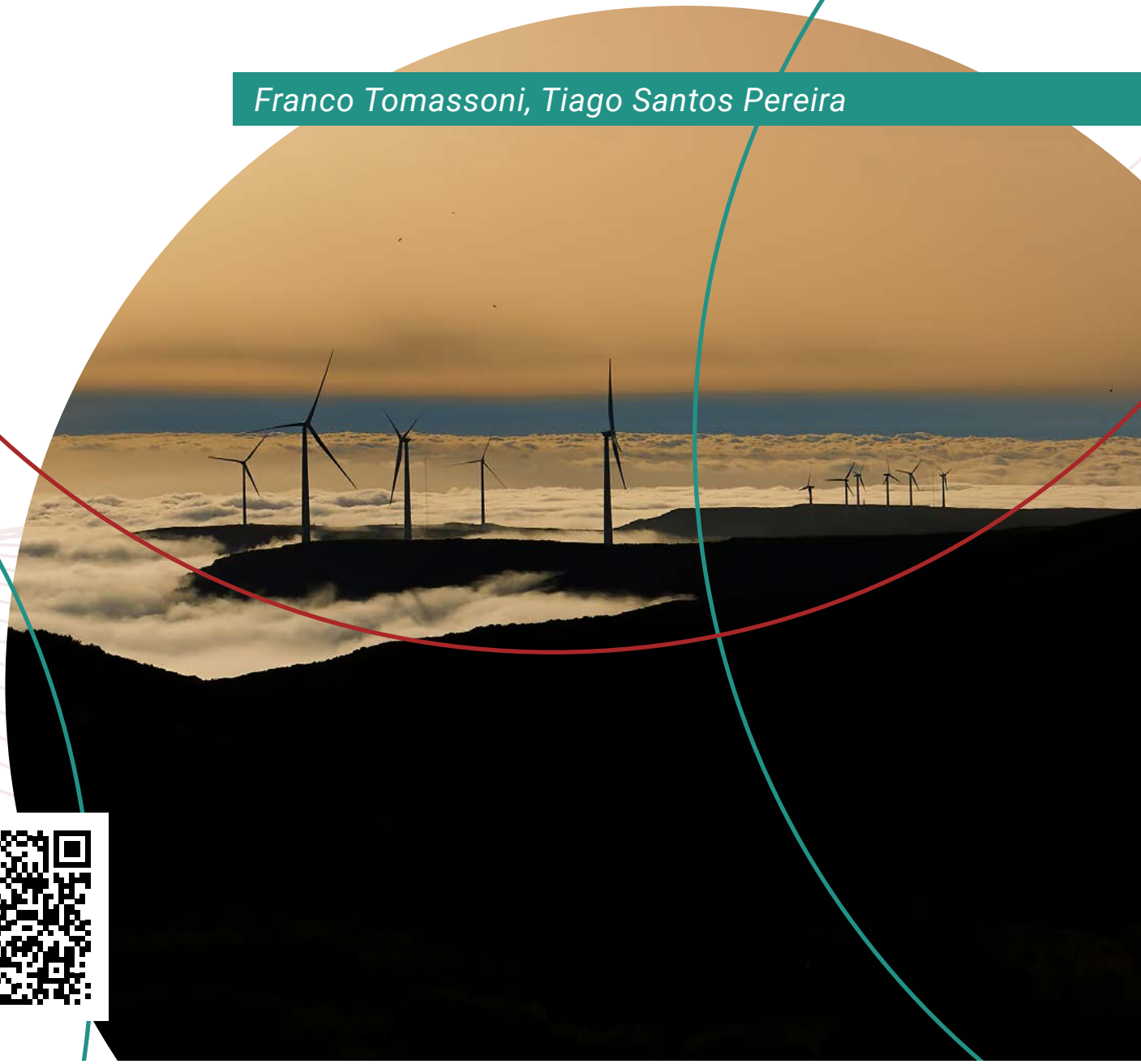
RECOVERY WATCH

POLICY STUDY
April 2024

HOW CAN REPOWEREU CONSOLIDATE RECOVERY?

Franco Tomassoni, Tiago Santos Pereira



FEPS
FOUNDATION FOR EUROPEAN PROGRESSIVE STUDIES

FRIEDRICH EBERT STIFTUNG

IEV

COLABOR

Policy Study published in April 2024 by

THE FOUNDATION FOR EUROPEAN PROGRESSIVE STUDIES (FEPS)
European Political Foundation - No 4 BE 896.230.213
Avenue des Arts 46 1000 Brussels (Belgium)
www.feps-europe.eu
@FEPS_Europe

FRIEDRICH EBERT STIFTUNG (FES)
EU-Office Brussels- Rue du Taciturne 1000 Brussels (Belgium)
www.brussels.fes.de
@FES_Brussels

INSTITUT EMILE VANDERVELDE (IEV)
Boulevard de l'Empereur 13 1000 Brussels (Belgium)
www.iev.be

Knowledge Partner for this Policy Study:

COLLABORATIVE LABORATORY FOR LABOUR, EMPLOYMENT AND SOCIAL PROTECTION (COLABOR)
Rua das Taipas 1, 1250-264 Lisbon (Portugal)
www.colabor.pt
@CoLABOR

This Policy Study was produced with the financial support of the European Parliament. It does not represent the views of the European Parliament. This paper only represents the opinion of its authors and not necessarily the views of FEPS.

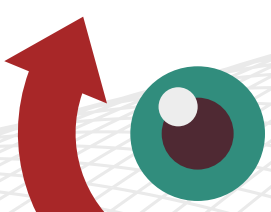
Legal deposit registration number: D/2024/15396./25

Copyright 2024 by FEPS
Cover photo: Shutterstock

Copy-editing: Rosalyne Cowie
Layout: Tryptique

ISBN: 978-2-931233-84-9

RECOVERY WATCH



RECOVERY WATCH

WHAT IS THIS PROJECT ABOUT?

The National Recovery and Resilience Plans represent the new framework in which European member states identify their development strategies and allocate European and national resources – with the objective of relaunching socio-economic conditions following the coronavirus pandemic.

This process, initiated as part of the European response to the global health crisis, follows the construction of NextGenerationEU. It combines national and European efforts to relaunch and reshape the economy, steering the digital and climate transitions.

For European progressives, it is worth assessing the potential of these national plans for curbing inequalities and delivering wellbeing for all, as well as investigating how to create a European economic governance that supports social, regional, digital and climate justice.

The Foundation for European Progressive Studies (FEPS), the Friedrich Ebert Stiftung (FES) and the Institut Emile Vandervelde (IEV), in partnership with first-rate knowledge organisations, have built a structured network of experts to monitor the implementation of National Recovery and Resilience Plans and assess their impact on key social outcomes. Fact- and data-based evidence will sharpen the implementation of national plans and instruct progressive policymaking from the local to the European level.

The Recovery Watch will deliver over 15 policy studies dedicated to cross-country analysis of the National Recovery and Resilience Plans and NextGenerationEU. Monitoring the distributive effects of EU spending via NextGenerationEU, and the strategies and policies composing the national plans, the project will focus on four areas: climate action, digital investment, welfare measures and EU governance.

KNOWLEDGE PARTNERS

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

EXECUTIVE SUMMARY

Europe has been dealing with a prolonged energy crisis since the latter half of 2021. This has led to significant hikes in the cost of gas and other fossil fuels, which have corresponding impacts on electricity costs. Initially, the crisis stemmed from a combination of factors, including a restricted global energy supply during the post-Covid economic recovery, reduced domestic energy production and diminished gas supplies from Russia since the autumn of 2021. This situation was further worsened by Russia's full-scale attack on Ukraine in February 2022.

In this context, the REPowerEU Plan can be seen as a double instrument: on the one hand, it constitutes a response to the new geopolitical scenario; on the other hand, the role played by the plan within the broader recovery strategy to face the socio-economic effects of the pandemic shows the potential for this contextual measure to take an essential role in the broader governance of European energy policy.

This policy study analyses how the objectives of the REPowerEU Plan, and the corresponding financial commitments, are differently translated into National Recovery and Resilience Plans (NRRPs) – focusing specifically on the cases of Denmark, Estonia, France, Portugal and Spain –, highlighting added and removed measures, possible conflicting policy areas and missing policy areas. It shows how energy policies have been a central action focus through the NRRPs and the REPowerEU initiative. While in the former, there has been an emphasis on the green transition and the corresponding concerns with the diversification of the energy mix through increased production of renewable energy by member states, the focus of the latter reflected concrete impacts of the war in Ukraine and its implications for energy security in Europe.

The success of these major programmes is not simply determined by policy decisions and well-drafted programmes,, but it is also largely dependent on the success of its implementation process and the efficacy of its initiatives. As an example of this concern in the REPowerEU initiatives, all five countries analysed here included projects to simplify administrative processes for developing renewable energy projects.

While the focus on hydrogen production was central to measures directed at strengthening European energy security through diversifying energy sources, there is underlying competition between the EU countries regarding its spillover effects through industrial policy. Such competition may reflect overambitious, duplicated efforts and may have additional costs as it increasingly requires using renewable energy as direct electricity to produce a supply of hydrogen indirectly.

The REPowerEU plans, across the countries studied, strongly complement the NRRPs, including new investments and upscaling investments initiated under the NRRPs. REPowerEU also provides a critical articulation, through structural or administrative reforms, that enhances the development of new projects, facilitates access to related public services and streamlines the administrative and regulatory process.

In addition to the national recommendations, the study frames some recommendations for the EU level, especially as REPowerEU cannot simply be subsumed to EU-level indicators or the aggregation of national policies but must reflect a multi-level governance process. It includes:

- The territorial dimension of the energy dependence also emphasises the need for strengthening coordination between member states, especially for infrastructure projects for the European market.

- Strengthening the criterion for the realisation of cross-border energy infrastructure for EU financing. This practical approach should also be accompanied by the realisation of assessment studies that aim to implement infrastructure projects while linking them to the economic and industrial development of all territories involved.

- Developing a new concept of energy security that takes into account this new reality involves placing at its core the strengthening of the internal market and territorial cohesion through the enhancement of energy infrastructure networks.

- Strengthening monitoring mechanisms regarding adopting new energy technologies and expanding renewable energy production capacity is crucial.

1. REPowerEU: COMPLEMENTING THE RECOVERY THROUGH THE ENERGY SECTOR

After the full-scale Russian invasion of Ukraine, the European Commission introduced the REPowerEU energy plan.[1] Its aim is to address the new energy scenario arising from a significant escalation in geopolitical tensions between the EU and one of its major energy partners: Russia. The REPowerEU plan contains a range of policy and legislative initiatives, including an addition to the broader financing framework for economic recovery, known as NextGeneration Europe. The National Recovery and Resilience Plans (NRRPs), funded under the NextGeneration Europe framework, had been devised before this recent geoenergetic shift. In this context, REPowerEU serves to adjust these national economic recovery plans, equipping them with the necessary tools to tackle the evolving situation. These amendments could involve extending existing policies and investments already outlined in the previously approved versions of the plans or introducing entirely new measures into new so-called REPowerEU chapters. In fact, the plan unveiled by the Commission in May 2022 not only included a revision of the regulation governing amendments to the financing mechanism of the NRRPs but also earmarked funding for new investments.[2]

The primary funding source for REPowerEU is the Recovery and Resilience Facility (RRF), with its remaining loans accounting for €225 billion. The funding scheme of the plan also includes grants for €20 billion, which are financed through the Innovation Fund (60%) and from the Emission Trading System (ETS) allowances (40%). Member states have the option to transfer up to €5.4 billion from the Brexit Adjustment Reserve (BAR) to the RRF for REPowerEU. Additionally, they can utilise existing transfer options, such as up to 10% from cohesion policy funds for supporting SMEs and vulnerable households and amend their cohesion programs to allocate up to 7.5% for REPowerEU priorities in the 2021-2027 period.

Submission of REPowerEU chapters is not mandatory within a specific timeframe. However, member states could only access relevant grant and loan resources following the Commission assessment of the national chapter, Council adoption and financing/loan agreement signature in 2023. To facilitate this, member states were advised to submit proposals by 30 April 2023, with four doing so by that deadline. The Commission emphasised that chapters should be submitted as early as possible and no later than August 2023, which is the final deadline for loan requests set in Article 14 of the RRF Regulation. After this date, completion before the deadline isn't guaranteed. In some cases, member states submitted amendments beyond the EU Commission timeframe, as seen in Table A1 in the Annex.

REPowerEU IN THE CONTEXT OF THE EU CLIMATE AND ENERGY POLICY

The REPowerEU plan interacts directly with four policy packages launched in recent years, which are shaping the EU's energy strategy:[3]

1) The "Energy Union Strategy", approved in 2015, defines five pillars of EU energy policy, namely, energy security, fully integrated European energy market, energy efficiency as the first tool for curbing energy demand, the decarbonisation of the European economy, and research and innovation.

2) "Clean Energy for all Europeans", from 2016 and adopted in 2019, introduces further policy objectives, specifically targeting the electricity market and focusing on energy efficiency, renewable energy and nationally integrated climate and energy plans.

3) The "European Green Deal", from 2019, encompasses different policy initiatives with the overarching aim of achieving net-zero greenhouse gas emissions in the EU in 2050.

4) The "Fit for 55" plan, proposed in 2021, follows up on the European Green Deal and further details how the EU can meet its legally established target of reducing emissions by 55% until 2030.

After the introduction of the European Green Deal in December 2019, European institutions focused on two primary objectives: setting a new, ambitious target for reducing greenhouse gas emissions by 2030; and formalising the goal of climate neutrality by 2050 through the European Climate Law. Concurrently, strategies and blueprints were developed to integrate the shift

towards cleaner energy across various policy domains, spanning from agriculture to finance and external trade. Conversations also revolved around establishing fresh targets for renewable energy and energy efficiency. Despite the adverse economic impacts of the Covid-19 pandemic and opposition from certain Eastern member states, notably Poland, the energy transition retained its central position in EU policy making. This commitment was underscored by the allocation of 30% of the EU's 2021-2027 Multiannual Financial Framework and the NextGenerationEU recovery package to climate initiatives. The European Climate Law was ratified in June 2021, enshrining the objective of climate neutrality by 2050 and elevating the EU's 2030 target for greenhouse gas emissions reduction to "at least 55%" compared to 1990 levels. This enhanced 2030 target was presented as the EU's nationally determined contribution at the 26th Conference of the Parties (COP) of the UN Framework Convention on Climate Change (UNFCCC) in Glasgow in December 2021.[4] In tandem with the European Climate Law, this reaffirmed the EU's commitment to leading global efforts in climate action.

> "After the introduction of the European Green Deal in December 2019, European institutions focused on two primary objectives: setting a new, ambitious target for reducing greenhouse gas emissions by 2030; and formalising the goal of climate neutrality by 2050 through the European Climate Law."

In 2021, the Commission introduced the Fit for 55 Package to implement the 2030 emission reduction target. This encompassed 15 legislative proposals amending directives and regulations on various aspects, including renewable energy, energy efficiency, the ETS, emissions in non-ETS sectors (such as agriculture, buildings, and transport), land use and forestry, and emission standards for automobiles. Targets for renewable energy and energy-efficiency enhancement were elevated from 32% to 40% and from 32.5% to 36%, respectively (in terms of final energy consumption). The revised Renewable Energy Directive EU/2023/2413 raises the EU's binding renewable target for 2030 to a minimum of 42.5%, up from the previous 32% target, with the aspiration to reach 45%. It means almost doubling the existing share of renewable energy in the EU.

In late 2021, the energy crisis triggered by several factors, including the rapid economic rebound after the pandemic, resulted in high energy prices and exerted increasing economic and social pressure on the EU's green agenda. This crisis initially arose from a combination of post-Covid economic recovery, leading to higher energy demand and a constrained global energy supply. In the autumn of 2021, the Russian state company Gazprom, the primary supplier to the EU with significant capacity to increase exports, opted to only provide gas volumes specified in long-term contracts and curtailed sales on spot markets, ultimately ceasing them on 13 October 2021. The structure of the EU gas market, which had previously shifted towards spot purchases instead of long-term contracts (contrary to the preferences of long-term suppliers like Russia), revealed its substantial flaws in a situation of limited supply. At this juncture, Russia seemed to be leveraging the situation to gain profits from higher prices and to exert pressure on the EU to permit the commencement of the Nord Stream 2 pipeline, which had encountered delays due to legal and political factors.

In this context, marked by the tightening of the energy supply even before the full-scale Russian invasion of Ukraine, the REPowerEU ambition was not only meant to address the new geopolitical context, but also to serve as a new instrument for reshaping the EU's energy strategy and strengthening the EU energy market.

1. REPowerEU: COMPLEMENTING THE RECOVERY THROUGH THE ENERGY SECTOR

REPowerEU: CONTEXT OF EMERGENCE, RISKS AND POTENTIALITIES

Europe has been dealing with a prolonged energy crisis since the latter half of 2021. This has led to significant hikes in gas, electricity, and other fossil fuels costs. Initially, the crisis stemmed from a combination of factors, including a restricted global energy supply during the post-Covid economic recovery, reduced domestic energy production (such as hydropower) and diminished gas supplies from Russia since the autumn of 2021. This situation was further worsened by Russia's full-scale invasion of Ukraine in February 2022. Preceding the recent phase of the conflict, many European politicians, especially in Central and Western Europe, viewed energy trade with Russia as a mutually advantageous and dependable relationship, or even as the final link for cooperation between the EU and Moscow. Given that Russia was the primary source of gas, oil, and coal for the EU prior to the conflict, the war presented an unprecedented challenge for European policymakers. In the months following the outbreak of the full-scale invasion, the EU banned coal imports and partially restricted oil imports from Russia. In response, Russia halted gas supplies to several EU member states that declined to adopt a new payment system in rubles and curtailed gas exports to others. This ensuing energy crisis has expedited the existing transformation in discourse and policies within the EU's energy and climate agendas.

> "
>
> The REPowerEU was presented as a tool to accelerate the shift towards cleaner energy, in the near and mid-term, the strategy of phasing out Russian fossil fuels and of reducing gas supplies from Russia embeds potential risks.
>
> "

The emphasis on climate objectives and the transition to cleaner energy sources had already been elevated with the introduction of the European Green Deal in December 2019, the implementation of the 2030 climate and energy framework, and the enactment of the European Climate Law. Additionally, the "Fit for 55 Agenda" in 2021 further reinforced these priorities. Russia's full-scale invasion of Ukraine prompted European policymakers to take additional initiatives to expedite the energy transition and phase out or drastically reduce EU reliance on Russian fossil fuels.

Although the European Commission presented the REPowerEU plan as a tool to accelerate the shift towards cleaner energy, in the near and mid-term, the strategy of phasing out Russian fossil fuels and of reducing gas supplies from Russia embeds potential risks. Firstly, and in the short term, Eurostat data[5] shows that the phasing out from Russian gas has been partially compensated for with coal, the inland consumption of which in the EU increased, although moderately, contrasting a decreasing tendency over the last decade. Secondly, EU countries witnessed a rapid surge in liquefied natural gas (LNG) imports from distant sources. Additionally, to construct more infrastructure for LNG imports and establish new pipeline connections, these developments carry the potential to divert resources and, at worst, result in new dependencies and prolonged reliance on carbon-intensive fuels. Furthermore, the effective expansion of the LNG infrastructure seems to contradict the main geopolitical claim of REPowerEU: as recent data shows, the European imports of Russian LNG surpassed pre-war levels.[6] Additional risks arise from the geopolitical landscape and are directly related to the EU's External Energy Strategy accompanying REPowerEU, notably those related to the expansion of infrastructure for fossil fuels and hydrogen in the Mediterranean countries (Algeria, Egypt and Israel, which are included in an area characterised by political and economic instability) and Azerbaijan, an autocratic regime. Furthermore, the tightening of the global energy supply and reduced imports to the EU have caused a sharp spike in gas and electricity prices, impacting various economic sectors and notably the well-being of lower-income citizens.[7] Finally, the high investment in infrastructure, for both, fossil and renewable energy, can potentially be in contradiction with environmental targets of the plan. For instance, the construction of wind farms may disrupt bird migration patterns or harm the habitats of endangered species. Similarly, hydroelectric projects can lead to the displacement of communities and alter river ecosystems, affecting aquatic life and water quality. These contradictions highlight the complex challenges faced by policymakers in balancing environmental conservation with the transition to renewable energy sources.

