayette | Kathleen Babineaux Blanco Public Policy Center

INTRODUCTION FROM MARK WIDMAR.



MARK WIDMAR
Chief Executive Officer

Since our founding 25 years ago, First Solar has invested in America, building our first manufacturing facility in Perrysburg, Ohio in 1999 and setting ourselves on the path to achieving 14 gigawatts of annual nameplate vertically integrated manufacturing capacity across the United States by 2026.

Today, First Solar is unique among the world's largest solar manufacturers for being the only US-headquartered company and for competitively producing advanced thin film photovoltaic (PV) solar panels at a scale unparalleled anywhere in the world. Our proprietary – and uniquely American – thin film solar technology was developed and has evolved in labs in California, Colorado, and Ohio. It is the world's second-most common PV semiconductor after crystalline silicon and is a significant enabler of the utility-scale solar fleet in the United States.

Each of our factories manufactures advanced thin film solar panels using a process that integrates the production of wafers and cells in a single process that transforms a sheet of glass into a fully functional solar panel in approximately four hours and under one roof.

We are expanding our American footprint to an unprecedented level. Between 2016 and 2026, we expect to have invested approximately $4 billion in manufacturing and research and development facilities in the United States. Between 2024 and 2026, we anticipate that our three operating factories in Ohio will be joined by new facilities in Alabama and Louisiana to make up a 14 GW American manufacturing footprint.

Later this year, we plan to commission the largest PV research and development innovation center outside of China, which will form part of our Ohio campus and accelerate the cycles of innovation needed to ensure that American innovation drives the energy transition not just here at home but globally.

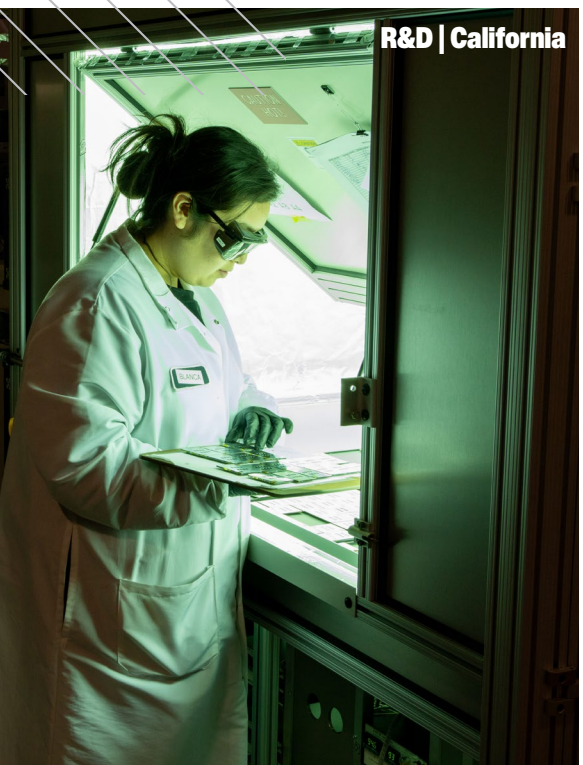
And we are not just innovating and manufacturing in America. We are sourcing our raw materials from across the country. In 2019, we put into place a strategy that would see us localize our value chains, setting into motion the changes that allowed us to source materials and services from large, medium, and small businesses across the US.

Today, our American-made solar panels are produced with American-made glass and steel. The steel value chain that serves our Ohio manufacturing footprint is located within a 100-mile radius of our factories, and we are one of the largest buyers of American-made float glass, consuming approximately 15% of the country's capacity.

Every day, we go to work making solar panels to support America's energy security and cleantech supply chain resilience, helping ensure that our country's energy future is not dependent on China.

And we are enabled by thousands of hardworking people across the country: soda ash miners in Wyoming, silica miners in Michigan, copper miners in Utah, steelworkers in Alabama, Louisiana, and Ohio, glassworkers in Illinois, Ohio, and Pennsylvania, woodworkers in Indiana, truckers, railroad workers, and many more. With these indirect and induced jobs forecasted to pay an estimated average salary of over $83,000 per year in 2026, our investments are providing American workers with an opportunity to earn happiness.

This is the real value of solar technology that is made in America, and not simply assembled here using imported components. This is the real value of American Solar.




Manufacturing | Ohio

And while we know that our investments are enabling jobs and prosperity in places such as Lawrence County, Alabama, Iberia Parish, Louisiana, and Crawford County, Pennsylvania, we recognize the need to quantify the real extent of our contribution to the US economy.

This comprehensive analysis, conducted by the Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana, Lafayette, maps First Solar's impact on America in meaningful terms: jobs, economic output, and value created in 2023 and forecasts for 2026 when we expect to achieve 14 GW of annual nameplate capacity across the US.

The data, unique to First Solar and a direct result of our operating model, which currently has no parallel in the solar manufacturing industry, creates yet another differentiator that further separates us from the competition.

It also confirms just why we have earned the right to call ourselves America's Solar Company.

