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Content

ESG

Decoding the Economics of EU and US Climate Policies

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Executive Summary

Addressing climate change has become a global imperative, touching virtually every sector. As its effects become increasingly evident across continents, it is crucial to foster measures that are both effective and sustainable. Central to this challenge is the interplay between environmental sustainability and economic vitality. The required shift is dependent on an efficient distribution of funds and the stimulation of additional investments towards a greener economy. In defining the economic guardrails for such transition, multiple approaches can be observed among nations.

To pinpoint areas for improvement for the EU's approach to green transition, this whitepaper provides a concise comparison of climate policies between the European Union (EU) and the United States (US).

The analysis contrasts the EU's broad set of legislations, financial programs, and ambitious climate goals with those of the US, revealing three key economic risks for the EU. Firstly, the EU's stringent ESG disclosure rules, especially under the CSRD, heavily tax corporations with compliance costs, potentially diverting innovation funds. Secondly, the EU's allocation of its €700B green budget's complicates access and dilutes the intended impact, as funds retrieved are substantially less than those initially allocated and are characterized by a tendency towards centralization at the member state level and fragmentation at the project level. Notably with the Recovery and Resilience Facility (RRF) centralizing over 20% of total green budget to Spain and Italy, with Italy alone channeling funds into more than 130,000 projects via the RRF. Thirdly, ambitious ESG targets may pressure suppliers towards costly net-zero transitions without matching market demand, risking financial shortfalls. These factors have the potential to threaten the global competitiveness of EU key industries.

In contrast the US approach is characterized by looser ESG disclosure requirements and climate targets while focusing heavily on the stimulation of mass market adoption of green technologies through tax credits.

Overall, the evolving economic landscape highlights a shift towards the United States as an increasingly attractive hub for green investments, challenging the European Union's long-standing dominance in green innovation and investment. This development accentuates the imperative for the EU to reevaluate its policy framework, drawing insights from global counterparts to effectively harmonize environmental objectives with economic competitiveness, especially amidst escalating global challenges.

With global policies focusing very much on CO_2 emissions within the much broader ESG spectrum, this white paper aims to build a foundation for future wider assessments of extensive environmental, social and governance themes in corporate and political discourse.

1. INTRODUCTION: UNVEILING ECONOMICS OF ESG PATHWAYS THROUGH A COMPARISON OF US AND EU APPROACHES TO CLIMATE TRANSITION

In today's world, addressing Environmental, Social, and Governance (ESG) challenges has transcended corporate responsibility to become a global necessity. Embracing this ethos is crucial not only for sustaining vital resources but also for internalizing the external impacts of our economic activities into the dynamics of free markets. This alignment is essential to meet the broad goals of the 17 United Nations Sustainable Development Goals (UN SDGs). ESG challenges, with their extensive reach, require well-rounded and in-depth strategies, along with thorough scenario planning, to secure long-term sustainability and equitable advancement.

The way ESG issues are tackled showcases a pronounced difference between the European Union (EU) and the United States (US), with each region allowing for the deduction of unique stories in terms of risks, opportunities, and economic implications.

Thereby, it is important to consider that the journey toward achieving ESG goals is intrinsically linked to maintaining viable economic stability. Without this balance, the pursuit of environmental objectives may encounter financial constraints and limitations. In this paper, we aim to explore the EU's approach to climate transition in relation to the US, elucidating the key economic risks and opportunities inherent in the EU's strategy, and examining their impact on both the economy and the achievement of climate objectives.

This analysis deliberately focuses on the element of climate transition within the wider ESG spectrum, following current ESG politics' emphasis on reducing CO_2 emissions.

Our goal with this paper is to foster awareness and stimulate a broader discourse in political and corporate circles about the multifaceted risks and opportunities associated with various ESG strategies – extending beyond climate issues to include broader environmental, social and governance aspects.

Within the scope of climate policies, our analysis divides into two principal categories: (1) Disclosure Requirements and (2) Sustainable Finance. We will first describe each category, contrasting the EU and US approaches and evaluating the inherent risks and opportunities. This exploration will then lead to a comprehensive view, assessing the overall economic impact and the efficacy of these measures in achieving defined climate targets. Through this dual focus, we aim to provide a complete perspective on the strategic differences between the two regional approaches.

2. DISCLOSURE REQUIREMENTS: DIVERGING STANCES CREATE AN UNEVEN REGULATORY LANDSCAPE

Disclosure requirements, crucial for creating transparency on the external effects of economic activities, are becoming an integral element in the regulatory approach to climate transition. While the European Union has already taken significant steps in enacting comprehensive ESG disclosure regulations, currently involving over 10,000 EU companies, the SEC just recently approved the first harmonized Climate Disclosure requirements in March 2024 with a much narrower scope than its EU counterparts (Sources: European Commission; SEC).

In the following sections, we aim to dive deeper into the differences in status quo and aspirations towards climate disclosure requirements between these regions. This assessment will enable the identification of associated risks and opportunities specifically for the EU.

2.1. THE EUROPEAN APPROACH: COMPREHENSIVE DISCLOSURE OBLIGATIONS COMPEL EU COMPANIES TO ACT IN 2024

European businesses are currently contending with a complex array of new disclosure obligations. Those affected by the Corporate Sustainability Reporting Directive (CSRD) are spending major resources in 2024 on establishing processes, gathering data, and generating reports to meet the broad range of stipulated requirements.

The subsequent paragraph delivers detailed insights into the core ESG disclosure mandates operative within the European Union, specifically highlighting the EU Taxonomy, Corporate Sustainability Reporting Directive (CSRD), Sustainable Finance Disclosure Regulation (SFDR), and the banking-focused directives pursuant to EBA Pillar 3.

Figure 01 – Overview EU disclosure requirements

EU Taxonomy provides basis for determination of sustainable activities

The EU Taxonomy is a classification system established to guide and promote sustainable investment by defining what constitutes an environmentally sustainable economic activity within the EU. It serves as a cornerstone in the EU's regulatory framework for sustainable finance, aiming to channel capital towards sustainable projects and activities that contribute significantly to the EU's environmental objectives. These objectives encompass climate change mitigation and adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems (Source: European Commission).

CSRD extends obligations to the broader ESG spectrum

2023 marked the advent of the CSRD, which supersedes the Non-Financial Disclosure Requirements (NFRD). This directive broadens the scope and depth of disclosures, demanding more quantitative data and encompassing a range of topics beyond climate change, like water resources, biodiversity, social and governance issues. At the core of the CSRD lies the principle of ‚double materiality', compelling companies to report both the financial impact of external factors (outside-in perspective) and the effect of economic action on their external stakeholders (nature, clients, employees, supplier, etc.). Further, the CSRD extends reporting requirements beyond immediate impacts by including the whole value chain (Scope 1 to Scope 3 emission reporting). Over the course of the coming few years, **approximately 50,000 European companies will have to report mandatory under the CSRD's umbrella**, a significant increase from the ~11,000 governed by the NFRD (Source: European Commission).

Creating transparency on investment decisions through the SFDR

Implemented to increase transparency in the financial sector, SFDR obliges financial market participants and advisers to disclose the sustainability risks and how their investment decisions impact environmental, social, and governance (ESG) factors. This regulatory measure aims to prevent greenwashing by ensuring that investors have access to clear, comparable, and comprehensive information regarding the sustainability profile of their investments. (Source: European Commission)

The special role of banks in financing the green transition translates in new requirements

Banks, central to financing the EU's green transition, are subject to disclosure requirements under the European Banking Authority (EBA) Pillar 3. In January 2022, the EBA introduced two new KPIs in the final draft of the pillar 3 disclosure requirements that have to be reported by mid-2024 – the Green Asset Ratio (GAR) and the Banking Book Taxonomy Alignment Ratio (BTAR). The GAR is designed to quantify the share of on-balance-sheet exposures that align with the EU Taxonomy, relative to the institution's total assets. Thereby the GAR only takes into considerations companies under NFRD/CSRD – neglecting in particular SMEs or smaller companies. For this purpose the BTAR was introduced, including specifically such smaller companies. In doing so the BTAR is expected to create significant data collection efforts at affected financial institutions (Source: EBA).

Presently, the emphasis in the banking sector is predominantly on fostering transparency, with concrete decarbonization targets still in development. This dynamic is expected to accelerate following the recent ECB report, which high-

lighted a **significant misalignment of 90% of European banks with the EU's climate goals**, as reflected in the divergence of their portfolios from the ideal PACTA sector pathways (Sources: ECB; BaFin).

2.2. THE AMERICAN STANCE: MODEST DISCLOSURE OBLIGATIONS IN THE MIDST OF THE DEBATE

In contrast, the US is at an early stage in shaping its ESG-related disclosure landscape. The SEC's Climate Disclosure requirements, represent the most advanced initiative in this regard. However, these have been just recently approved by the SEC and are yet to be taking full action. This evolving framework is further complicated by a patchwork of state-level responses, ranging from supportive to restrictive. Currently, **20 states have introduced so-called "anti-ESG laws", which pose significant challenges to standardized reporting**. These laws see ESG reporting a mechanism that do not protect but may harm investment decisions. This situation underscores the complexity and variability of the US approach to ESG disclosure (Sources: SEC; Morgan Lewis).