OVERALL OBJECTIVES OF REPOWEREU AND ITS DIMENSIONS

For the reasons expressed in the previous section, REPowerEU can be seen as a double instrument: on the one hand, it constitutes a conjunctural response to the new geopolitical scenario opened up by the full-scale Russian invasion of Ukraine; on the other hand, the role played by the plan within the broader recovery strategy to face the socio and economical effects of the pandemic shows the potential for this conjunctural measure to participate in the broader governance of European energy policy. Many measures advanced in the national REPowerEU chapters are expected to have a lasting impact on shaping the national energy regulatory framework, modernising the energy infrastructures, reinforcing cross-border cooperation and moving ahead with the deployment of renewable energy sources (RESs). A further aspect that makes it clear how the REPowerEU plan goes beyond its conjunctural scope is that national chapters of the plan incorporate investments and measures to boost the strategy encompassing the Important Projects of Common European Interest (IPCEI), a key strategic instrument with regard to the implementation of the EU's Industrial Strategy.

The communication of the European Commission of May 2022[8] advances the three main dimensions of the plan:

1) Energy savings. Utilising savings is the most efficient and cost-effective strategy to combat the current energy crisis. By decreasing energy consumption, both households and businesses can significantly reduce their energy expenses in the short and long term, as well as decrease reliance on Russian fossil fuels. Enhancing energy efficiency is a crucial element in transitioning towards clean energy, bolstering the EU economy's resilience and safeguarding its competitiveness against escalating fossil fuel prices. This conservation effort will extend the lifespan of our energy resources, particularly during these crucial upcoming months when investments are being implemented. The accompanying EU Save Energy Communication[9] proposes a dual approach: advancing long-term energy-efficiency measures for structural change, while simultaneously achieving immediate energy savings through behavioural adjustments, such as the limitation of the use of the air conditioning, the adjustment of the boiler settings or the limitation of the use of private transports vehicles.

2) Diversifying energy import. As anticipated in previous paragraphs, the initial communication of the plan advanced the proposal for a general mechanism to diversify energy import, especially by pushing forward LNG as a substitute for Russian gas. After receiving the mandate from the European Council in March, the Commission and member states have established an EU Energy Platform for the collective and optional procurement of gas, LNG and hydrogen.[10] The EU Energy Platform serves three key functions to facilitate the collective procurement of gas: (1) *demand aggregation and structuring*; (2) *optimised and transparent use of gas infrastructure*; and (3) *international outreach*.

3) Substituting fossil fuels and accelerating Europe's clean energy transition. Dramatically increasing the speed and scope of renewable energy adoption in various sectors like power generation, industry, buildings and transportation is expected to expedite the EU's transition away from Russian fossil fuels. This shift is also expected to lead to decreasing electricity costs and a reduction in imports of fossil fuels.

These dimensions are comprised of the objectives defined in Article 21c(3) of the RRF regulation of 2021 and its amendments of February 2023:[11]

a) improving energy infrastructure and facilities to meet the immediate security of supply needs for gas, including LNG, notably to enable diversification of supply in the interest of the EU as a whole; measures concerning the oil infrastructure and facilities necessary to meet immediate security of supply needs may be included in the REPowerEU chapter of a member state only where that member state has been subject to the exceptional temporary derogation in Article 3m(4) of Regulation (EU)No 833/2014 by 1 March 2023, due to its specific dependence on crude oil and its geographical situation;

b) boosting energy efficiency in buildings and critical energy infrastructure, decarbonising industry, increasing the production and uptake of sustainable biomethane and of renewable or fossil-free hydrogen, and increasing the share of and accelerating the deployment of renewable energy;

c) addressing energy poverty;

d) incentivising a reduction of energy demand;

e) addressing internal and cross-border energy transmission and distribution bottlenecks, supporting electricity storage and accelerating the integration of RESs, and supporting zero-emission transport and its infrastructure, including railways; and

f) supporting the objectives set out in points (a) to (e) through an accelerated requalification of the workforce towards green and related digital skills, as well as through the support of the value chains in critical raw materials and technologies linked to the green transition.

ABOUT THIS STUDY

Considering the early phase of implementation of the REPowerEU Plan, this policy study cannot address the concrete impacts of the implementation of the program but instead analyses how the objectives of the REPowerEU Plan, and the corresponding financial commitments, are differently translated into NRRPs, highlighting added and removed measures, possible conflicting policy areas and missing policy areas.

The study is conducted by analysing the energy context of five member states: Denmark; Estonia; France; Portugal; and Spain. The selection of these countries for monitoring the progress of the plan's goals is based on the following criteria. On one hand, France and the Iberian countries are border countries, which have been negotiating for years to enhance cross-border energy infrastructure to improve both national energy security and the European energy market. Portugal, Spain and France have different energy profiles: Portugal shows an increasing relevance of RESs in the national energy mix; Spain plays a decisive role in Mediterranean coordination, which makes the country's energy security reliant on fossil fuels from neighbouring Mediterranean countries; and France's nuclear sector is unique in Europe, impacting the electricity market of the EU, while moulding the country's strategic option for energy security and source diversification, as well as its external energy strategy. On the other hand, Estonia and Denmark have a very low import dependency due to domestic sources of fossil fuels. Both countries are compromising with their green targets and are operating to rapidly expand the RESs in their energy mix, expanding their national capacity of RES production and phasing out fossil fuels. They are also committed to infrastructure projects to expand their energy network with other European countries through coordination and collaboration initiatives. Nonetheless, for years, Estonia showed a high dependence on Russia for energy needs, notably for the country's refined oil product needs. Synthetically, Denmark serves as a pivotal hub within the North Sea energy context, while Estonia, along with the other Baltic countries, presents an intriguing case due to its geopolitical significance in the reorganisation of European energy geopolitics.

These existing disparities allow for a comprehensive assessment of a wide range of energy policies designed to address varying issues, enabling the analysis of impacts of REPowerEU on the development of cross-border policies. Such developments can be seen as indications of the extent to which REPowerEU contributes to strengthening European energy cooperation between member states.

The dimensions and objectives of the REPowerEU plan are organised here in three domains:

1) Energy mix and renewable energy resources. This analytical dimension outlines the energy mix profiles of the countries under study and delineates the key policies to enhance the transformative dynamics of their national energy mix.

2) Energy security. The encompassing dimension of energy security, incorporates multidimensional aspects such as the diversification of the country of supply, the capacity for storage, the resilience, potentiality and capillarity of the energy grid, the robustness of energy infrastructures for energy supply and energy inland distribution, and the ability of cross-border initiatives to reinforce the integration of a country's energy system within the EU energy market.

3) Energy efficiency and energy poverty. This dimension focuses on key aspects related to energy efficiency and endeavours to enhance energy savings. Additionally, it is closely linked to policies aimed at ensuring affordable energy prices for the end consumer, addressing the issue of energy poverty.

Section 2 of this study is divided into five subsections, each corresponding to a national case study. Each subsection comprises a short description of the energy profile of the country; the country's NRRP measures to address energy policy and transition; the measures for the energy transition advanced in the country's

REPowerEU Plan; and, finally, an analytical section highlighting the continuities, differences, changes, and modifications of energy policies between the original NRRP and its amended version. This section emphasises aspects of policy design that may pose potential conflicts with the country's energy target, identifies missing policy areas and potential risks, and provides country-specific policy recommendations. Regarding energy data, the main sources consulted include the data provided by international energy institutes, particularly those related to the energy mix of the analysed countries and data on electricity generation. Additionally, Eurostat data for 2022 has been consulted to provide a clear picture of relevant dimensions, such as energy efficiency, energy poverty and the energy import dependency of the observed countries. To give a broader picture of the specific country's energy landscape, and to assess the energy policy advanced in the country's NRRPin relation to country's target. The energy profile of each country is also complemented with a brief description their strategy related to their National Energy and Climate Plan (NECP).

To analyse the policy design of energy measures encompassing the NRRP, the main documents consulted are the official NRRPs, in their original and amended versions, and the Working Staff Documents of the Commission assessing the countries' NRRPs.

Section 3, the concluding section, identifies the primary and overarching trends resulting from the introduced amendments. It achieves this through a cross-comparison of the case studies, analyses the role of REPowerEU as an instrument in governing European energy policy and evaluates which introduced policies are most conducive to successful implementation.

"

The dimensions and objectives of the REPowerEU plan are organised here in three domains:

- Energy security

- Energy mix and renewable energy resources

- Energy efficiency and energy poverty

"

2. ENERGY POLICY IN NRRPS: GOVERNING NATIONAL PRIORITIES

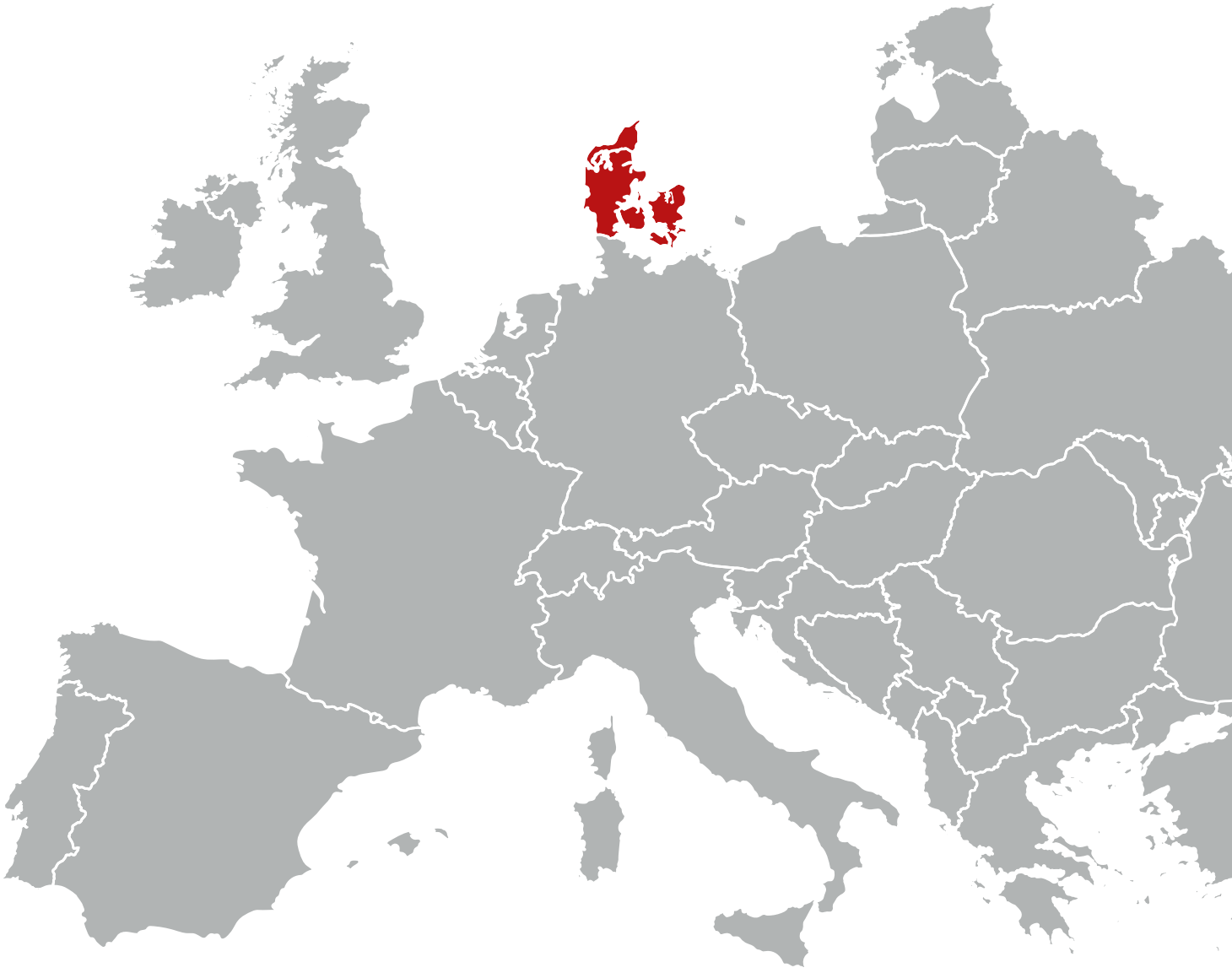
This section analyses the energy policies advanced in the NRRPs of five countries: Estonia; Denmark; France; Portugal; and Spain. The main objective of this section is to assess the contribution of the EU's recovery strategy in promoting energy policy at the national level, boosting the energy transition, and achieving the countries' energy targets set by the European energy strategy.

Each country profile is developed following the three macro dimensions defined in the introduction: (1) energy mix and renewable energy resources; (2) energy efficiency and energy poverty; and (3) energy security. Based on these three dimensions, the analysis of the national case studies identifies the overarching profile of the energy system for each country, how this profile is addressed by the country's specific energy strategy defined in the NECP, and the main measures and energy policies defined in the NRRP. It also assesses to what extent the introduction of the REPowerEU chapter in the amended version of the country's NRRP reshapes the energy measures defined in the initial version of the NRRP. Additionally, it explores whether its introduction represents a turning point, or if it has been used as a tool to correct and improve policy measures advanced in the original NRRP. The basis for assessing the design of the energy policy advanced in the countries' plans is the targets defined in the countries' NECPs. As will become clear through the case studies, some relevant issues and policy areas related to energy are not directly addressed in the countries' NRRPs, nor their amended versions. Nonetheless, the analysis advanced here also considers these issues directly relevant to the integration of the European energy market.

The national case study sections are introduced by a summary of the main points from the analysis and a table identifying the key energy measures in the national NRRP and REPowerEU chapter. This is followed by a background section characterising the country's energy profile and targets for the energy transition. This characterisation allows the presentation of the energy policy in the country's NRRP, describing the main investments in this regard, in the next section. The changes introduced by the REPowerEU chapter and their implications for the country's energy policy and for addressing the new energy context are analysed in the following section of each country case, leading to a discussion on the governance of the energy transition and the relation with the NRRP. The final section of each country's case study presents key policy recommendations.

> "What is the EU's recovery strategy's contribution in promoting energy policy at the national level, boosting the energy transition, and achieving the countries' energy targets set by the European energy strategy?"

DENMARK



2. COUNTRIES' CHALLENGES AND RECALIBRATION TRAJECTORIES BEFORE THE PANDEMIC

- The energy mix is highly reliant on RESs and oil.
- The phasing out of fossil fuels is pursued through the expanded deployment of RESs. Although the initial version of the NRRP fails to put forward measures to exploit the national potential for RES production fully, the REPowerEU partially corrects this deficiency.
- The country is one of the most energy-independent countries in Europe.
- Denmark emphasises a high level of energy efficiency. Nonetheless, some measures implemented due to the RRF (notably the implementation of carbon capture and storage (CCS) schemes serving neighbouring countries) highlight possible conflicts that can worsen or deteriorate the balance between energy output and input.

TABLE 1. Key energy measures in Denmark's NRRP and REPowerEU chapter.

	COUNTRY'S ENERGY PROFILE	NRRP	REPowerEU
ENERGY EFFICIENCY AND ENERGY POVERTY	Degrowth tendency of energy demand in the last years – on track with national targets	Investments to enhance the energy efficiency of residences, industrial facilities and public structures Renovation of heating systems Potential conflict between energy-efficiency measures and implementation of CCS technologies	Scaling up investments in households and industry renovations, and in heating systems Further measures and investment supporting CCS schemes
ENERGY MIX AND RENEWABLE ENERGY RESOURCES	High share of RESs in its energy mix	Lacks addressing the unlocking of the complete potential of renewable energy, which requires actions encompassing aspects such as storage, system flexibility, and distribution systems, and a reform to streamline administrative permitting procedures	Addressing missing policy area on RES deployment
ENERGY SECURITY	Highly energy independent	Diversification	

Source: elaborated by the authors.

Background: Denmark's energy profile and targets for the energy transition

In 2022, Denmark's primary energy mix experienced a modest increase in renewables, reaching 43% in total (hydropower 0.02%; wind 26.16%; solar 2.67%; biofuels 1.56%; other renewables 12.64%) compared to the 40% share in 2021. During the same year, the contribution of oil to the country's energy mix saw a slight uptick, accounting for 41%. Meanwhile, the share of gas dropped from 12.59% in 2021 to 8.97% in 2022. The share of coal remained stable, hovering around 6.5%.[12]

Regarding import dependency regarding gross available energy, the last available Eurostat data for 2022 shows that Denmark imports 42.86% of the country's available energy. The country performs better than the EU27 average of import dependency (62.5% in 2022). The last available data on import dependency by fuels (2022) highlights Denmark's low dependency on natural gas imports, accounting for 28%, while the import dependency for oil is in the range of 52.8%, and it is very high for solid fossil fuel, accounting for 100%.[13] Overall, Denmark can be categorised as possessing a strong supply security, encompassing both electricity and hydrocarbon production. Ensuring a secure supply is a priority for Denmark and its transmission system operators, particularly in advancing the growth of RESs and bio-based fuels.

Regarding energy efficiency and energy demand, Denmark reduced the amount of primary energy consumption from 16.35 million tons of oil equivalents (Mtoe) in 2021 to 15.99 Mtoe in 2022, reflecting a reduction in final energy consumption from 13.88 Mtoe in 2021 to 13.35 Mtoe in 2022.

The collective occurrence of energy poverty was ranked at 3%, in contrast to the EU average of 8.2%. About 10% of individuals belonging to the lowest-income 20% of the population in Denmark are incapable of adequately heating their homes.[14] In 2021, a significant 6% of households in the country faced challenges in adequately heating their homes, and a substantial 7.1% of the population found themselves falling behind on utility bills. This situation is particularly pronounced in rural regions and among low-income households.

The Danish NECP summarises the policy targets that clearly reflect the Danish strategy to address the country's energy profile (Table 2). The draft updated NECP submitted by the Danish government refers to the energy and climate targets recently revised under the Fit for 55 package and the REPowerEU.

Table 2. Summary of key targets of Denmark's NECP.

OBJECTIVES OF THE NECP WITH A VIEW TO 2030	NECP 2019	NECP 2023
Primary energy consumption	-	16.7 Mtoe (no target but WEM forecast)
Renewables in gross final energy consumption	-	70.9%
Electricity interconnection	15%	15%
Energy dependency	-	

Source: Denmark's draft updated NECP.

Note: "Denmark does not have national targets to reduce the energy import dependency on third countries, as they are already limited due to the already high diversification and the domestic production of oil and gas".

European Commission (2023), "Assessment of the draft updated National Energy and Climate Plan of Denmark", Staff Working Document, SWD (2023) 911 final, p. 4.

