RECOVERY WATCH

POLICY STUDY
January 2023

SYSTEMIC TRANSFORMATION OR STATUS QUO?

ASSESSING THE POTENTIAL SYSTEMIC TRANSFORMATION OF EU MEMBER STATES' ENERGY AND MOBILITY SECTORS THROUGH THEIR NRRPS

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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.

SYSTEMIC TRANSFORMATION OR STATUS QUO?

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EXECUTIVE SUMMARY

Over the past several decades, governments around the world have been slowly coming to terms with the fact that our climate is changing, and policies are needed that address and mitigate these changes. The COVID-19 pandemic and Russian invasion of Ukraine have demonstrated the urgent need to respond to immediate crises, while also showing that some of our problems are structural, making it difficult to react quickly in a way that addresses both the short and long term. The EU is now faced with the challenge of winning both the marathon and the sprint to crises without losing sight of long-term goals.

The Recovery and Resilience Facility (RRF) offers EU member states (MSs) the opportunity to use EU funds to help them recover from the shock of the pandemic, while also ensuring the resilience of societies. For European societies to be truly resilient, we need to set ambitious targets for the green transition and ensure that there is suf-ficient investment to meet them. They also should be designed in a way that is trans-formative, in order to meet both short- and long-term goals.

This study seeks to determine whether the national recovery and resilience plans (NRRPs) are able to do this by asking:

How transformative were Member States' NRRPs with regard to their status quo and investment needs?

To answer this question, **the research focuses on the energy and mobility sectors of four EU MSs**: Austria, France, Germany and Spain. Firstly, the pre-pandemic context, or status quo, is examined to understand the general state of these sectors prior to the pandemic.

The research then sets out the investment needs for energy and mobility, as described in the 2019 national energy and climate plans, and compares this to invest-ments in the energy and mobility components within the NRRPs to determine whether sufficient investment is included to reach the goals of the green transition.

Finally, these same components are assessed using the Recovery Index for Transformative Change, to see whether the policies are designed in a way that enables a systemic transformation.

By assessing both the quantity and quality of change, the researchers seek to determine whether these MSs' plans were transformative or, instead, presented only business as usual or a greening of business as usual.

This analysis shows that all four MSs fell short of investing sufficiently in their energy and mobility sec-tors through their NRRPs. Without sufficient additional investment, they will be unable or greatly challenged to carry out the green transition necessary for the EU and for limiting warming to 1.5°C. Additionally, while some MSs' components had promising elements, none were comprehensive enough to create a systemic transfor-mation through these plans.

In this regard, these MSs fell short on both quantity and quality in their plans. Without substantive addi-tional climate investment and structural reforms with a whole-of-society systemic approach, it is unlikely they will reach the EU's 2030 targets.

INTRODUCTION

Europe, and the world, is facing ever-increasing crises with impacts across multiple areas of society at the same time. To recover from one and prepare to avoid or absorb the effects of the next, it is necessary to create policies that address not only the short-term consequences, but also the structural issues that make us vulnerable to shocks. Europe must create policies to address these root causes to enact a systemic transformation. Substantial investment — trillions of US dollars per year globally[1] — is needed to make this happen.

The Recovery and Resilience Facility (RRF) offers EU member states (MS) the opportunity to use EU funds to address this challenge through their own national recovery and resilience plans (NRRPs). The RRF was introduced to help MSs recover from the shock of the pandemic, while also ensuring the resilience of societies through the do-no-significant-harm (DNSH) principle[2] and 37% climate tag requirement.

For European societies to be truly resilient, we need not just a greening of our policies with more ambitious environmental targets, but a systemic transformation of societies through policies and the way these policies are designed. This means looking across multiple policy areas to address trade-offs. This also means addressing power dynamics and mental models and norms to ensure that change goes deeper than the surface level. Transformative change is necessary to meet both short- and long-term goals. The question remains:

How transformative were MS' NRRPs with regard to their own contexts and investment needs?

One way to assess the transformative potential of policies is through the Recovery Index for Transformative Change (RITC). Using this index, ZOE Institute assessed the risks and potentials for transformative change of 13 MS' plans. However, what was missing in that assessment was a comparison to a baseline; it compared across countries, rather than comparing a country's own ambition over time. This study will build on this first analysis by comparing the NRRPs of four MSs (Austria, Germany, France and Spain, which are chosen for a geographical and socio-economic spread) to each of their own pre-pandemic baselines and the necessary investment to meet the EU's 2030 goals, as set out in their pre-COVID national energy and climate plans (NECPs).

In this context, we focus our research on the green transition of countries through their NRRPs, specifically through the **energy** and **mobility** components of their plans. These are the sectors that are most politically relevant today, in the context of the Russian invasion of Ukraine and the subsequent energy crisis, and the sectors that will be updated in the near future.[3]

We seek to answer our three research questions for each of the four MSs we analyse:

- **What was the national pre-COVID context with regards to the energy and mobility sector?**

We investigate the energy and mobility sectors, to have a broad understanding of the situation in each country.

- **Did the MS sufficiently invest in their energy and mobility sectors through the NRRP to transform beyond the status quo?**

We look at the 2019 NECPs, which forecast how much investment in energy and related industries, including transport, is needed to meet the 2030 climate goals. Then we look at the actual investment in energy and mobility set out in the NRRP, to compare necessary investment with actual investment.

- **Was the quality of the changes outlined in the plans transformative enough to create a systemic change?**

We look back at the previous RITC assessment to see, apart from investment, how the energy and mobility components of the plans could contribute to a systemic transformation.

We consider three different outcomes: **business as usual**; **a greening of business as usual**; or **transformative change**.

BACKGROUND

> "Our future is not a question of choosing between people or trees; it is neither or both"
>
> *(UNDP)* [4]

CLIMATE NEUTRALITY & EMISSIONS REDUCTION

Science is clear: limiting global warming to 1.5°C, in line with the Paris Agreement, is still possible, but will require a fast and far-reaching transformation across all sectors. The path towards a 1.5°C future is narrow, but still possible.[5] However, it requires a steep and ambitious pathway towards climate neutrality in Europe, which must begin immediately; the 2022 emissions gap report shows that policies currently in place around the world are projected to result in a warming of 2.8°C, reduced only to 2.4°C in the scenario of conditional nationally determined contributions (NDCs) and 2.6°C with unconditional NDCs.[6]

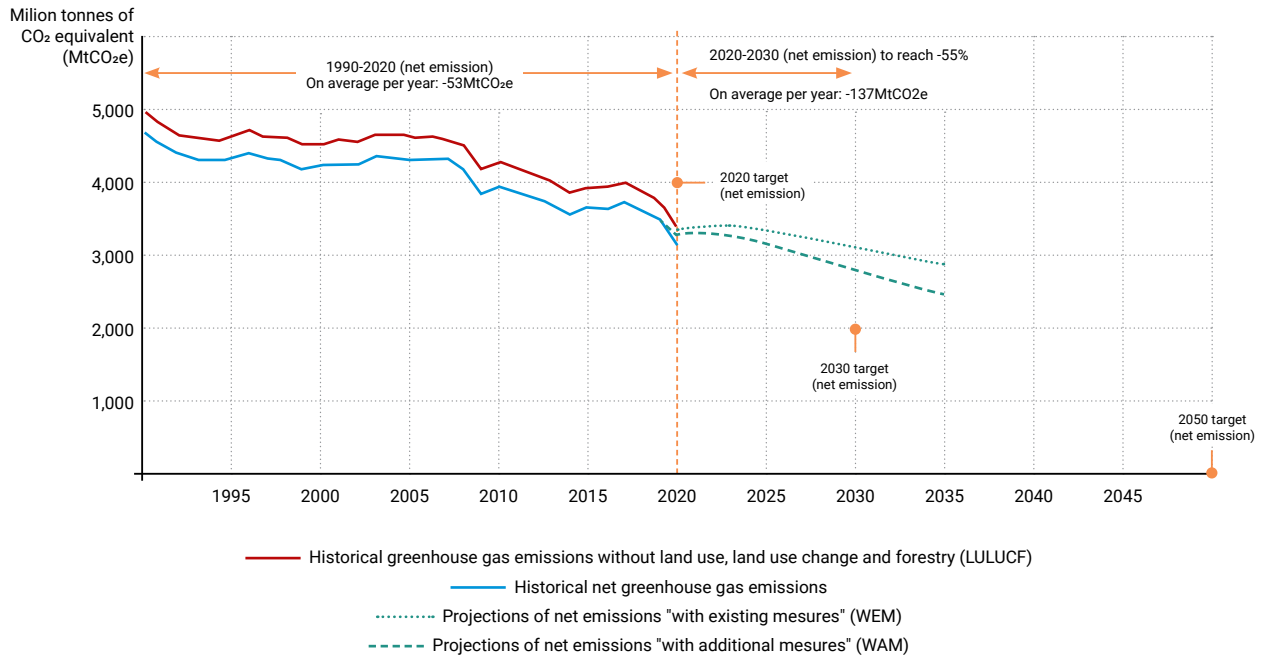
The EU has responded to this challenge and has set ambitious targets to achieve the goals of the Paris Agreement. Under the European climate law approved in 2021,[7] the EU aims for a 55% net reduction in greenhouse gas (GHG) emissions by 2030 before hitting net-zero by 2050.

The Fit-for-55 package refers to that target and aims to bring EU legislation in line with the 2030 goal.

To reach the 2030 climate goal of reducing GHG emissions by 55% compared to the 1990 levels, as determined in the 2030 climate target plan,[8] the speed of the current emissions reduction needs to accelerate significantly. The International Energy Agency's (IEA's) recently published World Energy Outlook 2022 identified an implementation gap of 551 Mt CO_2 between the EU's 2030 targets and the path of its current policies, including NRRPs.[9] To achieve the rapid transition needed, structural changes will be needed to steer individual and societal actions towards climate neutrality.

To achieve these ambitions, investment will also need to be significantly scaled up. The 2022 emissions gap report shows that average yearly flows of investment in Europe (around $200 billion) need to be doubled (~$400 billion) or even quadrupled (~$800 billion) until 2030 to meet the average annual needs for investment.[10]

FIGURE 1. The rate of reductions ahead in the EU[11]



Both the energy and mobility sectors are crucial areas for making the transition towards climate neutrality a success. **Energy was responsible for 77% of GHG emissions in the EU in 2019, of which transport accounted for one third.**[12] Almost 30% of the EU's total CO_2 emissions come from the transport sector, of which 72% are from road transport.[13] Moreover, the EU's transport-related GHG emissions have increased by 24% since 1990 and continue to rise.[14] This makes the transport sector the only one in which emissions are still higher than they were in 1990. This is because private car ownership has increased, as well as the overall demand for mobility. Thus, decarbonising the transport sector remains a major a challenge for the EU on the pathway to limit global warming to well below 2°, attempting to keep it to 1.5°C, as set by the Paris Agreement.

Russia's invasion of Ukraine makes the energy transition a more pressing challenge. The EU's access to fossil fuels has become insecure; its energy dependence rate accounted for 60.2% in 2019 and moderately decreased to 57.5% in 2020.[15] Russia is the EU's most significant supplier of fossil fuels, representing 29% of oil imports[16] and 56% of hard coal in 2020,[17] and 45% of gas[18] imports in 2021.

In light of Russia's invasion of Ukraine and the EU's response to reduce the dependence on Russian fossil fuels and speed up the green transition, the Commission proposed earlier this year to revise the renewable energy directive to increase the 2030 target from 32% to 45%, as part of its communication on REPowerEU.[19]

The latest IPCC report confirms the urgency of the energy transition and underpins the need to reduce fossil fuel consumption and increase energy production from low- and zero-carbon energy sectors.[20] To date, energy prices are surging, putting many households in the EU at risk of facing energy poverty. The policy mixes countries use will be crucial to mitigate the social impacts, while getting Europe on track for climate neutrality.

In addition, there are significant benefits of early action. Transitioning towards sustainable modes of transport and reducing energy consumption overall will also decrease the long-term economic costs of the energy transition by reducing annual investments by one third to €175.7 billion.[21] Achieving a systemic transformation in the energy and transport sector can also entail various co-benefits for citizens, such as improved health, less noise and improved outdoor air quality in cities.[22]

TRANSFORMATIVE CHANGE

Transformative change addresses the foundations of a system to alter the deeply rooted ways of living, producing, working and interacting.[23] It not only addresses the symptoms of an economy that harms both the environment and the wellbeing of people, but the root causes. As such, transformative change requires taking a holistic, cross-cutting approach to change by simultaneously directing the behaviour of policy, citizens, business and finance on sustainability and resilience.[24] To succeed in achieving a rapid transition that not only will reduce GHG emissions in the short term, but also steer our economies and societies towards long-term climate neutrality and cohesion, a long-term transformative vision is needed that addresses multiple objectives at a time.

The shock of the COVID-19 pandemic offered a unique window of opportunity for accelerating transformative change. In response to the crisis, governments took both short-term measures to limit the health impact of the pandemic and medium-term measures to ensure economic stability and, eventually, recovery. The EU's RRF provided a framework for such a change by setting out mandatory criteria for MSs' NRRPs; 37% of the measures in the plan had to contribute to green objectives and MSs had to demonstrate how social objectives were met. Similarly, all components in the plans had to comply with the DNSH principle. In other words, the RRF laid a foundation for addressing the overlapping and intersecting challenges the EU is currently facing and encouraged MSs to apply a systemic approach.

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METHODOLOGY

ANALYTICAL FRAMEWORK

Analysing investment

To assess whether MSs sufficiently invest in their energy and mobility sectors through the NRRP to transform beyond the status quo, we compare the investment needs indicated in the NECPs with the actual investments in the NRRP. The NECPs are ten-year plans for 2021-2030, which were introduced by the regulation on the governance of the energy union. They were required to address the following five key areas in their NECPs:[25]

- energy efficiency
- renewables
- GHG emissions reductions
- interconnections
- research and innovation.