Disclosure scope is limited in comparison to EU counterparts

The Climate Disclosure Requirements by the SEC are notably more limited than those in Europe. The SEC continues to adhere to a traditional outside-in perspective, focusing disclosures solely on the financial impact on the entity. Moreover, these requirements concentrate exclusively on climate change-related actions, omitting other environmental aspects like biodiversity and pollution. The reporting obligations cover only mandatory scope 1 and scope 2 emissions, with scope 3 emissions reporting being left out. (Source: SEC).

High variability of standards across states

As previously noted, the lack of uniform standards has led to varied state-level legislation in the US. While many states have enacted anti-ESG laws, others have adopted even more progressive approaches than the SEC proposal, with California being a prime example (Source: Harvard Law).

2.3. KEY RISKS AND OPPORTUNITIES: THE UNBALANCED REGULATORY LANDSCAPE PUTS THE EU MARKET IN AN AMBIVALENT POSITION

Based on this descriptive comparison, it becomes clear that the main differences between the EU and US in relation to climate disclosure are within the level of maturity, standardization and scope – with the EU being more extensive than the US in all of these dimensions. Based on these differences, the following highlights relevant economic risks and opportunities emerging for the EU.

Key economic risks for the EU

Increased Compliance Costs: Strict ESG reporting requirements can significantly increase compliance costs for businesses. This includes costs associated with data collection, reporting, and verification processes. For small and medium-sized enterprises (SMEs), these costs might be particularly burdensome, potentially affecting their competitiveness.

Investment Shifting: Investors might prefer markets with less stringent regulations. This could lead to a shift in investments towards countries with more lenient ESG reporting requirements, like the US, potentially impacting the EU's investment landscape.

Impact on Innovation: Strict ESG reporting might lead to excessive caution among businesses, potentially slowing down innovation. Companies might focus more on compliance rather than on exploring new, sustainable business models or technologies.

Market Access and Trade Implications: The EU's robust ESG standards could potentially create trade barriers, both for EU companies seeking to enter foreign markets and for international companies looking to operate within the EU. These barriers could arise if other countries view the EU's standards as too demanding or if they establish their own differing requirements.

Reputational Risks: The dynamic and evolving nature of ESG reporting standards could lead to reputational risks. Companies might face challenges in keeping up with changing requirements, leading to potential non-compliance and damage to their reputation.

Key economic opportunities for the EU

Investor Transparency: The EU's disclosure requirements, provide investors with a high level of ESG related transparency. This clarity enables investors to make more informed decisions, factoring in the resilience of businesses to climate change impacts. As investors increasingly prioritize sustainability and climate risk in their investment criteria, European companies adhering to these stringent standards are likely to benefit from greater investor confidence and potentially more favorable investment terms.

Attracting top talents: Companies with robust ESG practices are increasingly attractive to top talent, particularly

among younger generations. Strong ESG credentials enhance a company's employer branding, setting them apart as leaders in corporate responsibility and appealing to skilled professionals who seek to work for organizations making a positive global impact.

Risk transparency: The created transparency on exposure to climate-related risks enables businesses, investors, and policymakers to identify and address environmental risks proactively. Early identification of at-risk sectors not only guides strategic investments towards sustainable practices but also aids in the allocation of resources for innovation and adaptation measures.

3. SUSTAINABLE FINANCE: RECENT YEARS HAVE SEEN THE EMERGENCE OF MAJOR CLIMATE TRANSITION PROGRAMS IN THE EU AND US

Beyond climate disclosure requirements, another critical aspect of climate measures is Sustainable Finance. This refers to investments aimed at financing the transition towards a green economy, essential for meeting established climate targets.

„We today started the European Green Deal investment funds that will unleash €1 trillion over the next decade."
Ursula von der Leyen, 2020

"The Inflation Reduction Act invests $369bn to take the most aggressive action ever – ever, ever, ever – in confronting the climate crisis and strengthening our economic – our energy security"
Joe Biden, 2022

The EU and the United States, acknowledging the necessity of investments for ecological transition, have, over the course of the last 5 years, both initiated ambitious programs to finance and encourage their respective economic shifts towards sustainability. This section offers a comprehensive description of these programs with the aim to their differences and to evaluate associated risks and opportunities from an EU perspective.

3.1. DECODING THE EU'S €700 BILLION PUZZLE: GREEN INVESTMENTS IN A FRAGMENTED FINANCE FRAMEWORK

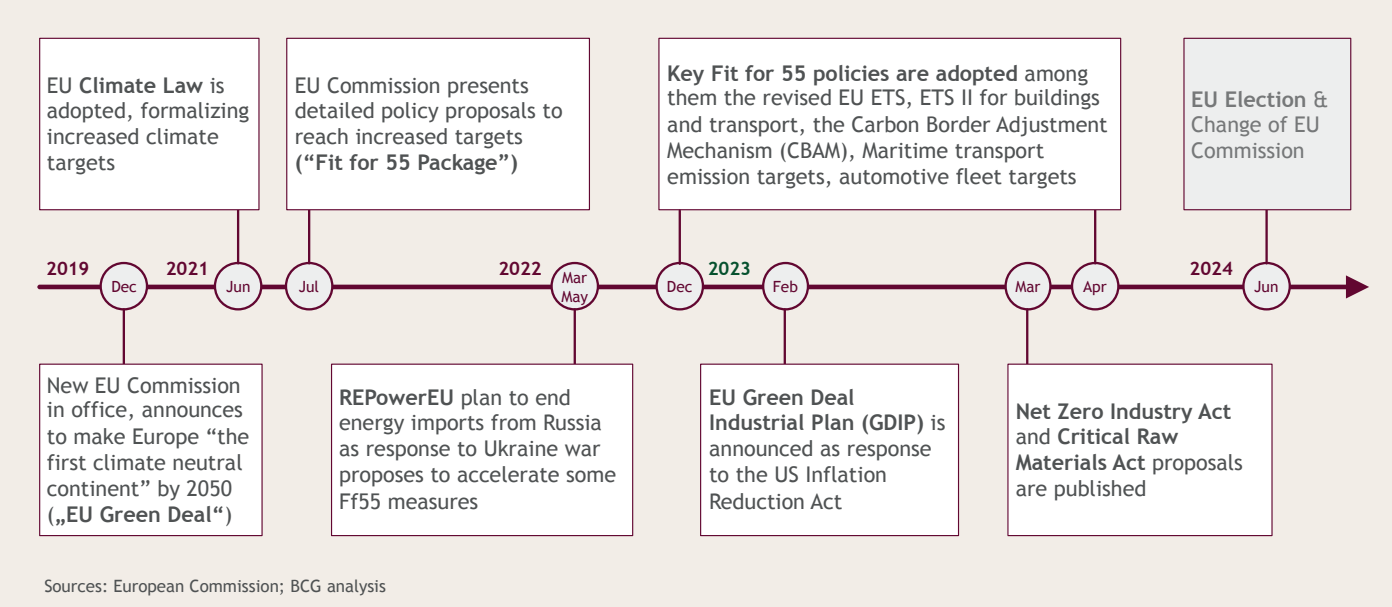


Figure 02 – Timeline of EU climate policies

In the heart of Europe's strategy to combat climate change lies the **"EU Green Deal"**. Launched in 2020, it pioneered international sustainability ambitions seeking to transform the EU into the first net-zero economy by 2050. The **plan involves mobilizing €1 trillion over the next decade** to support the transition towards a sustainable economy.

