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- PU: Public, fully open, e.g. web
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Summary

This deliverable is based on activities conducted under READJUST's task T1.2, which focuses on analysing policies and regulations pertaining to the green and digital transitions. It introduces a policy mix perspective to conceptualise synergies and commonalities in twin transition policies at EU level. Starting from this policy mix perspective, twin transition policies should be viewed as interconnected measures rather than isolated initiatives. Furthermore, it presents the results of a quantitative exploration of EU policy documents and qualitative content analysis of 15 selected EU policy documents, interpreting and contextualising their relevance for the twin transition. In addition, it includes insights gained from expert interviews and a detailed examination of how the Recovery and Resilience Facility (RRF) – one of the key EU policies supporting the twin transition - is implemented in four EU member states: Finland, Poland, Italy and Spain. Finally, it discusses synergies and commonalities in policies, strategies and programmes related to the twin transition in EU policies. Findings indicate that green, digital, and social objectives are often treated separately, highlighting the need for a more integrated policy mix for a just twin transition. Significant gaps remain in addressing certain domains of inequality, particularly environmental and procedural aspects, underscoring the necessity for a multifaceted approach.

1 Introduction

The aim of the READJUST project is to better understand and address the inequalities created or exacerbated by twin transition policies. Task T1.2 therefore takes twin transition policies (at EU level) as a starting point. It aims to identify the most relevant twin transition policies and analyses how these policies engage with existing and potential inequalities in the twin transition (inequalities as identified in READJUST's D1.1, see Stadler et al. 2024). More specifically, the analysis explores how inequalities are addressed or discussed within these policy documents. The analysis of twin transition perspectives in policies leads very quickly to the finding, that it is only a handful of policies which deal explicitly with the twin transition. However, the policy objectives of the green and digital transitions are targeted by various policies individually, which is why the policy mix addressing the twin transition is quite complex and a structured approach is needed to understand which aspects are addressed in each case. Academic concepts of policy mixes can inform the analytical framework for this study, as the policy mix perspective posits – among other features – the analysis of synergies and commonalities.

More precisely, the first important feature from policy mix thinking is that it is not meant to be looking at the interplay between various policy initiatives alone, but rather to encompass a broader picture of components of policies and policy-making. Two features have been highlighted more particularly in the academic literature: From a policy mix perspective one should consider the processes, by which these instruments emerge and interact (Flanagan

et al. 2011) and overarching long-term policy strategies which define the policy objectives either tailored to specific policy fields or more generally formulated (Rogge and Reichardt 2016). These insights have guided **the quantitative exploration of EU twin transition policies** of this report and led to include documents reflecting strategic thinking, overarching policy objectives (acknowledging that there is no universal strategic document on inequalities in the twin transition) as well as documents which reflect the processes by which policies emerge.

Policy mix thinking as developed by Rogge and Reichardt (2016) inspired this analysis also in a second way. Rogge and Reichardt (2016) developed an analytical framework to evaluate the impact of policy mixes. The analysis conducted as part of this deliverable is rather an exploration of the relevant 'body' of policies representing twin transition thinking, which is linked to inequalities in the twin transition. By doing this, the analysis strives to identify which policies can be considered to belong to such an emerging body of 'twin transition policies', because they address relevant dimensions of the green, digital and just transition. In technical terms, this means in this analysis, the focus is on the **relevance** of this emerging 'twin transition inequalities policy mix' (in how far it reflects a broad understanding of potential inequalities in the twin transition) and to some extent to its so-called **internal coherence** (e.g. synergies and commonalities) – to use the same terminology as in the EU's Better Regulation Toolbox. So, for these aspects, the Better Regulation Toolbox assessment criteria and the policy mix thinking jointly lead to the following research questions addressed in this work.

Box 1: Research questions addressed in READJUST's deliverable D1.2

The following research questions are addressed in this deliverable:

1. **Which EU policies are of highest relevance for the twin transition?** (Section 2: Quantitative exploration of EU twin transition policies)
2. **How do these policies (in their interplay) address twin transition inequalities?** (Section 3: Qualitative content analysis of EU twin transition policy documents)
3. **What barriers exist to implementation and acceptability of one specific twin transition policy (the RRF) at the national level?** (Section 4: Deep dive into the national implementation of the Recovery Resilience Facility)

The deliverable is structured as follows. First, it introduces the policy mix perspective applied in this deliverable to conceptualise synergies and commonalities in twin transition policies. Second, the policy analysis starts from identifying the most relevant policies at EU level relevant for the green and digital transition. This is done through a quantitative exploration of policy documents at EU level to determine which policies are of high relevance to the twin transition. Third, the deliverable examines how selected twin transition policy documents refer to existing and potential inequalities through a qualitative content

analysis. This is based on in-depth coding of policy documents to understand the extent and nature of attention given to inequality aspects. Fourth, the deliverable examines the national implementation of one key EU policy for advancing the twin transition through the the RRF. It focuses READJUST's four case study countries which were selected for in-depth analysis - Finland, Poland, Italy and Spain – and draws on interviews with policymakers at EU and national level to identify key barriers to implementation and acceptability. The methodological approach applied in each analytical step as well as its limitations are outlined and reflected in the respective chapters. Finally, the deliverable discusses synergies and commonalities in twin transition policies and concludes with key findings.

2 Quantitative exploration of EU twin transition policies

As a first step in the analysis of EU twin transition policies, a preparatory quantitative text analysis of potentially relevant EU policies was conducted. This approach was chosen to identify the most relevant policies within the complex landscape of EU policies for green and digital transitions thereby facilitating the selection of policies for deeper investigation in the subsequent analytical steps. The research question addressed in this analytical step is formulated as follows: **Which EU policies are of highest relevance for twin transition?** The chosen approach follows a growing field of studies which mixes quantitative text mining as a preparatory, complementary step towards deeper qualitative analysis in social sciences (among others Wiedemann 2015; Marcolin et al. 2023; Rutkowski et al. 2022). The following sections describe the methodology applied, present a summary of the results of this exploratory first step and include a short discussion of the results.

2.1 Methodology

To identify the most relevant EU level twin transition policies, the initial step was to create a corpus of policies subject to the quantitative text analysis. To do so, the recent academic literature discussing the twin transition, was identified by using the Scopus database (www.scopus.com). We started with a search for the term "twin transition*". The rationale for this approach was to identify articles that explicitly reference the concept of 'twin transition' (instead of combined queries for green and digital transition) under the assumption that these articles focus on analysing an integrated approach to green and digital transitions. After reviewing all abstracts and excluding articles from non-relevant fields (e.g., those not addressing twin transition in the context of green and digital transitions, such as articles from physics and chemistry), we identified a total of 79 articles that were selected for further analysis. These articles were scanned for the policy documents referenced in them to define the twin transition (including policies referring to different policy mix elements, such as third-party documents as well as policies in different stages of the implementation process). This resulted in an initial overview of European polices potentially relevant to twin transition. The overview was then further expanded by a manual

review of the EUR-LEX database for further policies of potential relevance, resulting in a total list of 153 potentially relevant policy documents[3] which were downloaded and treated for further investigation[4].

Next, three separate keyword lists for "digital transition", "green transition" and "social/justice relevance" were generated based on the initial keywords used in the search strings for the academic literature review conducted in READJUST's Deliverable 1.1 (Stadler et al. 2024). These lists were further expanded using a combination of generative large language models[5] and by building on input by READJUST consortium members to verify the results. Subsequently the keywords were in turn treated (i.e. stemming) in preparation for application[6]. Based on the pre-processed documents and the keyword lists, a keyword score (i.e. the term frequency of keywords in a document) and a keyword diversity score (i.e. the count of unique keywords in a document) were calculated for each document based on the three separate keyword lists. Subsequently a **combined score** for each digital transition, green transition and social relevance was calculated in which the diversity score serves as a logarithmic multiplier to the term frequency, thereby preventing an overrepresentation of documents with an unusual frequency of singular terms. Lastly a **twin transition index** was calculated as the total sum of the digital and green transition scores divided by the absolute relative distance between the two[7].

The goal of this approach is to identify those documents with high and simultaneously balanced digital and green scores based on the assumption, that a balance between the subjects reflects a high relevance for twin transition of the respective policies. Using this method such documents will achieve a higher score in the twin transition index than those with lower scores or a higher disbalance between the two topics. Meanwhile the combined score regarding social relevance serves as an additional orientation towards the investigation of the role of inequality and injustices in the different policies. This approach allows both dimensions (i.e. the digital as well as the green transitions) to be evaluated together through a single value which accounts for the relative balance between the two transformations (and therefore presumably reflecting a higher relevance towards twin transition as a holistic concept). This accounting for the relative balance simultaneously normalises the results to a certain extent, preventing long documents from automatically

[3] Full list can be found in appendix 6.1

[4] The policy documents were converted into plain text format and subjected to lemmatization while common English stop words, white spaces and other non-content relevant formatting were removed.

[5] For this purpose, the OpenAI ChatGPT4o model was posed the following prompt after being given the initial keywords from the previous search: „Formulate a keyword list of 50 words on [specific list theme] based on these initial terms, which will be used in a text analysis of EU policy documents to gauge their relevance to [specific list theme]".

[6] The resulting key word lists can be found in appendix 6.3

[7] A detailed description of the approach can be found in appendix 6.2

receiving top scores, simply due to their overall increased potential for a high aggregate keyword frequency.

However, this approach has significant shortcomings as well, especially in those cases where the respective scores for green and digital transition are very close, which results in disproportionally large index values even in cases where the individual scores are relatively low, which leads to interpretation challenges. Furthermore, while the use of the relative balance somewhat negates this, longer documents still have an increased chance to score higher than shorter documents. However, due to the legal nature of many texts, adjusting the scores for the text length of each document in turn might cause a bias as well, since documents of potentially high relevance might be misrepresented by their excessive preambles and description of formalities with little topical content. While other approaches to text analysis, like sentiment analysis or approaches making use of large language models etc., might deliver more accurate results, this approach has the advantage of being relatively resource efficient and transparent. Given that the results of this analysis only constitute the first step of this analysis and function as a type of a case selection for further qualitative investigations, this approach was deemed sufficient despite these shortcomings.

2.2 Results

Table 1 shows an abbreviated (i.e. the twenty documents ranked highest by their twin transition score[8]) overview of the results. Since the focus of the analysis is specifically on twin transition policies, the analysed documents were further divided into four broad classes of documents:

1. "EU Legislation" (e.g. policy mix elements categorised as **instrument**), containing all policies which have some level of direct effect on the EU's and its member countries decision making. This includes for the main part treaties, regulations and directives with legally binding aspects issued by the council, commission or parliament. This class of documents also includes policies of this type which were, only proposals at the time of writing.
2. "Non-binding EU policies" (e.g. policy mix elements categorised as **strategy)**, which includes recommendations and opinions but also EU-policies of any type which outline policy in an overarching nature, these latter in turn might encompass documents otherwise classified as EU Legislation.
3. A number of documents including "Other EU documents" and "Third party policy documents", which encompasses mostly the work of different EU information services (as for example the European Parliamentary Research Service), clarification and information material on policies, or reports by third-party interest groups as well

[8] The full list can be found in appendix 6.1

as press releases and speech transcripts (e.g. as part of the policy **processes** from which instruments emerge in a later step).

