Research Blast

US Inflation Reduction Act – August 2022

The Inflation Reduction Act of 2022 is the most important US clean energy legislation in recent history

The bill gives investors unprecedented policy visibility that was previously lacking

Energy tax credits have been expanded to investments such as standalone energy storage, clean transportation, hydrogen etc., opening up new investment opportunities

Top 5 takeaways for infrastructure

On 16 August 2022, President Biden signed the Inflation Reduction Act (IRA) into law. The bill contains USD 369 billion of spending targeted towards energy security and climate change. This is the most important clean energy legislation in recent history, and will significantly broaden the investable universe. We expect to see new investment opportunities across renewable energy, standalone energy storage, sustainable fuels, clean transportation, and traditional infrastructure supporting the domestic supply chain.

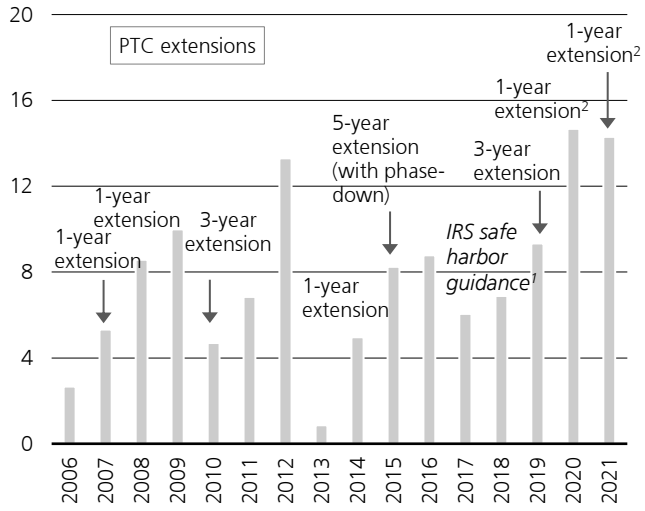
The passage of the IRA surprised almost everyone, especially after the failure of the Build Back Better Act (BBBA) at the end of 2021, and Senator Joe Manchin's continued opposition to various climate-related policies throughout the year. The final text of the IRA is over 700 pages long, and includes provisions around energy and climate, corporate minimum tax, IRS enforcement, prescription drug pricing, and the Affordable Care Act extension. For the purpose of this Research Blast, we will focus on the energy related provisions, and summarize the 5 key takeaways that are the most relevant to investors.

Takeaway #1: Renewable tax credits to last at least 10 years, giving unprecedented amount of policy visibility
The creation of the Production Tax Credit (PTC) and the Investment Tax Credit (ITC) have been transformative for the renewable energy industry in the US, spurring significant investments over the past two decades.

Behind the scenes though, these tax credits were often thrown around by politicians as legislative bargaining chips, and were usually included as small parts of larger spending bills. For example, the PTC has been extended over a dozen times since 1999, and often for short durations. Occasionally, the tax credits would even expire before being extended retroactively.

This created a highly unpredictable environment for renewable energy investors, who often rushed to complete projects before certain policy related deadlines. This is reflected in the amount of renewable capacity that is commissioned annually (see Figure 1), which fluctuates greatly from year to year.

Figure 1: Unpredictable energy policies created significant volatility in renewable investments
(wind capacity additions, GW)



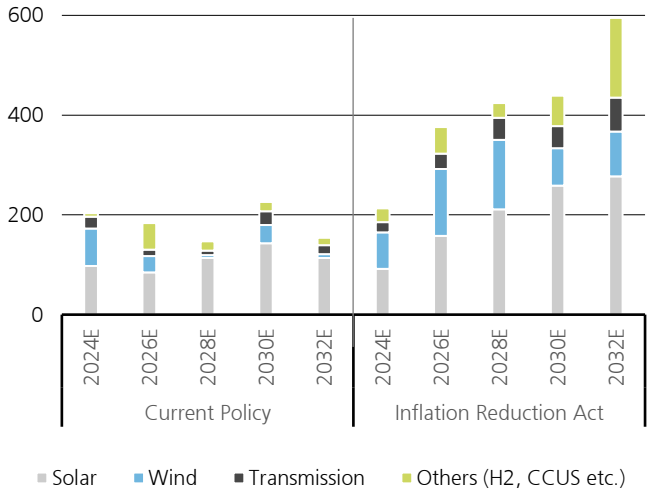
Source: EIA, US Congress, August 2022. **1** Safe harbor rules essentially extend tax credits if certain requirements are met. **2** Extensions push back the phase-down of tax credits, rather than reset credits fully.