Subsequent to the introduction of the EU Green Deal, the **„Fit for 55" package (Ff55)** was released in 2021. This package includes detailed policy proposals aimed at achieving a 55% reduction in greenhouse gas (GHG) emissions by 2030 relative to 1990 levels. Key policies implemented in 2022 as part of the Ff55 package include updates to the EU Emission Trading System (ETS) and the introduction of a new ETS for the buildings and transport sectors (ETS II). (Source: European Commission)

The European Emissions Trading System (ETS)

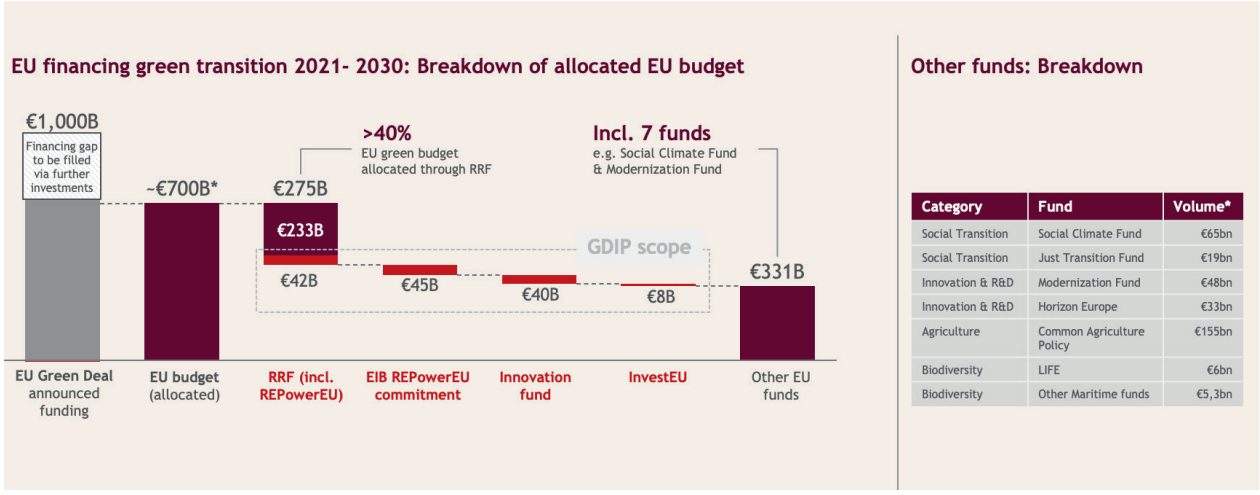
The ETS is the European carbon pricing mechanism that enforces the required purchase of CO_2 allowances for each emitted tCO_2. With this instrument, the external effects of CO_2 emissions for carbon-intensive industries are internalized. Expected funding through the ETS revenues is calculated on an average price of €75 per tCO_2.

Sources: European Commission

Figure 03 – European Emissions Trading System (ETS)

In response to external geopolitical events and internal policy developments, the EU introduced two significant programs in 2022 and 2023. The **REPowerEU plan**, formulated as a reaction to the war in Ukraine, seeks to eliminate the EU's energy dependency on Russia by accelerating the adoption of specific Fit for 55 measures. In 2023, the EU unveiled the **Green Deal Industrial Plan (GDIP)** in response to the **US Inflation Reduction Act (IRA)**. The GDIP includes the **Net Zero Industry Act**, which sets targets for reducing emissions in key industrial sectors, and improves access to existing funds such as REPowerEU, InvestEU, and the Innovation Fund, furthering the EU's commitment to achieving its climate and energy goals. (Sources: European Commission)

Breakdown EU green funds: How a pandemic fund builds the foundation for the green transition



Category	Fund	Volume*
Social Transition	Social Climate Fund	€65bn
Social Transition	Just Transition Fund	€19bn
Innovation & R&D	Modernization Fund	€48bn
Innovation & R&D	Horizon Europe	€33bn
Agriculture	Common Agriculture Policy	€155bn
Biodiversity	LIFE	€6bn
Biodiversity	Other Maritime funds	€5,3bn

Figure 04 – EU green budget allocation

In the comprehensive suite of programs and legislations referenced earlier, **the EU has earmarked approximately €700 billion for fostering a green transition**. This figure falls short of the initially announced goal of mobilizing €1 trillion, with the discrepancy intended to be offset by additional public and private investments within the Member States. This approach, while ambitious, relies on a collaborative financing model to meet the targeted investment volume. (Source: European Commission; BCG analysis)

The substantial portion of this €700 billion allocation is attributed to the **Recovery & Resilience Facility (RRF)**, which amounts to €275 billion. Originally established in response to the COVID-19 pandemic, the RRF was swiftly adapted to support other objectives, primarily those related to climate change and digitalization. It mandates that at least **37% of the projects financed under its framework contribute to climate targets**, making it responsible for **40% of the total EU green financing volume**. (Source: European Commission; BCG analysis)

Alongside the RRF, the Green Deal Industrial Plan (GDIP) plays a crucial role by providing facilitated access to selected pre-existing funds. These include the REPowerEU fund – financed again through the RRF – alongside the Innovation Fund, Invest EU, and additional allocations by the European Investment Bank. Through the REPowerEU initiative, the European Union provided its Member States the opportunity to revise their Recovery and Resilience Facility (RRF) funding allocations, directing funds towards achieving energy independence from Russian imports. **Despite a provision of €300 billion for the REPowerEU initiative, Member States have only redirected approximately €60 billion via updates to their RRF plan**s, of which just €42 billion is earmarked for climate-positive actions. (Sources: European Commission; RRF Scoreboard; EIB; BCG analysis)

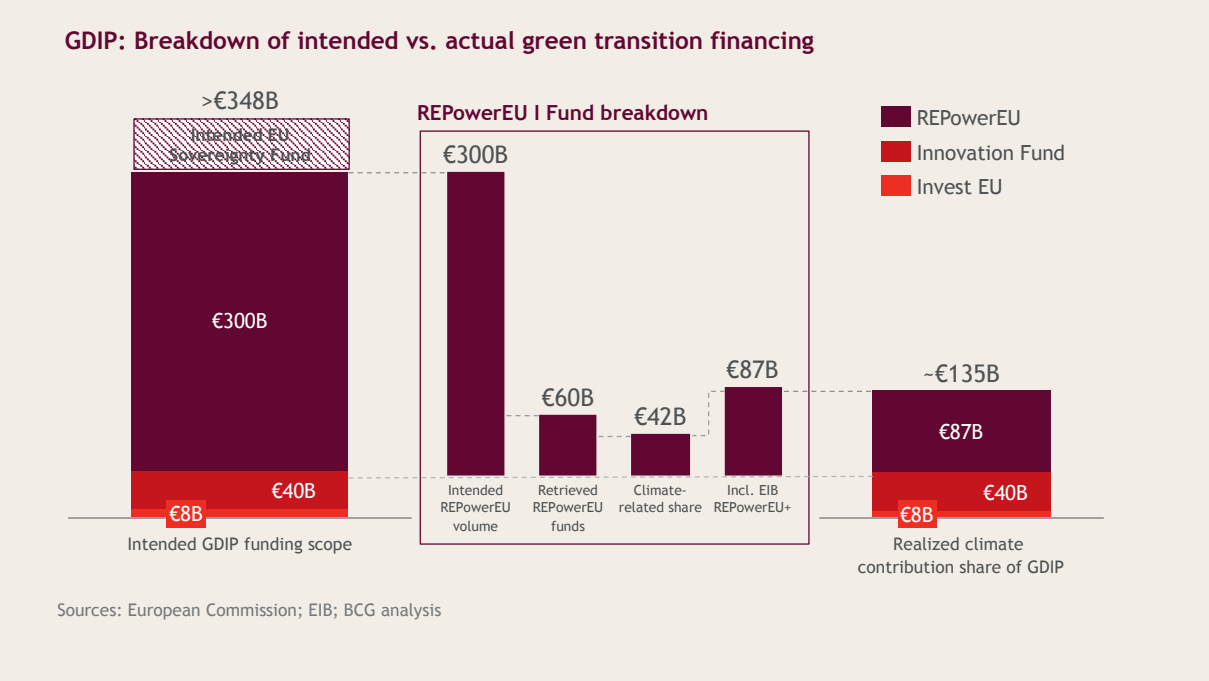


Figure 05 – GDIP Fund breakdown

Furthermore, the Green Deal Industrial Plan (GDIP) was intended to include the establishment of an EU Sovereignty Fund, as announced by European Commission President Ursula von der Leyen at the 2023 World Economic Forum in Davos. Yet, the realization of this fund remains pending. Consequently, the GDIP, as it currently stands, represents a considerably more modest endeavor than initially envisioned in reaction to the US IRA. (Source: World Economic Forum)

The remainder of the EU budget, amounting to €331 billion, is dispersed across a variety of other EU funds, as can be seen in Figure 04.

The EU fund allocation mechanism creates regional centralization and target fragmentation

Figure 06 – RRF allocation overview

The Recovery and Resilience Facility (RRF), as the predominant fund within the EU's green transition framework and a key driver of innovation and R&D funding ambitions, merits closer examination. Initially conceived as a support mechanism during the COVID-19 pandemic, the allocation criteria of the RRF retain elements reflective of its original purpose. Specifically, 70% of the grants are allocated based on overall economic underperformance, while the remaining 30% are distributed according to the severity of the pandemic's impact. This method results in a highly centralized distribution of funds, with **Spain and Italy collectively receiving more than 40% of the RRF funding, which translates to over 20% of the total EU green budget allocated to just these two countries**. (Source: European Commission)

The fund's distribution mechanism, which routes allocations through Member States rather than specifying technologies, leads to a significant fragmentation of the funds. For instance, in Italy, the RRF budget is spread across approximately 130,000 projects, resulting in an average project value of around €580,000—a relatively small sum that highlights the challenge of achieving meaningful impact at the project level (Source: Reuters).

