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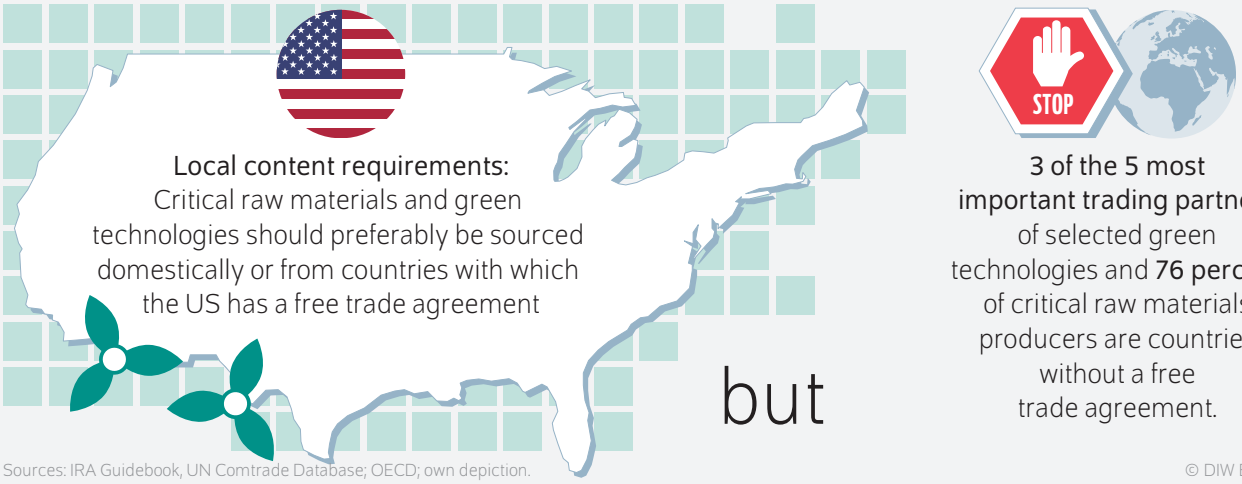
AT A GLANCE

US Inflation Reduction Act demands quick strategic action from the EU

By Kerstin Bernoth and Josefin Meyer

- US aiming to stimulate its domestic economy with the Inflation Reduction Act (IRA), especially in green technology
- Majority of production should take place in the US; critical raw materials are only to come from countries with which the US has a free trade agreement, if possible
- US may have difficulties achieving these targets in the short term, but the IRA could still have far-reaching negative effects for Europe as an industrial location
- Critical raw materials from reliable suppliers could become scarce; EU should ratify corresponding treaties quickly
- The consequences of the IRA are not to be underestimated by the EU Commission; the announced strategic countermeasures should be taken swiftly

US companies could have difficulties fulfilling the local content requirements of the Inflation Reduction Act



Sources: IRA Guidebook, UN Comtrade Database; OECD; own depiction.

FROM THE AUTHORS

"While the EU has recognized both the urgency of promoting green technologies and of the carbon-neutral industrial transition, it is now important to implement the announced measures quickly and without red tape to strengthen the European economy's competitiveness against the US."

— Josefin Meyer —

MEDIA

Audio Interview with Josefin Meyer (in German)
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US Inflation Reduction Act demands quick strategic action from the EU

By Kerstin Bernoth and Josefin Meyer

ABSTRACT

In August 2022, the US Congress passed the Inflation Reduction Act (IRA), a comprehensive piece of legislation aiming to stimulate the US economy and to increase its resilience. At an estimated 430 billion euros, it is a massive government investment and spending program in the welfare state, federal infrastructure, climate action, and environmental protection. At the same time, the IRA is intended to secure the USA's leading position as the largest energy producer in the long term, to support the reindustrialization of the US economy, and to provide a strong response to China's economic and technological hegemonic aspirations. The program's design provides enormous incentives and, in some cases, imposes obligations to relocate production to the US. These local content requirements can have a significant impact on the European economy if production is moved from the EU to the US. The IRA requires strategic economic policy responses that the EU has partially already announced, such as easing state aid rules. However, it must also make urgent changes in other areas, especially in the security of supply of critical raw materials.

In light of major climate challenges, steadily rising national debt, and high inflation, US Congress passed the federal Inflation Reduction Act (IRA) in August 2022.[1] The IRA provides an estimated 369 billion USD for investments in climate change mitigation as well as nearly 64 billion USD for additional expenses for the Affordable Care Act (Obamacare) over a period of ten years. The IRA is to be financed through a combination of new corporate taxes, increased tax enforcement, and prescription drug pricing reform. These measures will add an estimated 737 billion USD to the federal budget. The expected revenue surplus of around 300 billion USD spread over the next ten years is thus also expected to help reduce the budget deficit.[2]

The climate action investments in the IRA are the largest investments into a green transition of the US economy and society in the history of the country. The two other current major spending programs, the Infrastructure Investment and Jobs Act as well as the CHIPS and Science Act,[3] are larger in total volume in some cases, but provide for far less spending on climate change mitigation. Under the IRA, investment would flow primarily in the form of tax credits, grants, and loans for nearly every conceivable measure to combat climate change, such as expanding renewable energy sources, purchasing electric vehicles, and green technology goods (Figure 1).

