

Inflation Reduction Act of 2022

Key Investment Implications

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The 2022 Inflation Reduction Act became law in mid-August. While there are many important elements of the Act, [as we have written previously](#), the most notable provisions relate to renewable energy and related investments to combat climate change. Of the \$437 billion package, \$369 billion – 84% – is earmarked for such investments. Government funding for eligible technologies and investments begins in 2023, and the legislation provides a level of baseline or regulatory certainty through 2032.

At the highest level, there are several classes of investments that Pathstone believes are relevant to monitor and may have significant impact on some client portfolios. Elements of the legislation also have a potential impact on individuals and families looking to save money on energy and transportation, though most of the credits and rebates set out in the new legislation are targeted to companies.

The new law also includes investments in healthcare (via the Affordable Care Act), drought protection programs, and revenue-raising measures via changes to taxation, Medicare savings from prescription medicine negotiations, and IRS enforcement. This note focuses on the most substantive components of the legislation and the potential opportunities they may offer investors.

Power Generation and Storage

The largest line item in the Inflation Reduction Act is the extension and expansion of the production and investment tax credits for zero-carbon power generation (e.g., electricity produced by wind turbines, solar) or energy storage (e.g., battery backup power):

- The production credit amounts to \$27.5/megawatt hour (MWh), which represents enough energy to power the average American home for a month. The credit ramps up to \$33/MWh if the power generation is sited on 'brownfields', i.e., former oilfields, coal mines, or even fossil fuel generation plants. The law also restores credits for solar, which had expired recently. The production credit effectively [provides a 20-30% discount](#) to average electricity prices in the U.S. from all sources of generation, and therefore has potential to reduce prices at the meter for individuals as well as the companies generating the power (by lowering their costs and thus boosting margins).
- The investment tax credit reduces the cost basis for renewable energy equipment by 30% (or 40% if the domestic content eligibility requirement is met) and expands coverage to include battery storage technologies. There is an additional 10% bonus if the installation is located in low-income neighborhoods or tribal lands. This is relevant for businesses (i.e., electric utilities or any business installing clean energy equipment to power operations) and for individuals seeking to install, for example, rooftop solar.

Pathstone Perspective	This aspect of the Inflation Reduction Act should benefit both current and future renewable energy operators, those that want to invest in renewable energy equipment, and the equipment manufacturers themselves. This is especially important for solar companies, as the continued credit will help push solar costs below those of traditional fossil fuel-based generation.
Potential Beneficiaries	<ul style="list-style-type: none"> ▪ Utilities with owned/operated electrical generation ▪ States and municipalities owning generation assets ▪ Renewable energy equipment manufacturers (like solar panel or wind turbine manufacturers) ▪ Consumers looking to add renewable energy to their homes

Energy Manufacturing Credits

The legislation includes two energy manufacturing credits, the Advanced Energy Project Credit and the Advanced Manufacturing Production Tax Credit. The project credit is 30% and the manufacturing credit varies based on the component produced.

<p>Pathstone Perspective</p>	<p>The energy manufacturing credits have significant implications for manufacturers of clean energy products, as both support the expansion of industrial facilities involved in the supply chains of clean energy projects. New firms or existing power firms looking to pivot to renewable products or related components may be able to couple the credits and create leverage to transform their businesses to market clean energy. The credits are solely relevant to businesses now but could result in lower prices and energy security (e.g., by decoupling supply chains from China and other countries) for American consumers down the road.</p> <p>This aspect of the legislation is an incentive not only for traditional renewable energy and energy-efficiency projects like solar, wind, batteries, and electrification components, but also for the next generation of energy technology. Next-gen technologies such as non-lithium batteries, hydrogen, and small modular nuclear (more on the latter two below) are all interesting sectors that investors are following.</p>
<p>Potential Beneficiaries</p>	<ul style="list-style-type: none"> ▪ Renewable energy equipment manufacturers such as solar, wind, and battery producers ▪ Pre-commercialization and early-stage ventures in ‘next-gen’ renewable energy ▪ Industrial and electrical component suppliers with exposure to renewables

Clean Fuel Credits

Two new fuel credits were introduced: one for clean hydrogen production and another for sustainable aviation fuel:

- Clean hydrogen (also called “green or blue hydrogen”), is produced from either renewable electricity via electrolysis of water (in the case of green) or via traditional methane/natural gas with carbon captured and stored (blue). The [costs of green and blue hydrogen](#) today are roughly \$10-15/kg and \$5-7/kg, respectively, in the U.S. The fuel credit of \$3/kg for green hydrogen and up to \$1/kg for blue hydrogen (depending on the amount of carbon captured) is a significant subsidy that [advocates say](#) may make clean hydrogen competitive with ‘dirty’ hydrogen (from gas and the carbon *not* stored) in some places today, and in most of the U.S. by 2030.
- Sustainable aviation fuel, at \$8/gallon today, is twice as costly as traditional aviation kerosene. This credit doesn’t create parity with conventional fuels, but rather is intended to incentivize producers to satisfy the [79x demand increase expected by 2025](#).

Furthermore, the existing biofuels production credit of \$0.50/gallon will remain in effect alongside these hydrogen and aviation fuel credits until 2024, when all three will transition to a simplified ‘clean fuels’ credit in effect until 2027 (\$0.35 to \$1.25/gallon depending on emissions footprint).

<p>Pathstone Perspective</p>	<p>Clean fuel credits will have implications for industries that rely on those sources or may do so in future – e.g., aviation and heavy industries requiring higher-concentration fuels like jet fuel – as well as for producers of conventional fuel stocks.</p> <p>While individual consumers might not have a direct financial interest in these fuel credits, they might benefit from lower-cost sustainable aviation, or, for those who rely on biofuels to power their homes or vehicles, lower absolute costs.</p>
<p>Potential Beneficiaries</p>	<ul style="list-style-type: none"> ▪ Steel and cement sectors ▪ Shipping, aviation ▪ Downstream energy (refining and gas/liquids manufacturers) ▪ Green hydrogen and clean fuel manufacturers ▪ Ancillary components and services for those industries

Nuclear Energy

The legislation introduces a credit for nuclear production starting in 2024. It includes a base amount of \$0.01/kilowatt-hour (kWh), which is a 10% reduction from the average retail market price of \$0.11/kWh for all types of electricity generation. It nearly [halves the wholesale cost](#) of \$0.035/kWh for nuclear-sourced electricity. The legislation also creates a fund and regulatory/policy opening to allow the U.S. government to produce and distribute more of the specialty fuel required by new nuclear reactor designs.

Pathstone Perspective	<p>The nuclear industry will benefit substantially from this credit starting in 2024. The U.S. Congressional Budget Office estimates an even higher dispersal of funds for electricity generated from nuclear than from other renewable resources in that first year (2024), and this provision of the law makes up almost 50% of clean electricity credits over their duration (2032).</p> <p>Data from the International Energy Agency has shown that extending the life of existing nuclear plants is the most cost-effective option for low-carbon energy generation in the next 10-20 years. This incentive may prove to be a game changer for plant operators.</p>
Potential Beneficiaries	<ul style="list-style-type: none"> ▪ Utilities with existing nuclear electricity generation facilities ▪ Industrials and materials companies serving nuclear ▪ Next generation nuclear reactor startups (e.g., small modular reactors/SMR reactor designers)

Carbon Capture Storage

Carbon capture storage (CCS) is a technology that enables traditional sources of energy from fossil fuels to contain their carbon by-product when burned. The Inflation Reduction Act lowers the minimum annual capture requirements of CCS facilities (varying by type) while increasing the potential credit amount, up to a maximum of \$130/metric ton of carbon captured, an increase of over \$100/metric ton.

Pathstone Perspective	<p>This credit could support retrofitting CCS equipment to existing heavy industrial plants in sectors such as steel and cement production that require high levels of fossil fuels to manufacture. It could also restore economic viability to coal-fired electrical power plants. In the U.S., firms aren't legally required to cap or reduce emissions yet, and therefore it is not necessary for firms to buy/sell emissions. CCS is a market-based solution in countries like the EU, as capturing vs emitting a ton of emissions can be a cost-effective way to meet carbon caps or avoid taxes.</p> <p>CCS can be economically viable without subsidies when the market rate of carbon is at least \$50-60 per ton of emissions (the expense of operating the technology without subsidy). However, that requires a carbon price or tax framework, and although there may be a US carbon tax in the future, the \$130 credit may be attractive regardless for certain industries (assuming \$50-60 costs of implementation) and create a strong economic incentive for high-emitting industries like power generation, steel, or cement to adopt CCS. Said simply, a \$130/ton rebate with a \$50-60/ton cost structure creates a viable opportunity to adopt CCS.</p>
Potential Beneficiaries	<ul style="list-style-type: none"> ▪ Utilities with coal-generation assets (or even stranded/non-operating assets due to economics) ▪ Steel, cement, other heavy industries without viable transition fuels or technologies to date (e.g., hydrogen is not yet a commercially viable choice to power steel furnaces)