Moreover, the RRF's strict implementation timeline poses additional challenges, particularly for countries that receive allocations significantly large relative to their GDP. Both Italy and Poland have had to revise their RRF plans to recalibrate funding ambitions due to difficulties in expending the allocated funds swiftly enough to meet the RRF's predetermined milestones. This situation underscores the operational complexities faced by Member States in managing and deploying RRF funds efficiently, reflecting the intricate balance between ambitious funding goals and the practical realities of implementation. (Source: European Commission)

Estimated RRF fund usage by EU's 4 largest economies

Top 4 EU economies	Germany	France	Italy	Spain		
Available green RRF funding	€13B	€20B	€75B	€65B		
Fund usage					**Total**	**Share**
Sustainable mobility	€5,5B	€5,8B	€29,3B	€17,5B	~€58B	1 34%
Energy efficiency	€3,1B	€7,8B	€18,8B	€11B	~€41B	2 24%
Industry decarbonization	€1,7B	€0B	€0B	€19,5B	~€21B	3 12%
Renewable energy & networks	€0,5B	€1,8B	€9B	€7,8B	~€19B	4 11%
Nature preservation	€0B	€0,8B	€8,3B	€7,2B	~€16B	5 9%
Climate change adaptation	€0B	€0B	€6B	€1,3B	~€7B	6 4%
Other (incl. clean-tech)	€2,2B	€3,8B	€3,8B	€0,7B	~€10B	6%

Sources: European Commission; Reuters; EIB; BCG analysis

Figure 07 –Estimated RRF fund usage for top 4 EU economies

Sustainable mobility as investment priority for the top 4 EU economies

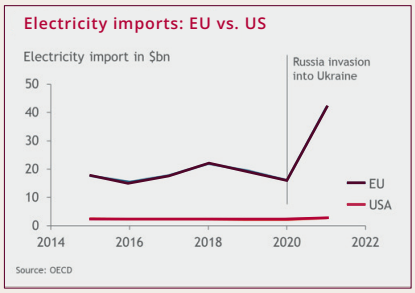
In analyzing the investment priorities within the four largest EU economies, it becomes evident that sustainable mobility commands the highest allocation of funds, with €58 billion dedicated to this sector. This investment is not solely focused on advancing the electric vehicle (EV) or hydrogen markets but also includes significant commitments to expanding railway infrastructure, with plans for at least €30bn in investments. Additionally, energy efficiency accounts for 24% of the allocated funds, followed by industry decarbonization at 12%, and increasing the share of renewable energy. (Sources: EIB Investment Report 2022/23; BCG analysis)

Exemplifying misleading policy guidance

The Carbon Pricing Dilemma

While the EU's revision of its Emissions Trading System (ETS) under the "Fit for 55" package marks a significant step towards enforcing carbon pricing, a conflicting approach emerges with the continued subsidization of fossil fuels. The EU's Eighth Environment Action Programme aligns with both EU and international commitments to phase out fossil fuel subsidies. Despite these commitments, fossil fuel subsidies have shown a troubling increase, remaining stable at approximately €56bn (in 2022 prices) from 2015 to 2021, before surging to €123 billion in 2022. This significant rise is largely attributed to the aftermath of the COVID-19 pandemic and the geopolitical tensions following Russia's invasion of Ukraine, which led to heightened energy prices (Source: EEA).

This paradoxical situation highlights a critical conflict of interest within the EU's environmental policy framework. On one hand, the ETS aims to mitigate climate change by making carbon emissions costly for companies, thereby encouraging a shift towards greener alternatives. On the other hand, the substantial subsidies for fossil fuels act as a counterforce, potentially undermining the incentives for reducing carbon emissions. This duality presents a significant challenge for the EU, exemplifying existing costly and ambivalent market steering approaches.



Sources: OECD; EEA; European Commission

Figure 08 – The Carbon Pricing Dilemma

3.2. US SUSTAINABLE FINANCE: THE INFLATION REDUCTION ACT INTRODUCES A NEW PATHWAY TO GREEN TRANSITION

In 2022, the United States followed suit with its Inflation Reduction Act (IRA). This act represented a significant shift in the US's approach to climate change and energy policy. President Joe Biden described the IRA as the "most aggressive action ever taken by the nation in confronting the climate crisis and strengthening our energy security." (Source: The White House)

With a total funding plan of ~$369bn for climate and energy initiatives, the IRA sets a keen focus on reducing carbon emissions, promoting clean energy, and enhancing the nation's energy security. Thereby the plan extends the already existing Infrastructure Investment and Jobs Act (IIJA) also known as Bipartisan Infrastructure Law (BIL) that already intended significant investments of $110bn into climate related purposes – **totaling US sustainable finance at ~$479bn**.

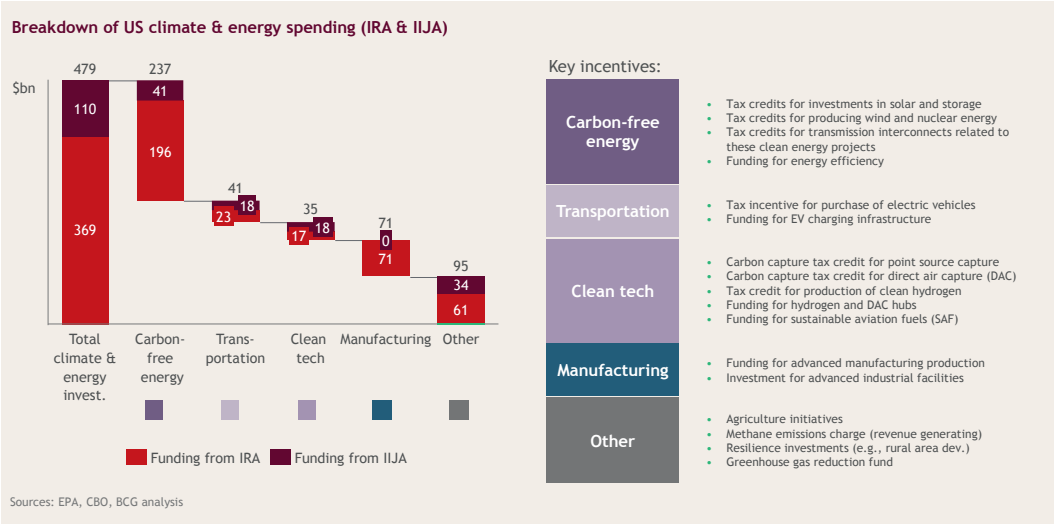


Figure 09 – US spending on climate & energy overview

The US sets the focus on direct supply-side subsidies and mass-market adoption

In a distinct difference from the EU's methodology, the **US' approach to climate finance is characterized by its directness and simpleness**. Unlike the EU's broader, multi-faceted funding mechanism, the IRA channels >60% of its budget through direct tax credits mainly to the supply side – more focusing on mass market adaption of green technology than the EU focus on innovation.

These tax credits span across various sectors, targeting clean electricity production, new and used electric vehicle purchases, and investments in clean energy and energy efficiency. Prime examples of these direct incentives are the tax credits on clean-energy, reducing the costs of energy significantly for suppliers – as can be seen Figure 10. (Sources: Lazard; BCG analysis)

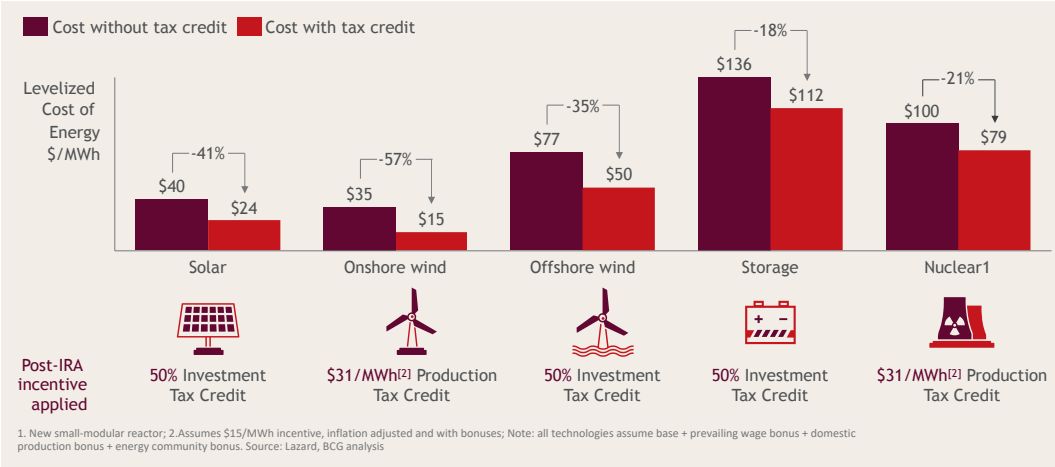


Figure 10 – IRA subsidies for carbon-free energy

The United States' strategic approach aggressively pushes down costs, thereby encouraging mass market adoption and facilitating the swift development of innovative technologies, such as carbon capture, which are projected to become economically viable at an accelerated pace. **This strategy imposes significant competitive pressure on the European market, challenging the European Union's ability to compete effectively with the United States**. It underscores the necessity for the EU to critically evaluate its own policies and consider adopting aspects of the U.S. approach to maintain competitiveness in the global market for green technologies.