The largest share of the IRA promotes measures for expanding renewable energy sources by providing support at both the corporate and household level as well as to structurally weak regions.

1 Cf. the text of the Inflation Reduction Act on the website of US Congress (available online; accessed on January 26, 2023. This applies to all other online sources in this report unless stated otherwise).

2 Since the tax credits are not capped but awarded purely based on demand, they could also be significantly higher. The amount of the revenue surpluses is also uncertain and could also be substantially lower or even negative. Cf. Congressional Budget Office, *Estimated Budgetary Effects of Public Law 117-169* (2022) (available online).

3 The 1.2-trillion USD Infrastructure Investment and Jobs Act, passed by US Congress in November 2021, provides funding to rebuild roads and bridges, improve mass transit, replace lead pipes and combat drinking water contamination, and expand access to high-speed internet. It also includes climate action measures. The CHIPS and Science Act became law on August 9, 2022, and provides for spending to expand domestic semiconductor production. Furthermore, the Act supports research and development in future technologies such as quantum computing, artificial intelligence, clean energy, and nanotechnology.

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The IRA has been a source of irritation for the European Union. EU Member States are concerned about their competitiveness if the US stimulates their domestic industry in such a way that the EU loses sales markets and production moves to the US. This paper analyzes the design of the IRA and how the EU can react to ensure its competitiveness.

The IRA: more than just an investment program

The IRA's climate policy goals focus on lowering energy costs, increasing energy security, and investing in the decarbonization of all economic sectors through innovative solutions. The entire package is estimated to reduce overall emissions by nearly 40 percent compared to 2005 by 2030.[4]

At the same time, the IRA also has clear industrial policy objectives. For example, it is intended to secure US hegemony as the largest energy producer in the long term; support the reindustrialization of the US economy, particularly in disadvantaged rural communities; and provide social and labor market policy stimulus. The US accomplishes these objectives by requiring various ancillary conditions to be met in order to be granted tax credits, which makes the IRA much more than a grant and investment program in climate action and environmental protection. For example, a majority of the climate-related provisions of the IRA include a tax credit that accumulates if various criteria are met (Table).

For example, the Investment Tax Credit (ITC) provides a six-percent credit for spending on renewable energy sources such as smaller solar or offshore wind projects. This credit can be up to 70 percent and be deducted from the tax liability amount if projects are realized within energy communities and/or if certain wage and training requirements and/or local content requirements are met (Figure 2). If none of these requirements are met, only the base credit amount may be claimed.

Overall, around 60 percent of the tax credit volumes contain a local content requirement, meaning that a certain share of the product must be produced in the US or come from countries with which the US has a free trade agreement.

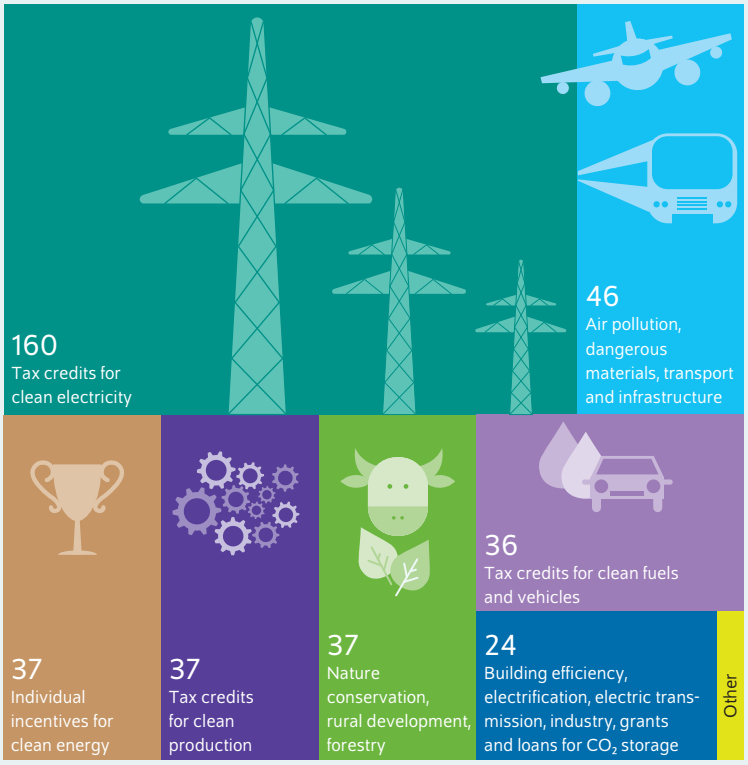
Access to critical raw materials: the Achilles heel of the US in the transition process

If clean energy replaces fossil-fueled electricity, this will reduce the demand for coal and gas. However, this transition fundamentally transforms electricity generation from a fuel-intensive system to a material-intensive system that is dependent on the import of certain critical raw materials.[5]

To this end, the US government included a list of 50 critical raw materials in the IRA and added a local content requirement,

Figure 1

The most important areas of investment of the Inflation Reduction Act
In billions of USD



Note: The colored squares depict the various volumes of the individual packages and thematically summarize the IRA's programs.

