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Energy Union 2.0. to deliver the European Green Deal:

stronger governance, common financing and democratic tools

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Supported by Breakthrough Energy

Abstract

The Energy Union aims at ensuring secure, sustainable, competitive and affordable energy supply to EU consumers. The European Green Deal initiated in 2019 further set the EU goal to reach climate neutrality by 2050. The multiple crises that hit the EU in recent years – pandemic, war, supply chain tensions – created an unprecedented alignment between the need to accelerate the energy transition, the need to safeguard security of supply, and the need to preserve EU competitiveness and social cohesion. EU common energy and climate policy improved as a result. Yet, EU regulatory, financing and governance instruments fall short compared to the scale of the challenges. More EU action is needed to achieve the objective of climate neutrality, while guaranteeing energy security and reasonable energy prices for households, businesses and industry.

This report proposes an Energy Union 2.0. as a strategic goal for the EU institutions following the next EU elections in 2024 to support the delivery of the European Green Deal while preserving energy security and reasonable prices.

Key elements of an Energy Union 2.0. include:

- **Governance:** a more European, goal-oriented, collaborative energy and climate governance
- **Funding:** an increased EU budget fit for energy resilience, security and prosperity
- **Democracy:** a democratic renewal, including permanent citizen assemblies on climate and resilience

Pragmatic steps to that end involve:

- **A new EU Energy Security Strategy** based on electrification, grids development, EU cleantech manufacturing and demand reduction, including a strengthening of the EU Energy Platform
- **An EU Clean Investment Plan, including an EU Sovereignty Fund,** allowing for the creation of an EU ARPA-E and the development of

EU-wide support schemes for cleantech and grids

- **An EU Energy Agency** providing easy access to up-to-date energy data to support public and independent assessments of proposed and existing policies
- **An "Energy and Climate Stakeholders' Dialogue Platforms Facility"** to offer financial and technical support for the early stages of the establishment of Energy and Climate Stakeholders' Dialogue Platforms at the national level
- **An EU Citizen Assembly on Climate** closely tied to EU decision-making to discuss new EU instruments to help with the implementation of the European Green Deal and strengthen the Energy Union

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Members of the Reflection Group have expressed a range of views which are not fully reflected in the present text. They do not necessarily endorse all the analyses and proposals introduced in the final version. Camille Defard thanks all the members for their valuable input, but takes full responsibility for the content of the document.

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Executive summary

Background

Since the launch of the European Green Deal in December 2019, the EU had to face a succession of crises in addition to the climate emergency. The European Commission, led by Ursula von der Leyen, made the goal of reaching climate neutrality its number one priority right before covid-19 hit Europe. The 2020 pandemic was followed by an energy crisis worsened by the war in Ukraine in February 2022. The energy crisis made energy security and affordability top priorities next to decarbonisation, in the face of major Russian weaponization of gas supply. The adoption of the Inflation Reduction Act (IRA) in August 2022, a massive subsidy programme for US cleantech manufacturing with protectionist features, further heightened Europeans' competitiveness concerns. Existing EU dependencies on China for cleantech supply chains also raise issues of excessive vulnerability.

As a result, over the past four years, intense legislative activity and policy debate took place to safeguard the three objectives of the Energy Union:

- energy security
- sustainability (e.g. climate neutrality)
- competitiveness and affordability (e.g. reasonable prices)

Aim

As the EU nears the end of this Commission's term, where does it stand in regards to the implementation of the European Green Deal and the achievement of Energy Union objectives? Launched in 2019, the European Green Deal aims at achieving climate neutrality by 2050. It complements the Energy Union introduced in 2015, with the goal of better coordinating and integrating EU and national energy policies in order to supply EU households and businesses with secure, sustainable, and reasonably priced (i.e. competitive and affordable) energy. This report aims to assess the current EU energy and climate framework as compared to these three policy objectives in order to identify the progress and remaining gaps of EU energy policy's regulatory, financing and governance tools.

Given the breadth of the subject, the overview is far from exhaustive. The issues of private finance, national public finance, monetary policy, biodiversity, and the EU as a global actor will mostly be left out of this report. Rather than diving into a detailed analysis of each EU policy instrument, the purpose is to adopt a more holistic point of view on EU energy policy and contribute to the policy debate leading up to the next European elections in June 2024 and the next European Commission mandate. The recommendations should be read as building blocks for future research and discussion rather than definitive and complete answers to the huge challenges at hand.

To facilitate reading, each part of the report starts with the corresponding key findings, which are further summarised in the present executive summary.

Key findings

Part 1: The European Green Deal and the Energy Union proved resilient strategies through crises.

The ambition of the European Green Deal was to put energy and climate policies at the centre of EU action and to make it the number one priority of the von der Leyen Commission. Four years down the road, this sounds like a job completed. The EU launched the European Green Deal to answer the climate crisis, the Recovery and Resilience Facility to address to the covid crisis, which filled part of the green public investment gap, the REPowerEU Plan to phase out Russian fossil fuels, which accelerated the European Green Deal ambition, and the Green Deal Industrial Plan to overcome cleantech mounting vulnerabilities.

The EU now clearly needs a successful energy transition to contribute to strengthening EU open strategic autonomy, economic security and long-term competitiveness. The deepening and widening of the scope of EU energy policy action because of multiple crises of different causes (pandemic, fossil fuels, clean transition) shows the relevance of EU common action. Yet EU answers to the crises heavily focus on regulation, with more limited financial, human, and technical support to lower government levels (national, regional), and limited coordination, obligations or compliance mechanisms. Will it be enough to meet the objectives of the Energy Union?

Part 2. Meeting the Energy Union objectives – achieving climate neutrality while maintaining high levels of energy security and reasonable energy prices – remain very challenging.

Tripling the emission reduction pace to achieve climate neutrality is a huge challenge considering the increasing bottlenecks on renewables deployment, the slow progress on demand reduction, and the mixed trends in fossil fuel phase-out policies.

The energy crisis clearly showed the alignment between the transition towards climate neutrality and the need for a common EU energy security approach. However, the EU is still in between two energy security paradigms, reliant on fossil fuels for its short-term security, increasingly challenged in its capacity to secure access to critical materials. Cleantech manufacturing and supply chains will be the backbone of future energy security and will involve domestic reshoring efforts. Yet, the associated supply chains are much more complex than simply oil and gas.

Lastly, with a transition characterised by high upfront investments costs and low operational expenditures, ensuring energy affordability is increasingly becoming a cohesion challenge and a distributive issue. Large social and political acceptability challenges are at play.

Part 3. Despite progress, the Energy Union still lacks the tools to achieve the European Green Deal and its objectives of security and competitiveness in an increasingly adverse environment.

The synergies between energy long-term security of supply, sustainability and affordability objectives are clearer than ever. But time and resources are a huge constraint. This energy transition is the first to be achieved purposefully and up against a deadline. The sheer scale of the challenge of avoiding carbon lock-in, insecurity lock-in, and high prices lock-in calls for more collective action. In other words, this transition requires an unprecedented degree of collaboration, coordination and solidarity across stakeholders and different government levels (EU, national, local).

The EU governance and financing instruments fall short of the challenges that arise from the EU regulatory framework implementation. There is a risk of diluting the ambition at the national level and a persistent lack

of coordination of national energy policies. Although the emergency answers to crises contribute to strengthening EU common energy policy tools, additional EU financing remains temporary, does not match the growing needs, and the quality of investment deserves a further look. Meanwhile, emergency regulations are too provisional and insufficiently binding for Member States (MS), and EU governance is still inadequate to achieve the Energy Union objectives.

Delivering the European Green Deal while preserving energy security and reasonable prices requires political agreements on allocation of costs and the distribution of risks. There is a need to strengthen common financing, policy coordination and governance tools. There is also a need to rebuild political consensus and legitimacy in order to prepare the ground for the adoption and implementation of the regulations necessary to achieve climate neutrality.

Key areas for action

Part 4. Democracy, governance and funding instruments required to strengthen the Energy Union

I POLITICS: THREE AVENUES TO SUPPORT BROAD POLITICAL BUY-IN

Designing effective and progressive policies with well-documented impacts would favour broad political buy-in. Information on how climate policies reduce emissions as well as on the distribution of costs and benefits (winners and losers) enhances acceptance. Yet this information is often lacking in the first place. Improving the knowledge of the impact of energy transition policies seems a key precondition to rebuild consensus around climate action. Additionally, be it for governments, businesses or citizens, turning the transition from a constraint to an opportunity calls for active policies that consider the differentiated capacity to act. Acknowledging actors' self-interest requires continued attention on solidarity and burden-sharing, which involve adequate financial and technical support.

A stronger EU democracy, including through improved participative democracy instruments, would benefit the European Green Deal, along with more inclusive stakeholder's participation processes to national energy and climate planning. Citizens are more open to binding mea-

sures and ambitious action than governments. The discrepancy between citizens' preferences and EU climate action calls into question the current EU institutional architecture.

A priority for the years to come should be to build and expand strategic public – private – civil society alliances to support political leadership for an ambitious energy transition. The current unprecedented alignment of energy challenges provides a fertile ground for new and expanded coalitions. The European Commission could support easily accessible Energy and Climate Stakeholders' Dialogue Platforms at all government levels, especially the national level, in order to give visibility and facilitate stakeholders' engagement into climate policy design and implementation.

GOVERNANCE: LEVEL UP THE COORDINATION GAME

Addressing climate change calls for renewed governance models to allow for a sustained policy effort, adaptability to new challenges and new knowledge, and the integration of different stakeholders, government levels, and sectors. A renewed energy and climate governance framework needs to be: integrated across sectors, multi-level and multi-stakeholders, implemented by skilled people and sufficiently staffed teams, and based on an improved knowledge infrastructure that allows for quality policy evaluation and monitoring.

• Towards an interactive multi-level and multi-stakeholder governance model

Interactive governance models show great results in designing solution-seeking and trust-enhancing processes across different stakeholders in highly uncertain environments. It leaves space for collective learning while aligning the interests of decentralized actors with common goals set at higher government levels. Solutions, trust and cooperation are the outcomes of the governance arrangement, rather than inputs. Valuable inspiration can be drawn from the governance of the US DARPA and ARPA-E, as well as from the experiences in mitigating certain environmental externalities.

Applying an interactive, "diagnostic monitoring" model could address compliance barriers in a more efficient way than the current "com-

pliance monitoring" model. Under the RRF, the Just Transition Fund (JTF), and the Social Climate Fund (SCF), EU funding disbursement is conditioned to achieving specific milestones laid out in ex-ante national plans. This "compliance monitoring" approach assumes a stable and homogeneous environment that allows for the translation of detailed plans into precise instructions for agents to execute. On the contrary, "diagnostic monitoring" is similar to the approach taken by the DARPA. It aims at facilitating and organising collective problem-solving towards a common objective, as a response to rising levels of uncertainty that erode the effectiveness of detailed ex-ante plans. The idea is to allow for collaborative adjustments towards goal delivery, stemming from dialogue between different levels of governments and stakeholders. There is an interesting potential for the translation of such governance models to the current EU energy and climate framework, especially considering the various national plans linked to EU funding.

- **People: staffing, skills, coordination**

The EU needs to contribute to the upcoming effort to provide the human and technical resources at all government levels (EU, national and local) and across stakeholders in order to foster efficient, high-quality and balanced participation to policy design and implementation. This would support both absorption of EU funds and achievement of policy objectives.

This calls for appropriate skilling and staffing among a wide variety of public and private stakeholders. Skills are the main barrier to EU cleantech manufacturing, energy renovation and renewable energy deployment, together with access to finance. There is currently a well-identified lack of administrative capacity and skilled staff to handle more complex green projects, especially at the local level and especially in cohesion regions. At the EU level, an example is the Innovation Fund, which is under-staffed and under-resourced compared to its expanding ambitions.

Properly staffed administrations should go together with administrative processes that foster efficient coordination with other stakeholders. The RECOVER task force established within the European Commission Secretariat-General to coordinate and implement EU recovery action is a good example of administrative organisation innovation. This initiative could be replicated with the creation of a RESILIENCE task force to ensure a coherent and coordinated action from the various EU funds and

align them with the objectives of the European Green Deal, REPowerEU and the Green Deal Industrial Plan.

- Improved knowledge on policy impacts

Under a renewed governance model based on more interactive and iterative process, policy evaluation and monitoring will be a key ingredient to adjust policy solutions to the diversity of local situation in a context of uncertainty. EU institutions should invest more intellectual and financial resources into in-depth analyses of the social impacts and distributive issues of the transition, evaluation of past policies, evaluation of energy and material resources needs, as well as analyses of supply chains and trade-offs between supply expansion and demand reduction. Quality evaluation requires easily accessible and comparable open data, as well as transparent access to information. The current lack of reliable and up-to-date data on energy hampers quality policy debates.

FINANCING: FILLING THE GAP TO FACE CLIMATE, SECURITY AND COMPETITIVENESS CHALLENGES

Current private and public climate spending falls short of the challenges. In the EU, times are currently difficult for green private financing due to the uncertainty created by the war in Ukraine, high energy costs, lack of availability of skilled staff, and lower access to finance caused by the hikes of ECB's rates. Additionally, sustained public investment is under threat. This report will focus on public investment as a key enabler for private investment, to fill the green investment gap, and improve absorption capacity and coordination. Meanwhile, the EU must address the question of how to handle the additional cost of increased energy and economic security and resilience.

Energy security, competitiveness and climate action have the characteristics of EU public goods. The lack of EU funding to ensure appropriate burden-sharing proved to be a barrier to ambitious EU energy action in 2022. Further, fair cost-sharing and risk-sharing can be considered as a core issue of political support for the transition. Distributive issues, justice and equity also increasingly appear as key elements of energy security and climate policies. Stronger public action is needed to mitigate the distributive impacts of the transition and bear the additional cost of increasing the resilience of the energy system.

EU climate-related financial tools, including subsidies, must increase to deliver the European Green Deal. Without additional resources (financial but also technical and human), it will be difficult to implement and further strengthen the regulatory framework. The relaxation of state aid as a result of the energy and competitiveness crises, along with uncoordinated emergency answers, is dangerously leading to single market fragmentation. On the contrary, EU financing would allow for a more united, cost-effective policy answer to the current challenges. It would reap the full business, job, local development and well-being opportunities of the ongoing cleantech industrial revolution and the associated energy transition. The EU needs to invest in clean infrastructure and manufacturing capacities, skills and people. Two key avenues for financing are new Own Resources for the EU budget, or new common debt, which would also raise the issue of new Own Resources at some point.

Recommendations towards an Energy Union 2.0.

I A MORE EUROPEAN, EFFICIENT AND COLLABORATIVE ENERGY AND CLIMATE GOVERNANCE

- **The European Commission should engage into the definition of an new EU Energy Security Strategy.**

The new EU Energy Security Strategy for cleantech supply chains, clean infrastructure, and demand reduction should be based on extensive collaboration with national authorities and other non-state stakeholders. It should include options to strengthen the EU Energy Platform to further operationalise joint purchase of gas and move forward on the CRMA proposal to replicate this approach to critical materials.

- **The European Commission should propose an ambitious revision of the Governance of the Energy Union Regulation that would improve national and EU energy and climate planning.**

  The proposed revision could include the following update of the dimensions of the Energy Union:
  - The "Energy Efficiency" dimension could become a "Demand Reduction" dimension to encompass sufficiency and planetary limits, as

well as the need to go beyond the sole energy focus to encompass materials and natural resources.
- The "Research, innovation and competitiveness" dimension should mention clean industry, to reflect the renewed attention to domestic manufacturing capacities and supply chains.
- A 6th "Just Transition" dimension could be integrated to emphasize the commitment to a fair and inclusive transition, including quality jobs creation, skills and training, public participation, addressing carbon inequalities as well as the distributive impacts of the European Green Deal.

- **The European Commission should propose to make the governance of some EU energy and climate related funds (SCF, cohesion funds, or another NGEU if it was replicated) more conditioned to green reforms, more agile and more collaborative.**

  - Link future EU climate funding to conditionalities on EU energy and climate regulatory framework timely and appropriate implementation.
  - Make EU energy and climate planning to access EU funds more agile and collaborative with more robust national and regional monitoring systems to oversee the progress, make changes when necessary, and allow for continuous integration of lessons learned during implementation.

- **The European Commission should create a new task force within its Secretariat General to coordinate the implementation of the EU climate-related funds with the Energy Union objectives.**

  A RESILIENCE task force for energy resilience similar to RECOVER could be created within the European Commission Secretariat General to oversee and coordinate the implementation of the various EU energy and climate-related funds and ensure that they effectively contribute to EU climate, security and competitiveness objectives.

I AN INCREASED EU BUDGET

- **The Council should agree on the creation of new Own Resources and/or the issuance of EU green bonds to increase the EU budget to make it fit for energy resilience, security and prosperity.**

The EU needs to invest in clean infrastructure and manufacturing capacities, skills and people. An EU budget for energy resilience, security and prosperity would increase the EU grants supporting the achievement of the European Green Deal while maintaining energy security and reasonable prices.

STRONGER DEMOCRATIC TOOLS FOR THE EUROPEAN GREEN DEAL

- **The European Commission, the Council and the European Parliament should launch and institutionalize an EU Citizen Assembly on climate and energy resilience.**

  An EU Citizen Assembly on climate and energy resilience should be institutionalized, organised on a regular basis (yearly for example) and closely tied to the EU decision-making process. Topics to be discussed could include possible new Own Resources to finance the European Green Deal, or measures to be included in the next 2040 energy and climate package.

- **The European Commission should launch a new "Energy and Climate Stakeholders Dialogue Platforms Facility".**

  A new dedicated "Energy and Climate Stakeholders' Dialogue Platforms Facility" could deliver financial and technical support for the early stages of the establishment of Energy and Climate Stakeholders' Dialogue Platforms at the national and regional levels. This would create a space where local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress. This would contribute to strengthening ambitious public – private – civil society alliances to support EU leaders in adopting bold decisions. In addition, it could support a more interactive and collaborative monitoring of energy and climate governance.

Pragmatic steps towards the Energy Union 2.0.

The need for action never seemed so pressing, with ever more alarming IPCC reports, the multiplication of extreme weather events, rising economic, social and geopolitical threats, as well as the sustained and

growing mobilization of civil society, including the scientific community, together with cleantech businesses that are urging to seize the moment. Agreeing on the above proposals for an Energy Union 2.0. would require a grand bargain on energy issues. A pragmatic start for the next Commission could include:

- **A new EU Energy Security Strategy** based on electrification, grids development, EU cleantech manufacturing and demand reduction, and including a strengthening of the EU Energy Platform
- **An EU Clean Investment Plan, including an EU Sovereignty Fund** allowing for the creation of an EU ARPA-E and the development of EU-wide support schemes for cleantech and grids
- **An EU Energy Agency** providing easy access to up-to-date energy data to support public and independent assessments of proposed and existing policies
- **An "Energy and Climate Stakeholders' Dialogue Platforms Facility"** to offer financial and technical support for the early stages of the establishment of Energy and Climate Stakeholders' Dialogue Platforms at the national level
- **An EU Citizen Assembly on Climate** closely tied to EU decision-making to discuss new EU instruments to help with the implementation of the European Green Deal and the Energy Union

Introduction

New era, renewed Energy Union?

The Energy Union: providing secure, sustainable, competitive and affordable energy

The aim of the 2015 Energy Union strategy[1] **is to build a resilient Energy Union, which would provide "*secure, sustainable, competitive and affordable energy*".** The Energy Union has five related and mutually reinforcing dimensions:

1. Security, solidarity and trust;
2. A fully integrated internal energy market;
3. Energy efficiency;
4. Climate action, decarbonising the economy (renewables and grids);
5. Research, innovation and competitiveness.

These five dimensions sometimes overlap and are not clearly defined. Their main translation is through the 2018 Governance of the Energy Union Regulation, which mandates Member States to report on their national progress on these five dimensions in National Energy and Climate Plans (NECPs).[2] The enforcement of climate and energy ambition and EU targets is supposed to take place through recommendations by the European Commission to Member States on their NECPs during the drafting and updating process.[3]

The Energy Union was created to address the lack of common EU energy policy approach and instruments in the face of mounting climate and geopolitical challenges, including fears over Russian gas supply reliability, as well as the need to accelerate the deployment of renewables and energy efficiency. In sum, challenges strikingly similar as today.

Even before the crises that shook Europe in recent years, analysts already considered the tools of the Energy Union as too limited to

1 European Commission, 2015. A framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy. COM(2015)080 final

2 NECPs are drafted for ten-year periods starting from 2021, and are currently in the process of being updated, with final drafts due by June 2024. Initial drafts were due by June 2023, yet in October 2023, 11 Member States still need to submit their updated NECPs to the Commission. European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.

3 Additionally, by 15 March 2023, and every two years thereafter, Member States shall report to the EC on the status of implementation of its NECP, but reporting has not been great so far.

efficiently fulfil its objectives,[4] partly because of Member States divergences over the need for collective action and different perceptions[5] of the risks and individual Member States ability to cope with them. Additionally, at the time, unresolved conflicts between the objectives of security, sustainability and affordability prevailed.

Crises threaten the Energy Union objectives

The EU and the world are facing a climate and sustainability crisis. Despite past efforts and progress, in 2019, 85% of the EU total energy use was still coming from oil and gas. As a result of a political momentum fuelled by IPCC reports, social movements, and electoral results, the von der Leyen Commission launched the European Green Deal (EGD) in December 2019. The objective set by the EGD is to achieve EU climate neutrality by 2050. This requires tripling the current emission reduction pace.[6] Although the EU is moving in the right direction, it needs to accelerate its efforts[7] in an ever more challenging environment.

The EU is additionally facing affordability, competitiveness and security of supply crises for both fossil energy and clean technologies (cleantech). The covid pandemic was followed by an energy crisis fuelled by Russian weaponization of gas supply and the war in Ukraine. Gas prices went up to ten times their historical average, electricity prices tripled, threatening EU industries, business competitivity, and social cohesion.

Tensions on gas supply accelerated the momentum for cleantech deployment. Yet this raises further issues of competitiveness and security of supply. Despite a good EU industrial base in some sectors, such as offshore wind and electric vehicles, China is a dominant player at all stages of cleantech supply chains, including upstream critical raw materials processing. The US has joined the subsidy race with the adoption of

4 Forthcoming policy brief on the origins of the Energy Union, originally intended to be the first part of this report, but removed for space and length considerations.
5 Mišík, M. 2019. External Energy Security in the European Union. Small Member States Perspective. Routledge.
6 European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.
7 European Climate Neutrality Observatory, 2023. State of EU progress to climate neutrality.

the Inflation Reduction Act[8] in August 2022. This raises the question of a third European way between these two blocks. Green industrial policy is currently on top of the political agenda in the EU, with many open questions and debates on how to ensure EU competitiveness and energy security during the transition towards climate neutrality.

Crises reshape the content of Energy Union objectives

The goal of climate neutrality by 2050 set out by the European Green Deal strengthens the initial sustainability objective of the Energy Union. Among others, it requires a renewed focus on demand reduction[9] on top of supply decarbonization, with greater consideration of efficiency, sufficiency and planetary boundaries.[10]

Energy security now involves managing the transition from fossils to a clean energy system. Availability, accessibility, affordability, and acceptability of the energy supply are key elements of energy security.[11] Availability and accessibility of clean energy still fall short of the needs, while new vulnerabilities emerge on cleantech supply chains.

The question of affordability and acceptability of fossil fuels compared to clean energy brings to light transition costs[12] and varying preferences across countries, business interests, and social groups. The absence of agreement on a Russian gas embargo laid bare the conflict between buying Russian gas and *de facto* supporting Putin, and the high reliance on cheaper gas for social cohesion and competitiveness.

Ensuring affordability and competitiveness may increasingly translate to a cohesion challenge. A clean energy system is characterised by

8 A large-scale long-term cleantech financing programme with protectionist features
9 EERA, 2023. Energy demand reduction as part of the Clean Energy Transition in Europe. Report.
10 Ibid.
11 Bazilian, M., Hendrix, C. 2022. New winners, new losers: toward a new energy security. Texas National Security Review.
12 Pisani-Ferry, J. 2021. Climate policy is macroeconomic policy, and the implications will be significant. PIIE. Policy paper.

high investment costs and lower operational costs.[13] This will bring to the fore, with a risk of worsening, the existing socio-economic inequalities between Member States, regions, and households, characterised by different access to funding and capacity to provide protection or be shielded from high prices, be it through temporary social compensation or long-term green investments in clean solutions.

Political and social acceptability emerge as major success factors for achievement of the objectives of the Energy Union (climate neutrality, energy security and reasonable prices), which appear increasingly interlinked.

Is the Energy Union fit to solve the energy trilemma in times of crisis?

Climate change is on a dangerous trajectory. The summer of the year 2019, when the European Green Deal was adopted, was the warmest on record globally since 1880 when records started. The summer 2023 broke that record by a large margin.[14] Extreme weather events are becoming increasingly common.[15]

Globally, peak demand of fossil fuels could be reached before the end of this decade, but that would not be enough to keep global warming below 1.5°C. [16] Crossing the 1.5°C threshold increases the risk of triggering climatic and earth system tipping points, with climate impacts growing in a non-linear manner.

The EU needs to solve the "energy trilemma",[17] achieving climate neutrality while guaranteeing security of supply and reasonable prices. The

13 Gil Tertre, M. 2023. Structural changes in energy markets and price implications: effects of the recent energy crisis and perspectives of the green transition. ECB Central Banking Forum.
14 Copernicus, 2023. Summer 2023: the hottest on record
15 European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.
16 IEA, 2023. World Energy Outlook 2023.
17 The energy trilemma refers to the difficulty to achieve these objectives at the same time.

massive energy bills support provided to mitigate the 2022 energy shock illustrated that affordability of the energy supply will remain the first priority of governments. In the short term, fossil fuels are still appealing, because of the transition costs to clean energy. Yet, the shifting paradigm of energy security towards cleantech manufacturing and supply chains bears large strategic implications.

This energy transition is the first to be achieved "purposefully and against a deadline".[18] The current energy transition's pace and drivers are different from past industrial revolutions. It took coal 60 years to supply 50% of world's primary energy, the shift to oil from 5 to 25% of world's primary supply took 40 years, and 60 years for fossil gas.[19] Renewable energies should go from 14% to at least 66% of global energy supply in the next 30 years, and 90% of electricity generation.[20] Historically the transitions to coal, oil and gas are considered to be driven mainly by technological innovations and market actors. This time, it is characterised by deliberate public actions to create rules, incentives and institutions[21].

The EU is entering a new era of limited (clean) energy supply. However, our energy policies were designed in a context of relatively cheap and abundant energy supply. Energy supply crises have been at the heart of EU integration[22] in the field of energy, from the early days in the 1950s with coal, to the Energy Union. Yet, calls for more unity do not necessarily translate into adequate action. The current supply and demand crisis led to additional EU solidarity and coordination instruments. Are they fit for the challenges we are facing?

18 Schmitz, H. 2015. Green Transformation. Is there a fast track? in Scoones, I., Leach, M., Newell, P. (Eds.) The politics of Green Transformations. Routledge.

19 Smil, V. 2016. Examining energy transitions: a dozen insights based on performance. Energy Research & Social Science.

20 IEA, 2021. Net Zero by 2050.

21 Kuzemko, C., Lockwood, M., Mitchell, C., Hoggett, R. 2016. Governing for sustainable energy system change: Politics, contexts and contingency. Energy Research & Social Science ; et al, 2016, Pisani-Ferry, J. Mahfouz, S. 2023. Les incidences économiques de l'action pour le climat. France stratégie. Rapport à la Première ministre.

22 defined as the selective pooling of national sovereignty. Peterson, J. 2001. European Integration, International Encyclopedia of the Social and Behavioral Sciences.

To understand what the EU needs to do, and why, this report will aim at investigating the progress and remaining gaps of EU energy policy regulatory, financing and governance tools to achieve its policy objectives.

Given the breadth of the subject, the overview is far from exhaustive. The issues of private finance, national public finance, monetary policy, biodiversity, and the EU as a global actor will mostly be left out.

Rather than diving into a detailed analysis of each EU policy instrument, the purpose is to use a more holistic point of view on EU energy policy, to contribute to the policy debate leading up to the next European elections in June 2024 and the next European Commission mandate. The recommendations should be read as building blocks for future research, discussion and policy piloting rather than definitive and complete answers to the huge challenges at hand.

Part 1 is a descriptive section that presents the recent improvements of the EU energy and climate framework and conclude that the European Green Deal and Energy Union proved resilient strategies in times of crisis.

Part 2 is also an explanatory section that aims at illustrating that the Energy Union objectives of climate neutrality, energy security and affordability are currently under threat.

Part 3 will assess the EU energy and climate framework presented in part 1 against the against the challenging context described in part 2. It will conclude that given the scale of the challenges, the European Green Deal and Energy Union instruments are still too national, too temporary, insufficiently binding, and do not adequately support the achievement of EU objectives.

Part 4 will explore policy pathways towards a renewed Energy Union. Delivering the European Green Deal in times of crisis requires reconciling the Energy Union objectives of climate neutrality, security and competitiveness of the energy supply. The scale of the challenge requires more collective action and cost-sharing. Improving the governance, financing and democratic instruments of the Energy Union seems necessary. The next European Commission and European Parliament mandate offers a window of opportunity for EU energy policy innovation, building on new and emergency tools, as well as the existing framework.

Part 5 will conclude with specific policy recommendations on both an ambitious scenario for an Energy Union 2.0., and pragmatic steps to start this journey.

To facilitate reading, each part of the report starts with a summary of the corresponding key findings.

Part 1.

The Energy Union and the European Green Deal, resilient strategies through crises

The objective of this section is to describe the recent EU energy policy innovations to show the progress of EU energy and climate policy because of the climate, security and affordability crises. It is an illustration of the resilience and relevance of the European Green Deal (EGD) and more broadly of the Energy Union strategy in troubled times. The initial push of the EGD was the climate emergency. In addition to the climate crisis, three major crises have profoundly changed the context in which the EGD operates:

- a cohesion crisis brought about by the covid-19 global pandemic,
- a security of supply and affordability/competitiveness crisis due to the energy shock and inflation in the aftermath of covid and the war in Ukraine,
- a security of supply and affordability/competitiveness threat linked to vulnerabilities of cleantech supply chains in the context of mounting US-China rivalry and geopolitical tensions.

These crises brought about more EU action as an answer to new challenges. This report will investigate EU energy policy progress according to the following categories of EU tools: regulatory, governance and financing.

The main findings of this first part are:

1. **In 2019, the EGD ambition mostly relied on a strengthening of the EU regulatory framework with the Fit for 55 energy and climate** package. Improvements of EU energy and climate governance were more modest, with the EU Climate Law marginally elaborating on the 2018 Governance Regulation. EU financing instruments for the European Green Deal were initially limited, leaving most of the financial burden to the national level.

2. **In 2020, the creation of the Recovery and Resilience Facility (RRF) filled-in part of the public green investment gap at the national level up to 2026,** as part of the EU answer to the covid crisis. 37% of RRF spending is earmarked for climate action. The RRF is an unprecedented EU fiscal instrument with strong green and EU solidarity features, and an innovative governance that links EU funding to targets and reforms.

3. **In 2022, the war in Ukraine and the energy crisis triggered the REPowerEU Plan which mainly strengthened EU energy regulatory framework.** It increased ambition on renewable energy and energy efficiency deployment, introduced the first EU-wide short-term energy demand reduction plan, greater EU energy security requirements, and an embryonic mechanism for joint gas purchase. Beyond a repurposing of RRF's remaining loans in order to achieve REPowerEU objectives, financing mostly took the form of a relaxation of state aid. Funding and governance instruments remained mainly national.

4. **In 2023, the Green Deal Industrial Plan (GDIP) was launched to address cleantech supply chains' tensions. It attempts to put net-zero industry at the heart of future EU competitiveness and energy security**. The GDIP proposed two new laws, the Net Zero Industry Act (NZIA) and the Critical Raw Material Act (CRMA), hence mainly building up EU industrial policy's regulatory tools. Modest EU financing is provided through the creation of the Strategic Technologies for Europe Platform (STEP) which recycles existing funds.

5. **These associated additional EU actions strengthen the European Green Deal and Energy Union's ambition and tools to achieve objectives of climate neutrality, security and competitiveness.** The RRF, REPowerEU, and GDIP contribute to filling critical gaps in the Energy Union and EGD policy architecture, in terms of funding, regulation and governance. They were not part of the initial plans of the European Commission when President von der Leyen launched the EGD. Over the past years EU energy policy became a bit more sustainable, interventionist, and European.

   - **The EGD enhance the sustainability objective of the Energy Union** with an objective of climate neutrality, and the Fit for 55 gives the European Green Deal a strong regulatory backbone.
   - **The RRF complements the initial toolbox of the EGD with a large investment facility that** provides vast amounts of EU funding for the energy transition assorted with conditionalities (domestic reforms). It also paves the way for a stronger Energy Union governance, since the RRF regulation suggested that national recovery plans build on the NECPs.

- **REPowerEU further strengthens the Energy Union sustainability and security** instruments, mainly through an additional regulatory effort.
- **The GDIP aims at reinforcing the Energy Union's security of supply and competitiveness pillars** through greater focus on cleantech manufacturing and supply chains. Similar to REPowerEU, the GDIP mostly mobilizes EU regulatory tools.

This first part should be read as a look on the bright side of the European Green Deal and recent EU energy policy-related activity. Readers already familiar with recent policy developments can skip this descriptive part and jump right away to the second part which presents the current challenges to the Energy Union objectives, or to the third part which takes a more critical stance on the presented instruments and attempts to answer the concluding question of this section: is the new framework strong enough?