Discrimination against foreign operations attracts international companies

In addition, the IRA implies through supply-side subsidies a bias towards U.S.-based operations, creating barriers for European entities by prioritizing domestic. This approach encourages international firms to establish or expand their presence within the U.S., directly impacting the EU's competitive landscape by attracting investments away from Europe. (Source: Reuters; Reuters)

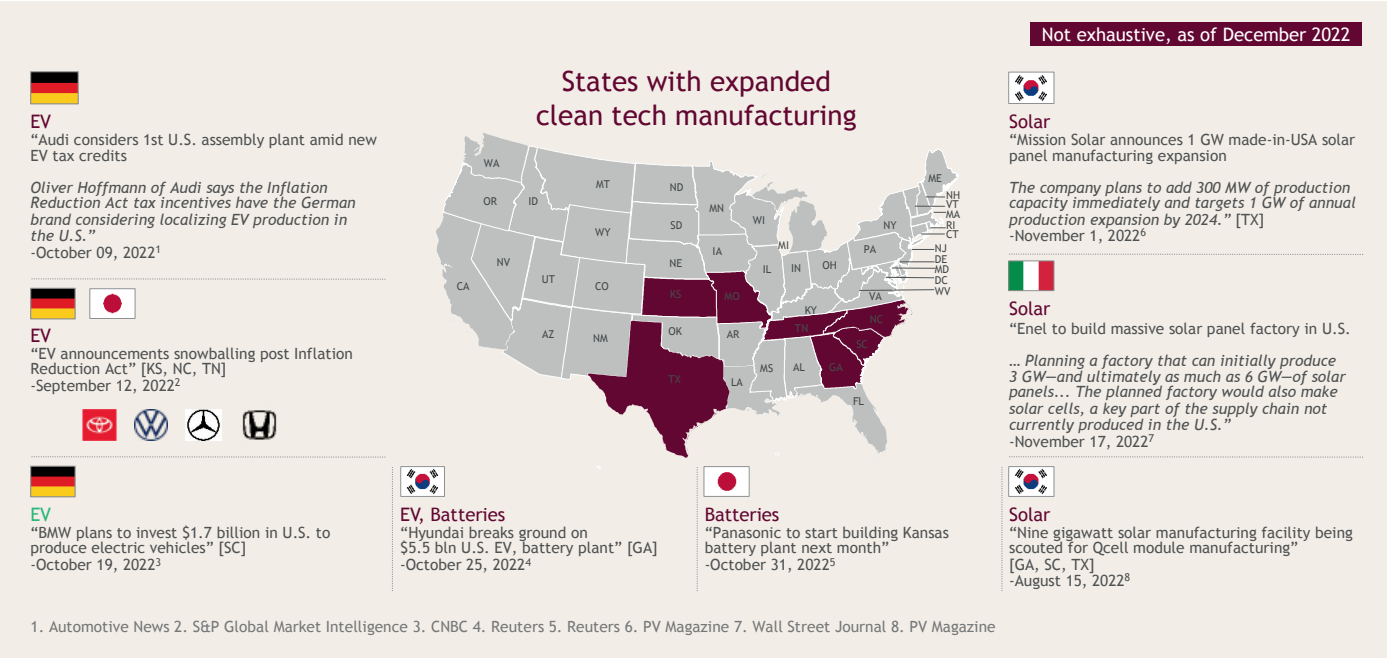


Figure 11 – Exemplary overview of investments in the US

IRA volume may expand to up to $1 trillion in spending

Lastly, many of the IRA fundings, are provided without a cap. These unrestricted tax credits aim to encourage broad adoption of eco-friendly practices and investments across various sectors. The scale of these credits is determined by corporate investment choices and consumer behavior. Contrary to the initial forecasts by the Congressional Budget Office and Joint Committee on Taxation, which estimated approximately $369 billion in green spending, recent studies predict the figure to be closer to $900 billion. This significant increase is primarily due to the anticipated tax credits for electric vehicles and carbon capture initiatives, which are expected to exceed initial projections by more than 30 times (Source: Bistline, Mehrotra & Wolfram, 2023).

3.3. KEY RISKS AND OPPORTUNITIES: FRAGMENTED AND COMPLEX EU FUNDING COMPETES WITH A MARKET-FIRST APPROACH IN THE US

In conclusion, both the EU and the USA have embarked on ambitious programs aimed at facilitating a green transition, with significant investment allocations on both sides. However, their strategies diverge in key aspects. **European Sustainable Finance exhibits a less discriminatory stance towards foreign producers compared to the US, prioritizes innovation over mass deployment through complex fund allocation mechanisms, and is characterized by a higher degree of fragmentation.** Conversely, the US approach is simpler and more streamlined, offering greater planning reliability for companies looking to invest or establish new facilities.

In terms of funding volume, the **IRA's uncapped tax credits allow for a potentially much larger investment pool in the US compared to the EU's budget**, a disparity that becomes even more pronounced when analyzed on a per capita basis. Additionally, the US strategy primarily relies on subsidies and price reductions to foster sustainable practices, whereas the EU incorporates an additional layer of carbon pricing to account for external environmental costs.

Key economic risks for the EU

Fragmentation and Insufficient Funding: The EU's strategy of distributing funds across a wide array of projects leads to a dispersion of resources, which may not meet the individual funding needs of projects adequately. This fragmentation risks diluting the effectiveness of the financial support and further losing momentum in comparison to the vast investment subsidies provided by the US.

Investment Diversion to the US: The US' emphasis on generous supply-side subsidies creates an attractive investment environment for companies. This may result in a reallocation of capital and strategic focus from the EU to the US, as firms seek to maximize the financial benefits and support available for their investments in sustainable technologies and infrastructure.

Questionable Allocation Effectiveness: The methodology behind the allocation of funds within the EU, often determined by Member State distribution rather than the merit of individual projects, raises concerns about the efficiency and impact of these investments. Additionally, the complexity of the funding mechanisms and the bureaucratic processes involved can hinder the full mobilization of intended funds, further challenging the EU's capacity to implement its sustainability agenda effectively.

Impact on Competitiveness Due to Carbon Pricing: While carbon pricing is designed to encourage a shift towards more sustainable business practices, it introduces additional costs for companies operating within the EU. These costs could potentially compromise the global competitiveness of European firms by increasing operational expenses, particularly if counterparts in other regions, such as the US, are subject to less stringent or differently structured environmental costs.

Key economic opportunities for the EU

Opportunity for Technology Diversification: The EU's approach of providing a framework rather than prescriptive directives for investments allows for a diverse allocation of funds across various technologies. This method not only encourages a wide range of technological development but also ensures that investments are not limited to a few selected areas, fostering innovation and progress in multiple sectors.

Mitigating Future Costs Through Just Transition: The EU's emphasis on a just transition is strategically positioned to minimize future expenses, particularly in regions most adversely affected by climate change. By proactively addressing the socio-economic impacts in these areas, the EU aims to prevent the escalation of costs that could arise from climate-related damages, thereby ensuring a more economically sustainable approach to environmental challenges.

Tailoring to Regional Needs for Balanced Growth: The EU's strategy of supporting a vast array of projects allows for a tailored approach to regional differences. This flexibility enables the EU to adapt its support to the specific needs and characteristics of different regions, promoting balanced growth. By recognizing and responding to the unique requirements of each area, the EU can effectively stimulate economic development in a way that aligns with the diverse contexts of its member states.

4. PATHWAY EVALUATION: ECOLOGICAL AND ECONOMIC METRICES PROVIDE FIRST INSIGHTS INTO THE IMPLICATIONS OF CLIMATE POLICY PATHWAYS

Building on the initial comparison between the EU and US climate transition measures, this section of the whitepaper focuses on evaluating the impact of these strategies on both economic and ecological metrics. We analyze historical trends to identify necessary future adjustments and examine preliminary projections for the effects of newly implemented measures.

This analysis is structured around two principal dimensions: ecological and economic.

Ecologically, the evaluation seeks to determine the progress made by the EU and US towards their environmental goals. This includes an analysis of each region's achievements in reducing greenhouse gas (GHG) emissions and advancing towards complementary targets such as the adoption of renewable and clean energy sources.

Economically, the paper assesses the influence of the EU and US climate transition strategies on economic stimulation, specifically looking at innovation, climate mitigation investments, and import dependencies. The selected metrics aim to capture the wider economic consequences of transitioning to sustainable practices.

4.1. ECOLOGICAL ASSESSMENT: EU OUTPERFORMS THE US BUT STILL LACKS SIGNIFICANT INVESTMENTS TO MEET AMBITIOUS TARGETS

Evaluating the economic impact of green policies requires examining their environmental effectiveness, as policies lacking clear ecological benefits risk being mere economic shifts without actual sustainable progress. This paper compares the EU and US in reducing GHG emissions and achieving related goals, like lowering energy use and increasing renewables. By analyzing historical data and future trends, the effectiveness of respective green policies are assessed.