The EU has set a goal of climate neutrality by 2050. The NECPs were established to provide an interim milestone on the pathway towards this goal. The EU set out a framework with targets that MSs should apply as a base for their NECP. At the time of writing the NECPs, MSs had to work towards a binding target of 40% GHG emissions reductions by 2030 compared to 1990.[26] In 2021, ambition on this target was increased to 55% through the European climate law.[27]

The final plans were required to be submitted by every MS by the end of 2019.[28] Through these overarching plans, the EU aimed to ensure coordination and coherence both across government departments within an MS as well as across different countries. The analysis was done using these plans for comparison with the NRRPs because they provided a recent assessment of each country's investment needs for the energy and climate transition.

We compare annualised investment needs from the NECPs with annualised investment plans from the NRRPs. A crucial part of the NECP was setting out the amount of financial investment needed in the ten years covered by the plan (2021-2030) in order to reach the 2030 goals. For our assessment, we divided the investment needs by ten to look at the average annual investment needs over this period. The NRRPs were to cover the period 2020-2026, but, since most funds were disbursed starting from 2021 when the plans were published, we considered the breakdown of annual costs based on 2021-2026, a six-year span and divided this for average annual investment. We also looked only at the parts of the investment needs that related most directly to the energy and mobility components of the NRRPs. Each country did the breakdown differently; for all four, "transport" was part of the NECP forecast, and we compared this to the NRRP "mobility" component. For comparison to the "energy" components of the NRRP, we looked at "area of conversion"[29] from the German NECP, "electricity" from the Spanish NECP, "energy and networks" from the French NECP, and "energy system" from the Austrian NECP. We left out other areas, such as buildings and renovation, that had been covered in the NECPs, as these were separate components in the NRRP.

It should be noted that the NRRPs don't cover the entirety of a country's investment in energy and mobility; the NRRPs were, in many, cases only a part of larger plans set out by the MS for their pandemic recovery. Nevertheless, the NRRP gives an indication of a MS's focus and priorities.

Analysing systemic change

To analyse systemic change, we refer to our RITC, developed initially in 2021 by ZOE Institute and the New Economics Foundation to analyse the NRRPs for their capacity to create a systemic transformation.[30] However, this analysis did not previously compare a country's progress to its baseline, but rather compared the systemic transformability of NRRPs across countries. This current study differs from the previous work by comparing not one time period across several countries, but one country across different time periods — pre-pandemic status quo circa 2018, investment forecasts from the NECPs circa 2019 and the NRRPs published in response to the pandemic in 2021.

To measure systemic change, the RITC looks at three different sets of indicators in two different groups. The first group, *width of change*, includes five indicators for just transition — which looks at social dimensions, including equality, diversity, access to basic needs, employment and participation — and four indicators for natural world, which covers land use, biodiversity, circular economy, nature-based solutions and climate action, to name a few examples. Together, the width of change investigated how cross cutting a component was by looking at different environmental and social aspects of the component at the same time. For example, the installation of wind turbines can provide clean energy, which is generally good for climate change mitigation, as it reduces dependence on fossil fuels.

However, using the lens of the RITC, we would also consider whether forest was cleared or ecosystems harmed to make space for this wind turbine and whether local workers were provided with jobs and training to install and maintain the turbine and energy storage.

The *depth of change* includes four indicators (see Table 1), which explore whether a component or policy measure addresses the root cause of a problem, rather than the symptoms alone. Using the same example given for the width of change, this would look at, among other factors, how the energy generated from the turbine would be distributed; is it serving a micro-grid for a local community or contributing to the national energy pool? Who decided how it is used or where it is placed — was this a top-down decision or one that was taken with public input from the bottom up?

TABLE 1. The RITC[31]

COMPONENT-LEVEL INDICATORS		
WIDTH OF CHANGE		DEPTH OF CHANGE
Just Transition (-5-+5)	**Natural World** (-4-+4)	**Systemic Change** (-4-+12)
Social Protection for Workers & Communities Most Affected by Transition Policies to support vital "social infrastructure": a range of public services and facilities that meet local needs and enable a good quality of life (e.g., education, health & social care)	**Biodiversity Conservation** Measures which conserve the abundance and diversity of different species of flora and fauna in a given place (e.g., rewilding projects, national parks, protected natural areas)	**Mental Models** Habits of thought—engrained beliefs, expectations and taken-for-granted ways of operating that influence thoughts, discourse and behaviour
Resilient Local Economies Should be locally specific, create economic diversity, meet local needs and provide community stability (e.g., utilities, food supply, transport networks)	**Nature-Based Solutions** Solutions to natural, semi-natural, novel & urban ecosystems which address societal challenges effectively and adaptively, providing human well-being & biodiversity benefits (e.g., reforestation to prevent flooding, green walls & roofs for energy savings)	**Relationships & Connections** Quality of connections and interchange between systemic actors, especially among those with differing histories and viewpoints
Jobs for Resilient Societies Jobs which are necessary for strong and resilient societies which don't harm the environment (e.g., social and health care, education, arts, green agriculture, renewable energy)	**Connecting People with Nature** Policies in this area should remedy poor individual behaviours and social habits towards nature (e.g., polluting actions) and create stronger connections between people and nature (e.g., increasing access to green spaces, educational programmes built around understanding the natural world)	**Power Dynamics** The distribution of decision-making power, authority, and both formal and informal influence among individuals and organizationss
Social Dialogue & Civic Engagement Should give citizens a say in the decisions that affect their lives and communities, especially citizens who have been historically marginalized, allowing people to participate in civic society (e.g., citizen assemblies and participatory budgeting)	**Climate Change Action** Responses to climate change may take the form of mitigation (e.g., reducing the emissions of greenhouse gases) and adaptation measures (reducing societies' vulnerability to the effects of climate change)	**Policies, Practices, Resource Flows** *Policies:* Government, institutional and organizational rules, regulations, and priorities that guide the entity's own and others' actions *Practices:* Established procedures of institutions, networks, and other entities in the pursuit of social and environmental objectives, as well as the methods, guidelines, or informal shared habits that structure their work *Resource flows:* The allocation and distribution of tangible and intangible assets like money, people, knowledge and information
Equity, Diversity & Inclusion Recognizing and addressing the power imbalances resulting from historical legacies and ongoing impacts of structural inequalities (e.g., racism, sexism, ableism)		

Assessment example

To demonstrate how the RITC is applied to the components of the NRRPs, we offer an example of the scoring of one of Spain's energy components, "electricity infrastructure, smart grids, flexibility and storage" (see also our assessment of Spain in this study and our country profile of Spain from the original assessment). The component is part of the lever "just and inclusive energy transition" and includes reforms addressing the integration of renewables into the energy system, an energy storage strategy and the development of a regulatory framework. Overall, this component of the Spanish NRRP earned an intervention score of 14 points out of a possible 21. For context, out of the 12 plans assessed, the highest score of any one component was 15 and the average component score was 4.8.

For the just transition, the scoring recognises that the plan emphasises the central role of citizens for the energy transition, and specifically states the recognition of social rights, equal opportunities and access to the labour market, as well as fair working conditions and social protection and inclusion. Notably, the Spanish NRRP states that measures are open to participation through public consultation processes. The plan further includes training measures to improve professional skills in the relevant sectors and foresees the creation of skilled jobs, with a prediction of net increase in employment. Regarding diversity and inclusion, the NRRP states that, in terms of gender equality, the renewable energy sectors actually comprise a higher share of women employed than energy sectors related to fossil fuels and recognises the cross-cutting position of gender equality in the energy transition.

Regarding the natural world, the scoring acknowledges Spain's strong commitment to further the energy transition. However, the components primarily emphasise energy infrastructure, promotion of smart grids and energy storage, while not addressing matters of biodiversity, incorporating nature-based solutions or connecting people with nature.

For the systemic change assessment, Spain most notably aims to build systems to better integrate renewables, the mitigation of territorial disparities promoting balanced regional development, and it remains open to public participation. In addition, it was noticeable that the Spanish NRRP stressed support for demand-side management projects across different consumer profiles. Moreover, barriers should be removed to increase effective participation in markets, to introduce new agents in the market and to attract investments. Spain's NRRP aspires to work towards new business models for the energy industry.

"

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Coding methodology

The RITC assessment was carried out first by coding the plans by sectors within the plan's own components. Then, one assessor would score the same sector across all countries. This way, scores for a sector were carried out consistently across countries, and assessors were able to focus on a sector aligned with their expertise.

After all plans were scored in all sectors, they were each reviewed two times by two different reviewers. The reviewers then sense-checked the scores and added comments and adjusted if necessary. They also assessed the scores for the full plan, as they reviewed a whole plan together, rather than one sector across plans like the assessors.

More details on the process can be found in the methodology of the RITC.

TABLE 2. Example of RITC assessment

Just transition	Strong potential to positively impact (1 yes, 0 no)	Strong risk that might negatively impact (−1 yes, 0 no)	TOTAL just transition	Natural world	Strong potential to positively impact (1 yes, 0 no)	Strong risk that might negatively impact (−1 yes, 0 no)	TOTAL natural world	Systemic change	-1 harmful, 0 neutral, 1-3 for strength of positive change	Intervention score
Social protection for workers and their communi-ties most affected by transition	1	0	5	Biodiversity conserva-tion	0	0	1	Polices, practice and resource flows	3	14
Resilient local economy	1	0		Nature-based solutions	0	0		Relation-ships & connections	1	
Good, green jobs	1	0		Connecting people with nature	0	0		Power dynamics	2	
Social dialogue and civic engagement	1	0		Climate change action	1	0		Mental modes	2	
Diver-sity and inclusion	1	0								

ASSESSMENT PROCESS

The research process begins by ascertaining the sectoral context of each country before the start of the pandemic, and then compares this to the ambitions set out in the NRRP. Additionally, the investments needed, as set out in the NECP, are compared to the investments within the NRRP. Through this, the researchers seek to determine whether these countries kept to a *business-as-usual* scenario, a *greening of business as usual* or a *systemic transformation*.

Three research questions guide this study:

Question 1: What was the national pre-COVID context with regards to the energy and mobility sector?

As outlined in the previous section, this question was approached through a literature review to provide evidence on the general state of the energy and mobility sectors in the country prior to the start of the pandemic. This provided an understanding of the foundation upon which the NRRP sought to build progress.

Question 2: Did the MS sufficiently invest in its energy and mobility sectors through the NRRP to transform beyond the status quo?

To answer this, the researchers looked at the MS' NECPs, published in 2019, in which the amount of investment in energy and energy-using sectors needed to meet the 2030 EU emissions reductions target[32] was laid out. The researchers then compared this to the investment in energy and mobility set out in the NRRP to compare investment needed (NECP) with actual investment (NRRP).

The sectoral breakdown within the NECP (e.g., energy equipment, building conversion, industry, transport, agriculture) is not the same across countries, nor is this the same as the delineation between components within each NRRP. As most NRRPs have separate components for building renovations and industry, the research focuses only on investment needs in energy equipment and systems from the NECP to compare with investment in the energy

component(s) of the NRRPs and the investment needs for transport to compare with investment in mobility component(s) in the NRRPs.

As each plan addresses a different time horizon (the NECP from 2021 to 2030 and the NRRP from 2020 to 2026), investment needs were compared based on the average *annual* investment needed by dividing the total costs by the number of years of the plans.

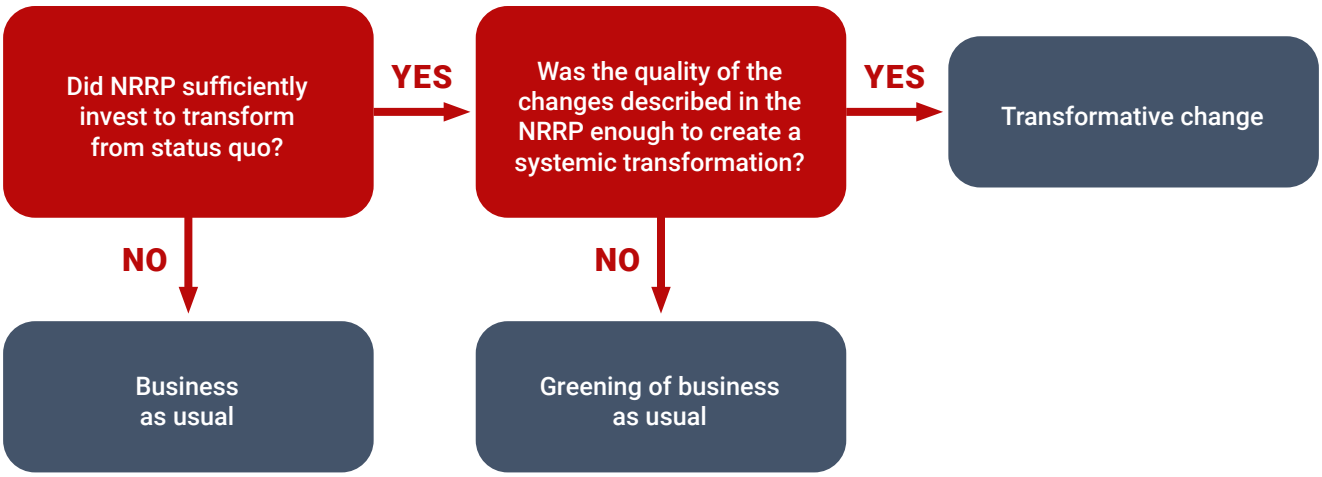
Question 3: Was the quality of the changes outlined in the plans transformative enough to create a systemic transformation?

For this, the researchers looked at ZOE Institute's 2021 RITC assessment[33] of each country to determine whether, in addition to creating more ambitious and "green" targets, they were complemented with an integrated consideration of social, economic and environmental problems and the depth of change needed to address the roots of the issue and create a systemic transformation. Without these transformative elements, the plan would represent a greening of business as usual.

In summary, the decision process followed in this analysis is illustrated in Figure 2.

The country-specific sections below highlight national characteristics of the MS's energy and climate sectors. This is followed by a presentation of the MSs most relevant climate and energy targets, set out in their NECP, and an analysis of how transformative the NRRP has been in this context.