The IRA is a 180-degree departure from the previous haphazard energy policy making process, as it is a comprehensive and coherent piece of legislation that focuses heavily on energy-related tax credits. It will be available for at least the next 10 years, and extended until certain carbon reduction requirements are met.

This gives project developers, equipment manufacturers and financial investors much needed certainty when making investment or operational decisions. Future capacity growth should become more predictable, which will also improve transmission planning for utilities, supply chain logistics, and workforce management.

Takeaway #2: Tax credits to accelerate clean energy investments, especially for new sectors and technologies
The 10-year extension of existing tax credits are a clear positive for wind and solar project deployments. The Princeton University ZERO Lab estimates that the IRA will double the amount of annual clean energy infrastructure investment by 2030 from USD 200 billion to USD 400 billion (see Figure 2).

Figure 2: Annual investments in clean energy infrastructure to accelerate under the IRA
(annual capital investments, USD billions)



Source: Princeton University REPEAT project, August 2022. H2 = hydrogen, CCUS = carbon capture, usage and sequestration.

Most of this will be driven by larger amounts of wind and solar investments, which will continue to drive up renewable penetration. This will also increase the need for new energy storage capacity and transmission lines.

Beyond wind and solar, the IRA also expands tax credits to many rapidly growing clean energy technologies and sectors. For example, standalone energy storage emerges as a big winner, as these projects now qualify for the ITC. This finally puts standalone projects on a level playing field with hybrid renewables-plus-storage projects (hybrid projects already qualified for the ITC before the IRA).

In addition, tax credits have been expanded to green hydrogen, biofuels and nuclear power. The tax credit for hydrogen is particularly generous. At USD 3/kg, the US will be one of the lowest cost green hydrogen producers in the world. Tax credits for carbon capture, utilization and sequestration (CCUS) have also been increased by 70%.

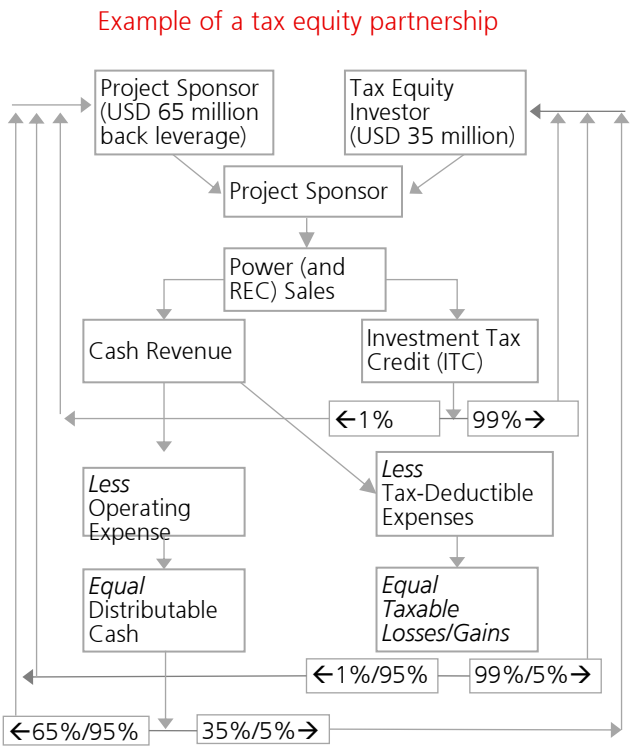
Finally, the IRA extends a USD 7,500 subsidy for new electric vehicles (EV) and eliminates the previous phaseout of subsidies for high volume suppliers (e.g. Tesla, General Motors), although the subsidy will have more stringent local content requirements. The bill also creates a subsidy for used EVs that is up to USD 4,000, and provides USD 1.7 billion of grants for EV charging and clean refueling infrastructure.