I . Climate crisis: bolder decarbonisation ambition of the Energy Union with the EGD

In 2019, the drive for additional EU policies primarily came from the climate threat. *"It is high time, but not too late"* declared Ursula von der Leyen, President of the EU Commission when she presented the EGD.[23] In the face of the climate emergency, the ambition is to become the "*first climate-neutral continent*" by 2050. By setting higher climate ambitions for 2030 and 2050,[24] the EGD enhances the decarbonisation dimension of the Energy Union.

23 European Commission, 2019. Speech by President von der Leyen in the Plenary of the European Parliament at the debate on the European Green Deal

24 from 80 to 95% emission reduction in 2050 to net zero, and from -40% in 2030 to -55% compared to 1990

Achieving climate neutrality requires tripling the current pace of greenhouse gas emission reductions.[25] Between 2005 and 2020, EU emissions decreased by over one quarter, the share of renewables more than doubled from 10 to 22%, and primary energy consumption decreased by 17,5%.[26] While these are positive results, pre-EGD policies would have only led to a 60% reduction in emissions by 2050, which is way too short for climate neutrality.

REGULATION: THE FIT FOR 55, DEEPENING AND EXPANSION OF EU ENERGY AND CLIMATE POLICY

The EGD includes a wide range of policy initiatives and proposals, but this report will focus on the Fit for 55 (FF55) regulatory package: a set of proposals to revise and update EU energy and climate regulatory framework with the aim of ensuring that the EU reaches its 2030 -55% target. The goal here is not to conduct an in-depth assessment of each file, but to highlight the main progress and innovations.

The FF55 offers quantitative progress. The increased targets require a significant acceleration of renewable energy and energy efficiency deployment. As an answer to the war in Ukraine, the FF55 energy efficiency and renewable energy targets were further increased by the European Commission as part of REPowerEU. Energy efficiency and renewable deployment efforts should be supported by the increased reduction pace of carbon market allowances on the first Emission Trading System (ETS1), and the higher national emission reduction targets for non-ETS1 sectors covered by the Effort Sharing Regulation.

25 More specifically, the annual average reduction in domestic greenhouse gas net emissions over the last decade should triple to achieve the 2030 -55% objective. European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.

26 ESABCC, 2023. Recommendations to EU and Member States on how to tackle both the energy and the climate crisis simultaneously.

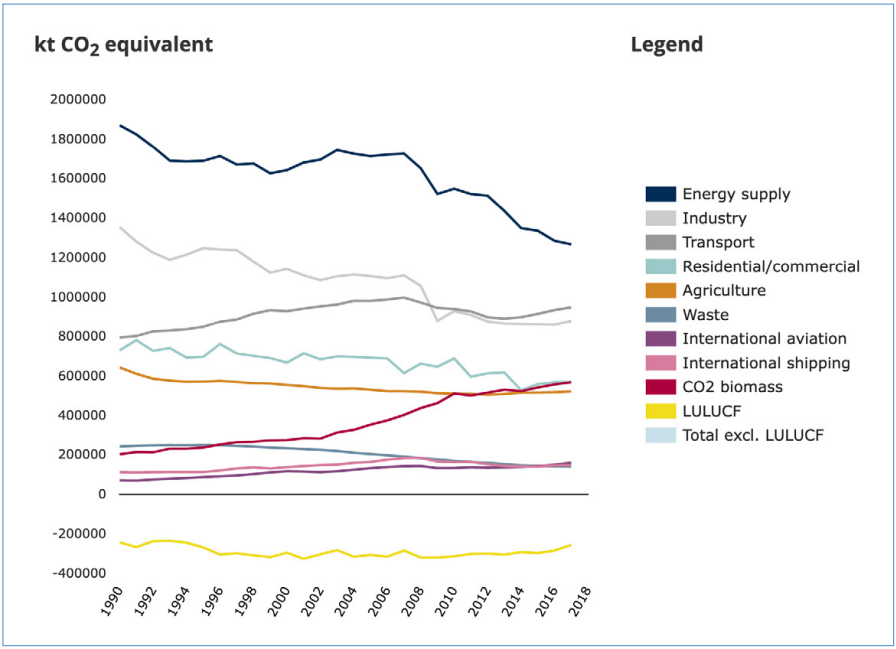
BOX 1. Higher renewable energy and energy efficiency targets for 2030

The new Renewable Energy Directive objectives of 42.5% renewable energy,[27] involves more than doubling the current deployment trends.[28] It includes sector specific targets in the transport[29] and heating & cooling sectors,[30] which display lower electricity and renewable penetration. Reducing the energy demand appears more essential than ever to achieve these very ambitious targets.[31] Additionally, the Energy Efficiency Directive objective to reduce final energy consumption by 11.7% by 2030 becomes binding at the EU level, and doubles the obligations for national energy savings.

So far, the key achievement of EU energy and climate policy action and focus has been electricity decarbonisation, with the deployment of renewables supported by targets, public support schemes, and carbon pricing through the EU carbon market (ETS). Energy supply is the main emitting sector in the EU. Its emissions, which include electricity generation, decreased by over 30% since 1990. Yet, climate neutrality involves the decarbonisation of all sectors of the European economy, especially industry, transportation, and residential/commercial. Agriculture and CO2 biomass emissions touch upon biodiversity considerations which are critical for climate neutrality but will mostly be left aside in this report since it would require specific developments.

27 from 32%
28 IEA, 2022. Is the European Union on track to meet its REPowerEU goals?
29 including a subtarget for advanced biofuels
30 which will contribute to an indicative taregt of at least 49% renewable energy share in buildings in 2030
31 IEA, 2022. Is the European Union on track to meet its REPowerEU goals?

FIGURE 1. Greenhouse gas emissions by aggregated sector in the EU (1990 - 2018)



▲ Source : European Environmental Agency, 2019

The FF55 introduces major policy innovations that significantly extend the scope of EU climate policy to large industry, buildings and road transport. Large industry will see a gradual phase-out of free allowances for sectors covered by the new Carbon Border Adjustment Mechanism (CBAM). Additional revenues from the free allowances phase-out will benefit the Innovation Fund, enhancing financial support for low carbon industry projects. The buildings and road transport emissions will be covered by a new EU carbon price through the establishment of a second Emission Trading System ("ETS2"). Part of ETS2 revenues will fuel a Social Climate Fund (SCF) designed to provide social compensation and green investments in building and mobility decarbonisation, targeted towards the most vulnerable. Additionally, new combustion engine cars sale will be banned from 2035 onwards, while new buildings should be

net zero and emission standards for existing buildings could be introduced[32] to drive renovation demand.

The CBAM, ETS2, SCF, ban on new thermal cars and renovation obligations are the first of their kind in the EU. They illustrate a qualitative leap in the scope of EU climate policy. These policy innovations show the core importance of carbon pricing, which will soon cover 80% of EU emissions, twice today's level.[33] Carbon pricing is complemented with new regulatory obligations that should contribute to sending signals to stakeholders (car and renovation industry, consumers, governments), and financing to support decarbonisation efforts. Whether or not the new EU regulatory and carbon pricing tools will be enough to spur the desired dynamic in new sectors remain an open question that will be addressed in the third part of this report.

GOVERNANCE: INCREMENTAL IMPROVEMENT

EU energy regulatory tools of direct application (ETS price, ban on sale of combustion cars) remain limited compared to what is required for the energy transition. For example, standards usually only apply to new cars, new buildings or new appliances. It leaves aside broader policies touching upon existing assets. For example, decarbonisation of mobility goes well beyond banning new combustion cars, but involves public transport, cycling and walking policies, and urban planning.

EU climate governance is key to ensuring that EU energy and climate policies are properly implemented at the national level. The purpose of the EU governance framework is to preserve the coherence of each national energy policy with the general EU objectives, ensuring that national policies are sufficiently ambitious. Ideally, the EU governance framework would also support national policies' coordination with one another.

32 Energy Performance of Buildings Directive still under negotiation at the time of writing

33 of which near half consists of free allowances, which still account for around 40% of the current ETS

The first regulation formally adopted in the context of the European Green Deal is the European Climate Law , in July 2021, which wrote into law the new EU climate objectives. It introduced, for the first time, the ambitious objective of achieving EU climate neutrality, and increased the 2030 emissions reduction target to -55% (compared to 1990). These targets are now legally binding across the EU, meaning that both EU institutions and Member States commit to taking the necessary measures to achieve them, while considering the need to enhance fairness and solidarity among Member States.[34] What "necessary measures" and "fairness and solidarity" imply remains open.

The EU Climate Law addresses some of the weaknesses of the 2018 Governance Regulation on public participation. The EU Climate Law mandates that the European Commission engages with "*all parts of society to enable and empower them to take action towards a just a socially fair transition to a climate-neutral and climate-resilient society*".[35] To that end, the European Commission should facilitate inclusive and accessible participation process at all governments levels and with all relevant stakeholders (social partners, academia, businesses, citizens and civil society organisations).[36]

This provision appears as an answer to the lack of implementation of public participation requirements of the 2018 Governance Regulation, which required the establishment of "*multi-level climate and energy dialogues*" by Member States. These dialogues must serve as a platform in which local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress.[37] Yet, multi-level climate and energy dialogues are often lacking at the national level.

FINANCING: INITIALLY LIMITED PROGRESS

The share of the budget dedicated to climate-related initiatives increased from 20% to 30% in the 2021 - 2027 Multiannual Financial Framework (MFF, or EU budget), totalling approximately €610 billion, or

34 European Commission, European Climate Law
35 Art 9, EU Climate Law regulation.
36 Art 9, EU Climate Law regulation.
37 Art 11, Governance of the Energy Union and Climate Action Regulation.

€87 billion per year, equivalent to 10% of the total estimated investment needed to reach the 2030 emissions target.[38]

A Just Transition Fund was created as part of the European Green Deal to support vulnerable regions in the transition, in line with EU cohesion policy goals to reduce regional inequalities. It initially consisted of a €8.5 billion[39] (about €1 billion per year) financial envelope. About 100 regions spread across Europe are eligible for funding. These are mostly coal-dependent regions, but also regions dependent on carbon-intensive industries like steel or chemicals.[40]

These are still modest amounts compared to the estimated additional investment requirement of €477 billion per year until 2030, and cohesion threats brought by the distributive impacts of the transition. This reflects the fact that the EU budget remains heavily constrained. As a result, the goal was mostly to leverage both private and public investments, particularly at the national level, to meet the necessary financial needs.

*

The European Green Deal was only a couple months old when the covid pandemic started to impact Europe. It was meant to be a significant regulatory effort with limited improvements in terms of governance and funding, but the EU successfully managed to make use of the crisis to strengthen the initial toolbox of the European Green Deal. The remainder of this section will present the additional EU energy and climate policy effort that resulted from the pandemic, the war in Ukraine and the tensions surrounding cleantech supply chains.

38 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

39 in current prices

40 Energy Cities, 2020. Is your city eligible for the Just Transition Fund?

II • Pandemic: financing the European Green Deal with the RRF, a green recovery and resilience plan

In July 2020, as an answer to the pandemic, its dramatic health, social and economic impacts, and the need to improve future resilience, EU governments agreed on a historic common stimulus; it was the largest package ever financed in Europe that featured with strong green and solidarity measures.

I AN UNPRECEDENTED EU FISCAL EFFORT WITH STRONG GREEN FEATURES

NextGenerationEU (NGEU) is a €800 billion temporary recovery instrument running until 2026. The centrepiece of NGEU is the Recovery and Resilience Facility (RRF) which provides up to €723.8 billion, of which €338 billion grants, to support reforms and investments in Member States.[41] NGEU also added €10.8 billions the Just Transition Fund, more than doubling the initial funding.

The EU recovery plan has green features. Applying the 'do not significant harm' (DNSH) principle[42] and dedicating the largest share of the RRF (37%) to green measures and investments reflects the need for a green recovery.

The EU recovery plan embodied EU solidarity in the face of the crisis. The grant component of the RRF is a major departure from previous EU crisis-related financial support which was entirely in form of loans. It has a redistributive aspect, since lowest-income and hardest-hit Member States benefit more. The distribution key considers the differentiated economic and social impact of the pandemic at the national level.[43] Beyond the mitigation of the socio-economic impacts of the pandemic, the objective of the RRF is to contribute to EU's long-term economic, social and territorial cohesion and convergence. The issuance of a mutua-

41 European Commission, Recovery plan for Europe.

42 The DNSH principle was introduced in the Taxonomy Regulation, an EU investment classification tool that aims at indicating to the private sector which economic activities are sustainable. Fossil fuels are in principle excluded, yet some exemptions can be granted on a case-by-case basis.

43 through the change in real GDP in 2020. Regulation 2021/241 establishing the RRF.

lised EU debt is also a demonstration of the increase in solidarity at the EU level.

Thanks to the RRF, EU funding plays a significant role in addressing green public investment needs in industry, buildings and energy decarbonisation until 2026.[44]

BOX 2. Exceptional financing of NGEU

NGEU was financed by breaking the taboo of large EU common debt. In 2020 the EU Heads of State and Government authorised the European Commission to borrow on capital markets up to €750 billion (2018 prices) to finance this exceptional EU recovery package in response to the Covid 19 crisis. To guarantee this new EU borrowing, the Member States agreed on an exceptional and temporary increase of the Own Resources ceiling[45] (a ceiling that determines the maximum amount of resources the Commission can call from Member States in any given year to cover EU expenditure), an amendment that required an unanimous vote in the Council and national ratification by all Member States.

The EU borrowing to finance NGEU takes place between mid-2021 and 2026. The repayment of the NGEU debt will start as of 2028 and will take place until 2058. The loans will be repaid by the borrowing Member States. The grants will be repaid by the EU budget. To help repay this part of the EU borrowing, the Commission need to propose new Own Resources to the EU budget which have to be approved (under unanimity) by the Council.[46] If the Council does not succeed in finding an agreement on new EU Own Resources, the repayment will be covered by the EU budget either through reductions in other EU spending programmes or an increase of national contributions to the EU budget.

44 Gagnebin, M., Graf, A., Buck, M. 2023. Breaking free from fossil gas. A new path to a climate-neutral Europe. Agora Energiewende.

45 European Parliament. The Union's revenue.

46 In addition to a new own resource based on non-recycled plastic packaging waste, the Commission proposed to introduce own resources based on revenues of the Carbon Border Adjustment Mechanism, the EU Emission Trading System, and a share of the residual profits of the largest and most profitable multinational enterprises following the agreement of the OECD /G20. European Commission, 2021. The next generation of EU own resources : Q&A.

GOVERNANCE: LINKING EU FUNDING WITH TARGETS AND REFORMS

The RRF operates as a performance-based tool, with disbursements linked to green spending target (37%) and reforms. To access RRF funding, Member States need to draft national Recovery and Resilience Plans (NRRPs), which can draw on their NECPs for the energy and climate component of recovery. NRRPs must be approved by the European Commission, based on their contribution to the objectives of the RRF, and to "*all or a significant subset of challenges identified in the relevant country-specific recommendations*"[47] from the European Semester. The underlying approach of the RRF is to fund coherent packages of complementary investments and reforms which jointly support recovery and resilience.

National governments retain a central role in drafting and implementing the EU recovery plan. Member States have flexibility in designing and implementing measures in a way that fits their national conditions and needs. Under the RRF, reform and green investment plans proposed by Member States are supported by positive financial incentives.[48]

The RRF responds in part to the limited effectiveness and political backlash stemming from the Economic Adjustment Programmes imposed on debtor countries during the euro crisis. It reinforces national ownership and commitment to NRRPs objectives, and offers a new grant component.

*

The RRF is a historic breakthrough for EU solidarity and integration in the face of deep crisis. In 2020, the EU economy contracted by 6,3%, with major turnover losses and a decline in jobs and investment.[49] In Spring 2021, signs of improvements, such as a quick recovery in world trade, hinted towards a strong rebound in 2021 and 2022. Yet, recovery

47 Regulation 2021/241 establishing the RRF, Art. 19(3)(b))

48 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

49 European Commission 2021. Updating the 2020 new industrial strategy. COM(2021)350 final

was also expected to take time and to require continued support, in the face of the fall in short-term private investment and rising numbers of firms facing liquidity issues.[50] However, a major energy crisis was just around the corner.

III • War and energy shock: strengthening the Energy Union with REPowerEU

The covid crisis was followed by an energy price crisis, which began in 2021, when Russia to weaponize gas supply to the EU,[51] combined with widespread commodity inflation, in the wake of the post-covid global recovery.[52] The energy price inflation was worsened by Russia's second invasion of Ukraine on 24 February 2022. The associated weaponization and disruption of gas supply triggered the first truly global gas crisis according to the IEA,[53] and laid bare a high EU vulnerability and dependence on fossil fuels from one single supplier.

Russian gas deliveries remained close to normal throughout the first half of 2022, but by the end of 2022, Russian gas imports had been cut by 80%, leaving the EU with a serious threat over a mismatch between gas demand and supply for the winter of 2022/2023. In 2021, the EU imported 155 billion cubic meters (bcm) of Russian gas, which was making up 45% of EU's gas imports and close to 40% of EU total gas consumption. By September 2022, Russia had reduced pipeline gas flows to Europe to only 9% of EU's imports.[54] Russian pipeline flows were further reduced to 7% of EU imports by June 2023.[55]

50 Ibid.
51 Gil Tertre, M. 2023. Structural changes in energy markets and price implications: effects of the recent energy crisis and perspectives of the green transition. ECB Central Banking Forum.
52 Nguyen, P.V., Pellerin-Carlin, T. 2021. The European Energy Price Spike. Overcoming the fossil fuel crisisThe European Energy Price Spike. Overcoming the fossil fuel crisis. Jacques Delors Institute. Policy Brief.
53 IEA, 2023. Global Gas Security Review 2023.
54 European Commission, 2022. State of the Energy Union 2022. COM(2022)547 final
55 European Commission, 2023. In focus: EU energy policy for energy independence. News article.

The gas crisis contaminated electricity markets. Gas is also used to produce electricity, and the current EU electricity pricing is based on the production cost of the most expensive power plant called to meet the demand.[56] The electricity price hike was further exacerbated by the low availability of hydropower and French nuclear energy. The energy crisis was additionally fuelled by uncertainty and fears of shortages. Part of the price hike was due to intra-EU competition in the face of the threat of energy shortages.[57] Congestion issues due to infrastructure bottlenecks in Western Europe also played a role.[58]

REPOWEREU: TOWARDS A "TRUE ENERGY UNION"[59] ?

The affordability crisis triggered attacks against the EGD and EU energy policies. Due to the social and economic impacts of high energy prices, the political pressure to act was tremendous at the national and EU level. As early as the autumn of 2021, when energy prices started to rise, several Member States called for a delay on FF55 elements that could further increase energy prices.

At the beginning of the energy crisis, EU action was limited to recommendations for Member States. The European Commission toolbox "Tackling rising energy prices" of October 2021, was aiming at providing guidance for Member States to address high energy prices, such as regulated retail prices, energy vouchers and temporary subsidies for households and businesses. As the crisis worsened, the need for EU action beyond national measures became evident.

The war in Ukraine sent shockwaves through Europe and prompted swift action from the EU. Remarkably, less than two weeks after the onset of the Russian invasion, on March 8, 2022, the European Com-

56 "Marginal pricing mechanism", that incentivizes the mobilisation of the cheapest electricity generators first. For a detailed explanation, see Nguyen, P.V. 2022. Overview of the European Electricity Market. Infographic. Jacques Delors Institute.

57 Gil Tertre, M., Martinez, I., Rivas Rabago, M. 2023. Reasons behind the 2022 energy price increases and propects for next years. CEPR VoxEU column. Energy.

58 Gil Tertre, M. 2023. Structural changes in energy markets and price implications: effects of the recent energy crisis and perspectives of the green transition. ECB Central Banking Forum.

59 European Commission 2022, REPowerEU Plan Communication, SWD(2022)230 final, May 2022

mission released the REPowerEU communication, outlining a collective European effort to achieve more affordable, secure, and sustainable energy. On March 11, the Council had officially endorsed REPowerEU. Its main objective aimed at reducing and ultimately eliminating the EU's reliance on Russian energy imports as rapidly as possible, with a target to achieve this well before the year 2030. In light of this endorsement, the Council invited the European Commission to develop a comprehensive REPowerEU plan, which was subsequently presented in May 2022.

REPowerEU is based on a strengthening of the Energy Union, with a focus on its aspects of decarbonisation (EGD/FF55), solidarity and energy security policies, in order to preserve the short- and long-term affordability of the energy supply. REPowerEU is based on three key pillars: energy savings (demand reduction), renewable deployment, and supply diversification of imports for "*a more resilient energy system and a true Energy Union.*"[60] No individual Member State possesses the capacity to independently manage the accelerated phasing-out of Russian gas. This underscores the need for a collective, coordinated effort on a European scale.[61]

BOX 3. REPowerEU key by instrument category

Regulation:

- accelerating the EU energy transition for greater energy security
  - FF55 strengthening amending Fit for 55 files (RED, EPBD and EED)
  - Save Gas for a Safe Winter
  - EU Solar Rooftop Strategy
- affordability:
  - securing a solidarity contribution from fossil fuel industry
  - capping revenues of electricity producers
  - market correction mechanism to limit episodes of excessive gas prices in the EU.

60 European Commission 2022, REPowerEU Plan Communication, SWD(2022)230 final, May 2022

61 Ibid.

- Governance: better coordination for energy security
  - new storage rules
  - joint purchase of gas and solidarity mechanism for gas demand aggregation
  - gas savings (August 2022 regulation on reducing gas demand by 15%, extended in March 2023)
  - electricity savings

Funding:

- EU state aid temporary crisis framework
- RRF funding redirection: New national REPowerEU Plans under the modified Recovery and Resilience Fund – to support investment and reforms worth €300 billion, mostly loans still available from RRF, estimated at €225 billion[62]

I STRENGTHENED CLIMATE AND ENERGY SECURITY REGULATORY FRAMEWORK

REPowerEU strengthened the EU climate and energy security regulatory framework to address the three challenges of accelerating the transition to a sustainable energy system, while preserving security of supply and cushioning the price impact for households and businesses.

• Sustainability

REPowerEU should accelerate the EU decarbonisation's pace, building on the ongoing energy and climate policy effort. This is an acknowledgement that energy security now requires climate action. REPowerEU first requires the full implementation of the FF55 proposals and higher targets for renewables and energy efficiency,[63] and lifting permitting barriers to renewable deployment. It aims at tripling the installed capacity of solar

62 Amounts requested by Member States under REPowerEU are uncertain

63 11,7% energy efficiency target by 2030 instead of 9% initially proposed by the EC, and 42,5% renewable target instead of 40% initially proposed. European Commission 2022, REPowerEU Plan Communication, SWD(2022)230 final, May 2022.

and wind by 2030.[64] If fully and successfully implemented, REPowerEU could lead to a 57-58% emission reduction by 2030, overshooting the EU Climate Law objective of -55%.[65]

- Security of supply

The previous security of supply framework was not fully fit for the current crisis due to its focus on short-term disruptions stemming from infrastructure failure or extreme weather. The EU is instead facing longer-term supply disruption from a major energy supplier deficiency affecting multiple routes simultaneously.[66]

As a first step to improve security of supply, the EU introduced temporary gas storage obligations.[67] The new gas storage regulation includes a burden-sharing mechanism, as a way to contribute both to the EU security of supply and to the financial burden of filling the EU's gas storage capacities. This demonstrates how ensuring EU energy security in the spirit of solidarity involves common action on both the physical energy flows and the associated economic cost.

REPowerEU introduces the first ever EU demand reduction measures beyond energy efficiency. Although mostly voluntary, this is a big step that was implemented and decided upon at the national level. The emergency EU gas demand reduction plan adopted in July 2022, set a demand reduction target of 15% until 30 March 2023, and was prolonged by one year. Member States also agreed on an emergency electricity demand reduction plan.[68]

64 Ibid.
65 Climate Analytics, 2022. 1.5°C Pathways for the EU27: accelerating climate action to deliver the Paris Agreement.
66 European Commission, 2022. Save Gas for a Safe Winter. COM(2022)360 final
67 New minimum gas storage obligations ahead of winter lie at 90% (80% for winter 2022/2023) until December 2025. Council of the EU, 2022. Council adopts regulation on gas storage. Press release.
68 adopted in September 2022, 5% obligation to reduce electricity demand during peak price hours, target of 10% reduction of overall electricity demand. These objectives were not achieved.

Establishment of the EU Energy Platform and mandatory gas demand aggregation. From 2023 onwards, Member States must aggregate gas demand equivalent to 15% of their gas storage obligation via a common platform – AggregateEU – which launches tenders and serves as a match marker for corresponding supplies. For the moment transactions are conducted outside the shared platform on a bilateral basis. These first auctions are an important step towards common gas procurement, which would strengthen the external dimension of the Energy Union. [69]

Planning solidarity for supply disruption. In a situation of energy scarcity, one's energy consumption has an impact on others' possibility to consume, be it in terms of price or in terms of physical quantity available. This explains why public authorities have taken sufficiency measures such as reduced indoor temperature.[70] In the absence of bilateral solidarity agreements, the Council agreed on temporary (one year) default rules of gas sharing in the case of severe supply disruption[71] in December 2022.[72]

- Affordability

The EU adopted a market correction mechanism to limit episodes of excessive gas prices, commonly referred to as a gas price cap, which would be activated in case of emergencies.[73] It is limited to exceptional events, rather than just high wholesale gas prices episodes. Such an event took place when EU gas prices went above 180€/MWh between August and October 2022, significantly detaching from global bench-

69 Andoura, S., Leigh, H., van de Woude, M. 2010. Towards a European Energy Community: a policy proposal. Jacques Delors Institute, Report.

70 EEB, 2022. Saving Energy for Europe. Spring 2023 update. Contrasting EU states' measure to reduce gas and electricity consumption.

71 Chapter IV of the Council Regulation enhancing solidarity through better coordination of gas purchases, reliable price benchmarks and exchanges of gas across borders.

72 The new solidarity regulation, which is only temporary and expires at the end of 2023, also provides for an extension of solidarity obligations from pipeline gas to include LNG and critical gas volumes for electricity.

73 More specifically, if the front-month TTF price exceeds 180€/MWH for three consecutive working days, and if it exceeds by 35€ or more a reference LNG price calculated on a basket of LNG import indexes, for details see ACER 2023, Market correction mechanism.

marks[74], reflecting local infrastructure bottlenecks and exposing a lack of coordinated EU approach to gas storage refilling.[75]

To support the fiscal effort required to limit the increase of consumer bills, the European Commission and the Council agreed to introduce an *exceptional, targeted and time-limited*[76] **EU framework to address energy prices.** It takes the form of a solidarity contribution from industries from fossil fuel suppliers, as well as cap on the revenues of some electricity producers (the so-called inframarginal producers).[77] These measures were not of direct application and had to be implemented by Member States, with some room for national adaptation.[78]

FUNDING REPOWEREU

The EU did not provide fresh EU funding to support additional requirements at the national level. The additional financing needs stemming from REPowerEU were estimated by the European Commission at a total of €300 billion until 2030, or around €40 billion per year between 2022 and 2030.[79] Instead, loans still available from the RRF, for an amount of €225billion, were made available towards the achievement of REPowerEU. To make use of this opportunity, Member States had to submit new REPowerEU chapters[80] in their RRPs by the end of April 2023, for approval by the end of August 2023. At the time of writing, the number of plans approved by the European Commission is uncertain.

74 S&P Global. 2023. EU gas market correction mechanism extension to other hubs comes into force.

75 Gil Tertre, M., Martinez, I., Rivas Rabago, M. 2023. Reasons behind the 2022 energy price increases and propects for next years. CEPR VoxEU column. Energy.

76 Council regulation (EU) 2022/1854 on emergency intervention to address high energy price

77 which benefited from high wholesale prices although their generation costs are low (mostly renewable energy and nuclear producers)

78 Council regulation (EU) 2022/1854 on emergency intervention to address high energy price

79 European Commission, 2022. Implementing the REPowerEU action plan: investment needs. SWD(2022)230 final

80 To finance these new REPowerEU chapters, that can benefit from 20% pre-financing, the RRF financial envelope is modestly increased with grants, including €20 billion from frontloaded sale of ETS allowances and resources of the Innovation Fund, a source of funding that has been controversial, given that it comes down to funding REPowerEU with a measure that decreases the ETS price.

As opposed to the covid crisis, REPowerEU actions are mostly financed by the national level, through the EU state aid temporary crisis framework.[81] It proved difficult to find the same major political impetus for common funding for a crisis that happened just two years after the covid crisis, and when the disbursement of RRF funds was still ongoing – although Member States had already fully used the available grants. With the temporary loosening of state aid rules, and a repurposing of RRF loans with the addition of a REPowerEU chapter, most of the additional financial burden rests on Member States.

*

The energy price crisis of 2021/2022 showed how vulnerabilities on energy security of supply can trigger an affordability and competitiveness crisis. The REPowerEU Plan builds on the FF55 and strengthens the EGD with the acceleration of renewable and efficiency deployment requirements. It introduces sufficiency for the first time in EU communications. REPowerEU also addresses major gaps of the Energy Union's security of supply dimension. However, a governance model in which the implementation of most EU policies rest on national political will and resources, and in which there is little harmonisation of EU measures, can eventually lead to weak compliance with European policy requirements and a lack of effective coordination.

IV • IRA and the global cleantech race: an Energy Union for competitiveness and security?

The transition to climate neutrality brings about opportunities linked to the cleantech industrial revolutions, but also new energy security vulnerabilities and competitiveness challenges.

81 Adopted in March 2022, the EU state aid temporary crisis framework was amended and prolonged in July 2022 and October 2022, in order to accommodate for the new gas and electricity demand reduction objectives, which required additional policy action to incentivize energy savings by consumers. European Commission, 2022. Temporary Crisis Framework for State Aid measures.

A EUROPEAN GREEN DEAL INDUSTRIAL PLAN

The European Green Deal, the Fit for 55 and REPowerEU involve an unprecedented increase in cleantech components and raw materials needs. The demand for batteries for electric storage and electric mobility could increase fourfold by 2030 and more than sevenfold by 2035. This implies a growth in demand for strategic materials such as lithium, graphite, cobalt, nickel, or manganese.

The Covid-19 pandemic and the invasion of Ukraine put global value chains under pressure. Combined with an acceleration of climate policies across the globe, this led to a sharp increase in international prices for critical minerals and metals in recent years.[82] Batteries have increased by 10% in 2022 as compared to 2021, after years of continuous decline. The cost of manufacturing wind turbines increased by 20% and those of solar panels by 25% in 2022.[83] The risk is to see the trend of decreasing costs of renewables reversed.

Addressing supply chains vulnerabilities requires the development of an EU industrial cleantech manufacturing and critical materials ecosystem,[84] even if supplier diversification will remain a part of the equation. Even before the US Inflation Reduction Act, the think tank Bruegel considered that having enough domestic companies and capacity to ensure supply of critical materials and components was necessary for EU economic security strategy.[85]

82 IEA, 2022. Securing Clean Energy Technology Supply Chains. Report.
83 IEA, 2023. Clean energy supply chains vulnerabilities. Energy Technology Perspectives 2023.
84 Fabry, E. 2023. A looming war for minerals? JDI. Blogpost.
85 Pisani-Ferry, J., Wolff, G.B., Shapiro, J., Ribakova, E., Leonard, M., 2019. Redefining Europe's economic sovereignty. Bruegel. Policy Brief.

BOX 4. JRC's analysis of value chains and materials supply chains vulnerabilities

The Joint Research Centre (JRC)'s analysis of value chains and materials demand shows significant vulnerabilities in the strategic technologies and sectors studied,[86] including Li-ion batteries, wind turbines, PV and heat pumps. The raw materials needed to manufacture them are consistently critical: the EU's share of global production never exceeds 7%. The vulnerability of the EU decreases as one moves up the value chain. At the end of the chain (assembly), the EU is in a better position, but for certain technologies such as batteries and PV, vulnerability is high throughout the chain. Regarding heat pumps and wind power, Europeans are well-positioned but increasingly in difficulty compared to their Asian rivals. Economies of scale have a big role to play in future EU domestic resilience.

The US Inflation Reduction Act (IRA) worked as a wake-up call for the EU. With the IRA, US industrial policy is back with protectionist features that could threaten EU clean manufacturing capacity development. It includes tax credits to subsidize investment and operational costs for domestic manufacturing across the supply chain, from critical materials to final assembly. Because some tax credits are uncapped, support for the industry could be much higher than planned according to some analysts[87] therefore creating fears over an uneven playing field with the EU.[88]

In March 2023, the European Commission proposed a regulatory package to implement its Green Deal Industrial Plan and thus meet the joint challenge of industry competitiveness and supply chain security for the green transition. It includes two new laws, the Net Zero Industry Act (NZIA) and the Critical Raw Materials Act (CRMA), as well as a reform of the European electricity market.

86 JRC, 2023. Supply chain analhysis and material demand forecast in strategic technologies and sectors in the EU - A foresight study.

87 Goldman Sachs, 2023. The US is poised for an energy revolution. Credit Suisse, 2023. US Inflation Reduction Act: A catalyst for climate action.

88 For a detailed presentation of the IRA and the global context, see Defard C. 2023. "The Resurgence of US industrial policy and Europe's response", *La Revue de l'Énergie*, n°666 mai-juin.

BOX 5. The EU electricity market

Under the EU electricity market directive, price is set by the last power plant called to balance supply and demand (marginal cost pricing).[89] The advantage of this pricing mechanism is that a high price sends a scarcity signal that helps with short-term balancing to avoid blackouts. However, during the energy crisis triggered to high gas prices in 2022, inframarginal producers benefitted from exceptional rents. An exceptional cap on the revenues of these producers was introduced to mitigate this. Yet, besides the energy price crisis, deeper issues need to be addressed to adapt the EU electricity market to the challenges of the energy transition.