4. A specification of "EU (funding) instruments" which consist of the fewest entries in the corpus concerning for the most part the operational procedures or outlines of different EU funding programmes (however, not their underlying legislative base).

The list of 20 documents most relevant to twin transition based on the calculated score includes policies that can be classified under different policy mix elements. Nearly half of the documents (nine documents) can be classified as "Other EU documents". This includes scientific reports such as the study "Towards a green & digital future" (Muench et al.) focusing on the requirements for a successful twin transition or the Reflection Paper "Towards a sustainable Europe by 2030" (European Commission 2019) that aims to inform the debate for the EU Strategic Agenda. We excluded documents classified as "Other EU documents" from further analysis, as they lack a direct connection to the implementation of policy measures and instead provide background information to support further policy development. While these documents are important for the policy process from which instruments emerge, the analysis in this deliverable focuses more effectively on final policy instruments rather than early-stage processes. Furthermore, two EU specific funding instruments are high-scoring documents, the Horizon Europe Work Programme 2021-2022 (European Commission 2022b)and a call for proposals of the European Social Fund (ESF 2022). These documents provide very detailed descriptions of the operational procedures of the respective funding measures and were therefore also excluded from further analysis.

The remaining nine documents consist of policies categorised as EU legislative documents or as strategic level non-binding EU policies (see policy mix elements, section **Fehler! Verweisquelle konnte nicht gefunden werden.**). These documents were in focus for further analysis (see section 3). Among these documents the highest ranking are a communication by the commission to the parliament on the implementation of the European Growth Model (European Commission 3/2/2022), the regulation establishing the "InvestEU Programme" (European Parliament; European Council 3/26/2021), the European Pillar of Social Rights Action Plan (European Commission 3/4/2021), and the regulation establishing the RRF (European Parliament; European Commission 2/18/2021).

Table 1: 20 most twin transition relevant policies by twin transition score

	Policy Document Name	Policy Element	Digital-Score	Green-Score	twin transition-Score	Social Score
1	Towards a green and digital future	Other EU documents	4028	3534	115887	822
2	100 climate-neutral cities by 2030 - by and for the citizens	Other EU documents	1889	2273	45076	157
3	Horizon Europe. Work Programme 2021–2022. 7 Digital, Industry and Space	EU instruments	7311	3814	35391	3968
4	Towards a Green, Digital and Resilient Economy: our European Growth Model	Non-binding EU Policies	463	428	22381	106
5	InvestEU	EU Legislation	969	1215	19385	548
6	Survey on the contribution of ICT to the environmental sustainability actions of EU enterprises	Other EU documents	1543	2556	16584	86
7	Social innovations for a fair green and digital transition (ESF-2022-SOC-INNOV)	EU instruments	288	314	13918	309
8	The European Pillar of Social Rights (Action Plan)	Non-binding EU Policies	418	371	13122	1104
9	Towards a Sustainable Europe by 2030	Other EU documents	1175	2106	11570	1779
10	Recovery and Resilience Facility	EU Legislation	495	604	11030	490
11	Transition pathways for European industrial ecosystems	Other EU documents	1023	1858	9932	571
12	Ecodesign for Sustainable Products Regulation	EU Legislation	693	537	9680	379
13	Business Innovation Observatory	Other EU documents	449	553	9679	1255
14	A Competition Policy Fit for New Challenges	Non-binding EU Policies	319	282	9616	65
15	European Chips Act	EU Legislation	553	446	9316	271
16	Artificial intelligence, platform work and gender equality	Other EU documents	6122	784	8936	4220
17	Horizon Europe Research & Innovation Framework Programme	EU Legislation	631	891	8917	581
18	Digitalisation in the Construction Sector	Other EU documents	5654	807	8614	486
19	The future of jobs is green	Other EU documents	836	3149	6867	321
20	Energy Performance of Buildings Directive (EPBD)	EU Legislation	425	623	5554	745

Beyond the top ranked policies, the overall twin transition score as well as the balance between the two dimensions of this transformation (i.e. digital and green aspects) reduce quickly (compare full table in appendix 6.1). Furthermore, some policies, like the Energy Performance of Buildings Directive (European Parliament; European Council 5/8/2024), are highly sector-specific regulations that fall outside the scope of the READJUST project, which focuses on general twin transition objectives or policies specifying these objectives for the agri-food and mobility sectors. This general uncertainty about the actual intention of a policy beyond the purely quantitative assertion of topical relevance makes further qualitative analysis necessary (cf. sections 3 and 4).

Furthermore, if looking beyond only the results of the twin transition index by taking the social scores of each document into account, it becomes apparent, that while certain twin transition policies can be identified at EU-level, it remains unclear from this quantitative exploration how strongly these documents are concerned with social issues and the general topic of inequality. Generally speaking, with the exception of the "European Pillar of Social Rights Action Plan" (European Commission 3/4/2021), the Horizon Europe Framework Programme (European Parliament; European Council 5/12/2021), theRRF (European Parliament; European Commission 2/18/2021) and interestingly the Directive on the Energy Performance of Buildings (European Parliament; European Council 5/8/2024), social keywords appear much less frequent in these policies than keywords of either green or digital transition. Similarly, if looking at those documents classed as Non-binding and EU-Legislation, with the highest social scores, only very few show simultaneously high twin transition scores (cf. Appendix 6.4), the only significant exception being the already mentioned InvestEU programme (European Parliament; European Council 3/26/2021).

2.3 Discussion

From the quantitative exploration as described above, policies can be identified at EU level with a potentially high relevance to twin transition based on their relative treatment of issues in the domains of digitalisation and green transformation. However, these policies differ vastly in topic ranging from economic and industrial to social issues and include various policy types including regulations, strategies, or even specific funding instruments. At the same time, keywords related to social and inequality aspects appear less frequently in these documents.

This exploratory quantitative examination of the relationship between twin transition and social issues has clear limitations. One inherent problem is the observation that EU policies are highly interdependent. For example, while the European Growth Model does not mention social issues by itself at a high frequency, it refers and opens dependencies to certain policies which explicitly focus on these issues (as for example the European Pillar of Social Rights). This is in line with the policy mix perspective introduced above (i.e. focusing on the

interaction of different policies) and means that judging the intent of the policy purely on base of quantitative frequencies is limited and needs further qualitative assessment.

Another issue lies in the assessment of the inequality consequences of policies, since it can be assumed that (presumed) twin transition policies might have positive or negative social and inequality related effects (including unintended consequences), beyond what is or can be considered in the underlying policy documents themselves.

Lastly, as the term itself (Kovacic et al. 2024), twin transition policies remain hard to define. The approach taken in the quantitative assessment of these policy documents was based on certain keywords with obvious thematic (digital, green or social) connotations of often very technical nature. However, depending how the issue of twin transition is being framed, policies explicitly and even intentionally addressing its social and justice effects might still make very little mention of such technical terms, or if so, only in the most general and off-handed way (as for example short problem descriptions in the pre-amble). This in effect could result in such policies not even being identified as twin transition policies in the first place, despite being so by intent.

Hence, while this quantitative keyword-based text analysis is no replacement for a deeper policy analysis, this approach can serve to narrow down the scope for the subsequent qualitative in-depth approach. Therefore, the results of this approach serve as the basis for the selection of the policies under deeper review in sections 3 and 4. Because the focus of the present study lies on the communalities, synergies and interdependencies of policies themselves, the decision was made to focus the qualitative for the most part on the “Non-binding EU policies” ranked highest by twin transition score, since they contain the overall policy strategies and therefore reflect best the potential conscious intent (or lack thereof) by EU policymakers in treating the phenomenon of twin transition and related extant inequalities (cf. Appendix 6.4). However, certain specific policies classified as “EU Legislation” were included as well, if they were deemed of systemic enough relevance to subject to deeper qualitative analysis and showed a high twin-transition score as in the case of the legislation underlying the InvestEU and RRF programmes (cf. Appendix 6.4).

3 Qualitative content analysis of EU twin transition policy documents

Beyond identifying the most relevant twin transition policies at EU level, this deliverable conducts a qualitative content analysis to explore how existing and potential inequalities are framed and addressed in selected policy documents. The research question examined in this analytical phase is stated as follows: **How do twin transition policies (in their interplay) address twin transition inequalities?** The aim of this analytical step is to better understand the inequality aspects highlighted, e.g. which inequality aspects are reflected in policy documents and which measures are described to address them.

3.1 Methodology

Starting from the quantitative exploration of EU twin transition policies, 15 policy documents were selected for a more detailed qualitative document analysis (see Table 2). These policies were selected due to their high 'twin transition' score (see section 2). Additionally, two policies were selected due to the sector specific focus of the READJUST project on the food and mobility sector, namely the Farm to Fork Strategy (European Union 2020) and the Sustainable & Smart Mobility Strategy (European Commission 12/19/2020). Sector-specific insights were coded during the qualitative document analysis to understand the references made to both sectors. However, apart from these two, the policy analysis adopted a broader focus beyond sector-specific policies. This approach provides a common starting point for READJUST to better understand what constitutes 'twin transition' policies at EU level.

All policy documents were analysed in a qualitative content analysis approach (Mayring and Fenzl 2014; Mayring 2015; Kuckartz 2018) using MAXQDA. The analysis proceeded in three steps.[9] In the initial step, a set of descriptive codes was applied to identify the green and digital elements referenced within the policies. In this step, also definitions of the 'twin transition' were coded, along with aspects related to social justice and inclusion. In a second step, references to inequality aspects were coded. This was done based on the inequality themes identified in READJUST's D1.1 (Stadler et al. 2024) including aspects of accessibility, procedural inequalities, environmental (in)justice, market driven inequalities, labour market effects as well as horizontal and spatial inequalities. Finally, a third set of codes was used to descriptively capture sector-specific insights from the mobility and food sectors, which are a focus of the READJUST project.

The sampling strategy followed in this task allows to better understand how the twin transition is framed in EU policies and helps identify the specific policy measures designed to support it. However, a key limitation lies in the complexity of the EU policy landscape, which permits only a qualitative examination of a very limited selection of documents. Policy documents frequently reference a range of other policies, reflecting this complexity in line with the policy mix perspective applied in this deliverable. To enable a closer examination of various mechanisms and measures within this complex policy landscape, the analysis presented here draws on the selection of documents identified through the quantitative exploration described earlier. Another limitation is that the analysis only captures references to the forms of social inequalities explicitly reflected within them. The analysis therefore does not allow for conclusions to be drawn about the inequalities that may arise from the policies. Nevertheless, it highlights which aspects are more prominently addressed and identifies potential gaps in addressing inequalities. Finally, it is important to note that the number of coded text segments does not provide insights into the qualitative

[9] The full list of deductive codes can be found in Appendix 6.5

content or the depth of references to social inequalities. The analysis presented below is based on qualitative findings, which are organised in table format for clarity. The absence of specific inequality aspects in the analysis does not necessarily indicate a complete lack of reference to these topics in the documents.