Mark Widmar
Chief Executive Officer
First Solar, Inc.

EXECUTIVE SUMMARY.

Founded in 1999, **First Solar is an American manufacturer of solar modules** that is unique within the industry as having both a headquarters and large-scale manufacturing based in the United States. The company employs a unique, fully vertically integrated manufacturing process, enabling the transformation of raw materials and components to a finished module in approximately four hours.

First Solar's thin film photovoltaic semiconductor further differentiates it within the solar industry, which primarily utilizes crystalline silicon (c-Si) semiconductor material. While c-Si panel manufacturing can require three to four different factories and multiple days to produce and assemble, First Solar's entire process takes place under one roof in a matter of hours. These differentiating factors allow the company to offer greater transparency, traceability, and localization of its supply chain.

This study examines the economic benefits of the company's operations in 2023, which the company ended with over 6 GW of operational US capacity, and in 2026, by which time it expects to have 14 GW of annual nameplate capacity in the country. Additionally, the study also evaluates the impacts of constructing First Solar's facilities in investments in Ohio, Alabama, and Louisiana, in 2023.

All of First Solar's activities are considered new to the national economy because in the absence of First Solar, it is likely that demand for solar panels would be met by a foreign company given the concentration of solar manufacturing overseas, especially in China.

Key Findings:

- While First Solar is currently undergoing a rapid expansion, the company's 2023 operations are estimated to **support a total of 16,245 direct, indirect, and induced jobs and nearly $1.6 billion in labor income in the US economy**. The company's operations are also estimated to support a total of nearly **$2.8 billion in value added** and almost **$5.3 billion in total output** when including indirect and induced economic effects.
- After the ongoing expansions in Alabama, Louisiana, and Ohio are complete, annual operational impacts on the US **economy starting in 2026 are projected to grow to a total of more than 30,000 jobs and almost $2.8 billion in labor income.** Operating at that scale will **support nearly $5 billion in value added and over $10 billion in output to the US economy including direct, indirect, and induced economic effects.**
- First Solar's **construction activities** in 2023 are estimated to create a total of **5,765 jobs and $637.8 million in labor income nationally** including indirect and induced effects. These activities are also estimated to have **supported more than $900 million in value added and $1.9 billion in output**, or total sales, within the national economy.
- While the unique impacts of a specific industry, or company, can vary based on a wide range of factors, First Solar's impacts can be attributed at least in part to **longstanding efforts to cultivate a domestic supply chain**, which helps capture a larger portion of indirect and induced economic activities within the national economy.

	2023	2026 *(Expected)*
Annual US nameplate capacity	6GW+	14GW
Employment*	16,245	30,060
Labor Income*	$1.59B	$2.78B
Value Added*	$2.75B	$4.99B
Output*	$5.33B	$10.19B

**All values represent direct, indirect, and induced impacts, and excludes construction-related jobs and spending*

Critical Materials | Utah

FIRST SOLAR'S US ECONOMIC IMPACT.

2023
Operational Impacts

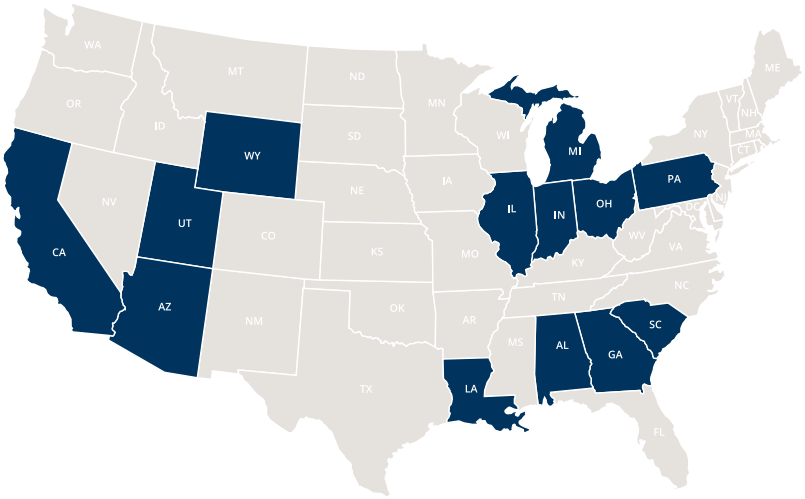
16,245
total jobs
includes direct, indirect, and induced jobs

6x
jobs supported for every First Solar job

$2.8B
value added to US economy

An American Value Chain

Alabama: Manufacturing, Steel, Construction
Arizona: Corporate HQ
California: R&D
Georgia: Factory Parts
Illinois: Glass
Indiana: Packaging
Louisiana: Manufacturing, Steel, Construction
Michigan: Silica
Ohio: Manufacturing, R&D, Steel, Glass, Construction, Distribution
Pennsylvania: Glass
South Carolina: Distribution
Utah: Tellurium
Wyoming: Soda Ash



2023 Construction Impacts

5,765
construction jobs
includes direct, indirect, and induced jobs

$900M
construction value added US to economy

2026
Projected Operational Impacts

30,060
total jobs
includes direct, indirect, and induced jobs

7.3x
jobs supported for every First Solar job

$4.9B
value added to US economy

Glossary of Terms

Capital Expenditure Impact: The economic effects resulting from the company's investments in capital assets or infrastructure. This includes the construction, maintenance, or improvement of long-term assets such as buildings, factories, equipment, machinery, or technology.