FIGURE 2. Determining business as usual, greening of business as usual and systemic transformation



ANALYSIS BY COUNTRY

AUSTRIA

AUSTRIA

Introduction

Austria is committed to achieving carbon neutrality at the latest by 2040, ten years earlier than the goal set by the European Green Deal. To date, however, Austria's GHG emissions are still above EU and national targets, and total GHG emissions are above 1990 levels. Current gains in emissions reductions in industry are offset by increases in final energy consumption in buildings and transport.[34]

In 2018, Austria released its climate and energy strategy, "#mission2030", which forms the basis of Austria's NECP. Since 2020, a new coalition between the Conservative party (ÖVP) and the Green party (die Grünen) has formed Austria's government. In the context of this government reshuffle, the Ministry of the Environment, under Leonore Gewessler, has significantly increased ambition with regards to reaching the goal of climate neutrality. The government has enacted a new climate protection law, with binding GHG reduction pathways to 2040 and interim targets for 2030, as well as sector-specific targets and timelines. Many of the proposed measures to reach these goals have been picked up in the Austrian RRP.

Context: Austria pre-COVID

As outlined in the Methodology, the research examined the "context" of each country by looking at pre-COVID statistics for the energy and mobility sectors.

Here, we present a brief review of the landscape in the energy and mobility sectors in Austria before the pandemic.

Energy

In 2019, Austria's final energy consumption increased by over 19% compared to 2000, due to a rise in consumption in the transport sector (+38.1%), industry sector (+14%) and residential sector (+4.6%) over this period.[35]

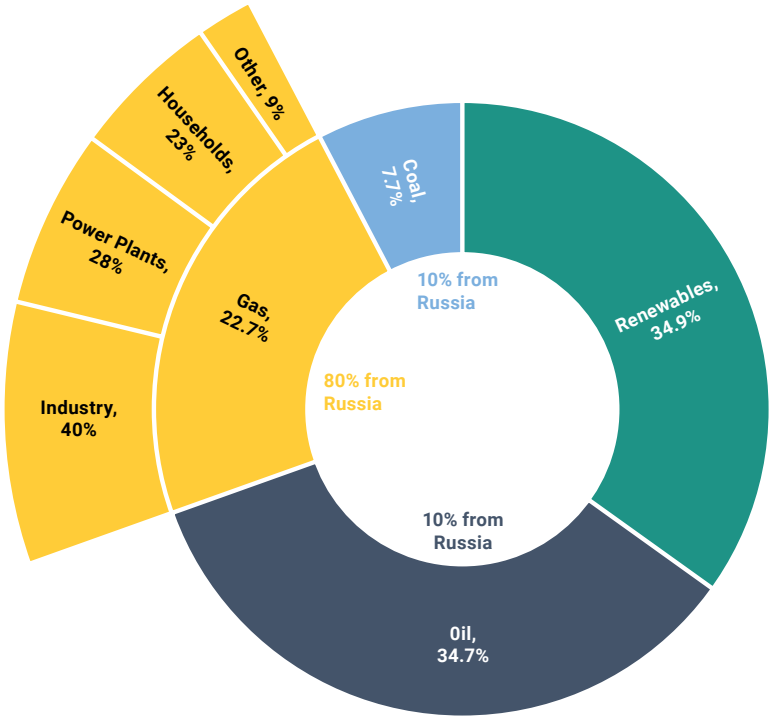
In the past decade, Austria has already made progress in the field of renewable energy and energy efficiency and in the reduction of GHG emissions. The latter was made possible, above all, by the expansion of renewable energy sources. In general, it can be said that, with a share of 30% of final energy consumption accounted for by renewables, Austria is well above the EU average. Its topographical location enables the expansion of hydropower and biogenic combustible fuels. In 2020, the share of renewables in Austria's gross final energy consumption was 36.5%.[36]

Renewables play a crucial role in electric power generation. In 2020, 77% of electricity came from renewables (including waste), of which up to 62% stemmed from hydropower. Wind and solar have also strongly increased in the last decade.

Austria's energy dependency rate was 64% in 2016, meaning that more than half of the energy which was consumed in Austria was imported. Austria's energy imports are mainly gas (37%) and oil (44%).[37] Austria's last coal-fired power plant was shut down in 2020; since then, coal has only been used in industry, where its replacement has been limited due to the lack of alternative fuels and technologies. However, in the context of current efforts to become independent of Russian gas imports more quickly, the Austrian federal government announced in June 2022 that the coal-fired power plant in Mellach should be reconnected to the grid.[38] Austria's goal of carbon neutrality will be achieved without nuclear energy, which has been banned by the constitution since 1999.

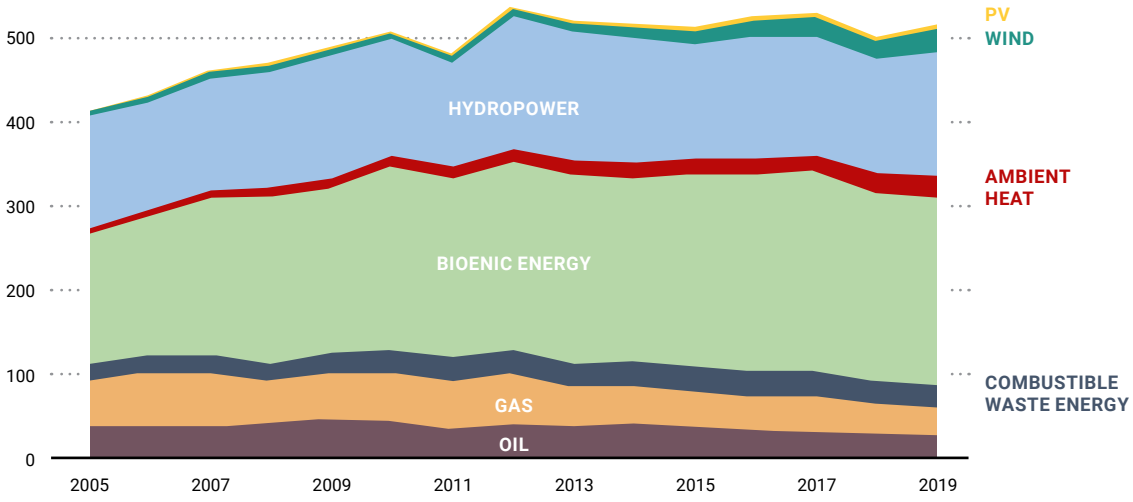
In 2018, the regulatory authority E-control published a study together with Statistik Austria, discussing definitions and indicators and announcing a quantitative pilot study, based on which targeted measures to tackle energy poverty can be developed. According to this study, around 94,000 households, or 2.4% of all households in Austria, cannot afford to keep their homes adequately warm.[39] The Austrian NECP also develops an approach to tackling energy poverty, which provides for a range of support measures. These include, in particular, minimum-income instruments, housing subsidies (subject support) and building support that is granted for housing construction and renovation works. However, the NECP does not set a specific target for reducing energy poverty.[40]

FIGURE 3. Austria's energy mix and dependency on Russia



Source: European Commission 2022.

FIGURE 4. Domestic primary energy production by energy source in petajoules 2005-2019



Source: BMK 2020.[41]

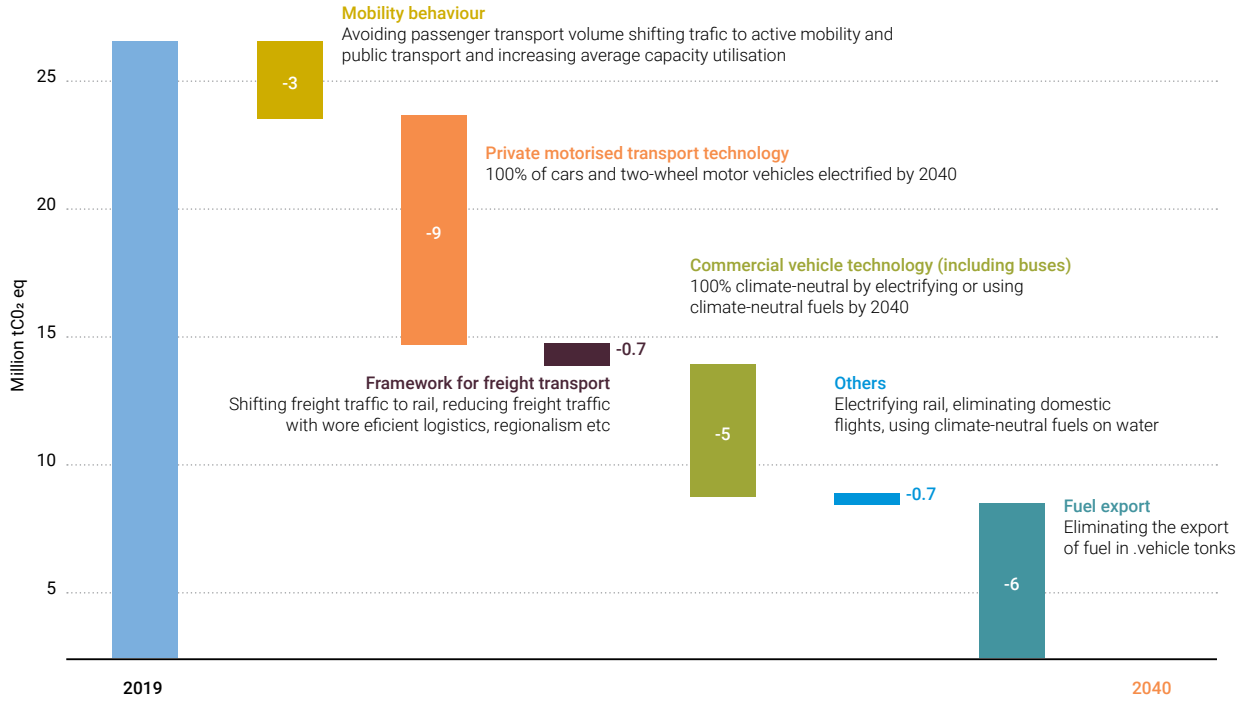
Mobility

The share of transport-related emissions (mainly road traffic, excluding aviation) has risen steadily since 1990 and has increased Austria's share of total GHG emissions from 18% to 30% (in 2019), with air-quality standards continuing to be a concern. Thus, reducing transport-related emissions is key to achieving climate neutrality by 2040 in Austria and for meeting air-quality standards.[42]

Austria is considered one of the frontrunners in passenger rail transport in the EU, with a relatively high number of passenger kilometres travelled by train. With 33%, Austria has also one of the highest shares of rail for freight transport in Europe.[43]

As part of the 2021 "Austrian mobility master plan", Austria sets out ambitious targets for transitioning towards a low-carbon mobility and transport system. Currently, around 60% of distances are travelled by car. The mobility master plan aims to reverse this ratio and puts forward a goal of 60% of the distances travelled using eco-mobility, such as electrified rail and active mobility. Likewise, the share of cycling distances should double to 13% by 2030. According to the plan, the share of private motorised transport needs to drop by 42%. Similarly, Austria aims for increasing rail share of the modal split in passenger transport by passenger kilometres travelled from 27% in 2018 to 40% by 2040. Regarding passenger transport, Austria's NECP foresaw an increase of the share of the volume of transport accounted for by eco-mobility by around half, from 30% to 47%.

FIGURE 5. Target pathway to climate-neutral transport by 2040



Source: BMK 2021.[44]

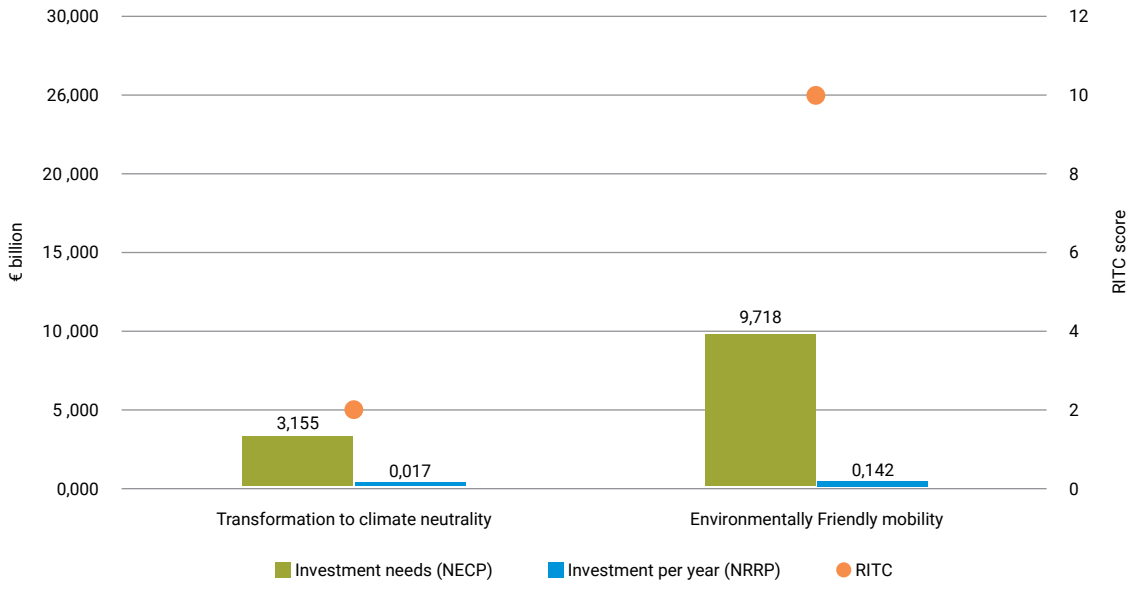
Are investment needs met?

The Austrian NRRP is categorised into four focus areas for a total cost of €4.5 billion. The "sustainable recovery" component includes both "transformation towards climate neutrality", which we assess as *energy*, and "environmentally friendly mobility", which we assess as *mobility*. About 19% of funds (€848.6 million) were reserved for mobility, and only 2% (€100 million) for energy.