A reform of the EU electricity market design was proposed as part of the GDIP to support future EU competitiveness while also trying to address the price spike. The proposal focuses on promoting existing mechanisms such as long-term contracts, to ensure greater predictability and price stability. Due to the limited time available for negotiations over the revision of the central piece of the EU energy policy architecture, only quick-fixes are expected, while a deeper reform could be undertaken during the next European Commission mandate.[90]

A more in-depth review would address the need for additional tools to incentivize an adequate development of electric grids, allow more efficient dispatch and investment signals, and support the deployment of flexibility solutions such as demand-response and storage.

I AN ADDITIONAL REGULATORY PUSH WITH NZIA AND CRMA

The main instruments introduced by the NZIA and the CRMA are targets and regulatory framework (simpler permitting processes for strategic projects, green public procurement) and governance (new bodies to oversee and support implementation, coordination of strategic stocks).

89 For a detailed explanation, see Nguyen, P.V. 2022. Overview of the European Electricity Market. Infographic. Jacques Delors Institute.

90 Zachmann, G., Heussaff, C. 2023. Phased European Union electricity market reform. Bruegel. Policy Brief.

- Targets and regulatory framework:

In the NZIA, the Commission is proposing that the European manufacturing industry should be able to cover 40% of Europe's clean technology needs to meet the 2030 targets. It defines the strategic technologies needed to achieve carbon neutrality: solar, wind, batteries, heat pumps and geothermal energy, electrolysers (to produce hydrogen), sustainable biogas and biomethane, carbon capture and storage, and electricity networks.[91]

The regulation on critical raw materials also proposes new indicative targets for 2030, namely: 10% of European needs in critical raw materials covered by European mines, 40% covered by European refining capacities and 15% covered by European recycling capacities.

The main regulatory lever mobilized is the simplification of procedures to facilitate the development of "strategic projects". The NZIA aims to improve the conditions for investment in these technologies, including the creation of "strategic net zero emission projects", which designates projects crucial to strengthen the resilience and competitiveness of European industry. This status would give access to simplified and accelerated procedures for granting permits. The CRMA also introduces a "strategic project" status, giving access to accelerated permitting times: two years maximum for extraction projects and one year for refining and recycling projects.

NZIA also proposes making use of green public procurement by including a "sustainability and resilience" criteria to create public demand for net-zero technologies and products, and to rebalance social, environmental, resilience[92] and innovation considerations in the price-quality ratio.[93] The CRMA provisions on public procurement are much more modest in scope, since they only concern the increase of the use of secondary critical raw materials in manufacturing.[94]

91 Nuclear power is not one of these strategic technologies as per the EC proposal, but it is included in the European taxonomy defining green investments as transitional energy.

92 Defined a as reduced dependence on imports coming from a single third country, based on the proportion of products originating from a single source of supply

93 Art 19, European Commission, 2023. Proposal for a NZIA COM(2023)161 final

94 by taking the recycled content into account in public procurement award criteria Art 25, European Commission, 2023. Proposal for a CRMA. COM(2023)160 final.

- Governance:

The EU would set up two new coordination bodies to ensure implementation. The Commission is proposing the creation of a **Net Zero Europe Platform** made up of representatives of the Commission and the Member States with the goal of coordinating their action and supporting the implementation of the law. Following the same model, a new body called the **European Critical Raw Materials Board**, has been created to support the Commission and Member States in implementing the CRMA.

The CRMA also includes security of supply measures inspired by the existing framework for gas: coordination of strategic stocks, establishment of minimum levels to guarantee EU security, and use of periodic stress tests. The most innovative measure is the proposal to set up a joint purchasing platform. However, the materials involved, the transformation stage and the minimum levels of demand concerned would be defined at a later stage, following a comprehensive vulnerability assessment. The clear parallel between the CRMA security of supply provisions and the existing framework for gas illustrates the ongoing shift towards clean technologies for EU energy security.

MODEST EU FINANCING

Achieving the objectives of the NZIA would require additional investment of around €90 billion over the period 2023-2030[95], including €16-18 billion of public funding. This figure does not consider the extraction, refining and recycling capacity requirements set out in the regulation on critical raw materials. It comes on top of the additional financing required to achieve the Fit for 55 targets by 2030 (€477 billion per year) and the REPowerEU plan by 2027 (€40 billion per year).

The European Commission opened the door for cleantech manufacturing projects financing under the REPowerEU chapters of the RRF. The agreement on the integration of REPowerEU chapters occurred in December 2022, at a time were a lot of pressure weighed on the European Commission to come up with an answer to the US IRA that was to be implemented by January 2023. Therefore, as part of the Green Deal

95 European Commission, 2023. Staff working document on investment needs to strengthen EU's Net-Zero technology manufacturing capacity. SWD(2023)68

Industrial Plan published in February 2023, the European Commission mentioned the possibility to use the REPowerEU chapters[96] to strengthen the EU cleantech manufacturing base.

To address additional financial needs, the initial idea of an EU Sovereignty Fund[97] was replaced by a more modest Strategic Technologies for Europe Platform (STEP) due to low political appetite by Member States to increase the EU budget. In June 2023, the Commission proposed STEP to support European leadership in critical technologies. The facility mostly builds on existing financing programmes[98] and brings little fresh money (€10 billion[99]) to the table. Even these €10 billions are far from certain, due to reluctance from Member States to agree on additional EU funding.[100] Besides, in addition to clean tech, STEP would also support digital technologies and biotech. This further dilutes its potential impact on the Green Deal Industrial Plan.

The financial pillar of the Green Deal's industrial plan mostly rests on a flexibilization of state aid. The new temporary framework extends until the end of 2025 several exemptions already granted following the war in Ukraine. The Commission is introducing new exemptions also until the end of 2025 for the manufacturing industry for strategic climate technologies (solar, wind, etc.), including refining and recycling plants for strategic raw materials.

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Before the IRA, the European Commission did not plan significant EU cleantech industry policy action. Concerns over cleantech supply chains for solar, wind and heat pumps were already identified as an area

96 European Commission, 2023. Guidance on RRPs in the context of REPowerEU.

97 First mentioned by Commission President Ursula von der Leyen in September 2022 in her State of the Union address, and repeated in the Communication on the Green Deal Industrial Plan in February 2023,

98 Such as InvestEU, Innovation Fund, Horizon Europe, EU4Health, Digital Europe Programme, European Defence Fund, Recovery and Resilience Facility, and cohesion policy funds.

99 European Commission, 2023. EU budget : Commission proposes STEP to support European leadership on critical technologies. Press release.

100 Contexte, 2023. Incertitude autour du financement du règlement industrie zéro émission nette

for action in the REPowerEU Plan. However, the European Commission initially only intended to introduce ecodesign and energy labelling requirements for solar PV to revise existing requirements for heat pumps and support efforts from Member States in joining forces in Important Projects of Common European Interest (IPCEIs) on breakthrough technologies along the solar, wind and heat pump value chains.[101]

A key challenge to address is the trade-off between swift cleantech deployment and partial reshoring of cleantech supply chains. Moving away from current dependencies on some cleantech products imports will come at a cost. The shifting geopolitical environment changed the perception of EU cleantech supply chain vulnerabilities and created a momentum in favour of a more integrated EU cleantech policy.

In this respect, the GDIP and associated proposed NZIA and CRMA strengthen the "research, innovation and competitiveness" dimension of the Energy Union. The purpose of this dimension is to support breakthroughs in low-carbon and clean energy technologies. Despite being in its infancy, the Green Deal Industrial Plan fills a gap in the EU energy policy framework and illustrates the ongoing shift from fossil fuels towards an increased relevance of cleantech as regards future security of supply and competitiveness.

Conclusion. Is "stronger" strong enough?

The European Green Deal and Energy Union came out of the crises even stronger. The ambition of the European Green Deal was to put energy and climate policies at the centre of EU action and to make it the number one priority of the von der Leyen Commission. Four years down the road, this seems like a job completed. The EU launched the European Green Deal to answer the climate crisis, the RRF to address to the covid crisis, which filled part of the European Green Deal green investment gap, the REPowerEU Plan to phase out Russian fossil fuels, which accelerated the European Green Deal ambition, and the Green Deal Industrial Plan to overcome cleantech mounting vulnerabilities.

101 European Commission 2022, REPowerEU Plan Communication, SWD(2022)230 final, May 2022.

Fit for 55 gives the European Green Deal a strong regulatory backbone. Looking closer at the details, targets could have been higher,[102] standards could have been more stringent,[103] free allowances could have been phased-out faster,[104] and more funds could have been directed towards energy efficiency, innovation[105] and a socially-fair transition.[106] The EU energy and climate framework did nonetheless improve significantly both quantitatively and qualitatively with FF55, which shows increased ambition in traditional areas such as renewable energy and energy efficiency, and deploys instruments in new sectors, especially industry, buildings and mobility. Given the current institutional architecture and decision-making process of the EU, it is a good deal.

In comparison, governance and financing tools were initially meant to only improve marginally. The EU Climate Law strengthens the Governance Regulation, notably with the creation of a European independent Scientific Advisory Board. The increased share of the EU budget dedicated to climate action, together with the creation of the Just Transition Fund and of the Social Climate Fund, are welcome. However under this framework, the bulk of public spending still depends on national capacity.

The RRF, REPowerEU, and GDIP contribute to filling critical gaps in the Energy Union and EGD policy architecture, in terms of funding, regulation and governance. They were not part of the initial plans of the European Commission when von der Leyen launched the EGD.

The RRF strengthened European Green Deal financing and governance. NRRPs are supposed to partly build on the NECPs introduced in the Governance regulation. Yet the difference is that NRRPs are binding, since funding is conditioned to achieving the targets and milestones laid

102 Stefan Scheuer, Fraunhofer ISI, 2021. Will the Fit for 55 package deliver on energy efficiency targets? A high-level assessment.

103 T&E, 2023. Over €200 to fill up a car – the cost of Germany's bid to keep combustion engines.

104 for example by 2025 for a full phase-out, instead of partial phase-out (only concerns sectors covered by CBAM, which represent about 50% of free allowances)

105 Lehne, J., Moro, E., Nguyen, P.V., Pellerin-Carlin, T. 2023. The EU ETS : from cornerstone to catalyst. E3G/JDI. Policy brief.

106 Defard, C. 2021. A Social Climate Fund for a Fair Energy Transition. JDI Policy brief.

out in the plans. It therefore lays the ground for stronger planning of climate action.

The energy price crisis that followed showed that past EU policy efforts paid off, and EU institutions proved their ability to foster greater EU unity in the face of a common threat. The EU did not face blackouts, partly thanks to past strengthening of interconnections, while the EU electricity market allowed for uninterrupted energy flows across borders.[107] Emergency energy council meetings helped national governments come up with solutions and overcome initial divergences to achieve impressive emergency EU legislative activity in close collaboration with the European Commission. Major gaps of the Energy Union start to be filled-in, with a price mechanism to protect consumers against extreme price spikes, mandatory gas demand aggregation as a first step towards gas purchase, and the introduction of calls for behaviour change to reduce demand (sufficiency).[108]

The Green Deal Industrial Plan and associated proposals are a great first step towards an EU clean industrial policy for future energy security. The CRMA builds on gas security framework for energy security provisions. The approach of accelerated permitting processes for renewables was replicated for cleantech supply chains related projects in NZIA and CRMA via the creation of the "strategic projects" status. Although governance and financing remain mostly national, the regulatory framework starts catching up.

Over the past years EU energy policy became a bit more sustainable, interventionist, and European. On the debate on what EU energy policy should look like across Member States and stakeholders, the usual political fault lines emerged: security vs. climate, liberal vs. interventionist, EU vs. national competencies. Yet, energy security, affordability and competitiveness got more aligned with climate action, and the EU

107 Glachant, J.M. 2023. Reforming the EU internal electricity market in the middle of a huge energy crisis: an absolute short-term emergency or preparation for the future? Robert Schuman Centre for Advanced Studies. The Florence School of Regulation. Working Paper.

108 European Commission, 2022. EU Save Energy Communication. COM(2022)240 final.

enacted deeply interventionist policy answers.[109] During the Eurozone crisis, EU action was broadly perceived as either insufficient or lacking.[110] This cannot be said of the answer to the covid crisis. REPowerEU and the Green Deal Industrial Plan, although less groundbreaking than the RRF, illustrate the need of EU-level energy and climate action to address current challenges.

The EU now clearly needs a successful transition to address the climate crisis, and to contribute to strengthening EU open strategic autonomy and economic security.[111] The deepening and widening of the scope of EU energy policy action due to multiple crises linked to different causes (pandemic, fossil fuels, clean transition) shows the relevance of EU common action to address the polycrisis, and illustrates the increasing alignment between EU policy objectives of sustainability, security, and long-term affordability and competitiveness.

However, the EU's answers to the crises heavily focuses on regulation, with limited financial, human and technical support for implementation, and limited coordination, obligations or compliance mechanisms. Will this kind of EU collective action be enough to address the current energy and climate challenges? To answer this question, the second part will have a look at the current energy challenges at the end of the von der Leyen Commission and current European Parliament's term, before turning to an assessment of the remaining policy gaps in a third part.

109 Goldthau, A., Sitter, N. 2022. Whither the liberal European Union energy model? The public policy consequences of Russia's weaponization of energy. EconPol Forum.

110 Tocci, N. 2022. A green and global Europe. Cambridge, Polity Press.

111 European Commission 2023. 2023 Strategic Foresight Report. Sustainability and people's wellbeing at the heart of Europe's Open Strategic Autonomy. COM(2023)376 final.

Part 2.

Meeting Energy Union objectives: achieving the European Green Deal, high levels of energy security and reasonable energy prices – progress and challenges

The energy transition in the context of multiple crises enhances both the complexity of the energy trilemma and the imperative to solve it. The transition will put a price on something that used to be available for free: a stable climate. This will entail a negative supply shock whatever the policy mix (carbon pricing, regulation, incentives). Combined with an increase in cleantech demand, it would lead to inflationary pressures, making clean energy less affordable and increasing transition costs.[112] Yet the policy answers to the energy crisis – massive energy bills subsidies – confirm that price stability and affordability, and therefore energy security, are essentials for the EU energy system.

The previous part described the key recent energy policy innovations and improvement, and showed that both the Energy Union and the European Green Deal proved relevant strategies throughout the crises. This second part will give an give an overview of the main progress and challenges of the transition according to the three Energy Union objectives:

- European Green Deal, climate neutrality (previously "sustainability"): the transition is just starting
- Security of supply: changing paradigm in an uncertain environment
- Affordability: towards a cohesion threat

The main findings of this section are:

1. **Tripling the emission reduction pace to achieve climate neutrality calls for serious policy effort** to address the increasing challenges on renewables deployment, the slow progress on demand reduction, and the mixed trends in fossil fuel phase-out policies.

2. **The energy crisis clearly showed the alignment between the transition towards climate neutrality and increased energy security, and the need for a common EU energy security approach**. Yet the EU is still in-between two energy security paradigms, still reliant on fossil fuels for its short-term security, and increasingly challenged in its capacity to secure access to critical materials, components and cleantech products.

112 Pisani-Ferry, J., Mahfouz, S. 2022. Climate action: a macroeconomic challenge. France Stratégie.

3. **With a transition characterized by high upfront investments costs and low operational expenditures, ensuring energy affordability and competitiveness is increasingly becoming a cohesion challenge and a distributive issue** of how and for whom investments should be financed. Large social and political acceptability challenges are at play. The establishment of new cleantech manufacturing capacities and supply chains in Europe, provided that they create quality jobs, could go a long way in supporting political buy-in for the transition.

I • Climate neutrality: the transition is just starting

I ADDRESSING RENEWABLES DEPLOYMENT CONSTRAINTS

2022 was an unprecedented year for renewable power generation. Wind and solar combined generated more electricity than gas for the first time.[113] 57 GW of solar and wind capacity were added (+16% on a yearly basis).[114] Despite the energy price crisis caused by high gas prices, and a slight increase in overall electricity generation from coal in 2022, coal generation fell from September to December 2022.[115]

However, meeting the new 42.5% renewable target for 2030 requires tripling the deployment rate of the past decade.[116] Achieving this requires lifting well-identified barriers to massive renewable deployment: insufficient or limited policy support, permitting, skilled workers shortage,[117] and grid congestion.[118]

113 Ember 2023. European Electricity Review 2023.
114 Europe is however dwarfed by China, which installed 4 times more wind and solar in 2022 than the EU. 133 GW solar, 108 GW wind, 34 GW hydro. large thermal additions (102 GW) yet less than the renewable additions. see also figures for comparison with US and India in European Commission, 2023. Quarterly report on European electricity markets. Q4 2022.
115 compared to the same period in 2021. Ember 2023. European Electricity Review 2023.
116 European Environment Agency, 2023. Share of energy consumption from renewable sources in Europe.
117 SolarPower Europe, 2023. EU Market Outlook for Solar Power 2022 – 2026.
118 IEA, 2022. Is the European Union on track to meet its REPowerEU goals?

Network expansion must go hand in hand with the development of generation capacity and electrification. Existing distribution networks need to expand to meet renewable targets.[119] The EU aims at doubling the number of heat pumps to 10 million by 2027, which raises the question of congestion of distribution grids, as is already the case in the Netherlands and Belgium.[120] Meanwhile, transmission networks will need to be significantly upgraded and expanded to integrate new large scale capacities. For example, the offshore wind expansion plans target a capacity of 65 GW in the North Sea by 2030, and 300 GW in 2050.[121]

Is it the end of the falling development costs era? Among others, increased interest rates, rise of materials' and land acquisition's costs and supply chains bottlenecks[122] push investments expenditures for renewable projects investment upward.[123] Additionally, there is now a low rate of return from renewable projects, which are considered as very secure investments.

LACK OF STRUCTURAL DEMAND REDUCTION

Energy demand reduction is a major lever towards climate neutrality, involving both sufficiency and efficiency actions. Sufficiency refers to measures aiming at avoiding demand (for energy, but also other natural resources such as water, land, and materials). For example, this includes lowering indoor temperature, lower road speed, smaller cars, car-sharing, or switching off lights in empty offices.[124] Energy efficiency designates actions to provide the same level of service with less energy. Deep reno-

119 Vasconcelos, J., Vasconcelos, M. 2023. Electricity market reform: a means to multiple ends.

120 Glachant, J.M. 2023. Reforming the EU internal electricity market will not suffice to deliver EU aims. In forum, Electricity market design during the energy transition and the energy crisis. May 2023, Issue 136. Oxford Institute for Energy Studies,

121 Ibid.

122 In July 2023, Vattenfall announced pausing a project in the UK due to higher inflation and capital costs than expected, mentioning the high vulnerability of offshore wind supply chains to the current geopolitical situation. Reuters, 2023. Vattenfall halts project, warns UK offshore wind targets in doubt.

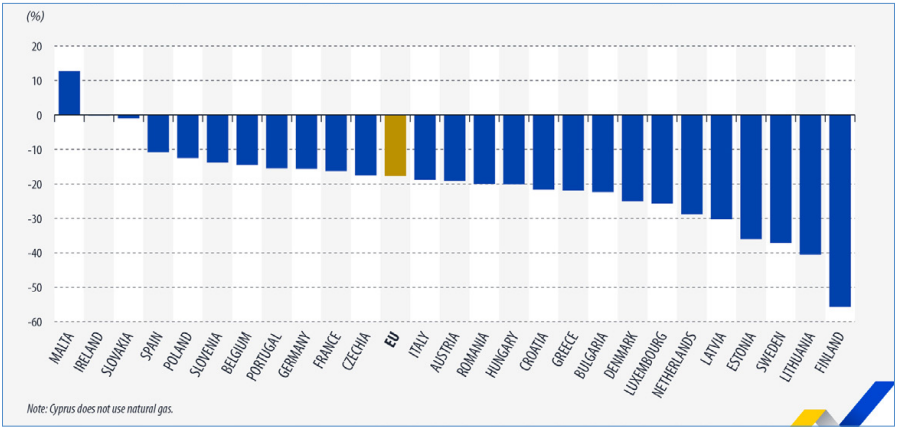
123 Eyl-Mazzega, M.A., Mathieu, C., Urbasos, I. 2023. The EU's renewables expansion challenge towards 2030: mobilizing for a mission almost impossible. Note, Ifri.

124 For more examples and an illustration of the role sufficiency can play in the European Green Deal, see the 2023 CLEVER scenario, which also addresses energy efficiency potential in complement to renewable deployment.

vation of buildings that can reduce buildings energy needs by up to 60 to 90%.

Due to the energy price crisis, demand reduction policies at the national[125] and EU level gained an unprecedented interest and visibility, culminating with the adoption of a voluntary objective of 15% gas demand reduction at the national level between August and March 2023. The objective was achieved EU-wide, but with stark national differences (Figure 2).

FIGURE 2. Natural gas demand reduction in the EU (Aug 22 - May 23 vs reference period)



▲ Note: the reference period is defined as the average of the very same month of the previous 5 years

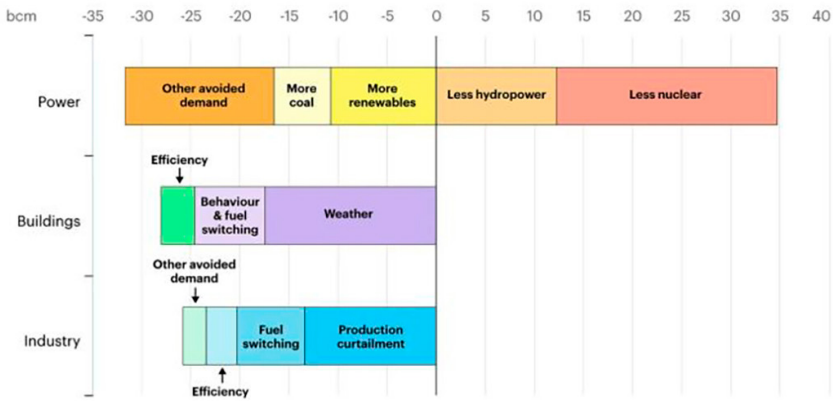
▲ Source: Eurostat 2023

It remains difficult to assess which part of the savings is temporary and which part is structural demand reduction such as permanent reduction of excess energy use by households, or energy efficiency investments. Some energy-intensive industries suspended activity during the winter

125 But with contrasted implementation, for details see EEB, 2022. Saving Energy for Europe. Report.

2022/2023.[126] Additionally, energy poverty due to high bills increased[127] in the context of general inflation. Both can be considered as demand destruction with negative social and economic impacts, which is not the intended objective of the transition. Besides, the weather played an important role in gas demand reduction during the winter 2022/2023 (Figure 3). The IEA attributed two thirds of gas savings in residential and tertiary buildings to the mild weather.[128]

FIGURE 3. Drivers of change in natural gas demand by sector in the EU, 2022 vs 2021



▲ Source: International Energy Agency 2023

Structural demand reduction is lagging and requires additional policy efforts. The 20% energy efficiency target by 2020 was collectively achieved, but external factors such as the covid pandemic and the 2008 financial crisis also played a role.[129]

126 With a risk of permanent demand destruction for some energy intensive activities which may prefer changing locations to benefit from lower energy prices outside Europe.

127 Latest Eurostat data on "inability to keep home adequately warm" indicator: increase from 6.9% in 2021 to 9.3% in 2022. Statistics | Eurostat (europa.eu)

128 IEA, 2023. Europe's energy crisis: what factors drove the record fall in natural gas demand in 2022?

129 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

COAL PHASE-OUT CHALLENGES

A detailed review of all the challenges to phasing out fossil fuels would go beyond the scope of this report. Here, coal will be used to show that difficulties are high, even when it comes to the obvious priority and low hanging fruit compared to oil and gas.

Phase-out coal in electricity generation should happen by 2030 in G7 countries and OECD countries to stay within the 1.5°C scenario,[130] or by 2035 to achieve EU climate neutrality by 2050.[131] Yet, the following examples show that short-term energy security, social and competitiveness considerations can be a blocking factor of the transition.

Poland has no coal phase-out commitment. Poland still uses coal to generate 70% of its electricity, a drop from 86% in 2010, thanks to the deployment of renewables. The government reached an agreement with coal miners' unions to close mines by 2049, but no date is foreseen for coal phase-out for electricity generation. Further policy action is needed to ensure a smooth transition of the coal sector, [132] and strengthen Poland's political will to move away from coal.

Bulgaria wants to renegotiate its commitment to cut energy sector emissions by 40% by 2025 compared to 2019,[133] which would imply the early closure of some coal plants that generate 45% of the country's electricity. This commitment of gradual coal phase-out was part of its NRRP.

Romania bets on gas development to replace coal. In 2022, Romania announced a coal phase-out in 2030, two years earlier than expected.

130 Ember, 2022. Why clean power 2035 means no coal by 2030.

131 Graf, A., Gagnebin, M., Buck, M. 2023. Breaking free from fossil gas. Agora Energiewende. Report.

132 The coal workforce has already been divided in four since 1990 as a result of the transition to a free-market economy. Economic growth did not prevent high social costs, especially for the coal workers. Lessons learned from this process include the need to include establishing retraining programmes, evaluating policies for the proposed instruments to strengthen consensus, and ensuring regional development in alternative sectors. See IISD, 2018. The transformation of the Polish coal sector. Report.

133 Reuter 2023. Bulgarian lawmarkers back coal plants with vote to roll back green targets.

However, it happened just after approving tax reductions on future income from offshore gas, with an estimated potential of 200 bcm in the Black Sea.[134] This goes against the IEA latest report, which is clear about the need to give up new gas fields to achieve our climate goals.

The political sticking points of the decisions to move away from fossil fuels need to be further investigated and addressed.

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Achieving the 2030 target of -55% emissions and putting the EU on track towards climate neutrality by 2050 means emission reduction must triple compared to the yearly average reduction achieved over the past decade.[135] The development of energy transition policies over the past decade greatly supported the EU in moving through the energy crisis, which clearly showed the alignment between the transition towards climate neutrality and increased energy security. Yet the energy transition towards climate neutrality is a bumpy road, with increasing challenges on renewables deployment, slow progress on demand reduction, and mixed trends in fossil fuel phase-out policies.

II • Security of supply: changing paradigm in an uncertain external environment

Security of supply came back as a top EU political priority in 2022. The acme of the crisis is behind us, but vulnerabilities related to the EU's fossil gas supply remain.[136] Besides, while energy security now aligns with the goal of climate neutrality, changing geopolitical and geoeconomic realities create a less favourable context for the transition.

134 Enerdata, 2022. Romania aims to phase out coal by 2030 instead of 2032.
135 European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.
136 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

THE ENERGY CRISIS IS NOT OVER - NEW EXTERNAL DEPENDENCIES

The pressure on energy prices has receded markedly since December 2022, but the EU is not out of the woods. Even with full gas storages, a cold winter and the halt of the remaining Russian gas pipe and LNG flows could lead to price volatility and market tensions.[137] Besides, the EU mostly replaced Russian gas with LNG. The EU is now sourcing over 50% of its gas on spot markets (as compared to 20% in 2021), increasing its vulnerability and exposure to price volatility[138] on international markets. EU prices will depend on external factors influencing gas demand and supply, such as the weather, global supply and demand, and the continuation of current Russian gas flows. Future gas TTF wholesale prices for the 2023/2024 winter season remain above 50 €/MWh,[139] which is well above historical average of 20€/MWh. This trend continues at least through the 2024/2025 and 2025/2026 winter seasons, which should remain tense on the supply side.[140]

Supply diversification efforts do not address core vulnerability issues. Despite national and EU efforts, securing gas contracts with alternative suppliers have not been very successful so far.[141] Although diversification makes the EU less exposed to one single supplier, it is nonetheless shifting EU dependency away from Russia to alternative suppliers (USA, Algeria ,Qatar, Azerbaijan) whose reliability cannot be guaranteed at all times.[142] With the interruption of most Russian gas pipeline deliveries, gas cannot be a transition fuel anymore in the EU. Demand reduction and phasing-out fossil fuels (e.g. the European Green Deal) remains the best way to guarantee long-term security of supply.[143]

137 IEA, 2023. Global Gas Security Review 2023.
138 Ibid.
139 Dutch TTF Natural Gas Futures, retrieved on 26/08/2023
140 Ibid.
141 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.
142 Ibid.
143 Ibid.

CHINA'S THREAT TO EU ENERGY RESILIENCE AND TECHNOLOGICAL SOVEREIGNTY

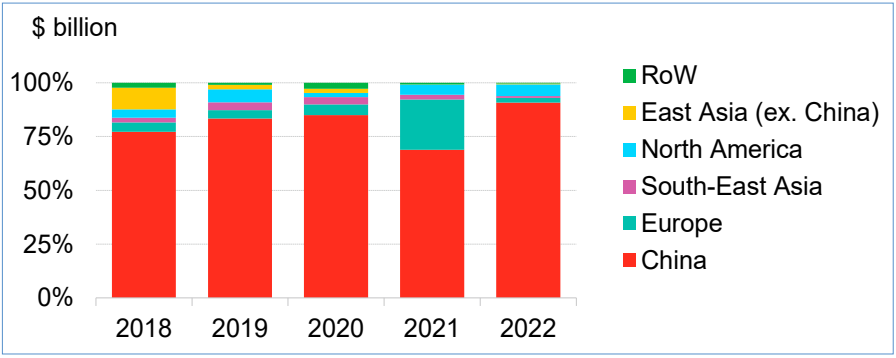
Cleantech supply chains are highly concentrated, particularly in China, which is a major actor at all stages of the value chain. This is the result of more than a decade of policies to support integrated domestic value chains. It accounts for three-quarters of the world's battery cell production. More than half of the lithium, cobalt and graphite refining capacity are located in China. The country controls 90% of the market for upstream solar products, and 30% of wind turbine manufacturing.[144] Europe holds a quarter of the world's electric vehicle (EV) production[145] but has little presence in the rest of the value chain.[146]

China's industrial policy has a clear self-sufficiency objective, and provides high amounts of subsidies to achieve it. China's objective for 2025 is to achieve 70% domestic content for key components and materials. By 2050, the ambition is to be the world's leading power in the technologies of the future (renewables, batteries, artificial intelligence, etc.). The two main instruments to achieve this are direct subsidies and concessional loans to state-owned companies. In 2019, the Center for Strategic International Studies estimated that the cost of China's industrial policy was between 1.7% and 4.9% of its GDP, compared to just 0.4% for the US.[147]

Projects under construction or planned indicate an increase in China's dominance over the next five years (Figure 4). The country largely dominates global investment in cleantech manufacturing capacity. China is expected to increase its battery production capacity six-fold by 2030. It should be self-sufficient in lithium by 2024. The US IRA has been perceived in Europe as a major threat to EU competitiveness, yet the US remains a cleantech dwarf, and the IRA can be seen as an attempt to catch up with China.

144 Goldman Sachs, 2023. China may reach energy self-sufficiency by 2060
145 IEA, 2023. Global EV Outlook 2023.
146 For example, EU manufacturing accounts for 7% of the global EV battery production capacity. IEA, 2022. Global supply chains of EV batteries.
147 Defard C. 2023. The Resurgence of US industrial policy and Europe's response, JDI, initially published in *La Revue de l'Énergie*

FIGURE 4. Clean energy factory investment by geography, 2018–22



▲ Source: Bloomberg NEF 2023

China has already taken measures to restrict the export of minerals. There is a risk that China will use its dominant position for other components. In early 2023, its Ministry of Commerce proposed the introduction of export licensing requirements for photovoltaic wafers. This could amount to an export restriction and, if implemented, could hinder the acceleration of PV deployment in the EU. In August 2023, China introduced import restrictions on gallium and germanium, two metals used for semiconductors.[148]

While total decoupling is neither possible nor desirable, the debate is more so about the extent and the sectors in which partial decoupling would be possible, through targeted reshoring and diversification of suppliers.

The EU is at risk of losing the battery race, according to a recent report of the European Court of Auditors, in part because of insufficient domestic supply chains.[149] The EU's raw material supply is dependent on a few countries with which the EU has no trade agreement.[150] Current

148 Reuter, 2023. China gallium, germanium exports curbs kick in; wait for permit starts.

149 ECA, 2023. Europe is in danger of losing the battery race.

150 87 % of its raw lithium imports come from Australia, 80 % of manganese imports from South Africa and Gabon, 68 % of raw cobalt imports from the Democratic Republic of Congo, and 40 % of raw natural graphite imports from China.

contractual arrangements usually secure supply for 2 to 3 years only. Long development times for new mines means that domestic mining will not quickly respond to the rising demand.

There is a need for greater policy coherence and foresight between energy targets and manufacturing capacity to deliver. Just like consistent grid development is a precondition for renewables to deliver, there is a need to foresee an appropriate EU battery industry manufacturing capacity to meet the upcoming demand from EVs. The European Court of Auditors calls for a thorough assessment thereof and warns that too great a mismatch could delay the ban of combustion engines foreseen in 2035, or lead the car industry to rely heavily on non-EU batteries and EVs to achieve it, which would be to the detriment of the EU car industry and workforce.