EU and US are expected to miss 2030 targets for GHG emission reduction

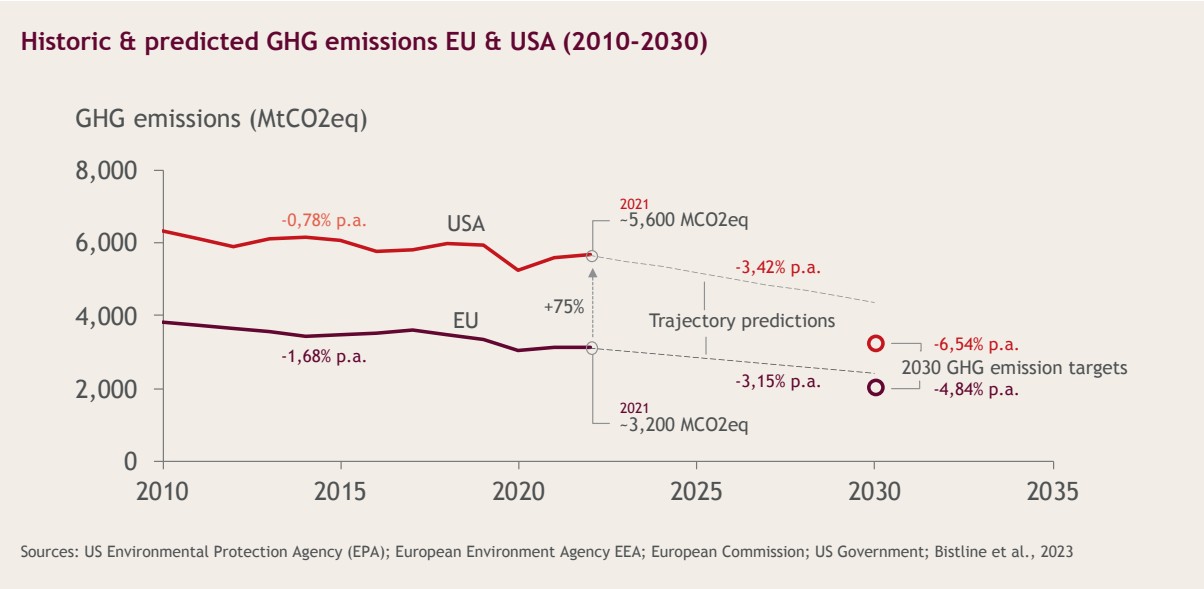


Figure 12 – Comparison EU vs. US GHG emissions

Aligned with the objectives of the Paris Climate Agreement to contain global warming well below 2 degrees Celsius compared to pre-industrial levels, the EU and the US have delineated their GHG emission reduction targets. The European Union has set an ambitious aim to cut emissions by 55% from 1990 levels by 2030, surpassing the United States' objective of a 40% reduction within the same timeframe. (Sources: White House; European Commission)

Thereby a pronounced divergence exists in the GHG emission profiles and historical trajectories of the two regions. Historically, the United States has exhibited significantly higher GHG emissions compared to the European Union. As of 2022, emissions in the United States were 75% higher than those of the EU (Sources: EPA; EEA).

Between 2010 and 2022, the European Union outpaced the United States in reducing GHG emissions, achieving an average annual decrease of 1.68%, in contrast to the United States' 0.78%. However, to meet the ambitious 2030 climate goals, both entities are required to intensify their efforts, necessitating an average annual reduction of 4.84% for the EU and an even more daunting 6.54% for the US. Initial assessments project an uptick in average annual reduction rates to 3.25% for the EU and 3.42% for the US, suggesting a notable acceleration in US reduction efforts relative to historical performance.

Despite these advancements, projections indicate the EU is on track for a 48% reduction, falling short of its 55% target, while the US is anticipated to achieve only a 25% reduction, considerably below its 40% goal. **These disparities underscore the urgency for both regions to reassess and potentially recalibrate their strategies to bridge the gap between current trajectories and their stated climate objectives**. (Sources: EPA; EEA; European Commission; US Government; Bistline et al. 2023)

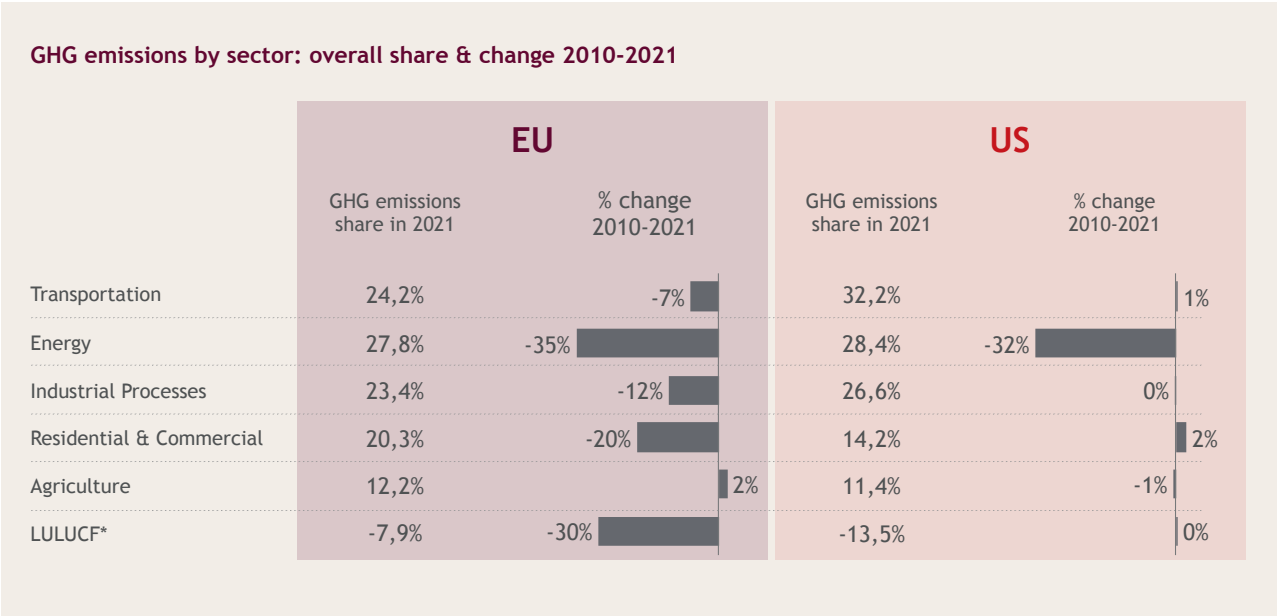


Figure 13 – GHG emissions by sector

A marked distinction becomes apparent when examining the trends in emissions reductions since 2010. The EU has achieved notable decreases in emissions across several sectors, particularly in energy, residential and commercial buildings, as well as industrial processes. This contrasts with the US, where reductions in GHG emissions have purely originated from the energy industry. This is in line with the identified focus of subsidies on carbon-free energy that was assessed in the description of Sustainable Finance.

EU's Ambitious Complementary Climate Goals: Opportunities and Substantial Risks

As can be seen in Figure 14, the legislative set of **complementary climate targets are significantly more exhaustive in the EU than the US**. Whereas the US only set additional targets for clean electricity mix and clean vehicle share, the EU defined a comprehensive set of complementary targets ranging from primary energy consumption reduction and renewable energy share to the annual manufacturing capacity targets under the Net Zero Industry Act – one of the three key legislations under the GDIP. The defined targets in the US are further less strict, with incorporating for example nuclear energy in the clean electricity target in comparison to the EU focusing solely on renewables in the energy share targets (Sources: European Commission; .

	2030 target		2022 value	
2030 target category	**EU**	**US**	**EU**	**US**
Primary energy consumption	990 Mtoe 11,7% below baseline	(no target defined)	1250 Mtoe (2.8 per m capita)	2300 Mtoe (7 per m capita)
Renewable energy share	42,5%	(no target defined)	22,5%	13%
Clean electricity share*	(no target defined)	80%	62%	41%
Clean vehicle share	55%	50%	21,5%	6,7%
Net-zero technologies manufacturing capacity	40%	(no target defined)	(NA)	(NA)
	EU with broader scope and higher ambition level		EU with leading values in all dimensions	

*clean electricity in this definition includes renewables and nuclear electricity
Sources: European Commission; US Government

Figure 14 – Overview complementary climate targets EU & USA

As can be seen in Figure 14, **the EU is outperforming the US in the assessed dimensions**. The US's primary energy consumption significantly exceeds that of the EU, showcasing the impact of lacking specific reduction targets in the US, where consumption has increased since 2010. Conversely, the EU has seen a consistent reduction, averaging a 1.2% annual decrease. The EU also leads in renewable energy (22.5% vs. the US's 13%) and clean electricity shares (62% vs. 41%). In clean vehicle market share, the EU's 22% starkly contrasts with the US's 7%.

However, **to meet the 2030 climate goals the EU and the US must both significantly accelerate their green transitions**, particularly in increasing renewable and clean energy shares – requiring more than double the current progress rate. An analysis focusing on the EU's manufacturing goals for net-zero technologies, part of broader climate objectives, reveals a **need for around €1.9 trillion in investments from 2022 to 2030**, or about €230 billion annually. This highlights the essential role of increased public and private investments, given the limitations of the current EU budget, in achieving these ambitious targets.