Sources: IRA Guidebook, CBO Cost Estimates.

The Inflation Reduction Act enables wide-reaching investments in climate action, providing nearly 400 million USD for it.

Table

Overview of conditions for receiving tax credits

Tax credits for...	When applicable
Wage requirements	Employees must be remunerated according to specific rules for construction work for IRA-subsidized projects and, in some cases, for future maintenance work as well.
Apprentice requirements	The hours worked by apprentices must be a certain percentage of the total hours worked on a construction project (2022 construction start: ten percent; 2023: 12.5 percent; from 2024: 15 percent).
Low-income communities	Communities with a poverty rate of at least 20 percent as well as a median household income of 80 percent or less compared to the national average.
Energy communities	Communities which have had 1) a mine closure since 1999; 2) a closure of a coal-fired plant since 2009; or 3) a loss of jobs in connection with fossil fuels since 2009 and whose unemployment rate is above the national average.
Local content requirements	One hundred percent of iron and steel must be produced in the USA. For products such as e-vehicles, solar plants, or wind farms, a certain share of the product must be produced in the US. In 2023, this share is 40 percent and will gradually increase to 55 percent by 2026. This share is 80 percent for batteries in 2026.

Source: IRA Guidebook, Pub Law 117–169.

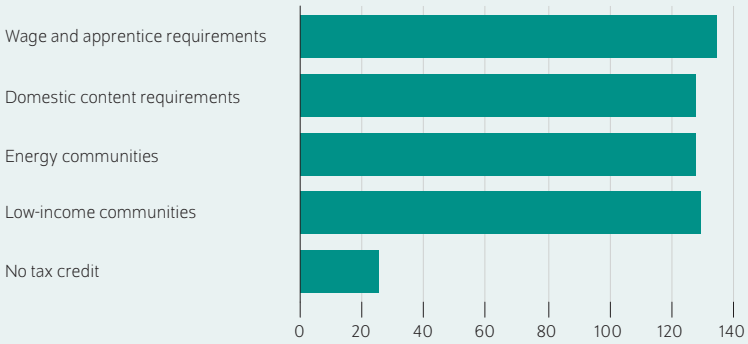
4 John Larsen et al., *A Turning Point for US Climate Progress: Assessing the Climate and Clean Energy Provisions in the Inflation Reduction Act* (2022: Rhodium Group) (available online).

5 A raw material is considered critical when it is economically important and has a supply risk. Cf. the website of the European Commission on critical raw materials.

meaning that the listed raw materials are to be sourced domestically if possible or imported from countries with which the US has a free trade agreement. This is to ensure the availability of the critical raw materials that are required to enormously expand the electric vehicle fleet, batteries, and renewable energy infrastructure. However, in 2021, the US only sourced 24 percent of the traded raw materials listed in the IRA from free trade agreement countries (Figure 3). Accordingly, the IRA may result in trade diversion effects on US imports of critical raw materials over the next several years.

Figure 2

Planned tax credit volumes of the IRA projects
In billions of dollars



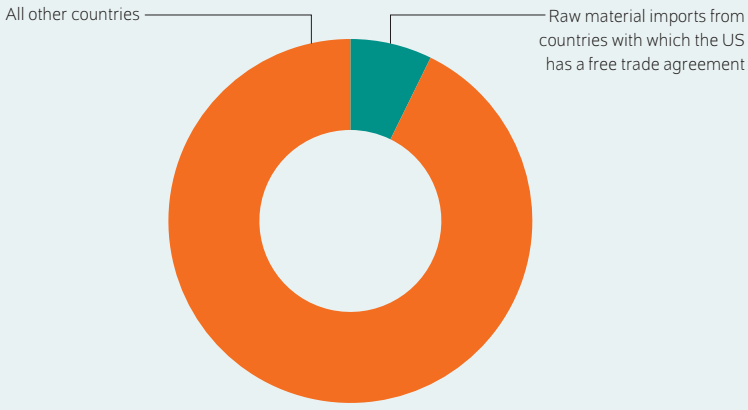
Note: Overall, the IRA consists of 142 investment programs, 21 of which are tax credit programs with an investment volume of 270 billion USD (around 73 percent of the total volume). Multiple categories are applicable.

Sources: IRA Guidebook, Public Law 117–169.

The tax credits should create incentives for investments, particularly in structurally weak regions, and domestic production.