As pointed out by the assessment of the commission, this draft version is not convincing on how these targets will be reached. "Policies and measures across dimensions are not always sufficiently described in terms of their scope, timing and expected impacts while actions are lacking in some dimensions."[15]

Denmark also plays a decisive role in regional energy cooperation and coordination with the other North Sea countries, and thus, in the EU energy market. The North Sea area is recognised for its substantial potential for renewable energy, with particular attention to offshore wind power, which is becoming progressively vital in the attainment of Europe's energy and environmental objectives. The EU's strategy on offshore renewable energy has set an ambitious target of achieving 300 GW of offshore wind capacity and 40 GW of ocean energy capacity by 2050.[16] On 19 January 2023, the North Sea Cooperation endorsed a non-binding agreement regarding renewable offshore energy production goals for 2050, which outlined intermediate milestones for 2030 and 2040, giving priority to the offshore grid corridor of the North Sea under the TEN-E Regulation.[17] The urgency is underscored by factors such as elevated energy prices, as experienced in 2022, and geopolitical instabilities that have threatened Europe's energy system. These circumstances emphasise the immediate necessity to accelerate the establishment of domestic renewable energy generation capability and regional-level transmission networks, thereby significantly enhancing energy security.

Energy policy in Denmark's NRRP

Denmark's NRRP was approved before the updated draft of NECP, and it encompasses measures that address the country's energy profile and the measures and targets defined in the 2019 country's NECP.

The Danish NRRP ranks as the sixth-smallest financed plan in the frame of the RRF. Denmark's allocation from the RRF is solely in the form of a non-repayable grant. Initially, Denmark was slated to receive a €1.5514 billion grant from the RRF, equivalent to 0.2% of the total RRF fund and 0.5% of Denmark's 2019 GDP.[18] The total value of Denmark's NRRP is €1.615 billion, indicating that the country will contribute the remaining funds. The revision of June 2022 reduced Denmark's maximum grant allocation to €1.429 billion (−7.9%). Denmark has received 32.4% of the funds through pre-financing and a single payment, surpassing the EU average. Additional payments will be contingent on the progress made during the plan implementation.

The plan is structured into seven main components, addressing the seven flagship areas identified by the RRF for the commission, which are further divided into sub-components, each intended to be executed through a combination of investment and reforms. In total, the endeavours encompassed within the seven components of the plan surpass the spending goals established by the RRF Regulation, with the green transition accounting for 59.4%, or €922.1 million of NRRP funds and the digital transformation accounting for 24.6%, or €382.3 million, as shown in Table 3.

Component 3 is the most ambitious in addressing energy and climate goals of the Danish NRRP and encompasses five investments incorporating a large array of issues: (1) replacing oil burners and gas furnaces; (2) energy efficiency in industry; (3) energy savings in public buildings; (4) CCS storage potential; and (5) energy efficiency in households. Investment (1) supports three subsidy schemes for the replacement of oil burners and gas furnaces, substituting them with electric heat pumps and renewable-source-based district heating. Funds are earmarked for subsidies aimed at accelerating the transition from oil burners and gas furnaces to green alternatives, thereby lowering the conversion costs for consumers. These funds can be utilised, for example, to subsidise the adoption of heat pumps. Investment (2) aims to accelerate the implementation of energy-efficiency measures and the transition to green energy in the industrial sector by supporting an existing subsidy scheme for energy efficiency in industry, which has a budget of 2,400 million Danish kroners (321,85m€) from national funds spanning 2021-2025. This scheme is projected to reduce CO2 equivalent emissions. To enhance the scheme's impact, an additional 315 million Danish kroners (42,15m€) from the RRF is being allocated. Investment (3) aligns with the Renovation Wave initiative, and its impact is expected to go beyond the targets defined in the Energy Efficiency Directive. The investment addresses the energy efficiency in buildings owned and used by municipalities and regions, such as schools, retirement homes, nurseries and hospitals. It also includes investment to convert buildings still reliant on fossil fuels for heating. Investment (4) targets private companies allocating funds to research and showcases the technical and economic viability of CCS in deployed oil and gas fields of the North Sea.

The objective involves conducting additional testing and studying CO2 storage to assess technical and financial feasibility. This assessment is crucial before considering the effective implementation of CCS. It's important to note that the support provided does not encompass investments required for establishing operational CO2 storage facilities; instead, it is solely allocated for the feasibility study. Investment (5) aims to enhance the energy efficiency of residential buildings and accelerate the transition from oil burners and gas furnaces to heat pumps. The measure supports activities such as insulation, optimising building operations and replacing heating systems with heat pumps. To facilitate these efforts, the measure subsidises the already existing scheme called "Building Pool" with an additional 565 million Danish kroners (75.6 m€).

Component 4 serves to expedite the economy's shift towards decarbonisation. This component has a dual impact, and in its first phase, it offers tax deductions for upfront investments, incentivising companies to adopt green and digital technologies, thereby promoting both the environmental transition and Denmark's recovery from the Covid-19 recession. This is projected to generate increased demand, employment opportunities, reduced greenhouse gas emissions and heightened digitalisation.

Component 5 will speed up reducing carbon emissions in the transportation sector. It is composed of four different elements, and the first one aims to reduce the registration tax to encourage a greater number of consumers to opt for zero- and low-emission vehicles. Specifically, the tax on electricity for these types of vehicles will be reduced. This initial set of measures also offers a bonus for scrapping old diesel cars, ensuring a swift transition from older, more polluting vehicles to newer, cleaner ones.

Table 3. Denmark's NRRP components and their contribution to climate and the energy transition.

COMPONENT	AMOUNT (€ MILLION)	AMOUNT ALLOCATED TO CLIMATE (€ MILLION)	COMPONENT SHARE FOR CLIMATE TRANSITION
C1 Strengthening the resilience of the health care system	32.8	-	-
C2 Green transition of agriculture and the environment	177.5	139.9	7.8%
C3 Energy efficiency, green heating and CCS	234.7	234.7	100%
C4 Green tax reform	580.5	196.5	33.8
C5 Sustainable road transport	258.2	241.7	93.6%
C6 Digitalisation	89.4	-	-
C7 Green R&D	242.1	109.3	45%
TOTAL	1,551	922.1	59%

Source: Denmark's NRRP

2. COUNTRIES' CHALLENGES AND RECALIBRATION TRAJECTORIES BEFORE THE PANDEMIC

Addressing the new energy context: Energy policy in Denmark's REPowerEU chapter

Denmark's REPowerEU chapter comprises two new measures and two scaled-up investments for a total amount of €197 million. The renewable energy measure involves the creation of a National Energy Crisis Staff (NEKST) aimed at streamlining administrative and permitting procedures to accelerate the transition to green energy. NEKST, established for 2023 and 2024, will oversee the expansion of district heating, enhance the electricity grid and promote renewable energy deployment. It will identify challenges and bottlenecks, with the authority to simplify procedures and formulate recommendations for political decisions.

This measure includes three investments:

1) 97.7 million Danish kroners (€13.10 million) will be allocated for the preparation and completion of a call for tender for 4 GW offshore wind turbines, aiming to expand offshore wind energy production by 4 GW by 2030.

2) 52.0 million Danish kroners (€6.97 million) will fund activities such as sensitivity mapping, technical screening and assessing cumulative effects of large-scale offshore wind expansion by early 2026.

3) 276.7 million Danish kroners (€37.09 million) will support the testing of wind turbines on land and offshore in 2023 to 2024, focusing on investment support rather than operational aid, in line with recommendations from the Test Wind Turbine Analysis of 2021.

The green upskilling measure allocates 103.9 million Danish kroners (€13.93 million) for the year 2025 and an equivalent sum for 2026 and seeks to provide businesses with the essential expertise required for the shift toward sustainability. It involves an investment in a proficient workforce capable of developing, implementing, and sustaining green technologies and practices.

The measure of replacing oil burners and gas furnaces scales up the investment allocated in C3.I1 of the Danish RRP before introducing the REPowerEU. Under the REPowerEU chapter, this initiative is expanded by allocating additional funds to the decoupling scheme and district heating pool, both of which fall under the existing measure. By increasing funding for the decoupling scheme, more Danish households will have the opportunity to disconnect from the gas network. Additionally, augmenting funding for the district heating pool will facilitate the extension of district heating to new areas, where subsidies will be provided to district heating companies to replace oil and gas furnaces. This expansion injects an additional 335 million Danish kroners (€44.91 million) into these measures for 2023, significantly amplifying existing efforts.

The initiative on CCS scales up an existing measure encompassing a study examining viable sites for CO2 storage in depleted oil and gas fields, as detailed in Component 3 of the initial version of the plan. In 2021, the Danish government took a further step by allocating 2.6 billion Danish kroners (€0.35 billion) to the Negative Emissions CCS Fund (NECCS Fund), aimed at achieving negative emissions through the capture and geological storage of biogenic CO2. This fund encourages investments in CCS technologies and infrastructure to attain negative emissions by 2025. Within the REPowerEU chapter, the NECCS will receive partial funding under REPowerEU. Specifically, the NECCS Fund will disburse 50.2 million Danish kroners (€6.73 million) in 2024, 319.9 million Danish kroners (€42.88 million) in 2025 and 107.7 million Danish kroners (€14.44 million) in 2026, while the remaining funding will come from national sources.

RRP and the governance of the energy transition in Denmark

The amended Danish NRRP does not eliminate any measures put forth in the initial version of the plan. Instead, it partially addresses policy areas that were absent in the original version, particularly focusing on measures related to the uptake of RESs. The initial plan underscores the contribution of renewable energy to renovation investments, emphasising its role in the swift phasing out of coal and the increased deployment of renewables in the energy system. However, it falls short in incorporating measures to expand renewable energy production.

The measures aimed at streamlining and simplifying administrative and permitting procedures, facilitated by NEKST, are expected to accelerate the implementation of renewable energy projects and reduce carbon emissions in household heating. Additionally, investments in renewable energy, such as the tendering for 4 GW of offshore wind, the assessment of Denmark's offshore wind potential and the commissioning of experimental wind

turbines, aim to contribute to the expansion of RESs in the national energy mix, aligning with the objectives of phasing out fossil fuels.

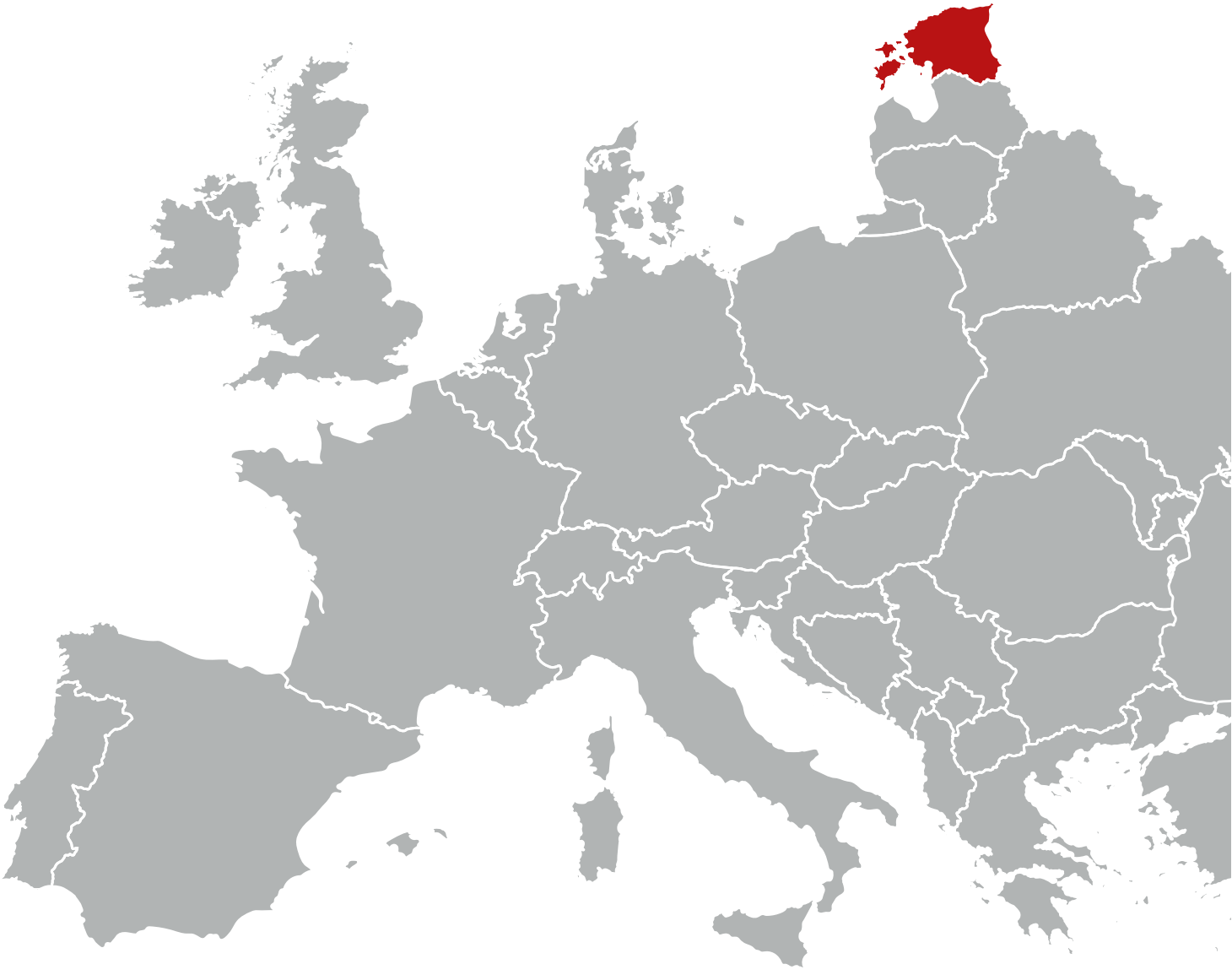
Concerning energy efficiency, the Danish NRRP focuses on reducing energy demand and promoting efficient energy use. This involves the implementation of a comprehensive plan to renovate both public and private buildings and replace traditional heating systems with district heating and heat pumps. However, the targets for energy efficiency contradict the measures outlined in the initial version of the NRRP, which were further expanded in the amended version, emphasising implementing CCS. Although the allocated investment for this component only covers the assessment of CCS implementation in the country, rather than their actual development, these studies are conducted to facilitate concrete implementation. The strategy of the Danish government is to place the country as being pivotal to the emerging industry of CCS.[19] Nonetheless, capturing carbon dioxide, considering the current available technology, requires additional energy inputs, leading to a decrease in overall energy efficiency and, thus, in the energy output/input balance.[20] Furthermore, neither the initial version of the Danish NRRP nor the forwarded amendments define adoption and implementation criteria for CCS, paving the way to use such technology as an alternative to reduce emissions through enhancing energy efficiency and through increased use of renewables, and therefore, is in potential contradiction to phase out fossil fuels.

No component of the Danish NRRP directly tackles the dimension of energy security, which is framed by the plan as being strictly linked to the "electric system and market [being] paramount to the continuous cost-effective integration of affordable renewable energy and a high level of energy security".[21] Finally, the plan does not tackle the aspect related to infrastructural improvement of electricity distribution. Denmark must enhance its electricity grid's integration and connectivity, spanning distribution and transmission levels.

Key policy recommendations

- To achieve the target advanced in country's NECP Denmark should speed up the reduction of its overall dependence on fossil fuels and realistically assess the expected technological development and the indirect impacts of investing in technologies such as CCS.
- To expand the production of RES, Denmark must introduce reforms to simplify and expedite administrative and permitting procedures, involving stakeholders in the process.
- To enhance national energy market distribution and the resilience of the electricity grids, Denmark needs to upgrade its investment in the infrastructure to modernise the country's transmission networks, improving efficiency and reducing risks.
- To enhance the country's integration in the EU energy market, Denmark needs to increase interconnections with neighbouring countries and strengthen the integration and connectivity of its electricity grid, spanning both distribution and transmission levels, thereby facilitating energy exports.
- To achieve the targets defined in the country's NECP, Denmark needs further investment and initiatives to improve energy efficiency.

ESTONIA



- The country's energy mix is highly reliant on indigenous sources of shale oil.
- The measures proposed in the country's NRRP support the deployment of RESs, especially by providing investments in RES projects, easing the administrative and legal framework for RES developers, and financing the industry for the energy transition. Nonetheless, the proposed policies have been criticised by civil society.
- The proposed measures support energy efficiency, primarily by modernising and expanding the electricity distribution network and by promoting investment in private housing renovation. Nonetheless, the advanced measures appear inadequate to address the country's energy poverty.
- Energy security is primarily addressed through the promotion of domestic energy production and energy diversification.
- The country's key cross-border infrastructural projects are addressed outside the framework of the RRF.

Background: Estonia's energy profile and targets for the energy transition

In Estonia's primary energy mix of 2022, the share of oil accounted for 23.69%, representing a decrease of approximately two percentage points compared to its contribution in the previous year. Natural gas also reduced its contribution to the national 2022 energy mix from 7.89% in 2021 to 5.87% in 2022. Nonetheless, the share of coal increased in the same period by about 3.5%, reaching 55.18% in 2022. The share of renewables increased, ranging from 14.84% in 2021 to 15.27% in 2022. Traditional bioenergy is also relevant in the country's energy mix, accounting for about 9% in 2022, mostly produced from low-quality wood.[22] The contribution of renewables to available Estonian energy is below the EU27 average (19.29%).[23]

Estonia possesses significant domestic fossil fuel sources, primarily coal and shale oil, the contribution of which is reflected in the low national energy dependency on imports, which was 6.159% in 2022 – well below the EU27 average of 62.5% in the same year[24] – and in electricity generation. The latter is dominated by shale oil (55.04% in 2022) and bioenergy (29.54% in 2022).[25]

Regarding energy efficiency and energy demand, Estonia increased the amount of primary energy consumption from 4.45 Mtoe in 2021 to 4.72 Mtoe in 2022, while the final energy consumption decreased from 2.83 Mtoe in 2021 to 2.79 Mtoe in 2022. The assessment of the correlation between the growth of primary energy and the reduction of final energy consumption requires an in-depth analysis of the energy intensity per sector, of the macro-economic dynamics or an analysis of the impact of climate events which is beyond the scope of this report. Nonetheless, the changes in the structure of the country's energy mix, and the correlated increase of coal, could partially explain the increase in the amount of primary energy consumption, while the reduction in final energy consumption can be speculatively explained by the realisation of effective energy-efficiency policies.

In 2021, Estonia exhibited energy-poverty indicators below the EU27 average, with only 2% facing challenges in maintaining warmth (compared to the EU27 average of 6.9%) and 4.1% experiencing delays in paying utility bills (compared to the EU27 average of 6.4%).

Against this background, the Estonian NECP summarises the policy targets that clearly reflect the Estonia strategy addressing the country's energy profile (Table 5). The draft update to the NECP submitted by the Estonian government refers to the energy and climate targets recently revised under the Fit for 55 package and REPowerEU.

"

Estonia possesses significant domestic fossil fuel sources, primarily coal and shale oil, the contribution of which is reflected in the low national energy dependency on imports,

"

Table 4. Key energy measures in Estonia's NRRP and REPowerEU chapter.

	COUNTRY'S ENERGY PROFILE	NRRP	REPowerEU
ENERGY EFFICIENCY	Correlation between the increase in primary energy consumption and reduction of final energy consumption	Support for the renovation of apartment buildings and private residences is anticipated Remove administrative hurdles for energy-efficient renovations Strengthening the electricity grid to increase energy efficiency	Expand investments in private buildings renovation Insufficient policy on energy poverty
ENERGY MIX AND RES DEPLOYMENT	Increasing share of renewables in country's energy mix Reliance on indigenous shale oil Increasing relevance of bioenergy	Plan to phase out shale oil Investments supporting the uptake of RESs in the private sector Strengthening the electricity grid to incorporate increased renewable energy production Investments for deploying and piloting green hydrogen integrated value chains in strategic areas Streamline administrative procedures for energy-efficient renovations Electrification of transport infrastructure and construction of electrified multimodal transport terminal in Tallin	Streamline permissions for renewable energy projects Lack in addressing energy community Expand investments for wind energy production Removal of the investments in infrastructure
ENERGY SECURITY AND ENERGY INFRASTRUCTURES	Energy dependency is significantly lower than the EU27 average Lack in energy supply infrastructure compensated for with cross-country cooperation Dependency on Russia for oil products and gas	The country tackles the issue of energy security mainly by promoting policies for energy-source diversification The key country challenges of synchronisation of the electricity grid with the continental European network by 2025 is addressed outside the plan	Cooperation and cross-border projects and infrastructure to phase out Russian imports is addressed outside the framework of the plan Diversify the sources of energy, ensuring the security of supply through the expansion of biogas production

Source: Elaborated by the authors.

