

An IRA deep dive: how significant is it and what uncertainties remain?

Legislation | The largest climate package in US history promises to turbocharge the country's solar sector, but considerable uncertainty remains around the impact the Inflation Reduction Act will have and how it will be enforced by authorities, writes Sean Rai-Roche.

You could be forgiven for thinking that the US was now on track to meet its climate targets given the fanfare and fervour created by the passing of the Inflation Reduction Act (IRA) in August. The landmark package, which contains US\$369 billion for climate change prevention, is a huge step towards achieving the US' climate goals of decarbonising its grid by 2035 and reaching net zero by 2050. But it is by no means a panacea, especially given how much the US still relies on fossil fuels and the legal uncertainty around how some of the act's provisions will be enforced in practice.

PV Tech Power has conducted a deep dive into the IRA, examining precisely what provisions are contained within the act, its potential to scale up US solar manufacturing, its likely impact on US deployment and what legal and regulatory hurdles remain. Through conversations with industry bodies, US developers, analysts, policy-makers and lawyers, we hope to provide you with an exhaustive assessment of the potential of the IRA to support the US' decarbonisation as well as an exploration of any uncertainties and barriers that might remain.

Despite the tremendous work of renewable stakeholders in the US, the country is still far behind much of the Western world when it comes to decarbonising its economy. It gets just over 20% of its power from renewables sources, according to World Bank data, is lagging behind Europe in the adoption of electric vehicles (EVs), needs a massive injection of investment into its failing grid system and has much work to do when it comes to just transition.

That said, the IRA has the potential to address several of these fronts and, if exploited properly, could turbocharge the US' downstream sector at the same time as facilitating a rapid buildout of the country's upstream PV manufacturing base. The US has increasingly, and with strong wording, expressed its desire to onshore

solar production – the theme of this issue of *PV Tech Power* – and reduce its reliance on Chinese imports, echoing sentiments found in India, Europe and elsewhere.

Brief history of the IRA

After gaining power, President Joe Biden tried to enact various different policy packages aimed at supporting the US' renewables sector. First, was his US\$2 trillion Build Back Better agenda that would have delivered considerable certainty for both the downstream and upstream sectors. That got scuppered by obstructive Democratic senator Joe Manchin, who occupies the party's right, alongside Arizona senator Kyrsten Sinema, who effectively stonewalled the bill's passage.

Initially expected to pass as early as November 2021, by July no progress had been made and many thought the hope for a favourable policy package for solar was dead in the water. But then, later that month, Manchin and Senate majority leader Chuck Schumer announced a shock breakthrough in negotiations, much to the surprise of political pundits and the solar sector.

Manchin U-turned and said he would support a bill that would "ensure our country invests in the energy security and climate change solutions we need to remain a global superpower through innovation rather than elimination" in a statement issued on 27 July 2022.

Dubbed the Inflation Reduction Act, the bill passed both chambers of the US Congress before heading to Biden's desk to be signed into law on 17 August. Setting aside US\$369 billion for decarbonisation efforts, the act was described by Biden as "the biggest step forward on climate ever".

Incentives contained within the IRA

As part of the IRA, the US' investment tax credit (ITC) increased from 26% to 30% for a period of ten years and, crucially, is now transferable to other taxpayers. From 2031,

the ITC will be phased down, with precise details on this forthcoming.

Previously excluded from accessing the ITC, standalone energy storage systems are now able to receive the 30% credit. The storage tax credit will allow existing solar and wind projects to be retrofitted with batteries without the need for any major grid connection changes, which remains the key bottleneck for new builds.

The IRA will also enable solar developers and manufacturers to make investments with the backing of a ten-year policy certainty, Christopher Seiple, vice chairman of energy transition and power and renewables practice at research firm Wood Mackenzie, previously told *PV Tech*. "The renewables industry, solar included, has never had a period in its future where it had policy certainty for ten-plus years."

On top of this, a production tax credit (PTC) has been made available to solar projects under the IRA. If projects meet 'prevailing wage requirements' (more on this shortly) set out under the IRA, then it will bag a tax credit of US\$0.025/kWh for the first ten years of its lifespan. If it doesn't meet those requirements, this is reduced to just US\$0.003/kWh. The PTC will rise in line with inflation.

