Belgian Financial Forum

The US Inflation Reduction Act and Europe's response[1]

Dennis Essers
Economist
National Bank of Belgium

ABSTRACT

This article discusses the landmark 2022 United States Inflation Reduction Act (IRA) and the EU's response so far. First, it lays out the main clean energy provisions of the US IRA, their underlying objectives, and the projected impacts. Second, the article examines the EU's concerns with the IRA and assesses the resulting policy initiatives of the European Commission proposed under the umbrella of the Green Deal Industrial Plan. While US and EU preferences and policy choices are clearly different, more international cooperation – between them and with others – will be needed for a successful green transition.

The US Inflation Reduction Act (IRA) of 2022 and EU reaction to it can be seen as a case study embodying multiple dimensions of "open strategic autonomy" (OSA) (ESCB IRC, 2023): the acknowledgement that the world economy is undergoing major shifts, as large economies are attempting to engineer a green transition; the laying bare of critical dependencies by such a transition; the reflex to address those dependencies with government interventions and protectionism; and the realisation by (most) policymakers that at least some degree of international cooperation will be needed, across the Atlantic and beyond. Above all, the US IRA and European response illustrate the difficult trade-offs and prioritisation issues that are inherent to OSA.

The US Inflation Reduction Act: what's in a name?

The IRA was signed into law by US President Biden in August 2022. The Act's name derives from its intention to withdraw excess purchasing power from the US economy by means of increased taxation and healthcare savings, to the tune of $739 billion. The IRA was conceived from the remains of the 2021 Build Back Better Act, which ultimately stranded in the US Senate. Arguably the internationally

[1] This article is based on a discussion of the European System of Central Banks' report on the EU's Open Strategic Autonomy, as presented by Isabel Vansteenkiste (ECB) at the National Bank of Belgium on 12 June 2023. The views expressed are those of the author and should not be attributed to the National Bank of Belgium or the Eurosystem.

most relevant component of the IRA are its clean energy provisions introducing various tax credits and direct expenditure items. These provisions were originally costed by the US Congressional Budget Office (CBO) at $392 billion over a ten-year period, with tax credits accounting for nearly 70% of the total (Bistline *et al.*, 2023).

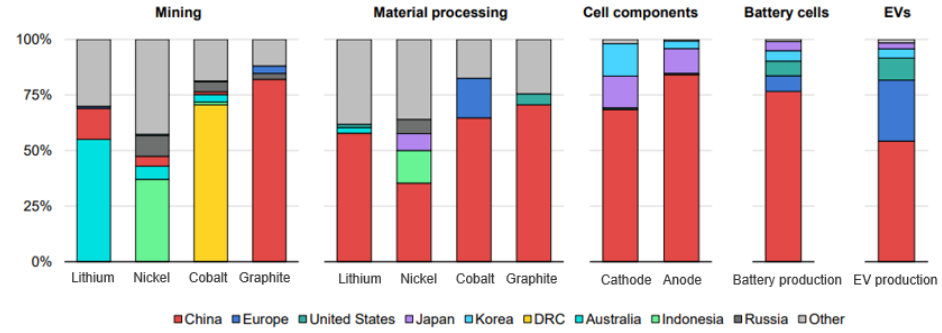
Three key categories of tax/subsidy measures can be distinguished (see Kleimann *et al.*, 2023). First, the IRA includes production and investment tax credits for the generation of clean energy and carbon capture. Those tax credits are topped up with bonus subsidies for projects that provide higher wages and possibilities for apprenticeships, for projects located in communities that currently produce dirty energy, and for projects that use domestically produced steel and other materials. Second, the IRA provides tax credits for manufacturers of clean technology products and components such as solar installations, wind turbines and batteries, and for producers of the associated raw materials, including high-grade polysilicon, aluminium, cobalt and graphite. Third, the IRA also supports consumer purchases of electric or hydrogen fuel cell vehicles. The size of the clean consumer vehicle tax credit (up to $7,500) depends on the vehicle's retail price, the buyer's income and, crucially, on the satisfaction of certain "local content requirements". The tax credit only applies to clean cars whose final assembly takes place in North America, i.e. the US, Canada or Mexico. Moreover, to qualify for the full credit a minimum share of the value of battery components *and* of critical raw materials used in those components needs to be sourced from the US or from a country that has a free trade agreement with the US (currently 20 countries, including Australia, South Korea, Singapore and several Latin American countries, but not the European Union). Those minimum local/partner shares increase progressively, from 50% to 100% by 2029 for components and from 40% to 80% by 2027 for critical raw materials. Moreover, from 2024/2025 there can be no sourcing at all of batteries and raw materials from "foreign entities of concern", meaning companies linked to China, Russia, Iran or North Korea.