Table 5. Summary of key targets of Estonia's NECP.

NATIONAL TARGETS AND CONTRIBUTIONS 2030	NECP 2020	NECP 2023
Share of energy from renewable sources in gross final consumption of energy (%)	42%	65%
Primary energy consumption (Mtoe)	5.4	5.1
Final energy consumption (Mtoe)	2.9	2.6
Level of electricity interconnectivity (%)	>60%	n.a.

Source: Estonia's draft updated NECP.

Estonia is among the most energy-independent EU member states. Nevertheless, the country imports 100% of both its natural gas and oil products, with a previous heavy dependence on Russian gas and oil before the Russia-Ukraine conflict. Since the full-scale Russian invasion of Ukraine, the country has significantly reduced its exposure to Russian gas imports, decreasing its dependency from 99% in 2019 to 11% in 2021. In 2022, Estonia succeeded in substituting oil product imports from Russia. The drastic reduction in imports from Russia has been achieved through cooperation with Finland (gas and oil products), Poland and Lithuania (oil products).[26]

The updated draft of the NECP defines concrete measures and targets for the diversification of its gas supply, as well as for the diversification of its energy mix by the increase of its biomethane production, the reduction of gas consumption and by assessing the options of embarking on nuclear production. On the last of these, however, the country is missing a legal framework and relevant infrastructure.

The updated Estonian NECP does not define any targets for electricity interconnectivity, but the country exhibits a high level of electricity interconnection with neighbouring member states, which was 67.6% in 2020. The updated NECP's key measure on electricity cross-border infrastructure is to accelerate the synchronisation of Estonia and the other two Baltic states with continental European networks by early 2025, as agreed in August 2023.[27] Additional connections with Finland, as outlined in the Estlink3 plan, and with Latvia will enhance the security of the electricity supply and further promote integration between the Nordic and Baltic electricity systems.

The draft updated NECP outlines plans for a slight reduction in the share of fossil fuels in gross available energy and the target set for the share of RESs in the country's mix of final energy consumption is significantly higher than that defined by EU legislation (the 2020 share of RESs in the country's final energy consumption was 30.1%).[28]

The updated draft of the NECP reaffirms an ambitious objective to decrease final energy consumption outlined in the 2020 NECP and outlines comprehensive measures to attain the energy-efficiency targets for 2030. Nonetheless, regarding the energy-efficiency dimension, the commission identifies some inconsistencies in the policy proposed. Notably, the new draft version of the plan does not update the target set in 2020 for its long-term renovation strategy (LTRS), which aims to renovate the whole building stock built before 2000 by 2050. It remains unclear, however, if the measures and investments envisaged are sufficient and realistic to achieve these objectives.[29]

Energy policy in Estonia's NRRP

Estonia's NRRP was approved before the updated draft of the NECP, which encompasses measures that address the country's energy profile and the measures and targets defined in the country's 2020 NECP.

Prior to the introduction of the REPowerEU chapter, Estonia's NRRP accounted for €953.5 million. The country's plan is structured around seven components: (Table 6): *C1, digital transition in enterprises;*

C2, green transition in enterprises; C3, digital Estonia; C4, sustainable energy and energy efficiency; C5, sustainable transport; C6, health care and social protection; and C7, management and control systems for the plan.

Estonia's plan exceeds the expenditure targets set by the RRF Regulation, with measures supporting the green transition representing 41.5% and those supporting the digital transition representing 21.5% of Estonia's total allocation. The main components addressing the green and energy transitions are component 2, component 4 and component 5. There is concern that the energy policies proposed in the Estonian plan may exacerbate damage to the country's ecosystem. This raises concerns that the Estonian plan may not have undergone a thorough 'Do No Significant Harm' assessment.[30]

Component 2 has a strong market orientation and aims to accelerate the green transition in the business sector. The component represents approximately 22% of the total NRRP allocation and encompasses one reform and six investments. A key aspect of this component is the support given to R&D by directly financing both research programs in green technologies and by supporting the training of personnel in the private sector. The component also provides funds to support the adoption of green technology to enhance energy efficiency. Additionally, this component establishes a green fund, for which the allocated investment is about 50% of the total component amount. The green fund aims to provide capital for developing new green technologies in strategic areas, funding innovative, research-intensive green technology companies and start-ups. Another key measure of this component is framed under the EU Hydrogen Strategy and aims to build up a green hydrogen production capacity by exploring the potential of offshore wind energy.

Component 4 put forward measures on two main axes. The first package of measures encompasses support for building renovation to improve energy efficiency. The measures aim to reduce bureaucratic obstacles to energy-efficient renovations by creating a regional advisory network. This network would offer guidance to apartment associations, private households and local governments on legal matters, technical considerations and financing options for renovation projects. The second axis directly targets the energy sector and encompasses a reform designed to aid in the deployment of RESs. The reform incorporates the targets and actions for phasing out oil shale already envisaged in the country's Development Plan for the Energy Sector.[31] The reform also aims to remove administrative hurdles hindering renewable energy installation. The reform is further promoted by three different investments intended to enhance the electricity grid to increase renewable energy production capacity, incentivise renewable energy installations in industrial areas and pilot possibilities for renewable energy storage

Table 6. Estonia's NRRP components and their contribution to climate andthe energy transition.

COMPONENT	AMOUNT (€ MILLION)	CLIMATE CONTRIBUTION TO NRRP TOTAL ALLOCATION
C1 digital transition in enterprises	116.2	-
C2 green transition in enterprises	220.2	22.2%
C3 digital Estonia	121.7	-
C4 sustainable energy and energy efficiency	92.1	9.4%
C5 sustainable transport	96.0	9.9%
C6 health care and social protection	363.3	-
TOTAL	982.5	41.5%

Source: Estonia's NRRP.

Component 5 comprises one reform and four investments addressing the decarbonisation of transport infrastructure. Some of the component's measures further extend investments planned due to the national Transport and Mobility Development Plan, which includes funding for developing interconnected and communal transportation options within urban settings. This component supports the development of transport infrastructure of the Tallinn region and the electrification of the railway between the two biggest towns, Tallinn and Tartu. The measure also aims to promote the use of light vehicles. Further investments directly support the cross-border Rail Baltic project, connecting the three Baltic capitals and countries with Poland. This investment supports the construction of the Ülemiste Rail Baltic terminal in Tallinn, a segment of the Tallinn-Rohuküla railway linking western Estonia to international hubs and the tramline in Tallinn's Old Port connecting Tallinn harbour and Tallinn airport.

Addressing the new energy context: Energy policy in Estonia's REPowerEU chapter

Estonia's REPowerEU chapter comprises two new investments and one scaled-up reform for a total amount of €90 million.

Reform 8.1 (facilitating the deployment of RESs) extends existing measures under component 4 of the country's initial NRRP. It aims to bring forward offshore wind projects in Estonia by easing legislative hurdles for wind energy developers, shortening strategic environmental impact assessment procedures and mapping additional suitable sites for wind parks. The reform strengthens the role of local authorities in administrative procedures related to wind energy development.

Investment 8.2 (program to increase the access of renewable energy production to the electricity distribution system) aims to incorporate renewable energy production in the electricity distribution system. The measure is expected to further expand the distribution of electric networks by adding 160 MW to the already existing capacity of 2337MW, thereby ensuring greater access for producers of electricity from RESs.

Investment 8.3 (increasing production and uptake of sustainable biomethane) promotes the adoption of sustainable biomethane. This initiative involves conducting comprehensive assessments and evaluations across various sectors of the biogas chain to identify potential challenges and areas for enhancing both production and application. It also aims to foresee potential scenarios and initiatives for guiding the utilisation of sustainable biogas/methane in line with current trends. The overarching aim is to bolster projects that swiftly boost the capacity for producing sustainable biomethane to decrease reliance on Russian fossil fuel imports and expedite the transition towards a more sustainable energy system.

RRP and the governance of the energy transition in Estonia

The introduction of the REPowerEU chapter partially addresses the inadequacies in measures supporting the deployment of RESs in the initial version of the country's NRRP. The revised version of the country's NRRP excludes four investments initially included in the initial RRP (noteworthy in the context of the energy transition is the exclusion of investments in the electrification of the west-bound section of the Tallinn-Rohuküla railway and the Rail Baltic multimodal joint terminal, Ülemiste, in Tallinn) and diverts money to new investments in the energy sector supporting a further development of offshore wind farms (amounting to €66.8 million), assists companies transitioning from fossil fuel heating sources (€20 million) and funds a multifunctional vessel aiming at sea patrol and anti-pollution operations to be carried out as well as increases research capacity for environmental studies (€18 million). Moreover, there has been an increase in financial assistance for renovating small residential buildings, ascending from €8.9 million to €28.9 million. The REPowerEU amendments encompass supplementary investments in the grid (totalling €38 million) and backing for biogas production (€20.2 million).

Although the investments in building renovation and private housing have been significantly expanded in the amended version of the Estonian NRRP, the investments are planned on a geographical basis, targeting rural areas, rather than based on household income, resulting in a limited response to energy poverty.

The amendments to the initial version of the NRRP, promoting the uptake of hydrogen production, explicitly recall the delegates' action on hydrogen of the Renewable Energy Directive 2018/2001/EU (REDII), and especially the principle of additionality, which defines that the supplies of renewable hydrogen, which are due to come on board by 2030, are connected to new,

rather than existing, renewable energy production. Nonetheless, like in other cases, the Estonian plan does not ensure that the increasing green hydrogen production will use RESs that are not needed for any other purposes or that the energy demand for hydrogen production will absorb the increasing production of renewable energy.

The measures supporting the deployment of RESs, scaled investments in biomethane production and the uptake of the hydrogen initiative contribute to the diversification of energy sources. These measures, combined with Estonian cooperation with other countries (namely, Finland, Poland and the other Baltic countries, as illustrated above), strengthen the country's energy security.

The improvement of the measures addressing the diversification of the energy sources and the increasing investment in the deployment of RESs consolidate further the measure of the initial plan toward phasing out shale oil.

The expansion of the country's biogas production is in line to reduce fossil energy and move towards complete electricity production based on RESs. Nonetheless, the plan explicitly defines agricultural input as one of the main sources of biogas production and does not establish any criteria for biogas production solely from residues and waste, excluding energy crop cultivation. This underscores a potential contradiction with the country's other environmental and biodiversity goals. This concern reinforces the concern expressed over the energy measures included in the initial plan and their impact on the country's ecosystem.

The deployment of RESs also appears to be a critical issue in elaborating Estonian energy policy within the framework of the RRF. While measures speeding up the deployment of RESs align with the energy goals of the RRF, Estonian environmental organisations have raised concerns about the potential for the reform to exacerbate negative impacts on biodiversity. Notably, installing wind parks is inevitably associated with some degree of deforestation. Environmental associations also underline the total absence of measures supporting the creation of energy communities.[32]

These critics evidence a broader problem related to the involvement of civil society in elaborating the plan. Both the first version[33] and the amended version[34] of the country's NRRP have been elaborated in a top-down fashion.

Key policy recommendations

- To achieve greater energy security, Estonia should seek to maintain full energy independence from the Russian Federation.
- To implement the energy transition the phasing out of shale oil should be accelerated and more clear criteria should be used to define biogas production, prioritising the use of residue and waste.
- The choice of sites for wind and solar energy production should consider its compatibility with environmental objectives and impacts on biodiversity.
- The production and deployment of green hydrogen should be prioritised to sectors where more favourable alternatives are not available.
- The support to the decentralisation of the energy system should be based on the implementation of an energy community and on enhancing public participation in the processes defining energy policies.
- Measures to improve energy efficiency through the support to renovation investment should consider household income to guarantee that it targets those most in need, and under conditions of energy poverty.

FRANCE

- The energy profile of France is characterised by a pivotal role played by nuclear energy.
- Measures put forth in the country's NRRP fall short of addressing the deployment of RESs. The RES share in the country's energy mix is lower than the EU27 average, and France has already missed the 2020 target for RESs. The French REPowerEU chapter tries to compensate for the lack of policy measures on the deployment of RESs. Nonetheless, the effectiveness of the envisaged reform appears uncertain.
- NRRP and REPowerEU put forward policies to curb energy demand and enhance energy efficiency, notably through a comprehensive renovation initiative for public and private buildings. This initiative also directly addresses issues related to energy poverty.
- Energy dependency from imports is lower than the EU27 average, but, like other EU countries, France heavily relies on the import of oil and gas.
- The French REPowerEU chapter does not introduce new reforms. It incorporates existing reforms endorsed by the government.
- The amended French NRRP does not contribute to modernising infrastructure for cross-border energy networks, thereby failing to enhance the EU's energy union.

Table 7. Key energy measures in France's NRRP and REPowerEU chapter.

	COUNTRY'S ENERGY PROFILE	NRRP	REPowerEU
ENERGY EFFICIENCY	Degrowth tendency for energy demand in the last years – on track with national targets	Comprehensive energy-efficiency plan for extensive building renovations, covering public and private buildings, social housing, health facilities, and SMEs Concurrently, reform housing policies and construction rules for new buildings	New and scaled-up investments for private and public building renovations Energy sobriety plan
ENERGY MIX AND RES DEPLOYMENT	Miss the national target for RESs in the energy mix	Lack of direct support measures for promoting renewable energy deployment; the focus is on contributing to ambitious actions to develop a decarbonised hydrogen value chain, aiming for further diversification of the energy mix Support the nuclear contribution to hydrogen production	Free-fossil industry initiative to support conversion of the industry sector toward low-carbon energy Further support R&D in the hydrogen value chain Fast-Tracking Renewable Energy Production Act
ENERGY SECURITY AND ENERGY INFRASTRUCTURES	Energy dependency lower than the EU27 average Difficulties in implementing multilateral projects for expanding the cross-border electricity network	Lack of financing and addressing cross-border energy infrastructure Modernisation of the national electricity network Diversify the sources of energy, ensuring the security of supply through the expansion of hydrogen production	Continuity in the policies adopted in the initial version of France's NRRP

Source: Elaborated by the authors.

Background: France's energy profile and targets for the energy transition

In France, the primary energy source of 2022, oil, increased its share to 34%, up from 31% in 2021. The shares of gas and coal remained steady, at 16.5% and 2.5%, respectively. Renewable energy also augmented its share in available energy from 13.57% in 2021 to 14.62% in 2022, below the EU27 average (19.29%). Nuclear energy, despite being the primary contributor to the country's energy mix over the last decade, experienced a decline from 36.48% in 2021 to 31.65% in 2022.[35]

The decline in nuclear energy in the primary energy mix is attributed to the *Grand Carénage* (Grand Overhaul) project. This initiative involves operational upgrades to address potential risks arising from adverse weather conditions that complicate the cooling process of reactors. The project also aims to enhance safety and extend the lifetime of reactors. Additionally, the discovery of cracks in pipes led to a temporary shutdown of 12 reactors. Despite this challenging situation, the government has reiterated the significance of nuclear technology in Franc"s energy landscape and has bolstered investments for its expansion.[36] The significance of nuclear power becomes even more evident when we analyse the electricity production mix. Nuclear energy alone accounted for 63.2% in 2022, representing a decrease from 68% in 2021, as explained earlier. In 2022, the decline in nuclear energy"s contribution was partially offset by an increase in electricity from renewables, which rose from 22.23% in 2021 to 24.54% in 2022. However, more relevant than the contribution of renewables was the substantial contribution of fossil fuel, which increased its share by more than three percentage points, ranging from 8.9% in 2021 to 12.15% in 2022.

Regarding import dependency in terms of gross available energy, the last available Eurostat data for 2022 shows that France imports 51.85% of the country's available energy. While the country performs better than the EU27 average of import dependency (62.5% in 2022), last available data on import dependency by fuels (2020) highlights France's high dependency on oil imports, accounting for 98.6%, 96.3% of solid fossil fuel and 94.7% of natural gas.[37] In addressing France's import dependency, it is also relevant to consider the reliance of the country's nuclear production on nuclear fuel import from abroad. The increasing import of nuclear fuel from Russia in 2022 must be highlighted in this context, as it makes France the largest EU importer of Russian nuclear products.[38]

Regarding energy efficiency and energy demand, France reduced the amount of primary energy consumption from 222.82 Mtoe in 2021 to 204.96 Mtoe in 2022, reflecting a reduction in the final energy consumption from 143.23 Mtoe in 2021 to 138.25 Mtoe in 2022.

Regarding energy poverty, in 2021, a significant 6% of households in the country faced challenges in adequately heating their homes, and a substantial 7.1% of the population found themselves falling behind on utility bills. This situation is particularly pronounced in rural regions and among low-income households.

Against this background, the French NECP summarises the policy targets that clearly reflect its strategy of addressing the country's energy profile regarding the above-mentioned dimensions of energy mix, security, and efficiency. The draft updated NECP submitted by the French government refers to the energy and climate targets recently revised under the Fit for 55 package and REPowerEU.

Table 8 provides an overview of the key targets defined by the 2019 NECP and the draft updated NECP with a view to 2030.

"

In addressing France's import dependency, it is also relevant to consider the reliance of the country's production on nuclear fuel import from abroad.

"

Table 8. Summary of key targets of France's NECP.

NATIONAL TARGETS AND CONTRIBUTIONS 2030	2019 NECP	2023 NECP
Share of energy from renewable sources in gross final consumption of energy (%)	23%	-
Primary energy consumption (Mtoe)	202.2	157.3
Final energy consumption (Mtoe)	131.4	104
Level of electricity interconnectivity (%)	16.5%	-

Source: France's draft updated NECP.

Note: For the share of energy, the assessment of the European Commission is negative: "France fell short of its 2020 target and does not provide indications of how it intends to meet its binding baseline. France did not submit a 2030 contribution." While the target defined to be achieved for 2020 was set at 23%, the actual share of RESs in gross final consumption in 2021 was 19.34%. European Commission (2023) "Assessment of the draft updated National Energy and Climate Plan of France". Staff Working Document, SWD (2023) 931 final, 29 March, p. 4.

France's energy import dependency primarily arises from the presence of fossil fuels in the country's energy mix. However, the supply of gas and oil is diversified among importing countries, ensuring high supply security, especially concerning gas. The updated NECP outlines a strategy to decrease the share of fossil fuels in the country's energy mix to 42% by 2030 and 29% by 2035, aiming to enhance energy security through the development of energy networks. Structural changes in gas and oil involve modernising infrastructure and constructing distribution and storage facilities. Despite ambitious goals for reducing gas consumption by 2030, the share of oil is expected to remain substantial by 2030. In terms of diversification, the plan includes expanding the contribution of biogas. The infrastructure for nuclear energy production has undergone a modernisation process, and new reactors are under construction. Also, considering the large import of nuclear fuels, it is worth noting the lack of the draft updated NECP in advancing measures to diversify and address the long-term supply of nuclear fuel and materials. The NECP does not refer to any recently finished or ongoing interconnection projects, nor does it outline a specific goal for interconnectivity.

The updated French NECP does not put forward a contribution towards the EU 2030 renewable energy target:

> *The draft plan also fails to address the shortfall to the 2020 target and does not indicate how France intends to close this gap and catch up with the requirements to maintain the 2020 target as a baseline for the following years.*

Therefore, the plan only vaguely outlines goals such as increasing the share of RESs in the national energy mix, along with a general orientation towards reducing nuclear energy.