Table 2: Overview of selected EU twin transition policies for qualitative content analysis

No.	Name / Description	Reference
1	**InvestEU programme (2021-2027)** EU initiative that consolidates various EU financing instruments under one framework to supports economic recovery, resilience, green growth, and employment within the EU	(European Parliament; European Council 3/26/2021)
2	**Recovery & Resilience Facility (2020-2026)** A key component of the EU's NextGenerationEU recovery plan that focuses on making EU economies and societies more sustainable, resilient, and prepared for green and digital transitions	(European Parliament; European Commission 2/18/2021)
3	**EU Growth Model: Green & Digital (2022)** The model outlines investments and reforms for driving the green and digital transition, aiming to achieve economic and social resilience.	(European Commission 3/2/2022)
4	**European Pillar of Social Rights Action Plan (2021)** Initiative that outlines principles and targets to support social rights and improve living and working conditions.	(European Commission 3/4/2021)
5	**Competition Policy for New Challenges (2021)** Review of EU competition policies aimed at accelerating recovery from the COVID-19 pandemic and supporting the green and digital transitions.	(European Commission 11/18/2021)
6	**Renovation Wave for Europe (2020)** An initiative under the European Green Deal aimed at enhancing energy efficiency in the building sector through funding support and revisions to legal frameworks.	(European Commission 10/14/2020)
7	**Sustainable & Smart Mobility Strategy (2020)** plan for the green and digital transformation of the EU transport system, setting milestones and defining key areas for action	(European Commission 12/19/2020)
8	**Update to New Industrial Strategy (2021)** Updated Strategy to address the economic impact of the COVID-19 pandemic and accelerate green and digital transitions, focusing on the resilience of the Single Market	(European Commission 5/5/2021)
9	**Urban Agenda for the EU: 'Pact of Amsterdam' (2016)** Framework for involving Urban Authorities in achieving Better Regulation, Better Funding, and Better Knowledge to support the EU's economic, environmental, and social objectives.	(European Commission 2016)

10	**New Industrial Strategy for Europe (2020)** Strategy for a resilient, sustainable, and innovative European industrial ecosystem, aiming to promote competitive sustainability.	(European Commission 3/10/2020)
11	**Action Plan for Digitalising Energy System (2022)** The plan aims to support the decarbonisation of the energy system through digital technologies, while also ensuring cybersecurity and data privacy.	(European Commission 10/18/2022)
12	**European Green Deal (2019)** EU's central strategy aimed at achieving climate neutrality by 2050, promoting sustainable economic growth, and ensuring that no one is left behind.	(European Commission 12/11/2019)
13	**Fair Transition Recommendation (2022)** Guidance to Member States and proposed measures to ensure a fair transition towards climate neutrality	(Council of the European Union 6/27/2022)
14	**Resource Efficiency Roadmap (2011)** Strategy for a sustainable economy, focusing on reducing resource use and minimising environmental impacts.	(European Commission 9/20/2011)
15	**Farm to Fork Strategy (2020)** Strategy for a sustainable, equitable, and health-conscious food system, addressing all stages of the food chain	(European Union 2020)

3.2 Results

The following section summarises the results of the descriptive coding of twin transition elements in EU policy documents (first- and third-level codes) and the coding of inequality aspects in these documents (second-level coding). It is organised as follows: First, it addresses the references to the twin transition described in the analysed documents, followed by an overview of the green transition objectives, the digital transition objectives, and finally the just transition objectives. Key policy references are highlighted in boxes at the end of each subsection. Second, references to inequality aspects are presented, beginning with an overview (see Table 3) and followed by a structured description based on the inequality dimensions.

3.2.1 Twin transition elements in EU policy documents

Twin transition elements, including green, digital, and just transition objectives, are described in varying levels of detail in the analysed EU policy documents. To support the twin transition objectives, references to other policies are highlighted within the complex policy landscape of the EU. These references point towards synergies and commonalities between different policies within the EU twin transition policy mix. However, conflicting objectives, a lack of synergies, varying priorities, or differing speeds in achieving objectives may act as hindering factors.

The twin transition policy mix

The analysed EU documents refer to the overall aim to accelerate and lead the twin transition to increase Europe's competitiveness. For instance, the Competition Policy for New Challenges highlights the objective of enabling EU industries to lead the twin transition, ensuring future competitiveness and fostering open strategic autonomy in a global context (European Commission 11/18/2021). The twin transition is therefore defined in line with the European Growth Model's objective of achieving competitive sustainability (European Commission 3/2/2022). Relevant policies outlining the twin transition objectives are the European Green Deal (European Commission 12/11/2019) as the core strategy related to Europe's green transitions and the Digital Decade (European Commission 3/2/2022) as central strategy related to Europe's digital transition. Furthermore, twin transition objectives are embedded in several **funding programmes**, notably the InvestEU programme, the Horizon Europe Programme and RRF that provides a detailed methodology for assessing funded projects and their contributions to digital and green objectives.

The objectives of the twin transition are also embedded in **sector specific strategies** and programmes on how these sectors can be aligned with the overall objectives of the twin transition. This includes the Sustainable and Smart Mobility Strategy (European Commission 12/19/2020), outlining the aim that green and digital transitions should reshape the sector and the Farm to Fork Strategy (European Union 2020) e.g. referring to the digital transformation of farms. Furthermore green and digital objectives are outlined for the building sector (European Commission 10/14/2020) or the energy sector (European Commission 10/18/2022). In terms of **technologies and innovations**, the twin transition is linked to various different technological developments in different sectors, e.g. smart buildings, smart and sustainable mobility systems, digital product passports, precision farming, energy and material efficiency or energy efficient semiconductors (European Commission 3/2/2022). Additionally, developments in hydrogen, batteries, offshore wind, safe chemicals, cybersecurity are identified as important enablers of twin transition (European Commission 5/5/2021). The Green Deal also highlights technological developments such as artificial intelligence, 5G, cloud and edge computing, the internet of things, distance monitoring of air and water pollution, clean hydrogen or carbon capture as significant examples (European Commission 12/11/2019).

While the policies outline the overarching objectives of the European twin transition, the associated **economic and societal challenges** of the green and digital transitions are also reflected: "The twin ecological and digital transitions will affect every part of our economy, society and industry. They will require new technologies, with investment and innovation to match. They will create new products, services, markets and business models. They will shape new types of jobs that do not yet exist which need skills that we do not yet have. And they will entail a shift from linear production to a circular economy." (European Commission 3/10/2020). Especially the need for skilled innovative workforce and to invest in education

and training systems are therefore highlighted (European Commission 3/4/2021). The documents therefore emphasise the need for twin transition to be implemented in a fair and inclusive manner.

Box 2: Referenced policies supporting the twin transition

Green Transition Objectives: Climate neutrality by 2050, European Green Deal

Digital Transition Objectives: Digital Decade, Digital Agenda, Digital Compass

Investments and Funds aligned with twin transition objectives: RRF, Horizon Europe Programme, NextGenerationEU, Connected Europe Facility, Global Gateway Strategy

Sector specific targets and programs: Smart Mobility Strategy, Farm to Fork Strategy, European Coal and Steel Community, Action Plan for Digitalising Energy System, Renovation Wave for Europe

EU initiatives: European Green Digital Coalition, European Green Deal data space, Destination Earth initiative

Green Transition objectives

The Fair Transition Recommendation outlines the objective of achieving a green transition, with reference to key European climate policies: "'Green transition' means the transition of the Union economy and society towards the achievement of the climate and environmental objectives primarily through policies and investments, in accordance with the **European Climate Law** laying down the obligation to achieve **climate neutrality by 2050**, the **European Green Deal** and international commitments, including the **Paris Agreement**, other Multilateral Environmental Agreements and the **Sustainable Development Goals**." (Council of the European Union 6/27/2022). Other policies more explicitly connect the green transition objectives to growth objectives, such as sustainable growth (European Commission 3/2/2022) and innovation in green products and services (European Commission 11/18/2021).

Green transition in the Mobility sector: For the mobility sector, EU policies connect green objectives with the growth agenda, stating that "[g]reening mobility must be the new licence for the transport sector to grow." (European Commission 12/19/2020). Green growth in the mobility sector e.g. refers to interconnected multimodal transport system, high-speed rail networks, infrastructure for zero-emission vehicles and smart and sustainable urban mobility (European Commission 12/19/2020; European Parliament; European Council 3/26/2021). The Sustainable & Smart Mobility Strategy sets specific **green transition objectives for the mobility sector**, such as having at least 30 million zero-emission vehicles on European roads by 2030, introducing zero-emission large aircraft to the market by 2035, and ensuring that nearly all cars, vans, buses, and new heavy-duty vehicles are zero-emission by 2050 (European Commission 12/19/2020).

Green transition in the Agri-food sector: Food systems are identified as major contributors to climate change and environmental degradation. In response, the Farm to Fork Strategy outlines the overarching goal of making "the EU food system a global standard for sustainability" (European Union 2020). This involves reducing reliance on pesticides and antimicrobials, minimising excessive fertilisation, expanding organic farming, enhancing animal welfare, and reversing biodiversity loss (European Union 2020; European Commission 12/11/2019). The **green transition objectives in the agri-food sector** include achieving 25% of the EU's agricultural land under organic farming by 2030, reducing the use of chemical pesticides by 50% by 2030, and halving per capita food waste at the retail and consumer levels by 2030.

Box 3: Referenced policies supporting the Green Transition

Policy Objectives: Paris Agreement, climate neutrality by 2050
Policy Strategies: 2030 Agenda for Sustainable Development, European Green Deal
Legislative acts: Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources, European Climate Law, Regulation (EU) 2020/852 on sustainable investment, Fit for 55 package.

Digital transition objectives

The **EU Growth Model** highlights the scope of digital transition, emphasising their transformative impact on various aspects of society and the economy. According to the model: "Digitalisation is transforming the way people study, work and connect with each other. At the same time, it allows entrepreneurs to set up and grow their business wherever they live, opening markets and investments across Europe and globally, and creating new jobs." (European Commission 3/2/2022). The **2030 Digital Compass** outlines the goals of Europe's digital transformation aimed at fostering solidarity, prosperity, and sustainability. Key objectives include employing 20 million ICT specialists in the EU by 2030, ensuring all European households have access to a Gigabit network by 2030, and achieving at least 20% of global production in sustainable semiconductors within Europe by 2030 (European Commission 3/9/2021). In terms of contributing to the green transition, the Compass states that "Digital technologies can significantly contribute to the achievement of the **European Green Deal** objectives". For instance, the introduction of a **Digital Product Passport** aims to enhance transparency and enable more sustainable choices. The **Digital Europe Programme**, the **InvestEU** programme as well as the **RRF** support investments in a broad range of technologies, such as investments AI factories, quantum technology, cybersecurity, the internet of things, blockchain, robotics and automatisation, photonics, digital solutions for distance monitoring of air and water pollution and energy efficiency or the Destination Earth initiative aimed at creating a digital twin of the Earth. Furthermore, education and training for skills development, the digitalisation of public services and education systems

and businesses (European Parliament; European Council 3/26/2021; European Parliament; European Commission 2/18/2021; European Parliament; European Council 5/11/2021). One underlying principle in this context is that digitalisation should contribute to the principles of interoperability, energy efficiency, and personal data protection for example in digitalised workspaces (European Parliament; European Commission 2/18/2021; European Commission 3/4/2021).