Takeaway #3: Broader pool of capital for clean energy project financing

One important feature of the IRA is that it streamlines the monetization of energy tax credits. In the past, renewable project sponsors often entered into complex *tax equity* financing structures with a tax equity investor (see Figure 3) in order to realize their projects' tax credits.

The IRA now allows tax credits to be transferred (i.e. sold) to an unrelated third party, which potentially opens up a wider pool of capital for projects. In addition, the IRA included a *direct pay* provision that allows tax-exempt entities (local governments, pension funds etc.), clean energy equipment manufacturers, green hydrogen projects, and CCUS projects to monetize the tax credit in the form of a direct cash refund from the government.

Figure 3: Complex tax equity partnership structures required to monetize tax credits



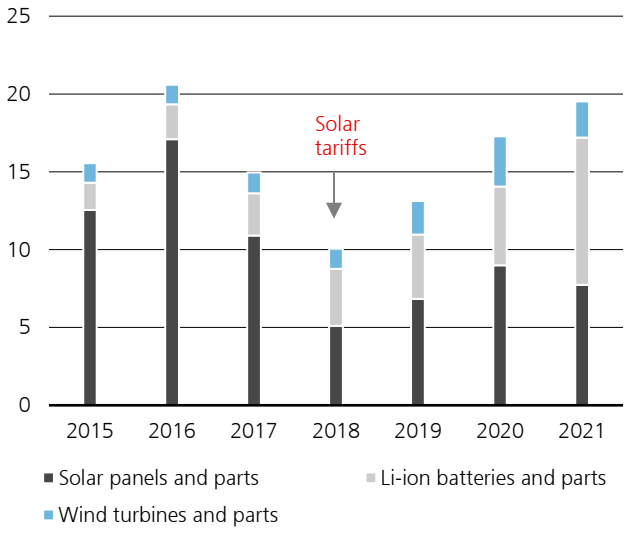
Source: Terms, Trends, and Insights on PV Project Finance in the United States, NREL, November 2018.
Note: / = flip point in transaction where cash distribution and income allocation ratios are altered; REC = renewable energy credits.

Traditional tax equity financing will likely remain, as it is a mature and relatively efficient structure (e.g. allows the monetization of depreciation) despite its complexities. The IRA's transferability and direct-pay provisions simply expand the number of project financing options, allow projects to access wider and deeper pools of capital, and attract a new class of investors who are looking to finance clean energy projects under simpler structures.

Takeaway #4: A more robust and resilient domestic supply chain for clean energy

The US currently imports large amounts of renewable energy equipment and components (see Figure 4), including wind turbines, solar panels, lithium-ion batteries, and related parts. This has become an issue for developers in the last two years due to supply chain bottlenecks caused by the pandemic and international trade disputes. According to the American Clean Power Association, since the end of 2021, more than 32 GW of clean energy projects have been delayed as of July 2022. That is more than the 28GW of total generating capacity that the US added in 2021.

Figure 4: US imports large amounts of key components for clean energy (USD billions)



Source: United States International Trade Commission, August 2022

The IRA will help the US build a more robust domestic supply chain. Domestic equipment manufacturers now have access to tax credits, and can also monetize them via a simple direct-pay method, which will encourage further investments in domestic manufacturing capacity.

The IRA also gives energy projects a 10% tax credit bonus if they satisfy *domestic content* requirements for their equipment, and apply a lower tax credit if they fail to meet prevailing wage and apprenticeship requirements. These provisions should help create a more robust domestic supply chain and labor force for the clean energy industry.