On energy efficiency, the targets set in the updated draft NECP are in line with those defined by Energy Efficiency Directive and the French updated draft of the NECP also "puts forward a set of comprehensive measures addressing most of the relevant sectors, including building, transport and business sector".[39] The French 2023 NECP addresses energy poverty by improving measures outlined in the country's NECP of 2019. This improvement is notably achieved by promoting measures that act in both the short term and the long term. Notably, the draft updated NECP incorporates, as discussed in the next section, the REPowerEU scaling-up investment known as "*MaPrimeRénov*" for renovating and improving energy efficiency in private housing.

Energy policy in France's NRRP

France's NRRP was approved before the updated draft of the NECP, and it encompasses measures that address the country's energy profile and the measures and targets defined in the 2019 country's NECP.

France's NRRP is a component of the broader "*France Relance*" (France Recovery) national recovery strategy, totalling €100 billion or 4.1% of France's GDP in 2019. The plan's execution incorporates €39.4 billion in grants from the EU's RRF. France has opted to utilise its full grant allocation and forgo loans. In June 2022, France's maximum grant allocation was adjusted to €37.5 billion (−4.8%). In practical implementation, France initially uses its domestic resources to fund investments, which are subsequently partially or entirely reimbursed by the RRF (anticipated to cover 20% to 100% of contributions).

France's NRRP comprises nine distinct "components" and includes 70 investment projects and 21 reform initiatives. The endeavours encompassed within the nine components of the plan surpass the spending goals established by the RRF Regulation, with the green transition accounting for 50.6%, or 20.7 billion of NRRP funds, surpassing the 37% objective stated in the RRF Regulation and the digital transformation accounting for 25.1%, or 10.3 billion, exceeding the 20% goal set in the RRF Regulation.

The climate and energy transitions are directly addressed by the reforms and investment encompassing component 1, energy renovation; component 2, ecology and biodiversity; component 3, infrastructure and green mobility; and component 4, green energy and technologies, which together account for 49% of the country's NRRP, with minor contributions from other components. Nonetheless, the direct contribution of component 2 to the energy transition is scarce, and a key reform of this component comprises the adoption of the Climate and Resilience law.

Component 1 encompasses investments in energy efficiency in public buildings (amounting to €3.8 billion, making it one of the largest measures in the plan), private residential buildings (€1.4 billion), social housing and SMEs. Additionally, it includes reforms to housing policy and environmental regulations for the construction of new buildings. As the commission's assessment highlights, "These actions generally build upon initiatives previously undertaken by France through earlier policy instruments, thus supporting an expansion in both the scope and scale of the renovation effort".[40]

Significantly, according to official data provided by the French government, the *MaPrimeRénov* scheme (My Renovation Grant), launched in 2020 to replace the energy transition tax credit (CITE), has already accelerated the pace of energy renovation projects carried out by low-income households. Out of the 1,705,000 applications submitted between 2020 and 2022, 1,482,000 have been approved, and 950,000 have already been completed.[41]

Component 2 advances measures to combat soil alteration, reduce seismic risks in distant regions, enhance water supply and sewage systems, conserve biodiversity and protected zones, lower carbon emissions in industrial processes, promote circular economy practices, hasten agricultural transformation, and rejuvenate forests. Relevant to the energy transition, this component includes EUR 300 million of support to industrial decarbonisation.

Component 3 comprises seven investments and two reforms and focuses on sustainable mobility. It advocates for improving infrastructure across cleaner transportation modes, including rail transport, charging stations, reserved lanes for low-emission road transport, and waterways. Additionally, this component promotes the electrification of road transport and subsidises the purchase of zero- and low-emission vehicles. A key measure within this component is to modernise the railway network through the recapitalisation of SNCF Réseau, the railway infrastructure manager in France. The recapitalisation of this state-owned company represents the largest investment in the French NRRP, totalling €4.39 billion. Moreover, this component directly addresses the resilience of the electric distribution grid in rural areas to enhance the integration of renewable energies and support the development of electric mobility, including installing charging stations in the territory.

Component 4 also contributes to green mobility by financing R&D projects in the aeronautic sector towards the development of a wide range of zero-emission aircraft technologies and solutions. The key measure of this component is the investment in the national hydrogen sector and the "decarbonised hydrogen" initiative, amounting to €1.925 billion, which follows up on France's 2030 hydrogen strategy (a larger national strategy totalling €7 billion until 2030) and in line with the commission's 2020 hydrogen strategy. This initiative is designed to promote a decarbonised hydrogen value chain and targets further diversification of the energy mix and takes part in the planned IPCEI.

2. COUNTRIES' CHALLENGES AND RECALIBRATION TRAJECTORIES BEFORE THE PANDEMIC

Addressing the new energy context: Energy policy in France's REPowerEU chapter

France's REPowerEU chapter constitutes component 10 of the amended NRRP. It encompasses measures totalling €2.8 billion and incorporates three new investments, one upscaled investment and three new reforms.

The new measure, fossil-free industry (C10.I1), is financed with €294 million and supports investments in decarbonising industrial heat, energy efficiency and process change investments in industry. This comprises sub-measures for three specific areas:

Sub-measure 1: production of biomass heat through supporting the installation of new biomass boilers to replace a fossil-fuelled unit. The biomass adheres to the sustainability and emission criteria outlined in Articles 29-31 of REDII, and related implementing and delegated acts.

Sub-measure 2: large-scale projects on energy efficiency and improving industrial processes to curb energy consumption through investments in energy efficiency, waste heat recovery, changes in production processes and electrification.

Sub-measure 3: small-scale projects on energy efficiency, covering similar types of investments to sub-measure 2, but for smaller projects (less than €3 million).

IPCEI Hydrogen Measure (C10.I2): the funding provision in the "France 2030" plan allows for the financing of IPCEI hydrogen projects. Under the REPowerEU chapter, a total of €651 million is allocated to finance four IPCEI hydrogen-related projects. These four projects are led by industrial companies (Gevia, Hyvia – the green hydrogen company of the Renault Group – Faurecia group, Arkema group) and involve research and development activities in various sectors. This encompasses research in electrolysing technology, the automotive industry and the production of hydrogen-powered light vehicles.

The measure on energy renovation of public buildings belonging to the state (C10.I3) supports the energy renovation of state buildings to reduce energy consumption with a short-term view to winter 2023-2024.

The upscaled investment of energy renovation of private housing, including energy sieves (C10.I4), adds €1.8 billion for the years 2024 and 2025 to the previous measure, C1.I1 for the energy renovation of private housing, including energy sieves, known as "*MaPrimeRénov*". This support scheme is currently being revised to strengthen the dynamics of the decarbonisation of heating systems and accelerate the deployment of larger-scale renovations and the gradual elimination of thermal sieves.

The new reform of component 10.R1 incorporates the Fast-Tracking Renewable Energy Production Act (APER) endorsed on 10 March 2023. The reform aims to ease the administrative bottlenecks hindering RES deployment by facilitating the granting of permits and defining "acceleration zones", accelerating the development of renewable projects, with a special focus on wind power, solar (including thermal, photovoltaic and agro-voltaic) and methanisation.

The new reform of component 10.R2 frames the General Secretariat for Ecological Planning set up in July 2022. This new body is placed under the responsibility of the prime minister and will coordinate national strategies in the field of ecological transition (energy, climate, biodiversity, circular economy, etc.), mobilise ministries as well as stakeholders, and measure the performance of actions taken in those fields.

The new reform of component 10.R3 incorporates the French Energy Sobriety Plan (Plan de sobriété énergétique) adopted in October 2022. This measure aims to reduce energy consumption by 10% by 2024, in comparison to winter 2018-2019, in all sectors and contributes to objective 21.3(b)-(d). It includes 15 flagship initiatives, covering a range of sectors (housing, transport, industry, etc.) and targeting public and private actors.

RRP and the governance of the energy transition in France

While the new and scaled-up investments of France's REPowerEU chapter complement and expand on some of the policies put forth in the initial version of the country's NRRP, the plan seems to operate more as an organisational framework for existing reforms than as the true catalyst for a comprehensive reformative effort. In fact, the plan does not introduce new reforms but incorporates national reforms approved outside the mechanism of the RRF. Key investments supporting the realisation of cross-border energy infrastructures toward further integration of the energy union are absent from the

French strategy outlined in the NRRP, although they are addressed outside the framework of the RRF. Regarding the deployment of RESs, the French NRRP, also in its amended version, is insufficient. Measures toward the diversification of the country's energy mix are concentrated on developing the hydrogen value chain and production, while the design of measures on energy efficiency, notably those related to private and public building renovations, seems coherent with the country's energy targets.

France's initial version of the NRRP addresses energy efficiency and energy poverty by promoting a comprehensive energy renovation plan that covers both public and private buildings. It dedicates an entire component to this initiative. The plan does not support direct measures to promote the deployment of RESs. Only a few measures in the NRRP address RES deployment, such as actions promoting the integration of RESs in building renovations to enhance the energy autonomy of public buildings. This includes the implementation of heat pumps, thermal or photovoltaic solar panels, geothermal energy, biomass utilisation and small wind turbines. Nonetheless, France promotes initiatives supporting the deployment of RESs outside the NRRP, including green bonds ("*OAT vertes*"). It basically concerns government bonds, and therefore, they operate in the same way as any treasury bond. However, the main difference lies in the use of proceeds allocated to approved and monitored environmental projects, aiming to help achieve the targets defined in energy strategies and the NECP.

The measures proposed in the initial version of the plan also address the modernisation of the electricity grids toward a more resilient electricity network, able to incorporate the increasing production of RESs, therefore, being in line with the target of augmenting the share of RESs in the national energy mix. Although the modernisation of electric infrastructure is necessary for the deployment of RESs, due to the NRRP's scarce or non-existent contribution to enhancing RES production, the design of this measure lacks a definition of the tools to expand the incorporation of RESs in the national electricity grid.

The overlooked policy area in the initial version of the NRRP, concerning the development of renewable energy production, is partially addressed in the amended version of the plan. Firstly, the proposed initiative for fossil-free industry directly supports the private sector in converting its energy system into renewable energy. Secondly, the plan incorporates the Fast-Tracking Renewable Energy Production Act. However, this reform also appears to be fragile, as new legislation, the Energy Sovereignty Law, is currently in its final stages of the approval process. The draft proposal of this law has been highly criticised for dismissing renewable energies, failing to mention the EU's renewable energy targets while largely prioritising nuclear power as a way of phasing out from fossil fuels r.[42] From this perspective, REPowerEU seems to be falling short in addressing energy policies with a medium-term view, particularly in the deployment of RESs.

The encompassing strategy of decarbonised hydrogen highlights the risks of conflicting policies and lack of policy coherence. Firstly, the implementation of hydrogen projects requires an increasing amount of energy, and the plan does not tackle this potential contradiction with the NRRP objectives of reducing energy demands. Secondly, the production of green hydrogen, following the EU regulation, can be based on both RES energy and nuclear energy, underlining a potential contradiction with the proposed objective of reducing the share of nuclear energy in the country's energy mix. Thirdly, the amended version of the plan was published before the endorsement of the delegated act to the REDII defining rules for the hydrogen market. Therefore, the plan does not recall the principles included in those acts, notably the principle of additionality, which defines that the supplies of renewable hydrogen due to come on board by 2030 are connected to new, rather than existing, renewable energy production. It also defines measures to ensure that renewable energies are not diverted from other purposes and directed towards hydrogen production. Finally, the further investment in hydrogen production from low-carbon sources advanced in the REPowerEU chapter exacerbate the contradiction between the pivotal role of nuclear energy in the developing hydrogen industry and the goals toward the reduction of nuclear energy in the country's NECP.

The REPowerEU investments in the hydrogen sector contain further potential risks. Notably, the investments for the RDI project led by the green hydrogen company of Renault and aiming at the development of hydrogen-powered light vehicles do not seem to consider sufficiently their cost-effective realisation. Essentially, the process of hydrogen liquefaction demands a significant amount of energy, and sustaining the necessary low temperatures for long-distance transportation and storage incurs additional energy losses and associated costs. This investment encompasses a risk of its ineffective realisation.

The French REPowerEU chapter expands on policies and investments to support the energy efficiency and renovation of private and public buildings. These measures also address the dimension of energy poverty. The new and upscaled investments, along with the energy sobriety plan, appear to move towards reducing energy demands.

The initial version of the country's NRRP does not put forward any measures on cross-border interconnection. Therefore, to achieve the 2030 target for electricity interconnection defined in the 2019 NECP of 16.5%, and downsized in the 2023 NECP to 15%, in line with the targets defined in the Regulation for the Governance of the Energy Union, more investment is needed. Despite the lack of addressing this relevant area, some large-scale interconnection projects are foreseen outside the framework of the plan, notably with Iberian countries and Ireland. It is worth underscoring that enhancing cross-border interconnected electricity infrastructure is a central policy toward the realisation of the EU energy union. Initiatives on this matter are still ongoing, however, outside the frame of the RRF, notably, the cooperation with Spain and Portugal, has been further reaffirmed in a Memorandum of Understanding, which address the energy interconnection beyond the electricity infrastructure,[43] and the cooperation with Ireland to accelerate the construction of the Celtic Interconnector.[44]

Key policy recommendations

- To improve cooperation with neighbouring countries and the strengthening of the energy union, France should prioritise the modernisation of cross-border energy network infrastructure, giving concrete application to the existing Memorandum of Understanding with the Iberian countries and to the cooperation with Ireland.
- To expedite the development of renewable energy, France should adopt a phased strategy, with a focus on rapidly installing renewable infrastructure while concurrently conducting sensitivity mapping for other sites.
- To guarantee the appropriate administrative procedures for RES deployment, should train and build the capacity of administrative staff in authorities overseeing the RES deployment.
- A process to define more realistic national targets and an effective strategy towards the expansion of the share of RESs in the national energy mix should be developed to achieve greater coordination between all actors.
- Develop a measure that links the increase in the deployment of nuclear energy with the increase in the production and deployment of RESs.

"Some largescale interconnection projects are foreseen outside the framework of the plan, notably with Iberian countries and Ireland."

PORTUGAL

2. COUNTRIES' CHALLENGES AND RECALIBRATION TRAJECTORIES BEFORE THE PANDEMIC

- The country's energy mix witnessed a continued increase of RES share.
- RESs contribute above the EU average for Portuguese electricity production.
- Both the initial and amended version of the Portuguese NRRP support RES production and their integration into the country's energy system. Simplification of administrative permitting in this area is advanced in the amended version.
- The country's energy poverty is addressed in both versions of the plan; nonetheless, the strategy proposed highlights the problem in its design, which makes the continuous monitoring of its effectiveness difficult.
- The hydrogen strategy presents a realisation problem that must be addressed at the EU level.
- The country's NRRP lacks in addressing the issues related to the cross-border electricity infrastructure.

Table 9. Key energy measures in Portugal's NRRP and REPowerEU chapter.

	COUNTRY'S ENERGY PROFILE	NRRP	REPowerEU
ENERGY EFFICIENCY AND ENERGY POVERTY	Increasing demand of primary energy consumption in the last two years, reflected in the increase of final energy consumption	Various measures contribute to supporting the energy efficiency of public and residential buildings Strategies and funding allocations are in place to enhance industrial energy efficiency	New and scaled-up investments for private and public building renovations National Observatory on Energy Poverty
ENERGY MIX AND RES DEPLOYMENT	Strong national RES production and incorporation into the national electrical system	Lessening energy reliance and implementing emerging technologies for renewable hydrogen and other RESs are being taken In the Azores and Madeira archipelago, investments support RESs, such as geothermal, wind, solar and hydropower, along with storage solutions Investments supporting the national hydrogen strategy under the IPCEI framework	Further investments for RESs and their deployment Streamlining and easing permitting procedures Further supporting hydrogen initiatives
ENERGY SECURITY AND ENERGY INFRASTRUCTURES	One of the most energy dependent countries in the EU. The country's import dependency increased over the last two year, slightly shifting the country away from the set objectives Lack in addressing cross-border electricity infrastructure	Lack in financing and addressing cross-border energy infrastructure Modernisation of the national electricity network Diversify the sources of energy, ensuring the security of supply through RES production	Continuity in the policies adopted in the initial version of the Portuguese NRRP Expansion of investments in RESs and traditional energy storage

Source: Elaborated by the authors.

Background: Portugal's energy profile and targets for the energy transition

In Portugal's primary energy mix of 2022, the share of oil increased to 49.24%, up from 44% in 2021. The share of gas remained steady at around 21.75%, while the share of coal decreased significantly, almost being eliminated from the Portuguese primary energy mix. RESs reduced their share from 33% in 2021 to 29% in 2022, primarily due to the dry season limiting hydro production.[45]

RESs play a crucial role in the Portuguese energy system, as reflected in their participation in electricity production, which reached 60.9% in 2022. This figure is well above the EU average of 41% in the same year, positioning the country as the fourth EU nation with the highest contribution of RESs to electricity production.[46]

Portugal's import dependency in terms of gross available energy increased in 2022 compared to the previous year. According to the latest available Eurostat data for 2022, Portugal's imports accounted for 71.3% of the country's available energy, significantly surpassing the EU27 average import dependency rate of 62.5% in 2022. This places the country as the 12th most dependent nation in the EU.[47]

Regarding energy efficiency and energy demand, Portugal increased the amount of primary energy consumption from 19.53 Mtoe in 2021 to 20.77 Mtoe in 2022, reflecting an increase in final energy consumption from 15.68 Mtoe in 2021 to 16.71 Mtoe in 2022.[48]

Regarding energy poverty, in 2021, a significant 16.4% of Portuguese households struggled to heat their homes adequately, a percentage that surpassed the EU average of 6.9%. This issue is more prevalent in rural areas and low-income households. Portugal's percentage (5.3%) of its population behind on utility bills is lower than the EU average (6.4%).

Against this background, the Portuguese NECP summarises the policy targets that clearly reflect the French strategy for addressing the country's energy profile, regarding the above-mentioned dimensions of energy mix, security and efficiency. Table 10 provides an overview of the key targets defined by the 2019 NECP and the updated draft of the NECP with a view to 2030.

Table 10. Summary of key targets of Portugal's NECP.

TARGETS OF THE NECP WITH A VIEW TO 2030	NECP 2020	NECP 2023
Renewables in gross final energy consumption	47%	49%
Renewables in transport	20%	23%
Energy dependency	65%	65%
Electricity interconnection	15%	15%
Energy efficiency (primary energy reduction)	35%	35%

Source: Portugal's updated draft of the NECP.

The energy mix for Portugal in 2022 indicates that the country is progressing towards its target of achieving 49% share of renewables in the gross final energy consumption, as outlined in its NECP, to contribute to the EU's 2030 target.

Despite the positive trend over the last year in reducing energy import dependency, as mentioned above, 2022 marked a countertendency, which raised concerns about reaching the target declared in the country's NECP. Furthermore, in 2022, there was a significant increase in

electricity imports, largely from neighbouring Spain, due to a drop in domestic production. The updated NECP identifies the accessibility of affordable energy (with natural gas having a particular role in the energy mix); controlling energy demand (in particular in transport); and enhancing electricity and stock infrastructure, namely, through storage and digitalisation, as key challenges for Portugal's energy security. Addressing these challenges involves diversifying the energy supply and strengthening the reliability of transmission and distribution networks, notably cross-border interconnected infrastructure directly addressed in the country's NECP.

In alignment with the EU's energy-efficiency target, Portugal is striving to reduce energy consumption by 35% by 2030 compared to 2005 levels. This corresponds to a contribution of 25.5 Mtoe for primary energy consumption and 14.9 Mtoe for final energy consumption.