Direct Impact: The immediate effects generated by the company's activities, such as employment, salaries and wages, and direct spending on goods and services.

Employment Impact: The effect of the business's activities on job creation or loss, including both direct employment within the company and indirect employment in related industries.

Indirect Impact: The secondary effects resulting from the spending of businesses in the supply chain associated with the company, including supplier purchases and additional economic activity stimulated by the company's operations.

Induced Impact: The broader economic effects that arise from the spending of employees and other individuals who receive income directly or indirectly from the company, such as household spending.

Labor Income: The total wages and salaries of direct and indirect workers associated with the company, including the value of employment benefits.

Operational Expenditure Impact: The effects that a company's day-to-day operations and activities have on the economy, including production output, employment levels, and purchases of goods and services from suppliers to run the business.

Output: The total economic output generated by the company, encompassing the value of goods and services produced and sold by its operations.

Ratio or Multiplier Effect: The amplification of economic impact as money circulates throughout the economy, creating a ripple effect beyond the initial investment or spending.

Value Added: The contribution of the company to the economy, or GDP, measured by the difference between its total revenue and the cost of intermediate goods and services purchased.

Logistics | South Carolina

FIRST SOLAR'S SUSTAINED IMPACT ON THE US ECONOMY.

2023

Operational Impacts

The long-term recurring impacts of First Solar's operations create a stable and lasting impact on the economy by creating long-term, good-paying jobs.

Table 1 shows estimated economic impacts of First Solar's 2023 operations on the US economy. In total, First Solar's 2023 operations include an estimated $2.1 billion in direct output, which combined with indirect and induced economic effects generates $5.3 billion total output. An important component of that output is the $485.7 million in direct labor income to support the 2,700 direct First Solar jobs.

First Solar embarked on a strategic diversification of its supply chain in 2019, and thanks to years of cultivating a domestic supply chain the direct First Solar activities generate large indirect effects including nearly 6,000 jobs and more than $1.6 billion in output.

Thanks to highly skilled induced jobs that generate substantial labor income, the average labor income associated with the 12,400 indirect and induced jobs created by First Solar operations is over $81,000 per year, well over the national median income.

First Solar supported over 16,000 direct, indirect, and induced jobs across the US economy with a total labor income of over $1.5 billion in 2023, or six jobs for every direct job it added.

By the Numbers

First Solar Operational Impacts: 2023 US

16,245
Estimated jobs supported

6x
Jobs supported for every First Solar job

$1.59 Billion
Estimated contribution to national labor income

$2.75 Billion
First Solar's estimated value added to the US economy

Note: All data includes direct, indirect, and induced effects.

Table 1: First Solar National Operational (US) Impacts 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	2,700	$485.7	$977.9	$2,133.9
Indirect	5,965	$608.4	$903.0	$1,649.3
Induced	7,580	$497.8	$876.9	$1,545.2
Total	**16,245**	**$1,591.9**	**$2,757.8**	**$5,328.4**
Ratio	***6.0***	***3.3***	***2.8***	***2.5***

**Labor income, value added, and output are reported in millions of dollars*

A Coast-to-Coast Value Chain

First Solar's uniquely American supply chain reflects the value it creates for the country. The company began a strategic pivot to a domestic supply chain in 2019, a business decision designed to reduce its exposure to overseas supply chains and risks to operational continuity. Given the current political appetite to buy American, this strategic shift gave First Solar a significant advantage over the competition, with its Series 7 module being manufactured with 100% US-made components identified in the current Inflation Reduction Act (IRA) domestic content guidance issued by the US Department of Treasury. The strategic shift also accounts for First Solar's impact on the US economy as its value chain spans the country from South Carolina in the East to California in the West, and covering states such as Alabama, Arizona, Georgia, Illinois, Indiana, Louisiana, Michigan, Ohio, Pennsylvania, Utah, and Wyoming.


Steel | Ohio

Construction Impacts

Over 2022 and 2023, First Solar announced approximately $2.8 billion in investments in Alabama, Louisiana, and Ohio, including two new factories, the expansion of its current manufacturing footprint, and a new research and development center. These investments translate into a significant amount of construction activity spread across three states.

Table 2 shows the economic impacts of First Solar's 2023 construction activities on the US economy. The national economy is impacted by large investments in the new Ohio and Alabama manufacturing facilities. At the time this study was conducted, the company had yet to begin meaningful construction activity on its just-announced facility in Louisiana. These investments support 775 direct jobs as well as a large number of indirect and induced jobs created by First Solar's direct construction expenditures. In total, First Solar construction activities in 2023 create an estimated 5,765 jobs and a total of nearly $640 million in labor income including direct, indirect, and induced effects.