BOX 6. The need for a third European way on industrial policy

China's industrial dominance raises classic industrial policy questions among its trading partners: what role should the state play in steering the economy, and why, how and to what extent should governments intervene to correct markets? Chinese leaders often retort to critics that they are simply replicating a classic development model. The United States also used tariff barriers to support its industries until the Second World War, while the economic take-off of East Asian countries, particularly South Korea, is closely linked to strong public support for family-owned conglomerates known as "chaebols", the best-known being Samsung. The Korean political elites' clientelist relationship with the chaebols, corruption scandals and lack of transparency have fuelled calls for reform.[151] This is one of the criticisms that can be made of the Chinese model of industrial development, which is not exempt from embezzlement, the financing of inefficient companies and clientelism.[152]

The cost of reviving an American industrial ecosystem could be staggering. While the benefits in terms of security of supply and the fight against climate change are real, they would nonetheless be obtained at the cost of massive subsidies to companies that are often profitable, such as Volkswagen

151 Albert, E., 2018. "South Korea's Chaebol Challenge", Council on Foreign Relations, Backgrounder.

152 Kennedy, S., 2022. "China Is the Wrong Industrial Policy Model for the United States", CSIS. Commentary.

or Tesla. For example, Panasonic's battery plant in Nevada could receive more than USD 1 billion in federal government funding each year to produce 38 GWh/year.[153] This raises the question of how to match public funding to the needs of industry and which conditions are needed to attach to this strong state support in order to avoid its capture by the most established interests.

Thus, the involvement of public authorities in the economy can be required to achieve political objectives not provided by the market (security, cohesion, economic recovery), but creates a risk of private interest's capture. Avoiding this pitfall raises issues of governance, particularly in terms of transparency, public participation and balancing stakeholder's interests, including in regards to the distribution of the costs and benefits of this policy.

At a time when the energy transition is gaining pace, the EU and the United States are actually facing similar challenges: increasing Chinese and international competition, vulnerable strategic value chains, labour shortages, lengthy permitting processes, public sensitivity to activities with a high environmental impact, and demands for a fair and equitable transition.[154] The difference lies within the type of policy answers provided as a result of these challenges.

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EU is in between two energy security paradigms, still reliant on fossil fuels for its short-term security, yet increasingly challenged in its capacity to secure access to critical materials, components and cleantech products.

The transition calls for a new energy security paradigm now characterised, among others, by access to critical materials and cleantech components.[155] Cleantech will be the backbone of future energy security, but the associated supply chains are much more complex than simply oil and gas. Analysing and addressing vulnerabilities will require building up new expertise[156] and new data.

153 Panasonic Holding Corporation, 2023. Fiscal 2023 Third Quarter Financial Results

154 Defard C. 2023. The Resurgence of US industrial policy and Europe's response, JDI, initially published in *La Revue de l'Énergie*

155 IEA, 2022. Securing Clean Energy Technology Supply Chains. Report.

156 The IEA just launched is Critical Mineral Market Review in 2023..

A new cleantech EU industrial policy is needed to contribute to securing cleantech supply chains. The involvement of public authorities in the economy is justified when the market fails to provide political objectives such as security, cohesion, economic recovery. However, it creates a risk of capture by powerful interests. Avoiding this pitfall raises issues of governance.

III • From affordability to a threat to cohesion

The affordability and competitiveness objective has been put under tremendous pressure in 2022, as a result of the energy security crisis.

This resulted in large national emergency energy bills' support programmes that strained public budgets without contributing to the energy transition. Member States are facing a triple financial challenge: debt has increased, interest rates are higher, and investment needs are more pressing.

Meanwhile, the EU competitiveness is at risk with the rise of US cleantech subsidies programme and scars of the energy price crisis.

Lastly, the energy transition is mainly about green investments, therefore transforming the objective of affordability into a cohesion challenge. Member States do not have the same capacity of financing and operating large green investments programme. Failure to appropriately support and anticipate climate action implementation challenges could fuel political resentment in the context of already rising far-right populism.

I THE COST OF ENERGY VULNERABILITY

The war in Ukraine reminded European Member States how much energy security is a critical component of price stability. If security threats do not materialise, vulnerabilities are not necessarily priced, but overreliance on one supplier allows for market manipulation and exposes us to supply disruption, leading to high prices.

So far, short-term considerations prevailed over longer-term affordability and competitiveness. Cheaper prices justified overreliance on Russian gas. The drastic actions needed to lower dependency on Russian

gas were not implemented, even after the 2009 and 2014 crises, despite mobilisation of Central and Eastern Member States for greater EU solidarity and ambition.[157]

Now, a changing geopolitical context means that more efforts must be deployed, with less resources: gas is now a risky and potentially expensive energy source, putting into question its former status of transition fuel in the EU.

Meanwhile, much has been spent on price subsidies to shield consumers from high prices, putting a strain on public budgets. Between September 2021 and January 2023, EU governments earmarked €646 billion to shield citizens and businesses from high prices. This is an amount almost equivalent to the RRF investments. Instead of investments, 46% of emergency measures consisted of direct support to final consumers, which were mostly untargeted. Universal measures translated in subsidising the energy bills of the wealthiest households too.[158]

EU Member States' emergency answers show that they are fully aware of the political and social risks associated with energy price hikes. This illustrates the exposure of EU businesses and citizens to fossil energy-induced price fluctuations. Too often, subsidies did not preserve the price signal, even though solutions like dual-pricing could incentivise energy savings once basic consumption needs are met. Fossil fuel subsidies are ill-designed, should be better targeted,[159] and phased-out as soon as possible. Yet they can also be seen as the inevitable cost of the delay in implementing the transition.

Unaffordable energy prices could lead to dramatic social and economic damage, which could translate into political resentment. Some

157 See forthcoming policy brief on Energy Union historical perspective, JDI.

158 Especially price support for transport, since wealthy households are more likely to drive heavy cars. Brezovska, R., Zachmann, G., Pellerin-Carlin, T. Nguyen, P.V., Leuser, L., Thalberg, K., Panzeri, D. Galindo, J. 2022. United in diversity? National responses to the European energy crisis. AMO, Bruegel, JDI, ECCO, EsadeEcPol. AMO.CZ Climate paper no.16

159 most measure for households were untargeted 73% according to Sgaravatti, G., Tagliapietra, S., Trasi, C. 2023. The fiscal side of Europe's energy crisis: the facts, problems and prospects. Bruegel. Blog post.

consumers can bear higher energy costs, but many middle and low-income households are already suffering from a cost-of-living crisis that is overburdening Central and Eastern European Member States.[160] Price affordability for businesses is a core aspect of EU competitiveness, in a context in which EU energy prices are already the highest in the world.[161]

Member States are facing a triple financing challenge: debt has increased, interest rates are higher, and investment needs are more pressing.[162] The massive national public funding provided to support energy bills is now jeopardising the viability of public finances and the ability of Member States to invest in the green transition. This is occurring against a backdrop of rising ECB interest rates.

I A COMPETITIVENESS RISK ASSOCIATED WITH THE GLOBAL CLEANTECH INDUSTRIAL REVOLUTION

The EU remains a bigger producer of wind energy components and batteries than the United States and has great potential for development in strategic value chains. 50% of European demand was supplied by domestic factories in 2022, mostly in Poland and Hungary. Battery production capacity could reach 70% of demand by 2025 and more than 100% between 2026 and 2028.[163] Finally, in view of the planned projects, the EU could secure 10% of its nickel and cobalt needs, as well as 50% of its lithium needs[164] from local mines by 2030.

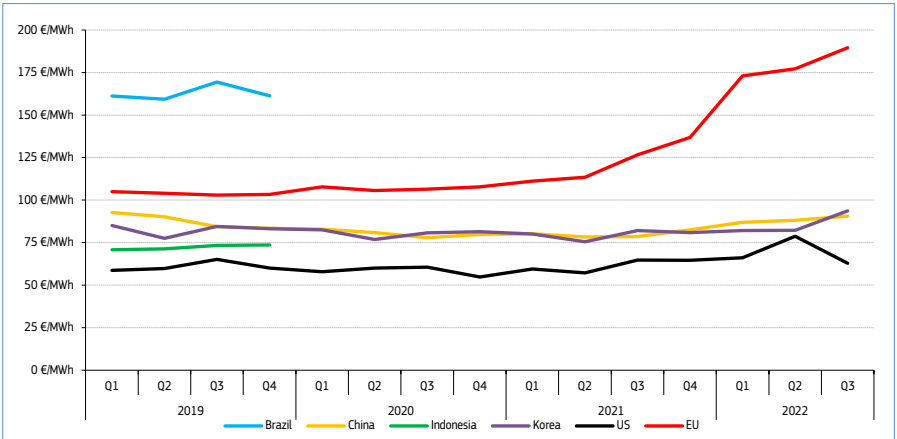
However the IRA seems to threaten several European manufacturing capacity projects. Two-thirds of the lithium-ion battery production planned in Europe between now and 2030 could be delayed, reduced or cancelled because of the IRA[165]. In addition to batteries, the solar and

160 ESABCC, 2023. Addressing the energy crisis while delivering on EU's climate objectives: recommendations to policy makers ; EIB, 2023. Trends in regional and social cohesion, Chapter 4 of the Investment Report 2022/2023.
161 European Commission, 2023. Quarterly report on European electricity markets. Q3 2022 ; EIB, 2023. Green transition and the energy crisis. Chapter 6 of the Investment Report 2022/2023.
162 Zettelmeyer, J., Claeys, G., Darvas, Z., Lennard, W., Zenios, S. 2023. The longer-term fiscal challenges facing the EU, Bruegel. Policy brief.
163 T&E, 2023. A European Response to US IRA. Report.
164 Ibid.
165 T&E, 2023. Deux tiers de la production européenne de batterie menacée

green hydrogen industries in Europe face a significant risk of losing competitiveness due to the IRA.[166]

Finally, the challenge of European competitiveness goes beyond the challenge posed by IRA subsidies. The gas shock linked to the post-Covid recovery, the Russian invasion of Ukraine and the interruption of most Russian gas deliveries in 2022 has accentuated the difference in energy prices between the EU and its main competitors.[167] While electricity is a major vector in the energy transition, industrial tariffs at the end of 2022 were twice as high in Europe as in the United States or China.

FIGURE 5. Retail electricity prices paid by industrial customers in the EU and some of its trading partners



Source: Eurostat, IEA, CEIC, DG ENER computations. The latest data for Brazil and Indonesia is not available. Industrial prices in the EU are represented by the ID consumption band for the purposes of international comparison.

▲ Source: European Commission 2023, Quarterly report on EU electricity markets Q3 2022

166 Jansen, J., Jäger, P., Redeker, N. 2023. For climate, profits, or resilience? Why, where and how the EU should respond to the Inflation Reduction Act. Jacques Delors Centre. Policy Brief.

167 European Commission, 2023. Quarterly report on EU electricity markets Q3 2022

HIGH ENERGY PRICES, DEINDUSTRIALISATION RISK AND THE POPULIST CHALLENGE

To shield consumers from fossil energy supply vulnerability, the only long-term solution is the massive deployment of sufficiency, efficiency and low carbon energy. This involves the diffusion of clean technologies (renewables, heat pumps, renovations), and new and improved infrastructure (cycle lanes, public transports, transport and distribution electric grids and EVs charging stations). Policymakers will have to handle the double issue of social compensation and green investment at the same time.

A clean energy system is characterised by high capital costs and investment needs which are later translated into operation expenses savings.[168] Despite large subsidies programmes targeting renovations, heat pumps and electric vehicles, the remaining amounts are usually still high for many households and businesses.

The transition investment costs will bring to the forefront, and risk worsening, the existing socio-economic inequalities between Member States, regions, and households. These inequalities are characterised by different access to funding and capacity to provide protection or be shielded from high prices, be it through temporary social compensation or long-term green investments in clean solutions.

The energy price crisis occurs in a context in which, since 1990, emissions cuts were achieved only among lower and middle income Europeans, while the 10% wealthiest increased their emissions.[169] EU social and regional cohesion is at risk, with the pandemic and energy crisis affecting disproportionately poorer, younger and less educated citizens.[170]

Insufficient policy support for climate action implementation could fuel discontent in already impoverished places across the EU, in the

168 UK Climate Change Committee, 2020. Sixth Carbon Budget.
169 Gore, T, Alestig, M. 2020. Confronting carbon inequality in the European Union. Why the European Green Deal must tackle inequality while cutting emissions. Oxfam international. Policy paper.
170 EIB, 2023. Investment report 2022/2023: resilience and renewal in Europe.

context of rising far-right populist challenges. High shares of far-right votes in socio-economically disadvantaged regions are correlated with a sense of political abandonment.

A similar political and social risk emerges from the required employment and industrial transition. As an example, the risk of China taking over the electric vehicle market is real, with Chinese car exports surpassing German ones for the first time in 2022. Some argue that deindustrialization risks in Germany are equivalent to the one that hit the US Rust Belt.[171] A larger trade shock from China was associated with support for nationalist parties and a shift towards right-wing parties in Europe.[172]

The EU needs to address the question of the measures needed to enable the development of timely alternative industries and mitigate business uncertainty. At this stage, the transition will entail the depreciation of tangible (equipment, infrastructure, buildings), intangible (patents) and human (skills) capital, which is likely to temporarily reduce growth while investment needs will increase.[173] For example, the ban of thermal cars will have a huge impact on car manufacturers and their suppliers, an industry on which Central and Eastern European Member States heavily rely on for jobs and economic activity. Meanwhile, the uncertainty created by the Ukraine war is slightly greater in Eastern Europe.[174]

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With a transition characterized by high upfront investments costs and low operational expenditures, ensuring energy affordability is increasingly becoming a cohesion challenge, and a distributive issue. Large social and political acceptability challenges are at play. The establishment of up new cleantech manufacturing capacities and supply chains in Europe, provided that they create quality jobs, could go a long way in supporting political buy-in for the transition.

171 Marin, D. 2023. L'Allemagne doit éviter les conséquences négatives d'un « choc chinois ». Le monde. 16/06/2023

172 According to a analysis conducted in fifteen EU countries over 1988 – 2007, in colum

173 Pisani-Ferry, J., Mahfouz, S. 2022. Climate action: a macroeconomic challenge. France Stratégie.

174 EIB, 2023. Investment report 2022/2023: resilience and renewal in Europe.

Conclusion. Three interlinked policy objectives under threat

Climate neutrality, security and affordability are three increasingly interlinked objectives that will be very challenging to achieve. The key findings of this second part are:

1. **Achieving the European Green Deal calls for drastic acceleration of the energy transition.**

Climate neutrality by 2050 means emission reduction pace by 2030 must more than triple compared to the yearly average reduction achieved over the last decade.[175] However, increasing challenges arise on renewables deployment while progress remains slow on demand reduction and trends are mixed on fossil fuel phase-out policies. Existing energy transition policies greatly supported the EU in moving through the energy crisis, which clearly showed the alignment between the transition towards climate neutrality and increased energy security.

2. **The EU is in between two energy security paradigms**.

The acme of the energy crisis is behind us, but EU fossil gas supply's vulnerabilities remain.[176] Although diversification makes the EU less exposed to one single supplier, it is nonetheless shifting EU dependency away from Russia to alternative suppliers whose reliability cannot always be guaranteed. The European Green Deal remains the best way to guarantee long-term security of supply.[177] Yet, while energy security now aligns with the goal of climate neutrality, changing geopolitical and geoeconomic realities create a less favourable context for the transition.

Cleantech will be the backbone of future energy security, but the associated supply chains are much more complex than simply oil and gas; they are also highly concentrated, particularly in China which is a major actor at all stages of the value chain. The US IRA has been perceived in

175 European Commission, 2023. EU Climate Action Progress Report 2023. COM(2023) 653 final.

176 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

177 Ibid.

Europe as a major threat to EU competitiveness, yet the US remains a cleantech dwarf. The IRA is an attempt to catch-up with China. At a time when the energy transition is gathering pace, the EU and the United States are actually facing similar challenges: growing Chinese and international competition, the fragility of new strategic value chains, labour shortages, slowness in granting building permits, public sensitivity to activities with a high environmental impact, and the demand for a fair and equitable transition.[178]

A new cleantech EU industrial policy is needed to contribute to securing cleantech supply chains. The involvement of public authorities in the economy can be required to achieve political objectives not provided by the market (security, cohesion, economic recovery), but creates a risk of private interest's capture. Avoiding this pitfall raises issues of governance, particularly in terms of transparency, public participation and balancing stakeholder's interests, including in regards to the distribution of the costs and benefits of this policy.

3. **The affordability and competitiveness objective is becoming a cohesion challenge.**

The war in Ukraine reminded European Member States the importance of a common EU energy security approach for price stability, affordability and competitiveness. So far, short-term considerations prevailed over longer-term affordability and competitiveness. Cheaper prices justified overreliance on Russian gas, and are at the centre of the debate around China's quasi monopoly on part of the cleantech supply chains. In the past, the drastic actions needed to lower dependency on Russian gas were not implemented, even after the 2009 and 2014 crises, despite Central and Eastern Member States mobilisation for greater EU solidarity and ambition.[179]

With a transition characterized by high upfront investments costs and low operational expenditures, ensuring energy affordability is increasingly becoming a cohesion challenge, and a distributive issue of how and for whom investments should be financed. The transition investment

178 Defard C. 2023. The Resurgence of US industrial policy and Europe's response, JDI, initially published in La Revue de l'Énergie

179 See forthcoming policy brief on Energy Union historical perspective, JDI

costs will bring to the forefront the existing socio-economic inequalities between Member States, regions, and households. These inequalities are characterised by different access to funding and capacity to provide protection or be shielded from high prices, be it through temporary social compensation or long-term green investments in clean solutions.

Member States are facing a triple financing challenge: debt has increased, interest rates are higher, and investment needs are more pressing.[180] Because of the energy price crisis, massive national public subsidies provided to support energy bills is now jeopardising the viability of public finances and the ability of Member States to invest in the green transition; this is occurring against a backdrop of rising ECB interest rates.

Large social and political acceptability challenges are at play with the issue of affordability and accessibility. EU social and regional cohesion are at risk, with the pandemic and energy crisis affecting disproportionately poorer, younger and less qualified citizens. [181]

The need to set up new cleantech manufacturing capacities and supply chains in Europe, provided that it creates quality jobs, could go a long way in supporting political buy-in for the transition. On the other hand, insufficient policy support for climate action implementation could fuel discontent in already impoverished places across the EU, in the context of rising far-right populist challenges.

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Is the EU energy and climate policy framework presented in part 1 adequate to take up the above challenges and meet the Energy Union's objectives of delivering the European Green Deal while maintaining high levels of energy, and preserving reasonable prices for EU consumers? This is the question that will be addressed in the next section, which will show the need for more EU action.

180 Zettelmeyer, J., Claeys, G., Darvas, Z., Lennard, W., Zenios, S. 2023. The longer-term fiscal challenges facing the EU, Bruegel. Policy brief.

181 EIB, 2023. Investment report 2022/2023: resilience and renewal in Europe.

Part 3.

Need for more EU action

With the European Green Deal, EU energy and climate objectives are now broadly aligned with what is needed to achieve climate neutrality.[182] Yet, the EU is being challenged on its three Energy Union objectives, as illustrated in part 2. Do we have the appropriate policy instruments? When adopted, do we have the capacity to successfully implement our energy and climate policies, while also strengthening energy security and maintaining competitiveness and social cohesion?

The key findings of this third part are:

1. **The existing EU energy and climate policy framework lacks appropriate governance and financial policy instruments. There's a risk of a diluted ambition or political backlash during national implementation of the Fit for 55 (FF55).** The main EU energy and climate governance tool are the NECPs, which are too soft to guarantee EU policies enforcement and proper EU coordination of national policies. While ambitions are set at the EU level under current EU institutional architecture, implementation comes down to Member States, who have different financial, technical and human resources, and are also constrained by EU fiscal rules. The European Green Deal has more sticks (EU regulations, EU carbon price) than carrots (financing, technical assistance, capacity building, proper skilling and staffing), which endangers an ambitious implementation of the FF55 package at the national and local level. The RRF filled part of the public green investment gap, but it will come to an end in 2026, a time where many new instruments of the FF55 will start kicking in.

2. **The Recovery and Resilience Facility (RRF) is a temporary financial instrument. The EU needs an European Green Deal Facility to provide funding based on quality energy and climate investment and reforms planning.** The lack of an already existing quality green investments and reforms pipeline, combined with constraints for recovery time, led to hasty drafting of NRRPs. Democratic participation deficiencies during the drafting process of NRRPs raise further questions over the quality of the projects put forward by national governments. Lastly, governance of the RRF has been found to be too rigid in the face of unforeseen circumstances, such as the energy price crisis or renewed attention to clean industrial policy. In summary, the RRF is a

182 Climate Action Tracker, 2023. EU country summary.

tremendous breakthrough for EU energy and climate financing, but if it was to be replicated, the RRF governance should be:

- **greener,** with financing linked to the implementation of the FF55, and based on better quality energy and climate planning and reporting,
- **more democratic,** with greater involvement of the European Parliament, local and regional authorities, and other stakeholders (cleantech businesses, trade unions, civil society organisations),
- **more agile,** to adapt to a highly uncertain geopolitical, social and economic environment.

3. **The EU still lacks adequate instruments to effectively support collective efforts and policy coordination during energy crises.** These instruments are necessary to address short-term security of supply challenges and heightened climate ambitions resulting from the conflict in Ukraine. In the absence of additional EU financing, the affordability and competitiveness shock was mitigated through national state aid and mostly uncoordinated national policies. P**otentially impactful regulatory provisions in response to the energy crisis were insufficiently European, insufficiently binding, and too temporary.**

4. **The Green Deal Industrial Plan, despite being a step in the right direction, suffers from similar issues,** with a regulatory framework too centred on the national level, a lack of EU financing and a loose governance framework which does not support adequate EU-wide coordination. An effective industrial policy for the European Green Deal would require greater foresight and policy coordination. Yet the EU needs to offer incentives to foster national action and EU coordination.

5. **As the European Green Deal enters its implementation phase, mishaps in green policies implementation might fuel the populistic trends.** A regulatory fatigue could make it harder to adopt EU regulations with the appropriate level of ambition. Yet additional EU regulations are still needed to achieve the EU climate, security and competitiveness ambitions, and lay the ground for post-2030 decarbonisation pathway towards climate neutrality.

6. **The Energy Union lacks appropriate governance and financing tools to foster more ambitious regulations, coordination and soli-**

darity. Delivering the European Green Deal while preserving energy security and reasonable prices requires political agreements on allocation of costs and distribution of risks; this implies a complex issue of cost-sharing and risk-sharing among stakeholders. There is a need to strengthen common financing, as well as policy coordination and governance, in order to prepare the political space for the adoption and implementation of the additional regulations we need to achieve climate neutrality. The green transition requires different types of resources: expertise, financing, organisational capacity, legitimacy, leadership.[183] Reorienting and creating these resources is a political choice, and reaching a political agreement requires identifying and lifting blocking points. The part4 will attempt to define policy pathways to overcome some of the current blockages.

I . FF55/REPowerEU implementation challenge

The main regulatory achievement of the von der Leyen Commission on energy and climate is the ambitious FF55 package, subsequently strengthened through REPowerEU. Now that most regulatory files are adopted, comes the issue of implementation at the national level. Two key challenges arise :

- **The current EU energy and climate governance is too soft and too national** to foster appropriate EU coordination of national policies, guarantee an appropriate implementation of the Fit for 55 by Member States, and provide for effective and multi-level energy and climate policy planning at the national level.
- **The EU energy and climate policy framework insufficiently supports the provision of adequate financial, technical and skilled human resources required for implementation.** Besides the green investment gap, more attention should be granted to technical assistance, capacity building, proper skilling and staffing of implementing bodies at the national, regional and local levels.

183 Schmitz, H. 2015. Green Transformation. Is there a fast track? in Scoones, I., Leach, M., Newell, P. (Eds.) The politics of Green Transformations. Routledge.

EU POLICIES ENFORCEMENT AND EU COORDINATION : A GOVERNANCE CHALLENGE

The success of the implementation of the FF55 and REPowerEU will largely rest on national governments. EU tools of direct implementation (EU carbon price, EU standards) are limited. Even the instruments that do not need transposition call for complementing national policies. As an illustration, the impending ban on new combustion engine cars in 2035 necessitates proactive anticipation by national governments. This entails the implementation of suitable subsidy schemes, the facilitation of a thriving second-hand market for electric vehicles, and the provision of adequate charging infrastructure.[184] Yet the increased FF55/RePowerEU targets will put further pressure on financing needs and collective ambition on the Member States in an unfavourable context.[185]

According to the European Court of Auditors, the European Commission has little indication that 2030 targets can be achieved or will be translated into sufficient action.[186] The FF55 impact assessment was based on the optimistic assumption of the full implementation of existing policies,[187] and did not take into account the risk associated with the energy dependency on Russia, the comeback of inflation, the estimated decrease in critical raw materials availability, or the rebound effect after the covid pandemic.

The 2020 targets achievement is not only an EU policy success. Unexpected GDP fluctuations, the financial crisis[188], and the covid pandemic

184 Partly addressed at the EU level through AFIR

185 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

186 Ibid.

187 which is very optimistic given the current delays and imperfect implementation of EU regulation. For example, the 2018 RED recast still needs to be properly and fully implemented by all Member States see Kerneis, K., Defard, C. 2023. A comparative analysis of the regulatory framework in Sun4All pilot cities. Sun4All. Report.

188 Reduced EU GDP by 4,5%, leading to an overall reduction in energy consumption and contributing to the fact that nine Member States had already achieved their 2020 renewable target in 2014. European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

heavily affected the collective Member States achievement of the 2020 targets.[189] This points at a lack of national implementation of EU policies, i.e. a lack of national policy effort to achieve the targets.[190] This further raises the issue of how to appropriately support policy efforts and how to ensure compliance.

The NECPs created by the Governance Regulation fail to guarantee EU policies enforcement and EU coordination. As an example, the collective ambition of previous 2020 NECPs amounted to only 29.7% of primary energy consumption, short of 32.5% for 2030, not to mention the new energy efficiency target of 40.5%.[191] NECPs are now in the process of being updated, but this shows the lack of stringency of the EU climate governance, which offers no guarantees that aggregated national climate planning will lead to appropriate EU ambition. Besides, as a national exercise conducted bilaterally with the European Commission, the NECPs' drafting process leaves little room for EU coordination.

Member States do not properly implement multi-level governance provisions of the Governance Regulation. The Governance Regulation requires the establishment of multi-level climate and energy dialogues by Member States to create a space in which local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress.[192] The implementation of these national climate and energy dialogues has been very uneven across Member States, with mixed results especially as regards national governments' participation.[193]These national energy and climate dialogues should be properly implemented and could be used as long-term advisory groups on energy and climate policies beyond NECPs.[194]

189 Ibid.
190 Which some Member States missed at the national level see ECA 2023
191 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.
192 Art 11, Governance Regulation.
193 Energy Cities, 2023. Multi-level Governance in EU energy and climate policy – first findings from NECPlatform.
194 Ibid.

The prominence of the EU carbon market instrument in EU climate policy can be attributed to the distribution of competences between the EU and its member states. It is an answer to the difficulty to ensure national policies appropriate level of ambition, proper implementation of EU requirements, not to say achieving national policies improved coordination. Yet, carbon calls for additional policies (Box 7).

BOX 7. ETS2 and the need for additional national policies

The creation of a second EU carbon market on buildings and road transport emissions (ETS2) is a major innovation of the FF55. Yet, the building and road transport sectors' decarbonisation process is less sensitive to price than the electricity sector. In these sectors, the bulk of emissions stem from households, who face higher financing and technical barriers than businesses.

Achieving buildings and mobility transition will require additional regulatory and financing efforts. New car and existing buildings performance standards at the EU level, as well as the SCF additional funding, are welcome complements to support the transition of buildings and road mobility, but will fall short of the implementation challenges, which will have to be addressed at the national level.

For buildings and mobility decarbonisation, the EU carbon price will act like a backstop, signalling that national policy efforts should be beefed up.[195] Yet, Member States have different administrative, financial, technical capacities and will not be able to deploy adequate efforts.

I MORE FINANCIAL, TECHNICAL AND SKILLED HUMAN RESOURCES NEEDED

Although the RRF filled part of the FF55 public green investment gap, it will come to an end in 2026, at the time where many new instruments will start kicking-in. Most FF55 directives have been or should be adopted in 2023. Given the usual transposition timeline of two years, they should theoretically start taking effect in 2025. Additionally, CBAM

195 Politt, M., Dolphin, G. 2020. Feasibility and impacts of EU ETS scope extension: road transport and buildings. CERRE.

and associated free-allowances phase-out for the industry should be gradually implemented from 2026 onwards, while the EU carbon market on buildings and road transport should start in 2027.[196] For now there is no indication that the gap that will arise once RRF finishes will be filled by the next EU budget (2028 - 2034).

A socially-fair implementation of the Fit for 55 would require additional EU funding. The SCF and JTF are welcome, but will fall short of the just transition challenges (Box 8).

BOX 8. SCF and JTF will fall short of the challenges

Deep renovation financing needs to lift the 35 million Europeans who struggle heating their homes out of energy poverty would represent five times the amount of the SCF, i.e. €50 billion investment per year between 2023 and 2030.[197] The SCF will amount to around €10 billion per year to fund social compensation and green investments in buildings and mobility sectors. Even considering that the Social Climate Fund will not be the only financing stream for just transition measures, the proposed amount falls short of what is currently needed. On the other hand, the Just Transition Fund has primarily been directed towards coal-dependent regions. Yet, massive threats loom on car industry-dependent regions, and cleantech sectors need more public support to deliver the new industrial revolution. Insufficient funding and technical assistance pose a risk of exacerbating economic disparities, fostering social exclusion, and generating political resentment towards the EU and green policies. This could potentially fuel populism, especially considering the fertile ground already existing for such narratives.

More funds should be available for climate action through ETS revenues. Part of the ETS revenues is pooled for EU level funds. Around 2% and 3% of the ETS allowances are dedicated respectively to the Modernisation Fund and the Innovation Fund. The former is a facility dedicated to supporting the uptake of renewables and energy efficiency in low-income

196 Unless energy prices are too high, in such case the scheme could be delayed by 1 year.

197 Authors' estimate, based on households of 2,2 people on average, average floor per household ~74,8 m2, renovation cost estimates of BPIE

Member States, the latter to supporting innovative low-carbon technologies, especially industry decarbonisation.

Yet these funds are mostly spent at the national level, with imperfect reporting and sometimes questionable project pipeline quality. The bulk of ETS1 revenues are used at the national level. The recast of the ETS directive now mandates that 100% of these revenues are spent on climate action. Yet, so far reporting has been riddled – when available – with inconsistencies and mistakes.[198]

Appropriate technical and administrative capacity and a skilled workforce seem to be key drivers of the successful use of EU funds, which explains that so far the wealthiest regions are the greater beneficiaries of cohesion funds.[199] Lack of administration capacity is higher in less developed regions.[200] More broadly, many local and regional governments also lack the capacity to deal with the multiple energy crises and implement the European Green Deal. Besides, disbursements for green investments under RRF are slower than for projects in other areas, showing the need to strengthen technical skills and to lift coordination and planning hurdles for more complex green projects.[201]

EU financing for climate, innovation and a just transition will fall short of the needs of FF55 implementation, with the end of the RRF in 2026, the small scale of the JTF and SCF, and the bulk of ETS revenues being used at the national level with uncertainties on reporting. Green projects seem more complex to implement and calls for further technical and human resources.

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In conclusion, the European Green Deal has more sticks (EU regulations, EU carbon price) than carrots (financing, technical assistance, capacity building, proper skilling and staffing). There's a risk of a diluted

198 WWF, 2022. EU ETS revenues report 2022.
199 Rodriguez-Pose, A., Garcialo, E. 2013. Quality of government and the returns of investment. Examining the impact of cohesion expenditure in European regions. OECD Regional Development Working Papers.
200 EIB, 2023. Investment Report 2022/2023: Resilience and renewal in Europe.
201 Ibid.

ambition during national implementation, and social backlash against an already insufficient package particularly since the existing package lacks essential enabling and supporting policies. The issue is that under current EU institutional architecture, new ambition is set at the EU level, but implementation comes down to Member States, which are additionally constrained by the EU fiscal rules.

II • The RRF is not an European Green Deal Facility

From a climate investment perspective, the Recovery and Resilience Facility (RRF) has several shortcomings, primarily rooted in the challenge of reconciling the dual objectives of recovery and resilience. Recovery focuses on addressing the immediate socio-economic impacts of the crisis, while resilience places a greater emphasis on longer-term considerations. Decisions involving the allocation of hundreds of billions of euros had to be made within a short span of time. Yet the low quality of NECPs resulted in the absence of a well-prepared energy and climate investment plan. Combined with significant time constraints, this resulted in hasty drafting of NRRPs, which did not allow for the development of new high-quality green projects, limited opportunities for public and stakeholder involvement, and hindered significant actions to alleviate absorption bottlenecks.

I A MISSING CONDITIONALITY ON QUALITY ENERGY AND CLIMATE PLANNING AND REPORTING

First of all, not all projects labelled as green are green. According to an analysis of the Wuppertal Institute and E3G concluded at the end of 2021, most final recovery plans are set to miss the 37% climate spending target and were not aligned with the 2030 climate target.[202] Worse, there are significant risks that measures labelled as green may end up supporting fossil fuels, for example the development of "hydrogen" infrastructure in regions where it is unlikely to be ever used for anything else than fossil gas. As another example, building renovation programmes are a key element of climate spending under the French NRRP, however there is little

202 Green Recovery Tracker, 2021. EU Recovery: How green is recovery spending in different sectors ?EU Recovery: How green is recovery spending in different sectors ? Wupperthal Institut, E3G

data on the performance of these renovations in terms of emission reduction and energy savings, or on how many deep renovations are actually conducted.