The renovation of buildings is a growing concern in Portugal, requiring proactive and well-designed building renovation programs to enhance energy efficiency and decrease energy poverty. Specifically, it is estimated that an annual renovation rate of 2.6% in the residential sector from 2021 to 2050 could result in primary energy savings of 17.5 TWh by 2050.[49] The national LTRS, approved in 2021, estimates that a total investment of €143 billion until 2050 (€4.95 billion per year) is necessary for the full transformation of the Portuguese building stock.

Energy policy in Portugal's NRRP

Portugal's NRRP[50] comprised a total of 20 components organised within the RRP dimensions of resilience, climate transition and digital transition. The climate transition dimension also intended to address the NECP targets and the main limitations of the energy structure in Portugal. This dimension is subdivided into six strategic components: the blue economy;[51] sustainable mobility; decarbonisation of industry; bioeconomy; energy efficiency in buildings; and renewable energies. The objective of achieving climate transition accounts directly for 18% of the total funds allocated under the NRRP, encompassing eight reform actions and 17 investment initiatives. It is also further tagged by components from the other two dimensions, thereby expanding the total proportion of RRP investments dedicated to climate transition to 38%, as detailed in Table 11.

Component 7 addresses the deployment of renewables through the implementation of a new model of business hosting areas (*Áreas de Acolhimento Empresarial*). These areas, in addition to providing a series of infrastructural conditions (namely, digital) for the implementation of businesses and corresponding ecosystems, where there are established market failures, are expected to support investments in the auto-production and storage of renewable energy, energy quality, support for electric charging and hydrogen stations, thus promoting energy-efficient businesses and transition processes and the establishment of energy communities. It also plans a pilot intervention to test service quality islands for energy stability.

Component 11 aims to promote the decarbonisation of the industry sector through the integration of low-carbon technology in the industrial sector, and through the increased incorporation of renewable energy and energy storage. In this context, the promotion of the inclusion of renewable gases, in particular hydrogen, in industry is particularly relevant, namely, in those sectors where technological options for decarbonisation, especially through electrification, are more limited.

Component 13 indicates energy efficiency and building renovation as a key strategy to reduce the country's energy bill and dependency. Energy efficiency is also further addressed in components 1-4, 10 and 13, which focus on increasing energy-efficient renovations across public and private buildings (C13), national health system facilities (C1), social service facilities (C2), main national theatres (C4) and the fishing fleet (C10).

Component 14 integrates strategies to advance the production of renewable energy, particularly hydrogen and other renewable gases, complementing the activities in component 11 from the side of production. The measures associated with hydrogen are articulated by the objectives defined in the national hydrogen strategy. This component promotes not only the development of renewable energy production but also the corresponding storage capabilities, which are of the essence to the management of RESs. For the autonomous regions, the emphasis lies in the deployment of diverse RESs, such as geothermal, wind, photovoltaic and hydropower, and energy storage. Component 14 also encompasses measures for the modernisation of Madeira's two primary power plants and the implementation of smart grids, fostering the decentralisation of energy production. In the Azores archipelago, the plan aims to augment installed geothermal power for electricity generation, introduce a wind farm and a photovoltaic park, and establish electrical energy storage systems across

six of the nine islands to enhance the capacity for renewable energy integration. Furthermore, the plan entails an increase in installed capacity by 12.6 MW, driven by a focus on electrification, decentralised production and distributed storage.

Component 15 pairs energy demand reduction with decarbonisation targets, promoting the use of electric vehicles (both public and private), enhancing public transport and modernising transport. Components 1 and 3 also envisage the renewal of some of vehicles in the health and social services' fleets with electric cars. However, the centrepiece is component 13, energy efficiency in buildings. It targets urban regeneration; boosting building energy performance and fusing energy efficiency, renewable energy and electrification. A specific emphasis is on low-income households to enhance living conditions and lower energy costs.

Table 11. Portugal's NRRP components and their contribution to climate and the energy transition.

COMPONENT	AMOUNT (€ MILLION)	AMOUNT ALLOCATED TO CLIMATE	COMPONENT SHARE FOR CLIMATE TRANSITION
C1 national health services	1,383	215	23%
C2 housing	2,733	1,076	39%
C3 social responses	833	208	25%
C4 culture	243	60	25%
C5 business capitalisation and innovation	2,914	547	19%
C6 skills and qualifications	1,324	182	14%
C7 infrastructure	690	91	13%
C8 forestry	390	306	78%
C9 waters	615	615	100%
C10 sea	252	124	44%
C11 decarbonisation of industry	715	715	100%
C12 sustainable bioeconomy	145	145	100%
C13 building energy efficiency	610	610	100%
C14 hydrogen and renewables	370	370	100%
C15 sustainable mobility	967	967	100%
C19 public administration	578	9	2%

Source: Portugal's NRRP.

Addressing the new energy context: Energy policy in Portugal's REPowerEU chapter

The Portuguese REPowerEU chapter consists of six new reforms, five upscaled investments and 11 new investments for a total amount of €22.2 billion. Due to the extension of the new reforms and investments encompassing the Portuguese REPowerEU chapter these are introduced in Table 12 below.

Table 12. Overview of the measures comprising the Portuguese REPowerEU chapter (component 21).

NAME OF THE MEASURE	TYPE
Green skills	Reform
National Observatory on Energy Poverty	Reform
Citizen Energy Space	Reform
Regulatory Framework for Renewable Hydrogen	Reform
Biomethane development	Reform
Simplification of administrative procedures for RES projects	Reform
Green agenda	Investment
Green industry	Investment
Industry decarbonisation	Investment
Energy efficiency in residential buildings	Investment
Energy efficiency in utilities buildings	Investment
Energy efficiency in public buildings and facilities	Investment
Renewables gasses	Investment
One-stop shop for licensing new projects on RESs	Investment
Assessment study for offshore energy potential	Investment
Network flexibility	Investment
Incentive mechanism for the production and storage of RESs	Investment
Incentive mechanism for the acquisition and installation of energy storage systems from RESs	Investment
Boosting renewable electricity production on the island of Porto Santo	Investment
Decarbonisation of public transport	Investment
System of bus rapid transit in Braga	Investment
Acquisition of electric boats	Investment
Nazaré funicular	Investment

Source: Elaborated by the authors.

Measures comprising the REPowerEU chapter widely address the issues of energy efficiency, energy poverty and enhancing existing attempts in curbing energy demand. In terms of reforms, the chapter incorporates measures aimed at simplifying permitting processes, such as establishing a centralised licensing platform for renewable energy projects and providing training for public officials involved in renewable energy permitting. Additionally, there are initiatives designed to facilitate the adoption of biomethane and renewable hydrogen, including the implementation of regulatory frameworks for renewable hydrogen and the introduction of the first auction for sustainable biomethane along with a biomethane action plan. Furthermore, the chapter includes the establishment of a National Energy Poverty Observatory dedicated to monitoring and shaping policies to assist households facing energy poverty and the creation of energy-efficiency one-stop shops for citizens and efforts to promote green skills among various categories of workers and the unemployed.

The chapter put forward investments to bolster and facilitate the advancement of renewable energy. Portugal is proposing investments in renewable energy initiatives in Madeira and the Azores, which directly provide an incentive system for purchasing and installing renewable energy storage systems in the Azores archipelago and Madeira island. The plan also includes investments to fund crucial technical studies aimed at exploring the potential for offshore wind energy and the implementation of a digital platform for streamlining the permitting and monitoring process of renewable energy projects, which complement the reform to facilitate administrative permitting procedures for renewable projects. A significant investment is also aimed at expanding storage capacity to enhance the energy system's flexibility.

The REPowerEU chapter allocates additional funding to enhance energy renovation efforts in public buildings in Madeira and to establish a financing program for the development of net-zero technologies. Furthermore, supplementary funds will be directed towards expanding initiatives aimed at further reducing carbon emissions in industrial processes and production as well as in public transportation.

RRP and the governance of the energy transition in Portugal

While the measures outlined in the initial versions of the Portuguese NRRP and the REPowerEU chapter primarily target areas such as energy efficiency, reduction of energy demand, and increasing the capacity for renewable energy production and integration, the proposed amendments partially address the absence of policies for specific areas that were lacking in the initial version of the country's NRRP.

The deployment and production of RESs can be considered as Portugal's specialisation strategy in the global energy market. While the initial version of the country's NRRP included measures to promote RES production, it failed to capitalise on the opportunity to reform and streamline the legal framework and provide significant administrative improvements, such as investing in the training of administrative personnel involved in the RES sector. The proposed reforms in REPowerEU address this policy gap, bringing greater coherence to Portugal's RES strategy and aiding the country in reaching its target for the share of RES in the primary energy mix.

Focusing on RESs, the envisaged investment supporting a comprehensive study to assess the potential for offshore wind production lacks details on its potential conflict with the policy on environment protection and conservation.

> "Portugal's national hydrogen strategy is part of the IPCEI hydrogen-related projects, totalling €7 billion. The strategy aims to reduce natural gas imports by 2030 and takes advantage of favourable conditions in Portugal for developing a renewable hydrogen economy."

Portugal's national hydrogen strategy is part of the IPCEI hydrogen-related projects, totalling €7 billion. The strategy aims to reduce natural gas imports by 2030 and takes advantage of favourable conditions in Portugal for developing a renewable hydrogen economy.

Portugal's national hydrogen strategy is part of the IPCEI hydrogen-related projects, totalling €7 billion. The strategy aims to reduce natural gas imports by 2030 and takes advantage of favourable conditions in Portugal for developing a renewable hydrogen economy. Key factors include the strategic geographical location, notably the deep-sea water port of Sines, and

the partial reconversion of a local deactivated power plant, which helps minimise local employment impact. While the strategy's systemic industrial approach promises broader impacts beyond direct energy, questions have been raised about its effectiveness.[52] The priority given by the government to this initiative, which has already garnered relevant international investments, has not been without concerns,[53] and it could result in an extension of time and costs beyond the REPowerEU schedule. Furthermore, as in the case of electricity connectivity in the existing agreement between the Iberian countries and France, the extent of the green hydrogen infrastructure connecting these countries and improving the EU energy market is not yet clear. In essence, the risk of investment being held back by the absence of political agreement among member states is high, as the lack of a comprehensive and concrete agreement jeopardises the existence of export markets. Considering this aspect, the proposed strategy misses the opportunity to direct investment in the hydrogen strategy toward an encompassing policy supporting national industrial sectors.

In both versions of the plan, energy security is subordinated to the measures diversifying energy sources and expanding national production (RESs and hydrogen). Nonetheless, the proposed amendments reference investments to enhance the storage capacity and facilities, which were mainly directed toward the Azores archipelago and Madeira Island in the initial version of the plan.

The principal missing policy area is related to energy security, notably with the cross-border electricity infrastructure. On this last point, the Portuguese NRRP is not aligned with the NECP objectives of enhancing the cross-border energy cooperation to increase the Iberian electricity interconnectivity capacity. The development of adequate interconnection infrastructure is not just relevant for energy supply, but it supports the demand for renewable energy generated domestically during periods of surplus supply and establishes an environment conducive to competitive and steady electricity prices. As mentioned in the case of Spain and France, Portugal participates in the quadrilateral coordination with these two countries and the EU Commission, aiming to achieve a common agreement and start with the operative working on European interconnection. This initiative, being conducted outside the RFF framework, highlights a missed opportunity to address a country's strategic infrastructure.

As previously noted, energy poverty is of high concern in Portugal. To combat these issues, the government rolled out measures outside the RRF, such as the energy social tariff initiative, which had 814,669 beneficiaries by the end of 2021. This initiative aims to provide access to electricity at reduced prices for economically vulnerable families and individuals. The initial version of the country's NRRP provides investment in building renovation aimed at comprehensive requalification of private housing and public buildings to address the issues related to energy poverty by enhancing energy efficiency. Nonetheless, the initial version of the Portuguese RRP omitted an encompassing strategy and specific body to assess the problem. The amended version of the plan addresses this issue, by implementing a national observatory able to monitor the situation, the rural divide on energy poverty and access, and direct investments in accordance with the real need. What is still missing from the Portuguese strategy to combat energy poverty is a timeline with concrete goals, an essential tool to continuously assess public policy toward the topic.

Key policy recommendations

- The initiatives directed towards reducing energy poverty and improving energy efficiency in households should guarantee broad social inclusion and monitoring and articulation with wider housing policies.
- The promotion of a strategy for hydrogen should be complementary to initiatives towards the strengthening of the hydrogen ecosystem within the wider industrial and innovation policies.
- The improvement of administrative response in the development of new investment projects should be sought while guaranteeing appropriate monitoring procedures throughout the implementation process.
- The development of cross-border electricity infrastructure is of central importance to improving energy security in Portugal, and existing objectives within the NECP should be implemented.
- The alternatives in the development and usage of RESs should primarily focus on the target of guaranteeing the most efficient reduction of emissions.

SPAIN

- The majority of Spain's energy mix remains fossil fuels with a slow increase in RESs.
- The share of RESs in electricity consumption has been increasing steadily.
- The NRRP addresses energy poverty largely through the renovation of buildings; however, while its potential to address marginalised populations is presented, it is only indirectly considered and not directly addressed.
- Streamlining of procedures, facilitating access to related services, to promote the implementation of new RESs, is relevant in Spain's REPowerEU chapter, with legislative changes already approved.
- There is a strong priority in the production and distribution of hydrogen, with significant investment, but the indirect effects are still to be accounted for, namely, in the use of RESs.

Table 13. Key energy measures in Spain's NRRP and REPowerEU chapter.

	COUNTRY'S ENERGY PROFILE	NRRP	REPowerEU
ENERGY EFFICIENCY AND ENERGY POVERTY	Increasing energy demand Main energy-poverty indicators well above the EU average	Investments for building renovations Measures to address energy poverty through higher energy efficiency and the construction of social rental housing Regulatory changes to promote investment in energy efficiency	RDI projects in energy storage and energy efficiency Expanding investments in the Energy Rehabilitation of Buildings Programme (PREE), aligned with energy-efficiency criteria
ENERGY MIX AND RES DEPLOYMENT	Energy mix reliant on fossil fuel energy RESs increasing their presence in the country's energy mix and in electricity generation, but still distant from objectives Potential for wind and solar production	Investments supporting the expansion of RES generation and for flexible and decentralised grids Investments supporting the development and use of energy from renewable sources (special focus on offshore wind), renewable hydrogen and the sectoral integration of renewable energy Reform of the legal framework for renewable energy	Reform improving permitting for renewable energy production projects and electricity network infrastructure Further investments supporting the integration of RESs in the national energy network Investment supporting scheme for the value chain of RESs and storage
ENERGY SECURITY AND ENERGY INFRASTRUCTURES	High level of import dependency due to the country's high reliance on fossil fuels Island regions with specific energy security issues	Lack in addressing cross-border electricity interconnectivity infrastructure Strengthen internal energy market and internal energy network distribution	Lack in addressing cross-border electricity interconnectivity infrastructure Further investments supporting the national energy security plan "Más Seguridad Energética" (More Energy Security)

Source: Elaborated by the authors.

Background: Spain's energy profile and targets for the energy transition

In 2022, Spain's energy mix was composed of oil (46.16%), gas (20.70%), coal (less than 3%), nuclear energy (9.17%) and renewables (21.04%). This data indicates an increase in the usage of oil and a slight decline in gas and renewables from the previous years, while the percentages of coal and nuclear energy remained stable. However, the share of renewables in final electricity consumption has been increasing steadily from 35.2% in 2018 to 50.9% in 2022.

The electricity mix in Spain underscores the significance of nuclear power within the country's energy system. Despite the growing contribution of low-carbon energy sources to electricity production in recent years, the share of nuclear energy in total electricity production has remained relatively stable, hovering around 20.5% in 2022, similar to its proportion in 2018. Conversely, RESs such as solar, wind and hydropower have experienced notable increases in their contribution to the country's electricity generation over the same period, representing a promising sector.

Spain's import dependency in terms of gross available energy increased in 2022 compared to the previous year. According to the latest available Eurostat data for 2022, imports accounted for 74.3% of the country's available energy, significantly surpassing the EU27 average import dependency rate of 62.5% in 2022. [54] This places the country as the ninth most dependent nation in the EU.

Regarding energy efficiency and energy demand, Spain increased the amount of primary energy consumption from 111.5 Mtoe in 2021 to 113.23 Mtoe in 2022, reflecting an increase in final energy consumption from 80.33 Mtoe in 2021 to 81.23 Mtoe in 2022.[55]

Energy poverty is a growing concern in Spain. In 2021, 14.2% of Spanish households could not adequately heat or cool their homes, well exceeding the EU average of 6.9%. Moreover, 4.5 million individuals, representing 9.5% of the population, were behind on utility bill payments, also significantly surpassing the EU average of 6.4%.

Against this background, the Spanish NECP summarises the policy targets that clearly reflect the French strategy for addressing the country's energy profile, regarding the above-mentioned dimensions of energy mix, security and efficiency. Table 14 provides an overview of the key targets defined by the 2019 NECP and the draft updated NECP with a view to 2030.

Table 14. Summary of key targets of Spain's NECP.

OBJECTIVES OF THE NECP WITH A VIEW TO 2030	NECP 2020	NECP 2023
Share of renewables in electricity generation	74%	81%
Number of dwellings renovated	1,200,000	1,377,000
Renewable share of final energy	42%	48%
Energy-efficiency reduction of primary energy consumption	39%	42%
Energy-efficiency reduction of final energy consumption	41.7%	44%
Energy dependency	61%	51%

Source: Spain's draft updated NECP.

Spain's NECP has set an ambitious goal for 2030, aiming to achieve a 48% (42% in the original NECP of 2019) share of renewables in the final energy consumption. Despite the relevant contribution of renewable energy to electricity generation, reaching this target still demands significant effort. It involves further developing renewable electricity sources, such as offshore wind and solar energy; promoting renewable hydrogen production; and integrating renewable energy across various sectors. Additionally, devising cost-effective strategies for this renewable energy increase is critical.

"

The updated NECP also recognises the relationship between energy efficiency and energy poverty, particularly concerning the efficiency gains in residential and public buildings. The primary challenge in reducing energy demands and enhancing energy efficiency lies in the renovation of private and public buildings.

"

The updated NECP sets the ambitious minimum targets of reducing the percentage of the population unable to adequately heat their homes to 6% and those in arrears on utility bills to 5.5%. Such targets will be particularly addressed by the National Strategy against Energy Poverty (*Estrategia Nacional contra la Pobreza Energética*, ENPE), launched in 2019 by the Spanish government, which includes strategies involving local governments and authorities, to monitor the statistical indicators of energy poverty in alignment with EU directives. The corresponding operational plan launched for 2023-2024 will also prepare for the strategy's update by 2025. Meanwhile, to counteract the rise in energy prices in 2022, the government introduced measures addressing the socio-economic fallout from Russia's full-scale invasion of Ukraine, simplifying access to the social bonus, through a discount on electricity bills.

The updated NECP also recognises the relationship between energy efficiency and energy poverty, particularly concerning the efficiency gains in residential and public buildings. The primary challenge in reducing energy demands and enhancing energy efficiency lies in the renovation of private and public buildings. Projections suggest that if Spain can maintain an annual renovation rate of 2.6% at an optimal cost level, it could achieve a primary energy saving of around 108 TWh by the year 2050.[56] In the NECP, Spain has a number of specific energy-efficiency actions for buildings, including renovating (1) 1,377,000 residential buildings by 2030 and (2) heating and cooling systems of 300,000 residential buildings on average per year.

Spain's updated NECP directly tackles the country's dependency on high energy imports. Spain has a high energy import dependence due to the country's high reliance on fossil fuels, which are still the bulk of the Spanish energy mix, accounting for 70% in 2022. The measures advanced in the updated draft of the NECP aim to reduce this share between 68% and 65% by 2030. The plan aims to reduce Spain's energy dependence by expanding the domestic production of renewables, and by reducing imports of coal, petroleum products and natural gas.