"While solar now qualifies for the PTC, projects coming online in 2023 may primarily use the ITC if it is too late to change project financials," says Pol Lezcano, BloombergNEF's lead analyst for North American solar. "After 2024, we expect most utility-scale solar installations to opt for PTC given their low upfront capex and high generation potential. Only projects in diminished capacity factor areas are expected to keep using ITC."

Adds key to maximising IRA benefits

While lucrative, the ITC being set at 30% for ten years is just the beginning of benefits able to be accessed under the IRA. On top of that 30% credit, developers can also



A 75MW solar farm in the US state of Virginia. Image: Nextracker.

Credit: Nextracker.

access three other adders that provide an additional 10% credit, including ones for paying “prevailing wages” and having apprenticeship schemes, one for sourcing domestic content and one for “energy communities”.

Developers can access an additional 10% tax credit by paying workers prevailing wages and ensuring they are part of an electrical apprenticeship programme. This has been designed not only to benefit local populations and ensure a fair wage is paid but also to grow the US solar workforce. These tax credits will begin to apply to projects over 1MW in 2023.

If contractors or subcontractors employ more than four workers to perform construction, alterations or repairs, then they must employ at least one qualified apprentice. Breaking these rules could result in a US\$5,000 fine for each worker being underpaid, or even up to US\$10,000 if the US Department of Labor deems this to be intentional.

Next is the domestic content adder. If PV projects receiving the ITC source their hardware from companies manufacturing in the US, they can access an additional 10% credit. All steel used in solar projects wishing to access this credit must be manufactured in the US. For goods with longer and more opaque supply chains,

such as modules, inverters and balance of system equipment, 40% needs to be US-made, with this percentage set to rise moving forwards.

The industry has called for greater clarity on this (and we will get into how developers should approach the domestic content adder later on) but it is important to note that certain products may be imported if the quality of US-made alternatives is not up to scratch or would push up project costs by more than 25%.

Thirdly, there is the project siting and “environmental communities” adder. Under this adder, projects located in former “energy communities” can earn the additional credit. The IRA defines energy communities as brownfield sites or locations that have been linked with fossil fuels. This adder was designed to ensure those communities historically reliant on coal are included in the energy transition and are reskilled to focus on clean energy instead.

Manufacturing credits critical to upstream buildout

Under the IRA, companies will receive solar manufacturing tax credits, similar to the Solar Energy Manufacturing for America Act, as proposed by Georgia senator Jon Ossoff, which will be critical to building

out the country’s upstream PV sector. Under the system, the US government will support domestic solar manufacturing, offering incentives for each unit of polysilicon, solar wafers, cells and modules produced within the US.

The solar manufacturing tax credits are as follows:

- Modules would receive US\$0.07, multiplied by the capacity of the module (on a per direct current watt basis)
- Thin-film or crystalline PV cells would get US\$0.04, multiplied by the cell’s capacity (on a per direct current watt basis)
- Wafers would secure US\$12 per square metre
- Polymeric backsheets would receive US\$0.40 per square metre
- Solar-grade polysilicon would get US\$3 per kilogramme

There is also a separate manufacturing tax credit for inverter manufacturers given the importance of the systems to a plethora of key technologies. For inverter manufacturers, the credit applies per watt of alternating current (AC). They are as follows:

- Central inverter: US\$0.0025/W
- Utility inverter: US\$0.015/W
- Commercial inverters: US\$0.02/W

- Residential inverters: US\$0.065/W
- Microinverters: US\$0.11/W

Additionally, torque tubes used in racking will get US\$0.87/kg, while structural fasteners will receive US\$2.28/kg.

IRA's impact on the US' clean energy industry

The impact of the IRA is going to be felt across the US' (and indeed the world's) clean energy sector, but the biggest impact will not be felt until the end of 2023 and moving into 2024, most industry analysts agree. This is because it will take time to scale up the US manufacturing sector and current module constraints that have plagued the US' solar sector for the past two years are set to persist in the short term.

After that point, however, deployment in the US is set to skyrocket. "The impact of the IRA on deployments is gigantic," says Sylvia Leyva Martinez, Wood Mackenzie's senior analyst for North American utility-scale solar.