Clean Vehicles

The clean vehicles credits associated with the new legislation come in two forms: 1) an alternative refueling infrastructure credit of 30% of costs up to \$100,000 per business, and 2) a clean vehicles credit of up to 30% for non-commercial and 15% for commercial vehicles (with respective \$7,500 or \$14,000 maximums for new autos) from qualified manufacturers. Vehicles are required to be manufactured domestically. There is also a \$4,000 credit for low-income families or individuals for purchasing used electric vehicles.

Pathstone Perspective	<p>This section of the legislation is highly relevant for individuals and businesses looking to ‘go electric’ with their vehicles. At current prices, the credit puts electric vehicles (EVs) roughly at parity with gas-powered counterparts, and over the lifetime of the vehicle may save drivers \$6,000-10,000, mostly from lower maintenance and fuel costs.</p> <p>The requirement for domestic manufacturing may hamper some growth in EVs (and batteries) initially, but there are domestically produced EVs and charging companies that will benefit, and more manufacturers intend to produce EV models in the U.S. in 2023.</p> <p>As EVs proliferate due to both customer demand and policy action, there is an investment gap with regard to the refueling infrastructure and grid capacity which other elements of the legislation are intended to incentivize.</p>
Potential Beneficiaries	<ul style="list-style-type: none"> ▪ Auto manufacturers with US manufacturing, ▪ EV and alternative fuel refueling infrastructure ▪ Ancillary component manufacturers (chargers, inverters, etc.)

Energy Efficiency

The law earmarks \$9 billion for home energy rebate programs. This includes a taxpayer credit of up to \$14,000 for energy efficiency upgrades (such as an \$8,000 rebate for installing a heat pump, an alternative home heating and cooling solution).

Pathstone Perspective	<p>This element of the Inflation Reduction Act is perhaps the most relevant and impactful for individuals. Some early analysis finds that homeowners taking advantage of these credits may save upwards of \$1,000/year in energy costs.</p> <p>Retrofitting existing homes is the largest investable opportunity given the dynamics of this market. New construction costs will often include many of the standard efficiency features and new appliances that this incentive looks to address. Simple solutions like insulation and windows have an outsized impact on lowering heating and cooling costs for customers, and the inclusion of the heat pump rebate may significantly boost that solution in the market.</p>
Potential Beneficiaries	<ul style="list-style-type: none"> ▪ Homebuilders, building suppliers, appliance and HVAC manufacturers (especially with heat pump products)

Agriculture

The IRA provides \$44 billion for several programs aimed at farm and ranching communities and industries, including \$18 billion for four conservation programs, \$19.5 billion for the USDA’s Natural Resource Conservation Service (supporting nutrient conservation such as preventing nitrogen loss in soil), and \$3 billion in farm debt relief.

