Can the U.S. Make Solar Panels? This Company Thinks So.

First Solar kept producing them in Ohio after most of the industry moved to China. President Biden wants many more domestic manufacturers.

By Ivan Penn
New York Times

For more than two decades, workers at a factory in Perrysburg, Ohio, near Toledo, have been making something that other businesses stopped producing in the United States long ago: solar panels.

How the company that owns the factory, First Solar, managed to hang on when most solar panel manufacturing left the United States for China is critical to understanding the viability of President Biden's efforts to establish a large domestic green energy industry.

Mr. Biden and Democrats in Congress last year authorized hundreds of billions of dollars in federal incentives for manufacturing solar panels, wind turbines, batteries, electric cars and semiconductors. The efforts amount to one of the most expansive uses of industrial policy ever attempted in the United States.

As a result, many companies, including First Solar, have announced the construction of dozens of factories, in total, around the country. But nobody is entirely sure whether these investments will be durable, especially in businesses, like battery or solar panel manufacturing, where China's domination is deep and strong. Chinese manufacturers enjoy lower labor costs, economies of scale and incentives from a government eager to control industries critical to fighting climate change.

First Solar survived the shift of most manufacturing to China in part because its panels do not use polysilicon, a material found in most panels and now made almost entirely in China. But it has not been an easy ride, and the company has struggled at times, especially after the 2008 financial crisis.

"They're sort of a unicorn," said Michael Heben, director of the Wright Center for Photovoltaics and Innovation at the University of Toledo, who has worked with First Solar. "It's been a rocky history. The revenues have been pretty lumpy."

Some analysts warn that efforts to make solar panels in the United States are misguided. Even in the best of times, the business yields modest profits and does not employ a lot of people. It would be better to import panels from low-cost producers to quickly shift from fossil fuels to renewable energy, said Jenny Chase, a solar analyst at Bloomberg New Energy Finance.

“Solar panels would have been cheaper,” Ms. Chase said, if policymakers did not insist on domestic manufacturing. “In the United States, even with the manufacturing boom, it will still be expensive.”

But many lawmakers and corporate executives insist that the United States should make solar panels. They contend that it would be unwise for the country and allies like the European Union and Japan to remain dependent on China for such an important technology. Supply chain chaos during the pandemic, and the growing economic hostility between Beijing and Washington, highlighted the huge risks.

One thing is certain: The world will need many more solar panels to eliminate greenhouse gas emissions. The capacity of solar power installed worldwide needs to be at least 20 times as big as today and possibly as much as 70 times, energy experts said.

“We are going to need very large amounts of photovoltaics around the world,” said Nancy Haegel, director of the National Center for Photovoltaics at the National Renewable Energy Laboratory. “While it’s a very ambitious goal, it is also achievable given the growth of photovoltaics in recent years.”

First Solar’s chief executive, Mark Widmar, said he was confident that his company and others could quickly expand U.S. production. The company, which is based in Tempe, Ariz., is building its fifth U.S. factory in Louisiana. It is already expanding in Ohio, where it has three plants, and building one in Alabama. It also has factories in Vietnam and Malaysia and is working on one in India.

“It’s daunting,” Mr. Widmar said at the Perrysburg factory when describing the company’s plans. “It’s really a David versus Goliath.”

Mr. Widmar, 58, who grew up in a working-class family in South Bend, Ind., about two and a half hours from Perrysburg, said he was motived by a desire to create U.S. jobs and extend America’s lead in technology.

He was the first in his family to attend college — his father worked in a mailroom, and his mother was a secretary — earning degrees in accounting and finance from Indiana University.

Soon after becoming chief executive five years ago, Mr. Widmar said, he pushed his engineers to roll out a new generation of solar panels that would generate more energy at a lower cost per watt. The move was risky because it required removal of old equipment and a big investment in new machinery, a switch that sharply reduced production in 2018.

“I said, ‘Let’s leapfrog,’” Mr. Widmar said. “A lot of C.E.O.s wouldn’t have made that decision. I knew we had to grow.”

First Solar began in 1990 as Solar Cells, founded by Harold McMaster, an inventor and businessman who was a pioneer in producing tempered glass, which is used in skyscrapers and solar panels.

In the 1990s and 2000s, the solar panel business was growing fast in the United States, Europe and Japan. But like many boom industries, it soon hit hard times, and many companies, including Solyndra, which the Energy Department backed during the Obama administration, shut down.

At the same time, the Chinese government and Chinese companies doubled down on the technology. They greatly expanded panel manufacturing, helping to drive down costs sharply.

First Solar, which benefited from investments by Walmart's founding Walton family, survived in part by quickly scrapping plans to expand production. That saved the company from having to sell panels at a steep loss, according to a case study by the Center for Strategic and International Studies in Washington.

It also helped that First Solar's panels were different from most Chinese panels. Instead of silicon, the company used a proprietary thin film of cadmium telluride.

One thing that helped sustain First Solar was strong growth in Europe, where many countries, particularly Germany, offered generous subsidies to encourage the use of solar power.

Yet First Solar has not been immune to the industry's ups-and-downs. The company lost more than $100 million in 2019 before earning about $400 million each in 2020 and 2021. Last year, it lost $44 million, which the company attributed to the volatile cost of freight and shipping.

Mr. Widmar said the Inflation Reduction Act, Mr. Biden's signature climate law, set the stage for a growing domestic solar manufacturing industry. But he worries that the law could become "a political football" — a real threat given that some Republican lawmakers have sought to repeal all or parts of the legislation.

He also said the United States must protect domestic producers from what he described as unfair Chinese competition. "If we are to have a diverse, competitive and sustainable solar manufacturing industry, China's anticompetitive behavior must be addressed," he said.

One of First Solar's advantages, Mr. Widmar said, is that it is not as exposed to the use of forced labor, which human rights groups and U.S. government officials say is common in China's western Xinjiang region.

In August, First Solar revealed that it had uncovered the use of forced labor by subcontractors at its plant in Malaysia. The subcontractors had forced immigrant

workers to pay fees to get jobs and had withheld wages and passports. Mr. Widmar said he was determined to publicize the findings, compensate the workers and get the subcontractors to return their passports.

“I’m an auditor by nature," Mr. Widmar said. “I’ve always felt in order to sleep at night you always have to do what’s right.”

Human rights activists worry that as manufacturers ramp up solar panel production, forced labor, sometimes referred to as “modern slavery,” will become more common. Walk Free, a human rights group based in Australia, estimates that 50 million people around the world lived under forced-labor conditions in 2021, about 10 million more than in 2016.

Michael Carr, executive director of the Solar Energy Manufacturers for America, a trade group, said more domestic manufacturers like First Solar were needed to ensure that the United States had a secure supply of panels untainted by forced labor.

“The module manufacturing in the United States is starting to happen,” Mr. Carr said. But, he added, “our international competitors have built up a really sizable lead.”