Figure 3

Share of of critical raw materials with and without a free trade agreement country
In percent in 2021



Note: Raw material imports refer to the sum of the imports of all 50 critical raw materials named in the Inflation Reduction Act in 2021.

Sources: IRA Guidebook, UN Comtrade Database.

The US wants to increase the number of raw material supplier countries with which they have a free trade agreement.

Thus, the US is facing a major foreign policy challenge. The sheer volume of critical raw materials required for the energy transition is massive. At the same time, the global raw materials markets and the related supply chains are dominated by a small number of countries, with China at the top (Figure 4).

For example, China produces 60 percent of global rare-earth elements, important raw materials that are needed for constructing wind power and solar panels. Together, Australia and Chile produce nearly 80 percent of the global supply of lithium, a mineral that is required for the manufacture of electric vehicle batteries. The Democratic Republic of the Congo supplies about 70 percent of the world's cobalt, another mineral needed for batteries. Indonesia delivers around 30 percent of the world's nickel, Chile and Peru provide 40 percent of the world's copper, and Russia contributes 37 percent of the palladium supply, which is needed for catalytic converter technology. Like China, Russia is a raw materials supplier that the US considers a "country of particular concern."[6]

In addition to dominating the global raw materials markets—China is the sixth largest nickel producer and third largest copper producer—China also dominates the markets for refineries and advanced downstream production facilities. According to a study by the Brookings Institution, China supplies 68 percent of the world's nickel, 40 percent of its copper, 59 percent of its lithium and 73 percent of its cobalt. More importantly, however, China has 78 percent of the global production capacity for electric vehicle batteries, the majority of the global production of solar cells, and three fourths of the global lithium-ion battery factories.[7]

US aims to reduce dependency on China and Russia

One important geopolitical objective pursued by the US with the IRA is a reduction of dependence on China and Russia, or, more specifically, their critical raw materials, by developing resilient value chains. China and Russia export critical raw materials like rare-earth elements or palladium. An important instrument for achieving this objective is the local content, or "Buy American-" Requirement. To enjoy the entire Commercial Clean Vehicle Credit, the critical materials and components used in battery cell production must be sourced domestically.[8]

6 US Department of State, *Countries of Particular Concern, Special Watch List Countries, Entities of Particular Concern* (2023) (available online).

7 Rodrigo Castillo and Caitlin Purdy, *China's Role in Supplying Critical Minerals for the Global Energy Transition What Could the Future Hold?* (2022: The Brookings Institution (available online).

8 The IRA prohibits the use of critical raw materials from China, Russia, and other "countries of particular concern" in battery production after 2025. Otherwise, no tax credit can be claimed.

By 2023, battery manufacturers must source at least 40 percent of the battery material used either from the US or from free trade agreement countries (Figure 5). This rule excludes Indonesia and Argentina, two important nickel and lithium suppliers. The local content requirements will become even stricter over time: By 2026, the tax credit will require 80 percent of battery material to come from the US or free trade agreement countries.

US dependent on a few green technology exporting countries

In addition to sourcing conditions for critical raw materials, the IRA imposes local content requirements for receiving tax credits along the broader value chain of low-carbon technologies such as wind, solar, and nuclear power, hydrogen, alternative fuels, and CO_2 storage. It is likely that this will lead to trade diversion effects. As of 2023, the US sources the majority of select green technologies from only a small number of countries. For example, 78 percent of all photovoltaic batteries, 76 percent of all lithium batteries, 98 percent of all wind turbine imports, and 98 percent of all alternative fuel imports are sourced from the top five trading partners (Figure 6). These mainly include Asian countries and EU Member States without a free trade agreement with the US.

This means the US cannot sustain its green technology efforts on its own; rather, it is extremely dependent on other countries that do not meet the local content requirements. Since these dependencies cannot be resolved so quickly, the US has three options: Either move production of these technologies to the US, relax the requirements, or conclude country- and sector-specific agreements that provide for exemption rules.

In turn, the EU, which does not have a free trade agreement with the US, could see its exports to the US restricted in the future by the IRA. However, for the EU, the US is not the main target for green export products such as photovoltaics, wind turbines, lithium batteries, and alternative fuels. Of these products, wind turbines account for the highest share of exports to the US at an estimated ten percent (Figure 7).

The situation is similar in Germany. Germany is more broadly positioned in the selected green technologies than the EU as a whole and is therefore less dependent on exports to the USA. Most German exports of green technologies go to the EU. Nevertheless, the US is one of Germany's five most important markets for these products.