Investments and reforms of the NRRPs are explicitly linked to the CSRs laid out in the European Semester.[203] NRRPs must include an explanation of how they contribute to addressing the 2019 and 2020 CSRs.[204] However, the 2019 CSRs simply encouraged Member States to undertake green investments.[205] Due to the pandemic and the need for a green recovery enhancing longer-term resilience, 2020 CSRs further expanded the recommendation on low-carbon investment.[206] This contrasts with 2022 CSRs, which now explicitly mention the need to reduce reliance on fossil fuels.[207]

CSRs generic recommendations on green measures contrast with the much more detailed NECPs, which lay out several hundred pages long energy and climate plans.[208] Yet NRRPs are not linked to NECPs' planning and reporting framework.[209]

One issue with NECPs is that they are currently outdated and undergoing review, to be finalised by June 2024. This highlights the need to keep climate strategies up to date so that in case of emergency and future recovery programme, speed can be combined with good governance. Allowing for more continuous updates would require revising the governance of the NECPs, to make it more agile.

The green conditionality of the RRF is on the share of spending on climate action, be it investments or reforms (37% of the total). It lacks a condi-

203 Art 18.4.b Regulation 2021/241 establishing the RRF.
204 Grigaite, K., Hecser, A., Zorpidis, A., Zsitnak, A. 2022. Country-Specific Recommendations for 2019, 2020, 2021 and 2022. A tabular comparison and an overview of implementation. European Parliament. IPOL Economic Governance Support Unit. Study.
205 Ibid.
206 Ibid.
207 2022 European Semester Spring package
208 European Commission, National energy and climate plans. EU countries 10-years national energy and climate plans for 202 – 2030.
209 Regulation 2021/241 establishing the RRF.

tionality on quality energy and climate planning. Greater alignment of NRRPs with up-to-date NECPs and the development of a climate tracking methodology[210] could contribute to fill this gap.

DEMOCRATIC INSUFFICIENCIES OF THE RRF GOVERNANCE

National recovery plans were largely developed behind closed doors, with little independent scrutiny and public participation.[211] The democratic insufficiencies of the governance of the RRF can be understandable due to time constraints, since the RRF aims at getting funds flow as quickly as possible. Yet the centralisation of the process around national governments also played a role.[212]

The public participation provision in the RRF regulation simply requires Member States to explain how they consulted stakeholders in the preparation and implementation of their NRRPs. [213] It does not outline clear rules on meaningful engagement, such as the Partnership principle that applies to cohesion funds. The Partnership principle demands the mandatory inclusion of monitoring committees composed of partners (businesses, local authorities, civil society organisations) which allow for public scrutiny, voting on calls for proposals, and to issue recommendations.[214] Therefore, involvement of local and regional authorities, as well as social partners, in drafting NRRPs has been reported as insufficient.[215]

The current process does not guarantee well-designed, evidence-based drafts and proper political ownership. The European Parliament, in its 2022 report on the implementation of RRF, underlined how crucial

210 Green Recovery Tracker, 2022. How to go about measuring alignment of funding with climate targets?
211 Ibid.
212 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.
213 Art 18q, Regulation 2021/241 establishing the RRF
214 Citizen's observatory for Green Deal financing, 2023. No recovery without citizens. Why public involvement is key to Europe's green transformation.
215 Energy Cities, 2023. How can REPowerEU Chapters make or break local transitions? Deadlines & inspiration for the next national recovery and resilience plans. Briefing.

a proper stakeholder participation was for the success of the RRF, and expressed concern over the absence or inadequacy of regional and local authorities' involvement in the NRRP drafting processes.[216] When civil society organisation proactively sent their recommendations, they were often left without response, or did not succeed to see their views properly reflected in the final drafts.

Excluding citizens, civil society and institutions of democratic control such as the European and national parliaments[217] from the recovery plans drafting and monitoring can lead to harmful investments not aligned with EU climate objectives and citizens' needs.

AN ABSORPTION CHALLENGE

With the EU recovery plan, Member States can spend significantly more EU funds than previously for economic, social and territorial cohesion. Bulgaria, Germany, Ireland, Greece, Cyprus, and Finland can spend more than twice as much as during the 2014 – 2020 period, Belgium, Denmark, Spain, France, Italy, Austria and Sweden three times more, Luxembourg and the Netherlands seven times more.[218]

Yet, an overly rigid governance framework does not support absorption and targets achievement. Disbursements are linked to achieving targets and milestones defined in the initial NRRPs. However, it has been observed that the framework is excessively inflexible, creating high administrative burden.[219] This rigidity also poses challenges in adapting predefined targets and milestones to address unforeseen circumstances and in assimilating feedback derived from implementation experiences.[220]

Allocating more EU funding to municipal staff to implement the NRRPs would improve absorption. Milestones are good for making things move,

216 EP, 2022. Report on the implementation of the RRF
217 Guttenberg, L., Nguyen, T. 2020. How to spend it right – a more democratic governance for the EU RRF. Jacques Delors Centre. Policy Brief.
218 ECA, 2023. EU Financing through cohesion policy and the RRF. A comparative analysis. Review.
219 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.
220 Ibid.

but national authorities need to ensure local authorities have the capacity to get things done in time. Yet some plans did not allow for expenditure for technical assistance, for example in Italy.[221] Implementation of investments in case of inadequate involvement of domestic stakeholders in the NRRP drafting process leads to reduced projects' quality and deficient implementation.[222]

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The lack of already existing quality green investments and reforms pipeline, combined with recovery's time constraints, led to hasty drafting of NRRPs. Public participation deficiencies raise further questions over the quality of the projects put forward by national governments. Lastly, the governance has been found too rigid in the face of unforeseen circumstances, such as the energy price crisis or renewed attention to clean industrial policy.

In sum, the RRF is a tremendous breakthrough for EU energy and climate financing, but as for any innovation, lessons can be learned from real life experimentation. If it was to be replicated, the RRF governance should be:

- **greener,** linking financing with the implementation of the FF55, and based on better quality energy and climate planning,
- **more democratic**, with greater involvement of the EP, local and regional authorities, and other stakeholders,
- **more agile,** to adapt to a highly uncertain geopolitical, social and economic environment.

III • An incomplete Energy Union

The scale of the energy price crisis laid bare the inadequacy of the Energy Union to face such a major challenge, and demonstrated the need to strengthen it. The answer to the energy crisis has been too national, leading to economic divergence and weak EU coordination. The Energy Union still lacks adequate funding to effectively support

221 Ibid.
222 Ibid.

collective efforts and policy coordination, while potentially impactful regulatory provisions are insufficiently European, insufficiently binding, and too temporary.

A TOO NATIONAL ANSWER TO THE ENERGY CRISIS

2022 can be seen as an illustration of the past and remaining shortfalls of EU and national energy policies. The delay in the transition led to over-exposure to fossil fuel supply disruption and high prices,[223] while the lack of integration of EU energy policy led to emergency common measures that show the added value of the EU solidarity in the face of great challenges.

Gas market coordination is an example of interdependency and the value of a common EU approach: there is a need to ensure refilling of storage, gas demand reductions, access to new supply, and uninterrupted gas flows where it is most needed. A failure of national governments to coordinate would lead to an overall less secure,[224] sustainable and more expensive system. **External unity demands internal solidarity.**

Yet despite the progress highlighted in part 1, **the policy response has so far been too national, which could undermine the goals of calming the energy markets and achieving ambitious climate targets.** EU governments prioritised national interests over an integrated European approach on security of supply and affordability.[225]

The difference in policy response between covid and the energy crisis is striking, and was underlined by several analysts and governments pushing for a more European answer.[226] Of course, energy is a much more complex commodity than vaccines. However, the pandemic trig-

223 Bazilian, M., Goldthau, A. 2023. Russia's war in Ukraine: green policies in a new energy geopolitics. New Security Beat. Guest contributor.

224 Less secure for the low-income landlocked Member States that lack the funds and infrastructure to secure energy supply, making the EU system as a whole less secure.

225 McWilliams, B., Sgaravatti, G., Tagliapietra, S., Zachmann, G. 2022. A grand bargain to steer through the European Union's energy crisis. Bruegel. Policy Brief.

226 Reuters, 2021. France, Spain urge pan-European response to the energy price surge. 04/09/2022; Pisani-Ferry. J. 2022. Europe's Looming Energy Disaster. Project Syndicate.

gered a joint recovery funding effort financed by a common EU borrowing scheme, joint purchase and a fair distribution of vaccines across the EU. On the other hand, during the energy crisis, Member States were unable to reach a consensus on mandatory common gas purchase. To preserve competitiveness and national social cohesion, they resorted to providing national subsidies equivalent to the entire Recovery and Resilience Facility (RRF) allocation in just one and a half years. These substantial subsidies have placed a significant strain on national budgets and are currently posing a threat to the integrity of the EU single market.

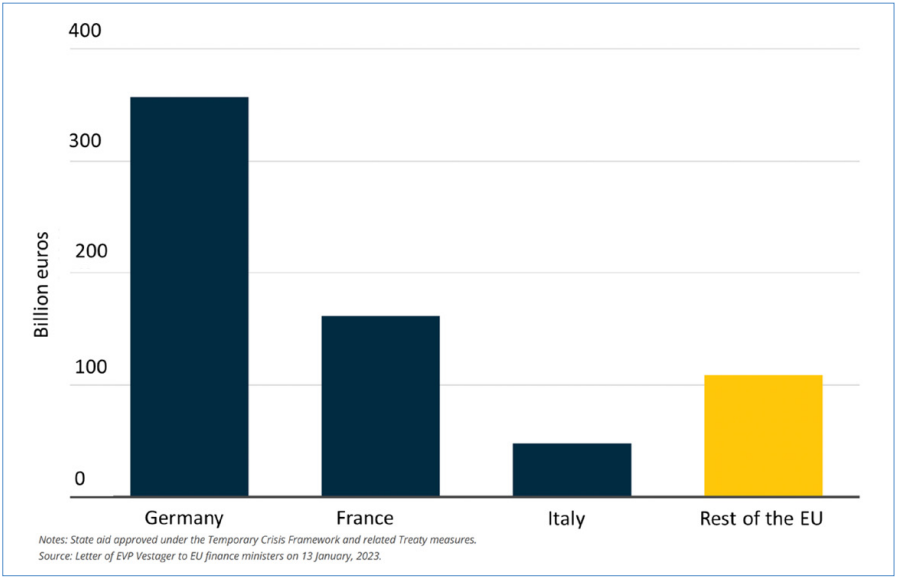
The use of more flexible state aid rules raises fears of a new fragmentation of the single market. By leaving the way open for Member States to subsidise their industry, there is a risk of accentuating inequalities in the treatment of businesses from one country to another, especially as the response to these growing challenges comes at a difficult time for national public investment in Europe.

State aid support was not evenly distributed across the EU. In January 2023, just three countries accounted for 84% of the total support : Germany (53%), France (24%) and Italy (7%).[227] These figures reflect the lack of a common EU strategy.[228]

227 Euractiv, 2023. EU Commission's Vestager proposes change to state aid rules (13/01/2023)

228 Pisani-Ferry. J. 2022. Europe's Looming Energy Disaster. Project Syndicate.

FIGURE 6. Distribution of state aid under the Temporary Crisis Framework (March - Dec 22)



▲ Source : Euractiv, based on European Commission 2023.

Economic divergence reflect variations in national energy mixes and different national policy reactions to the energy price crisis. The IMF estimated that the pass-through of wholesale to retail gas prices varied from less than 10% to over 40%.[229] At the peak of the crisis in Autumn 2022, inflation rates ranged from 6% in France to 24% in Estonia.[230] Since Member States were free to choose their fiscal answer to the price hike, this resulted in incoherent action at the EU level.

Lastly, the impossibility to agree on a Russian gas embargo displays a lack of unity of Member States due to vast differences in the national level of dependency to Russian gas.[231] EU common action involving core

229 IMF, 2022, in Pisani-Ferry. J. 2022. Europe's Looming Energy Disaster. Project Syndicate.
230 Eurostat 2022. Annual inflation up to 9,9% in the euro area.
231 Mišík, M., Nosko, A. 2023. Each one for themselves : exploring the energy security paradox of the European Union. Energy Research & Social Science.

security and geopolitical concerns can be delayed and watered down if the differentiated economic impacts across Member States is not properly taken into account, including through EU financial compensation.[232]

ENERGY UNION STILL FALLS SHORT ON FINANCING, REGULATION AND GOVERNANCE

The mobilisation of RRF for REPowerEU raises some of the following challenges pointed out by the European Court of Auditors.[233]

- **Unlike during the COVID-19 pandemic, no EU grants were made available.** The remaining loans from the Recovery and Resilience Facility (RRF) can be utilized for REPowerEU actions, but they will place additional strain on Member States' budgets within a tightening fiscal context. EU fiscal rules, which were suspended during the pandemic, are scheduled to be reinstated in 2024.[234]
- **RRF relies on measures identified solely at the national level to achieve EU-wide objectives.** This approach introduces a risk of discrepancies and gaps between individual Member States' priorities and the overarching objectives of the European Union as a whole to increase the resilience of the EU energy system[235]
- **The limited timeframe to request and implement RRF funds (2026) may not be appropriate for some REPowerEU objectives (potentially up to 2030),** especially for the long-term measures required to address energy efficiency, transmission bottlenecks and skills.[236]
- The REPowerEU amendment of the RRF regulation,[237] **provides a general exemption to the 'do-not-significant-harm' principle, on the ground of improved security of supply.**[238] This illustrates the tension between short-term security which still relies on fossil fuels, and long-term resilience.

232 Redeker, N. 2022. Same shock, different effects. EU member states' exposure to the economic consequences of Putin's war. Jacques Delors Centre. Policy Brief.
233 ECA, 2022. Opinion 04/2022 on the proposal of REPowerEU chapters in RRPs.
234 Ongoing negotiations over a reform of these fiscal rules are not expected to conclude by the end of 2023.
235 ECA, 2022. Opinion 04/2022 on the proposal of REPowerEU chapters in RRPs.
236 Ibid.
237 See for CEE country progress up to March 2023 in CEE Bankwatch, 2023. REPowerEU Chapters Factsheet.
238 ECA, 2022. Opinion 04/2022 on the proposal of REPowerEU chapters in RRPs.

The Energy Union still lacks adequate funding to effectively support collective efforts and policy coordination, whether addressing short-term security of supply challenges or addressing longer-term transition needs and heightened climate ambitions resulting from the conflict in Ukraine. The affordability and competitiveness shock was mostly mitigated through national state aid and uncoordinated national schemes.

Potentially impactful regulatory provisions are insufficiently European, insufficiently binding, and too temporary. Despite the many improvements and breakthroughs in EU energy policy, joint gas purchase and gas demand reduction, the most meaningful solidarity instrument, remain voluntary and/or temporary. Mandatory gas demand reduction looks particularly crucial both for increased security of supply and sustainability.[239] Lastly, the bilateral gas security of supply solidarity agreements between Member States are useful, but an EU-wide approach would be preferable, as repeatedly advocated by the European Commission and some Member States, such as Spain who was pushing for a strategic European gas reserve and joint gas purchase to increase EU's bargaining power.[240]

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During the energy price crisis, weak EU financing and regulatory framework negatively impacted policy coordination. Existing governance mechanisms proved insufficient, with the answer to the crisis heavily skewed towards national measures, with the EU actually providing derogations to EU requirements, for example on the gas demand reduction targets.[241] Too limited improvement of collective action, despite the common threat, and the great alignment of climate, security and affordability objectives, can be attributed to differences in energy mixes and diverging impacts of the crisis on national economies.[242]

239 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

240 Reuters, 2021. France, Spain urge pan-European response to the energy price surge.

241 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

242 Schramm, 2023. Some differences, many similarities: comparing Europe's responses to the 1973 oil crisis and the 2022 gas crisis. European Political Science Review.

Overcoming these challenges is a deeply political issue. Agreeing on NGEU required a substantial amount of political capital within the Council, the EU Commission, and the European Parliament. The energy crisis emerged shortly after the pandemic, when the RRF was still in the early stages of its implementation. This placed the EU in a challenging position to achieve another political breakthrough and left little room for ambitious immediate emergency responses.

IV • A timid EU green industrial policy still in its infancy

The Green Deal Industrial Plan, despite being a step in the right direction, suffers from similar issues, with a regulatory framework too centred on the national level, the lack of EU financing and a loose governance framework which does not support adequate EU-wide coordination.

I A SHALLOW REGULATORY PUSH

The regulatory push remains shallow. The NZIA sparked little enthusiasm in the political and industrial ecosystem, due to the lack of concrete instruments to achieve the new target of 40% of European production in clean technologies, a figure that is, moreover, unsubstantiated. Apart from carbon capture, the law contains no quantified targets by sector, even though vulnerabilities and the need to deploy new industrial capacity vary greatly from one technology to another and depend on the stage in the value chain under consideration. Additionally, the list of net-zero technologies excludes some key sectors such as energy efficiency and near-zero materials.

The central innovation of the NZIA and CRMA is the introduction of the status of "strategic projects" which would allow selected projects to benefit from accelerated permitting processes. Yet, skills and access to funding tend to be the greatest barriers to manufacturing projects.[243] Additionally, NZIA only has weak provisions on green public procurement, although it could be instrumental. The "sustainability and resilience" award criteria of the NZIA can be waived if the domestic offer

243 EIB, 2022 in Tagliapietra, S., Veuglers, R., Zettlemeyer, J. 2023. Rebooting the European Union's Net Zero Industry Act. Bruegel. Policy Brief.

would result in a disproportionate cost[244], therefore making the provision ineffective in many cases.

To avoid a mining boom, the circular economy and sufficiency requirements should also be strengthened. Yet, the CRMA recycling target is only indicative. Making it mandatory would be a first step towards the establishment of an ambitious recycling industry. Only 12% of the materials used in European industry come from recycling. A sufficiency approach would further prioritize essential energy uses and make sure the raw materials mined are not wasted for inefficient uses.

AN INSUFFICIENT FINANCING PILLAR

It is not necessary to respond to the IRA with perfectly equivalent amounts because of the robustness of the European regulatory framework. The Fit for 55 already sends a strong signal to industry, with targets for greening the economy in all sectors and a high carbon price, currently around €80 per tonne of CO2. The EU has theoretically equivalent or even greater funding than the US available for the deployment of electric vehicles, renewable energies and green industry.[245]

However, the differences in funding between the United States and Europe are in practice far from trivial. IRA subsidies to industry are uncapped, hence potentially up to seven times higher than the EU funding available to the cleantech industry. Besides, EU support for the manufacturing industry is more fragmented and more difficult to access, and does not provide the same long-term (up to 10 years) visibility as the US tax credits.[246]

A potential new European Sovereignty Fund would have contributed to limit economic divergences between Member States in responding to IRA, yet the initial ambition was eventually largely reduced to existing

244 Defined as a cost gap of more than 10% between the domestic and the foreign technology.

245 Kleimann, D., Poitiers, N., Sapir, A., Tagilapietra, S., Véron, N., Veuglers, R., Zettelmeyer, J., 2023. How Europe should answer the US Inflation Reduction Act, Bruegel. Policy Brief.

246 The vast majority of tax credits will be granted for ten years, i.e. until 2031/2032, and are based on the date of construction, which means that a project started in 2030 could benefit from subsidies until 2040.

funds' reshuffling. To this end, a European Sovereignty Fund to support domestic industry has been floated around by the Commission, but abandoned in June 2023. Given the low political appetite for such a proposal among some Member States, the Commission proposed the modest Strategic Technologies for Europe Platform (STEP) to support European leadership on critical technologies, instead of the envisaged EU Sovereignty Fund. STEP is close to the minimum option of reorganising existing funds within the European budget without additional expenditure.

The financial pillar of the GDIP is insufficiently ambitious in relation to the issues at stake. The Commission considers that the current European budget is not adequate to support the EU's industrial objectives for its Green Deal, while ensuring a level playing field between Member States.[247] STEP was presented as the precursor of a fully-fledged EU Sovereignty Fund by von der Leyen.[248] The think tank Agora Energiewende estimates that public funding needs to scale EU manufacturing to minimum insurance levels are between €164 and 180 billion for 2022 – 2034.[249] The same analysis expects the public funding needs to triple in the next EU budget period (2028 – 2034).

THE NEED FOR A EUROPEAN INDUSTRIAL STRATEGY

An effective industrial policy for the European Green Deal would require greater foresight and policy coordination. This would involve an EU-wide assessment of the manufacturing needs against our climate targets, to clarify the EU strategy regarding the sectors in need of support, taking into account supply vulnerabilities depending on the global context.[250] Skills shortages are a major barrier, yet the NZIA doesn't introduce a strategy to address these. Net-Zero Academies remain quite unsubstantiated, limited to existing initiatives' coordination through the

247 EC, 2023a. Staff working document on investment needs to strengthen EU's Net-Zero technology manufacturing capacity SWD(2023)68 final

248 European Commission, 2023. EU budget: Commission proposes STEP to support European leadership on critical technologies. Press release.

249 See Agora Energiewende and Agora Industry, 2023. Ensuring resilience in Europe's Energy Transition: the role of EU clean-tech manufacturing.

250 Jansen, J., Jäger, P., Redeker, N. 2023. For climate, profits, or resilience? Why, where and how the EU should respond to the Inflation Reduction Act. Jacques Delors Centre. Policy Brief.

Net Zero Europe Platform.[251] There is a need to coordinate the multitude of industrial policies initiatives already existing at the EU, national and regional levels.[252] Yet the NZIA does not provide instruments to that end.

EU oversight of national decisions over the selection of "strategic projects" will be minimal. The Net Zero Europe Platform is not tasked with the goal to ensure that the right projects are selected, or that NZIA objectives are met efficiently. To that end, an EU-wide strategy would be required. The Net Zero Platform, conceived as a forum to exchange best practices instead of a real steering and coordination body, will not address the fragmentation of industrial strategies, and the governance centred around national governments risks worsening the fragmentation further.[253]

Yet for greater national action and EU coordination, the EU needs to be able to offer incentives.[254] There is a need to encourage governments with the deployment of cleantech manufacturing, especially as the temptation remains high to keep going with traditional industry players, as illustrated by Romania's plans to develop new offshore gas fields. When incentivizing and planning for cleantech manufacturing rollout, particular attention should be paid to the inclusion of vulnerable Member States and regions, as well as smaller players, especially SMEs, to generate positive redistributive impacts for European cohesion.

Social impacts must be anticipated. The Slovak or Spanish NRRPs do not address the transition effect in the car industry employment, although the job losses are already reported in manufacturing facilities shifting to electric-vehicle production.[255]

251 This raises the question of how the NZIA Net Zero Academies will work with the existing EU initiatives on skills, such as the skills agenda and the pact for skills, and answer to the need to develop skills intelligence to ensure training programmes alignment with future labour markets.

252 Tagliapietra, S., Veuglers, R., Zettlemeyer, J. 2023. Rebooting the European Union's Net Zero Industry Act. Bruegel. Policy Brief.

253 Ibid.

254 Ibid.

255 3000 jobs lost at the Volkswagen plan in Brastislava, for a case study see Nelli, L., Virgillito, M.E., Roventini, A. 2022. Policy challenges and policy actions for a just climate transition. Five recovery plans in comparison. FEPS. Recovery Watch. Policy Study.

Adopting a comprehensive value chain approach would contribute to fostering greater social acceptability and economic convergence. Industries need abundant and cheap access to energy. The shift to clean energy is partly reshuffling the geographical distribution of areas favourable for industrial development. The infrastructure (grids), social and economic implications thereof should be properly anticipated. For example, mining and refining have a comparatively lower GDP and employment impact than battery cell production,[256] although environmental impacts are significant. Cohesion, just transition and convergence considerations should be fully part of the EU industrial policy foresight.

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The challenges with the FF55/REPowerEU implementation, answers to the energy price crisis and the IRA are strikingly similar. It reflects the imbalance in EU's institutional development. On the one hand, it has a powerful judicial system and an extensive body of law. On the other hand, it lacks fiscal, administrative and coercive capacity required to complement its regulatory powers.[257]

V • The political challenge of European Green Deal additional regulations adoption

I THE EUROPEAN GREEN DEAL GOES BEYOND THE FF55

The von der Leyen mandate has been characterised by an intense EU regulatory activity, and new laws need to be implemented at the national level.

Yet, additional EU regulations are still needed to achieve the EU climate and security ambitions, and lay the ground for post-2030 decarbonisation pathway towards climate neutrality. The EU Climate Law introduced binding targets on both greenhouse gas emission reduc-

256 Patuleia, A., Waliszewska, A. 2023. Making clean technology value chains work for EU economic convergence. E3G. Report.

257 Kelemen, R.D., McNamara, K.R. 2023. State-building and the European Union: Markets, War, and Europe's Uneven Political Development. Comparative Political Studies.

tions and carbon natural sinks greenhouse gas emissions absorption. Improving the carbon absorption capactiy of EU land and forests requires additional action on biodiversity. Besides, the EU Climate Law foresees that the European Commission will propose an EU target for 2040 and the associated policy package in 2024. The 2040 emission reduction target recommended by the European Scientific Advisory Board on Climate Change is 90 to 95%.[258]

Amidst the prevailing energy security and competitiveness crisis, there are three regulatory themes that so far have received relatively insufficient attention: electric grids, cleantech manufacturing and supply chains, and demand reduction, including sufficiency policies. These areas require renewed political focus and commitment to ensure their advancement. For example, supporting cleantech innovation in the area of critical raw materials would require additional regulatory standards, to reduce processing waste, recover materials and reduce the use of harmful chemicals, while using water more efficiently.[259]

The incremental alignment of our regulations with climate neutrality is delaying the transition and creating an unsteady environment. Part of the high workload for policy makers in the field of energy is due to the conjunction of crises, the pandemic, energy price crisis, competitiveness and cleantech risk, but it is also a result of the lack of ambition of the past framework.

The FF55 was the third 2030 energy and climate framework update. Initially adopted in 2014 with the headline targets of 40% emissions cuts, 27% renewable energy, and 27% energy efficiency, the framework was then revised under the 2019 Clean Energy for All Europeans package as part of the Energy Union under Juncker's term. The Clean Energy package further raised the renewable and energy efficiency targets and included a review of the electricity market design. Each review attempts to address the ambition gap left out during the negotiations.

258 ESABCC, 2023. Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030 – 2050. Report.

259 Davis, R. 2023 Doing more with less : A European Critical Raw Materials Strategy fit for Cleantech Competitiveness. Cleantech for Europe. Report.

THE RISK OF REGULATORY FATIGUE AND TURNING POLITICAL TIDE

Short-term domestic priorities over cost-of-living and fears of over-ambitious policies may increase national governments' reluctance to enact additional regulations. This is worsened by the rise of anti-climate right-wing populists across Europe. In many Member States, extreme-right populism is on the rise, with recent examples in Italy, France and Sweden.[260] They tend to embrace an anti-climate narrative.[261]

The European Parliament is witnessing shifting political preferences on climate action, especially on topics touching upon agriculture and biodiversity. In Summer 2023, a political battle emerged against an ambitious nature conservation law, championed primarily by the European People's Party (EPP). The EPP, alongside a faction of the centre-right represented by Renew, underscored the importance of implementation, instead of additional regulatory efforts, echoing the "pause"[262] advocated by French President Emmanuel Macron and Belgian Prime Minister Alexander De Croo in May 2023.

The EPP signals a lower willingness to adopt the regulations necessary for the European Green Deal in the next term. This is a very worrying political dynamic that creates a less favourable context for the negotiations of the current files and future 2040 framework. Time will tell if these cleavages are here to stay, but the concerns over implementation challenges should be adequately taken into account.

As the European Green Deal enters its implementation phase, mishaps in green policies implementation might fuel political backlash. The

260 Silver, L. 2022. Populists in Europe – especially those on the right – have increased their vote shares in recent elections. Pew Research Center.

261 as illustrated by the reaction of hard-right Prime Minister Giorgia Meloni to the devastating floods that hit Northern Italy in May 2023, where she blamed climate policy instead of pointing to the consequences of the delay in addressing climate change, which will lead to more frequent extreme weather events. Tocci, N. 2023. After two years of real progress in climate, a European 'greenlash' is brewing. The Guardian. 12/07/2023

262 Particularly targeting environmental norms and biodiversity conservation issues, and introducing a distinction between emission reduction needs and emission absorption needs, although the latter is fully integrated into the European Green Deal emission reduction objectives and enshrined in the EU Climate Law.

recent popular backlash against the gas boiler ban in Germany, that pitched chancellor Olaf Scholz's government into its worst crisis since taking office,[263] is a good illustration of how ill-designed climate policy can have adverse effects of social acceptance, political support and emissions reduction.

Making the transition easy for the consumer is a difficult task for policy-makers. Government should make sure that sufficient workforce is available, combine phase-out policies with timely alternative infrastructure development, and make sure the administration has enough capacity to handle the new subsidy and technical support schemes.

Providing good job opportunities should be at the core of European Green Deal implementation and additional regulations adoption, but requires active specific policies and strengthening the social dialogue. The fossil industry tends to provide higher-than-average wages, better labour protection and representation than other sectors.[264] The decline in secure, good jobs seems to be the fundamental cause of nativist politics[265] that tend to be anti-climate.

More broadly, there is a need to strengthen the Energy Union toolbox to support the delivery the European Green Deal at all government levels. This will be addressed in part 4.

Conclusion. New instruments fall short of the challenges

Member States are facing huge economic, industrial, social, political and democratic challenges that no country can face on its own. On the other hand, common action, if correctly implemented, can lower the cost of action and increase EU welfare.

263 Chazan, G. 2023. 'Outraged and furious': Germans rebel against gas boiler ban.'Outraged and furious': Germans rebel against gas boiler ban. The Financial Times. 26/05/2023

264 Le Merle, K., Tribukait. I. 2023. Improving territorial justice. Transparency, inclusiveness, capacity building and strategy in the Territorial Just Transition Plans. FEPS. Policy Brief.

265 Rodrik, D., Sabel, F. C. 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty Research Working Paper

In the face of the multiple crisis, preserving the EU cohesion and the single market from further fragmentation calls for new instruments to foster more collective action. The successful implementation of the European Green Deal raises the question of how to ensure reasonable energy prices (affordability and competitiveness) while steering our energy system through the transition and maintaining security of supply.

The Energy Union lacks appropriate governance and financing tools to foster more ambitious regulations, coordination and solidarity that would allow for the fulfilment of its three policy objectives.

- The implementation of FF55/REPowerEU calls for a renewed governance that fosters better EU coordination and includes more incentives towards EU law implementation at the national level.
- The RRF filled part of the green investment gap, but if replicated, its governance should be greener, more democratic, and more agile.
- During the energy price crisis, weak financing and regulatory framework negatively impacted policy coordination. Existing EU governance mechanisms proved insufficient. The answer to the crisis is heavily skewed towards national measures, with the EU actually providing derogations to EU requirements, for example on the gas demand reduction targets.[266] Despite a common threat, and a great alignment of climate, security and affordability objectives, improvement of collective action during the energy crisis was too limited. This can be attributed to differences in energy mixes and diverging impact of the crisis on national economies.[267]
- The EU did not yet manage to find the same political impetus to answer the energy price crisis or the cleantech manufacturing challenges with the same level of ambition as the covid crisis.

The key to this challenge is agreeing on the allocation of costs and the distribution of risks among stakeholders. This is a matter of common financing, policy coordination and governance. Strengthening these

266 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

267 Schramm, 2023. Some differences, many similarities: comparing Europe's responses to the 1973 oil crisis and the 2022 gas crisis. European Political Science Review.

tools seems key to preparing the political space for the adoption and implementation of the additional regulations we need to achieve climate neutrality.

The green transition requires different types of resources: expertise, financing, organisational capacity, legitimacy and leadership.[268] Reorienting and creating these resources is a political choice, and reaching a political agreement requires identifying and lifting blocking points. The next section will attempt to define policy pathways to overcome some of the current blockages.

268 Schmitz, H. 2015. Green Transformation. Is there a fast track ? in Scoones, I., Leach, M., Newell, P. (Eds.) The politics of Green Transformations. Routledge.

Part 4.

Policy pathways for a stronger Energy Union to support the European Green Deal

Looking ahead to a bold 2040 framework aimed at tackling the remnants of the FF55, it is clear that additional regulatory measures will be essential to sustain the ongoing execution of the European Green Deal, set to extend until 2050. What does the EU need in order to achieve successful climate action implementation and continued political support for the additional regulations? This section aims at investigating policy pathways for a successful implementation of current energy and climate policies and a successful pursuit of the European Green Deal.

The key findings revolve around the following areas for action : politics, governance and funding.

1. Politics: three complementary avenues should be explored to build up broad political buy-in for climate policies.

- Climate policies should be effective and socially fair, with well-documented impacts.
- The democratic functioning of the EU should improve to overcome institutional deadlocks, including through improved citizen and stakeholder participation to decision-making. This could be done through institutionalized deliberative democracy and multi-stakeholders' exchange platforms closely tied to the decision-making process at all levels of government.
- The current unprecedented alignment of energy challenges provides a fertile ground for new and expanded coalitions to support mass deployment of clean solutions. A priority for the years to come should be to build and expand strategic public – private – civil society alliances in favour of the energy transition.

2. Governance: addressing climate change calls for renewed governance models that would allow for a sustained policy effort, an adaptability to new challenges and new knowledge, and the integration of different stakeholders, government levels, and sectors.

The EU needs an integrated Energy Security Strategy on clean manufacturing, supply chains, and infrastructure, including a renewed focus on demand reduction. More specifically, it should particularly include reflections on the next steps towards: an ambitious implementation of the Energy Efficiency First (EE1st) principle and the update of the EE1st principle into a new "Energy and Material Demand Reduction first" principle that would include sufficiency and natural resources use, and a

stronger external unity by further operationalising joint purchase of gas through the EU Energy Platform and moving forward on the proposal to replicate this approach with critical materials.