The Austrian NECP is expected to bring savings of 14.2 million tonnes of CO_2 with a total investment volume of €166-173 billion in the period from 2021 to 2030. Concretely, the plan estimates that the investment needs for the transport sector amount to €97.183 billion until 2030 and between €31.547 and 38.547 billion for the energy system.[45] The 2022 country report for Austria highlights that the investment needs to make the electricity network fit for 100% renewable electricity until 2030 amount to €18 billion.

As illustrated in Figure 6, the investment set out in the NRRP is significantly less than the investment needs described in the NECP. The energy investments in the NRRP represent only about 0.53% of needs for the sector, and mobility investments only 1.46%.

FIGURE 6. Austria — investment needs compared to investments in NRRP per year in billion euros versus RITC score[46]



How transformative was the NRRP?

ZOE Institute and the New Economics Foundation assessed the Austrian NRRP with the RITC.[47] The overall scoring of the plan was among the highest of the 13 assessed and performed well on all three sets of indicators (just transition, natural world and systemic change). The plan's components and measures are structured and balanced, but coherence between them and between policy areas is not addressed explicitly in detail.

The breakdown of the scoring for the energy and mobility components can be seen in Table 3.

TABLE 3. RITC energy and mobility scores of Austria

COMPONENT	Just transition potential	Just transition risk	Just transition total	Natural world potential	Natural world risk	Natural world total	Systemic change	TOTAL SCORE (OUT OF 21)
Transformation to climate neutrality	0	−1	−1	1	0	1	2	2
Environmentally friendly mobility	3	0	3	2	0	2	5	10

Energy

The energy sub-component was one of the lowest-scoring areas of the NRRP and had one of the smallest portions of investment, at only 2% of the total plan, and less than 1% of the investment needed, as evidenced in Figure 6. This lessens the impact of the low score but is also a shockingly small amount of investment for such a crucial issue.

The plan sets out an ambitious goal to complete Austria's energy transition to convert the electricity supply to be 100% from renewable energy sources by 2030 and become climate neutral by 2040. Unfortunately,[48] biomass is considered to be a renewable energy source in this context, but in a smaller amount than other sources (1 TWh increase by 2030 out of 27 TWh increase of electricity generation from renewable sources)

The plan also aims to increase hydropower by five TWh, which has risks for biodiversity,[49] though the DNSH assessment outlines additional ecological criteria for the promotion of hydropower plants.[50]

A point of concern of this component is in the just transition; the plan mentions that 500,000 industrial jobs are in energy-intensive industries that rely on fossil fuels and are responsible for more than 25% of Austria's GHG emissions. However, there is no mention of reskilling or retraining workers whose jobs will be lost as industry is decarbonised, nor support for the communities whose economies will change through this transition.

"There is no mention of reskilling or retraining workers whose jobs will be lost as industry is decarbonised, nor support for the communities whose economies will change through this transition."

Mobility

The mobility sub-component was one of the stronger areas of the NRRP, with strong scores in all three indicator sets and a rather large share of total funds. Measures in the component are oriented around the goal of affordable and environmentally friendly mobility for all, with investment in rail infrastructure and promotion of zero-emission public transportation. To make public transportation easier to use, the plan introduces a new ticket that integrates all means of public transport under one ticket and introduces affordable annual passes to encourage use over less-sustainable means of transport. The 2030 mobility master plan will also show ways to increase walking and cycling. The Koralm railway project also implemented biodiversity and ecosystem measures alongside infrastructure development.

"

Measures in the component are oriented around the goal of affordable and environmentally friendly mobility for all, with investment in rail infrastructure and promotion of zero-emission public transportation.

"

However, there is also investment in electric vehicles that reduce emissions but have their own set of environmental risks (see Germany). Additionally, while the mobility master plan claims to aim for increasing cycling and walking, investments in infrastructure such as bike lanes, walking paths and pavements are not explicitly mentioned, although a cycling master plan and a walking master plan are referred to, and more details with a clearer investment breakdown may be found within those. For example, to achieve the 2030 goal of the cycling master plan to double cycling participation in the country to 13%, €7 billion of additional investment is needed. Investments shall go in the expansion of the regional and local communing networks, including cycling superhighways (€5.4 billion), the improvement of the infrastructure for parking bicycles (€144 million), as well as the expansion of existing bicycle hire offers, communication efforts, education and research.[51] Furthermore, while sustainable modes of transportation and related infrastructure are outlined in the plan, there does not appear to be a complementary phasing out of unsustainable options, such as car-free city centres or disincentives for using personal vehicles.

Missed opportunities

The ambition to reduce final energy consumption and, as such, to reduce emissions in heavy-emitting sectors, such as transport and heating, are rather low. Before 2020, efficiency gains in the areas of transport and heating were offset by an increase in final energy consumption. For Austria to achieve its ambitious goal of climate neutrality by 2040, clear commitments and far-reaching efforts to reduce final energy consumption are lacking.

Most notably, the transport sector has significant potential for emissions reductions for the transition to carbon neutrality. Although investment in sustainable mobility accounts for the largest contribution to the climate target in Austria's NRRP, it will be crucial to further develop solutions to decarbonise and electrify heavy-duty vehicles and develop further mobility solutions and alternatives to car use through promoting public transport and shared and active mobility. Moreover, efforts are lacking to connect the "last mile" to public transport networks, especially in remote and rural areas.[52]

The recovery funds only make a small contribution to the investment needed for transformative change. This is most notable for the energy sector, where €100 million of investments are allocated to the transition towards the 100% renewable energy target by 2030. The 2021 reform of support for renewables, including the NRRP, created the necessary framework for increasing the share of renewable energy in electricity consumption by adding 27 TWh of yearly electricity generation capacity from renewables by 2030. However, Austria would need to significantly increase its investments in the network infrastructure, such as storage, distribution and transmission networks, to significantly expand renewable power generation. For this, investment needs amount to €18 billion until 2030.[53]

> Although investment in sustainable mobility accounts for the largest contribution to the climate target in Austria's NRRP, it will be crucial to further develop solutions to decarbonise and electrify heavy-duty vehicles and develop further mobility solutions and alternatives to car use through promoting public transport and shared and active mobility.

Conclusion

The political context is important for assessing the changes in ambition in achieving the climate targets. The Austrian NECP was written under a coalition government between the Conservative and far-right parties. The new government, led by the Conservative and Green parties, was tasked with submitting the NRRP. It is likely that the government reshuffle has also changed the course of the content of the climate and energy strategy and investment.

Additionally, at the time the plan was presented, half of the investment volume had already been implemented or decided, as part of the new government programme. Almost half of the remaining projects were already included in the government programme. Only five of the planned investment projects in the NRRP, i.e., 4% of the investment volume, are actually new or additional projects.[54]

For the energy sector, our results indicate that a significant investment gap remains, as RRF funds only meet a very small fraction of 0.5% of the annual investment needs in this area. At the same time, on the qualitative side, the transformation potential has been very little exploited in the NRRP. The energy component received only a two in the RITC assessment. The comparison with the national context has made it clear that efforts in this area can be expanded. Austria already leads the EU average, in terms of the share of renewable energies in electrical energy, but did not expand this pioneering role with the energy component in the RRP. On the contrary, efforts to address barriers to the further expansion of renewables, such as storage capacities or bureaucratic approval hurdles, are relatively low. There is also a lack of strategies regarding energy efficiency, and thus, the reduction of final energy consumption, which is an essential aspect of decarbonisation.

For the mobility sector, RRF funds contribute 1.45% to the annual investment needs in the sector. This is a relatively narrow contribution, leaving a large investment gap here as well. However, Austria exploits the transformative potential in the area of mobility very well and receives a rank of ten in the RITC assessment. The mobility component of the Austrian RRP presents crucial reforms and investments for a fair and green transition, such as a "climate ticket" for public transport, in the form of a flat-rate season ticket that is valid throughout the whole country, and the investment in regional and rural transportation. However, it is not sufficient to reduce emissions in the transport sector sufficiently to meet the 2040 climate-neutrality target, as shown above.

> Austria already leads the EU average, in terms of the share of renewable energies in electrical energy, but did not expand this pioneering role with the energy component in the RRP.

FRANCE

FRANCE

Introduction

The French government under President Macron has increased its awareness and urgency of the need for climate action and has strengthened the energy transition policy framework. In 2019, the High Climate Council, an independent body advising the government to reduce France's GHG emissions, was created. In addition, France launched a citizens' convention that took place from 2019 to 2020 and provided a range of recommendations for speeding up climate action by 2030 at regional, local and national level. These have been reflected in the 2021 climate and resilience law. As such, the inclusion of citizens in national energy and climate policy plays a strong role.

France's decarbonisation framework, enshrined in the 2015 energy transition act, is based on the national strategy for low-carbon energy by 2050 (*Stratégie Nationale Bas-Carbone*, or SNBC), which sets targets for reducing fossil fuel use and emissions by sector within the framework of three five-year carbon budgets until 2034. This strategy is currently coming to an end, and thus, a new strategy is expected soon.

In the energy sector, the measures are implemented through two successive five-year energy investment plans (*la programmation pluriannuelle de l'énergie*, or PPE). Building on the SNBC and the PPE, the regions set their own climate and energy transition targets within the framework of regional spatial plans, sustainable development and equality. At the local level, municipalities are working on their climate, air and energy plans.

Context: France pre-COVID

As outlined in the Methodology, the research examined the "context" of each country by looking at pre-COVID statistics for the energy and mobility sectors.

Here, we present a brief review of the landscape in the energy and mobility sectors in France before the pandemic.

Energy

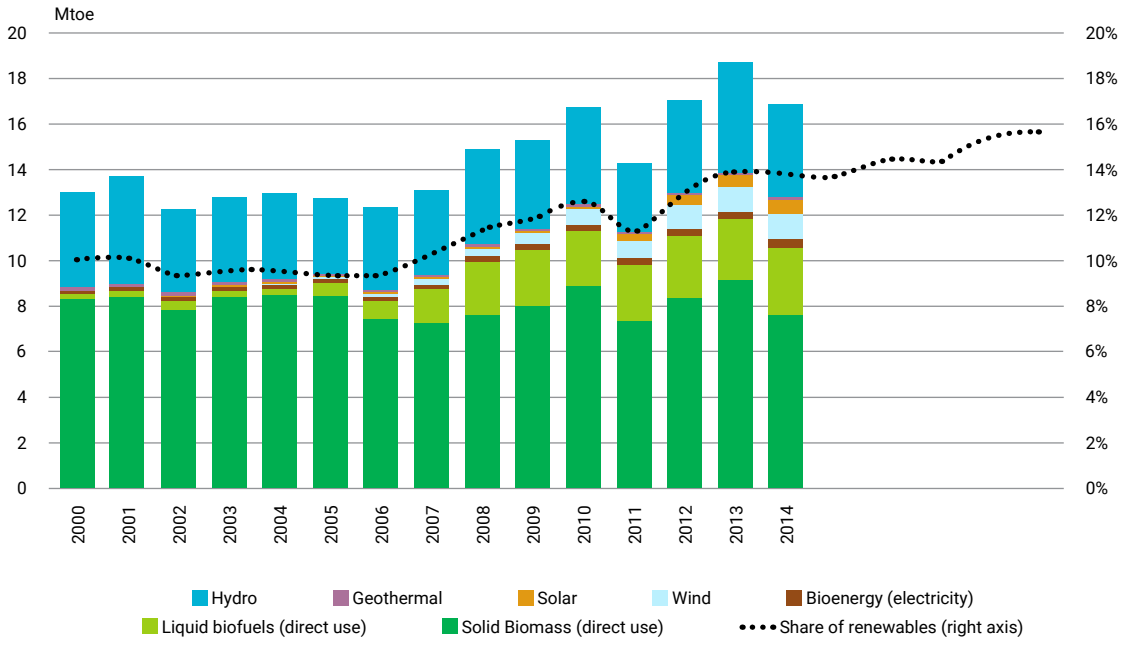
France has long been considered an international a frontrunner of energy transition. France was the first country to implement a green budgeting approach in Europe, aligning national budgetary processes with climate and environmental goals.[55] The French energy sector is characterised by the strong role of nuclear energy. In 2020, France produced 122.6 million tonnes of oil equivalents (Mtoe) of energy. Electricity was produced from nuclear energy (66.6%) and renewable sources (24.2%), such as solar power, wind turbines, biofuels and hydropower. As a result, France benefits from decarbonised electricity and the lowest per capita emissions in the energy sector, compared to other advanced economies.[56]

> "France is lagging behind on realising the energy transition. France was the only EU country that did not meet the 2020 climate targets agreed in 2015, with regards to increasing the share of renewables in final energy consumption and energy efficiency."

However, to date, France is lagging behind on realising the energy transition. France was the only EU country that did not meet the 2020 climate targets agreed in 2015, with regards to increasing the share of renewables in final energy consumption and energy efficiency.[57] The share of renewables in the gross final energy consumption (consumed by end users) was at least five percentage points behind the target of 23%.[58] The share of total petroleum products accounted for 37.1%, electricity for 27.6% and natural gas for 20.6% in final energy consumption. In terms of energy efficiency, final energy consumption in 2019 was 145.5 Mtoe, well above the 2020 target of 130 Mtoe.[59]

Over the last ten years, electricity generation from wind power and photovoltaic electricity generation has increased, raising the share of renewables in electricity generation from 14% in 2010 to 23.4% in 2020. The plan to reduce the share of nuclear electricity to 50% was postponed from 2025 to 2035.

FIGURE 7. Historic trend of renewable energy in total final energy consumption in France, 2000-2019



Source: IEA 2021.