Energy policy in Spain's NRRP

Spain's NRRP is among the most heavily financed by the Next Generation EU recovery instrument, resulting in a total amount of €69.5 billion, which corresponds to 9.6% of the overall RRF. This NRRP is structured around four strategic lines of action – green transition, digital transformation, social and territorial cohesion, and gender equality – which are further divided into ten "lever policies", including 30 components. These components tackle the challenges identified in the seven flagship areas outlined by the Commission under the RRF. The NRRP will be implemented through a mix of 211 distinct investments and reforms. The plan allocated 39.7% of its resources towards the green transition and 28.2% towards the digital transition, surpassing the expenditure targets set by the RRF Regulation, which were 37% and 20%, respectively. The lever policy termed the "Inclusive and Just Energy Transition" (*Transicion Justa y Inclusiva*) represents the strategic intervention area on climate and energy. It encompasses four strategic components – renewable energy, electricity infrastructure, hydrogen and just transition – which together account for 9.2% of the total funds of Spain's NRRP. The climate transition is also supported by other components, as shown in Table 16.

Table 15. Spain's NRRP components and their contribution to climate and the energy transition.

COMPONENT	AMOUNT (€ MILLION)	AMOUNT ALLOCATED TO CLIMATE	COMPONENT SHARE FOR THE CLIMATE TRANSITION
C1 sustainable urban mobility	6,520	4,727	72.5%
C2 urban renovation	6,820	5,592	82%
C3 agri-food and fisheries	1,051	420	40%
C4 ecosystem and biodiversity	1,642	755	46%
C5 coast and water resources	2,091	1,233	59%
C6 sustainable long-distance mobility	6,667	4,933	74%
C7 renewable energy	3,165	3,165	100%
C8 electricity infrastructure	1,365	1,365	100%
C9 hydrogen	1,555	1,555	100%
C10 just transition	300	300	100%
C11 public administration	4,238	1,059	25%
C12 industrial policy	3,781	1,398	37%
C14 tourism	3,400	646	19%
C17 science technology and innovation	3,456	48	1,4%
C20 vocational training	2,076	158	7.6%
C23 labour market reform	2,363	222,5	9.41%
C26 sports	300	133	44.65%
C27 tax system reform	n.a.	n.a.	n.a.

Source: Elaborated by the authors.

Reducing the country's reliance on fossil fuels constitutes the outreaching objective of the NRRP's component 7, renewable energy, which addresses the ambitious NECP target of increasing RESs in the final energy consumption to 48% in 2030. These €3.165 million components include the development of a clear and stable regulatory framework for the deployment of renewables, which brings together the fragmented legislation on RESs, the development of self-consumption and energy communities, and the promotion of research and innovation. Corresponding investments will promote smart electricity grids and deploy storage capacity, with an investment of €700 million to address the transition to clean energy in the Balearic and Canary Islands.

Defining this legal framework and investment, component 7 is in synergy with other components. Component 1, mobility, aims to boost renewable energy usage in the transport sector by providing financing for projects that seek to integrate renewable self-consumption into electric vehicle charging installations. Component 2, urban rehabilitation and regeneration, foresees the incorporation of renewables into building construction, as part of global projects for the energy rehabilitation of buildings. Component 2 also includes actions directed at small municipalities through small-scale renewable projects and the promotion of energy communities. In component 8, infrastructure, the integration of renewable energy into the grid is linked to storage actions and optimisation or digitalisation of the grid.

Component 9, hydrogen, foresees a significant investment of €1,555 million to scale-up the renewable hydrogen value chain. This component aims to bolster the current value chain, which is rooted in SMEs and technology centres, to create a large-scale renewable hydrogen production and sectoral integration cluster in the framework of the IPCEI focused on hydrogen. As in other countries, hydrogen is seen not only as an alternative energy source but also as an instrument for a transition-based industrial policy.

Spain has made limited progress in reducing its dependence on energy imports, decreasing from 77% in 2010 to 74.3% in 2022. In 2022, Spain imported 103.2% of its consumed natural gas (with 12.6% coming from Russia) and 101.2% of its oil (with 3.2% sourced from Russia). Clearly, and following the objectives of Spain's updated NECP, more efforts are required to meet the 2030 target of 51% energy imports.

The main strategy involves reducing fossil energy imports and increasing the share of renewables in the country's primary energy mix. For 2022-2023, the Spanish government approved an extensive plan called "More Energy Security" (+SE). The plan's key objectives include the protection of vulnerable consumers and businesses via energy-saving and renewable initiatives, reinforcing strategic and energy autonomy by speeding up structural transformations within the energy and climate strategy framework, and enhancing cooperation with EU member states through the optimised use of existing infrastructure.

Spain faces substantial challenges in its engagement with the intra-European electricity market due to a relatively low interconnectivity capacity of 6% (6000 MW). This situation limits the Iberian peninsula's involvement in the broader European electricity network. To overcome these obstacles and align with the EU's energy strategy for market integration, Spain, alongside Portugal and France, is prioritising infrastructure modernisation. As part of its NECP, Spain seeks to reach 15% energy interconnection capacity by 2030. This improvement, facilitated through collaborative efforts with France and Portugal, is instrumental for Spain's integration into the European energy market and the enhancement of its energy security.

The country's NRRP addresses the issues of energy security and energy dependency through the components related to energy efficiency and renewable energy. Curbing energy demand and deploying RESs are seen as key strategies to reduce energy imports and diversify the energy mix. However, as is the case in Portugal, interventions in infrastructure for electricity interconnections, in cooperation with the French and Portuguese governments, are tackled out of the framework of the plan. Component 7, renewables, identifies RES deployment as a way to reduce energy import by substitution with non-carbon energy sources. Similarly, component 8, infrastructure, highlights the deployment of energy storage and smart grids as key investments for enhancing social and economic resilience and reducing reliance on external energy sources. This, in turn, lessens dependence on fossil fuel prices by facilitating the integration of renewable energies. The objective of achieving energy security and lowering energy dependency from abroad is also addressed in measures encompassing component 9, hydrogen, and component 10, just transition, of the NRRP, although the impact on the efficient use of renewable energy is not fully accounted for.

The NRRP includes an ambitious level of investment in energy-efficiency renovation of buildings, in line with the Renovation Wave and with the Spanish Long-Term Building Renovation Strategy.[57] The total amount directed to renovation of residential dwellings, public buildings and urban rehabilitation in component 2, urban renovation; for public buildings in component 11, public administration; and for sports facilities in component 26, sports, reached €7.8 billion and corresponded to more than 10% of Spain's RRF. Component 2 encompasses €6.8 billion investments to renovate 355,000 individual residential dwellings, 600 hectares of urban areas, 40,000 residential buildings and 690,000 m2 of non-residential buildings, 26,000 residential buildings in small municipalities and urban areas, and 1,230,000 m2 of public buildings by 2026. The underlying investments in residential building renovations are expected to contribute to the energy-saving target by 2030 and to the objective set in the NECP in terms of the number of dwellings to be renovated. However, with the inflation of renovation costs and the corresponding decrease in demand, the targets for these actions were not reachable and were lowered.[58]

Addressing the issue of energy poverty, component 2 plans aid programs aiming to increase affordable rental housing for low-income households in energy-efficient buildings, thus lowering energy consumption. These programs also contribute to narrowing the gender gap and promoting social inclusion, as among those particularly vulnerable to energy poverty are single-parent households, households with at least one person with a disability and older women living alone. These initiatives can thus generally benefit those of these demographics who have higher-than-average electricity and heating expenses. Finally, component 2 foresees a reform to foster private investments by facilitating communities of owners to borrow and by providing *Instituto de Crédito Oficial* (ICO) guarantees to banks for lending for the purpose of building renovation. Although contributing to benefit those most at risk of energy poverty, it is to be seen whether financial and bureaucratic hurdles may limit social inclusion through these initiatives.

Addressing the new energy context: Energy policy in Spain's REPowerEU chapter

Spain's REPowerEU chapter comprises seven new investments, one upscaled investment and one new reform for a total amount of €6.9 billion.

Reform C31.R1 (reform improving permitting for renewable energy production projects and electricity network infrastructure) seeks to simplify the procedures associated with initiating new renewable energy projects and new electricity network infrastructure. New legislation to facilitate the development of renewable energy plants and self-supply plants was already approved at the end of 2023. This initiative also establishes a new administrative unit within the central administration to support the processing of permitting applications. This initiative aims to decrease the overall dependence on fossil fuels.

Scaled-up investment C31.I1 (investment promoting self-consumption (based on renewable energy and behind-the-meter storage) and energy communities) expands the total amount allocated to measures C7.R3 (development of energy communities), C7.I1 (development of innovative renewable energies, integrated into buildings and production processes) and C8.I1 (deployment of energy storage) of the original plan. It aims to enhance storage capacity and strengthen the deployment of RESs by initiatives in support of self-consumption and energy communities.

Investment C31.I2 (support scheme for the production and uptake of renewable hydrogen) allocates public investment in a scheme designed to promote the production and use of renewable hydrogen. C31.I2 is expected to reduce overall reliance on fossil fuels and to accelerate the deployment of renewable hydrogen.

Investment C31.I3 (support scheme for the value chain of RESs and storage) supports a scheme designed to improve access to finance in the value chain in the design, manufacturing, storage, recycling, or R&D of technologies and components relevant for the transition to a net-zero-emission economy, contributing to reducing the overall reliance on fossil fuels.

Investment C31.I4 (investment to support electricity network infrastructure) is expected to facilitate investments in electricity transmission grids, integrating higher quantities of renewable energy and connecting new industrial sites operating at net-zero emissions.

Investment C31.I5 (investment to support industrial decarbonisation in the form of grants) is part of the strategic project for industrial decarbonisation. Its objective is to boost the decarbonisation of industrial processes, primarily directly to the manufacturing industry, supporting projects that aim at greenhouse gas emission reduction, as well as the development of new, highly efficient and decarbonised manufacturing facilities.

Investment C31.I6 (subsidy scheme for decarbonisation projects (grants)) allocates public investment in a public subsidy scheme to be implemented by ENISA (National Innovation Company – Public Entity). This measure's aim is to support the decarbonisation of industrial processes in all sectors in the context of the Strategic Project for the Decarbonisation of Industry (PERTE-DECARB), and it is strictly connected to investment C31.I5.

Investment C31.I8 functions in the same way as C31.I6, although the provided financial support took the form of loans and not of grants.

Investment C31.I7 (investment to support industrial decarbonisation in the form of loans) is part of the strategic project for industrial decarbonisation, granting support in the form of loans to projects that aim at the decarbonisation of the manufacturing industry. The financial support offered by this measure aims to sustain projects that address at least one of three different lines of action:

1) support to projects implementing the decarbonisation of the manufacturing industry;

2) completion of a pilot project to incentivise companies to undertake significant industrial decarbonisation projects with high associated costs and substantial greenhouse gas emission reductions by paying a fixed carbon price over a given period (carbon contract for differences); and

3) the establishment of modern, highly efficient and low-carbon manufacturing facilities. This investment is geared towards promoting the decarbonisation of industrial processes across various sectors and is closely connected to investment C31.I5.

RRP and the governance of the energy transition in Spain

The measures outlined in the REPowerEU chapter are in line with the initial RRP, notably reenforcing its commitment to increasing the share of RESs in the country's energy mix. The implementation of investments to decarbonise industry outlined in component 31 (I5, I6, I7 and I8), along with the expansion of investments to deploy additional renewable energy and energy storage (C31.I1), a public initiative supporting renewable hydrogen (C31.I2), and the reform streamlining permitting procedures for renewable energy projects (C31.R1), are expected to significantly boost the deployment of RESs and decrease the country's reliance on fossil fuels. Additionally, the execution of the investment in new electricity transmission infrastructure (C31.I4) is projected to address internal and cross-border energy transmission and distribution challenges, expediting the integration of RESs.

All the measures outlined in Spain's REPowerEU chapter align with the six key pillars of the governmental energy security plan adopted in October 2022, named *Plan Más Seguridad Energética* (More Energy Security plan), reflecting an overall strategic articulation between policy initiatives. These pillars include: (1) promoting energy savings; (2) driving the energy transition; (3) safeguarding vulnerable consumers; (4) providing tax rebates to support energy consumers; (5) ensuring energy independence; and (6) demonstrating solidarity with other EU member states. Additionally, the investment in production and utilisation encompasses projects with a transnational and cross-border impact. The execution of investments supporting self-consumption, electricity transmission infrastructure and industrial decarbonisation is anticipated to reduce Spain's reliance on fossil fuel imports and contribute to bolstering the EU energy market.

Energy efficiency and the objective of reducing energy demand are primarily tackled through strategic measures aimed at facilitating the green transition in industry sectors. This involves providing support for the renovation of industrial facilities. Additionally, energy efficiency and demand reduction goals are addressed through measures focused on achieving energy savings in critical infrastructure, such as improvements in electricity infrastructure. However, it is important to note that Spain's REPowerEU chapter does not extend investments for the renovation of housing and public buildings, nor does it strengthen investments and public policies to combat energy poverty in the country. This is despite the fact that, on one hand, the initial implementation of renovating housing faced increasing costs and lower demand, and, on the other hand, the renovation of buildings and households can have a very significant impact on the decrease of overall emissions.

Key policy recommendations

- The significant reduction of the external energy dependence should remain a primary objective, through the increase in RESs.
- The objectives of improving cross-border energy interconnection should be further deepened through the investment in infrastructure modernisation.
- The modernisation of energy production and distribution infrastructure should be articulated with transition-based industrial policies.
- The development of inclusive policies to address energy poverty should target specifically those most at risk, and provide appropriate monitoring processes.
- Procedures in place to streamline new investment projects should be assessed in order to guarantee proper monitoring throughout implementation.

"

The measures outlined in the REPowerEU chapter are in line with the initial RRP, notably reenforcing its commitment to increasing the share of RESs in the country's energy mix.

"

3. CONCLUSIONS

REPowerEU needs to be understood clearly in connection with the wider package of energy-related regulatory policies directly linked to the NECPs. The analysis presented herein shows how energy policies have been a central action focus through the NRRPs and the REPowerEU initiative. While in the latter, there has been an emphasis on the green transition and the corresponding concerns with the diversification of the energy mix through increased production of renewable energy by member states, the focus reflected concrete impacts of the full-scale invasion of Ukraine and its implications for energy security in Europe. These twin dimensions of the energy transition were clear in the countries studied, albeit with different emphasis.

> "One area of convergence in the initiatives proposed across the different countries was the simplification of administrative procedures in the development of new energy-related projects."

REPowerEU not only addressed concerns about the conditions of energy supply in Europe resulting from the changing geopolitical context and its implications for energy security in Europe. In fact, one area of convergence in the initiatives proposed across the different countries was the simplification of administrative procedures in the development of new energy-related projects. While this might appear to be a minor issue, a simple "simplification", it clearly reflects the fact that the REPowerEU initiative cannot be considered without regard to the previous initiatives embedded in the NRRPs. The success of these major programmes does not simply depend on policy decisions and well-drafted programmes, but it is also largely dependent on the success of its implementation process and the efficacy of its initiatives. The success of the development of new projects for the production of renewable energy requires that the necessary administrative process is also articulated with this priority, facilitating its implementation rather than impeding it. In the REPowerEU initiatives, all five countries included projects to simplify administrative processes for developing renewable energy projects (e.g., through the simplification of the legal and regulatory framework for renewable energies in Portugal and Spain).

To address the "soft" infrastructure for the energy system, there are significant investments proposed in the "hard" energy infrastructure. This will contribute to improved integration of the energy supply in the electric grid, with expected gains in energy efficiency. In addition, investments in new infrastructure, such as the IPCEI, have also been of particular importance in the national REPowerEU initiatives in the five countries, namely, with regard to the importance of hydrogen in the energy supply. While, in some cases, this corresponded to new projects, in others it was reflected in a significant upscaling of prior hydrogen projects (e.g. France and Portugal). Nevertheless, while the focus on hydrogen was central to measures directed at the strengthening of European energy security through the diversification of energy sources, there is underlying competition between the EU countries regarding the spillover effects of hydrogen production through industrial policy that may reflect overambitious, duplicated efforts and which may have costs at the level of the use of renewable energy as direct electricity with regard to indirectly producing a supply of hydrogen.

Despite the importance of such initiatives, and concerns with energy security, it is only in the case of the REPowerEU plan for Estonia that the renewal of energy sources and its implication in terms of energy security is directly addressed in relation to the changing geopolitical context in Europe. While Estonia has shale oil as a relevant local energy source, it imported all of the refined products from Russia, upon which it has been highly dependent. In the remaining cases, the diversification of energy sources is framed mostly through the lens of the energy transition and the need to address climate objectives.

Nevertheless, while the REPowerEU plan brought a new ambition to the energy transition policies in the EU, some of the current targets remain limited concerning the change in the share of the national energy mix represented by renewable sources. For example,

in Estonia, despite a clear priority in diversifying its energy supplies through the REPowerEU plan, the targets are still considered moderate and the share of local renewables will continue to represent a small share of the overall energy supply.

"

There is a risk that the lack of substantial investment in these measures, complemented in some cases with significant investments in fossil fuels, such as the move to gas or even the move back to coal, might divert resources from areas where investment could contribute to improved energy efficiency more broadly, with gains across the economy.

"

In other cases, such as Portugal and Spain, while the national plans included measures to address the structural issue of energy poverty, the impacts of such measures and their concrete implementation are less clear. With the exception of France, there is no scaling up of the investments previously defined for the renovation of buildings to increase energy efficiency and improve living conditions, and with the increase in the costs of renovations, the impact of the planned renovation activities is likely to be effectively reduced.

Although the current analysis cannot be expected to address the concrete impacts of these plans on inequalities – more often than not addressed only indirectly – there is a risk that the lack of substantial investment in these measures, complemented in some cases with significant investments in fossil fuels, such as the move to gas or even the move back to coal, might divert resources from areas where investment could contribute to improved energy efficiency more broadly, with gains across the economy. As it is, REPowerEU still envisages a significant increase in energy consumption.

It is nonetheless relevant to highlight that the REPowerEU plans, across the countries studied, are strongly complementary to the NRRPs, including not only new investments but also investments that upscale investments initiated under the NRRPs. REPowerEU also provides an important articulation, through structural or administrative reforms, that enhances the development of new projects and facilitates access to related public services and streamlines the administrative and regulatory process (as has been the case in Spain). The nexus of energy efficiency, energy security and energy poverty are clearly addressed in the proposed programs, even if the concrete balance might vary across countries, as well as their concrete relevance.

"

Nevertheless, while the focus on hydrogen was central to measures directed at the strengthening of European energy security through the diversification of energy sources, there is underlying competition between the EU countries regarding the spillover effects of hydrogen production through industrial policy.

"

LESSONS LEARNED FOR EUROPE AND POLICY RECOMMENDATIONS

Financial resources and the community political efforts deployed for the economic recovery of member states from the pandemic, materialised in the Next Generation EU plan and the RRF, which aimed to link the economic recovery of the various countries to greater efforts for cohesion and convergence among the member states. In the energy field, the objective of this convergence is quite evident, as explicitly stated in the NRRPs and REPowerEU, which place the strengthening of the single energy market and European energy security at the centre of energy policies.