The EU energy and climate governance should shift to an interactive, "diagnostic monitoring" governance model, taking inspiration from the US DARPA, or existing arrangements that address environmental externalities. The current "compliance monitoring" model for planning and disbursement of EU energy and climate related funding (like the NRRPs) assumes a stable and homogeneous environment that would allow detailed plans to be translated into precise instructions for agents to execute. On the contrary, "diagnostic monitoring" aims at facilitating and organising collective problem-solving towards a common objective in a context of uncertainty. It leaves space for experimentation and collective learning, as well as pragmatic innovation towards a common goal delivery.

An improved EU energy and climate governance requires adequately staffed and skilled teams at all government levels (EU, national and local) and across stakeholders. The EU should to contribute to the upcoming effort to provide the human and technical resources needed for a successful acceleration of the energy transition. This would help foster efficient, high-quality and balanced participation in policy design and implementation. Ultimately, this would support both absorption of EU funds and achievement of policy objectives.

Under a renewed governance model based on a more interactive and iterative process, policy evaluation and monitoring will be crucial to adjusting policy solutions to the diversity of local situations in a context of uncertainty. The distributive issues of the transition, past policy effectiveness, energy and material resource requirements, supply chains vulnerabilities, and the trade-offs between supply expansion and demand reduction are key topics that need further investigation. EU institutions should invest more intellectual and financial resources into in-depth analyses on the impacts of climate policies. A first step to that end could be the creation of a European Energy Agency, which would strengthen the knowledge infrastructure on energy matters, providing open data and enabling the development of autonomous tracking tools and evaluations. It would contribute to build informed public opinions.

3. Financing: the EU should contribute to the additional funding needs to achieve the European Green Deal in an increasingly adverse environment

Energy security, competitiveness and climate action have the characteristics of EU public goods. The lack of EU funding to ensure appropriate burden-sharing proved to be a barrier to ambitious EU energy action and implementation in 2022. Moreover, cost-sharing and risk-sharing are a core issue of political support for the transition. Distributive issues, justice and equity also increasingly appear as key elements of energy security and climate policies. This advocates for stronger public action to mitigate the distributive issues of the transition and bear the additional cost of increasing the resilience of the energy system.

EU climate-related financial tools, including subsidies, must increase in order to execute the European Green Deal. Without additional resources (financial but also technical and human), it will be difficult to implement and further strengthen the regulatory framework. The relaxation of state aid as the result of the energy and competitiveness crises, along with uncoordinated emergency answers, is dangerously leading to single market fragmentation. On the contrary, EU financing would allow for a more united, cost-effective policy answer to the current challenges.

I • Politics: aligning actors' preferences with climate neutrality

The European Green Deal was the result of a political dynamic in favour of climate action fuelled by social movements, including from the youth and academics, as well as the results of the 2019 EU elections.[269] According to a July 2023 Eurobarometer, four years down the road, a majority of citizens still favour an acceleration of the green transition.[270] Yet, this

269 The IPCC Special Report on Global Warming of 1.5°C from October 2018 announced that the world had only 12 years left to mitigate climate change. To remain below 1.5°C, global CO2 emissions must peak in 2020, be cut by 45% by 2030, and reach net zero by 2050. The IPCC report fuelled a new wave of social movements for climate action, with the birth and rise of Fridays for Future, Extinction Rebellion, and global climate strikes.

270 European Commission, 2023. Eurobarometer: Majority of Europeans consider that the green transition should go faster.

does not tell us what kind of energy transition would be favoured by citizens and stakeholders.

As climate action changes gear, the conflict between the old and the new development paradigm will heighten. This subsection will explore three avenues for ensuring that as many actors as possible embrace the new paradigm. There is a need to design effective and progressive climate policies with well-documented impacts, to improve the democratic functioning of the EU to overcome institutional deadlocks, and to build and expand new public – private – civil society organisation political alliances.

EFFECTIVE AND PROGRESSIVE CLIMATE POLICIES WITH WELL-DOCUMENTED IMPACTS

Citizens' support for climate policies depends on policy design. A recent study by the OECD and the Social Economics Lab at Harvard investigated the characteristics and beliefs of citizens towards climate policies,[271] based on a survey of over 40 000 people conducted in 20 high- and middle-income countries, including Poland and Ukraine. Interestingly, worrying about climate change doesn't strongly predict what people think about policies.[272]

The three key criteria for social acceptability of the transition laid out by the study are: the effectiveness of the policy in reducing emissions, **social justice**, i.e. the fairness of the costs and benefits distribution, not hurting the most vulnerable, and **self-interest**, i.e. the policy does not financially hurt the respondent.

It is important to develop and provide quality information on the impact of climate policies on the above criteria. Knowledge and communication around how climate policies reduce emission, and the distribution of costs and benefits (winners and losers) of the climate policy enhances acceptance.[273] Yet, this information is often lacking in the first place. Improving the knowledge infrastructure around the energy transition

271 Dechezleprêtre, A., Fabre, A., Kruse, T., Planterose, B., Sanchez Chico, A., Stantcheva, S. 2023. Fighting climate change: international attitudes towards climate policies. Harvard Social Economics Lab

272 Ibid.

273 Ibid.

policies seems a key precondition to rebuild consensus around climate action.

Focusing on the effectiveness of the policy, equity and actors' self-interest could foster political buy-in within national and local governments, businesses and other stakeholders. But be it for governments, businesses or trade unions, turning the transition from a constraint to an opportunity calls for active policies that consider the differentiated capacity to act. Renewed attention should be given to ensuring adequate financial and technical support for the concerned actors to make alternatives to fossil fuels both attractive and easy to adopt.

Fostering large deployment of alternatives before or while increasing climate ambition would favour political support:

- **Among citizens.** In the OECD/Harvard study, citizens expressed support for green infrastructure programmes (public transport) and subsidies for low-carbon technologies (heat pumps) and clean solutions (building renovation). These results are coherent with other opinion polls.[274] Expanding the accessibility of public transportation led to an increase in support for banning combustion engine cars.[275] Citizens' opposition to climate policies is correlated with "carbon dependence",[276] i.e. the lack of public transport, high car use, high gas expenses.
- **Among businesses.** From the perspective of businesses, buy-in can be secured through clean public infrastructure programmes such as grid development, which facilitates the integration of renewable and cleantech manufacturing projects, or easing access to EU funds for small cleantech innovators.[277]

274 Such as the Ipsos/BNP Paribas, 2023. Just Transition Global Report conducted on 9 EU Member States, or in France, RTE/Ipsos, 2023, Étude sur les mécanismes de décision des Français en matière de consommation énergétique.

275 Dechezleprêtre, A., Fabre, A., Kruse, T., Planterose, B., Sanchez Chico, A., Stantcheva, S. 2023. Fighting climate change: international attitudes towards climate policies. Harvard Social Economics Lab

276 Socio-economic factors play a role, but are less important compared to "carbon dependence"

277 Small cleantech innovators struggle to access the EU Innovation funds because of complex application processes and selection criteria. Humphreys, C. 2023. The sharpest tool in the box: how to strengthen the EU Innovation Fund for climate competitiveness and security. I4CE. Climate report.

- **Among governments.** From the perspective of national and local governments, the cleantech industrial revolution brings opportunities for local economic development and economic convergence within the EU.[278] Beyond industry, green economic activities such as energy renovation show great potential for job creation and have other benefits like improved public health and productivity.[279]

Acknowledging actors' self-interest calls for continued attention on solidarity and burden-sharing. It is necessary to deal with both agents of change (prospective winners) and agents of resistance (prospective losers).[280] Initiatives like the JTF and SCF should be either scaled-up or the approach mainstreamed across EU policies, to provide appropriate upfront investments, technical assistance and training to the most exposed to fossil fuel phase-out.

I A DEMOCRATIC RENEWAL FOR BOLDER CLIMATE ACTION

Citizens are more open to binding measures and ambitious action than governments. Recent research comparing the outcomes of the citizen assemblies on climate (Box 9) with the NECPs in Austria, Germany, Denmark, Spain, Finland, France, Ireland found that climate assemblies recommendations are more in favour of regulatory instruments and sufficiency measures than the NECPs.[281]

BOX 9. New forms of deliberative democracy: citizen assemblies

In the EU, citizen assemblies are a relatively novel method of participatory democracy, and more specifically deliberative democracy. It has become popular in the EU since the 2008 financial crisis, with deliberative platforms

278 Patuleia, A., Waliszewska, A. 2023. Making clean technology value chains work for EU economic convergence. E3G Report.

279 See Renovate EU 2050 Infographic ; Kerneis, K., Defard, C. 2023. The multiple benefits of energy efficiency. REFEREE. Policy Brief.

280 Schmitz, H. 2015. Green Transformation. Is there a fast track ? in Scoones, I., Leach, M., Newell, P. (Eds.) The politics of Green Transformations. Routledge.

281 Lage, J., Thema, J., Zell-Ziegler, C., Best, B., Cordroch, L., Wiese, F. 2023. Citizens call for sufficiency and regulation – a comparison of European citizen assemblies and National Energy and Climate Plans. Energy Research & Social Science. Vol 104.

(also called "Citizens' panels", citizen assemblies, or deliberative polls) created at the local, national level and European level.[282] The latest EU-wide experience was the Conference on the Future of Europe, which took place in 2021-2022. It usually consists of randomly chosen citizens representative of society's diversity in terms of geography, gender, age, and socio-economic background.

The deliberative process makes space for open discussion, hearing diverse and opposite arguments from experts and their fellow citizens. Unlike representative democracy, which relies on voting in elections, or direct democracy, which involves, for example, voting in referendums, deliberative democracy methods do not require citizens to hold pre-established opinions on the issue at hand. Such opinions are likely to be heavily influenced by the information available in the public debate, which is not always balanced, and the person's daily experiences, which can be blind to the diversity of social realities.

During the deliberative experience, citizens are expected to revaluate their initial perspectives and collectively come to a fresh, shared understanding, which forms the basis for the legitimacy of the deliberative process's outcomes. Experience has shown that participants are both capable and likely to change opinion,[283] even on contentious topics, like climate change mitigation.

A space protected from vested interests. In addition to the power of argumentation and balanced debate, other citizens are more likely to trust decisions taken by non-professional politicians, shielded from party agenda, re-election motives, revolving doors, or large private interests.

A space to strengthen mutual bonds, especially beneficial in polarized societies. Deliberation has been used for constitution-making and peacebuilding in South Africa, Northern Ireland and Iraq.[284]

Deliberative democracy could complement and strengthen representative democratic institutions. It could improve the democratic quality of EU decision-making processes and outcome.[285]

282 Ricard-Nihoul, G. 2020. Representation and participation. Reinventing European Democracy. Policy Paper. Jacques Delors Institute.

283 Offe 2014, Fishkin 2014, in Cengiz, F. 2023. Dilemmas of deliberative democracy in the EU: why (not) and how (not)? in Bremberg, N. Norman, L. (Eds) Dilemmas of European Democracy. New Perspectives on Democratic Politics in the European Union. Edinburg University Press.

284 Ibid.

285 Ibid. while contributing to the shared identity of EU citizenship, since limited opportunities for collective engagement with EU-level issues can be seen as a factor explaining the weak common EU identity

The popular call for regulation and sufficiency echoes results of the EIB 2022-2023 Climate Survey, where two thirds of Europeans are in favour of stricter government measures to impose a change in behaviour,[286] and 84% consider that if we fail to drastically reduce our consumption of energy and goods in the coming years, we will be heading for a global catastrophe.[287] On the other hand, only a third of respondents think that their governments will succeed in steering sufficient change to achieve their 2030 emission reduction objectives.[288]

The discrepancy between citizens' preferences and EU climate action calls into question the current EU institutional architecture. Climate policy debate among non-state actors (green businesses community, think tanks, academics, NGOs, local government associations) looks much closer to citizens' preferences and contrasts sharply with the political debates in the Council, where national governments are sitting.

A stronger EU democracy at the supranational level would benefit the European Green Deal, strengthening its legitimacy and improving its instruments. This is illustrated by the results of the Conference on the Future of Europe that resulted in around 50% of the total recommendations on climate being associated to sufficiency,[289] a policy area still in its infancy at EU level. The more conservative outcome of national governments' policies can be explained by the short-term orientation of the policy-making process, the influence of powerful actors and vested interests, and the uncertainty about economic effects and consequence. Climate assemblies on the other hand seem more open on innovative and controversial topics.[290]

Improving participative democracy instruments, as a useful complement to representative democracy,[291] is part of the recommendations

286 EIB, 2023. 2022-2023 EIB Climate Survey. Part 2 of 2
287 EIB, 2023. 2022-2023 EIB Climate Survey. Part 1 of 2
288 Ibid.
289 Zell-Ziegler, C. Sanchez, M.O., Borragan, G., Liste, V. Toulouse, E. 2023. Sufficiency – a scoping paper.Sufficiency – a scoping paper. Öko-Institut e.V.
290 Lage, J., Thema, J., Zell-Ziegler, C., Best, B., Cordroch, L., Wiese, F. 2023. Citizens call for sufficiency and regulation – a comparison of European citizen assemblies and National Energy and Climate Plans. Energy Research & Social Science. Vol 104.
291 Franco-German working group on EU institutional reforms, 2023. "Sailing on high-seas – reforming and enlarging the EU for the 21st Century". Report

of the recent report of the Franco-German working group on EU institutional reforms.[292] The Conference on the Future of Europe conducted in 2021 and 2022 was the largest transnational participatory exercise ever undertaken in the EU. Yet, it has not been directly connected to the EU's regular decision-making process, and its conclusions have had little impact on the EU agenda. Existing participatory instruments such as Citizens Panels (the term used at the EU level for citizen assemblies), should be institutionalized and tied more closely to EU decision- making,[293] for example through a legally-binding follow-up by EU institutions which would have to provide a written feedback on the citizens' proposals adoption or rejection.[294] A permanent EU citizen assembly could meet annually, building on the priorities identified national and regional citizen agoras, and feeding into the consultation mechanism on the annual Work Programme of the Commission.[295] Citizen assemblies should also be given the opportunity to discuss major choices such as the reorientation of existing policies or treaty reforms.[296]

Next to citizens, the EU should support multi-level democratic processes,[297] through enhanced public and stakeholder participation in local and national energy and climate planning. This would allow to bridge the current gap between citizen's preferences and policy outcomes, and improve the implementation of EU funding instruments. For example, great results in the Territorial Just Transition Plans (TJTP) development process were achieved by regions that started a deliberative process early on, and before EU instruments implementation. They had more local expertise build-up, greater popular support, a more engaged

292 launched by the German Minister of State for EU affairs Anna Lührmann and her French counterpart Laurence Boone

293 Ibid.

294 Scholz, H. 2021. Report on Citizens' dialogues and Citizens' participation in the EU decision-making (2020/2201(INI)). European Parliament.

295 Ibid.

296 Franco-German working group on EU institutional reforms, 2023. "Sailing on high-seas – reforming and enlarging the EU for the 21st Century" Report ; Offe 2014, Fishkin 2014, in Cengiz, F. 2023. Dilemmas of deliberative democracy in the EU: why (not) and how (not)? in Bremberg, N. Norman, L. 2023. Dilemmas of European Democracy. New Perspectives on Democratic Politics in the European Union. Edinburg University Press.

297 As acknowledged by the Council, 2021. Council recommendation on ensuring a fair transition towards climate neutrality.

civil society and more effective participation.[298] Regional and local leadership were decisive in providing effective support and should benefit from continued EU support to that end.

LEADERSHIP AND POLITICAL ALLIANCES

The European Commission and like-minded actors successfully managed to push for more EU energy solidarity, coordination, and climate ambition in the past years. For example, the European Commission and the European Parliament seized the 2006 and 2009 gas crisis to build "energy security" as a European problem, a narrative particularly supported by Central and Eastern European Member States. Energy efficiency made it as a main pillar of the Energy Union partly thanks to the European Commission persistent attempts to reframe the issue in terms of competitiveness, sustainability and security.[299] Likewise, the reform of the ETS system with the creation of the Market Stability Reserve in 2015 was attributed to successful advocacy activities by non-state actors.[300]

Moving organisations forward requires a combination of political leadership and political alliances. Leadership can be exemplified Commission President Ursula von der Leyen and former Vice President Franz Timmermans, who launched the European Green Deal and hold on to it during the succession of crises and despite tremendous political pressure. Yet, leadership can only do little in the absence of strong and visible political support.

This calls for a new impetus for bottom-up initiatives gathering large part of the society, from green business community, scientists, investors, NGOs, to support willing leaders in adopting bold changes and standing up against powerful interests and actors. Coalitions' support for climate action recently contributed to pushing the International Energy Agency to align its scenario modelling on the Paris Agreement (Box 10).

298 Bärbel Rösch, L., Epifanio, D. 2022. Just transition in 7 central and eastern European countries. What works and what does not.

299 Dupont, 2018, in Herranz-Surrallés, 2019. Energy Policy and European Union Politics. Oxford Research Encyclopedia of Politics.

300 Fitch-Roy, Fairbrass, Beson, 2019. In Herranz-Surrallés, 2019. Energy Policy and European Union Politics. Oxford Research Encyclopedia of Politics.

BOX 10. Aligning IEA scenarios with the Paris Agreement

In recent years, the IEA has departed from its originally fossil-fuel friendly climate modelling, which did not even consider the Paris Agreement 1.5°C temperature goal. Each successive report is more optimistic for renewables and demand reduction, and sceptical of fossil-based solutions. Its 2021 Net Zero Roadmap sets out a global pathway for a 1.5°C-aligned world. The 2023 update of this roadmap reiterates the need to stop new fossil fuel production. It also calls for tripling the renewable capacity and doubling the energy intensity improvements by 2030.

This intellectual transition of the IEA has been supported by a climate campaign that gathered business leaders, scientists and activists back in 2019, asking the IEA to incorporate the 1.5°C temperature objective in its World Energy Outlook.[301] This outlook is used by businesses, investors and governments as the global benchmark for energy industry modelling. The climate commitments of the IEA go against some of its most powerful Member States, the USA, which are the largest contributor to the IEA budget and a huge producer of fossil fuels, accounting for more than a third of global oil and gas expansion plans to 2050.[302] Private – scientists – civil society coalitions pressure supported the IEA's modelling alignment with the Paris Agreement.

The current unprecedented alignment of energy challenges provides a fertile ground for new and expanded political alliances between public, private, and civil society organisations. Coalitions can be composed of actors motivated by co-benefits rather than primary climate action. For example, wind energy experimentations in Denmark were supported by policy-makers and businesses concerned with energy security.[303]

The rising climate challenges, which are now both a threat and an opportunity for security, local development, quality green jobs and citizens well-being, contribute to the alignment of interests of many actors, from climate activists to cleantech innovators, green businesses, municipali-

301 Climate Home News, 2019. IEA develops pathway to ambitious 1.5°C climate goal. 11/06/2019

302 Followed by Canada and Russia. According to Oil change international, 2023. Planet Wreckers: how 20 countries' oil and gas extracting plans risk locking in climate chaos.

303 Schmitz, H. 2015. Green Transformation. Is there a fast track? in Scoones, I., Leach, M., Newell, P. (Eds.) The politics of Green Transformations. Routledge.

ties, civil servants and social and climate NGOs. Yet a simple alignment of interest without coordination does not equate strategic alliances leading to joint action.

BOX 11. Examples of alliances for climate action

Academic – private – policy makers platform already exists and should be replicated. The University of Cambridge Institute for Sustainability Leadership engages with businesses, governments, financial institutions and civil society representatives to focus on their shared potential for just and ambitious climate action. For over a decade, it has been providing the secretariat for the Corporate Leaders Groups Europe, coalition of green businesses that provides knowledge and advocacy.[304]

EU energy policy is increasingly gathering attention at the national level, leading to national private – civil society coordinated advocacy for ambitious action at the EU level, for example in Spain on EPBD.[305]

New cleantech manufacturing and businesses alliances were recently launched as a result of the energy crisis. The Energy Resilience Leadership Group launched at the 2023 Munich Security Conference is a further illustration of the synergies between energy transition, industrial competitiveness and security concerns. It defines itself as a coalition of CEOs, entrepreneurs, policymakers, executives of the financial sector committed to the goal of supporting cleantech fast deployment for fossil gas phase-out and a bolstered EU techno-political sovereignty.[306]

A priority for the years to come should be to build and expand strategic alliances across cleantech businesses, trade unions, public actors, and civil society organisations. Given the mounting risk of political backlash against climate action, at the very moment where it should accelerate, getting the right instruments to achieve the European Green Deal will require a lot of political work. Achieving appropriate regulatory ambition requires to build and expand political coalitions.

304 See for example the CLG Europe's Fit for 55 package knowledge hub.
305 Open letter Por una aprobación temprana y ambiciosa de la revisión de la Directiva Europea de Eficiencia Energética de los Edificios, October 2023
306 Energy Resilience Leadership Group 2023. 5-point action plan.

The European Green Deal is an opportunity for economic convergence: Central, Eastern and Southern Member States have huge opportunities for solar and cleantech deployment. [307] Alliances should reach out and include businesses and civil society organisations from cohesion regions to strengthen their case at the EU and local level. Citizens in favour of climate action tend to be more urban and more educated. Expanding climate coalitions implies to better consider rural and peri-urban realities and ensure their concerns and constraints are heard in the climate debate. With the EU nature restauration drama, farmers entered the European Green Deal as a key opposition force that needs to be turned into a partnership.

As the political scene might get tenser, the European Commission should support the emergence of such coalitions and encourage broad participation to the public debate. This is in line with provisions of the EU Climate Law, that mandates that the European Commission engages with all parts of the society to enable and empower them to take action towards a just a socially fair transition to a climate-neutral and climate-resilient society, facilitates inclusive and accessible participation process at all government's levels and with all relevant stakeholders (social partners, academia, businesses, citizens and civil society).[308] Making this a reality would probably require a dedicated funding facility, to provide targeted grants to support the engagement of the stakeholders most remote from the political debate. The European Commission could also support easily accessible Energy and Climate Stakeholders' Dialogue Platforms at all government level, from the EU to the local level, to give visibility and support stakeholders' engagement into climate action.

307 Mišík, M., Oravcova, V. 2021. From economic to energy transition. Three decades of transitions in Central and Eastern Europe. Cham, Switzerland: Palgrave Macmillan

308 Art 9, EU Climate Law regulation.

II • Governance: level up the coordination game

Climate change is a long-term, dynamic and cross-cutting challenge. Addressing it calls for renewed governance models to allow for a sustained policy effort, adaptability to new challenges and new knowledge, as well as the integration of different stakeholders, government levels, and sectors. [309]

To that end, this subsection will address four key elements of a renewed energy and climate governance framework, which needs to be:

- integrated across sectors (A)
- collaborative and agile (B)
- implemented by skilled people and sufficiently staffed teams (C)
- based on improved knowledge (D)

I A. AN INTEGRATED EU ENERGY SECURITY STRATEGY

There is a need for a public policy shift towards a systemic policy mix approach. Strategies and priorities to guide public finance and investment are key complements to regulatory frameworks and tax incentives (in the case of the EU, mostly ETS carbon pricing) that guide private sector's engagement in the energy transition.[310] Energy generation, industry, buildings, road transport represent around three quarter of EU emissions. These four key sectors need to undergo a structural shift in the next ten to twenty years, with high interdependencies across sectors.

An EU cleantech manufacturing strategy

The EU Energy Security Strategy needs to address the lack of coordination of national cleantech manufacturing policies and initiatives,

309 Oberthür, S., Moore, B., von Homeyer, I., Söebech, O., 2023. Towards an EU Climate Governance Framework to Deliver on the European Green Deal. GreenDeal-NET, VUB; Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A. and Salvi, M. 2023 Towards a fair and sustainable Europe 2050: Social and economic choices in sustainability transitions Publications Office of the European Union, Luxembourg, 2023.

310 Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A. and Salvi, M. 2023 Towards a fair and sustainable Europe 2050: Social and economic choices in sustainability transitions, Publications Office of the European Union, Luxembourg, 2023.

as well as to assess the needs and policy gaps. To seize the full opportunities of the cleantech revolution, the EU should support the strategic orientation of industrial policy with an integrated value chain approach at all levels of governments, from the local to the EU level, through an EU cleantech manufacturing strategy.[311]

Germany and France are both taking significant steps in shaping their national industrial policies. Germany is currently contemplating the implementation of a substantial electricity subsidy program aimed at supporting energy-intensive industries, while France is considering offering generous tax credits to promote the growth of its domestic cleantech manufacturing sector.

Yet the single market is the only way forward for any "reshoring" ambitions,[312] with China and the US now investing to replace their imports with domestic production. The success of cleantech manufacturing deployment in one Member States will depend on what happens in other countries.[313] An EU strategy would allow for EU synergies, improve cost- and risk- sharing, and enhance opportunities.

An EU clean infrastructure strategy

The new EU Energy Security Strategy needs a clean infrastructure chapter.

Parallel deployment of electrification, electric grids and renewable generation capacities will support new EU cleantech industrial ambitions. Cleantech manufacturing facilities require abundant and affordable clean energy supply, mostly from electricity.[314] Germany has a grid deve-

311 Patuleia, A., Waliszewska, A. 2023. Making clean technology value chains work for EU economic convergence. E3G. Report.

312 Linder, J., Redeker, N., 2023. Warum Deutschland jetzt einen Europa-Pakt braucht. Handelsblatt. Gastkommentar 19/09/2023

313 For example, the Intel factory in Magdeburg, Germany, will work closely with an Intel factory in Wroclaw, Poland, where the German semiconductors would be further processed into final processors. Intel also plans further investment in France, Spain and Italy. In Ibid.

314 Prioritisation of direct electrification of industrial processes would lead to greater primary energy reduction. Graf, A., Gagnebin, M., Buck, M. 2023. Breaking free from fossil gas. Agora Energiewende. Report.

lopment plan up to 2045, but many other Member States and the EU lack such a long-term vision. The European Network of Transmission System Operators – Electricity (ENTSO-E) only has a ten-year network development plan and adequacy study. It lacks coordination with other existing planning tools such as the NECPs. Besides, distribution networks planning requires renewed attention. The Grid Action Plan currently under development within the EC should include align transmission and distribution networks development plans with NECPs and industrial plans.[315]

Applying the "Energy Efficiency First" (EE1st) principle requires to prioritize energy renovation as a key resource for demand reduction and flexibility. The EE1St principle is an attempt to correct the persistent bias towards supply enhancing decisions over demand management.[316] It was introduced in the Governance Regulation to express the need to prioritize cost-efficient energy efficiency alternatives in energy planning, policies and investments. The latest recast of the EED and EPBD gives more strength to the EE1st principle implementation.[317]

Buildings should be fully integrated in grid planning. In the US, a study conducted in just 5 of the 20 grid regions estimated that energy efficiency avoids electric grid costs of the order of $10 to 19 billion annually by 2050,[318] and that energy efficiency can reduce the annual load needed from non-renewable sources by 30 to 45% by 2030, and 40 to 86% by 2050. By reducing space heating and cooling demand, energy renovation has the greatest impact on avoided electricity system costs through 2050, followed by heat pumps deployment.

315 EDSO and T&D europe, 2023. Investing in Europe's electricity networks and grid technology sector.

316 Enefirst, 2020. What is energy efficiency first?

317 Kerneïs K., Defard C. 2023. The multiple benefits of energy efficiency. *REFEREE*, Report.

318 Specian, M., Bell-Pasht, A. 2023. Energy efficiency in a high renewable energy future. ACEEE. Research report.

Lastly, a strategy for clean infrastructure should include specific employment considerations, by supporting labour-intensive activities and associated skills. Deep renovation of buildings, upgrade of transport infrastructure and operation of public transportation are typically labour-intensive activities.[319]

New energy and material demand reduction efforts

In times of resources scarcity, future EU competitiveness and resilience will depend on new energy and material demand reduction efforts.

The new EU Energy Security Strategy should initiate work on an "Energy and Material Demand Reduction First" principle, updating the EE1st principle to include sufficiency and demand for resources beyond energy. Given the recent energy landscape development, with sufficiency making it for the first time in the 2022 IPCC report[320] and renewed calls for behaviour change in the light of the energy crisis,[321] there is an urgent need to better include sufficiency into the EU energy and climate framework. The IPCC defines sufficiency as a set of measures and daily practices that avoid demand for energy, materials, land and water while delivering human well-being for all within planetary boundaries.

Sufficiency and efficiency approaches should encompass natural resources. This transition will be material-intensive, and demands a careful use of rare resources, emphasizing the need for efficiency and sufficiency. Such a strategy can bolster social acceptance and competitiveness while mitigating wasteful practices. Implementing a circular economy model can for example play a significant role in averting a mining boom while contributing to EU strategic autonomy, as highlighted by the Spanish presidency proposals for EU resilience.[322]

319 Rodrik, D. 2023 Productivism and new industrial policies: learning from the past, preparing for the future. In Tagliapietra, S., Veugelers, R. (Eds) Sparking Europe's new industrial revolution. A policy for net zero, growth and resilience. Bruegel. Blueprint series 33.

320 IPCC, 2022. Mitigation of climate change. WGIII contribution tot he 6th assessment report oft he IPCC. Summary for policymakers.

321 Nguyen, P.V., Defard, C., Breucker, F. 2023. Gas supply security in Europe beyond the war in Ukraine. JDI Policy paper.

322 Spain's National Office of Foresight and Strategy. 2023. Resilient EU2030. A future-oriented approach to reinforce the EU's Open Strategic Autonomy and Global Leadership

Joint purchase of gas and critical materials

The new EU Energy Security Strategy should include joint purchase of gas and critical materials.

Joint gas purchase was at the heart of previous calls for greater EU action on energy[323] **and the 2014 Polish proposal of an Energy Union,**[324] based on existing processes within nuclear policy. Several Central and Eastern European Member States have since then repeatedly proposed to have a more united EU voice when dealing with external suppliers.[325]

The new EU Energy Platform launched as part of REPowerEU is a first step towards joint gas purchase. Member States must aggregate demand equivalent to 15% of their storage filling obligations within Aggregate EU. Yet, for now effective purchase takes place outside the platform, which remains a matchmaking initiative between suppliers and the aggregated EU demand. Besides, the gas volumes involved are low.

The new EU Energy Security Strategy should work on further operationalising joint purchase of gas and move forward on the proposal to replicate this approach to critical materials, as proposed by the European Commission in the CRMA.

Summary: towards a new integrated EU Energy Security Strategy

- The EU needs a cleantech manufacturing strategy to address the lack of coordination of national industrial policies and initiatives, as well as to assess the needs and gaps.
- This new cleantech manufacturing strategy needs to be developed jointly with a clean infrastructure strategy, especially grid development.
- In times of resources scarcity, future EU competitiveness and resilience will depend on new energy and material demand reduction efforts.

323 Andoura, S., Leigh, H., van de Woude, M. 2010. Towards a European Energy Community: a policy proposal. Jacques Delors Institute, Report

324 Mišík, M. 2022. The EU Needs to improve its external energy security. Energy Policy. Vol 165.

325 Mišík 2019, in Mišík, M. 2022. The EU Needs to improve its external energy security. Energy Policy. Vol 165

- The new EU Energy Security Strategy should work on further operationalising joint purchase of gas and move forward on the proposal to replicate this approach to critical materials.

B. A MORE COLLABORATIVE AND AGILE GOVERNANCE

The transition requires steering and investment from a multi-level and multi-actor governance configuration.[326] Public actors will be in the driving seat of the reorientation towards a climate neutral economy.[327] Yet governments cannot come up on their own with single good fix or solutions to such a complex and intricated challenge. The context is riddled with uncertainty on technological deployment, distributive impacts, policy effectiveness, and spill-over effects, not to mention geopolitical vulnerabilities. This requires greater EU coordination, better involvement of the local level, and enhanced public-private-civil society collaborations.

This subsection will show that:

- The cross-cutting dimension of the climate transition calls for greater cooperation and collaboration across different government levels and stakeholders.
- **Interactive governance models show great results in designing solution-seeking and trust-enhancing processes across different stakeholders in highly uncertain environment.** They could address two of the major barriers to ambitious EU climate action:
  - the need to consider local and sectoral specificities to achieve objectives set at higher government levels,
  - the need to build trust and cooperative behaviours across various stakeholder groups.
- There is an interesting potential for the translation of such governance models to the current EU energy and climate framework, especially the various national plans linked to EU funding.

326 Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A., Salvi, M. 2023 Towards a f air and sustainable Europe 2050: Social and economic choices in sustainability transitions. JRC. Report.

327 Kuzemko, C., Lockwood, M., Mitchell, C., Hoggett, R. 2016. Governing for sustainable energy system change: Politics, contexts and contingency. Energy Research & Social Science ; et al, 2016, Pisani-Ferry, J. Mahfouz, S. 2023. Les incidences économiques de l'action pour le climat. France stratégie. Rapport à la Première ministre.

- **The need for greater collaboration and cooperation across different government levels and stakeholders**

The cross-cutting dimension of the climate transition calls for greater collaboration and cooperation across different government levels and stakeholders.

The EU energy and climate governance framework is insufficiently European and insufficiently local. NECPs are developed at the national level, with insufficient consideration of the need for EU coordination of national energy policies. Additionally, solving the climate challenge requires contextualised solutions, tailored to local settings on which they apply.[328] There is more decision-making power at the national or EU level, yet the local level is increasingly relevant as the ultimate stage of implementation in many energy transition areas: renovation, mobility, industry. The local level is an essential link in the chain of governance, yet still insufficiently integrated in national decision-making in many Member States.[329] Greater involvement of the local level in higher decision-making levels (national, EU) would allow to improve policy designs, by anticipating and addressing implementation issues.