The objectives of the IRA's clean energy provisions are multi-fold (see Bown, 2023). Obviously, by subsidising the generation and take-up of clean energy, the US government wants to encourage the transition of the US to a net zero carbon economy. Indeed, transportation is the single largest contributor to US greenhouse gas emissions and US consumers have so far been much slower than their European or Chinese counterparts to switch from traditional cars with internal combustion engines (ICE) to electric vehicles. Additionally, by stimulating domestic (and partner) capacity the US is looking to enhance the security of its energy supplies and the resilience along the supply chains of green products such as electric vehicles and their batteries. Relatedly, the IRA aims to increase US competitiveness in those supply chains, in order to create new jobs for the US middle class as well as to protect existing jobs that are threatened by the switch from ICE to electric cars. Many of the at-risk jobs are concentrated in swing states like Michigan and Ohio, traditional manufacturing hubs that suffered large economic losses from the early 2000s onward, at least in part under the impulse of rising Chinese imports (Autor *et al.*, 2021).

Figure 1 shows that the American security of supply fears motivating the IRA are not that far-fetched. While the mining of critical raw materials used in current-generation batteries occurs mostly elsewhere, China dominates the further downstream stages of the global electric vehicle battery

supply chain.[2] The country is world leader in the refining of critical raw materials, represents between 70% and 90% of the global production capacity of cathodes, anodes and entire battery cells (CATL being the number one lithium-ion battery producer), and accounts for more than half of the world's electric car production (with home-grown brands such as BYD). China achieved its top position by an early bet on the transition to EVs with generous consumer subsidies as early as 2009.

Figure 1. Geographic distribution of different stages of global electric vehicle battery supply chain (%, based on production location; 2021)



Source: IEA (2022).

In the solar panel industry, China's dominance is even greater, all the way from the production of high-purity polysilicon to complete photovoltaic modules (De Sloover *et al.*, 2023).