The energy dependency rate was at 44.5% in 2020, meaning that almost half of the energy consumed in France was imported. For gas, about 36% of the energy imports came from Norway, followed by Russia with 17% in 2020.[60] Compared to other EU countries, the dependency on Russian fossil fuels is thus limited. In addition, France has four liquefied natural gas terminals, which allows for diversification of gas imports. France's energy mix is also characterised by a very low dependence on coal (around 2% of gross inland consumption, compared to 11% for the EU average), as well as a below-average dependence on gas (15%, compared to 25% for the EU average).[61]

Mobility

The transport sector accounted for 38% of total CO_2 emissions and 30% of GHG emissions in 2017. Mobility is the only sector where GHG emissions have not decreased in France in recent years. This is due to high car ownership and a general increase in the population's need for mobility. 82% of the kilometres travelled were by car in 2018 and almost 64% of people have a car in France. Emissions for new cars have increased, reaching an average of 112 grams of CO_2 per kilometre by mid-2019. This is mainly due to SUVs and petrol cars. Likewise, emissions due to heavy-duty vehicles have increased from 2018 to 2019 by 5.8%.[62]

The 2019 mobility act proposes to improve the rail network and develop new mobility solutions, with the aim of a decarbonised transport system. The 2020 cycling plan aims to increase 9% of trips by bicycle by 2024 and to increase the budget for bicycle mobility to €60 million. The last multi-annual energy planning (PPE) foresees a modal shift from −5% for cars to +3% for collective transport and +2% for cycling in the period 2015-2028.[63]

In the transport and buildings sectors, France already levies a carbon tax as part of its energy taxation at €44 per tonne of CO_2.[64]

Are investment needs met?

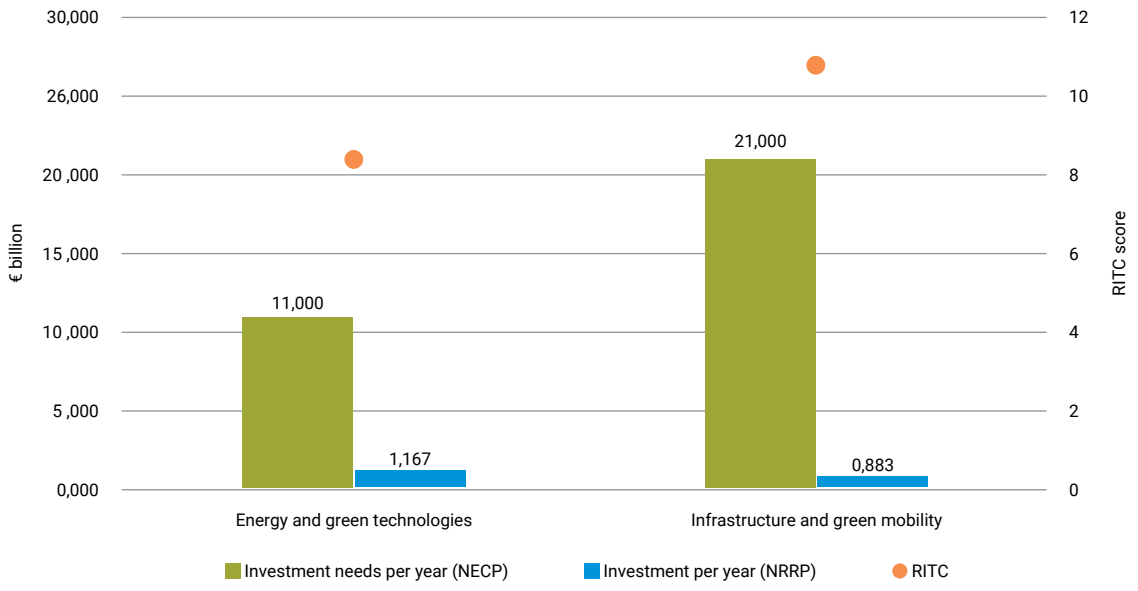
France's NRRP makes up almost €40 billion of the €100 billion investment plan "France Relance", that was launched in September 2020. The French NRRP is structured along nine components, contributing to three key priorities: the green transition, competitiveness, and social and territorial cohesion. In total, the plan earmarks €39.4 billion in investments. About 13% of all funds (€5.3 billion) are dedicated to the "energy and green technology" component, fostering innovation policies in key green technologies, and including a broad scheme to finance innovative projects in green technologies for the energy transition. Furthermore, about 17% (€7 billion) are for "infrastructure and green mobility", including modernisation of the rail network. The plan also includes a climate and resilience law, setting out a national legislation to contribute to the GHG reduction target for 2030.

In the French NECP, investment needs are calculated by "total costs" and "additional costs only". As set out in its NECP, France needs €45–85 billion of additional investments per year to be on a trajectory towards carbon neutrality, according to the estimate in the NECP for the period of 2019-2032. This includes around €15-25 billion for the energy efficiency of buildings, €20-50 billion for clean transport and €10 billion for renewable energy and electricity grids annually.

For our purposes and for consistency with the other countries, we show the discrepancy between the total investment needs, as set out in the NECP, and the amount of investments in the NRRP in Figure 8. Within the calculation in the NECP, the investment needed is broken down into buildings, transport, and energy and networks. For comparison with the NRRP, we have aligned investment needed in "energy and networks" from the NECP with "energy and green technologies" in the NRRP, and "transport" in the NECP with "infrastructure and green mobility" in the NRRP.

As evidenced by Figure 8, the investment in energy and mobility laid out in the NRRP is significantly less than the investment needs calculated in the NECP. The investment per year in energy is only 10.6% of the investment needs, and the investment per year in mobility is a mere 4.2% of what is needed.

FIGURE 8. France — investment needs compared to investments in NRRP per year in billion euros versus RITC score



How transformative was the NRRP?

ZOE Institute and the New Economics Foundation assessed the French RRP with the RITC.[65] The French NRRP achieved the highest scores among the 13 plans assessed. This is because the plan contains several exemplary measures in the areas of biodiversity, jobs, research and development strategy, strengthening the environment, and social cohesion.

The breakdown of the scoring for the energy and mobility components can be seen in Table 4.

TABLE 4. RITC energy and mobility scores of France

COMPONENT	Just transition potential	Just transition risk	Just transition total	Natural world potential	Natural world risk	Natural world total	Systemic change	TOTAL SCORE (OUT OF 21)
Energy and green technologies	2	0	2	2	0	2	3	7
Infrastructure and green mobility	3	−1	2	2	0	2	5	9

Energy

The plan puts a strong focus on energy efficiency and targets further diversification of the French energy mix by supporting innovation in hydrogen. To be at the cutting-edge of renewable hydrogen production and low-carbon technologies, France will support projects led by companies across the country to encourage the emergence of French hydrogen solutions. It will set up a mechanism to support hydrogen produced by water electrolysis and will create an important project of common European interest (IPCEI) to support industrialisation in France and develop demonstrators. Investment in the green energy transition will also generate jobs in industry. To support workers in that area, campuses for qualification and training will be created.

France has also committed to achieving a 32% share of renewables in final energy consumption by 2030, which aligns with the target that was set by the EU after the recast of the renewable energy directive (RED II) in 2018.[66] Under REPowerEU, it is currently being debated whether to lift this target to 45%. The French target of 32% is therefore not very ambitious.

Mobility

The component of green infrastructure and mobility within the French NRRP includes measures that cover a large spectrum of different transport modes. Firstly, the measures in the plan aim to improve the quality of the rail network, as well as develop projects for public transport in urban areas. The goal is to increase supply in the less densely populated areas and better link them to urban areas; to speed up the work to improve the experience at railway stations, especially for reduced-mobility persons; and to develop the transport of goods to closely serve companies, logistics platforms and ports under good economic conditions. Furthermore, measures in the plan also aim at rolling out electric vehicle charging points, improvements of the inland waterway infrastructure, greening projects in ports, development of road infrastructure reserved for public/shared transportation and support schemes for the purchase of zero- or low-emission vehicles. As such, the recovery plan will mobilise €1.2 billion to develop the use of bicycles and public transport by improving existing services.

The plan considered the biodiversity impacts of the interventions. Overall, the measures aim to comprehensively transform mobility and transport across France and its sectors, with the public sector leading by example, encouraging innovation and investing coherently. In addition, the plan provides a comprehensive demonstration of the opportunities for greening transport by rail, road and water, showing the potential of sustainable travel and various opportunities for environmentally friendly behaviour in transport.

Missed opportunities

France still has potential when it comes to expanding renewable energy sources. In particular, solar energy and wind power are still poorly developed compared with other EU countries. The current pace of renewable energy deployment is insufficient to meet France's 2030 goal of 33% renewable energy sources in gross final energy consumption. Higher public investments in energy infrastructure are needed to support the integration of renewables in the electricity grids. Furthermore, the Commission states that the central linchpins for accelerating the expansion of renewables are public acceptance and third-party complaints regarding wind and solar power. Thus, closer coordination and dialogue with the regions are crucial to reduce land-use conflicts and increase local acceptance.[67]

Moreover, strategies to quickly phase out the usage of fossil fuels are missing in the French NRRP. These would have significant potential to increase the competitiveness of renewable energy sources and stimulate private investment.[68]

The French NRRP shows little effort to tackle poverty and support vulnerable groups (other than young people) in the context of decarbonisation. In the face of rising energy bills, the risk of increasing poverty is heightened, while access to affordable and social housing is insufficient. In addition, a quantitative target for the reduction of energy poverty is missing.

The context has also played an important role in France; however, in this case, social dimensions and citizen acceptance have been at the centre. The yellow-vest movement was a major turning point for French climate policy and an instructive example of how important it is to think about social aspects of the climate issue. The originally planned continuous increase of the CO_2 component (*composante carbone*) in energy taxation was suspended indefinitely in response to the social unrest and frozen at the level of November 2018 (€44.6 per tonne of CO_2). The financial shortfalls are to be compensated for by additional measures yet to be defined.

In response to the protest movement, the President of the Republic initiated the French citizens' conference for climate (CCC) in 2019, where 150 randomly selected citizens were tasked with drafting climate proposals. The NRRP's climate and resilience bill refers to the CCC's proposals, but has been criticised for including only about 10% of the proposals and either discarding or significantly watering down the rest.[69] The lack of a clear political commitment structure resulted in a low political uptake and represents a missed opportunity to strengthen goals and ambition.[70]

Conclusion

To meet the 2030 climate goals, efforts in France to reduce GHG emissions will have to increase. For energy, investments as part of the NRRP make up about 10% of the annual investment needs in that area. Thus, the NRRP contributes to a relatively significant extent to closing that gap. The French NRRP unlocks crucial investments for the energy renovation of buildings, and thus, improving energy efficiency. According to the RITC rating, the plan achieves a score of seven, indicating that there are some transformative approaches but still room for improvement.

For transport, the measures in the NRRP contribute, with 4%, to closing the annual investment gap in that area. In terms of the quality of the NRRP's transport measures, they achieve a relatively high score of ten in the RITC assessment. The investments in the modernisation of the railway network, as well as the electrification of vehicles and road infrastructure, should have a positive effect on the emissions reductions. What was missing, however, was a focus on reducing final energy consumption as a whole and a focus on strategies to strengthen non-motorised mobility. The presentation of the French government's "*Plan de Sobriété énergétique*"[71] in October 2022 is, however, contributing to filling this gap.

Despite efforts in the French NRRP to reskill and upskill workers and support young people, removing barriers to the education and training for vulnerable groups, including non-EU-born, low-skilled people, remain central challenges to reduce their exposure to poverty.

GERMANY

GERMANY

Introduction

In June 2021, Germany adopted an amendment of its climate change act (*Klimaschutzgestz*), setting ambitious climate targets: a 65% reduction of GHG emissions by 2030 and 88% by 2040, with the goal of net-zero emissions by 2045 – five years sooner than the EU's 2050 target.[72] This is to be funded primarily through the energy and climate fund (*Energie- und Klimafonds*).[73] Progress will be monitored with reports from the council of experts on climate issues every two years. This council will also assist the federal government with the rapid adoption of emergency measures, if the reports show that Germany is not on track to reach its goals.[74] However, Robert Habeck, Vice Chancellor of Germany and Minister for Economic Affairs and Climate Action, has said that reaching these goals is a "mammoth task" and that Germany would likely not meet its 2022 targets.[75]

Context: Germany pre-COVID

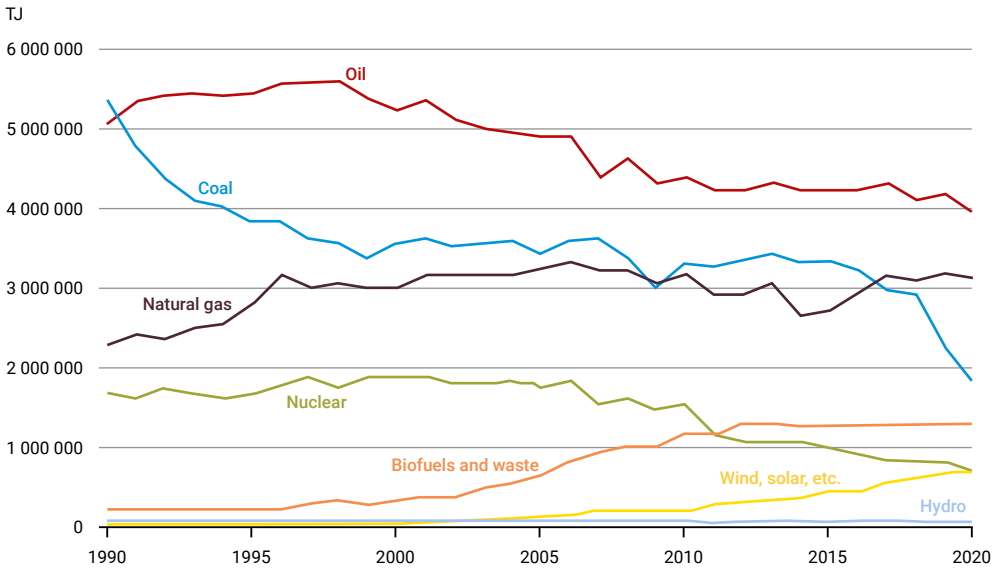
As outlined in the Methodology, the research examined the "context" of each country by looking at pre-COVID statistics for the energy and mobility sectors.

Here, we present a brief review of the landscape in the energy and mobility sectors in Germany before the pandemic.