"We estimate that the IRA will increase utility-scale developments by 83% (200GW) over the next ten years compared to a scenario without the tax credit extension," she tells *PV Tech*. "This is driven mainly by the added certainty of having a ten-year extension of the ITC (at least), but also the expansion to PTC and transferability options."

BNEF expects the IRA to boost solar build by 63GW and storage by 20GW/78GWh between 2022 and 2030. Broken down by sector, it is predicting the additional deployment because of the IRA tax credit extensions (and high power prices) to be distributed pretty evenly between 2022 and 2030 across utility-scale (49GW more build, a 22% increase compared with previous forecast), residential (10GW more build, 18% increase) and commercial (4.8GW more build, 20% increase), according to Lezcano.

Moreover, the combination of domestic content adders and advanced manufacturing production tax credits are expected not only to develop the US solar supply chain, but mitigate the impact of potential changes in trade policy, such as the ones experienced since 2021, Leyva Martinez says.

Trade association the American Council of Renewable Energy (ACORE) laid it out for *PV Tech Power* in financial terms. "We project that investments in renewable generation and enabling technologies will

accelerate from the current US\$50-US\$60 billion annually to US\$90-US\$100 billion annually, which is more in line with our national climate goals," said its president and CEO Gregory Wetstone.

Wetstone said, however, that achieving the US' long-term emission reduction targets "will require additional steps beyond the pivotal gains we will see from incentives".

One of the main objectives of the IRA was to onshore more PV production to the US and analysts are predicting a significant buildout of the country's module

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production capacity by 2030. Since the announcement of the IRA alone, around 20GW of new module capacity has been announced, according to BNEF.

A recent analysis by the Solar Energy Industries Association revealed that the passage of the IRA will accelerate the build-out of large-scale manufacturing facilities, likely to commence as soon as next year. The trade body predicts the US will have over 10GW of module manufacturing capacity by 2024, and over 30GW of capacity by 2025.

But Lezcano reminds us that forecasting module manufacturing capacity is extremely difficult due to the "too many unknowns", including if "you believe the construction timelines and capex shared by the manufacturer". Readers should be wary of forecasts that do not bake in contingencies and unforeseen economic shocks. There is also still a great deal of uncertainty regarding certain aspects of the IRA, as previously mentioned, which may temper manufacturing forecasts.

Significant uncertainties remain

These legal uncertainties are regarding precisely how the IRA will be implemented by US authorities. "In general, the entire implementation of the IRA remains uncertain," noted Leyva Martinez, adding big question marks were hanging over the exact requirements to access adders, such as how to qualify for the energy

community adders and the details on how transferability will work.

"I think the tax credit transferability is the most important aspect that needs clarification. If the government allows the transfer of tax credits to be a little cumbersome, they could radically change the project finance dynamics in the US and remove the main bottleneck, which is tax equity," Lezcano noted.

Carl Fleming, partner at law firm McDermott Will & Emery, renewable energy lawyer and former White House energy advisor, has been working on several IRA-related cases for clients. He says cases can generally be grouped into three buckets: transactions that can happen now with no more clarity needed, transactions that can occur now but may need to wait for funding and those that are transactable at all.

For example, Fleming says he was working on a couple of deals relating to energy communities where the requirements were clear enough to be certain support could be accessed. But in other areas, things are less clear. He called the domestic content adder "the most transformative aspect of the IRA" but said it was "too vague" in its current form, urging the Internal Revenue Service (IRS) to clarify the rules and simplify the wording.

The IRS initiated a consultation period that ended on 4 November, which Fleming said would likely help clear up some of the uncertainty, adding that the IRS had historically been "receptive to commercial feedback". Given the sheer volume of comments, Fleming said it would be remarkable if any added clarity was provided before the end of Q1 2023.

For now, companies should be making preparations by getting financing commitments and contingent funding ready for when clarity comes, Fleming advised. Otherwise, they risk playing catch-up on early movers when more information is provided, with this risk compounded by the increased strain on the IRS as a result of massively increased requests.

While the IRA is a significant boon for the US solar sector, it is by no means the complete solution. Added clarity and guidance on its provisions need to be provided soon in order to maximise the benefits it is expected to bring in 2023 and onwards. It has previously been described as the "best chance the US has" and a "game changer" for the country's solar sector, and all stakeholders will need to work together to bring this about. ■