Digital transition in the Mobility sector: The **Sustainable & Smart Mobility Strategy** identifies digitalisation as a crucial driver for modernising the transport system. According to the strategy: "Digitalisation will become an indispensable driver for the modernisation of the entire system, making it seamless and more efficient." (European Commission 12/19/2020).Technologies described as enablers of this transition in the mobility sector include automated and connected multimodal mobility, smart traffic management systems powered by digitalisation, and the integration of smart mobility solutions (European Commission 12/11/2019). The Strategy also highlights critical areas such as cybersecurity, public and social acceptance of digital technologies, the deployment of digital infrastructure (through 5G), and ensuring data availability, access, and exchange to support smart mobility solutions. Finally, the strategy sets digital transition objectives for the mobility sector, such as the large-scale deployment of automated mobility by 2030 and the full operationalisation of the multimodal Trans-European Transport Network (TEN-T) by 2050 (European Commission 12/19/2020).

Digital transition in the Agri-food sector: Also in the Agri-food sector, digitalisation is identified as a key driver of sustainable development, as the **Fark to Fork strategy** states: "Farmers, fishers and aquaculture producers need to transform their production methods more quickly, and make the best use of nature-based, technological, digital, and space-based solutions to deliver better climate and environmental results, increase climate resilience and reduce and optimise the use of inputs (e.g. pesticides, fertilisers)" (European Union 2020). Specific technologies promoted include the digitalisation of catch certificates to combat illegal fish products, the exploration of digital tools to improve food information accessibility or precision agriculture (European Union 2020; European Commission 12/11/2019). The Farm to Fork Strategy does not explicitly define objectives for the digital transition of the food system. Instead, it encourages the use of digital technologies, for instance, by providing funding to improve digital food information and facilitate the green and digital transition of farms (European Union 2020).

Box 4: Referenced policies supporting the Digital Transition

Policy Objectives: 2030 Digital Compass: the European way for the Digital Decade

Policy Strategies and Action Plans: Digital Finance Strategy, SME Strategy for a sustainable and digital Europe, European Strategy for Data, Digital Education Action Plan, 5G Action Plan

Legislative acts: Digital Markets Act, Digital Services Act, European Chips Act, Data Act

Funding Programmes: Digital Europe Programme, Connecting Europe Facility, InvestEU, RRF

Just transition objectives

Achieving a socially inclusive and equitable transition towards a green and digital Europe is identified as a cross-cutting priority in the analysed twin transition policies. This objective is further detailed through fundamental principles such as the '**no one is left behind**' principle and the '**do no significant harm**' principle. The 'no one is left behind' principle serves as a basis of the 2030 Agenda for Sustainable Development and its Sustainable Development Goals: "As we embark on this great collective journey, we pledge that no one will be left behind. Recognizing that the dignity of the human person is fundamental, we wish to see the Goals and targets met for all nations and peoples and for all segments of society. And we will endeavour to reach the furthest behind first (United Nations 2015, pp. 6–7). Furthermore, the EU Regulation 2019/2088 defines in particular sustainable investments along the principles that "neither the environmental nor the social objective is significantly harmed" (European Parliament; European Council 12/9/2019) and the Fair Transition Recommendation outlines a 'polluter pays principle": "Principles of social fairness, cohesion and solidarity are firmly built into the design of relevant climate, energy and environmental frameworks at Union level, including via the 'polluter pays principle' [...]"(Council of the European Union 6/27/2022, p. 5)

The analysed documents also identify specific groups of people who are particularly vulnerable to the impacts of green and digital transitions. According to the **Fair Transition Recommendation**: "People and households in vulnerable situations' means those who, independently of the green transition, face or are at risk of facing a situation of limited access to quality employment, including self-employment, and/or to education and training and/or to a decent standard of living and essential services, implying low capacities to adapt to the consequences of the green transition" (Council of the European Union 6/27/2022, p. 10). The opportunities presented by the twin transition should be accessible to all individuals, "irrespective of sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation" (European Commission 3/4/2021, p. 4).

Principles of social justice and fairness in the mobility sector: The **Sustainable and Smart Mobility Strategy** references the **European Pillar of Social Rights** to define the objectives of a just transition in the mobility sector. This includes ensuring that mobility is "available and affordable for all," with specific attention to rural and remote regions, as well as accessibility for people with disabilities or low digital literacy. The strategy also highlights the 'polluter pays' principle and the importance of fair pricing across transport modes. Additionally, it addresses passenger rights and the rights of workers in the transport sector.

Principles of social justice and fairness in the agri-food sector: The **Farm to Fork Strategy** emphasises that all citizens and value chain operators, should benefit from a just transition. The strategy aims to ensure that everyone has access to sufficient, nutritious, and sustainable food, and to ensure plant health, and animal welfare. Additionally, it prioritises preserving food affordability, ensuring fair economic returns across the supply chain, and making the most sustainable food options the most accessible and affordable.

Box 5: Referenced policies supporting the Just Transition

Policy Objectives: Charter of fundamental rights, European Pillar of Social Rights, UN 2030 Agenda for Sustainable Development, UN Convention on the rights of persons with disabilities

Policy Strategies and Action Plans: The European Pillar of Social Rights Action Plan, European Disability Strategy

Legislative acts: Employment Equality Directive, Racial Equality Directive, Work-Life Balance Directive

Funding Programmes: Cohesion Fund, Just Transition Fund, NextGenerationEU

Initiatives: EU Energy Poverty Observatory

3.2.2 Inequalities aspects referenced in EU twin transition policy documents

Starting from different types of inequality in the twin transition (as identified in READJUST's D1.1, see Stadler et al. 2024), the references to these inequality aspects made in the policy documents were coded. As described above, it is important to note that this approach follows a qualitative logic, and the number of coded segments does not allow conclusions about the depth of references made to certain inequality aspects. Nevertheless, the coding results highlight which aspects receive particular attention. Table 1 provides an overview of the coded inequality aspects. The results are presented in a style aligned with a heat map. A particularly dark colour indicates that this aspect is especially emphasised in the analysed documents.

The visualisation of the heat map indicates two key findings:

1. First, certain dimensions of inequality are referenced less frequently than others. This is particularly evident for the dimensions of procedural and environmental justice, which are mentioned only to a limited extent, in contrast to market-driven inequalities and labour market effects, which appear more frequently in the analysed policy documents.
2. Second, some policies explicitly reference multiple aspects of inequality, with the RRF notably linking to all the analysed dimensions. While it was anticipated that policies such as the European Pillar of Social Rights and the Fair Transition Recommendations would clearly reference several inequality dimensions, it is more surprising to see this connection outlined in other policies, such as the InvestEU programme and the Sustainable & Smart Mobility Strategy.

Table 3: Overview of inequality aspects referenced in EU policy documents (presented in the style of a 'heat map')

	Accessibility	Environmental (in)justice	Procedural (in)justice	Market driven Inequalities	Labour Market effects	Horizontal inequalities	Spatial inequalities
InvestEU	x			x	x	x	x
Recovery & Resilience Facility	x	x	x	x	x	x	x
EU Growth Model: Green & Digital		x		x	x		x
European Pillar of Social Rights Plan	x			x	x	x	x
Competition Policy for New Challenges	x			x	x	x	x
Renovation Wave for Europe							
Sustainable & Smart Mobility Strategy	x	x		x	x	x	x
Update to New Industrial Strategy				x	x	x	x
Pact of Amsterdam	x	x		x	x	x	x
New Industrial Strategy for Europe	x				x	x	
Action Plan for Digitalising Energy System	x				x	x	x
European Green Deal				x	x		x
Fair Transition Recommendation				x	x	x	x
Resource Efficiency Roadmap				x	x		x
Farm to Fork Strategy							

Accessibility

Building on READJUST's D1.1 (Stadler et al. 2024), inequalities in terms of accessibility are understood as different conditions in access to smart and sustainable solutions (analysed in D1.1 in the mobility sector) e.g. due to socio-economic barriers or the digital divide. The analysed policy documents refer to several aspects of accessibility. The analysed policy documents address several dimensions of accessibility. For example, the InvestEU programme highlights “Inequality of opportunities” (European Parliament; European Council 3/26/2021, p. 35) and emphasises the importance of measures aimed at enhancing access to education, training, and social services. The Competition Policy for New Challenges approaches accessibility primarily in terms of improving digital connectivity in rural areas to meet the targets outlined in the Digital Decade (European Parliament; European Council 12/19/2022).

In particular, the **RRF** (European Parliament; European Commission 2/18/2021) highlights issues of accessibility, with a focus on connectivity, access to IT services and digital skills. It provides funding mechanisms aimed at improving these areas, thereby promoting digital inclusion. Furthermore, it specifies that these digital solutions should align with energy efficiency criteria and contribute to greenhouse gas (GHG) emission reductions, thereby linking the objectives of the green and digital transitions. The **Action Plan for Digitalising the Energy System** (European Commission 10/18/2022) also explicitly highlights the importance of empowering consumers with limited digital skills. In line with the "nobody left behind" principle, it emphasises that digital tools should be designed in a consumer-oriented manner, considering the specific needs of older individuals in ageing societies.

Accessibility plays a significant role in the context of mobility and is therefore prominently addressed in the **Sustainable and Smart Mobility Strategy** (European Commission 12/19/2020). The strategy highlights challenges related to mobility in rural and remote regions, as well as issues of accessibility for individuals with reduced mobility. Measures aimed at improving accessibility may be supported through the Just Transition Mechanism, as outlined in the strategy: “The Commission will therefore ensure that possibilities under the just transition mechanism are fully explored to make this new mobility affordable and accessible in all regions and for all passengers including those with disabilities and reduced mobility” (European Commission 12/19/2020, p. 20).

In summary, the selected policy documents underline how the twin transition gives rise to a range of challenges related to accessibility, including digital connectivity, the digital divide, and spatial accessibility. While these documents partially reflect on these aspects of inequality, they address this type of inequality by outlining different funding mechanisms aimed at improving accessibility across different sectors.

Environmental (in)justice

Inequality aspects related to environmental justice are outlined in READJUST's D1.1, highlighting how digitalisation can contribute to mitigating negative environmental impacts, e.g. digital advancements that reduce emissions, noise, and air pollution (Stadler et al. 2024). In the policy documents analysed for this deliverable, environmental justice is addressed in terms of the objectives of these policies. For example, the Pact of Amsterdam (European Commission 2016) highlights the objective of ensuring good air quality through technical and legislative measures, including those related to cars and agricultural activities. The EU Growth Model (European Commission 3/2/2022) quite generally refers to the objective of protecting biodiversity and preventing pollution.