Energy

Germany's energy sector is highly dependent on fossil fuels; as of 2020, the total energy supply came primarily from oil (34%), natural gas (26.7%) and coal (15.5%). Oil and coal supply have been steadily decreasing over the past three decades, but natural gas supply has increased since 1990. Wind and solar energy supply have been steadily increasing since 2005, but remain one of the smallest energy supplies, at only 6% of the total in 2020.[76] In 2010, Germany initiated a plan, "*Energiewende*", for making its energy system more efficient. Under this, the coal exit commission created in 2018 recommended to end coal-fired power by 2038.[77] Additionally, the government committed to phasing out nuclear energy by 2022, as part of the 2011 nuclear energy act.[78] While fossil fuel use is still high, it should be noted that, overall, the total primary energy supply has decreased 21.17% since 1990.[79] However, as GHG emissions decrease overall, the energy sector has consistently been the highest-emitting sector since at least 1990, with 212 million tonnes in 2020 (29% of the total).[80]

FIGURE 9. Total energy supply by source, Germany 1990-2020



Source: IEA.

Domestic production of oil and gas, the two main energy sources of Germany, is small and its energy production overall has decreased 48% since 1990.[81] As such, the country relies heavily on imports. As of 2020, 93% of the country's natural gas supply was imported, with largest portion of this coming from Russia.[82] This reliance on Russian gas supply has repercussions for energy security, which are being felt today in the context of Russia's war on Ukraine.

Worryingly, especially in the current context of energy security concerns, Germany has no definition of energy poverty, and the country's official statistics do not cover indicators for this. As such, there are few measures in place to address and alleviate energy poverty. In 2019, German households paid the highest electricity prices in Europe and rising electricity prices from 2010 to 2018 brought the social costs of the energy transition into the public debate.[83] However, Eurostat data show that the percentage of households unable to pay energy bills on time, one of several indicators for energy poverty, was consistently much lower than the EU average from 2007 to 2014 and was the seventh-best performer out of 33 countries, with around 4% of households in arrears on monthly utilities.[84]

Mobility

Germany's transport and mobility can be categorised as traditionally having a strong focus on car and road infrastructure. The automotive industry has been called the "backbone industry" of Germany, and the country is a global leader in this area;[85] in 2021, the automotive sector represented around 20% of industry revenue in Germany, and around a quarter of all passenger cars in Europe are manufactured in Germany.[86] As such a significant industry in the country, the German Association of the Automotive Industry (VDA) has a strong influence in Germany, with access to policymakers that gives the industry the opportunity to shape regulation.[87] The VDA has lobbied against EU and German climate policy and GHG emissions targets and opposed phase-out dates for internal combustion engine vehicles.[88] The German car manufacturer Volkswagen's "Dieselgate" scandal, which broke in 2015, brought attention to the industry's power and influence, as well as how polluting diesel cars are.[89]

Because of the size and influence of this industry, transport is still very dominated by automobiles. In 2017, survey data showed that 43% of trips were made by car as a driver, with an additional 14% by car as a passenger.[90] This demonstrates that not only is there a high amount of car-based transport, but that even carpooling seems to be low. Additionally, on average, Germans own more than one car per household,[91] and car density was at a record high in 2021.[92] By contrast, only 10% of people reported their main transport mode as public transportation.[93] However, it is positive to note that, in the first half of 2020, sales of bicycles (along with other sports and camping items included in the same indicator) increased, while car sales decreased, and in a survey the same year, more than half of respondents said they would *probably* or *definitely* advocate the creation of car-free zones in city centres.[94]

Deutsche Bahn is the national railway company in Germany. Leading up to the pandemic, its number of passengers on long-distance and regional transport was increasing steadily every year from 2016. However, punctuality of trains is a consistent problem, with only around 75% of trains reaching their destinations on time in 2018, 2019 and 2021, with a spike to 82% – a 15-year record – in 2020.[9596] If trains are seen by consumers as unreliable, it will be difficult to convert them from personal vehicles where they have more control over the journey.

In addition to carrying passengers, in 2019, 18.7% of freight transport in Germany was by rail,[97] with 2,732 trains per day in 2019 for freight and 23,466 for passengers.[98] In comparison to other EU countries, the share for rail freight transport in Germany ranks slightly above the average.[99] Deutsche Bahn has become greener in recent years, with 60% share of renewable energy in 2019, compared to only 42% in 2016. The target is for 100% by 2038.[100] Additionally, final energy consumption has decreased since 2018 in passenger rail, but unfortunately has stayed mostly stagnant in freight transport.[101] The transport sector was responsible for 147 million tonnes of emissions of CO_2 equivalents in 2020, 20% of the total in the country that year.[102]

Are investment needs met?

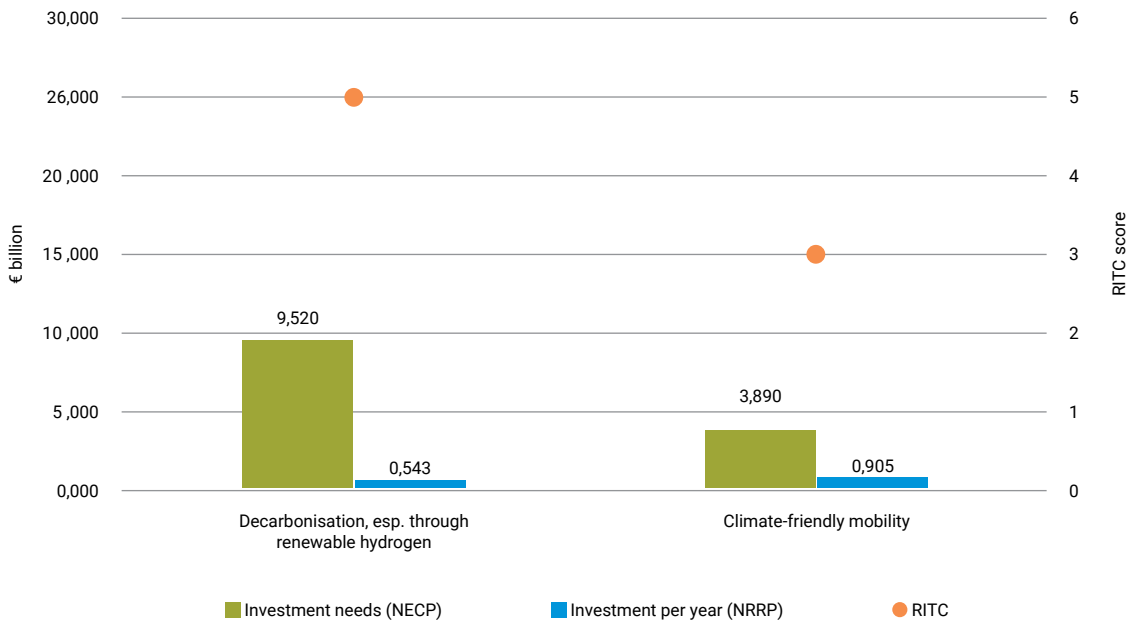
The German RRP covers six key policy areas and earmarks €27.95 billion in investments. The energy and mobility components both fall under the broader "climate policy and energy transition" category. About 11.7% of funds (€3.26 billion) are for the "decarbonisation, especially through renewable hydrogen" component, which, for our purposes,

is considered the *energy* component. About 19.4% of the funds (€5.43 billion) are for the "climate-friendly mobility" component, which is referred to here as *mobility*.

In the German NECP, investment needs are described as the "additional investments in the climate action programme scenario 2030 compared to the baseline". These investments are broken down by area of conversion (including equipment, networks and storage facilities) and final demand sectors (private households; commerce, trade and services; industry; and transport). For comparison to NRRP investments, the whole "area of conversion" section was compared to "decarbonisation, especially through renewable hydrogen" as the *energy* sector. From the "final demand sectors" section, transport was compared to "climate-friendly mobility" as the "mobility" sector for our assessment. The other final demand sectors were not included, as these related to other components of the NRRP.

As illustrated in Figure 10, the investment set out in the NRRP is significantly less than the investment needs described in the NECP. The annual investments in energy set out in the NRRP represent only 5.7% of the investment needs, and the investments in mobility represent 23.3% of the total needs.

FIGURE 10. Germany — investment needs compared to investments in NRRP per year in billion euros versus RITC score



How transformative was the NRRP?

ZOE Institute and the New Economics Foundation assessed the German NRRP with the RITC.[103] The overall scoring for the German plan was one of the lowest of the countries assessed. This was due to the rather isolated, rather than holistic, way the components were described, which failed to take into account the interlinkages between policy areas. Many components contained both potentials (positive points) and risks (negative points), which then cancelled each other out for the final score.

The breakdown of the scoring for the energy and mobility components can be seen in Table 5.

TABLE 5. RITC energy and mobility scores of Germany

COMPONENT	Just transition potential	Just transition risk	Just transition total	Natural world potential	Natural world risk	Natural world total	Systemic change	TOTAL SCORE (OUT OF 21)
Decarbonisation, esp. through renewable hydrogen	2	−1	1	1	0	1	3	5
Climate-friendly mobility	2	−1	1	1	0	1	1	3

Energy

The energy component "decarbonisation, especially through renewable hydrogen" included investments for hydrogen projects under the IPCEI, support for the decarbonising industry, a pilot program for carbon contracts for difference, climate protection research, and research and innovation on hydrogen. However, the German plan relies heavily on investments in new technologies, such as hydrogen, and does not frame it as a transition involving a complex mix of renewable sources and reduction of use.

The NRRP notably does not include other investments in renewable energy. However, it is possible that other national investment separate from the NRRP could go towards this, which is beyond the scope of the current study.

The energy component offers promising aspects, such as innovation support for SMEs, municipalities and universities. The plan also includes a sub-component for the decarbonisation of industry, which aims to reduce GHG emissions through the enabling and advancement of climate-neutral technologies for GHG-neutral production processes. The plan also states that the conversion of energy-intensive industries will drive innovation, and thus, secure highly qualified jobs. However, this is based on assumptions, and there is no mention of specific jobs in green energy, nor the reskilling that would be necessary through industry shifts. Additionally, the quality of jobs that could be created is not mentioned.

Mobility

The mobility component also includes some places with transformative potential, but still leaves some room for improvement. It aims to reduce reliance on imported fossil fuels and create local economic growth in the electric vehicle sector and alternative fuel sector, with a focus on SMEs and start-ups in innovation for hydrogen and fuel cells. There is investment to create markets for these sectors as well, with the creation of jobs in manufacturing electric vehicles and fuel and for operating transport. Strengths can be found in the large investment in low-emission transport for commercial and private purposes, and the development of the necessary infrastructure to support this.

However, the German plan invests too heavily in the status quo of automobile-based transport, rather than further developing and increasing demand for diverse, sustainable, shared or public forms of transport, such as rail. Continued reliance on electric vehicles will have long-term environmental impacts, such as non-exhaust emissions and microplastics, which do not come from internal combustion engines but from other aspects of road driving, such as tyre abrasion and brake wear.[104] On the supply side, the manufacturing process is energy intensive, and batteries, made from materials such as lithium and cobalt, which are mined in some of the world's poorest countries with exploitative labour practices, require special handling and can only be partially recycled.[105]

On the demand side, incentives for the purchase of electric cars tend to benefit higher-income groups who can afford to buy one. There is also the risk that lower-income groups who can't transition to electric vehicles will bear a higher tax burden in the future.

Missed opportunities

The Russian war on Ukraine and the resulting energy crisis have demonstrated the weak points of many MSs' energy sectors, but Germany has been the most notable in its reliance on Russian gas. The country imports 36.5 billion m3 of natural gas from Russia per year; this is the highest quantity among European countries and represents 42% of domestic consumption. Prior to the energy crisis, Germany spent nearly 1% of its GDP on natural gas, and this was expected to rise with the phasing out of nuclear power.[106] Although the NRRP was submitted before the start of the war, Germany could and should have used the NRRP to diversify its energy supply and invest more heavily in renewable energy sources besides hydrogen, which was the central focus of the energy component.

The NRRP also represented an opportunity to diversify mobility options while decarbonising the sector. Rather than shifting thoughts away from the norm of automobiles towards a broader and better coverage of public transportation, the mobility component was focused almost entirely on the promotion of electric vehicles and related infrastructure. The only inclusion of public transportation was the purchase of buses with alternative drives; this is doubling down on road-based transport and doesn't include an expansion of coverage or promotion of public over personal transportation options. The only inclusion of rail transport was for the promotion of alternative drive systems, as currently only around 60% of rail lines are electrified.

Beyond the scope of the NRRP, to combat the increasing gas prices and encourage sustainable mobility, Germany offered a country-wide €9 per month transport ticket, with which purchasers could use all public transport and regional rail lines. This ticket was offered for the months of June, July and August 2022 and was purchased by over 52 million people. CO_2 emissions were cut by 1.8 million tonnes during this period and air-pollution levels decreased by up to 7%.[107] This ticket also improved social outcomes, with a study showing that it increased social participation of low-income people.[108] The success of the €9 ticket shows that there is high demand for public transportation and that its affordability can have very beneficial impacts on environmental and social outcomes. This begs the question as to why the NRRP didn't include investments or reforms such as this.

Additionally, the plan didn't include any investment for cycling infrastructure. Yet, in 2020, sales of bicycles increased, while car sales decreased, and in 2018, more e-cargo bikes were sold in Germany than e-cars. A survey in 2020 showed strong public support for car-free city centres to make more space for pedestrians and cyclists.[109] As with public transportation, there is strong demand for cycling, yet the NRRP missed the opportunity to invest in an expansion of the available infrastructure or promotion to increase this trend.

Conclusion

Germany's NRRP did not provide sufficient investment for achieving decarbonisation goals, nor did it include a meaningful ambition towards changing the status quo, which continues to see natural gas dominating the energy sector and automobiles dominating the mobility sector. Both the energy and mobility components had investments of less than a quarter of what is needed, and both scored very low on the RITC for their transformative potential. The targets set in the amended climate change act six months after the NRRP was published do provide additional investment and more ambitious targets for decarbonisation and reducing emissions to net zero, which adds some optimism for Germany's green transition.

However, these plans were both presented prior to the Russian war in Ukraine, which spurred the energy crisis that has emphasised Germany's need to move away from natural gas. This illustrates how structural changes are needed to address the root causes of these issues for long-term change. Without this, Germany will be greatly challenged to achieve these goals.