The IRA's estimated impacts

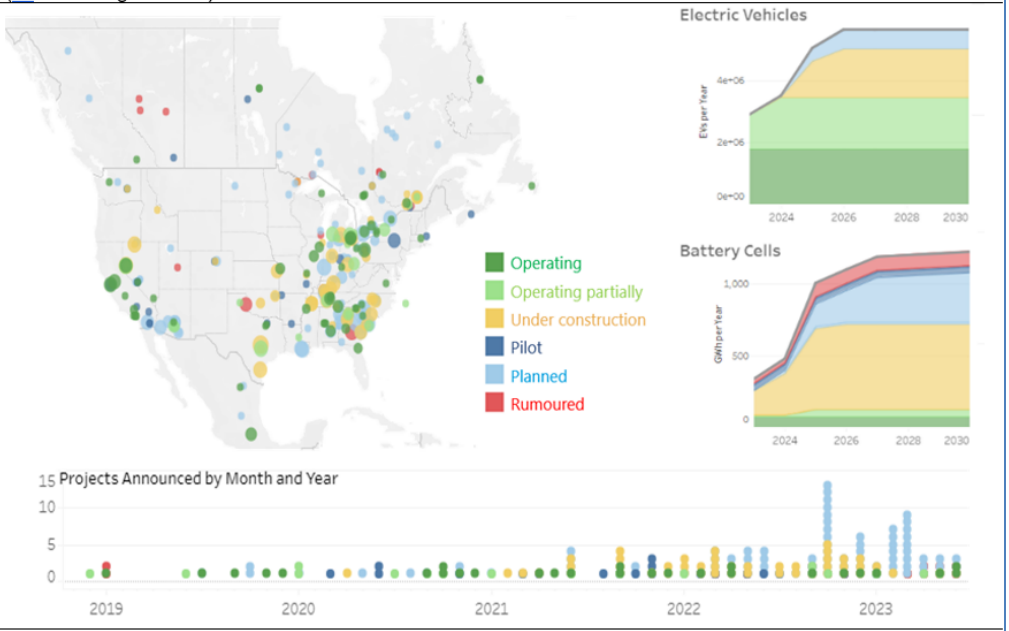
The IRA is a real game changer on the climate front: it represents the largest climate policy effort in US history. The IRA's support measures are expected to lead to significant, double-digit reductions in the "levelized cost" of renewable energy, like solar, wind or nuclear power – i.e., the average cost of electricity generation over the lifetime of a facility (Jung *et al.*, 2023). Preliminary estimates suggest the share of US electricity generation from renewables could be increased by as much as 19 percentage points relative to a baseline without the IRA (IMF, 2023). Hence, the IRA will bring the US closer to its Paris Agreement commitments to reduce net greenhouse gas emissions by 50% to 52% below 2005 levels by 2030 and to reach net-zero emissions by no later than 2050; recent studies point to an emissions reduction that is 6 to 11 percentage points larger than in a no-IRA scenario (Bistline *et al.*, 2023). However, it remains to be seen if a subsidy-focused mitigation policy approach without an explicit carbon price will be sufficient for the US to fully achieve its Paris Agreement goals (De Sloover *et al.*, 2023). For now at least, a US-wide carbon tax appears to be politically infeasible.

The fiscal cost of the IRA's energy and climate provisions could well be a multiple of the $400 billion original estimate (with recent ballpark figures as high as 1.2 trillion) since many of the support measures are uncapped and the final bill will depend on the actual uptake. The net budgetary impact

[2] The location-based percentages shown in Figure 1 are believed to underestimate true market control of Chinese companies over the mining of critical raw materials (see Leruth *et al.*, 2022).

also hinges on the relative success of the plans of extra revenue mobilisation. The effects of this supply-side policy package on overall US output, wages and labour productivity are forecasted to be positive but rather small. For example, simulations suggest the IRA climate support would add around 0.1 percent to the level of US GDP by 2030, reflecting an expansion of the economy's productive capacity which more than offsets any decline in investment from the higher taxes needed to finance the support measures (IMF, 2023).

Figure 2. Location, announcement timing and projected capacity of mines and battery/electric vehicle factories in North America
(as of 17 August 2023)



Sources: Turner ***et al.*** (2023), charged-the-book.com.
Note: Dot sizes on the map are proportional to the estimated capital investment.

The IRA has already resulted in private sector commitments that will provide a serious boost to North American clean energy value chains. According to the White House (2023) itself, in the IRA's first year of existence, companies have announced more than $110 billion in new clean energy manufacturing investments, including more than $70 billion in the electric vehicle supply chain and more than $10 billion in solar power manufacturing. Project developers are said to have planned investments worth at least $122 billion across 800+ clean energy generation projects, amounting to an extra 80GW in total.[3] Independent monitoring by Turner *et al.* (2023) has produced similar estimates; it identifies $70 billion of capital investment across about 100 projects along the electric vehicle, battery and mining supply chain since mid-August 2022 (see Figure 2). Besides US company projects, such as Tesla's car and battery plant expansions in Nevada, these include ventures by European and Asian

[3] One can also observe a surge in investments in IRA-related sectors in the months prior to the IRA's passage, plausibly because firms anticipated the increase in support measures based on earlier policy proposals and debates (US Treasury, 2023).

firms, like the Volkswagen/PowerCo battery plant in Ontario (Canada) or Hyundai and LG's joint facility in Georgia. In many projects, IRA incentives are topped up with US (or Canadian) state-level support. While it is too early to properly assess the effectiveness of the IRA's place-based incentives, the US Treasury (2023) finds that announced investments in IRA-related sectors have been concentrated in relatively disadvantaged communities with lower wages, lower college graduation rates, and lower employment rates.