The IRA's industrial and geopolitical ambitions

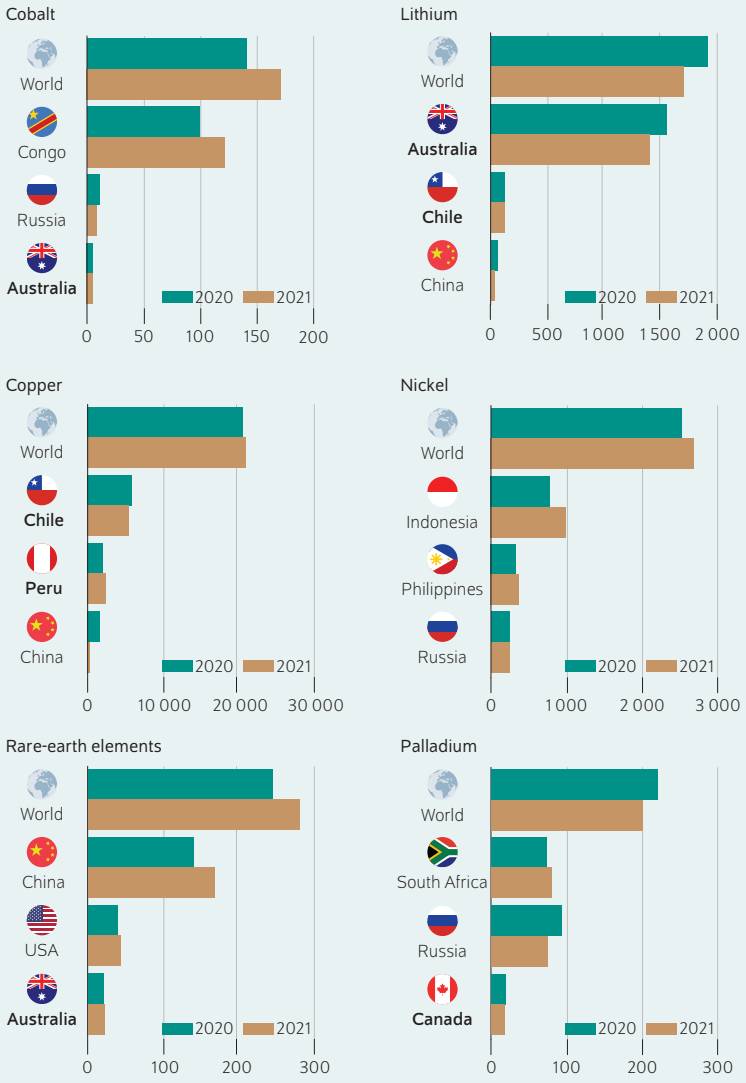
With the IRA, the Infrastructure Investment and Jobs Act, and the CHIPS and Science Act, the US is investing around 2 trillion USD in economic competitiveness, innovation, and industrial productivity. All three programs contain incentives and, to some extent, commitments to relocate production processes to the United States, thereby supporting the reindustrialization of the domestic economy and reclaiming critical raw material chains.

The local content requirement is a wake-up call for German and European policymakers. Although support for an eco-friendly transition should be provided transparently in the spirit of international cooperation and under the fairest possible competitive conditions, the IRA shows that Europe must not blindly rely on economic and strategic cooperation with international allies. Like China, the US is pursuing an industrial policy strategy tailored solely to its own interests and local politicians are right to criticize the distorting effect on competition. They fear the loss of sales markets for European companies that could result from the IRA.