For every First Solar construction job in 2023 there are approximately 7.4 jobs created in the US economy, with an average of $110,600 in total annual labor income per job. First Solar's construction activities contribute $280.4 million in direct value added and direct output of $755.6 million, which generate a total of $907.1 million in value added and more than $1.9 billion in total output in the US economy including indirect and induced economic effects.

Table 2: First Solar US Construction Impacts in 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	775	$273.8	$280.4	$755.6
Indirect	1,955	$164.9	$276.2	$550.2
Induced	3,035	$199.1	$350.4	$617.4
Total	**5,765**	**$637.8**	**$907.1**	**$1,923.2**
Ratio	***7.4***	***2.3***	***3.2***	***2.5***

**Labor income, value added, and output are reported in millions of dollars*

FIRST SOLAR'S ECONOMIC IMPACT AND JOB CREATION IN OHIO.

2023

First Solar's presence in Ohio dates to its founding in 1999 and the company has manufactured in the Buckeye State for over two decades. The Toledo area, with its deep ties to the glass industry, was a natural incubator in First Solar's early years and the company has continued to build an ecosystem of suppliers and service partners around its campus, currently the largest solar manufacturing footprint in the Western Hemisphere with over 6 GW of annual nameplate capacity at the end of 2023. As a result of First Solar's presence, the state can uniquely claim to be home to every aspect of the solar value chain, from R&D and manufacturing to recycling.

Given the longstanding presence and large concentration of First Solar operations in Ohio, state-level impacts were also analyzed in the state. Table 3 shows First Solar's Ohio operational impacts in 2023, a year of significant growth with the company's third manufacturing facility in the state coming online during the year.

From operations alone in 2023, First Solar employs 2,400 workers in the state and is estimated to have generated more than 10,000 total jobs including direct, indirect, and induced economic effects. In other words, every First Solar job created 4.4 total jobs in the Ohio economy in 2023. Those jobs are estimated to have added more than $1 billion in labor income to the Ohio economy including more than $580 million in indirect and induced effects.

First Solar's direct economic output is estimated at more than $1.6 billion in the state including creating more than $563 million in value added in Ohio's economy. In total, First Solar's activities supported more than $3.2 billion in output including nearly $1.5 billion in value added within Ohio in 2023.


Manufacturing | Ohio

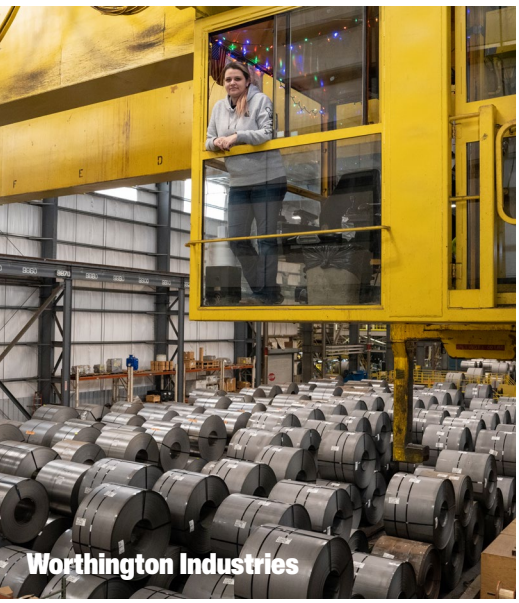
Table 3: First Solar Ohio operational impacts in 2023

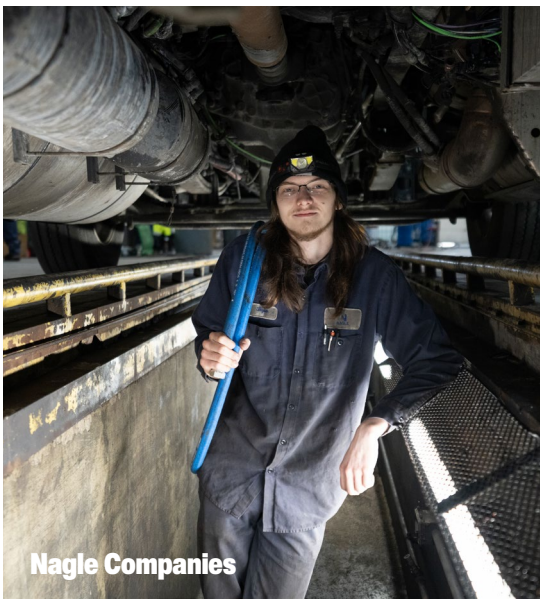
Impact	Employment	Labor Income*	Value Added*	Output*
Direct	2,400	$450.5	$563.0	$1,663.0
Indirect	3,980	$353.7	$500.3	$896.9
Induced	4,125	$229.0	$415.6	$724.7
Total	**10,505**	**$1,033.2**	**$1,478.9**	**$3,284.6**
Ratio	***4.4***	***2.3***	***2.6***	***2.0***