Europe's concerns and reaction to the IRA

Before zooming in on Europe's critiques, it is important to stress that the EU has welcomed the US becoming much more serious about its green transition − the IRA being the pinnacle of that.

Also, one should bear in mind that while the EU had no flagship green subsidy scheme like the IRA, it already had a multitude of initiatives in place, at both EU and member state levels, that employ subsidies for broadly similar purposes (see Kleimann *et al.*, 2023 for a more detailed overview). In 2020 EU member states together distributed about €80 billion in subsidies for electricity production from renewable energy sources, mostly in the form of feed-in tariffs and premia and with solar energy being the biggest beneficiary. Loans from the European Investment Bank (EIB) have provided additional support for renewable energy deployment. European clean technology manufacturing has received funding from various corners, including loans and grants from the Recovery and Resilience Facility (RRF), support under the EU Important Projects of Common European Interest (IPCEIs) for batteries and hydrogen, the EU Innovation Fund, the EU Innovation Council (EIC) Accelerator and, again, EIB loans and guarantees. Moreover, almost every EU member state has been subsidising electric vehicle purchases, to varying extents but at an estimated average incentive of around €6,000 per car across the EU.

A direct quantitative comparison of IRA and EU green support remains difficult, however, as information on US state-/local-level and EU national measures is hard to come by. Kleimann *et al.* (2023) conclude that European aid for electric vehicle purchases and clean tech manufacturing may be of a similar magnitude than IRA measures, whereas European clean energy support is deemed more generous than in the US. The main differences may be more qualitative, though, with US support more easily and rapidly accessible, less fragmented, and more focused on the mass deployment of current-generation technologies than on innovation.

Europe's key concerns with the IRA relate to the discriminatory local content requirements that several of the IRA tax credits impose, signalling a total disregard for basic World Trade Organisation (WTO) rules and a continuation of an "America First" approach (Scheinert, 2023). Combined with already cheaper access to energy in the US (reinforced by the lack of US carbon taxes), the IRA's protectionist character has instilled fears that European competitiveness would be harmed and that European firms active in renewables, batteries and/or electric vehicles would relocate *en masse* to the US. Several threats by firms to leave for the US unless Europe provided them with more subsidies

have further fuelled such fears. Ceteris paribus, a large-scale exodus of clean energy firms would undermine Europe's own green transition.[4]

Even if the IRA requirements are clearly WTO-inconsistent, there has been limited appetite in Europe to start a new WTO trade dispute with the US. On a practical level, the WTO dispute settlement process is currently dysfunctional (because of earlier US blocking of appointments to the WTO's appeal body). Moreover, politically, the US might retaliate on the upcoming EU carbon border adjustment mechanism and is a key ally in the war in Ukraine. Instead, European policymakers have sought negotiated solutions, with some success so far.

In December 2022, the US Treasury clarified that, *in case they are leased*, clean consumer vehicles would fall under the IRA's separate tax credit regime for clean *commercial* vehicles, where none of the local content requirements with respect to assembly, battery components and raw materials, nor any price or income caps, apply. This was good news for European luxury car brands. Unsurprisingly, the leased share of electric vehicles entering the US has increased rapidly since (Bown, 2023). Similar to Japan and other countries, the European Commission has also tried to negotiate a limited trade agreement with the US that would count toward the "free trade agreement" requirement for the critical raw material sourcing criterion in the clean vehicle tax credit.[5] Nevertheless, even if the US and EU may have resolved some of the most pressing bilateral issues invoked by the passing of the IRA, other sources of friction, including other discriminatory elements and the two blocs' fundamentally different views on international subsidy rules and carbon pricing, remain unaddressed (Bown, 2023; Kleimann *et al.*, 2023).

The EU Green Deal Industrial Plan: the good, the bad and the ugly

The European Commission felt compelled to launch further initiatives of its own in response to the IRA. In February 2023 it announced the Green Deal Industrial Plan, aimed at providing "a more supportive environment" for Europe's clean energy industries. The Green Deal Industrial Plan consists of multiple policy proposals, to be further discussed in the European Parliament and the Council.