The local level is the closest of social and environmental acceptability issues, as well as opportunities and threats for local economic development, all of these being at the heart of the distributive issues associated with the transition, and a potential make or break for political acceptability.

The EU should improve its tools to better support local and regional governments into achieving policies that are both popular and beneficial for EU climate objectives. During the Conference on the Future of Europe, citizens voiced support for quality public transport systems, improved connectivity of rural areas, and the development of bike lanes, just to mention a few. Interestingly, these policy areas touch upon what are usually local or regional competencies instead of EU ones. This calls for an improved multi-level governance in which the EU level appropriately supports lower government levels to implement the European Green Deal.

328 Rodrik, D., Sabel, F. C., 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty. Research Working Paper.

329 Patuleia, A., Waliszewska, A. 2023. Making clean technology value chains work for EU economic convergence. E3G. Report.

Strengthening the role of public action requires to make it more inclusive. This calls for enhanced public-private-scientific-civil society collaborations. Businesses will be at the forefront of the economic transformation and industrial revolution. Firms, including SMEs and cleantech start-ups must contribute to shaping future industrial policies. Additionally, renewed climate governance should better include academics, trade unions, consumer organisations, as well as social and environmental NGOs to capitalize on their knowledge and field experience. This would allow to consider scientific, workers, consumers and citizens' concerns as well as to tap into the great innovation potential of the civil society and the private sector.

There is a need to reflect on criteria for better integration of stakeholders' input, as well as justification of policy choices when the input is not taken into account in the final draft. The JTF follows the cohesion fund governance that is based on the Partnership Principle, and therefore has stronger participation requirements than the RRF. Yet under the TJTPs drafting process, governments were found to be insufficiently responsive to the input provided by stakeholders.[330]

BOX 12. Avenues for improvement of the current EU multi-level governance

The Governance Regulation already requires the creation of national Energy and Climate dialogues to discuss NECPs. The European Commission could consider dedicating funding to support the creation and improvement of these platforms, and push to institutionalize them.

Improving stakeholders' participation's provisions in the Governance regulation could include :

- a mandatory two-stages process with input opportunities during the initial scoping phase and on the draft,[331]

330 "one-directional stream of information" is an ongoing practice in many countries. Bärbel Rösch, L., Epifanio, D. 2022. Just transition in 7 central and eastern European countries. What works and what does not.

331 Velten, E.K., Evans, N., Spasova, D., Duwe, M., de la Vega, R., Duin, L., Branner, H. 2022. Charting a path to net zero: An assessment of national long-term strategies in the EU. Ecologic Institute

- ensuring an inclusive representative stakeholder engagement process, with public authorities proactively seeking to engage those that are the most remote or have the less capacity to access and contribute to decision-making, be they local governments, civil society organisations, or businesses.[332]
- including a detailed description of the participatory process (who, when, how long)[333] in the planning documents (NECPs, LTSs) would also contribute to increased transparency and accountability.

• Governance models to facilitate collective learning

A governance fit for climate neutrality should incentivize collaboration and cooperation across stakeholders. When designing EU strategies, policies and investment plans, EU institutions together with governments and stakeholders will have to answer tough questions, and their understanding could evolve.[334] The green transition requires a combination of different types of resources (expertise, financing, organisational capacity, legitimacy, leadership) that tend to be distributed across public, private and civil society actors.[335]

Valuable inspiration can be drawn from existing arrangements within the US ARPA-E (as detailed in Box 13), which foster collaborative exploration of science and technology frontiers by public and private actors. Similar settings can also be observed in businesses practices when undertaking innovative and complex projects.[336]

Good practices also stem from some regulatory arrangements in the field of environmental externalities mitigation, for example the imple-

332 Ibid.
333 Ibid.
334 For example, the European Commission will soon be conducting assessments of critical materials' supply chains vulnerabilities, to define minimum levels of strategic stocks needed to ensure EU security. This raises the question of which criteria should be used to assess energy supply or supply chain vulnerability, how to define energy security, but also how to ensure the assessment remains up-to-date.
335 Ibid.
336 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

mentation of EU obligations regarding water pollution control for dairy farming activities in Ireland.[337] In this example, while solutions to address water pollution exist, estimating the cost of implementation is difficult. General measures will need to adapt to very different local contexts. There is a fear of overburdening the regulated entities. This often results in regulations that are either too timid to be effective, or insufficiently tailored to local particularities.[338] In that case, **governance needs to create an information exchange regime that fosters local actors' cooperation towards a contextualised solution while benefiting from each other's experience.**[339]

BOX 13. DARPA and ARPA-E interactive governance model

The DARPA (Defence Advanced Research Projects Agency), is an example often quoted to illustrate how the knowledge economy benefitted from decisive public support. It was created in 1958 as a part of the US answer to the launch of Sputnik, the first satellite ever, by the USSR in 1957.

DARPA's mission is to make public R&D investments in breakthrough technologies. It played a fundamental role in organizing the research for the building blocks of the information economy.

The ARPA-E (Advanced Research Projects Agency – Energy) was created after the financial crisis to foster innovation in the energy sector, taking inspiration from the DARPA.

The DARPA and ARPA-E have innovative governance models connecting top scientists and corporate experts with the highest political decision-levels. Instead of taking a detailed contracting approach, the government set broad common goals based on input from the scientific and industrial community. It then sets up a joint governance system involving academic, corporate and

337 Developed by Rodrik, D., Sabel, F. C., 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty. Research Working Paper.

338 Ibid.

339 An example developed by Rodrik and Sabel is the regulation of water pollution in agriculture in Ireland in relation to EU regulations, especially the implementation of the Water Framework Directive. Compliance failures triggered research programs, which in turn supported the emergence of a web of institutions that constitute an integrated system of local governance of water quality, expanding public participation. Rodrik, D., Sabel, F. C., 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty. Research Working Paper.

governmental partners to oversee the progress towards the agreed direction.

Goal setting is the result of an iterative design process between the expert community and high government levels. For example, internet was the result of the ambition to create a protocol for an open information exchange infrastructure.[340] The overall direction is open to challenge and revision along the way.

The budgets' flexible spending allows for rapid adjustment and redirection to account for new knowledge or ideas, while a high degree of failure is fully integrated in the governments' expectations. To adopt a proactive stance towards technological disruption requires creativity, vision, speed and intensity in execution.

This calls for flexible, unbureaucratic, efficient processes, with decision-making decoupled and de-conflicted from existing private and public interests. To that end, the agencies are endorsed with sizable and sustained budgets to achieve critical mass. Rapid adoption is supported by the fact that government is the primary customer, facilitating trial deployment within public institutions.[341] An additional benefit stemming from the fact that the public is the beneficiary of the sponsored research, is the improved efficiency and accountability of the program.

To replicate such an institution in the EU would require a lot of political will and a feeling of urgency. The shock of Sputnik triggered the creation of the DARPA, can the war and multiple energy crises lead to the same kind of momentum in the EU? The EU already has great assets to build on, including a world-leading scientific community and a strong industrial innovation potential.

This governance model aims at turning uncertainty from an obstacle to a spur for collective learning, eventually leading to the solution, which becomes an outcome rather than an input. It involves setting broad and open-ended objectives, establishing regular joint progress reviews with interim targets, processes for determining if and how to proceed further, and mechanisms for addressing disagreements. Policy evaluation becomes an integral part of the policy process,[342] with mechanisms for

340 Waibel, A., 2019. What is DARPA. How to design successful technology disruption. ORBIS / ESPAS European Strategy and Policy Analysis System

341 Ibid.

342 Rodrik, D., Sabel, F. C., 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty. Research Working Paper.

regular feedback and integration of the lessons learned along the way. Threats of penalties[343] encourage investigation of new solutions and collaborations among regulated parties and regulator. This institutional setup aims at making it risky to bet on the status quo and potentially rewarding to surpass expectations.

Such institutional ecosystems blur the distinction between regulation and compliance mechanisms. [344] When the current rules and best practices reach their limits, collaborative investigation becomes necessary, especially as establishing what should be done goes hand in hand with understanding and building the capacity needed to accomplish it. [345] It supports the development of new forms of capacity building and public participation in regulatory decision-making.

Trust and cooperation are the outcome, not the starting point of joint efforts.[346] As the process unfolds, the involved parties develop a more precise understanding of their shared goals and a deeper level of trust in each other's capabilities.

Trust and mutual reliance result from the commitment to collaborate. In short, it brings about a virtuous trust circle and lays the ground for mutual understanding of each other's constraints.

Such interactive, multi-stakeholder's governance models seem promising avenues to address two of the major barriers to ambitious EU climate action: the need to consider local and sectoral specificities to achieve general objectives set at higher government levels (climate neutrality), as well as to build trust and cooperative behaviours across various stakeholder groups.

343 Penalties are applied in cases of failure to report or submit reports of insufficient quality, as well as persistent failure to achieve results comparable to those achieved by similar actors. These penalties serve to incentivize cooperation in the production of essential information required to determine the best way forward.

344 Rodrik, D., Sabel, F. C., 2019. Building a Good Jobs Economy. Harvard Kennedy School Faculty. Research Working Paper.

345 Ibid.

346 Ibid.

- **Potential for translation to the current EU energy and climate framework**

EU energy and climate governance framework already incentivise the creation of new governance instruments for the adaptation of EU policies at lower government levels. Yet it mostly focuses on the national level, with insufficient consideration of the local level. The idea is not to allow the local (or national) level to disregard the priorities decided at the EU level, such as emission and energy demand reduction policies for example, but rather to allow for collaborative adjustments towards goal delivery, stemming from dialogue between different levels of governments and actors.

It could be fruitful to apply more interactive and iterative governance models to the current EU energy and climate governance framework and national planning exercises, such as the NECPs, National Recovery and Resilience Plans (NRRPs), Territorial Just Transition Plans (TJTPs) in the context of the Just Transition Fund, or future Social Climate Plans (SCPs) for the Social Climate Fund. The conflict in Ukraine in 2022 and the renewed focus on manufacturing and competitiveness underscore the necessity for more flexible updates to the initial NRRPs, many of which were formulated in 2020. Preliminary feedback from TJTPs echoes this observation, emphasizing the importance of enhancing adaptability and flexibility while ensuring continuous monitoring by all relevant stakeholders to maintain the correct course.[347]

BOX 14. Compliance monitoring vs. diagnostic monitoring

NRRPs and TJTPs can be classified as "compliance monitoring" governance models**.** They are performance-based financing with funding disbursement conditioned to achieving specific milestones laid out in ex-ante plans. This approach assumes a stable and homogeneous environment that allows the translation of detailed plans into precise instructions for agents to execute.

On the contrary, **"diagnostic monitoring" serves as a response to rising levels of uncertainty that erode the effectiveness of detailed ex-ante plans**.

347 Le Merle, K., Tribukait. I. 2023. Improving territorial justice. Transparency, inclusiveness, capacity building and strategy in the Territorial Just Transition Plans. FEPS. Policy Brief.

Diagnostic monitoring is similar to the approach taken by the DARPA or other institutional arrangements such as the example of Irish dairy farming. It aims at facilitating and organising problem-solving by the actors, not to use the threat of punishment for bad performance as an incentive for good behaviour.[348]

In the case of economic and climate governance, the EU does not have a good track record on enforcement based on penalties. **Shifting the EU energy and climate governance model towards a more "diagnostic monitoring" approach could help lift compliance barriers in a more efficient way than the current "compliance monitoring" model.**

Such governance innovations could be used to strengthen the involvement of local authorities and other stakeholders into drafting and monitoring energy and climate plans, as well as EU coordination of national energy policies. For example, the RRF regulation mandates the creation of national coordination bodies to ensure effective monitoring and implementation of NRRPs. They have been found to have major effects on the coordination of domestic policy-making and on the implementation of NRRPs,[349] and could be improved to foster multi-level and multi-stakeholders' collaboration.

Summary

1. The cross-cutting dimension of the climate transition calls for greater cooperation across different government levels and stakeholders.
2. Interactive governance models show great results in designing solution-seeking and trust-enhancing processes across different stakeholders in highly uncertain environment.
3. There is an interesting potential for the translation of such governance models to the current EU energy and climate framework, especially the various national plans linked to EU funding.

348 Sabel, C.F. 2016 in Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

349 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

C. PEOPLE: STAFFING, TRAINING, ABSORPTION CAPACITY

Skilled and sufficiently staffed teams are a requirement for an improved EU energy and climate governance that successfully delivers on climate neutrality, energy security and competitiveness.

Appropriate skilling and staffing will allow for improved stakeholders' participation to decision-making, together with effective contribution to implementation. Skills is the main barrier to EU cleantech manufacturing,[350] energy renovation[351] and renewable[352] deployment, together with access to finance. The public sector has a responsibility in steering private and public training institutions reorientation towards the areas where skill shortages are the strongest.[353] Developing public – private collaboration on skills intelligence would ensure that skills will match current and future labour market needs. Strengthen civil society technical understanding has been found to be a prerequisite to allow them to effectively participate into TJTPs drafting process.[354] Technical assistance for capacity building for stakeholders is often too limited to allow them to effectively contribute to the programming of cohesion policy funds.[355]

The greater role of public actors requires appropriate human resources to perform increased tasks. A study on 21 OECD countries shows that countries with higher administrative capacity fare better at coming up with appropriate policy designs to address environmental problems.[356] This illustrates more broadly the need for an adequate strengthening of administrative capacity to conduct the transition (foresight, strategy, implementation) at all levels: EU, national, and local.

350 Tagliapietra, S., Veuglers, R., Zettlemeyer, J. 2023. Rebooting the European Union's Net Zero Industry Act. Bruegel. Policy Brief.

351 Corporate Leaders Groups, 2022. More than 150 business leaders call on EU to strengthen energy security by accelerating green transition. Open letter to President von der Leyen. May 2022.

352 Ibid.

353 See the pact for skills, also mentioned in the NZIA, yet funding and resources remain vague.

354 Bärbel Rösch, L., Epifanio, D. 2022. Just transition in 7 central and eastern European countries. What works and what does not.

355 Canali, F. 2022. Public Participation at stake in participatory processes in the EU. CEE Bankwatch Network.

356 Fernandez-i-Marin, X., Knill, C., Steinebach, Y. 2021. Studying Policy Design Quality in Comparative Perspective. American Political Science Review. 115.

There is currently a well-identified lack of regional administrative capacity and skilled staff to handle more complex green projects.[357] Capital regions, which tend to be richer and more endowed with highly educated workforce, benefit more from cohesion funds than poorer regions.[358] Cohesion regions appear to particularly lack the technical capabilities required to access public or EU funds and boost investments.[359]

At the EU level, the newly established EU coordination bodies would need appropriate resources to perform their duties. The EU Energy Platform, the Net Zero Industry Platform, and the Critical Raw Material Board have been proposed or set up to answer gas supply disruptions and the need to secure supply chains. They have common governance features, as they are all composed by Member State and Commission representatives, and have monitoring and overseeing duties. Considering the lack of resources allocated to these bodies compared to their numerous tasks, one can question their ability to perform, at least as regards the two latest bodies that are still under negotiation, i.e. the Net Zero Industry Platform[360] and the Critical Raw Materials Board. Both are tasked with needs analysis, monitoring and coordination, identification of skills and workforce gaps, and overall follow-up of any matter necessary to achieving the EU's objectives.

Another example is the European Climate, Infrastructure and Environment Executive Agency (CINA), which manages the Innovation Fund, and is under-staffed and under-resourced compared to its expanding ambitions.[361]

The local level is the level which is the most likely to lack the human, technical, and financial resources to participate in the public debate or to properly implement the transition. It is especially true for Just Transition regions, which are facing an ongoing trend of outflow of young people and an ageing population, hence reducing the human capital avai-

357 EIB, 2023. Investment Report 2022/2023: Resilience and renewal in Europe.
358 Lang, V., Redeker, N., Bischof, D. 2022. Place-based policies and inequalities within regions. OSF Preprints.
359 Ibid.
360 Claeys, G. 2023. The Net Zero Industry Act puts EU credibility at risk. Bruegel. First glance.
361 Humphreys, C. 2023. The sharpest tool in the box: how to strengthen the EU Innovation Fund for climate competitiveness and security. I4CE. Climate report.

lable. More broadly, current Territorial Just Transition Plans may worsen the existing local inequalities, since they tend to favour larger stakeholders (companies, municipalities) who have better technical, financial, and human capacity for drafting proposals and project management.[362]

Renewed attention should be given to resource inequalities of different stakeholders when drafting and monitoring climate plans, to alleviate rather than accentuate existing patterns.

Properly staffed administrations should go together with administrative structures that foster efficient coordination with other stakeholders. The need for cross-sectoral and multi-actors coordination requires to overcome historic silos and adapt the organisation to the new challenges. The creation of a Recovery and Resilience ("RECOVER") Task Force within the European Commission Secretariat-General to coordinate and implement EU recovery action[363] is a good example of administrative organisation innovation. This initiative could be replicated to ensure a coherent and coordinated action from the various EU funds and align them with the European Green Deal,[364] REPowerEU[365] and Green Deal Industrial Plan objectives.

Greater efficiency and inclusivity require a simplification of EU administrative processes. Bureaucracy creates a high entry barrier to public support schemes, which tends to exclude small actors be they public or private. It also diverts significant resources within large actors, such as national governments, where NRRP monitoring and reporting has been found to be extremely bureaucratic for both the European Commission and the Member States.[366] The RRF is not lighter to manage than cohe-

362 Bärbel Rösch, L., Epifanio, D. 2022. Just transition in 7 central and eastern European countries. What works and what does not.

363 EU funding overview, Recovery and resilience taskforce.

364 Corporate Leaders Groups, 2022. More than 150 business leaders call on EU to strengthen energy security by accelerating green transition. Open letter to President von der Leyen. May 2022.

365 Buck, M., Duslot, A., Hein, F., Redl, C., Graf, A., Holl, M., Sartor, O., Baccianti, C. 2022. Regaining Europe's Energy Sovereignty. 15 Priority Actions for REPowerEU Agora Energiewende.

366 See detailed case studies on Spain, Latvia, Belgium, Estonia, Netherlands, Portugal in Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

sion funds. Because the reporting processes are different for RRF and cohesion funds, it increases the workload for national administrations. Simplification could benefit from digitalisation and the creation of specific software's and apps to streamline administrative processes.

Providing the right incentives for collaboration across government levels and stakeholders should be given more attention. Particularly for strategic and broad authority positions, a strict policy on conflict of interests should prevail. As an example, a DARPA programme manager, who has the power to fund, launch, abort and redirect activities based on community input and performance evaluation, must be deconflicted.[367] Another provision to incentivize a sole focus on the mission is to limit the tenure to 3 to 4 years. This may need to be tailored to the positions and sectors, but could be a fruitful field of future research, how to align civil servants and corporate actors' behaviours with the transition imperative and the need for good collaboration and effective action towards a common goal.

Summary

The EU needs to contribute to the upcoming effort to provide the human, technical and financial resources at all government levels (EU, national and local) and across stakeholders to foster efficient, high-quality and balanced participation to policy design and implementation will support both absorption of EU funds and policy objectives' achievement.

D. IMPROVING KNOWLEDGE ON POLICY IMPACTS

The rise of new policy instruments to address new challenges calls for an improved knowledge on the impact and effectiveness of policies. Under a renewed governance model based on more interactive and iterative process, policy evaluation and monitoring will be a key ingredient to adjust policy solutions in a context of uncertainty and diversity of local situations. Quality evaluation requires easily accessible and comparable open data, as well as transparent access to information.

367 Waibel, A., 2019. What is DARPA. How to design successful technology disruption. ORBIS / ESPAS European Strategy and Policy Analysis System

This would enable independent tracking tools and evaluations. For example, there is a need for an independent tracking platform to assess public and private funding for the several dimensions of the EU taxonomy.[368] Similarly, it would be useful to replicate the Green Recovery Tracker experience for an independent, scientific evaluation of NRRPs[369] in addition to the official Recovery and Resilience Scoreboard.[370] According to the Green Recovery Tracker, 26% of measures of the NRRPs analysed were having an uncertain climate impact. Regardless, these measures are often classified as green by the European Commission.[371]

Identifying the right policy mix is a highly political question that fuels calls for the creation of a European Energy Agency to strengthen independent public knowledge infrastructure.[372] This call echoes past recommendations for the creation of a European Energy Information Service within the European Environment Agency.[373] This shows the expansion of the scope of policy action to new areas, and the need to make room for independent analysis and public debate. Target setting, the design of support schemes, investments selection all require reliable and easy access to data on the current energy system. Yet, a lot of this data, be it how much industry pays for electricity, which electricity lines are the most congested, what is the current efficiency of the building stock, is not provided in a consistent, independent, reliable, up-to-date and easily accessible manner. This creates a high entry barrier to critical policy discussion for many stakeholders.[374]

368 Climate change mitigation, climate change adaptation, sustainable use of protection of water and marine resources, transition to a circular economy, pollution prevention and control, protection and restoration of biodiversity and ecosystems. Green Recovery Tracker 2022. How to go about measuring alignment of funding with climate targets? Wuppertal Institut, E3G.

369 Ibid.

370 European Commission, Recovery and Resilience Scoreboard.

371 Green Recovery Tracker 2022. How to go about measuring alignment of funding with climate targets? Wuppertal Institut, E3G.

372 Tagilapietra, S., Zachmann, G., Creti, A., Edenhofer, O., Fabra, N., Glachant, J.M., Linares, P., Löschel, A., Maćkowiak-Pandera, J., Szabó , L. 2023. Green transition: create a European energy agency. Bruegel. First Glance.

373 Pellerin-Carlin, T., Vinois, J.A., Rubio, E., Fernandes, S. 2017. Making the energy transition a European success. Tackling the democratic, innovation, financing and social challenges of the Energy Union. JDI Report.

374 Bärbel Rösch, L., Epifanio, D. 2022. Just transition in 7 central and eastern European countries. What works and what does not.

Informed public opinions that are clear on the choices we are facing are more likely to have higher expectations from innovators and policy-makers.[375] EU institutions should invest more intellectual and financial resources into in-depth analysis of the social impacts and distributive issues of the transition,[376] past policies evaluation,[377] energy and material resources needs, supply chains, trade-offs between supply expansion and demand reduction.

III • Financing: filling the gap to face climate, security and competitiveness challenges

I CURRENT PRIVATE AND PUBLIC CLIMATE SPENDING FALLS SHORT

In the EU, times are currently difficult for green private financing. The energy crisis triggered additional private investment in energy efficiency, however Southern European and small firms lag behind this trend.[378] Current uncertainty created by the war in Ukraine weakens the private investment incentive created by high energy costs.[379] Together with energy costs and availability of skilled staff, uncertainty is a top long-term obstacle to investment for firms.[380] It is higher in Eastern Europe and acts as a great deterrent to private investment.[381] ECB rates hikes deteriorate lending conditions[382] for all actors, with a special impact on

375 Rodrik, D. 2023 Productivism and new industrial policies: learning from the past, preparing for the future. In Tagliapietra, S., Veugelers, R. (Eds) Sparking Europe's new industrial revolution. A policy for net zero, growth and resilience. Bruegel. Blueprint series 33.

376 Crespy, A., Munta, M. 2023 Lost in transition? Social justice and the politics of the EU green transition. Transfer: European Review of Labour and Research; Corporate Leaders Groups, 2022. More than 150 business leaders call on EU to strengthen energy security by accelerating green transition . Open letter to President von der Leyen. May 2022.

377 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

378 EIB, 2023. What drives firms' investment in climate action? Evidence from the 2022 – 2023 EIB Investment Survey. Economics Department – Studies Division.

379 EIB, 2023. Investment Report 2022/2023: Resilience and renewal in Europe.

380 Ibid.

381 Ibid.

382 Reuters, 2023. European private loan market falters as corporate credit stress mounts. 07/09/2023

small businesses' access to finance,[383] in a context of higher investors' reluctance to take on risk.

Additionally, the EIB warns that sustained public investment is under threat.[384] Historically, public investment proved more vulnerable than other types of public spending in unfavourable fiscal contexts. Yet it has a catalytic effect to crowd-in private investment and to minimize economic scarring over the longer term.[385] In this report, we will mostly focus on public investment as a key enabler for private investment,[386] filling the green investment gap, and improving absorption capacity as well as coordination.

On top of higher investments needs, there is an increasing competition for limited available EU support for operational expenses (OpEX) under the Innovation Fund. EU funds usually cover capital expenditures (CapEx). Yet the need to answer the IRA, which offers OpEx subsidies, in a context of high energy prices led to increased calls for more EU financing to cover operational costs. The Innovation Fund will soon finance the new EU Hydrogen Bank, an initiative to support investment in sustainable hydrogen through a fixed premium in €/kg of renewable hydrogen produced over 10 years.[387] These fuelled calls for the replication of such a scheme for innovative critical raw materials projects.[388]

Even *a priori* profitable renewable projects would currently need additional EU public support, because of the business uncertainty created by the ongoing market reform. To mitigate this, Georg Zachmann and Conall Heussaff, from Bruegel, proposed the implementation of a temporary renewable premium[389] granted on a first-come first-served basis upon connection to the grid with an option to split the incentive with the grid

383 EIB, 2023. Investment Report 2022/2023: Resilience and renewal in Europe.
384 Ibid.
385 Ibid.
386 Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A. and Salvi, M. 2023 Towards a f air and sustainable Europe 2050: Social and economic choices in sustainability transitions. JRC. Report.
387 European Commission, 2023. Upcoming EU Hydrogen Bank pilot auction: European Commission published Terms & Conditions. News.
388 Davis, R. 2023 Doing more with less : A European Critical Raw Materials Strategy fit for Cleantech Competitiveness. Cleantech for Europe. Report.
389 for up to 120 GW of solar and 60 GW of wind

operator to support grid deployment.[390] They suggest funding it with the Innovation Fund, which is not originally designed for such schemes but rather for investment subsidies for breakthrough low carbon innovation projects.

The question is how to handle the additional cost of increased energy and economic security as well as resilience. Increasing EU security in times of transition towards climate neutrality will involve the reshoring of some activities currently mostly conducted in China. Due to higher environmental and social standards, EU cleantech products and components are likely to be more expensive, in a context of already high green investment needs, further fuelled by inflation. Besides, the full cost of the climate and biodiversity crisis are unknown, therefore current figures may be underestimated because they do not consider the need to increase adaptation and resilience to a changing climate of our transport infrastructures, energy, building, manufacturing plants.[391]

Fair cost-sharing and risk-sharing can be considered as a core issue of political support for the transition, especially since distributive issues, justice and equity also increasingly appear as key elements of energy security[392] and climate policies. This advocates for stronger public action, to mitigate the distributive impacts of the transition and bear the additional cost of increasing the resilience of the energy system.

COMMON ACTION CALLS FOR ADDITIONAL EU FUNDING

The lack of EU funding to ensure appropriate burden-sharing proved to be a barrier to ambitious EU energy action and implementation in 2022. The economic vulnerability to the impacts of the Russian invasion of Ukraine was and is still unevenly distributed across Member States.[393] According to Nils Redeker from the Delors Centre, short-term

390 Zachmann, G., Heussaff, C. 2023. Phased European Union electricity market reform. Bruegel. Policy Brief.

391 European Commission 2023. 2023 Strategic Foresight Report. Sustainability and people's wellbeing at the heart of Europe's Open Strategic Autonomy. COM(2023)376 final.

392 Bazilian, M., Goldthau, A. 2023. Russia's war in Ukraine: green policies in a new energy geopolitics. New Security Beat. Guest contributor.

393 Redeker, N. 2022. Same shock, different effects. EU member states' exposure to the economic consequences of Putin's war. Policy Brief. Jacques Delors Centre.

burden-sharing would have allowed greater political unity in the face of Russian invasion of Ukraine.[394]

Without additional common financing, achieving REPowerEU objectives seems unlikely.[395] To that end, Matthias Buck et al., from the think tank Agora Energiewende, called for a €100 billion EU Energy Sovereignty Fund until 2027 to support investments not covered by existing EU funds, especially in Member States with less fiscal space.[396] Greater financing at EU level would allow for fair compensation and support towards climate goals. It seems increasingly justified in the light of the growing challenges in supplying affordable and reliable energy and the associated strategic and economic dimensions.

While energy can be treated as any commodity, security of supply, competitiveness and climate action have EU public goods characteristics.[397] Public goods are defined as non-excludable (everyone can enjoy the benefits) and non-rival (enjoying the benefits does not prevent others to do so). Energy is a strategic good with security, competitiveness and climate implications. The crisis strengthened EU Member States energy interdependency, and the EU is the right government level to handle growing trade tensions. National approaches to the energy crisis are detrimental to security of supply and increase the risk of market fragmentation.[398]

394 Redeker, N., Jäger, P. 2022. New needs, new prices, same money. Why the EU must raise its game to combat the war's economic fallout. Jacques Delors Centre. Policy Brief

395 Ibid.

396 Buck, M., Duslot, A., Hein, F., Redl, C., Graf, A., Holl, M., Sartor, O., Baccianti, C. 2022. Regaining Europe's Energy Sovereignty. 15 Priority Actions for REPowerEU Agora Energiewende.

397 Von Weizsäcker, J., Lamy, P. 2018. Il faut développer les biens publics européens. Le monde 26/09/2018; Fuest, C., Pisani-Ferry, J. 2019. A primer on developing European public goods. EconPol Policy report; Papaconstantinou, G., Buti, M. 2022. European public goods: how can we supply more. CEPR Voxeu column; Goldthau, A., Sitter, N. 2022. Whither the liberal European Union energy model? The public policy consequences of Russia's weaponization of energy. EconPol Forum.

398 McWilliams, B., Sgaravatti, G., Tagliapietra, S., Zachmann, G. 2022. A grand bargain to steer through the European Union's energy crisis. Bruegel. Policy Brief.

Additional EU-level green financing needs have been identified with different scope of ambition, from EU-level subsidies focusing on early-stage cleantech projects[399] to a broader scope.[400] The available amounts for the Innovation Fund should increase thanks to a high ETS price and free allowances phase-out. However Ciaran Humphrey, from the think tank I4CE, estimates that the remaining gap still stands at €22 billion over 2025 – 2029 to meet the needs of EU clean tech.[401] In an ECB staff occasional paper, Laurent Abraham, Marguerite O'Connell and Inigo Arruga Oleaga proposed the establishment of a €500 billion EU Climate and Energy Security Fund over 2024 – 2030 as an effective and efficient option to address EU energy and climate needs.[402] Jean Pisani-Ferry, Simone Tagliapietra, and Georg Zachmann from Bruegel call for a EU Green Investment Plan of €180 to 400 billion between 2024 and 2026 to ensure that EU green grants remain at least at the current level (€50 billion per year) until 2030 despite the end of the RRF in 2026.[403]

Addressing the green investment gap calls for additional financing levers, such as taxation and public debt. Under the current EU fiscal framework, only 9 Member States[404] would have enough fiscal space to achieve the EU climate targets.[405] In France, a report from Jean Pisani-Ferry and Selma Mahfouz with contributions from the Finance

399 Kleimann, D., Poitiers, N., Sapir, A., Tagilapietra, S., Véron, N., Veuglers, R., Zettelmeyer, J., 2023. How Europe should answer the US Inflation Reduction Act, Bruegel. Policy Brief.

400 T&E, 2023. A European response to US IRA. Report; Cornago, E., Springford, J. 2023. Europe needs both fiscal and energy solidarity. CER. Policy brief; Berghmans, N. 2023. Three priorities for the Green Deal Industrial Plan. IDDRI. Blogpost. Jansen, J., Jäger, P., Redeker, N. 2023. For climate, profits, or resilience? Why, where and how the EU should respond to the Inflation Reduction Act. Jacques Delors Centre. Policy Brief.

401 Humphrey, C. 2023. The sharpest tool in the box: how to strengthen the EU Innovation Fund for climate competitiveness and security. I4CE. Report.

402 Abraham, L., O'Connell, M., Arruga Oleaga, I. 2023. The legal and institutional feasibility of an EU Climate and Energy Security Fund. Occasional Paper Series. ECB.

403 Pisani-Ferry, J., Tagliapietra, S., Zachmann, G. 2023. A new governance framework to safeguard the European Green Deal

404 Ireland, Sweden, Latvia and Denmark, Luxembourg, Bulgaria, Lithuania, Slovenia and Estonia

405 Mang, S., Caddick, D. 2023. Beyond the bottom line. How green industrial policy can drive economic change and speed up climate action. New Economics Foundation.

Ministry, the think tank Bruegel and the French Central Bank estimated that the reorientation of brown finance would fall short of the national energy transition investment needs, and suggested two additional financing levers: debt and an exceptional one-off wealth tax on the richest households.[406] Rethinking taxation should be part of the answer to sustained public budget efforts for the green transition.[407] Investigating these options at the EU instead of the national level would offer opportunities for more EU coordination.

In the face of such questions, there seemed to be a sense of political paralysis in the EU,[408] because it partly touches upon the very institutional architecture of the EU. The EU remains a fragmented collection of sovereign states, with highly constrained EU fiscal capacity to address external threats.[409] Yet, EU institutional weaknesses hinder the development of a genuine single market[410] as illustrated by the uneven national answers to the energy price crisis and the US IRA which come with risks of market fragmentation and policy incoherence.

Fiscal federalism has recently been gaining ground at the highest levels of the EU debate, including from political heavy-weights such as Mario Draghi.[411] In a tribune in the Economist, the former President of the ECB calls for the federalisation of some investment needs.[412] The current President of the ECB Christine Lagarde recently called for another round of EU issued green bonds, replicating the NGEU financing experience, this time for the European Green Deal.[413] Considering the multitude of supranational challenges that the EU is currently grappling with, substantial investments are urgently needed within a limited time-

406 Pisani-Ferry, J. Mahfouz, S. 2023. Les incidences économiques de l'action pour le climat. France stratégie. Rapport à la Première ministre.