The **RRF** highlights the potential to support investments aimed at mitigating the adverse impacts of climate change. This is particularly relevant to climate change adaptation efforts designed to prevent damage caused by floods, fires, storms, and droughts. Eligible investments include initiatives focused on awareness-raising, civil protection, and disaster management (European Parliament; European Commission 2/18/2021). Similarly, the **Sustainable & Smart Mobility Strategy** sets out the goal of reducing pollution and improving air quality. The strategy explicitly addresses the environmental-related external costs, emphasising that these costs should be borne by those responsible for them. In doing so, it clearly touches upon aspects of environmental justice: "By internalising these external costs, those who use transport will bear the full costs rather than leaving others in our society to meet them and this will trigger a process towards having more sustainable transport modes with lower external costs." (European Commission 12/19/2020, p. 12).

Overall, aspects of environmental justice are less prominently addressed in the documents analysed. The proposed measures to address these issues include, on the one hand, investments aimed at mitigating negative impacts, and on the other hand, the redistribution of costs as well as the introduction of new technical standards.

Procedural (in)justice

Inequality aspects related to Procedural Justice are highlighted in READJUST's D1.1 (Stadler et al. 2024) focusing on the potential to address inequalities in the twin transition. This is particularly linked to equitable planning and decision-making processes supported by digital tools. However, aspects related to procedural inequality aspects are rarely coded in the analysed documents. For instance, the **RRF** (European Parliament; European Commission 2/18/2021) is one of the few that mentions potential investments in government ICT solutions and e-services, which could potentially support decision-making processes. However, there is little elaboration on how these technologies might address or mitigate specific dimensions of procedural (in)justice. Furthermore, the **Fair Transition Recommendation** (Council of the European Union 6/27/2022) refers to the need to include people in vulnerable situations in policy design and decision making, for examples as part

of the 'Climate Pact'. One possible explanation for the limited attention to procedural justice in the documents analysed is that these aspects are often operationalised at the policy implementation level and are therefore less frequently reflected in high-level strategic or legislative texts.

Market driven Inequalities

Inequality aspects associated with Market-Driven Inequalities are outlined in READJUST's D1.1, addressing issues such as market power imbalances, the dominance of private companies, data exploitation, economic disparities, and dependency on technology provided by private firms (Stadler et al. 2024). The analysed documents frequently address aspects related to market-driven inequalities. For instance, the EU Growth Model highlights the importance of trade policies in tackling unfair trading practices while maintaining open access to markets (European Commission 3/2/2022). Similarly, the Update to the Industrial Strategy discusses the market advantages enjoyed by first-mover companies that have already invested in digital and green business models. It also underscores the need to further incentivise business models that promote sustainable competitiveness (European Commission 5/5/2021).

Especially the **InvestEU** programme reflects on market driven inequalities associated with market failures (European Parliament; European Council 3/26/2021). This is especially evident in its focus on investments that contribute to the public good, such as education and skills development, cross-border infrastructure, and initiatives supporting climate and environmental protection. Additionally, the InvestEU programme places emphasis on investments in education, training, health, and housing. "To counter the negative effects of profound transformations of societies in the Union and of the labour market in the coming decade, it is necessary to invest in human capital, social infrastructure, microfinance, ethical and social enterprise finance and new social economy business models, including social impact investment and social outcomes contracting" (European Parliament; European Council 3/26/2021). A strong reflection on market driven inequalities and its balance is also evident in the **Competition Policy for New Challenges.** It highlights the need for ensuring fair conditions for European businesses (European Commission 11/18/2021). For instance, it highlights the necessity for innovative policy instruments to more effectively tackle challenges associated with digital gatekeepers, dominant digital platforms and companies operating within the Single Market "to ensure fair competition in all sectors and to enable European firms to reach efficient scale" (European Commission 11/18/2021, p. 3). A review of competition policy tools "aims at enabling EU industries to lead the twin transition, and fostering the resilience of the Single Market" (European Commission 11/18/2021, p. 2).

Market-driven inequalities are carefully reflected in the analysed policies, connecting these challenges to the objective of developing innovative policy solutions aimed at addressing competition issues, market failures, and imbalances in competition affecting the Single

Market. This aspect lies at the heart of the objective of the twin transition to achieve competitive sustainability (see section 3.2.1).

Labour Market effects

Based on READJUST's D1.1, labour market-related inequalities are identified as outcomes of green and digital developments that might lead to job displacement, skills gap, precarious employment conditions, and instances of labour exploitation (Stadler et al. 2024). Inequalities related to labour market effects are the most extensively addressed in the analysed policies. This particularly refers to the need for skill development. For example, the European Green Deal highlights the importance of proactive reskilling and upskilling, as well as protecting workers during green transition processes (European Commission 12/11/2019). While digital platforms have increased labour market flexibility and accessibility, they have also, in some cases, led to challenging working conditions (European Commission 11/18/2021).

The **European Pillar of Social Rights Action Plan** draws attention to market-driven inequalities that may emerge in the realm of employment. For instance, it underscores the specific needs of low-skilled and low-paid workers, women (referring to the gender employment gap), migrant workers, as well as the challenges posed by youth unemployment. Policy efforts and innovative solutions in labour market policies should therefore focus on fostering the creation of quality jobs, facilitating job-to-job transitions, and promoting re-skilling initiatives (European Commission 3/4/2021). Several policy initiatives are mentioned to address these objectives, such as the Action Plan on the Social Economy (European Commission 2021d), the initiative on the right to disconnect (European Parliament 2021c) or the 2020 Skills Agenda (European Commission 2020b) and the Digital Education Action Plan (European Commission 2020a). The **EU Growth Model** underscores the importance of addressing labour and skills shortages while also emphasising the need to ensure good working conditions, including fair wages.: “The fairness of the twin transition will also require measures to promote adequate working conditions, including as regards minimum wage” (European Commission 3/2/2022, p. 12). Also the **Fair Transition Recommendation** puts a strong focus on the need to ensure high quality job and skill developments (Council of the European Union 6/27/2022). To support vulnerable households, the Recommendation also considers a revision of the taxation system: “Depending on the national and individual situation, this could, for instance, involve a shift of taxation away from labour and towards climate and environmental objectives as envisaged in the proposal for revision of the Energy Taxation Directive, a review of unemployment schemes and/or temporary and targeted direct income support, where necessary." (Council of the European Union 6/27/2022, p. 41).

The need for reskilling and upskilling is the most strongly addressed aspect. These elements directly contribute to the overarching goal of the twin transition: achieving competitive sustainability. These aspects are also linked to investments, e.g. in education and training

or smart specialisation described in the InvesEU programme (European Parliament; European Council 3/26/2021) or der RRF (European Parliament; European Commission 2/18/2021). The policy mix also proposes more radical changes, including the phase-out of policies that counteract this policy objective of achieving competitive sustainability, as highlighted by references to the taxation system.

Horizontal inequalities

Horizontal inequalities, as described in READJUST's D1.1, refer to individual factors that increase vulnerability to aspects of the green and digital transitions. Examples include challenges faced by individuals with disabilities as well as inequalities affecting migrants, homeless individuals, older employees, marginalised workers, racialised workers and undocumented persons as vulnerable groups in twin transition processes (Stadler et al. 2024). Several policy documents emphasise the significance of addressing horizontal inequalities to uphold the principle of leaving no one behind. For instance, both the **InvestEU** programme and the **RRF** outline the possibility of funding initiatives aimed at fostering gender equality, as well as investments in children's and youth education to enhance youth employment (European Parliament; European Council 3/26/2021; European Parliament; European Commission 2/18/2021). The **RRF** furthermore considers the circumstances of migrants, refugees, and marginalised groups, such as the Roma, and their access to education (European Parliament; European Commission 2/18/2021). The **Sustainable & Smart Mobility Strategy** places particular emphasis on addressing the mobility needs of individuals with disabilities (European Commission 12/19/2020). It frames fair mobility as guaranteeing affordability and accessibility, including for people with reduced mobility, disabilities, or limited digital literacy.

In particular, the **European Pillar of Social Rights Action Plan** outlines measures to support the groups most impacted by transitions, aiming to achieve competitive sustainability. The Plan describes disparities in employment, education, social inclusion, and access to essential services. Key issues include the gender employment gap, the high number of young people not in employment, education, or training, and barriers faced by marginalised groups such as LGBTIQ individuals, Roma, ethnic minorities, migrants, and persons with disabilities. To address these inequalities, the document mentions a range of policy initiatives, such as the Employment Equality Directive, the Racial Equality Directive or the European Disability Strategy (European Commission 3/4/2021). EU funding instruments like ESF+ (European Parliament 2021a), Erasmus+ (European Parliament 2021b), InvestEU (European Parliament; European Council 3/26/2021), and Horizon Europe (European Parliament; European Council 5/12/2021) support these goals by investing in social infrastructure, education, and employment opportunities. The aim is “to affirm the EU’s role as a responsible global leader” (European Commission 3/4/2021, p. 31). The **Fair Transition Recommendation** build up on the observation that vulnerable groups are disproportionately affected by the green transition, increasing pre-existing inequalities. As vulnerable groups,

the Fair Transition Recommendation e.g. mentions low-income households, single parents (often women), persons with disabilities, older individuals, and ethnic minorities. These groups face heightened risks of energy and transport poverty or the risk of job losses. Horizontal policy measures seek to mitigate the social impacts of the green transition while promoting equality and sustainability (Council of the European Union 6/27/2022).

To conclude, horizontal inequalities are mentioned in most documents, highlighting that certain societal groups are more affected by the twin transition than others and that the negative impacts on these groups must be mitigated. To address these effects on certain vulnerable groups, the analysed policy documents policies outline cross-cutting equality standards. It is important that, for each sector and policy, it is made explicitly clear how these standards are implemented and upheld.

Spatial inequalities

Inequality aspects related to spatial inequalities are outlined in READJUST's D1.1, focusing on disparities in regional development. These include challenges such as limited digital connectivity in certain areas and the concentration of services in more affluent regions (Stadler et al. 2024). Like the challenges associated with horizontal inequalities, spatial inequality is also identified as a cross-cutting issue in several of the policy documents analysed. For instance, the **Pact of Amsterdam** emphasises the importance of place-based solutions in deprived neighbourhoods and the need "to contribute to territorial cohesion by reducing the socioeconomic gaps observed in urban areas and regions" (European Commission 2016, p. 5). The **Competition Policy for New Challenges** underlines the importance of ensuring territorial cohesion and highlights that "several regions, notably the least developed, still lag behind in terms of digital transformation, from access to the right skills, or the deployment of cutting-edge infrastructures and capacities, to the take-up of digital tools in businesses to enhance productivity" (European Commission 11/18/2021, p. 12). In particular, the Just Transition Fund (European Parliament; European Council 6/30/2021)is specifically designed to support the least advantaged regions.