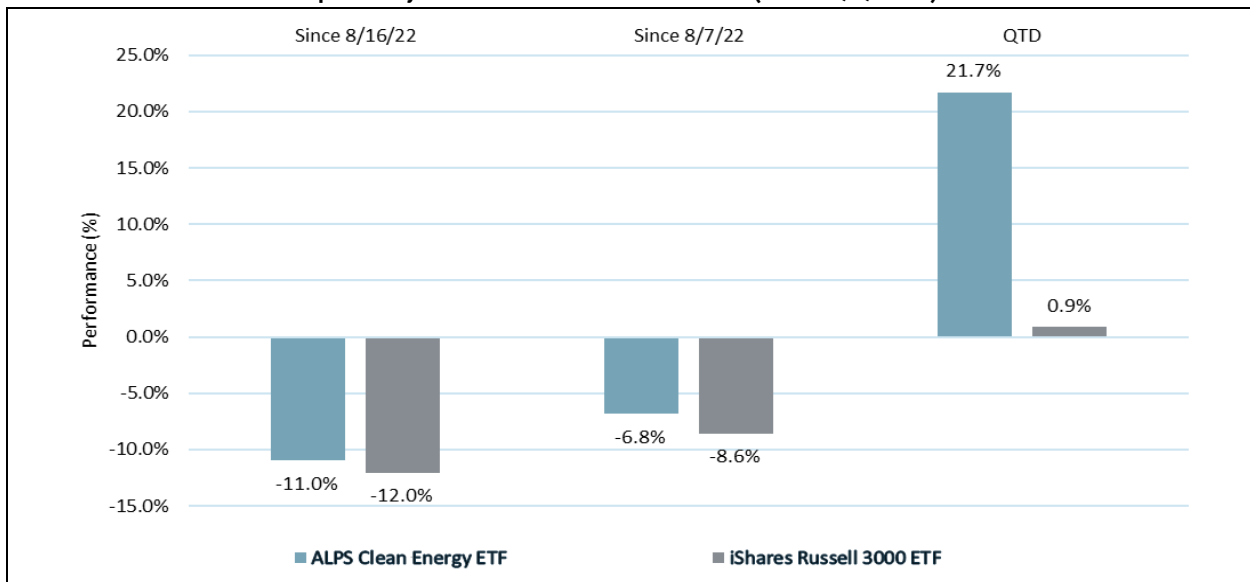
Pathstone Perspective	<p>While an important environmental and regulatory priority, much of the assistance provided will not necessarily provide investable opportunities, as the conservation programs are broader in scope and the debt forgiveness impacts only Farm Services Agency (FSA) loans.</p>
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In Sum: A Boost for Many Industries – and Potentially for Investors

The provisions of the Inflation Reduction Act present significant investment opportunities. Some of the largest impacts should be from the production credits provided for energy generators and operators that are able to quickly bring assets online – and of course the renewable energy companies that ultimately will be selling equipment to those operators. For instance, solar panel and wind turbine manufacturing, battery back-up integration and manufacturing, and related components like inverters all are expected to get a big boost.

Financial markets are already starting to reflect the changing dynamics. For instance, the Alps Clean Energy ETF, a clean energy fund with more than 80% U.S.-based stocks, holds many of the stocks expected to benefit from this legislation; it outperformed the broad Russell 3000 U.S. index through the passage of the bill. *(For reference, the Inflation Reduction Act of 2022 [IRA] was passed in the Senate and House on August 7 and August 12, respectively, and signed into law on August 16.)*

Performance of Industries Impacted by Inflation Reduction Act of 2022 (as of 10/5/2022)



Source: Pathstone.

Beyond the public equity markets, private market portfolio companies in future markets such as hydrogen and non-lithium-ion battery technology should also be well placed to take advantage of the new credits. Hydrogen should be especially well placed, as analysts target **current production costs at ~\$2/kg**, while the new production credit of \$3/kg creates a net negative market. This may create dislocations in broader markets, but bodes extremely well for manufacturers of hydrogen production, transportation, and storage equipment.

The law also includes a **\$27 billion fund for green banks**, which is expected to spur private investment into additional greenhouse-gas reducing projects alongside asset managers and private-sector banks, who would reduce risk as the new bank likely takes first-loss tranches of lending.

Many investment managers on Pathstone’s platform are already taking advantage of these diverse investment opportunities in public or private markets. We have seen the market adjust prices to the new legislation quickly, but the effects on company fundamentals will take time to play out. Investment managers with expertise in these areas will be well positioned to benefit.

For individuals and families, the law will reduce energy and transportation costs (as a result of lowered fuel costs over the long term). It should also cushion the economy from future price shocks as a result of creating domestic manufacturing centers to decouple key industries from reliance on China and other foreign partners that present operational risks.

Significant Execution Risks to Forecasts

Despite the positive reception of the Inflation Reduction Act from the clean energy business community, there remain some criticisms and key unanswered questions.

Domestic Manufacturing Requirements

First, many of the credits are tied to domestic manufacturing requirements, as are almost all of the additional ‘bonus’ credits. While some parts of the markets affected in the legislation, like solar panels, wind turbines, and biofuels, are currently domestically produced (or available from a qualifying U.S. free trade partner), domestic manufacturing in the battery industry and thus the EV market is not there yet. It’s possible that the manufacturing credits will incentivize the onshoring or retooling of production in this sector, but currently many of the necessary components in these technologies are [produced in China](#), including more than two-thirds of the lithium used in batteries today. Therefore, the outlook with battery storage may have little impact on markets or on target emission reductions in the near term.