Figure 4

The three most important producers of selected critical raw materials

Output in thousands of tons in 2020 and 2021



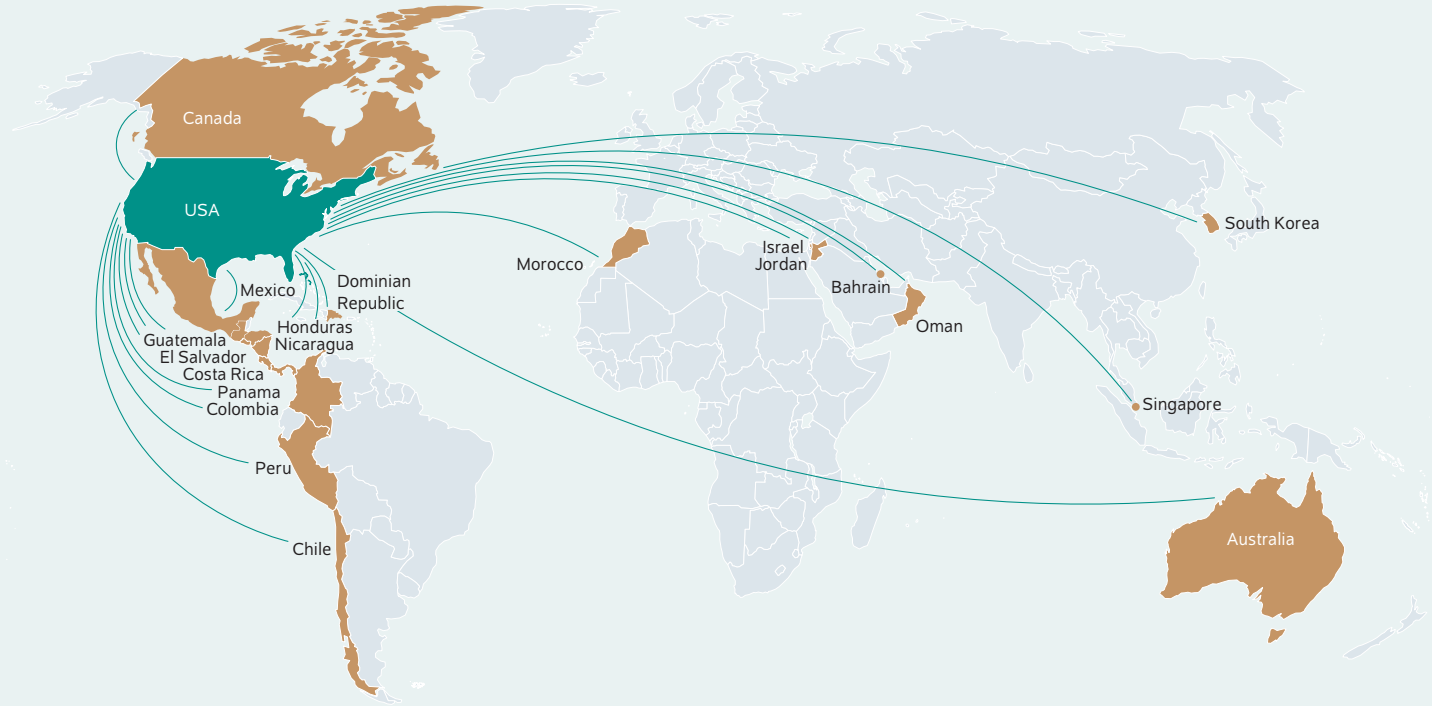
Note: Countries with a free trade agreement are in bold.

Source: OECD.

Of the major producers of critical raw materials, few have a free trade agreement with the United States.

Figure 5

Countries with a free trade agreement with the US
As of 2023



Source: US Federal Government.

Only 20 countries worldwide have a free trade agreement with the US, not including the EU.

In fact, the sales market is expanding initially due to the investments and grants. However, it is more difficult for companies with production exclusively in Europe to access this market, although they could tap into it by partially relocating production to the US. This would have disadvantages for Germany as an industrial location, as it would entail job losses and the migration of experts.

Europe's answer to the US's industrial policy action

To solve this conflict, the US and the EU have formed a transatlantic task force. A new directive was confirmed at the end of December 2022, according to which EU companies may also benefit from the Commercial Clean Vehicle Credit.[9] This agreement could also serve as a blueprint for other sector-specific contracts.

From a European perspective, economic policy responses to the IRA should nevertheless be provided. The EU must support European companies in the challenging green transition period, in the race to develop new clean technologies, and in maintaining access to critical raw materials so as not to fall behind in the long run. Germany in particular, with its high share of industry and the significant importance of technology in its production portfolio, is likely to be affected by the geopolitical and industrial policy ambitions of China as well as the United States.[10]

Strategic industrial policy in Germany and Europe

Although both Germany and Europe have tended to oppose a targeted strategic industrial policy in the past, they must consider the current industrial policy activities of their major competitors and act accordingly.

It is important that the EU and Germany remain, respectively become, internationally competitive, if not leaders, in the development and production of green technology through strategic industrial policy. The German government has already enacted important measures to promote research and innovation in key technologies to help solve problems relating to societal challenges such as climate change. The EU Commission

9 EU Commission, "EU welcomes access to US subsidy scheme for commercial vehicles," press release from December 29, 2022 (available online).

10 Peter Bofinger, "Paradigmenwechsel in der deutschen Wirtschaftspolitik," in Hubertus Bardt et al., "Industriepolitik – ineffizienter staatlicher Eingriff oder zukunftsweisende Option?" *Wirtschaftsdienst* no. 2 (2019) (in German; available online).

published a new industrial strategy for Europe in March 2020, with a focus on the ecological and digital transitions as well as global competitiveness. So far, however, this has been more a declaration of intent, and action must follow.[11]

To date, EU state aid law under Article 107 of the Treaty on the Functioning of the European Union includes a general ban on state aid by Member States in order not to distort competition in the Single European Market. Thus, the EU rules on state aid are significantly stricter than the US rules in the IRA. Among other things, they prevent EU countries from granting the same generous tax breaks to foreign companies that want to set up shop in Europe that these companies receive in the United States. However, according to paragraphs 2 and 3 of Article 107 of the Treaty on the Function of the European Union, EU state aid law allows for exceptions if the measures serve to support structurally weak areas or to promote important projects of European interest.