It is also clear that the set of policies and initiatives conveyed through the NRRPs and the REPowerEU national programs towards the promotion of the energy transition cannot be understood simply from a national perspective or a macro-EU level one. Multi-level governance dimensions clearly emerge, which require that attaining objectives at the European level cannot simply be subsumed to EU-level indicators or to the aggregation of national policies (albeit strongly promoted and supported at the EU level), but rather must reflect a process of multi-level governance. This becomes evident at different levels. The interconnection of energy infrastructure is more evident in some cases than others, but it clearly requires governance processes that cross borders and involve different national actors. However, the territorial dimension at the national level is also relevant. While energy security can best be understood at the national level, energy dependence is also relevant at a territorial dimension, namely, in countries such as Portugal and Spain with island-based regions, whereby local production and autonomy become relevant. This includes when the initiatives that have been presented and discussed above, such as the energy mix and the corresponding technological and industrial capabilities, are seen from a supra-national level. While national policies can have strong rationales and proper articulation with other sectoral policies, these may be less strong if seen from a European level and if national priorities overlap. As such, the monitoring of policies and initiatives and multi-level governance are of particular importance.

Nevertheless, as seen in the analysis of case studies, strengthening coordination between member states at the European level for the execution of recovery and resilience funds has been limited due to both the RRF's design and the Member States' preferences. For example, strategically relevant infrastructure projects for the European market, such as strengthening electrical grid interconnections between the Iberian countries and France, are treated outside the framework of the RRF. From this perspective, it is a missed opportunity, but it speaks volumes about the centrality of national options in the execution of EU funds. Regarding electrical interconnection, efforts to coordinate between Baltic countries to synchronise their electrical grid with that of Western Europe also need monitoring.

An analogous argument regarding hydrogen can be developed. As shown in the French case, the definition of green hydrogen as an energetic vector also produced from nuclear energy is anything but consensual. As emphasised in the analysis of the French case, this particular designation can create imbalances in the EU hydrogen market. Still, concerning hydrogen, there are no sufficient guarantees regarding the realisation of large interconnectivity infrastructure between countries, which could lead to investment blocks. Furthermore, concerning hydrogen, the French and Portuguese cases show two distinct approaches but also reproduce different geopolitical and geoeconomics positions. While funds for hydrogen allocated in the French NRRP help develop a national plan for an industrial sector capable of supporting the entire value chain, in the Portuguese case, the focus on production and exports could contribute to making hydrogen a vector of peripheralisation of the country, rather than a solid contribution to national industrial policy within the framework of strengthening the European energy market.

These examples illustrate the difficulty of reconciling policies of coordination between states that can simultaneously strengthen national economies and contribute to the strengthening of the European market, almost testifying to a constant tension between national and community prerogatives.

Policy recommendation: strengthen the criterion for realising cross-border energy infrastructure for EU financing. This practical approach should also be accompanied by the realisation of assessment studies that aim to implement infrastructure projects, while linking them to the economic and industrial development of all territories involved. In essence, it is about affirming the principle of economic convergence and mutuality within the energy policy framework.

Regarding energy security, the analysed case studies demonstrate how this issue is addressed in various ways and through different strategies. However, one emerging trend is that only countries most dependent on fossil fuel imports from Russia have directed funds towards developing reception infrastructure.

Nevertheless, even in this last case, supply infrastructure development has constituted only a small portion of the funds allocated to energy security. In all countries, albeit with varying degrees, European funds have also been directed towards strengthening storage capacities.

However, the common element across all analysed countries is the correlation between decarbonising the economy and increasing the production of indigenous RESs as a tool to enhance energy security. It is emblematic that two countries, namely, Estonia and Spain, which exhibit vastly different energy, economic, political, geographic and demographic profiles, propose similar measures, namely, reducing dependence on fossil fuel sources, indigenous in the case of Estonia and imported in the case of Spain, through the reinforcement of wind and solar energy production.

These considerations readily emerge from the observation of national cases. However, they contrast with the concept of energy security at the European level, which is still heavily focused on the relationship between imports, exports and prices. With the increasing involvement of RESs in the European energy mix, while, import/export relationships, especially with non-European countries, will decrease, at least partially reducing their relative importance, the dimension related to prices will be primarily determined by the modernity and density of energy transport networks.

Policy recommendation: developing a new concept of energy security that considers this new reality involves strengthening the internal market and territorial cohesion at its core through the enhancement of energy infrastructure networks.

As observed in some cases, the transition to green energies and the strengthening of RES participation also produces secondary effects. For instance, the increase in renewable energy production may jeopardise biodiversity preservation and environmental conservation goals. Simultaneously, developing specific technologies, such as those for CCS, may diminish the energy-efficiency gains achieved through extensive energy and building modernisation works, thus reducing the impact of structural investments.

Regarding CCS technologies, there is also a risk of developing technologies that do not lead to source diversification, but rather focus on mitigating the impact caused by the most polluting energy sources.

Policy recommendation: strengthening monitoring mechanisms regarding adopting new energy technologies and expanding renewable energy production capacity is crucial.

ANNEX

Table A1. Overview of submission timelines of modified Recovery and Resiliance Plans (RRPs) and REPowerEU chapters.

	DATE OF SUBMISSION	REPOWEREU CHAPTER SUBMITTED	DATE OF COMMISSION'S POSITIVE ASSESSMENT	DATE OF ADOPTION BY EUROPEAN COUNCIL
Belgium	20 July 2023	Yes	16 November 2023	8 December 2023
Bulgaria	2 October 2023	No	21 November 2023	8 December 2023
Czechia	30 June 2023	Yes	26 September 2023	17 October 2023
Denmark	31 May 2023	Yes	19 October 2023	9 November 2023
Germany	9 December 2022	No	17 January 2023	14 February 2023
	18 September 2023	No	16 November 2023	8 December 2023
Estonia	9 March 2023	Yes	12 May 2023	16 June 2023
Ireland	22 May 2023	No	26 June 2023	14 July 2023
Greece	31 August 2023	Yes	21 November 2023	8 December 2023
Spain	6 June 2023	Yes	2 October 2023	17 October 2023
France	20 April 2023	Yes	26 June 2023	14 July 2023
Croatia	31 August 2023	Yes	21 November 2023	8 December 2023
Italy	11 July 2023	No	28 July 2023	12 September 2023
	7 August 2023	Yes	24 November 2023	8 December 2023
Cyprus	1 September 2023	Yes	16 November 2023	8 December 2023
Latvia	27 September 2023	Yes	16 November 2023	8 December 2023
Lithuania	30 June 2023	Yes	23 October 2023	9 November 2023
Luxembourg	11 November 2022	No	9 December 2022	17 January 2023
Hungary	31 August 2023	Yes	1 September 2023	8 December 2023
Malta	26 April 2023	Yes	26 June 2023	14 July 2023
Netherlands	6 July 2023	Yes	29 September 2023	17 October 2023
Austria	14 July 2023	Yes	19 October 2023	9 November 2023
Poland	31 August 2023	Yes	21 November 2023	8 December 2023
Portugal	26 May 2023	Yes	22 September 2023	17 October 2023
Romania	8 September 2023	Yes	21 November 2023	8 December 2023
Slovenia	14 July 2023	Yes	29 September 2023	16 October 2023
Slovakia	26 April 2023	Yes	26 June 2023	14 July 2023
Finland	26 January 2023	No	28 February 2023	7 March 2023
	6 October 2023	Yes	21 November 2023	8 December 2023
Sweden	24 August 2023	Yes	19 October 2023	9 November 2023

Source: European Commission.

ENDNOTES

1 REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition

2 Agreement on REPowerEU chapters in recovery and resilience plans

3 EU Energy strategy

4 Updated NDC Synthesis Report: Worrying Trends Confirmed

5 Quarterly report On European gas markets. Volume 15(issue 4, covering fourth quarter of 2022) p.14

6 McWilliams, B., G. Sgaravatti, S. Tagliapietra et al. (2023) "The European Union is ready for the 2023-24 winter gas season". Bruegel, 10 October.

7 "China halts military and climate ties over Pelosi's Taiwan visit". ABC News, 5 August 2022.

8 European Commission (2022), "Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: REPowerEU Plan". COM(2022) 230 final, 18 May.

9 European Commission (2022) "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU 'Save Energy'". COM(2022) 240 final, 18 May.

10 "EU-US LNG trade". European Commission.

11 OJ L 57, 18.2.2021, p. 17.

12 "Statistical review of world energy 2023". Energy Institute.

13 Eurostat: nrg_ind_id

14 European Commission (2022) "Recommendation for a Council Recommendation on the 2022 National Reform Programme of Denmark and delivering a Council opinion on the 2022 Convergence Programme of Denmark". SWD(2022) 607 final, 23 May.

15 European Commission (2023), "Assessment of the draft updated National Energy and Climate Plan of Denmark", Staff Working Document, SWD(2023) 911 final, 18 December, p. 4.

16 European Commission (2020), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. "An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future." COM(2020) 741 final.

17 Non-binding agreement on goals for offshore renewable generation in 2050 with intermediate steps in 2040 and 2030 for priority offshore grid corridor Northern Seas offshore grids (NSOG) pursuant to Article 14(1) of the TEN-E Regulation (EU) 2022/869.

18 European Parliament (2023), "Denmark's National Recovery and Resilience Plan: Latest state of play". Briefing, July 2023.

19 "With EU blessing, Denmark aims to corner carbon capture market". Euractiv, 6 July 2023.

20 Alva Argaez, A. (2009) "Industrial energy efficiency and carbon capture (CCS): The thermodynamic cost of going 'green'". Process Ecology, 11 November.

21 Denmark Ministry of Finance (2021), "Denmark's Recovery and Resilience Plan", p. 311.

22 IEA Bioenergy (2021), "Implementation of bioenergy in Estonia - 2021 update". Country reports, 10 2021.

23 "Statistical review of world energy 2023". Energy Institute.

24 Eurostat: nrg_ind_id

25 "Statistical review of world energy 2023". Energy Institute.

26 "2023 country report: Estonia". European Commission.

27 Directorate-General for Energy (2023) "Estonia, Latvia & Lithuania agree to synchronise their electricity grids with the European grid by early 2025". European Commission, 3 August.

28 According to the formula set out in Annex II of the Regulation (EU) 2018/1999 on the Governance Regulation of the Energy Union and Climate Action.

29 European Commission (2023), "Assessment of the draft updated National Energy and Climate Plan of Estonia", Staff Working Wocument, SWD(2023) 912 final, 20 June.

30 Freisinger, T., D. Thomson, Z. Ujj et al. (2022) "Behind the 'green recovery': How the EU recovery fund is failing to protect nature and what can still be saved". CEE Bankwatch Network, Euronatur, June.

31 Republic of Estonia, Ministry of Economic Affairs and Communications (2017), "Energy sector development plan".

32 Pedaja, M. (2023) "Estonia's REPowerEU chapter: Civil society excluded from decision-making on energy transition investments". CEE Bankwatch Network, 7 June.

33 Zeitlin, J., D. Bokhorst and E. Eihmanis (2023) "Governing the RRF drafting, implementing, and monitoring National Recovery and rRsilience Plans as an interactive multilevel process". Policy study, Foundation for Progressive European Studies, June.

34 Pedaja, M. (2023) "Estonia's REPowerEU chapter: Civil society excluded from decision-making on energy transition investments". CEE Bankwatch Network, 7 June.

35 Energy Institute (2023), "Statistical review of world energy 2023".

36 Zissler, R. (2022) "France's nuclear power: Current difficulties, new policies, and 100% renationalization". Renewable Energy Institute, 23 August.

37 Eurostat: nrg_ind_id

38 Euractiv (2023), "France is EU's first importer of 'Russian nuclear products': study", 21/9/2023.

39 European Commission (2023), "Assessment of the draft updated National Energy and Climate Plan of France", Staff Working Document, SWD(2023) 931 final, p. 5.

40 European Commission (2021), "Analysis of the recovery and resilience plan of France". Staff Working Document, SWD(2021) 173 final, 23 June, p. 62.

41 Ministère de la Transition Écologique et de la Cohésion des Territoires (2024),"Tableau de suivi de la rénovation énergétique dans le secteur résidentiel", Paris, 7 March.

42 Messad, P. (2024) "France's 'last mile' strategy for renewables under fire from all sides". Euractiv, 12 January.

43 Directorate-General for Energy (2023) "European Commission and Energy Ministers of France, Portugal and Spain strengthen cooperation on cross-border energy infrastructure in South-West Europe". European Commission, 19 December.

44 Directorate-General for Energy (2022) "Celtic Interconnector between Ireland and France: Next milestone reached". European Commission, 25 November.

45 Energy Institute (2023), "Statistical review of world energy 2023".

46 Energy Institute (2023). «Statistical Review of World Energy 2023».

47 Eurostat : nrg_ind_id

48 Eurostat : nrg_ind_eff

49 Zangheri, P., R. Armani, G. Kakoulaki et al. (2020) "Building energy renovation for decarbonisation and Covid-19 recovery". EUR 30433 EN, Publications Office of the European Union, Luxembourg, 2020, JRC122143. DOI: 10.2760/08629,

50 The current section considers the initial version of the NRRP, prior to its revision in 2023, which included the implementation of the REPowerEU plan.

51 "Blue Economy", sometimes identified as "Ocean Economy", refers to all economic activities related to the sea. Portugal has created in its national accounts statistics a satellite account for the ocean, including sea/coastal-related tourism; fisheries and aquaculture; maritime services; or ports, transport and logistics. Ocean-based energy production (e.g., offshore wind or wave energy) should also be considered here.

52 A public letter "Tertúlia Energia" signed by several actors was presented contesting the National Hydrogen Strategy.

53 On 7 November, the Portuguese prime minister resigned following an investigation that targeted suspicions of influence regarding different large-scale projects of public interest, including the hydrogen project in Sines, also involving the Minister for Infrastructures. The process is still in its investigation phase and no one has been formally accused.

54 Eurostat: nrg_ind_id

55 Eurostat: nrg_ind_eff

56 Zangheri, P., Armani, R., Kakoulaki, G., Bavetta, M., Martirano, G., Pignatelli, F. and Baranzelli, C., "Building energy renovation for decarbonisation and Covid-19 recovery", EUR 30433 EN, Publications Office of the European Union, Luxembourg, 2020, ISBN 978-92-76-24766-1, doi:10.2760/08629, JRC122143.

57 Castellazzi, L., P. Zangheri, P. Paci et al. (2019) "Assessment of second long-term renovation strategies under the Energy Efficiency Directive". EUR 29605 EN, Publications Office of the European Union, JRC114200. DOI: 10.2760/973672,

58 European Commission (2023), "Analysis of the recovery and resilience plan of Spain". Staff Working Socument, SWD(2023) 326 final, 2 October.

ABOUT THE AUTHORS

Franco Tomassoni is a research fellow at the Collaborative Laboratory for Labour, Employment, and Social Protection (CoLABOR) in the research line of labor, employment, technology, and industrial relations. He holds a Ph.D. in Globalization Studies from the Faculty of Social Sciences and Humanities (FCSH) at Nova University of Lisbon (UNL). Grounded in the intersection of geopolitics, history, social theory, and macroeconomics, his research explores the relationship between technology, hegemonic transitions, and global markets, with a particular focus on labor dynamics and digitalization. He has developed several research projects on the geopolitics of energy and energy security, on the impact of platformization on labor, and on the political responsibility and accountability of platform and digital companies. He is also a member of the editorial committee of the publisher Outro Modo – Le Monde Diplomatique – Portuguese Edition.

Tiago Santos Pereira, DPhil in Science and Technology Policy Studies from SPRU, University of Sussex, has been a Coordinating Researcher at the Collaborative Laboratory for Work, Employment and Social Protection - CoLABOR, where he led the research line on the impacts of technology on work and employment. Continuing to collaborate with CoLABOR, he has recently taken up the post of Director of the Centre for Social Studies of the University of Coimbra (CES), which is one of the associate partners that constituted CoLABOR. His research has also focused on the policies and governance of science and technology and the modes of articulation of knowledge between public sector research, business, public decision making and society. He is Co-Director of the Doctoral Programme 'Governance, Knowledge and Innovation', a partnership between CES and the School of Economics of the University of Coimbra. In 2022 he was nominated member of the National Council on Science, Technology and Innovation (CNCTI).

FEPS
FOUNDATION FOR EUROPEAN
PROGRESSIVE STUDIES

THE FOUNDATION FOR EUROPEAN PROGRESSIVE STUDIES (FEPS)

The Foundation for European Progressive Studies (FEPS) is the think tank of the progressive political family at EU level. Our mission is to develop innovative research, policy advice, training and debates to inspire and inform progressive politics and policies across Europe. FEPS operate as hub for think- ing to facilitate the emergence of progressive answers to the challenges that Europe faces today. FEPS works in close part- nership with its members and partners, forging connections and boosting coherence among stakeholders from the world of politics, academia and civil society at local, regional, nation- al, European and global levels.

FRIEDRICH EBERT STIFTUNG

FRIEDRICH EBERT STIFTUNG (FES)

The EU Office of the Friedrich-Ebert-Stiftung (FES) participates in the European integration process, backs and accompanies the interests of the Federal Republic of Germany in Europe. As an agency of dialogue, education and consultancy, the Frie- drich-Ebert-Stiftung fulfils its special role as a 'political network organisation' for and with the various European institutions.

IEV

INSTITUT EMILE VANDERVELDE (IEV)

The Emile Vandervelde Institute is the researche centre of the Belgian Parti Socialiste and devotes itself to research concern- ing all questions of an economic, social, financial, administra- tive, political, ethical and legal nature facing the party and its organizations. The IEV carries out analytical notes and studies on social issues and topical issues for the general public, as- sociations and PS activists. The activities of the institute shall offer prospective and analyses accessible to all, thus contrib- uting to the awareness, critical knowledge and engagement of citizens and activists in the social, economic, cultural and environmental debates.

COLABOR

Collaborative Laboratory for Labour, Employment and Social Protection (CoLABOR)

CoLABOR is a non-profit association, with the Collaborative Laboratory label awarded since its foundation in 2018 and revalidated by the Foundation for Science and Technology (FCT) until 2028.

It pools resources from academia, companies and the social sector to foster the understanding and provide public and private policy solutions for complex problems in its main areas of activity:

- Work, employment and technology
- Social protection
- Social and solidarity economy

RECOVERY WATCH

In the context of the energy crisis and full-scale attack on Ukraine, the REPowerEU Plan can be seen as a double instrument, which shows the potential for this contextual measure to take an essential role in the broader governance of European energy policy. It constitutes a response to the new geopolitical scenario and plays a role within the broader recovery strategy to face the socio-economic effects of the pandemic.

This policy study analyses how the objectives of the REPowerEU Plan, and the corresponding financial commitments are differently translated into National Recovery and Resilience Plans (NRRPs) – focusing on the cases of Denmark, Estonia, France, Portugal and Spain –, highlighting added and removed measures, possible conflicting policy areas and missing policy areas. It shows how energy policies have been a central action focus through the NRRPs and the REPowerEU initiative. While in the former, there has been an emphasis on the green transition and the corresponding concerns with the diversification of the energy mix through increased production of renewable energy by member states, the focus of the latter reflected concrete impacts of the war in Ukraine and its implications for energy security in Europe.

The success of these major programmes does not simply depend on policy decisions and well-drafted programmes. Still, it is also largely dependent on the efficacy of its initiatives and the success of their implementation and administrative processes. Additionally, while the focus on hydrogen production was central to measures directed at strengthening European energy security through the diversification of energy sources, there is underlying competition between the EU countries regarding its spillover effects through industrial policy. Finally, in addition to the national recommendations, the study frames some recommendations for the EU level, especially as the latter cannot simply be subsumed to EU-level indicators or the aggregation of national policies but must reflect a multi-level governance process.

POLICY STUDY PUBLISHED IN APRIL 2024 BY

FEPS FOUNDATION FOR EUROPEAN PROGRESSIVE STUDIES

FRIEDRICH EBERT STIFTUNG

IEV

Knowledge partner

COLABOR

ISBN : 978-2-931233-84-9