Especially the **InvestEU** programme reflects on spatial inequalities, related to the challenges that regions undergoing structural transitions are facing. To address these disparities, the InvestEU Programme prioritises under-invested areas, focusing on social infrastructure, education, training, and the re-skilling and upskilling of workers (European Parliament; European Council 3/26/2021). The **Just Transition Mechanism**, aligned with territorial just transition plans, enables investments that benefit affected regions directly or indirectly. Efforts to promote geographic diversification include the establishment of investment platforms that bring together public authorities, financial institutions, and civil society to pool expertise and resources. Also the **Fair Transition Recommendation** highlights the need to support vulnerable regions such as rural, remote, and low-income areas, as well as the outermost regions and islands (Council of the European Union 6/27/2022). To prevent social exclusion in most affected territories, outlined policy initiatives emphasise measures to

support job creation, entrepreneurship, and social protection systems. Investments in social and physical infrastructure, such as renewable energy solutions, affordable housing, and low-emission public transport, aim to enhance connectivity, access to services, and economic resilience.

Spatial inequalities are reflected in different policy documents. To address spatial inequalities, the analysed documents refer to specific measures such as the Just Transition Mechanism and the Just Transition Fund. Given that this issue constitutes a cross-cutting inequality dimension, it is crucial to ensure that spatial inequalities are consistently addressed across multiple policy areas.

3.3 Discussion

The analysis of twin transition elements in EU policies reveals that twin transition is described as a policy objective, focusing on achieving competitive sustainability. However, when it comes to formulating specific policy objectives, green and digital objectives are often addressed separately. For example, targets are set for achieving climate neutrality by 2050 and for the digital transition by 2030, including targets for specific technologies. Yet, the overlaps between these objectives, along with their integration and prioritisation in cases of trade-offs, are articulated much less clearly. These overlaps are made explicit only in a few instances, such as in the context of sustainability or energy efficiency standards for digital technologies. This becomes even more evident when examining the goals for a Just Transition. Overarching principles, such as the reference to the 'leave no one behind' principle, are frequently mentioned as cross-cutting themes in many documents. Additionally, the European Pillar of Social Rights and its accompanying Action Plan outline key principles and objectives for a Just Transition, which are linked to specific measures within various sector-specific policies. However, in relation to the objectives of the twin transition, these principles and their prioritisation are reflected in a less concrete and systematic manner. Connections between twin transition objectives and elements of social inequality are made explicit only occasionally, for example, through the focus on issues such as energy poverty and transport poverty.

Importantly, funding instruments such as the InvestEU programme and the RRF explicitly reference twin transition objectives, thereby enabling support for their implementation. However, these funding schemes tend to be very broad and allow for differing speeds in achieving the targets. While they provide support for both green and digital projects, they may fail to explicitly integrate or connect the two transition processes. Furthermore, legislative acts are outlined that must be aligned with these objectives, focusing on more specific, sector-based measures.

The analysis of inequalities reveals a stronger focus on aspects related to skills, market-driven inequalities, and labour market effects. These aspects are central to achieving the overall twin transition objective of competitive sustainability. Measures to address these

issues include initiatives in education and training, improving workers' rights, competition policies, and the design of tax systems. In contrast, inequality aspects are less prominently reflected, particularly about environmental and procedural inequality. A key point, especially concerning procedural aspects, is the targeted inclusion of vulnerable groups in the development of measures to reduce inequality. This aspect is less emphasised in the analysed documents but should also be viewed more as a process characteristic, which may not be elaborated in detail within the scope of the documents reviewed here. Finally, there are various cross-cutting forms of social inequality, such as horizontal and spatial inequalities. While these are frequently mentioned in the descriptions, it can be assumed that they are particularly complex to address (such as discussed for sustainability related developments in marginalised places, see e.g. Benner et al. 2024; Wei 2015) given that measures must be integrated into different sectoral policies to address cross-cutting inequality dimensions. An important aspect to consider is the intersectionality of vulnerability. This means that certain mechanisms of inequality often tend to reinforce one another. In such cases, a single policy solution targeting specific groups or sectors is usually insufficient. Instead, in line with the policy mix approach, the interplay of different measures is crucial.

It is important to note that the results outlined here come with certain limitations. For this analysis, only a small sample of selected policy documents at the EU level was examined, using a qualitative document analysis approach. Each of these documents is embedded in a complex policy formulation process, characterised by various synergies and overlaps with other documents at different stages of implementation. Consequently, the presented findings offer only a very limited snapshot of the complex policy landscape at the EU level, with the aim of providing systematic insights within this narrow scope.

4 Deep dive into the national implementation of the Recovery Resilience Facility

Main aim of this part of the deliverable is to zoom-in on the national level and present findings related to barriers to implementation and acceptability. The third and final step of the analysis focuses on the implementation of twin transition policies at the national level. This step aims to identify the barriers related to acceptability and implementation within the national context. The research question addressed in this step is as follows: **What barriers exist to implementation and acceptability of one specific twin transition policy (the RRF) at the national level?**

To examine the barriers to implementation and acceptability of twin transition policies at the national level, the analysis focused on a key EU-level instrument, the RRF. The RRF was established in response to the COVID-19 pandemic and is a key pillar of the European Commission’s economic recovery plan, NextGenerationEU. The budget of €723 billion in

loans and grants aims to facilitate the recovery from the economic and social impacts of the pandemic, particularly for those member states hit hardest, while accelerating the green and digital transition. Thereby, the RRF also functions as a long-term investment strategy corresponding to the EU's environmental and climate targets, digital strategy and broader goals of social cohesion and economic resilience. Member states needed to submit the national Recovery and Resilience Plans (RRP), which drafts planned reforms and investments. The RRP's were required to allocate at least 37% of their costs to the green, and at least 20% to the digital transition.

The RRF was thus chosen as a focus of this exercise, as it explicitly targets both the green and digital transition, making it one of the clearest and most structured manifestations of EU twin transition policy. Furthermore, the RRF is the only analysed policy document that addresses all inequality aspects examined in READJUST (see section 3.2.2), making it a strong foundation for analysing how these inequalities are reflected in the implementation process. As all EU member states participate in the RRF, it allows for a comparative analysis across our four countries of analysis (Italy, Spain, Finland, Poland). Additionally, the RRP's focus on societal cohesion also enables to assess whether and how inequality questions are (or are not) addressed when implementing and designing twin transition policies.

Semi-structured interviews were conducted with experts from four EU-countries, Spain, Italy, Finland and Poland. These countries were selected based on READJUST's focus on case studies in these four countries and to represent diverse regional and socio-economic contexts within the EU. For each country, both European Commission staff involved in coordinating or monitoring the RRF and national level stakeholders with expertise on the design and implementation of the RRPs were interviewed.

Table 4: Overview of interviewed experts

Country	EU-level Stakeholders	National-level stakeholders	Other stakeholders (e.g. science, civil society)	Total interviews
Italy	2		1	3
Spain	1	1		2
Finland	2		3	5
Poland	1		1	2

The analysis of the RRF comes with several limitations. First, inequalities are often mentioned only indirectly or described in rather abstract terms within the RRF framework. The focus on this specific programme was chosen to better understand barriers to implementation at the national level in four countries (Italy, Spain, Finland, and Poland). While the RRF is clearly linked to green and digital aspects, it primarily functions as a funding programme, which presents different barriers to implementation compared to regulatory measures. Through the RRF, countries have access to substantial financial

resources via grants and subsidies, enabling them to implement long-standing plans that were previously stalled due to funding constraints. This availability of large sums of money reduces resistance and conflicts around green transitions, making the RRF a less contentious case. Nevertheless, the national implementation plans allow insights into the policy changes on the national level linked to twin transition objectives and which inequality aspects might arise in the process of implementation. The study relied on a very small number of interviews, with only two interviews conducted in Poland. To produce more valid and generalisable insights, it would have been necessary to conduct interviews across a broader range of sectors and stakeholder types.

4.1 Finland

Finland's RRP is coined by a strong climate focus and relatively small budget. With €1.95 billion in grants (and no loans), the country received a modest share of EU recovery funds, consistent with its status as a wealthier member state. The RRP is implemented through Finland's *Sustainable Growth Programme* and was centrally coordinated by the Ministry of Finance, due to its cross-sectoral nature (Kivimaa et al. 2023). All ministries except the Ministry of Defence were involved in the drafting process. As Kivimaa et al. (2023) note, the strong climate focus of the Finnish RRP reflects the political preferences of the government in office at the time, which used the RRP as a mechanism for advancing its ambitious climate agenda, most notably the national target to reach carbon neutrality by 2035.

In terms of funding, 52.3% of the plan supports climate objectives, while 28.9% is dedicated to the digital transition. Key measures for the green transition include an amendment to the Climate Act, a reform of the Waste Act to increase recycling and reuse, a reform of energy taxation to promote renewables and investments into the decarbonisation of the energy sector (€319 million), low-carbon hydrogen (€136 million) and green transportation (€13.6 million). Key measures for the digital transition included investments into high-speed broadband infrastructure (€32 million), the Euoprean Rail Traffic Management System (€85 million), social welfare and health care systems (€100 million), continuous leaning (€32 million), key digital technologies (€25 million) and streamlining work- and education-based immigration (€20 million). The green and digital components were mostly developed in parallel, rather than through an integrated twin transition strategy.

Inequality aspects

The Finnish RRP accounts for justice aspects only selectively (FI3). While the plan includes some social measures (e.g. youth employment centres, access to social and health care services), justice was not a guiding principle in its design or implementation. Concepts such as *social justice* and *just transition* appear only sporadically in the plan—once and twice, respectively, reflecting the **absence of an overarching justice strategy** (Kivimaa et al. 2023). As one researcher explained,

> *Justice-related topics were already part of the research community's discussions on transitions at the time. I'd give two reasons [for the lack of justice]. First, the preparation process and the plan's general logic were very technocratic. It was led by the Ministry of the Environment, Ministry of Economic Affairs and Employment, and the Ministry of Finance—three core ministries that don't necessarily focus on justice. Second, although justice isn't explicitly emphasised, there might have been an assumption that some justice aspects were already integrated through the early consultation process... so they weren't given further attention.* (FI3)

Extensive stakeholder consultations were held prior to the submission of the Finnish RRP to gain 'bottom-up perspectives' and include regional actors (FI1, FI4, FI5) (Tukiainen 2023). Interviewees saw this as an attempt to establish procedural justice, while also noting that the process was ad hoc and came too late in the drafting process, likely limiting its influence on the final plan (FI3) (Kivimaa et al. 2023). However, according to interviewees, the newer REPowerEU component accounted more systematically for justice (FI2), where *"specific tasks related to transition justice in the energy system have been made central"* (FI3).