Takeaway #5: Despite some additional costs, the fossil fuel industry breathes a sigh of relief

The IRA does not apply any particularly punitive policies to the existing fossil fuel industry. On paper, there are some increased costs, as the IRA imposes a tax for methane emissions (methane is 80x more potent of a greenhouse gas vs CO2, according to the UN, which makes tackling methane leakages in the oil and gas industry an important issue).

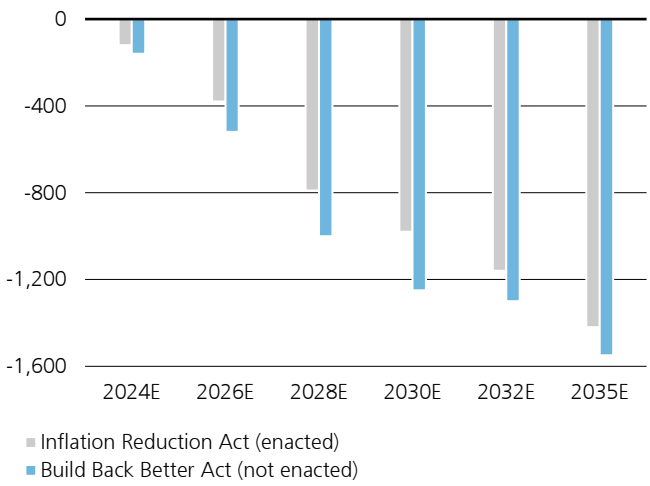
However, the oil and gas industry is already tackling the methane leakage issue, and the solutions (e.g. satellite imagery, laser-based sensors) are all relatively economical. The IRA even includes USD 1.5 billion that helps fossil fuel companies improve their methane detection and measurement, further alleviating their financial burden.

More controversially, the government is now restarting federal and offshore leases for the oil and gas industry. The IRA even requires minimum amounts of offshore oil and gas leases to be sold as a prerequisite for offshore wind leases, which certainly raises some eyebrows.

Finally, Senator Manchin has separately received the backing of Democratic leaders and the Biden administration to complete the Mountain Valley Pipeline, a natural gas pipeline that runs through his home state of West Virginia. The project is already 94% complete, but has been delayed by regulatory and environmental hurdles.

In our view, these concessions were necessary for the passage of what is a certainly a transformative bill for the clean energy industry. Based on estimates from the Princeton University ZERO Lab, the IRA is actually almost as potent as the now defunct Build Back Better Act in reducing long-term greenhouse gas (GHG) emissions (see Figure 5). The IRA has actually retained many of the major energy provisions in the BBBA, despite a much smaller headline price tag (BBBA was USD 1.7 trillion).

Figure 5: Despite concessions to the fossil fuel industry, the IRA is still highly effective in reducing GHG emissions
(annual change in GHG, Mt CO2-e)



Source: Princeton University REPEAT project, August 2022
MTCO2-e = Metric tons of carbon dioxide equivalent.

Summary

The IRA lays out a coordinated and multi-pronged clean energy strategy that the US has never had before. Its support for clean energy deployment, supply chain optimization and workforce development make it as much industrial policy as it is energy policy. Its scope covers a broad number of industries (see Figure 6), and will spur large amounts of investments in wind, solar, standalone energy storage, clean transportation, sustainable fuels, and traditional infrastructure supporting the domestic supply chain.

Figure 6: Summary of major energy and climate related spending items in the Inflation Reduction Act of 2022

Major spending items	2022-31E spending (USD billions)
Tax credits for clean electricity (wind, solar, standalone energy storage etc.)	127
Tax credits and rebates for energy efficiency for buildings (commercial and residential)	47
Energy manufacturing and energy security	37
Tax credits for nuclear	30
Tax credits for hydrogen	13
Clean vehicles (new vehicles, previously-owned vehicles, commercial vehicles etc.)	12
Clean fuels (biodiesel, renewable diesel, sustainable aviation etc.)	9
Tax credits for carbon capture, utilization and storage	3
Clean vehicle refueling and recharging	2
Others (environmental justice, conservation, rural development etc.)	91
Total energy security and climate change	369

Source: Congressional Research Service, Congressional Budget Office, August 2022

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