Public transportation was a glaring omission from the German NRRP. Germany also has more to learn from its own success with the €9 ticket, which combatted transport poverty and emissions by providing low-cost public transportation. Transport ministers of 16 states have since proposed a €49 follow-up for local transportation; however, financing for this is as-yet unresolved.[110] Additionally, the high demand by consumers for €9 tickets highlighted the insufficiency of the network to meet this demand, with frequent delays and overcrowded trains.

SPAIN

SPAIN

Introduction

Spain adopted its first climate law in May 2021, ten years after it was first called for and just two weeks after submitting its NRRP. It is seen as one of the Spanish government's most important achievements to date. The law calls for climate neutrality by 2050, with a 2030 emissions reduction target of 23%.[111] While the 2050 goal is on a par with that set by the EU, the 2030 target is only half of the reduction needed by 2030, according to the EU climate law. However, the new Spanish target is one of the EU's most ambitious, compared to a 2020 baseline, as emissions are higher than other countries at present.[112]

The Spanish law set more ambitious targets for renewable energy sources in the electricity system, with a target of 74% by 2030 and 100% by 2050. The law also immediately banned new coal, gas and oil exploration and production permits and will end the production of fossil fuels on Spanish territory by 2042.[113]

Notably, the Spanish climate law also includes an emphasis on a fair energy transition, with just transition strategies to be updated every five years.[114] This priority is also seen in the NRRP, which emphasises a just transition. The Spanish government launched a just transition strategy in 2019 to address and mitigate social impacts of the shutdown of power plants and in coal-producing regions and maximise social gains of the ecological transformation.[115]

Context: Spain pre-COVID

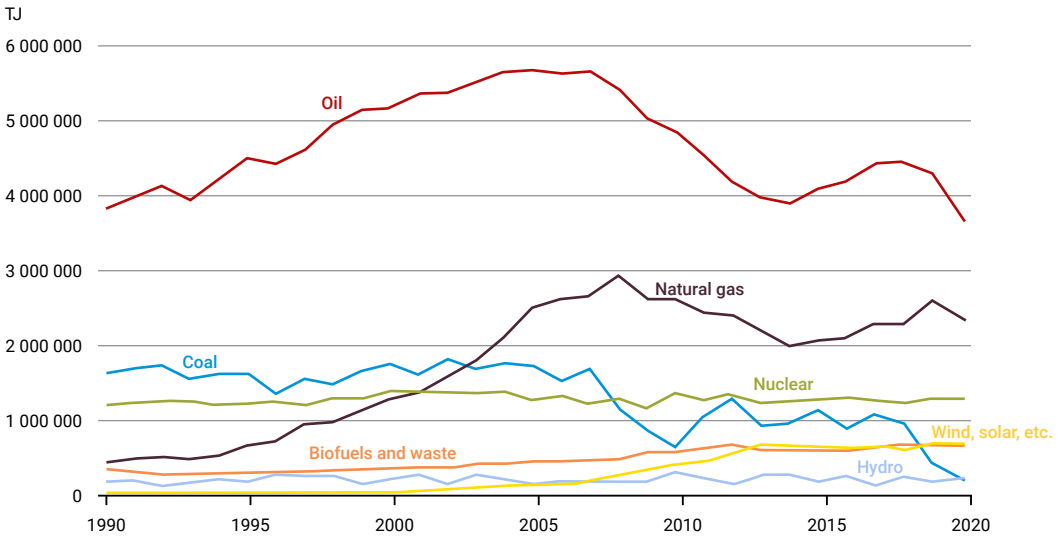
As outlined in the Methodology, the research examined the "context" of each country by looking at pre-COVID statistics for the energy and mobility sectors.

Here, we present a brief review of the landscape in the energy and mobility sectors in Spain before the pandemic.

Energy

Spain's energy sector is dominated by oil and natural gas, with only a 16% share of renewables in the country's final energy mix, as of 2016.[116] Since 2018, the supply of oil and coal, and since 2019 natural gas, have sharply decreased, while renewable energy supply has remained mostly static, signalling that energy use overall is decreasing as fossil fuels begin to be phased out. However, fossil fuel use is still significantly higher than renewables and, as of 2020, the total primary energy supply was up nearly 21% and final electricity consumption was up 75% compared to 1990.[117]

FIGURE 11. Total energy supply by source, Spain 1990-2020



Source: IEA.

Spain's import dependency was 74% in 2017.[118] However, the IEA's 2015 review of Spain highlighted a dramatic decrease in the country's dependence on energy imports, since its previous review in 2009, citing the rapid increase in the supply of renewable energy. Additionally, the import sources were diversified, thus improving energy security.[119]

> "The plan is a good example of multi-sector cooperation; it involves different social, economic and institutional actors and was written by an inter-ministerial working group, which included experts in the fields of energy poverty and environmental protection, and NGOs will be involved in monitoring and implementation."

A strongly holistic facet of Spain's energy approach is that it has a national strategy against energy poverty, which was approved in 2019. The plan is a good example of multi-sector cooperation; it involves different social, economic and institutional actors and was written by an interministerial working group, which included experts in the fields of energy poverty and environmental protection, and NGOs will be involved in monitoring and implementation. Compared to other EU countries, Spain's energy poverty situation is intermediate. According to 2018 data, 9.1% of people in Spain were unable to keep their home adequately warm, which is 1.5 percentage points higher than the EU average, and 7.2% were unable to pay utility bills on time, compared to the EU average of 6.8%. Many homes, especially those of the most vulnerable members of society, are not energy efficient.[120] As of 2015, end-user prices of electricity were among the highest amongst IEA member countries.[121]

Mobility

The state holds exclusive competence over railways and land transport, which pass through more than one autonomous community; motor vehicle traffic; air traffic and transport; and merchant navy, amongst other things established in article 149.1 of the constitution.[122] Thus, much of the mobility sector in Spain is publicly owned. However, in 2018, the government approved a royal decree law to allow new private railway companies to operate in the country, starting in 2020.[123]

Spain has made notable investments in its mobility infrastructure in the past decades. It has the second-largest high-speed rail network in the world, and the largest in Europe, with over 3,200 kilometres of rail, as of 2017. However, it also had the longest network of motorways and highways in Europe in the same year, and roads accounted for 90% of all transport and 85% of freight transport.[124] In 2016, 27% of GHG emissions were allocated to the transport sector.[125] Additionally, rail freight has been lagging, with less than 5% of land freight transport accounted for by rail and trucks dominating the scene.[126]

Regarding urban mobility, the Spanish law for a sustainable economy was approved in 2011 and encouraged the creation of sustainable urban mobility plans by local administrations. Researchers from Universidad Politécnica de Madrid assessed plans for 38 cities in 2018. They found that most plans included measures to improve pedestrian and cycling mobility, but not to a sufficient level of quality and consistency. Additionally, there was an overall absence in measures to restrict private vehicle use, and measures for road hierarchy[127] and traffic reorganisation were poor. Overall, the researchers found the plans lacked a holistic approach that took the quality of life of residents into account.[128]

Are investment needs met?

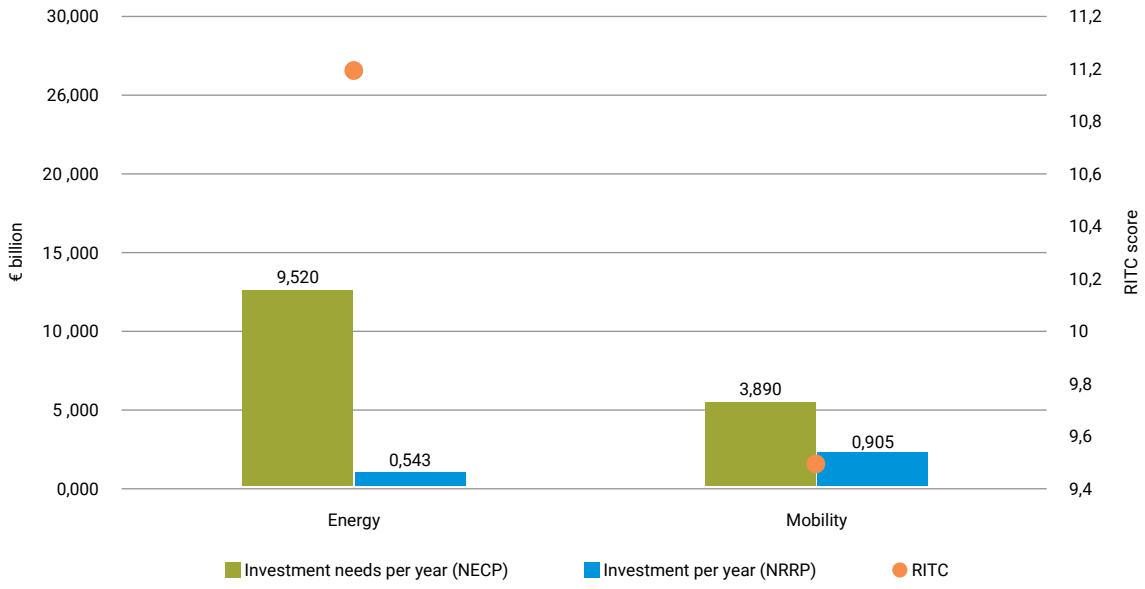
The Spanish NRRP is one of the largest being financed by the NextGenerationEU.[129] It includes 30 components within ten categories and earmarks €69.528 million in investments. The category "fair and inclusive energy transition" includes four components that cover different areas of the energy transition, including a component dedicated to a just transition. About 9.2% of the total funds (€6.385 million) requested are for these four components together. For our analysis, these four

components together are referred to as *energy*. There are two components that cover mobility. Under the category "urban and rural agenda, fight against depopulation and development of agriculture", one component is "sustainable, safe and connected mobility shock plan in urban and metropolitan environments". The investment in this component is 9.4% of the total investment, or about €6.536 million. In the "resilient infrastructures and ecosystems" category, one component is "sustainable, safe and connected mobility". The investment in this component is 9.6% of the total plan, or about €6.667 million. Together, these two components are assessed here as *mobility*.

In the Spanish NECP, the estimated investment to achieve the targets of the NECP amounted to a total of €241 billion between 2021 and 2030, or an average of €24.14 billion per year. The flow of these investments was broken down from four core levers of "savings and efficiency", "renewable energy", "networks and electrification", and "other measures" to the sectors of electricity, transport, industry, residential and services, agriculture and other. As a basis of comparison, we use the estimated investment in electricity in the NECP (wherein investment comes from the levers of "renewable energy" and "networks and electrification") for comparison with the combined investment of all four energy components in the NRRP, summed as *energy* in Figure 12. We use estimated investment in transport from the NECP (coming from the levers of "networks and electrification" and "savings and efficiency") for comparison with the combined investment in the two mobility components of the NRRP, summed as *mobility* here.

As illustrated in Figure 12, the investment set out in the NRRP is significantly less than the investment needs described in the NECP. The annual investments in the four energy components of the NRRP combined represent only 8.4% of the investment needs. The annual investments in the two mobility components represent 40.5% of the total needs for transport investments set out in the NECP.

FIGURE 12. Spain — investment needs compared to investments in NRRP per year in billion euros versus RITC score



How transformative was the NRRP?

ZOE Institute and the New Economics Foundation assessed the Spanish NRRP with the RITC.[130] The overall scoring for the Spanish plan was one of the highest of the countries assessed. The plan demonstrated a good level of coherence and synergies between different policy areas and earned strong scores for both the just transition and natural world potentials, with no significant risks in any of the energy or mobility components. However, within the plan as a whole, the biggest amounts of funding are not allocated towards the most transformative components. For example, the component "electricity infrastructure, promotion of smart grids, and deployment of flexibility and storage" earned the second-highest score of all the components in the plan but is only allocated 2% of the total funds, thus limiting the overall impact.

The breakdown of the scoring for the energy and mobility components can be seen in Table 6.

TABLE 6. RITC energy and mobility scores of Spain

POLICY AREA	COMPONENT	Just transition potential	Just transition risk	Just transition total	Natural world potential	Natural world risk	Natural world total	Systemic change	TOTAL SCORE (OUT OF 21)	AVG FOR POLICY AREA
ENERGY	Deployment & integration of renewable energies (C7)	4	0	4	1	0	1	5	10	11
	Electricity infrastructure, promotion of smart grids, and deployment of flexibility & storage (C8)	5	0	5	1	0	1	8	14	
	Renewable hydrogen road map & its sectoral integration (C9)	4	0	4	1	0	1	3	8	
	Just transition strategy (C10)	5	0	5	2	0	2	5	12	
MOBILITY	Sustainable, safe & connected mobility shock plan in urban & metropolitan environments (C1)	2	0	2	2	0	2	5	9	9.5
	Sustainable, safe & connected mobility (C6)	3	0	3	1	0	1	6	10	

Energy

Spain's NRRP included four components related to energy – deployment and integration of renewable energy (C7); electricity infrastructure, promotion of smart grids and deployment of flexibility and storage (C8); renewable hydrogen road map and its sectoral integration (C9) and a just transition strategy (C10). There are many strong aspects of these components that set Spain's RITC score for energy higher than that of other countries.

Ambition was high for the energy transition; C7 sets a target of 42% of final energy consumption to be from renewable energy sources by 2030, which was ten percentage points higher than the EU target at the time.[131] It also sets a target for 74% of renewables in electricity. In addition to increasing penetration of renewables, the plan (in C10) also includes the closure of coal and mining in Spain and reconverting the economy and society of these territories, which has significant impact on climate change action as well as biodiversity conservation, along with the territorial aspects of the just transition.

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The just transition approach was strong in C10, with measures to transition to clean energy sources, while also cushioning negative socio-economic impacts for both workers and regions that would be most affected by this transition. Unfortunately, this component made up less than 1% of the total funds requested in the NRRP, limiting the overall impact it will be able to create.