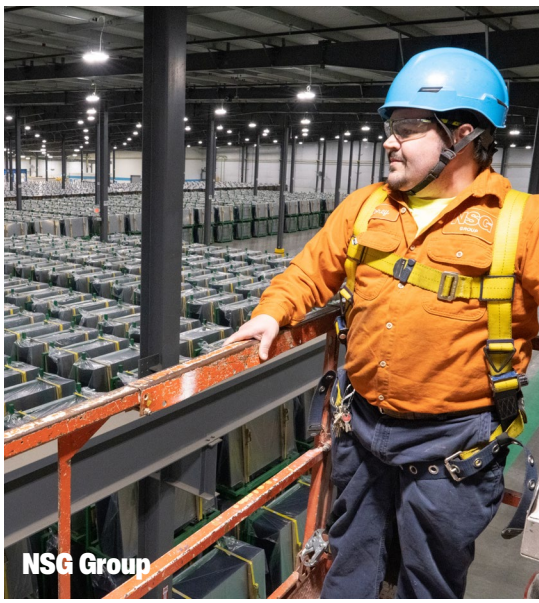
**Labor income, value added, and output are reported in millions of dollars*

Investing in an Ohio Value Chain

First Solar's strategic decision to develop a domestic supply chain in parallel with the expansion of its manufacturing footprint has spurred investment and job creation in the state. In response to the company's expansion plans, the NSG Group constructed its first new float glass plant in the US in four decades. The facility, which is in Luckey and started operations in 2020, represented a $380 million investment and created 150 new jobs. Similarly, Ice Industries invested $9 million and created 120 new jobs when it established a new facility in Bowling Green to produce steel back rails for First Solar's advanced thin film modules. Significantly, First Solar's steel value chain is located within a 100-mile radius of its Perrysburg campus, with the steel made in Cleveland, processed in Delta, and fabricated into back rails in Bowling Green.


Worthington Industries


Nagle Companies


NSG Group

Ice Industries

Construction Impacts

Given the historical concentration of First Solar's US activity in Ohio, construction impacts are examined at the state level in Ohio as part of the more targeted assessment of economic impacts within the state.

Table 4 shows economic impacts of First Solar's 2023 construction activities in Ohio. The 275 construction workers directly engaged in constructing First Solar's third manufacturing facility earned $29.8 million in labor income, but also created an estimated 865 indirect and induced jobs, adding nearly $60 million in labor income to the total economic impact of construction activities within the state.

These construction activities are also estimated to have generated $136.6 million in total value added and $367.7 million in total output to the Ohio economy. Based on 2023 construction activities, the total economic impact of building First Solar's new facilities shows a jobs multiplier of more than four total jobs in Ohio for each job directly engaged in construction.

The average labor income per construction worker on a First Solar site in Ohio is $108,400 while the average labor income for the associated indirect and induced jobs is $66,500 illustrating the high pay for high-skilled workers needed to build the company's manufacturing and R&D facilities.

Table 4: First Solar Ohio Construction Impacts in 2023

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	275	$29.8	$36.5	$178.2
Indirect	515	$38.1	$64.8	$128.0
Induced	350	$19.4	$35.3	$61.5
Total	**1,140**	**$87.3**	**$136.6**	**$367.7**
Ratio	***4.1***	***2.9***	***3.7***	***2.1***

**Labor income, value added, and output are reported in millions of dollars*

A Decades-Long Partnership

Headquartered in Wallbridge, Ohio, the Rudolph Libbe Group (RLG) has constructed every First Solar facility in the state since the company's first manufacturing facility in 2002. Today, the partnership has expanded beyond Ohio as RLG constructs First Solar's new facilities in Alabama and Louisiana. By 2026, RLG will have completed approximately 9 million square feet of manufacturing and R&D infrastructure across the three states. The Ohio projects alone accounted for approximately 4.5 million square feet and were constructed by union tradespeople. In fact, the three facilities constructed by RLG for First Solar in Ohio since 2016 consumed an estimated 2.5 million union hours.

First Solar Ohio III

LOOKING FORWARD: PROJECTED US OPERATIONAL IMPACTS.

2026

Catalyzed by the Inflation Reduction Act (IRA) of 2022, First Solar has embarked on an expansion plan that is expected to see it achieve 14 GW of annual nameplate capacity in the US across three states by 2026. Given that the company is expected to double its nameplate capacity between 2023 and 2026, this study examined its 2026 operational impacts on the national economy.

The company's national output nearly doubles in scale from 2023 to 2026, with indirect jobs growing at an even faster pace as domestic supply lines expand to support First Solar's operations.

Table 5 shows the expected annual economic impacts of First Solar's operations on the US economy by 2026. Once the expansions that are currently underway in Ohio, Alabama, and Louisiana are complete, First Solar expects its operations to create more than $1.5 billion in value added in the national economy, while generating a total added value 3.2 times larger after accounting for direct and induced economic impacts. The total output generated in the national economy is nearly $10.2 billion, which is 2.6 times larger than direct output.