407 Matti, C., Jensen, K., Bontoux, L., Goran, P., Pistocchi, A. and Salvi, M. 2023 Towards a fair and sustainable Europe 2050: Social and economic choices in sustainability transitions. JRC. Report.

408 Tooze, 2023. Carbon note 2: the "Western" energy transitions – narcissism of small differences. 07/04/2023

409 Tagliapietra, S., Zettelmeyer, J. 2023. Europe's critical struggle with its economic paradigm. Politico. Opinion. 25/05/2023

410 Ibid.

411 Draghi, M. 2023. Mario Draghi on the path to fiscal union in the eurozone. The Economist. By Invitation. Europe's economic challenges. 06/09/2023

412 Ibid.

413 Euractiv, 2023. ECB's Lagarde calls for EU-issued green bonds. 29/09/2023

frame. Past reliance on China for exports and Russia for energy seems untenable. Jean Pisani-Ferry and Selma Mahfouz further raise the question of whether the EU can simultaneously be a leader in climate action, multilateralism and national fiscal discipline.[414] Achieving this appears highly improbable without an appropriate EU fiscal capacity.

Additional EU funding could be either permanent as investigated by Frédéric Allemand et al. in a FEPS/OCFE study,[415] **or temporary** as studied by Laurent Abraham et al. in their ECB occasional paper.[416] Depending on the ambition (permanent or not, with or without transfers), it would not necessarily require treaty change.[417]

Two avenues for financing are new own resources for the EU budget, or new common debt – which would also raise the issue of new resources at some point. In any case, the issue of own resources is already discussed within the Council and the EP in the framework of the reimbursement of NGEU.

New common debt would be limited in time or size under current treaties.[418] Replicating common borrowing for amounts of the like of NGEU would only allow for exceptional temporary funding.[419] No permanent EU tasks would be financed through NGEU-like funds and NGEU-like financing could not exceed financing through Own Resources.[420] EU primary law allows debt-financing of the EU budget, but it is very limited scope compared to a sovereign state, since the EU must be able to service its debt any year with its Own Resources.

414 Pisani-Ferry, J. Mahfouz, S. 2023. Les incidences économiques de l'action pour le climat. France stratégie. Rapport à la Première ministre.
415 Allemand, F., Creel, J., Leron, N., Levasseur, S., Saraceno, F. 2023. Making NextGeneratioEU a permanent tool. FEPS. Recovery Watch. Policy Study.
416 Ibid.
417 Garicano, L. 2022. Combining environmental and fiscal sustainability: a new climate facility, an expenditure rule, an independent fiscal agency. CEPR Voxeu column.
418 Grund, S., Steinbach, A. 2023. European Union debt financing: leeway and barriers from a legal perspective. Bruegel. Working Paper.
419 Ibid.
420 Ibid.

Calls for a proper EU budget and Own Resources to support a common energy policy have been around for close to 15 years.[421] It could rest on an a tax on financial transactions or a common EU corporate tax as suggested by the European Parliament,[422] a tax on large internet companies,[423] or a wealth tax (an exceptional one-off, as suggested by Jean Pisani-Ferry and Selma Mahfouz at the French level,[424] or permanent).[425]

In any case, an enlarged EU would call for a greater pool of common EU resources, and matching decision-making on resources and spending. The prospect of further enlargement of the EU calls for institutional reforms. This is an opportunity to address the EU green funding gap. The report of the Franco-German working group on EU institutional reform recommends shifting fiscal and tax policy under Qualified Majority Voting in the Council,[426] instead of unanimity rule that blocks progresses on the EU budget. Given the time often required for new ideas to permeate high-level policy-decision circles, it is necessary to prepare the ground for these upcoming discussions.

421 Andoura, S., Leigh, H., van de Woude, M. 2010. Towards a European Energy Community: a policy proposal. Jacques Delors Institute, Report.

422 European Parliament, 2023. Report on own resources: a new start for EU finances, a new start for Europe.

423 Woźniakowski, T.P., Poiares Maduro, M. 2020. Why fiscal justice should be reinstalled through European taxes that the citizens will support – a proposal. European University Institute, School of Transnational Governance. Policy analysis.

424 Pisani-Ferry, J. Mahfouz, S. 2023. Les incidences économiques de l'action pour le climat. France stratégie. Rapport à la Première ministre.

425 Wildauer, R. 2022. How to address Europe's green investment gap. FEPS. Policy Brief; Kapeller, J., Leitch, S., Wildauer, R. 2023. Can a European wealth tax close the green investment gap? Ecological Economics

426 With safeguards, including a 'sovereignty safety net' on topics of vital national interest, see Franco-German working group on EU institutional reforms, 2023. "Sailing on high-seas – reforming and enlarging the EU for the 21st Century". Report

Conclusion. Stronger democratic, governance and financing tools are necessary

To rebuild consensus around climate action implementation and adoption, the EU needs to strengthen its approach on politics, governance and financing.

To better align actors' preferences with climate neutrality, the EU should contribute to a democratic renewal with institutionalized deliberative democracy and multi-stakeholders' exchange platforms at all levels of government. It should also support the build-up and expansion to broad private – public – scientific – civil society political alliances that will strengthen the resolve of EU leaders to adopt bold, progressive and efficient energy and climate policies.

Great challenges call for collective intelligence and action. We need a governance that considers interdependencies between sectors and that exploits synergies, a governance that plans for an orderly and consistent public infrastructure deployment in order to integrate private assets and projects (manufacturing facilities, energy generation capacities, electrification). EU competitiveness, resilience and economic security will require a new approach to demand reduction policies; it should include sufficiency and efficiency in the use of materials in times of limited resources, as well as more external unity towards energy and raw materials suppliers.

Interactive governance models show great results in designing solution-seeking and trust-enhancing processes across different stakeholders in highly uncertain environments. A renewed governance would integrate all levels of government and concerned stakeholders in an interactive, flexible and iterative process; this would allow for constant improvement of policy instruments while keeping a firm overall objective of an efficient and fair transition to climate neutrality. There is an interesting potential for integrating such governance models in the current EU energy and climate framework, especially the various national plans linked to EU funding.

Such governance would be made by and with skilled people that have the right incentives to collaborate in both the public and the private sector. It would work on making collaboration easy through simplified

administrative processes. It would also count on a strong information backbone to guide informed public choices and public debate.

Politics and governance should pave the way for ambitious solutions, including new Own Resources and new common EU green bonds that would take the suit of NGEU and finance the European Green Deal in an effective and efficient way. The EU remains a fragmented collection of sovereign states, with highly constrained EU fiscal capacity to address external threats. Yet, EU institutional weaknesses hinder the development of a genuine single market and the achievement of our climate and security objectives.

The above political, governance and financing proposals would be complementary and have the potential to support one another. For example, an EU Citizen Assembly could discuss the question of new Own Resources. This would allow to better evaluate the social acceptability of some of the current proposals, and potentially investigate new options. At the same time, increased EU public financing requires a solid governance and regulatory framework, otherwise it would risk being either captured by some powerful interests or being misused on low impact projects. There is a need to decide upon how the funds should be spent and what to prioritise, and to make sure that projects are subsequently appropriately implemented. An interactive multi-level and multi-stakeholders model could foster a more agile, goal-oriented and inclusive EU energy and climate governance. This would lead to high performance in achieving the three objectives of the Energy Union: climate neutrality, security and competitiveness.

Part 5.

Recommendations

I • Energy Union 2.0.: new carrots for better coordination towards common goals

EU financing, governance and democracy instruments must be strengthened and aligned with climate neutrality. They should be seen as preconditions for a more constructive and productive energy policy debate that would ultimately allow an ambitious additional regulatory push. EU energy and climate regulation, despite being the most ambitious in the world, will still need to be improved in coming years to support the rise of cleantech manufacturing and supply chains, and clean infrastructure including grids, housing, mobility. The Fit for 55 only paves the way to reaching the 2030 objective of 55% emissions reduction. More financing, improved governance making an efficient use of EU funds, including though better absorption capacity across all sectors and stakeholders, as well as greater participation in the policy debate could foster a successful implementation of existing policy instruments, and enhance the political acceptability of the required additional efforts.

An Energy Union 2.0. to deliver the European Green Deal calls for:

- Governance: a more goal-oriented and collaborative governance with green conditionalities
- Financing: an increased EU budget fit for energy resilience, security and prosperity
- Democracy: a democratic renewal, including permanent citizen assemblies on climate and resilience, and permanent Energy and Climate Stakeholders' Dialogue Platforms at the national and regional levels

BOX 15. Summary of the Energy Union 2.0. recommendations

A MORE EUROPEAN, EFFICIENT AND COLLABORATIVE ENERGY AND CLIMATE GOVERNANCE

- **The European Commission should engage into the definition of an new EU Energy Security Strategy.**

  The new EU Energy Security Strategy for cleantech supply chains, clean infrastructure, and demand reduction should be based on extensive collaboration with national authorities and other non-state stakeholders. It should include options to further operationalise joint purchase of gas and move

forward on the CRMA proposal to replicate this approach to critical materials.

- **The European Commission should propose an ambitious revision of the Governance of the Energy Union Regulation that would improve national and EU energy and climate planning.**

  Revising the NECPs template update could include the following update of the dimensions of the Energy Union:

  – The "Energy Efficiency" dimension could become a "Demand Reduction" dimension to encompass sufficiency and planetary limits, as well as the need to go beyond the sole energy focus to encompass materials and natural resources.

  – The "Research, innovation and competitiveness" dimension should mention clean industry, to reflect the renewed attention to domestic manufacturing capacities and supply chains.

  – A 6th "Just Transition" dimension could be integrated to emphasize the commitment to a fair and inclusive transition, including quality jobs creation, skills and training, public participation and addressing carbon inequalities as well as the distributive impacts of the European Green Deal.

- **The European Commission should propose to make the governance of some EU energy and climate related funds (SCF, cohesion funds, for another NGEU if it was replicated) more conditioned to green reforms, more agile and more collaborative.**

  – Link future EU climate funding to conditionalities on EU energy and climate regulatory framework timely and appropriate implementation.

  – Make EU energy and climate planning to access EU funds more agile and collaborative with more robust national and regional monitoring systems to oversee the progress, make changes when necessary, and allow for continuous integration of lessons learned during implementation.

- **The European Commission should create a new task force within its Secretariat General to coordinate the implementation of the EU climate-related funds with the Energy Union objectives.**

  A RESILIENCE task force for energy resilience similar to RECOVER could be created within the European Commission Secretariat General to oversee and

coordinate the implementation of the various EU climate-related funds and ensure that they effectively contribute to EU climate, security and competitiveness objectives.

AN INCREASED EU BUDGET

- **The Council should agree on the creation of new Own Resources and/or the issuance of EU green bonds to increase the EU budget to make it fit for energy resilience, security and prosperity.**

  The EU needs to invest in clean infrastructure and manufacturing capacities, skills and people. An EU budget for energy resilience, security and prosperity would increase the EU grants supporting the achievement of the European Green Deal while maintaining energy security and reasonable prices.

STRONGER DEMOCRATIC TOOLS

- **The European Commission, the Council and the European Parliament should launch and institutionalize an EU Citizen on climate and energy resilience.**

  An EU Citizen Assemblies on climate and energy resilience should be institutionalized, organised on a regular basis (yearly for example) and closely tied to the EU decision-making process. Topics to be discussed could include possible new own resources to finance the European Green Deal, or measures to be included in the next 2040 energy and climate package.

- **The European Commission should launch a new "Energy and Climate Stakeholders' Dialogue Platforms Facility".**

  A new dedicated "Energy and Climate Stakeholders' Dialogue Platforms Facility" could deliver financial and technical support for the early stages of the establishment of Energy and Climate Stakeholders' Dialogue Platforms, as well as support broad stakeholder participation at the national level" après participation. This would create a space where local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress. This would contribute to supporting ambitious public – private – civil society alliances to support EU leaders in adopting bold decisions. In addition, it could support a more interactive and collaborative monitoring of energy and climate governance.

A MORE EUROPEAN, EFFICIENT, COLLABORATIVE

New challenges call for a more European approach to energy. Additionally, EU energy and climate governance should be more agile, collaborative, goal-oriented and less bureaucratic. The EU should make use of EU funds to foster and support EU coordination and planning, ambitious climate action at all levels of government, strong social and political buy-in, and striving public – private – civil society partnerships.

- **The European Commission should engage into the definition of an new EU Energy Security Strategy.**

The new EU Energy Security Strategy would integrate internal and external unity aspects on cleantech manufacturing and supply chains, grids and clean infrastructure deployment as well as demand reduction.

The European Commission should formulate an integrated EU Energy Security Strategy for cleantech supply chains, grids and clean infrastructure, based on extensive collaboration with national authorities and other non-state stakeholders. There is a need to define a strategy, prioritize, and create quality project pipelines at EU, national and local levels. It could build on synergies with national energy and climate plans (NECPs) while inspiring greater EU coordination and planning. For example, an EU cleantech manufacturing strategy should be based on a thorough and peer-reviewed analysis of EU cleantech supply chains vulnerabilities, in order to address the issue in a more differentiated way than the target proposed in the NZIA. It should also build on the EU Grid Action plan currently under development, and have a renewed focus on demand reduction levers such as building renovation and sufficiency.

In addition to improving the coherence and quality of EU clean infrastructure development plans**, the new EU Energy Security Strategy should include options to strengthen the EU Energy Platform by further operationalising joint purchase of gas and moving forward on the CRMA proposal to replicate this approach to critical materials.** In the current interconnected EU internal energy market, individual moves by national governments to protect their own national supply in energy resources is likely to have negative impacts on other Member States. On the other hand, solidarity and external unity, including through joint purchase of

critical energy commodities, have a high potential to ensure energy security for EU consumers.

- **The European Commission should propose an ambitious revision of the Governance of the Energy Union Regulation that would improve national and EU energy and climate planning.**

The template for NECPs is outdated given the wide evolution of the energy and climate challenges, with additional challenges pertaining to manufacturing, supply chains, multi-level coordination or social acceptance.

As the main Energy Union planning tool, the upcoming revision of the Governance of the Energy Union and Climate Action Regulation in 2024 is an opportunity to improve NECPs templates, reporting and data requirements, as well as local and EU levels integration.

Revised NECPs templates should include reporting requirements on:[427]

- **Financing: e**xpected costs and financial impacts, investments' needs and source of funding
- **Resilience: l**inks to new cleantech industrial and economic strategies, requirements to prepare integrated cleantech value chain development strategies[428] with incentives to think cross-border, requirements to include considerations on adaptation to climate change, sufficiency policies and circularity
- **Democracy and social justice:** improved reporting requirements on the process and results of public participation, include considerations on spatial and social groups benefits distribution during implementation, including on employment, in the monitoring requirements [429]

This may require updating the five dimensions of the Energy Union, along which the reporting template is structured. As a reminder, the five dimensions are 1) Security, solidarity and trust; 2) A fully integrated internal

427 T&E, 2023. How to improve the climate and energy governance rules. Briefing.
428 Patuleia, A., Waliszewska, A. 2023. Making clean technology value chains work for EU economic convergence. E3G. Report.
429 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

energy market; 3) Energy efficiency, 4) Climate action, decarbonising the economy (renewables and grids), and 5) Research, innovation and competitiveness.

- **The "Energy Efficiency" dimension could become a "Demand Reduction" dimension** to encompass sufficiency and planetary limits, as well as the need to go beyond the sole energy focus to encompass material and natural resources.
- **The "Research, innovation and competitiveness" dimension should explicitly mention cleantech industry,** to reflect the renewed attention to domestic manufacturing capacities.
- **Lastly, a 6th dimension should be integrated, a "Just Transition" dimension** that would emphasize the commitment to a fair and inclusive transition, including public participation, quality jobs creation, skills and training, mitigating carbon inequalities as well as the distributive impacts of the European Green Deal.[430]

The European Commission should provide additional technical support for quality NECPs, such as capacity support, common modelling tools or parameters. Launching a permanent forum for good practices and knowledge sharing among Member States would allow for better coordination and cross-border planning processes.

Additionally, NECPs' drafting and implementing process should better include policymaking levels and stakeholders that were initially not at the centre of EU integration process, like regions, or totally missing, like cities or communities, and which are now meant to play a decisive role.[431] New division of tasks is required between the European Commission, national and sub-national government levels, especially given the need to ensure wide participation, context-sensitive measures, and smooth implementation.

430 Pellerin-Carlin, T., Vinois, J.A., Rubio, E., Fernandes, S. 2017. Making the energy transition a European success. Tackling the democratic, innovation, financing and social challenges of the Energy Union. JDI. Report

431 Carrosio, G., Cicerone, G., Faggian, A., Urso, G. 2022. How place-sensitive are the NRRPs? FEPS. Recovery watch. Policy study.

- **The European Commission should propose to make the governance of some EU energy and climate related funds (SCF, cohesion funds, for another NGEU if it was replicated) more conditioned to green reforms, more agile and more collaborative.**

Use EU fund conditionality to strengthen energy and climate governance and monitoring. An early analysis of the ECB considers that the RRF focus on performance gives a positive incentive for compliance, and enables countries to implement legislative change with adequate resources.[432] However, NRRPs are explicitly linked to Country Specific Recommendations of the European Semester, which only provide generic guidance on energy. It would be very fruitful to link future EU climate funding to stronger conditionalities on EU energy and climate policies implementation, such as the Fit for 55 and REPowerEU. This would allow to address the risk of diluted ambition during implementation.[433] Similarly, approval should be conditioned to more effective public participation along the following criteria: early, meaningful, and iterative during both preparation and implementation.[434]

Improve the agility of energy and climate planning to access EU funds with more robust national and regional monitoring systems. EU climate-related funds increasingly request national (NRRPs, SCPs) or regional (cohesion funds, TJTPs) energy and climate planning. Planning is a good tool to ensure the quality and adequacy of the projects financed. Yet energy and climate planning must be more flexible to accommodate uncertainty. The current detailed contracting approach is cumbersome and unable to adapt swiftly to changing geopolitical, technological or social realities, as well as the policy lessons learned as implementation progresses. **Instead, it could be useful to agree on broader common goals and set up a joint governance system to oversee it**. This would allow constant monitoring by all relevant stakeholders to ensure the

432 ECB in Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

433 European Court of Auditors, 2023. Special report 18/2023: EU climate and energy targets – 2020 targets achieved, but little indication that actions to reach the 2030 targets will be sufficient.

434 Velten, E.K., Evans, N., Spasova, D., Duwe, M., de la Vega, R., Duin, L., Branner, H. 2022. Charting a path to net zero: An assessment of national long-term strategies in the EU. Ecologic Institute

right direction.[435] National coordination bodies designated to implement NRRPs could be made responsible for the establishment of an internal diagnostic monitoring process for reform and investment projects[436] undertaken with the support of EU funding, in order to oversee the progress, make changes when necessary, and allow for continuous integration of lessons learned during implementation.

These recommendations could be first piloted at a small scale, for example for the SCF which has not yet started, and for which national plans are due by 2025. Yet, the small amounts at stake might lower the incentives for governments to undertake it. It would be stronger and more ambitious to consider applying it to the next EU budget.

- **The European Commission should create a new task force within its Secretariat General to coordinate the implementation of the EU climate-related funds.**

A RESILIENCE task force for energy resilience similar to RECOVER could be created within the European Commission Secretariat General to oversee and coordinate the implementation of the various EU climate-related funds and ensure that they effectively contribute to EU climate, security and competitiveness objectives. It would allow for the integration of different funds and strategies for more effective coordination.[437] It could pave the way for the integration of RRF and cohesion policy systems, together with the SCF and the JTF, into a single multi-level framework to create European economies of scale and scope of EU budget governance.[438]

435 Le Merle, K., Tribukait. I. 2023. Improving territorial justice. Transparency, inclusiveness, capacity building and strategy in the Territorial Just Transition Plans. FEPS. Policy Brief.

436 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

437 Le Merle, K., Tribukait. I. 2023. Improving territorial justice. Transparency, inclusiveness, capacity building and strategy in the Territorial Just Transition Plans. FEPS. Policy Brief.

438 Zeitlin, J., Bokhorst, D., Eihmanis, E. 2023. Governing the RRF. Drafting, implementing, and monitoring national recovery and resilience plans as an interactive multilevel process. FEPS Recovery Watch. Policy Study.

AN INCREASED EU BUDGET

- **The Council should agree on the creation of new Own Resources and/or the issuance of EU green bonds to increase the EU budget and make it fit for energy resilience, security and prosperity.**

Additional EU grants are needed for the new cleantech industrial revolution, for tomorrow's jobs, and for today's green investment needs. The RRF contributes to filling the public investment gap in buildings, mobility and industry until 2026, but it does not consider new financing needs, such as the implementation of the Green Deal Industrial Plan, and does not solve the issue of what will happen after 2026. The relaxation of state aid as the result of the energy and competitiveness crises is dangerously leading to single market fragmentation. Without additional resources (technical, human, financial), it will be difficult to implement and further strengthen the regulatory framework, invest in skills, steer private investments, and create a high-quality pipeline in public infrastructure projects that will be the backbone of EU's future competitiveness, jobs and well-being.

The EU needs to invest in clean infrastructure and manufacturing capacities, skills and people. An EU budget for energy resilience, security and prosperity would increase the EU grants available to achieve the objectives of climate neutrality, energy security and reasonable prices. The amounts needed should be subject to both EU institutions detailed analysis and independent assessments at the EU and national level. It could draw from the exercise of defining a new EU Energy Security Strategy.

The creation of new Own Resources for the EU budget to make it fit for energy resilience should go hand in hand with potential reforms to allow new common EU debt at the scale required to address the challenges at hand. Besides new Own Resources and debt, another option to increase EU grants for the energy transition would be to pool more ETS revenues at the EU level.

A DEMOCRATIC RENEWAL TO SUPPORT THE EUROPEAN GREEN DEAL

Agreeing on ambitious EU climate instruments this will be hard, especially given the unfavorable political conditions in many Member States,

which may weaken the backing of the Council and of the next the European Parliament for future efforts.

The Energy Union 2.0. would benefit from a democratic renewal and institutional reforms at the EU level, which would allow for greater political inclusion to better reflect citizens' views, and a more efficient decision-making process. To address the concerns of the most vulnerable countries, regions, businesses, workers and citizens, solidarity and burden-sharing gaps should be addressed through improved financing and governance. Overcoming institutional hurdles in the Council could go a long way in improving EU decision-making. The Franco-German report on EU reforms envisages for example a generalisation of qualified majority voting on fiscal and tax policy matters.[439]

To support a climate policy design that fits citizens' expectations, addressing the EU democratic gap is needed. The creation of a truly transnational electoral space, including through transnational lists,[440] would strengthen representative democracy at the EU level. Additionally, perspectives stemming from places remote from political centres urgently need to be better considered, since they might be prone to populist narratives currently on the rise that (will) neither spare the EU nor the energy transition. Deliberative democracy experiences seem to be a promising tool and a good complement to representative democracy in that respect. It creates a shared space for independent specialists and citizens, shielding the discussion from vested interests. It is urgent to cool down the debate, to make it fact-based, while acknowledging a variety of perspectives and experiences.

An EU Citizen Assembly on climate and energy resilience should be institutionalized, organised on a regular basis (yearly for example) and closely tied to the EU decision-making process. For example, the process could include a mandatory discussion of the Citizen Assembly proposals by EU institutions, followed by a report on the conclusions with transparent and substantive justifications in case of rejection. Topics to be discussed could include possible new Own Resources to finance the Euro-

439 Franco-German working group on EU institutional reforms, 2023. "Sailing on high-seas – reforming and enlarging the EU for the 21st Century". Report

440 Brack, N., Wouter, W. 2023. European political parties, poorly identified political bodies? Study. Jacques Delors Institute.

pean Green Deal, or measures to be included in the next 2040 energy and climate package. This could go a long way in improving the legitimacy of bold, efficient and progressive climate policy instruments, and support political leaders in moving forward with the European Green Deal.

Furthermore, the European Commission should support the establishment of permanent Energy and Climate Stakeholders' Dialogue Platforms at the national, regional and local levels, to create a space where local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress. Taking inspiration from the new "European Energy Communities Facility",[441] this support from the European Commission could come from a new dedicated "**Energy and Climate Stakeholder's Dialogue Platforms Facility**" that could deliver financial and technical support for the early stages of the establishment of Energy and Climate Dialogue platforms, as well as support broad stakeholder participation. The LIFE Clean Energy Transition grant programme could fund it. This would contribute to supporting ambitious public – private – civil society alliances at the national and local levels to support EU leaders in adopting bold climate policy instruments. Implementing such Dialogue Platforms at the national level as a priority would support the implementation of the Governance Regulation provision that requires the establishement of national energy and climate dialogues.

II • Pragmatic steps towards the Energy Union 2.0.

The need for action never seemed so pressing, with ever more alarming IPCC reports, the multiplication of extreme weather events, rising economic, social and geopolitical threats, as well as the sustained and growing mobilization of civil society, including the scientific community, together with cleantech businesses that are urging to seize the moment. Agreeing on the above proposals for an Energy Union 2.0. will require a grand bargain on energy issues. A pragmatic start for the next Commission could include:

441 European Commission, European Energy Communities Facilities.

A NEW EU ENERGY SECURITY STRATEGY

A new EU Energy Security Strategy based on electrification, grids development, EU cleantech manufacturing and demand reduction, including :

- **An "Energy and Material Demand Reduction First"** principle would help to prioritize uses for rare energy and material resources. It could take the form of an update of the EE1st principle. Endless fights over supply divert a lot of political energy, while remaining blind to demand reduction potential, an issue that remains massively under-addressed. The EU should shift from an energy-only approach to demand reduction to better encompass material demand, since the energy transition involves technologies that are material and mineral-intensive.[442] Energy and material efficiency and sufficiency policies should encompass energy and material resources, and their key role in security, competitiveness and well-being should be acknowledged during the next Commission's term.
- **Strengthening the EU Energy Platform** to further operationalise joint purchase of gas and prepare for the replication of joint purchase for selected critical materials, based on a vulnerability analysis as foreseen in the CRMA proposal.

AN EU CLEAN INVESTMENT PLAN WITH AN EU SOVEREIGNTY FUND

The EU needs an EU Clean Investment Plan to achieve its 2030 targets and preserve the single market from further fragmentation. An EU green financing gap arises as the RRF comes to an end, while heightened challenges of energy security and competitiveness fuel demands for more EU-level support. **The EU Clean Investment Plan should include an EU Sovereignty Fund** that would allow for a targeted increase of EU grants or subsidies for cleantech manufacturing and grids.

442 Whole-life-carbon approach to buildings for example, accounts for emissions from the material production and transport caused by the construction phases, and its integration in the energy policy framework is still in its infancy. An ambitious Construction Products Regulation revision would create ecodesign requirements for construction products and a demand pull for low carbon, efficient materials. As regards minerals, new lithium mines for example would be more acceptable if the lithium is not used for e-SUVs but light or collective vehicles.

- **It could serve for the creation of an EU ARPA-E** (Advanced Research Projects Agency – Energy)[443] that would support breakthrough progress in clean energy technologies. For example, innovation is required along the critical raw materials value chain (mining, processing, refining, recycling, eco-design) to optimize the use of resources for the cleantech economy.
- **It should also support the development of EU-wide cleantech support schemes,** and a renewed focus on electric grid planning and expansion for transport and distribution. The new EU Energy Security Strategy on cleantech manufacturing, clean infrastructure and demand reduction would could guide the selection of large infrastructure projects.

AN EU ENERGY AGENCY

The creation of an EU Energy Agency should be part of the effort to provide up-to-date, reliable energy data. Lack of data currently prevents public, private and independent policy assessment, and increases the risk of low performance of the policy designs in achieving climate neutrality, security and competitiveness. An EU Energy Agency could also respond to the EU Citizen Panel on climate change recommendation to set up a platform with regularly updated and diverse scientific environmental information in an easily accessible and transparent way for citizens, and provide streamlined information and training campaigns about the impact of daily activities in the EU. Beyond an EU Energy Agency, the EU should incentivise national governments to provide clear, complete, timely, reliable and relevant public sector data and information, along with the OECD recommendation on open government.[444]

AN ENERGY AND CLIMATE STAKEHOLDERS DIALOGUE PLATFORMS FACILITY

The European Commission should create an "Energy and Climate Stakeholders' Dialogue Platforms Facility" that could deliver financial

443 Also proposed in, among others, Terzi, A., Sherwood, M., Singh, A. 2023. European industrial policy for the green and digital revolution. Science and Public Policy. Blanchard, O., Tirole, J. (rapporteurs). 2021. Les grands défis économiques. Rapport de la commission international présidée par Blanchard et Tirole. France Stratégie.

444 The OECD recommendation of the Council on Open Government

and technical support for the early stages of the establishment of national Energy and Climate Stakeholders' Dialogue platforms, as suggested by the Governance Regulation. The goal would be to support the creating of a space where national and local authorities, civil society organisations, businesses, investors and other relevant stakeholders can engage and discuss energy and climate policies, and review implementation progress of the European Green Deal at the national level. The LIFE Clean Energy Transition grant programme could fund it. This would contribute to supporting ambitious public – private – civil society alliances at the national and local levels to support EU leaders in adopting bold climate policy instruments.

AN EU CITIZEN ASSEMBLY ON CLIMATE

Given the political challenge and uncertainty surrounding the implementation of the European Green Deal, an EU Citizen Assembly on Climate closely tied to EU decision-making could enhance the legitimacy of the additional policy effort required for the European Green Deal implementation, be it regarding institutional, governance, financial or regulatory instruments. An EU Citizen Assembly on Climate would create a space protected from vested interests for open discussion between citizens and experts. It could contribute to cool down the debate and provide fresh and shared understanding of highly political issues at stake. It could for example discuss new EU funding and governance instruments for the support of the implementation of the Fit For 55, and contribute to the future negotiations on the 2040 energy and climate framework.

Conclusion

The EU energy and climate policy achieved great progress since the launch of the EU Green Deal. The successful adoption of the Fit for 55, the contribution of the RRF to green investments, the launch of REPowerEU, and current discussions around EU cleantech industrial policy are good steps towards climate neutrality, a stronger common EU energy security and future competitiveness.

However, the EU is facing increasing geopolitical, economic, social and political challenges that threaten the achievement of the objectives of the Energy Union to provide clean, secure and reasonably priced energy to EU consumers.

The EU already has excellent foundations on energy and climate policy, but the European Green Deal and Energy Union instruments are still too national, too temporary, insufficiently binding, and do no adequately support the achievement of the EU objectives.

Greater EU solidarity, coordination and collective action at all levels are required to successfully implement the European Green Deal while preserving energy security and reasonable prices. More specifically, in order to sustain and enhance ongoing policy efforts, the EU needs to upgrade its energy and climate governance, increase common funding and develop its democratic tools, paving the way for a stronger Energy Union.

The Energy Union 2.0. builds on existing policies. It is mostly about improving, replicating and institutionalising some of the best practices and some of the most promising policy innovations. Instead of reacting to crises with emergency and temporary answers, the EU needs to further strengthen its permanent tools to prevent the next ones. Given the convergence of climate, security (both energy and economic), competitiveness, and cohesion challenges, this should be the top priority of the next Commission and other EU institutions.

Annexes

Boxes

Figures

Abbreviations

ARPA-E	Advanced Research Projects Agency – Energy
bcm	billion cubic meters
CAPEX	Capital expenditure
CBAM	Carbon Border Adjustment Mechanism
cleantech	clean technologies
CRMA	Critical Raw Material Act
CSR	Country Specific Recommendation
DARPA	Defence Advanced Research Projects Agency
DNSH	Do Not Significant Harm
EC	European Commission
ECA	European Court of Auditors
ECB	European Central Bank
EE1st	Energy Efficiency First
EED	Energy Efficiency Directive
EGD	European Green Deal
EIB	European Investment Bank
ENTSO-E	European Network of Transmission System Operators – Electricity
EP	European Parliament
EPBD	Energy Performance of Buildings Directive
ESABCC	European Scientific Advisory Board on Climate Change
ETS	Emission Trading System
ETS2	Emission Trading System 2
EU	European Union
EV	Electric vehicle
FF55	Fit for 55

GDIP	Green Deal Industrial Plan
IEA	International Energy Agency
IPCEI	Important Project of Common European Interest
IRA	Inflation Reduction Act
JRC	Joint Research Centre
JTF	Just Transition Fund
MEP	Member of the European Parliament
MFF	Multiannual Financial Framework
MS	Member States
NECP	National Energy and Climate Plan
NGEU	NextGenerationEU
NRRP	National Recovery and Resilience Plan
NZIA	Net Zero Industrial Act
OPEX	Operating expenses
RRF	Recovery and Resilience Facility
SCF	Social Climate Fund
SCP	Social Climate Plan
STEP	Strategic Technologies for Europe Platform
TJTP	Territorial Just Transition Plan
US	United States

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Energy Union 2.0. to deliver the European Green Deal: stronger governance, common financing and democratic tools

Camille Defard

Head of the Jacques Delors Energy Centre

Research Fellow in EU Energy Policy

The Energy Union aims at ensuring secure, sustainable, competitive and affordable energy supply to EU consumers. This report aims to assess the current EU energy and climate framework as compared to the Energy Union policy objectives in order to identify progress and remaining gaps.

This report proposes an Energy Union 2.0. as a strategic goal for the EU institutions following the next EU elections in 2024 to support the delivery of the European Green Deal while preserving energy security and reasonable prices.

To sustain and enhance ongoing energy policy efforts in challenging times, the EU needs to upgrade its energy and climate governance, increase common funding and develop its democratic tools, paving the way for a stronger Energy Union.

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