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The just transition approach was strong in C10, with measures to transition to clean energy sources, while also cushioning negative socio-economic impacts for both workers and regions that would be most affected by this transition. Unfortunately, this component made up less than 1% of the total funds requested in the NRRP, limiting the overall impact it will be able to create. More strengths regarding social aspects include a focus across the components on citizenship and social participation, skills and training, and a gender lens.

The plan also included elements in shifting power dynamics. C7 included a national self-consumption strategy, which included both reforms for reducing barriers and investments for promotion and lines of support for the strategic framework outlined in the reform. It also includes a reform for the development of energy communities. C8 includes a sub-component of reforms and investments for new business models in the energy transition, with support for demand-side management projects in large industry, as well as SMEs and renewable energy communities, and support for start-ups and innovative initiatives in energy.

Mobility

The Spanish NRRP included two mobility components – sustainable, safe and connected mobility shock plan in urban and metropolitan environments (C1) and sustainable, safe and connected mobility (C6). Both components have a focus on improvements to transport infrastructure and decarbonising mobility and will create jobs in this area. C6 also includes provisions for gender equality and accessibility, along with efforts for road safety for vulnerable users, which is important for a just transition.

As in other countries' NRRPs, the Spanish plan has a plan to promote electric vehicles. This does come with benefits towards decarbonisation, but there are drawbacks that we do not yet know the full extent of (see Germany). However, this component also includes the creation of low-emission zones, incentives to reduce the use of private vehicles and investment in suburban rail services, all of which should serve to reduce the use of cars overall.

Notable also are the targets set for increasing freight by rail alongside investments in the rail infrastructure. Freight in Spain is currently dominated by trucks and a move to rail should serve to reduce emissions.

Missed opportunities

While the Spanish NRRP was strong in many aspects, there is still some room for improvement, although there are no glaring omissions from the plan. Investments and reforms to improve recycling and a circular economy in Spain could support the country with reaching EU ambitions, on which it is currently below average. Additionally, investment in research and development (R&D) in Spain is well below the EU average. While there is financial support for this in the NRRP, actions to strengthen collaboration between public and private sector and innovation support for SMEs is important to close Spain's R&D gap.[132]

Conclusion

Of the four MSs assessed in this study, Spain had the plan with the most transformative potential both in terms of the quantity of its investments and quality of its plans. In terms of quantity, the investment gap was the smallest compared to the other MSs in this study. In terms of quality, the average RITC score of the four energy components was 11 out of a possible 21. This shows plenty of room for improvement, but it was the highest of the energy components of MSs assessed in this study, setting a strong basis for traveling in the right direction of progress. The average of the two mobility components was 9.5 out of a possible 21, second only to Austria.

However, while the plan is more transformative than the others assessed, it still falls short on meeting investment needs and in achieving a plan for systemic change. Still, the climate law introduced just after the NRRP shows promise for Spain's aims for the future. What remains to be seen is whether these can and will be achieved.

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DISCUSSION

> We have never talked so much about investing in a transition, but never invested so little in a transition.
>
> *Thomas Dermine, State Secretary for Economic Recovery & Strategic Investment, Belgium*[133]

Our analysis shows that EU MSs are failing to invest sufficiently in the green transition set out by the EU, which is necessary for limiting global warming to 1.5°C. It is also important to note that, while the comparison of actual NRRP investments to needed investments, as per the NECP, already shows a dramatic underinvestment in energy and mobility, the real difference is much more drastic than that. The investment needs laid out in the NECPs were calculated based on an emissions reduction target of 40%. Since then, and before the NRRPs were published, ambition on this has increased to 55%, meaning that even more investment will be needed, and the NRRPs fall even shorter on investment needs than those demonstrated in this study.

Our analysis also reveals that it is difficult to define which efforts to systemically transform the energy and mobility sectors were motivated by the introduction of the RRF. Because the European Commission has allowed MSs to include already planned and partially implemented investments in their NRRPs, many of the measures in the NRRPs were already at the national planning or implementation stage when the plans were submitted. In many countries, the NRRPs were part of larger stimulus programmes that we did not include in our analysis. The German plan is an important example of this. Accordingly, our analysis has limitations, as we cannot take into account national stimulus measures outside the NRRPs financed through the RRF.

The rapidly changing political context has also been a factor. At the time of publishing this paper, governments across the EU are feverishly working on solutions to cushion the impacts of high energy prices on households and strategies to achieve rapid energy independency from Russia. Current efforts in response to topical challenges contribute significantly to the goal of a rapid and profound transformation. However, further research will be needed to assess whether the current emergency measures will have long-lasting effects in contributing to a transformative change. Thus, it is also important to note that looking at the countries' NRRPs and comparing them to their baseline did not allow us to get a comprehensive picture of all possible transformative changes across MSs. In addition, in some countries, government reshuffles took place between our baseline year of 2018 and when the plans were submitted in 2021. As it was the case in Austria, for example, the green party has entered the government during that time, and thus, the country has pursued a more environmentally and socially ambitious government programme. For this reason, too, it is difficult to determine the scope of the Commission's impulse through the RRF to contribute to a transformative change.

> Instead of coherent and well-thought-out strategies, the MSs' measures as part of the RRF or, more recently, in response to the energy market and geopolitical situation, seem opportunistic, as ad-hoc reactions to current events.

DISCUSSION

An important finding of this analysis is that many national climate and energy policies are crisis driven. In wake of the recovery from the pandemic and the more recent energy crisis, many targets were adjusted and ad-hoc policy strategies for the energy and transport sector were invented. This suggests that, instead of coherent and well-thought-out strategies, the MSs' measures as part of the RRF or, more recently, in response to the energy market and geopolitical situation, seem opportunistic, as ad-hoc reactions to current events. For example, within only three weeks, the city of Berlin rolled out 12 km of new protected bike-lane streets to adapt to the spatial implications of social distancing.[134] This suggests that MSs are focusing from one sprint to the next with little attention on how to win the marathon at the same time to achieve climate neutrality in Europe.

A clear picture of the scale and size of what this transformative change entails is needed for in-depth policy planning for this transition. At the start of this is the need for a clear breakdown of investment needs in the different sectors, as well as a plan for where the financing will come from. In fact, our research reveals that there is no common methodology in MSs' NECPs to calculate the investment needs. The published investment needs differ for many dimensions, like the sectors covered (whole economy, energy sector, transport, etc.) and the targets that should be achieved by the investments (green transition, green and digital transition, social goals). Furthermore, NECPs lack concrete plans on where the funding for massive investment gaps will come from.

In our analysis, we also assessed the transformative nature of the plans in terms of the ambition of the targets, such as for the expansion of renewable energy sources or for the transformation to a low-carbon transport system. Many MSs have set ambitious targets for the next decades. We can also see that many had transformative features in their NRRPs. However, ambitious targets are only the first step and do not matter if these are not achieved. The gap between the transformative concepts and the level of funding committed is striking in each country we examined. For a successful transformational change, structurally transformative strategies are needed that underpin ambitious goals with realistic investment plans and concrete measures. This also includes a plan for which funds will feed the investment needs.

Also relevant to note is that we initially sought to assess and quantify a transformation gap between the NECP and NRRP. However, MSs fail to set targets with consistent indicators across these plans, which makes it difficult to see whether ambition has increased along with new access to investment. This inconsistency is a limitation, as a clear direction of travel is key to ensure goals are met.

Our analysis has shown that the RRF only makes a small contribution to what is needed to achieve the goals. As a next step, MSs need not just a plan for achieving targets, but also a plan for investing in the measures needed to realise those targets. This investment plan also needs to consider all possible economic policy levers to shift investment for decarbonisation to realise a holistic and systemic shift.

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MSs fail to set targets with consistent indicators across these plans, which makes it difficult to see whether ambition has increased along with new access to investment.

"

CONCLUSION

In this study, we paired quantity and quality by looking at both investment and ambition of the NRRPs to understand their transformative potential and impact. Overall, we found that plans were lacking in both areas. Investment plans in the NRRP were far below what was needed, according to the NECPs, which was also based on a less-ambitious emissions reduction target. In most cases, the NRRPs were also not ambitious towards creating a systemic transformation, with insufficient inclusion of plans for creating a just transition or changing the root causes of the issues we are facing today.

> "Incremental change is no longer an option: broad-based economy-wide transformations are required to avoid closing the window of opportunity to limit global warming to well below 2°C."[135]

TABLE 7. Percent of needed investment covered by NRRP and RITC score of 4 MS

	ENERGY		MOBILITY	
	% NRRP of NECP	RITC	% NRRP of NECP	RITC
AUSTRIA	0.528	2	1.458	10
FRANCE	10.606	7	4.206	9
GERMANY	5.707	5	23.265	3
SPAIN	8.401	11	40.528	9.5

On **energy**, the comparison with the baseline makes it clear that some potentials have not been exploited. For example, France's ambition to fully decarbonise the energy supply or Austria's lack of ambition to further invest in the expansion of renewables. These countries missed the opportunity to combine green and social targets, such as energy poverty, which remains a major challenge, as the current rise in energy prices could aggravate the energy poverty of low-income households.

On **mobility**, there is a lot of potential across countries for decreasing emissions in the sector; this is the only sector where emissions have not decreased in past decades. However, the NRRPs lacked ambition and innovation. There was significant investment across countries in the promotion of electric vehicles and related infrastructure, but insufficient consideration of the need to transition away from vehicles and promote alternative forms of transportation. Efficiency improvements alone will not be enough to reach emissions targets.

In terms of our methodology, we conclude that all four MSs assessed only succeeded in a **business-as-usual** scenario. Investment was not sufficient for a meaningful **greening** of business as usual, and ambition is not yet high enough to create a systemic transformation.

Still, there were some strong measures within some of the plans, which should be acknowledged, especially given the short time frame in which they were developed. While no energy or mobility component presented here demonstrated a fully systemic approach,

some components were headed in the right direction, with increased ambition in targets and a consideration of power dynamics and mental models, such as the Spanish energy component.

However, this study does not present a final picture of the pathway of the transformation of MSs towards a green and just economy. Between the publishing of the NRRPs and the publishing of this study, further initiatives, investments and policies are underway that aim for a rapid transition towards climate neutrality and energy sovereignty, such as REPowerEU. This is motivated by the need to achieve energy security in Europe and to cushion high energy prices as countries respond to a newer crisis, the Russian war in Ukraine, and its shockwave effects.

FUTURE OUTLOOK

Looking forward, it is now essential that MSs are granted sufficient fiscal leeway to fill the investment gaps that we've discussed in this research. Public budgets have a key role to play in mobilising private capital for green infrastructure projects for which there is currently no business case.[136] In this context, it will be important to find effective and rapid solutions in the current reform debates on EU fiscal rules, so that important investments for the green transition are not undermined by debt reduction requirements and can build on the momentum created by the RRF.

Apart from enabling EU MSs sufficient leeway to invest, it is crucial that joint efforts for a green and social future do not stop after 2026. A successor instrument to the RRF in the form of a permanent central fiscal capacity will be important to address cross-border challenges and can support social cohesion by aligning national fiscal policies with the needs of the entire Eurozone. MSs that lack the risk-absorbing capacities needed in crises would be supported by others, thus enabling targeted support for MSs with the highest and most urgent investment needs.

Drawing lessons from the RRF experience will be critical for a more robust and effective implementation of a future EU-level funding instrument. The RRF succeeded in incentivising crucial investments and reforms, whilst ensuring the quality of public spending by linking the disbursement of funds to the achievement of milestones that contribute to common goals. This enables monitoring of the quality of capitals' usage of the funds for a green and just future. However, there is room for improvement in the concrete implementation. For example, there have been significant gaps and inconsistencies in the application of the DNSH principle.[137] Similarly, many MSs did not do justice to the Commission's requirement to involve stakeholders and citizens in the drafting process. ZOE Institute has explored the legacy and potential of this principle in much more detail in the study on ensuring the significance of do no significant harm.

"

The RRF succeeded in incentivising crucial investments and reforms, whilst ensuring the quality of public spending by linking the disbursement of funds to the achievement of milestones that contribute to common goals.

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In addition, there is room for improvement in the monitoring framework of the NRRPs' progress towards delivery on the green and digital transitions. The common indicators showing progress of the implementation could be more specifically selected, in response to common objectives, to adequately reflect where MSs are in achieving a just and resilient economy and society.[138] A more transparent and visual tool can allow citizens and decision-makers to get a more holistic picture of current quantitative and qualitative efforts in relation to common environmental, social and economic objectives. This also requires consistency in the calculations of investment needs for the implementation of the EGD goals. ZOE Institute's compass 2030[139] provides a tool to visualise the EU's progress towards a renewable energy economy and can thus serve as a blueprint for a more holistic dashboard that relates current policies to the ambition and investment needed for a climate-neutral Europe.

It is crucial that in the coming years the green transition is not just goal oriented, whether by target levels of investment, emissions reduction targets or social goals, but that these goals are also paired with implementation plans and monitoring for a deep and systemic transformation towards a climate-neutral Europe.

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RECOVERY WATCH

RECOVERY WATCH

In modern times of crisis and response, Europe needs policies which address not only the short-term consequences, but the root causes through a systemic transformation.

In this policy study, the authors from ZOE Institute for Future-fit Economies look at four EU Member States for a geographic and socio-economic spread: Austria, France, Germany, and Spain and seek to answer the question:

How transformative were Member States' National Recovery and Resilience Plans with regard to their contexts and investment needs?

Within those Member States, the research focuses on the energy and mobility sectors by looking first at the pre-pandemic context, or status quo, to understand the general state of these sectors prior to the pandemic and the Recovery and Resilience Facility, introduced to help Member States recover from the crisis through their own National Recovery and Resilience Plans.

The study lays out the investment needs for energy and mobility as described in the 2019 National Energy and Climate Plans and compares this to the investments set out in the National Recovery and Resilience Plans to determine whether sufficient investments were included to reach the goals of the green transition.

Finally, the energy and mobility components of the National Recovery and Resilience Plans are assessed using the Recovery Index for Transformative Change to determine the transformative potential of these components.

By assessing both the quantity and quality of change, the research will determine the level of transformation within these Member States' plans.

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