The expansion of First Solar's impacts extends to job creation as the company expects to grow its US workforce from 2,700 in 2023 to 4,100 people in 2026. This increase in direct employment, in turn, allows First Solar to support a total of more than 30,000 jobs across the economy with nearly $2.8 billion in labor income. In other words, every person First Solar directly employs supports 7.3 direct, indirect, and induced jobs across the US.

Furthermore, First Solar's operations directly are expected to create more than $1.5 billion in value added in the national economy but generate total added value 3.2 times larger after accounting for direct and induced economic impacts. The total output generated in the national economy is forecasted to be nearly $10.2 billion, which is 2.6 times larger than direct output.

By the Numbers

First Solar Expected US Operational Impacts: 2026

30,060
Number of jobs supported

7.3x
Jobs supported for every First Solar job

$2.78 Billion
Estimated contribution to national labor income

$4.99 Billion
First Solar's estimated value added to the US economy

Note: All data includes direct, indirect, and induced effects.

Table 5: First Solar US Operational Impacts 2026

Impact	Employment	Labor Income*	Value Added*	Output*
Direct	4,100	$622.9	$1,540.9	$3,979.6
Indirect	12,675	$1,291.9	$1,916.8	$3,499.7
Induced	13,285	$872.3	$1,536.4	$2,707.4
Total	**30,060**	**$2,787.1**	**$4,994.0**	**$10,186.7**
Ratio	***7.3***	***4.5***	***3.2***	***2.6***

**Labor income, value added, and output are reported in millions of dollars*

Renewing American Communities

A glassmaking facility in Meadville, Pennsylvania, which had been operational since 1968, was forced to shut down in 2020 in response to slowing demand from the US automotive industry and the economic effects of the pandemic. In 2023, the facility was given a new lease on life as First Solar signed an agreement with its owner, Vitro Architectural Glass, to manufacture float glass for use in its American-made solar modules. In response, Vitro announced it would invest $93.6 million to rebuild and modernize the plant, creating approximately 130 new high-quality jobs, subsequently increasing its investment to approximately $180 million to adapt and upgrade its current facilities, effectively doubling the plant's output. The plant is expected to be operational in 2025, bringing the jobs, economic growth, and tax revenues that domestic manufacturing stimulates.

> **"The plant reopening was a surprise to all of us in town. They announced that they were going to be bringing the second line in their plant back online and hiring another hundred or so workers back. It's obviously a big plus for our community."**
>
> **Kurt Dennis**
> Greenwood Township Supervisor

> **"I go to Westminster College where I'm studying biology. My brother Nathan works here and hopefully I can keep working here for the next eight years because I plan on going to dental school."**
>
> **Hailey Maynard**
> Finishing | Vitro

Conclusion

Beyond the one-time boost created by large capital investments like construction of a new manufacturing facility, the long-term recurring impacts of a company's operations are often most valued because of their stable and lasting impact. For First Solar, those impacts were analyzed in 2023 to assess the company's current impact as it undergoes continued growth and expansion, but also in 2026 after the current expansions in Ohio, Alabama, and Louisiana will be complete and the company will be operating at a significantly larger scale.

In 2023, total national impacts include more than 16,000 jobs, nearly $1.6 billion in labor income and just over $5.3 billion in total economic output including indirect and induced effects. Notably, the total jobs created by First Solar's operations represent an effective economic impact multiplier of 6.0 meaning that for each of First Solar's 2,700 direct jobs, a total of 6 jobs are created in the US economy. Within Ohio, the total economic impacts include 10,505 jobs, over $1 billion in labor income, and nearly $3.3 billion in total economic impact.

First Solar's impacts can be attributed at least in part to longstanding efforts to cultivate a domestic supply chain, which helps capture a larger portion of indirect and induced economic activities within the national economy.

By 2026, First Solar's operations are expected to grow to include 4,100 direct employees and total direct output of nearly $4 billion nationally. The national economic impact of operating at that scale includes creation of more than 30,000 jobs, $2.8 billion in labor income, and $10 billion in total output including direct, indirect, and induced effects. In 2026, it is expected that First Solar's effective national jobs multiplier will reach 7.3, meaning that for every First Solar job, the company will create a total of 7.3 jobs in the national economy.

These results compare favorably to other industries such as highway construction, which has a jobs multiplier of 2.1; small electronics manufacturing, which has a jobs multiplier of 4.2; and even a high impact industry like oil and gas extraction, which has a jobs multiplier of 6.7.

While the unique impacts of a specific industry, or company, can vary based on a wide range of factors, First Solar's impacts can be attributed at least in part to longstanding efforts to cultivate a domestic supply chain, which helps capture a larger portion of indirect and induced economic activities within the national economy.

Learn more about First Solar's US value chain at
AmericasSolarWorkers.com

CONTEXTS: A HIGHLY DIFFERENTIATED SOLAR MANUFACTURING AND TECHNOLOGY COMPANY.