In addressing the economic implications of stringent climate targets within the EU, it becomes imperative to contrast the potential benefits against the associated downsides. On the positive side, setting ambitious climate goals can **catalyze a faster innovation cycle**, propelling advancements in green technologies and sustainable practices. This, in turn, **enhances ecosystem resilience**, fortifying natural habitats against the ravages of climate change and preserving biodiversity. The push for reduced emissions is also likely to **increase energy efficiency** across various sectors, leading to cost savings and reduced energy consumption.

However, these advantages are counterbalanced by several economic and strategic challenges. **Premature technology adoption or resource misallocation** could arise, with investments funneled into currently available but potentially suboptimal technologies, thereby inhibiting the exploration and development of more effective solutions. An example for such premature technology adaptation, marks the adoption of first-generation biofuels provides a clear case. Initially, biofuels derived from food crops (such as corn ethanol and palm oil biodiesel) were seen as a renewable alternative to fossil fuels, leading to their widespread promotion and adoption, supported by government mandates and subsidies. However, it soon became evident that the cultivation of crops for biofuels was causing deforestation, loss of biodiversity, and even food price increases due to the diversion of crops from food to fuel production. This not only had adverse environmental impacts but also questioned the carbon-saving credentials of these biofuels when lifecycle emissions were considered, including land-use changes.

Technological lock-in presents a risk where early commitments to specific technologies can hinder later adoption of superior alternatives. This is particularly problematic for industries like Germany's automotive sector, **where supply-side transitions to net-zero vehicles may outpace demand**. Consequently, investments in these changes risk not being offset by market revenues, threatening the financial viability of key industries.

Furthermore, the rapid transition to green technologies could exacerbate **global supply chain vulnerabilities**, particularly for critical raw materials needed for renewable energy systems, thus affecting market stability and economic security. Lastly, the phenomenon of **carbon leakage** – where stringent climate policies in the EU push carbon-intensive industries to relocate to regions with looser environmental regulations – could undermine global efforts to mitigate climate change, offsetting the EU's reductions in greenhouse gas emissions.

In conclusion, it becomes evident that while the push towards stringent climate targets in the EU heralds significant opportunities for innovation, ecosystem preservation, market development, and energy savings, it also necessitates careful navigation of economic risks, including premature technological commitments, supply chain vulnerabilities, and potential discrepancies in global emission outcomes.

4.2. ECONOMIC ASSESSMENT: EU IS AT RISK OF LOOSING ITS LEADING POSITION IN CLIMATE MITIGATION INVESTMENTS & INNOVATION

An economically viable transition towards a green economy is characterized by multiple economic metrices. Key factors are the ability to be innovative in terms of green technologies, the stimulation of sufficient public and private investments as well as a secure supply of required resources. For this matter, we look in this economic assessment at metrices in these three dimensions (1) innovation, (2) investment and (3) trade.

Innovation: How the EU environmental leadership position is under pressure

The described emphasis of the EU policies on innovation over mass market adoption in correlated in the past with a pronounced leadership of the EU in the innovation of environmental technologies.

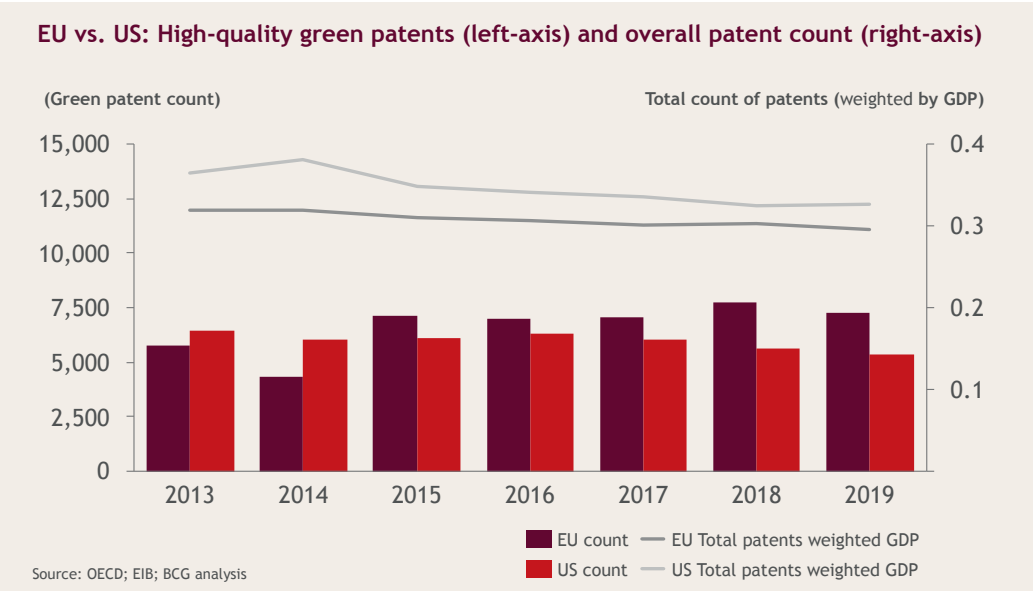


Figure 15 – Comparison high quality green patents and overall patent count

As can be seen in Figure 15 despite the US dominating the filling of new patents overall, the **EU continues to lead in the generation of high-quality green patents**. This observation is further corroborated by the EU's R&D Innovation Scoreboard, which assigns the United States a score of only 71.7% in environmental technology innovation, markedly lower than the EU's baseline of 100%. (Sources: OECD; EIB Investment Report 2023/2024; EU R&D Innovation Scoreboard)

Recent trends indicate a shifting momentum towards the United States, characterized by its overall significantly increased R&D expenditures in climate mitigation – amounting to €38 billion in 2021 compared to the European Union's €32 billion (Source: EIB Investment Report 22/23). Further exemplified is this trend looking at the top 2,500 innovative companies since 2017, where only 10% of new entrants were based in the EU, compared to 45% within the US (Source: EU R&D Innovation Scoreboard).

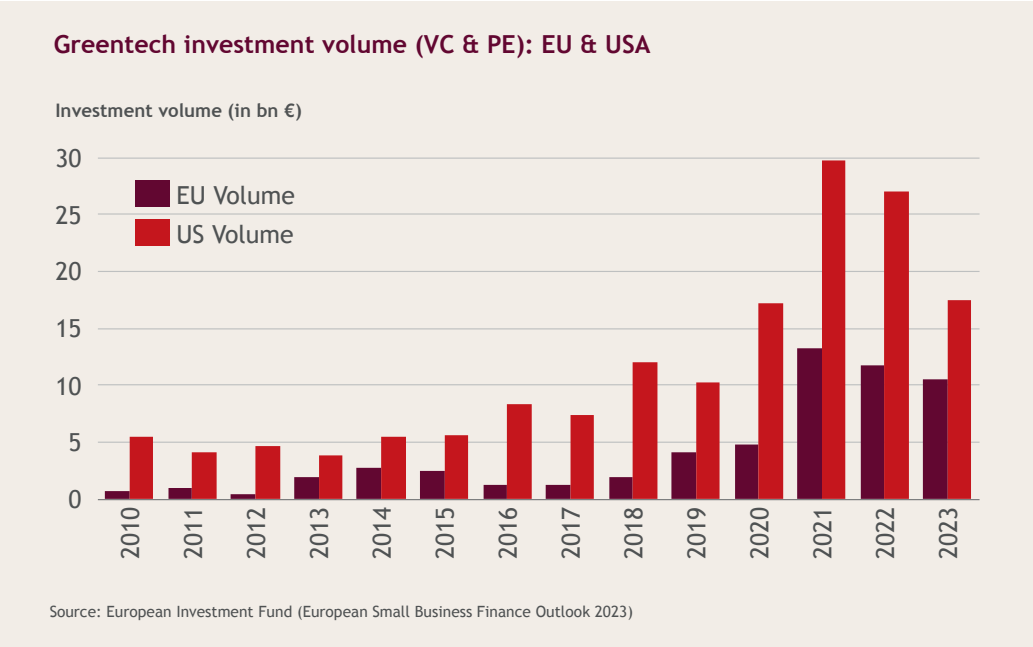


Figure 16 – Greentech investment (VC & PE)

Shifting the focus back on green innovation, another important metric is the greentech investment volume in the EU and the US through VCs and PEs. As Figure 16 highlights, the US continues to have significant higher investments volumes. However, the gap appears to be narrowing as of 2023. It is essential to highlight that the full impact of the IRA on these investment figures remains to be seen and warrants close monitoring. (Source: European Small Business Finance Outlook 2023)

With this in mind it can be said that the **EU is yet keeping its leading position in the innovation of green technologies but might sooner or later see the implications of recent US policies** – where the pull from mass market adoption may translate into a push for innovation.