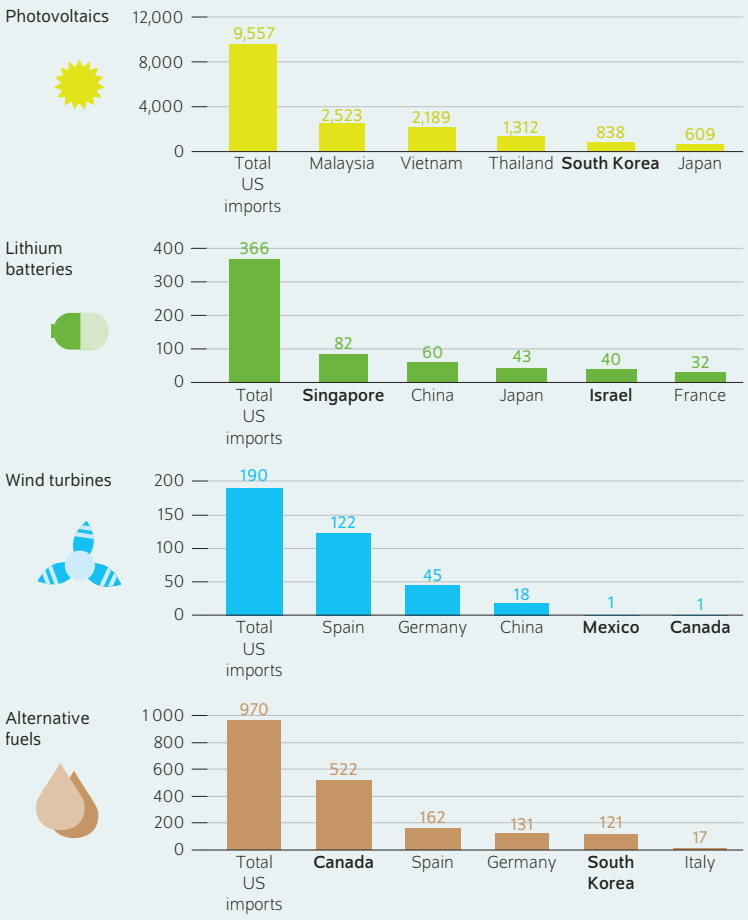
In mid-January 2023, EU Commission President Ursula von der Leyen outlined a possible European response to the IRA before the European Parliament, the Green Deal Industrial Plan. The corresponding package of measures was introduced on February 1, 2023. The plan should, firstly, temporarily adjust EU state aid rules to facilitate and accelerate granting investment aid and tax credits in critical sectors.[12] The aim is to enable EU Member States to provide even more support for future technologies.[13] In addition, it is envisaged that EU state aid measures will cover the entire value chain of strategic green sectors, including large-scale deployment and access to raw materials. Furthermore, the EU Commission is proposing a net-zero industry law that would specifically strengthen the industries that are crucial to climate neutrality.[14]

However, the issue is that only EU countries with fiscal leeway are generally able to afford effective subsidies. Not all Member States currently have this leeway, which emphasizes the urgency of improving debt sustainability within the EU as quickly and sustainably as possible in order to support long-term growth through investments and to counteract undesirable fragmentation and threats to the Single European Market. This problem has been an issue long before the IRA. To solve this issue, it is planned, on the one hand, to reform EU fiscal rules to improve Member States' debt situation in the long term. In the short term, the EU Commission wants to use the loans from the coronavirus recovery funds that have not yet been drawn drown to combat the financial challenges of the EU Member States. In the longer term, it is counting on the establishment of an EU sovereignty fund.

Figure 6

The five most important suppliers of selected green technology imports to the US

In millions of dollars in 2021



Notes: Countries with a free trade agreement are in bold. The HS codes are 854140 for photovoltaics, 850650 for lithi-um batteries, 850231 for wind turbines, and 382600 for alternative fuel.

Source: UN Comtrade Database.

Some European countries are among the major suppliers of green technologies to the US and few major suppliers have free trade agreements.

Lower energy costs

To remain attractive in international competition for business, energy costs play an important role, at least for some sectors such as the basic materials and chemical industries. Energy prices are likely to decrease in the medium to long term in the US due to the IRA. The EU and Germany would be well advised to reduce energy costs as well as energy dependence on third countries in the long run through a well-thought-out energy transition. Much is needed to do so: The accelerated deployment of renewable energy sources, new energy partnerships with reliable suppliers, intra-European cooperation in energy procurement and the associated provision of infrastructure, and government investments and guarantees that provide backing for private investors and companies and cushion their investment risk.

11 For a comprehensive overview of the various industrial policy initiatives, strategies, and country-specific measures, cf. Heike Belitz et al., "Prioritäten setzen, Ressourcen bündeln, Wandel beschleunigen – Neue Ansätze in der Industrie- und Technologiepolitik," *Wiso-Diskurs* no. 2, chapter 4 (in German; available online).

12 EU Commission, "Von der Leyen stellt im Europaparlament den Industrieplan des Green Deal vor," press release from January 18, 2023 (in German; available online).