First Solar has consistently leaned into and leveraged its differentiators to deliver growth and navigate unprecedented change and industry volatility. The company is unique among the world's largest solar manufacturers for being the only US-headquartered company and for producing thin film solar panels that are not dependent on Chinese c-Si supply chains.

Moreover, First Solar's commitment to Responsible Solar and sustainability, its distributed manufacturing strategy, the strength of its localized supply chains, its technology advantage, and the strength of its balance sheet all drive value creation for its investors and for America. From 2016 to 2026, First Solar expects to have invested almost $4 billion in US manufacturing and R&D infrastructure, demonstrating its commitment to America.

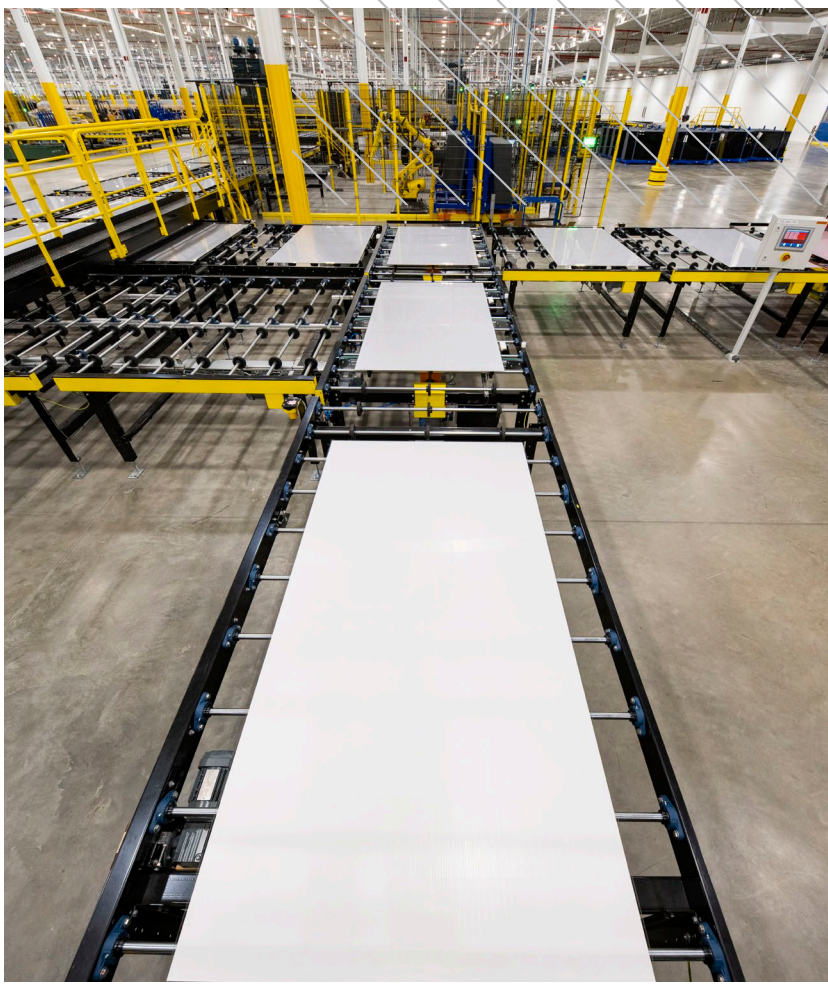
This section explains some of First Solar's key differentiators that help drive its impact on the US economy.

Uniquely American Solar Technology

The US is the global leader in cadmium telluride (CdTe) manufacturing[1] having developed the technology in the 1950s, although it was only commercialized by First Solar in 2002. Today, CdTe is the second most common PV semiconductor after c-Si, which is dominated by Chinese companies.

CdTe's qualities include lower cost, superior scalability, and a higher theoretical efficiency limit. Over time, and with almost $2 billion invested in research and development, First Solar has been able to harness other advantages that are unique to CdTe. Its strategic advantages include reduced dependence on China's crystalline silicon supply chains, supporting US energy security and supply chain continuity through rapid deployment of new manufacturing capacity.

The semiconductor uses two byproducts from zinc and copper mining waste streams, cadmium and tellurium, which are combined into a stable compound. Each First Solar module includes a layer of semiconductor that is only three percent the thickness of a human hair.



[1]Source: https://www.nrel.gov/pv/cadmium-telluride-solar-cells.html

Fully Vertically Integrated Manufacturing Process

First Solar's fully vertically integrated manufacturing template, which was developed and operationalized in Ohio, is unique in its ability to integrate the manufacturing of thin film wafers and cells in its module manufacturing process. The semiconductor is deposited on sheets of glass in a high-tech process that has more in common with producing flat screen televisions than it does assembling a c-Si solar panel.

This streamlined process allows First Solar to convert a sheet of glass into a fully functional module under one roof in approximately four hours, compared to c-Si's batch processing approach, which has not fundamentally changed in the past two decades and requires three to four different factories, multiple companies, and multiple days to achieve the same result. Significantly, First Solar's manufacturing template has allowed it to deploy vertically integrated manufacturing at a location of its choosing in fewer than 24 months.