One central piece is the Net-Zero Industry Act (NZIA), which sets a target for the domestic manufacturing capacity of strategic net-zero technologies (including solar, wind, batteries, heat pumps and carbon capture) to meet at least 40% of the EU's annual deployment needs by 2030. The NZIA seeks to accelerate the permitting process for net-zero manufacturing projects that involve technologies close to commercialization and to coordinate private funding, limited public funds from the member states, and public procurement procedures. It also acknowledges skill shortages as a major constraint, but without developing concrete solutions. A second component is the Critical Raw Materials (CRM) Act. The CRM Act sets EU capacity benchmarks for the extraction (10% of annual

[4] In the longer run, an IRA-driven reduction in the cost of clean technologies may help the green transition in Europe and elsewhere.

[5] Some members of US Congress have criticised the Biden administration for the flexibility it has shown in interpreting the IRA after complaints by the EU and other countries, while other Congress members have admitted that errors were made in the IRA's drafting (Bown, 2023).

consumption by 2030), processing (40%) and recycling (15%) of strategic raw materials and formulates an additional diversification target (no more than 65% of each material at any relevant stage may come from a single third country). On the international front, the CRM Act wants to promote engagement with reliable partners, including though a "CRM Club" of like-minded countries willing to strengthen value chains and by means of trade agreements with CRM chapters. A third pillar is the Temporary Crisis and Transition Framework (TCTF) for state aid, which modifies the 2022 framework that was set up to deal with the consequences of the Russian invasion of Ukraine. The modified framework provides additional flexibility for member state support of the renewable energy roll-out, industrial decarbonization, and clean energy manufacturing. Among other things, it includes the possibility of matching third-country aid (up to what would be needed to have the investment made in Europe), under certain conditions. The TCTF has already been adopted and would remain in place until end 2025.

Finally, the Green Deal Industrial Plan reiterated the idea of a European Sovereignty Fund, as a medium-term complement to existing financing under REPowerEU, InvestEU and the Innovation Fund. However, with member states' finances already stretched and EU elections looming, finding additional money − beyond a symbolic repackaging of existing funds − has proven very difficult. Suggestions by the Commission to issue another round of EU joint debt have met with strong opposition from several member states. More generally, the IRA has exacerbated the discord between proponents and of a stronger role of the state at the national and European level, the latter instrumentalised under a more centralised EU industrial policy (Scheinert, 2023).

What to make of the Green Deal Industrial Plan and associated policy proposals? One positive aspect is the increased awareness among policymakers (and sharpened monitoring) of some of the critical dependencies (including on China) and chokepoints in clean energy and other green value chains. The willingness to streamline bureaucratic processes such as permitting and procurement is another plus. Fortunately, unlike the US, the EU has not resorted to measures that discriminate between different trading partners.

On the downside, however, with its 40% self-sufficiency goal, the NZIA has a protectionist, import-substituting angle. This is likely to make the EU's green transition slower and costlier. It is also bad signalling for a Europe that claims to be committed to multilateral cooperation and risks to lead to retaliatory trade restrictions. In addition, it is insufficiently clear how the Commission's very ambitious domestic capacity targets in clean energy technology and in critical raw materials will be achieved. For example, is it realistic to develop a whole new European mining and refining business, given the long lead times and many social and environmental issues with such projects?

As Kleimann *et al.* (2023) suggest, rather than putting forward ad hoc numerical targets, initiatives such as the NZIA should be judged on how successful they are in mobilising the required private investments for Europe's clean energy needs as well as their effect on Europe's competitiveness and resilience (i.e., its capacity to absorb or recover quickly from shocks). Most measures focus too much on the merits of particular projects or technologies and too little on structural obstacles such as a general lack of competitiveness or skills.