Climate Investments: IRA impacts and EU's energy dependencies demonstrate economic risks

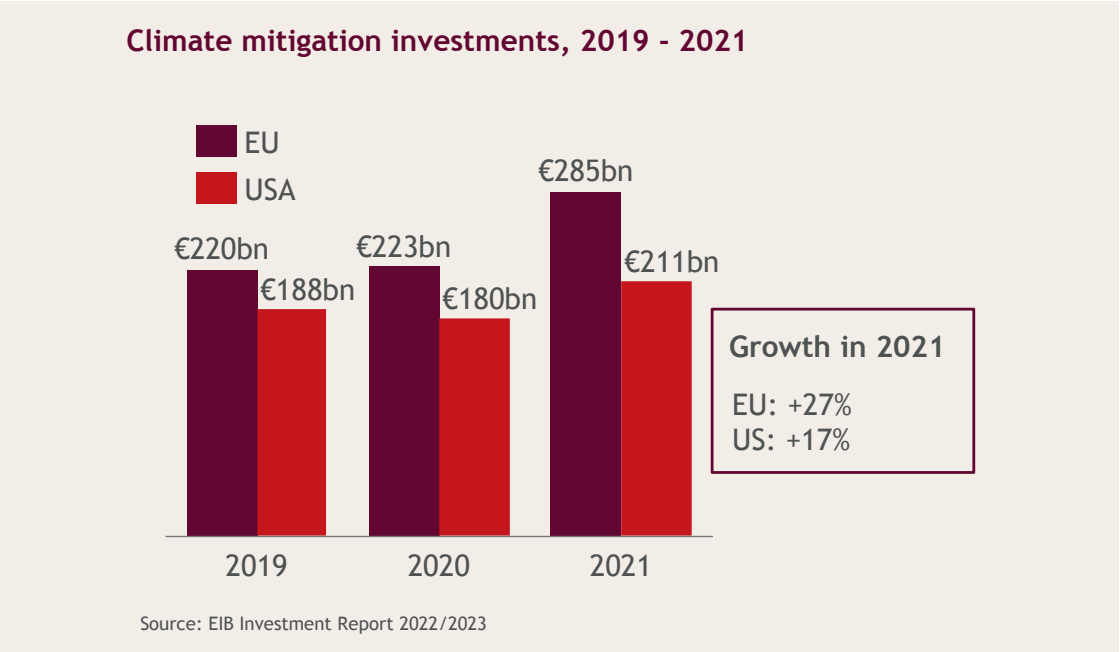


Figure 17 – Climate mitigation investment volume & structural breakdown

In delving further into the domain of investments into climate mitigation efforts, again the EU emerges as a frontrunner, boasting a substantial growth rate of 27% in 2021 in comparison to 17% in the US. This brings total climate mitigation investment in the EU in 2021 to ~€285bn in comparison to the US value of €211bn. However, the full impact of the IRA on the landscape of climate mitigation investments remains to be quantified, suggesting a potential shift in momentum may be on the horizon.

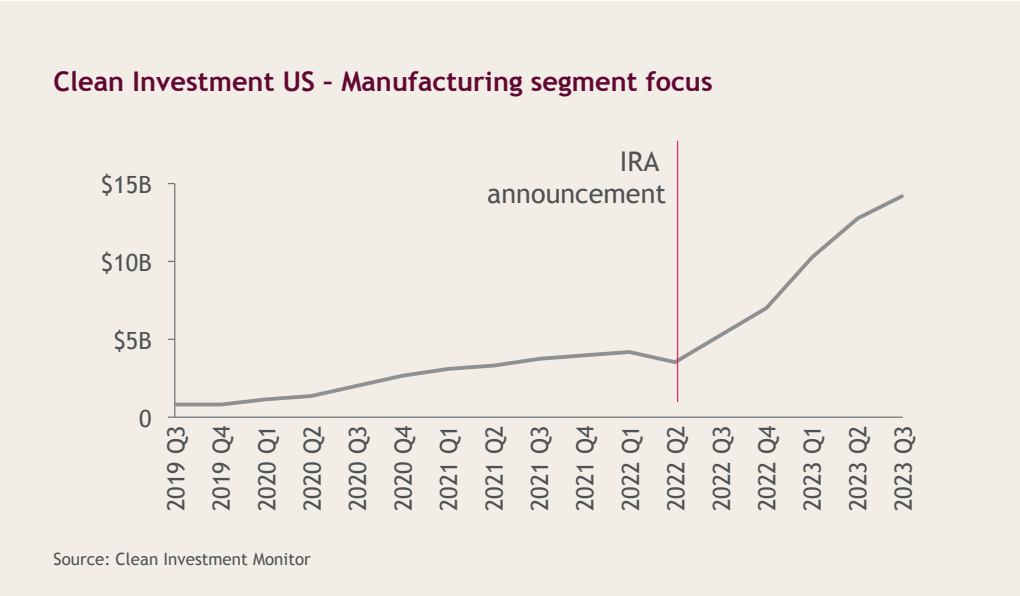


Figure 18 – US clean investments – manufacturing

The influence of the IRA is already palpable within the realm of clean investments in the manufacturing sector. Since the announcement of the IRA in 2021, the sector has witnessed a remarkable surge in growth, indicating a direct correlation between the legislation and increased investment in clean technologies. This uptick not only highlights the effectiveness of targeted government policies in stimulating economic sectors but **also signals a burgeoning shift towards sustainable practices within the United States**.

5. CONCLUSION: A DIRECT AMERICAN STRATEGY PUTS PRESSURE ON EUROPEAN GREEN DOMINANCE

The findings of this analysis underscore that both the European Union and the United States are at a pivotal moment in their efforts to combat climate change. Recent legislative actions indicate a growing attractiveness of the US as a destination for green investments. However, the full implications of these initiatives remain to be seen.

This shift brings to light three principal challenges that could undermine the EU's current leadership in innovation and investment in green technologies: (1) the high compliance costs associated with stringent disclosure requirements, (2) the complex and potentially inefficient fragmentation of fund allocation, and (3) the enforcement of strict ESG targets that may lead to the costly adoption of premature technologies.

(1) The implementation of a comprehensive set of broad ESG disclosure requirements, particularly through the CSRD and specific regulations targeting financial institutions, exerts substantial pressure on EU corporations. This necessitates considerable allocation of resources towards compliance, thereby constraining the funds available for innovative endeavors. (2) Furthermore, the intricate and bureaucratic process of distributing the substantial €700B EU green budget, across more than ten distinct funds, diminishes its accessibility. This complexity is exacerbated by the reliance on the Recovery and Resilience Facility (RRF) as the principal conduit for green financing showcasing centralization on Member State level while the absence of specific guidelines for fund usage results in the dispersion of funds across numerous projects - diluting the potential impact of the allocated resources. This fragmented approach to funding allocation undermines the RRF's ability to effectively support targeted green economic growth. (3) Moreover, stringent ESG objectives risk imposing considerable supply-side costs by mandating suppliers to transition towards net-zero capabilities without a corresponding demand-side readiness to embrace such rapid transformations, potentially leading to revenue shortfalls for suppliers. Cumulatively, these factors could impose significant financial burdens on pivotal industries within the EU, jeopardizing the competitiveness of its companies.

In contrast, the United States has yet to achieve a comprehensive harmonization of ESG disclosure requirements and set less stringent climate targets. On the other hand, the US has adopted a very targeted approach, emphasizing streamlined tax incentives for the mass-market adoption of clean technologies. Historically, the US has struggled to significantly reduce GHG emissions and to foster substantial investments in the green economy. However, the enactment of the Inflation Reduction Act in 2022 marks a pivotal shift, catalyzing a surge in green investments that is anticipated to significantly accelerate the reduction of GHG emissions. The long-term ecological impacts of these

policies remain to be fully evaluated, suggesting an area ripe for further research. Preliminary observations, however, indicate that the US strategy may be effectively stimulating its green economy, potentially redirecting investments towards the US from other regions.

With the US elections approaching at the end of 2024, it remains unclear how the policy approach of the US towards climate targets may shift afterwards. Nevertheless, the current divergence in policy between the EU and the US shows inefficiencies of the EU approach, potentially reallocating global focus and resources to the U.S – away from the EU's historic leadership position in green innovation and investments. This risk is further heightened by the current geopolitical and economic unrest. The EU faces challenges of economic stagnation, exacerbated by geopolitical tensions, notably the war in Ukraine which severely affects the region's energy security and market dynamics, alongside other global issues such as U.S.-China trade disputes, persistent inflation, and ongoing international conflicts.

This development accentuates the imperative for the EU to reevaluate its policy framework, drawing insights from global counterparts to effectively harmonize environmental objectives with economic competitiveness, especially amidst escalating global challenges.

This whitepaper thereby highlights the necessity for continuous review of climate strategies to ensure they effectively incorporate the costs of environmental externalities, while meeting climate objectives without sacrificing economic growth. Through the analysis of existing climate actions, this paper provides the basis for deeper discussions among policymakers and the business community and aims to encourage the development of climate policies within the larger ESG framework that align environmental goals with economic stability.

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