State and Local Funding Provisions

In addition to the aforementioned target industries we covered in this note, there is a \$60 billion allocation in the budget for state and local governments to help direct investments in [climate justice solutions](#) for low-income communities and those disproportionately affected by climate impacts. This approach relies on states to make the right calls and not direct funds either inefficiently or to high-emitting industries which may be thinly veiled as ‘clean.’

Nuclear Inclusion

Nuclear energy’s inclusion raised some eyebrows, as many facilities that exist are either slated to be decommissioned or, in the case of the new facilities the legislation looks to incentivize, may require long time frames to develop and would likely face community resistance. Advanced nuclear solutions, like small modular reactors (SMRs), could be deployed more safely and quickly, but they aren’t yet fully commercial, and [opponents say](#) they result in more waste and costs than should be considered viable vs. other commercial renewable generation sources like wind or solar today.

Overall Readiness

There is also the unaddressed concern of the overall power grid’s readiness for so much new electricity generation to come online, including the growth in end-user demand from technologies like electric vehicles. There is likely a large investment opportunity for traditional electrical distribution equipment manufacturers as new power generation facilities from wind, solar or other sources look to interconnect with transmission facilities. Smart grid technologies and other electrical transmission equipment could also get a boost as it is likely many new utility-scale renewable energy generation sites are not collocated on existing generation plots. However, the timing of power grid strengthening versus demand growth remains a risk.

Last word

In sum, the Inflation Reduction Act appears to have the potential to significantly reduce emissions, create large opportunities for clean energy players in the market, and save American consumers some money on utility bills and at the pump. Some elements of the law appear to address systemic issues of inequality and trade imbalance, which may have positive social impacts on top of the headline environmental impacts.

The implications of the new Inflation Reduction Act of 2022 for financial markets are vast. There are over 200 public companies in the U.S. that offer renewable or clean energy products; there are dozens of other publicly traded firms in transportation and pollution control/ treatment that will also be in scope to benefit from the spending. And this says nothing of the private market opportunities presented by the legislation, which is targeted to aid smaller (generally private) firms via the state and local incentives.

While there are some significant challenges yet to be overcome in domestic manufacturing and details on implementing the ambitious programs, the Inflation Reduction Act has drastically shifted the policy and business landscape for the energy and technology sectors exposed to the new incentives.

Sources:

https://www.cbo.gov/system/files/2022-08/hr5376_IR_Act_8-3-22.pdf
<https://www.natlawreview.com/article/house-passes-inflation-reduction-act-what-will-mean-clean-energy-and-manufacturing>
<https://www.wsj.com/articles/inflation-reduction-acts-27-billion-in-green-funds-could-be-boon-for-private-sector-11660055699>
<https://www.vox.com/policy-and-politics/2022/7/28/23281757/whats-in-climate-bill-inflation-reduction-act>
https://energyinnovation.org/wp-content/uploads/2022/08/Modeling-the-Inflation-Reduction-Act-with-the-US-Energy-Policy-Simulator_August.pdf
<https://www.jdsupra.com/legalnews/hydrogen-related-provisions-of-the-2283064/>
<https://www.chemistryworld.com/news/the-next-generation-of-nuclear-reactors-will-produce-even-more-radioactive-waste/4015753.article>
<https://www.washingtonpost.com/politics/2022/08/12/inflation-reduction-act-clean-energy/>
<https://www.mossadams.com/articles/2022/08/inflation-reduction-act-clean-energy-credits>
<https://www.thirdway.org/blog/sustainable-aviation-taking-off-thanks-to-inflation-reduction-act>
<https://www.flyingmag.com/could-saf-be-a-cost-effective-solution-to-rising-aviation-fuel-prices/>
<https://www.utilitydive.com/news/green-hydrogen-prices-global-report/627776/>
https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_6_a
<https://agamerica.com/blog/inflation-reduction-act-for-farmers-and-landowners/>
<https://www.nbcnews.com/politics/politics-news/inflation-reduction-act-puts-60b-focus-biden-priority-environmental-ju-rcna42891>

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