First Solar's factories exemplify America's manufacturing prowess, operating 24 hours a day, seven days a week, 365 days a year, with the industry's highest utilization rates. The factories are believed to set the standard for capacity utilization and manufacturing cost, demonstrating how American manufacturing can effectively compete globally.

First Solar also stands apart from the competition for its early embrace of a distributed manufacturing strategy. Enabled by its easily replicable manufacturing template, the company took the decision to site new manufacturing capacity close to demand to accelerate the speed at which it could deliver solar panels to its customers without the risk of relying on transoceanic shipping.

Respect for People and the Planet

First Solar has long understood its responsibility towards the planet, the community, and its customers. The company places sustainability at the heart of everything it does, setting its sights on exceeding industry standards, not merely meeting them. Today, First Solar has a long history of establishing benchmarks in recycling, supply chain transparency, the carbon and water footprint of PV technology, and health and safety.

First Solar's solar technology has the lowest environmental footprint in the industry. Its Series 7 module has a carbon and water footprint that is nearly four times lower than conventional crystalline silicon modules manufactured in China and an energy payback time that is approximately five times faster.

The company pioneered recycling of solar panels and its proprietary process allows it to recover approximately 90% of materials from each processed module. In fact, a kilogram of CdTe can be recycled 41 times to produce electricity for 1,200 years before it stops being effective.

Crucially, First Solar has led the industry in taking a stance of zero tolerance for forced labor in solar supply chains. The company is one of the only solar manufacturers not to have any exposure to the Chinese province of Xinjiang, where state-sponsored forced labor is reportedly used to support elements of c-Si value chains, including the production of polysilicon.

METHODOLOGY.

Approach and Assumptions

In addition to the direct expenditures and employment of a company, or other grouping of economic activities, economic impact assessments capture the broader set of economic activities generated by an initial infusion of new dollars into the economy. When new economic activity occurs, businesses will purchase additional inputs and workers will have additional dollars for purchasing goods and services. The total economic effect accounts for indirect spending by businesses and induced spending by workers benefiting from additional dollars.

In general, these studies focus on new dollars entering a regional (or national) economy. On a national scale, this framework would consider money paid by foreign customers or investments by foreign companies as new dollars entering the national economy. In the present context, all of First Solar's activities are considered new to the national economy because in the absence of First Solar, it is likely that demand for solar panels would be met by a foreign company given the concentration of solar manufacturing overseas, especially in China.

Economic impact analysis provides the tools to quantify the full impact of the indirect and induced effects within a regional economy due to an initial round of spending using jobs, earnings, value added, and output multipliers. This methodology is based on measuring inter-industry linkages across the economy and relies on the commonly used input-output method developed by Wassily Leontief. While input-output models have advanced considerably over time, the same fundamental principles apply.

To analyze the economic impact of First Solar's expected economic impact in 2023 and following the expansion currently underway, this report accounts for the one-time expenditures involved in the construction of new facilities in Ohio, Alabama, and Louisiana and the ongoing domestic operational expenditures across the company once the new facilities have been commissioned. The study includes an analysis of First Solar's economic multipliers compared to various industries across the United States and in the state of Ohio. These benchmarks provide a gauge as to how First Solar's economic activity truly impacts the economy in comparison to other common industries.

About the Study

The **Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana at Lafayette** serves as a hub for research and education on critical policy issues in Louisiana and beyond. Named after the state's first female governor, the center honors her legacy by addressing key challenges facing the region, including education, healthcare, and economic development. Through collaboration with policymakers, community leaders, and academics, the center aims to inform evidence-based policy solutions that promote the well-being and prosperity of Louisiana's citizens.

The Researchers

To lead and produce the study referenced in this report, First Solar commissioned **Dr. Stephen Barnes**, Executive Director of the Kathleen Babineaux Blanco Public Policy Center at the University of Louisiana at Lafayette and an Associate Professor of economics in the B.I. Moody III College of Business Administration.

Dr. Barnes serves as the independent economist on the Louisiana Revenue Estimating Conference, a forecasting panel that sets income projections used to create the state budget. He has collaborated with federal and state agencies, industry partners and advocacy groups as well as scholars in more than a dozen disciplines on research addressing many aspects of the economy and population of Louisiana.

Dr. Barnes has publications spanning the economics of education, environmental risks, health and health care, and transportation. Dr. Barnes holds a bachelor's degree in economics from Louisiana State University and a master's and PhD in economics from the University of Texas at Austin.

Dr. Barnes was assisted by **Andrez Joseph**, a Research Associate at the Kathleen Babineaux Blanco Public Policy Center. Joseph is originally from Roseau, Dominica, an island in the Caribbean, where he began his undergraduate studies in Mathematics and Physics prior to moving to the United States. Upon arrival in 2017, he completed his Bachelor of Science in Mathematics from the Louisiana State University at Alexandria and continued his education at the University of Louisiana at Lafayette where he attained a Master of Science in Applied Mathematics.

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