13 Cf. the website of the Federal Ministry for Economic Affairs and Climate Action for more on the Important Project of Common European Interest (IPCEI).

14 The model for this law is the European Chips Act, which is about to be passed and is intended to boost semiconductor production in Europe with an extensive catalog of measures.

Conclusion: EU Commission should swiftly enact announced countermeasures

In addition to an ambitious transition to green technology, the IRA also has clear economic, industrial, and geopolitical objectives. Like China with its "Made in China 2025" industrial and innovation policy strategy, the US is now also pursuing an aggressive industrial policy with the IRA in order to strive for a dominant position on the world markets for high-tech products and green technologies. With the local content requirements of the IRA, the US is aiming to expand local supply chains or trade with free trade agreement countries to improve the economy's resilience. However, the US remains dependent on imports of both critical raw materials and green technologies from countries with which it does not have free trade agreements, such as the EU. By its design and volume, the IRA may well affect the business models of the EU and Germany as industrial locations.

Currently, the share of green technology exports from the EU and Germany to the US as a percentage of total exports is only in the single digits. But if the IRA were to be widely applied, European companies could shift at least some of their production to the US in order to meet the increased demand for green technology there, while at the same time satisfying local content requirements.

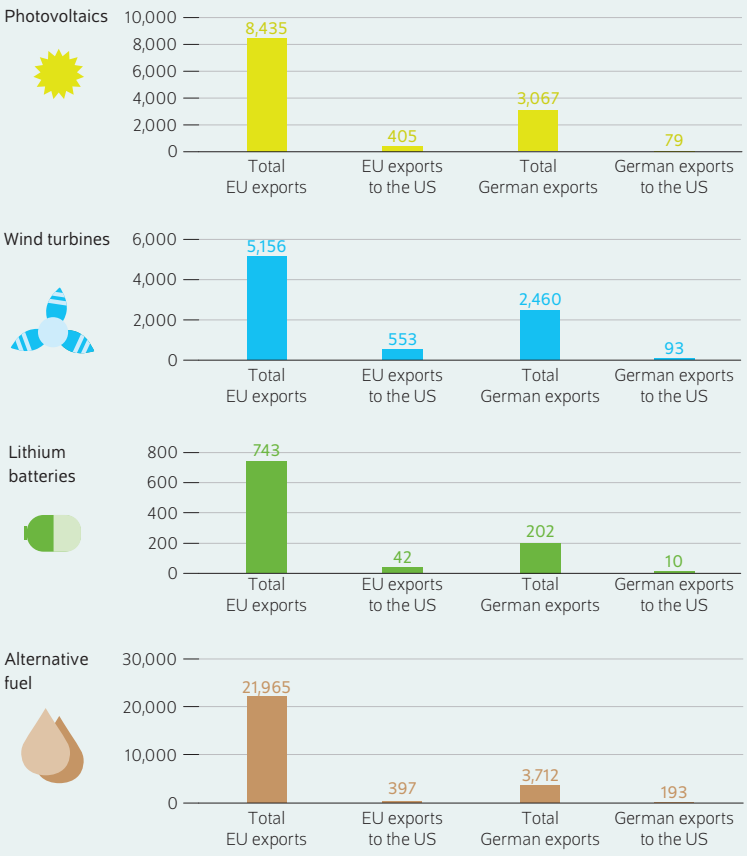
The EU Commission has recognized the danger of a relocation of production and has already outlined several measures to prevent this, such as the reform of investment aid and subsidy regulations. However, this should also include a skilled labor offensive in strategic industrial sectors, promotion of research and development, and the production of green technologies of the future.

In addition to the increased expansion of renewable energies, it is important to secure access to critical raw materials. To this end, the trade agreements negotiated at the European level should be ratified swiftly and the ongoing negotiations concluded as quickly as possible, as EU Commission President Ursula von der Leyen also emphasized in her Green Deal Industrial Plan. The trade agreements with resource-rich countries in Africa and Latin America are of strategic importance in this respect.[15] As the recent discovery of large deposits of rare-earth elements in Sweden in mid-January 2023 has shown, it is also helpful to identify deposits of critical raw materials in Germany and other EU countries.[16]

The effects of the IRA are difficult to estimate or to quantify because it cannot be predicted to what extent tax credits will be used and to what extent the EU will be impacted. However, the announced measures should be implemented as swiftly as possible so that the EU can continue to compete as an industrial location for future technologies.

Figure 7

EU and German exports of selected green technologies
In millions of dollars in 2021



Source: UN Comtrade Database.

The share of European and German exports in the US of total imports is generally in the one-digit range.

15 Cf. Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, "Energiekrise solidarisch bewältigen, neue Realität gestalten," *Jahresgutachten* 394 (2022) (in German; available online).

16 Cf. Lukas Menkhoff and Marius Zeevaert, "Germany Can Increase Its Raw Material Import Security of Supply," *DIW Weekly Report*, no. 49/50 (2022) (available online).

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