The EU would do good to leverage its Single Market more, including making progress on the capital markets union. Instead, prolonging the relaxation of state aid rules risks fragmenting the Single Market and distorting intra-EU competition, because larger countries with more fiscal space and larger, incumbent companies will benefit disproportionately from state aid. Also, a subsidy war between the US, EU and China (as well as within the EU) should be avoided. It would result in an enormous waste of public money, and Europe is unlikely to have the deepest pockets.

Final reflections

With their respective IRA and Green Deal Industrial Plan, the US and EU are trying to balance multiple goals: achieving a green transition; increasing energy and supply chain security; all the while protecting or, preferably, boosting international competitiveness and employment. This implies difficult trade-offs, such as between a fast and cost-efficient transition, on the one hand, and more resilient supply chains, on the other.

Clearly, the US and EU have different prioritizations for those goals and have adopted different policy measures in practice. The US has gone all-in on tax credits for clean energy investment and production, while the EU counts on the incentives provided through its carbon pricing, topped up with targeted subsidies. The IRA appears to disregard international trade norms on non-discrimination, while the EU is anxious to remain within the boundaries of WTO rules. The US also takes a much more aggressive stance vis-à-vis China, trying to cut it out as much as possible from clean energy value chains.

Nevertheless, it is crucial to enhance coordination and collaboration on the green transition if it is to succeed globally (De Sloover *et al.*, 2023) – between the EU and the US, *within* the EU (which implies restrictions on state aid) and with like-minded third countries. Even with China, now the world's largest greenhouse gas emitter, a dialogue on climate change mitigation will need to be maintained, despite multiple geopolitical and economic tensions. At the very minimum, we should prevent bilateral EU-US differences on green subsidies and the like from becoming another source of geoeconomic fragmentation.

References

Author D., D. Dorn, G. Hanson (2021). "On the persistence of the China shock", *Brookings Papers on Economic Activity*, September: 381-447.

Bistline J., N. Mehrotra, C. Wolfram (2023). The economic implications of the climate provisions of the Inflation Reduction Act. *NBER Working Paper*, No. 31267.

Bown C. (2023). Industrial policy for electric vehicle supply chains and the US-EU fight over the Inflation Reduction Act, *PIIE Working Paper*, No. 23-1.

De Sloover F., D. Essers, T. Stoerk (2023). Do all roads lead to Paris? Climate change mitigation policies in the world's largest greenhouse gas emitters, *NBB Economic Review*, No. 6.

ESCB IRC [Work stream on Open Strategic Autonomy, International Relations Committee of the European System of Central Banks] (2023). The EU's open strategic autonomy from a central banking perspective: Challenges to the monetary policy landscape from a changing geopolitical environment. *ECB Occasional Paper*, No. 311.

IEA [International Energy Agency] (2022). *Global supply chains of EV batteries*, Technology Report, July.

IMF [International Monetary Fund] (2023). *United States: Article IV consultation*, Country Report, No. 23/208.

Jung M., J. Rodgers, E. Larson, I. Bowen, M. Sheller (2023). Five actions for utilities to prepare for IRA impacts, *ICF White Paper*, May.

Kleimann D., N. Poitiers, A. Sapir, S. Tagliapietra, N. Véron, R. Veugelers, J. Zettelmeyer (2023). "Green tech race? The US Inflation Reduction Act and the EU Net Zero Industry Act", *The World Economy*, Early View, 7 August.

Leruth L., A. Mazarei, P. Régibeau, L. Renneboog (2022). Green energy depends on critical minerals. Who controls the supply chains?, *PIIE Working Paper*, No. 22-12.

Scheinert C. (2023). *EU's response to the US Inflation Reduction Act (IRA)*, Briefing requested by the European Parliament's Committee on Economic and Monetary Affairs, June.

Turner J., A. Abliadzhyieva, P. Chintalapudi (2023). US Electric Vehicle Supply Chain Tracking Database. https://www.charged-the-book.com/na-ev-supply-chain-map. Accessed on 24 August 2023.

US Treasury (2023). *The Inflation Reduction Act and U.S. business investment*, Featured Stories, 16 August.

White House (2023). *One year in, President Biden's Inflation Reduction Act is driving historic climate action and investing in America to create good paying jobs and reduce costs*, Factsheet, 16 August.