Spatial justice was identified as a key focus in the European Semester process on Finland, and interviewees agreed it was the main lens through which justice was understood (FI1, FI2, FI3, FI4, FI5). *"We needed to do something that would benefit the whole population—not just those in urban areas."* (FI4). Policymakers aimed to ensure geographic inclusion by directing investments into rural regions, for instance through infrastructure measures such as 5G network expansion or through building the world's first solar park north of the Arctic Circle (FI2). Mobility solutions were also shaped by this spatial logic: instead of focusing on electric buses for city transit, the RRP prioritised public and private charging infrastructures or hydrogen solutions that could be deployed across regions. FI4 explained, *"A large portion of the population lives in areas with long travel distances."* The territorial focus was justified both as an enabler of justice and as an economic necessity (FI4).

Barriers to implementation

Similar to other EU member states, the implementation of Finland's RRP has been slower than planned. Interviewees identified a range of implementation barriers, the most prominent being **external shocks,** such as the war in Ukraine, the energy crisis, inflation, and slower market developments in key technologies like hydrogen (FI1, FI2). These created planning uncertainties and halted investments. The **tight deadline** set by the European Commission—requiring all RRF-funded projects to be implemented by August 2026—was widely seen as unrealistic, especially for infrastructure projects that involve complex permitting processes and long planning cycles (FI4, FI5). *"The RRP did not fully achieve its goals precisely because the implementation schedule was too fast"* (FI4). **Administrative capacity** emerged as another key barrier, especially for smaller countries like Finland that lacks the staff to manage reporting and monitoring requirements (FI1, FI4). Moreover, **regulatory ambiguity** on how to interpret existing rules and criteria, particularly concerning EU rules on green taxonomy and the Do No Significant Harm (DNSH) principle, caused

delays while Finnish authorities sought clarification, e.g. on whether gas-based projects were eligible (FI4). Interviewees also pointed to **changing implementation rules**: *"The reporting rules, auditing, monitoring—everything has been shifting and changing [from the Commission's side]"*(FI3). Finally, the RRP faced **weak political prioritisation** from Finnish policymakers, partly because it lacked public salience and involved rather modest amounts of EU funding (FI2).

Despite these challenges, several aspects of the RRP were seen as successful. Two examples were highlighted. Finland used **open calls**, allowing actors to submit project proposals, which interviewees considered a best practice for promoting transparency, competition, and quality—although the process was also described as slow (FI1, FI3). Additionally, Finland adopted the new **Climate Change Act** as part of its green transition reforms, which allows citizens and organisations to sue the government for non-compliance to climate targets (FI1). This legal mechanism has already been exercised by Greenpeace and the Finnish Association for Nature Conservation (Greenpeace 2024).

Acceptability

The Finnish RRP was widely viewed as uncontroversial, with interviewees reporting little political or public resistance, especially after its adoption (FI1, FI2, FI3, FI4). Some critique emerged during the pre-adoption phase—most notably from the populist True Finns party and other actors critical of EU-level financial integration (FI1, FI2, FI3). Concerns centred less on the plan's content and more on wider questions whether the distribution of recovery funds across EU member states was fair and desirable (Kivimaa et al. 2023). As one researcher explained, *"There was a heated public debate before the RRP was put in place. This was especially driven by the Finns Party, who opposed this kind of common financial mechanism... [and anything] seen by them as a step toward a federal European state"* (FI3). The RRP's content, especially its green or digital components, did not spark notable media coverage or sustained public debate (FI4). This may partly be explained by the RRP's strong alignment with existing national strategies and instruments (FI3), which created a sense of continuity for implementing actors. Another explanation was that, compared to other countries, the Finnish RRP was too small to attract wide public interest (FI2).

Synopsis

The Finish RRP demonstrates, that green and digital transitions are, at least in this case, implemented rather independently. The strong focus on mostly green and climate related issues in the national implementation reflects to a certain extent a separation of the two transitions components on the Finnish institutional level. Consequently, the implementation of the RRF through the national RRP in Finland indicates a rather limited effect on 'twin transition' policy-making in Finland. Since Finland already had set itself very ambitious climate and environmental goals (e.g. decarbonisation and coal phase-out in the Climate Act, or waste management and recycling goals in the Waste Act) while being progressive in

the area of digitalisation, the design and implementation of the RRP mostly underlined or supported existing trends.

***Box 6**: Selected Finish policies relevant in the context of the implementation of the RRP*

Selected national Finish policies relevant in the context of the implementation of the RRP (see European Commission 2021a):

- **Climate Act (update 2022):** legally binding target of CO_2-neutrality by 2035 and net-negative emissions "soon after" (Ministry of the Environment (Finland) 2022)
- **Roadmap for a Fossil-free Transport Sector (2021)**: reduction of 50 % in transport related greenhouse gasses emissions vs 2005 by 2030 (Ministry of Transport and Communications 2020)
- **Digital Infrastructure Strategy 2025 (2018):** nationwide gigabit fibre and 5G coverage; groundwork for 6G (Ministry of Transport and Communications 2019)
- **Social & Health Care (SOTE) Reform Acts 2021:** consolidation of services into 21 welfare regions and the city of Helsinki; including a 7-day care guarantee (Ministry of Finance et al. 2020)
- **Continuous Learning Reform (since 2020):** lifelong-learning ecosystem, digital platforms and skills vouchers for green & digital competences (OECD 2020)

Selected measures to address green, digital and just transition objectives addressed as as outlined in the EU Commission's assessment of the initial plans for RRP implementation (European Commission 2021a):

- Implementation of measures to address **green-transition objectives**: e.g. investments in renewable electricity and grids, low-carbon hydrogen and carbon capture and storage, electrification of industrial processes, phase-out of coal & oil-based heating, renovation grants, nation-wide EV/H_2 charging, diverse restoration and biodiversity & peatland measures
- Implementation of measures to address **digital-transition objectives**: e.g. roll-out of gigabit fibre and 5G in sparsely populated areas, digitalisation of rail traffic control, virtual portals for government, social and health services, and economy, increased RDI support for digital technologies, digital up- and reskilling programmes.
- Implementation of measures to address **just-transition objectives**: Nordic model of Public Employment Services, abolition of extended unemployment benefit days, integrated youth centres, expansion of work-capacity & mental-health services, Continuous-Learning reform incl. vouchers for green/digital skills, broadband and tele-health for remote regions, 7-day care guarantee and health-care reform, strengthened worker protection and full DNSH & social-impact checks.

4.2 Italy

The Italian RRP, or *Piano Nazionale di Ripresa e Resilienza*, stands out through its large budget equivalent to 10.8% of its GDP in 2019 and focus on economic recovery and structural reforms (D'Alfonso, 2024). With €194.5 billion of funding (€71.8 billion in grants and €122.6 billion in loans), Italy is in absolute terms the largest recipient of EU recovery funds. This reflects the country's vulnerability during the COVID-19 crisis and its longstanding structural weaknesses (IT2) (Buti and Messori, 2020). The RRP is centrally coordinated by the Ministry of Finance, with individual ministries responsible for sectoral reforms and investments, and regional and local authorities mainly involved in implementation. Critics argue that the drafting process was highly centralised, with limited opportunities for participation by civil society or subnational actors; a consultative partnership table was established after the plan had largely been finalised (Carrosio et al. 2022).

Italy allocates 39% of its budget to climate goals and 25.6% to the digital transformation. Key green transition investments include energy efficiency in buildings (€16.9 billion), sustainable transport (€34.5 billion), and renewable energy, circular economy, and waste and water management (€24.7 billion), alongside reforms on regulatory frameworks, water governance, EV infrastructure, and electricity market competition. Important digital transition investments include high-speed internet and 5G (€5.3 billion), business innovation and digitalisation (€13.4 billion), and digitalising public administration (€6.1 billion), as well as reforms on cloud services, digital procurement, and data interoperability between government bodies. Despite individual measures, such as smart grids, qualifying as twin transition measures (IT2), interviewees emphasised that the green and digital transitions *"are treated as separate pillars"* (IT3), rather than being integrated into a cohesive twin transition strategy.

Inequality aspects

The Italian RRP formally places equality aspects as a central concern through its three strategic axes: digital transition, ecological transition, and social inclusion and territorial rebalancing (Carrosio et al.). The plan also defines three cross-cutting priorities (gender equality, youth empowerment, and overcoming territorial disparities) that are intended to be implemented across all missions. Mission 5 ("Inclusion and Cohesion") directly addresses equity concerns, allocating around €20 billion to employment, social infrastructure, and territorial cohesion.

A strong equity focus lies in **spatial justice** and efforts to reduce the North–South divide (IT1, IT2, IT3) as *"certain regions, particularly in the South, lag behind"* (IT1). Italy has a national legal requirement (i.e. not imposed by the EU) that mandates a minimum share of RRP funds be directed to Southern Italy, which has historically suffered from structural economic weaknesses and lower institutional capacity. *"This is not an EU rule, but rather an Italian legal requirement aimed at reducing regional disparities,"* IT2 explains. Regional

disparities are also regularly highlighted in Italy's Country-Specific Recommendations under the European Semester.

The RRP also includes measures targeted at horizontal social justice, with interviewees highlighting reforms addressing undeclared work in the agri-food sector or housing for migrant workers (IT1). Despite this, respondents suggest that **equity is not systematically integrated** across the plan (IT1, IT2, IT3), while a report by the Greens/EFA concludes that the Italian RRP only **insufficiently addresses the gender gap** (Badalassi, 2022). As one interviewee puts it, *"My personal view is that equity concerns were addressed through specific measures, rather than being fully mainstreamed across all policy areas in the Italian plan."* (IT1) A notable gap is also the lack of a comprehensive just transition strategy for industrial regions in decline. IT3 argues, *"The biggest gap is around industrial areas that need reconversion"*.

Barriers to implementation

Italy has encountered a range of barriers in implementing its RRP. A key challenge highlighted by interviewees is the **limited administrative capacity**, especially in southern regions and municipalities (IT1, IT2, IT3). Municipalities in the South often lack the technical expertise to identify relevant funding opportunities, prepare competitive applications, or manage complex procurement processes. *"Small municipalities often don't know when funding opportunities are available... They may lack the expertise to prepare a strong application."* (IT2) This uneven capacity contributes to what IT3 called *"the real North–South divide"*. Interviewees also highlighted the **underutilisation of available funds**, as some businesses fail to apply. An example is a €6 billion tax credit intended to support industrial energy efficiency, which has seen surprisingly low uptake. *"Despite being free money, companies are not applying for it, and we don't fully understand why."* (IT2) Possible explanations include complex application procedures or limited awareness among companies. Another major obstacle lies in the technical **complexity and long timelines of large-scale infrastructure investments**, such as those in the railway sector (IT1). These projects involve multiple phases, planning, procurement, and construction, and progress is often slow. Implementation has also been complicated by **external shocks**: *"Inflation and global supply chain disruptions have made implementation, especially for investments, more difficult. Some projects now have higher costs, meaning that with the same budget, fewer targets can be met"* (IT1). **Resistance from the fossil fuel industry**, especially from the oil and gas industry, has further slowed progress, also by lobbying for access to funds despite non-compliance with DNSH standards (IT3).

Several best practices were highlighted by interviewees. The development of **hydrogen valleys** aimed at converting former industrial zones into hydrogen production hubs was successful because *"the incentive structure was well-designed to attract companies that actually wanted to transition to hydrogen"* (IT2). The **Transition 4.0 programme** also proved effective:

> *Transition 4.0 has been very successful, particularly in helping firms upgrade their digital infrastructure and equipment. It also included a training component, which is crucial for both the green and digital transitions. Skills development needs to go hand in hand with infrastructure investments to ensure long-term success.* (IT1)

Another notable success was the **permitting reform for renewable energy**, including the creation of a "one-stop shop" model. The Campania region, where strong political will for renewable energy projects existed, became one of the best-performing regions (IT3).

Acceptability

Public and political support for the Italian RRP is broad, but interviewees argue this might be due to the scale of funding it delivers (IT1, IT2, IT3). As IT3 noted, *"There's broad public acceptance of the RRP, but mainly because of the money involved."* Even parties critical of EU climate policy have supported green investments when they benefit domestic industries (IT3). At the same time, the RRP enjoyed unusually high visibility (IT1). One official explained, *"The RRP has been at the centre of public debate from the start. Given the large amount of funding involved, the stakes are high"* (IT1). Public interest goes beyond typical policy audiences: *"My mother, who doesn't usually follow these topics, knows about it"* (IT2). This prominence also leads to high scrutiny: ministries report regular inquiries from citizens, NGOs, and local actors about specific measures (IT1). Despite broad acceptance, some tensions have emerged in certain sectors. A key example is the Trieste cable car project, which was removed after courts found that it violated the DNSH rules. The DNSH principle has also drawn criticism from some industries and ministries, who view it as overly strict or difficult to interpret (IT2).

Synopsis

The implementation of Italy's Recovery and Resilience Plan (RRP) reveals a limited integrated approach to twin transitions, as green and digital transition measures are treated as separate pillars rather than being cohesively linked (despite individual measures, such as smart grids). The RRP places a stronger emphasis on green transition aspects, allocating 39% of its budget to climate goals compared to 25.6% for digital transformation. Inequality aspects are primarily addressed through a focus on spatial justice, particularly efforts to reduce the North-South divide, with specific measures aimed at social inclusion and territorial rebalancing. However, significant implementation gaps exist, including limited administrative capacity in southern regions, underutilisation of available funds, and a lack of a comprehensive just transition strategy for declining industrial areas.

Box 7: *Selected Italian policies relevant in the context of the implementation of the RRP*

Selected Italian policies relevant in the context of the implementation of the RRP (European Commission 2021b):

- **National Energy and Climate Plan 2021-2030 Italy (updated 2024**): national framework for achieving EU energy and climate goals, addressing e.g. the

objective to achieve 40.5 % of gross final consumption of energy from renewable sources in 2030 (among others)

- **Italian National Strategy for Digital Skills (2021):** outlining objectives for the digital transition such as to equip 70% of the population with at least basic digital skills and bridge the gender skills gap in the ICT sector
- **National Circular Economy Strategy Italy (2022):** framework that outlines policy measures to achieve a transition from a linear to a circular economic model by 2035
- **Transition Plan 4.0 / Transition Plan 5.0:** focus on supporting support Italian manufacturing businesses in their digital transformation

Selected measures to address green, digital and just transition objectives addressed as as outlined in the EU Commission's assessment of the initial plans for RRP implementation (European Commission 2021b):

- Implementation of measures to address **green-transition objectives**: e.g. investments in energy communities, investments in electrolysers, hydrogen production, deployment of the European Rail Traffic Management System, investments in logistics for the agri-food supply chain (among others)
- Implementation of measures to address **digital-transition objectives**: e.g. investments in the digitalisation of public administration and Italian businesses, training on digital skills (among others)
- Implementation of measures to address **just-transition objectives**: e.g. addressing gender equality by promoting female entrepreneurship, investments to strengthen basic digital skills among citizens (among others)

4.3 Spain

The (updated) Spanish RRP contains of €163 billion value of the plan (13.1% of 2019 Spanish GDP) which includes around €80 billion RRF grants and about €83 RRF loans as well es 142 investment streams and 111 reforms (Mileusnic 2025). There is a strong political focus on the green transition which is evident e.g. through the creation of a vice presidency for ecological transition in 2018 (SP2). In terms of the twin transition, green and digital transitions are rather approached separately but can and do surely overlap with the example of the digitalisation of water usage (SP1).

40% of Spain's RRP is intended for climate objectives and 26% of the plan is dedicated to the digital transition. Some of the green and digital investments include the 'Instituto de Crédito Oficial' Loan Facility for the Promotion of Social Housing' which aims to finance the construction and renovation of energy-efficient affordable and social housing (around €22.2 billion), the development and integration of innovative renewable energies into building and

production processes (around €2.4 billion), the program to boost competitiveness and industrial sustainability (around €2.5 billion), the scheme to support the production and uptake of renewable hydrogen (around €1.6 billion) and fiscal incentives for energy efficiency renovations and for purchases of electric vehicles and charging points (around €483 million), investments to the digitalisation of the central government (around €1.2 billion) and the digital transformation of vocational training (around €290 million) (Mileusnic 2025). Besides green and digital efforts, the Spanish RRP lays focus on gender equality as well as social and territorial cohesion (Feás and Steinberg 2021; Aranguiz 2022).

Similarly to Italy, the COVID pandemic hit Spain particularly hard which resulted in Spain being one of the first countries to ask for loans and taking part in intensive negotiations with the EC (SP1). A "*core group of ministries*" (SP2) negotiated with the EC on behalf of the Spanish RRP. This includes the Ministry of Labor and the Ministry for Ecological Transition and Demographic Challenge (SP2). The Spanish Ministry of Finance played a central role in coordination throughout the entire drafting process, including managing negotiations across components of the RRP (SP1). In terms of updates of the evolvement of the RRP, Spanish ministries meet with labour unions and civil organisations with whom they maintain (close) relationships. For example, the Ministry for Ecological Transition holds regular meetings with the five largest environmental NGOs (SP2).

Inequality Aspects

The interview partners (SP1 & SP2) described that equity and justice concerns were already actively debated and tackled before the RRP was in place. In accordance with the priorities established by the current social democratic Spanish Government (SP1) *"[...] inclusive, equity-focused policies were already being developed before the RRP*" (SP2) for example, in the case of equity in access to digitalisation, e.g. digital training centres for women. However, the RRP enabled upscaling or launching of initiatives previously difficult to implement due to a lack of budget (SP2). One example for an inclusive policymaking process is the Spain's Just Transition Strategy which is, however, separate from the RRP (SP1). It targets inequity and injustice more actively and included social dialogue. Therefore, cases in which justice and green priorities overlap are not necessarily dependent on the RRP in the Spanish case.

Barriers to implementation

The implementation of Spain's RRP encounters various challenges. An issue is a rather slow absorption of funds connected to the RRP (SP1, SP2) with "[...] *The large amount of funds has affected many ministries and units that have no prior experience managing EU funds.*" (SP2). Many public institutions are under-resourced and lack the capacity to manage the influx of funds, e.g. in the case of energy efficiency (SP1). In terms of administrative capacity of the ministries, there has been "[...] *more flexibility in hiring staff and a strong push for capacity building within ministries*" (SP2) to establish higher capacities.

Besides external difficulties, such as the war in Ukraine, or inflation, which created high levels of uncertainty and instability, there are structural problems, hindering the implementation of Spain's RRP: Spain's companies are predominantly SMEs (SP1). However, they are often not able to meet requirements for RRP funding or might need more individual and flexible solutions (SP 2).

Some regional and local governments felt sidelined during the drafting process, leading to reluctance to implement measures they did not help drafting. This concerns, for example, reoccurring costs regions did not want to commit to (SP1). Similarly, a lack of institutionalised social dialogue with NGOs and civil society is described (SP1). Another barrier lies within uncertainties in terms of developments of certain green technologies, leading to insecurities in terms of planning. An example is green hydrogen: "*When you're asked to define milestones, outcomes, and impacts in advance, it's difficult. You need testing, and you don't always know if the technology will work or if there will be demand for it*." (SP2)

Acceptability

Public acceptance has generally been described as positive, with many stakeholders viewing the RRP as a necessary step for recovery (SP1 & SP 2). This based on a shared interest in g, even in cases of industries that are criticizing green transition efforts (SP1). However, few projects exist that receive public criticism (SP2). As was the case in Galicia "*where the regional government wanted to finance a company which produces cellulose [...]*" was "*[...] heavily criticised by environmental NGOs because of its ecological impact*." (SP2). Critical public debates focused on implementation challenges, particularly regarding delays in fund disbursement and the functioning of public administration (SP1, SP2). *"Most of the negative attention is focused on implementation, not on what is being done, but how it's being done."* (SP2)

A specific "conferencia sectorial" (SP2) was set up for the RRP. Ministries asked regions to share their priorities to make sure they were consulted. However, disagreements regarding the consultation of regions in the drafting process as well as in terms of distribution of the RRP funds emerged. The interview partners also touch upon regional and local governments feeling left out during the drafting of the RRP: the RRP is therefore perceived as a "*state-led plan*" (SP2). The lack of involvement of regional and local governments is named as a point of criticism, since regional actors and governments are crucial in terms of implementation (SP1), highlighting a disconnect between the national plan and local needs. Similarly, stakeholders were technically consulted but complained about how little impact their input had. For instance, social trade unions raised concerns that there would be a major lack of skills to implement planned measures for energy efficiency (SP1). NGO's criticise structural issues such as a lack of skilled personnel and limited capacity in administration.

Synopsis

Spain's RRP highlights both commitment to green and digital transitions, albeit with some distinct objectives and measures. While the green transition focuses on sustainable energy, biodiversity and circular economy measures, digital transition emphasises enhancing digital skills, enhancement of public administration or the promotion of digital connectivity. However, there are some examples where the transition is handled as intertwined, e.g. in the case of the component 'Green and digital transformation of agri-food and fisheries industries'. (Mileusnic, 2025). Still, there is a definitive highlight on green transitional objectives. This aligns with Spain's aforementioned green ambitions prior to the establishment of the RRF.

Box 8: *Selected Spanish policies relevant in the context of the implementation of the RRP*

Selected Spanish policies relevant in the context of the implementation of the RRP (European Commission 2021c)

- **Spanish Strategy on Circular Economy, Spain 2030**: sets quantitative objectives to be met by 2030, such as increasing of reuse and preparation for reuse to 10 % of the municipal waste generated (Ministry for Ecological Transition and Demographic Challenge 2020)
- **2025 Digital Spain Agenda**: includes the (Spanish) Connectivity Plan, the 5G Promotion Strategy, the National Artificial Intelligence Strategy, the National Digital Skills Plan, and the Digitalisation Plan for Public Administrations, the Plan for Digitalisation of SMEs and the Spanish Audio-visual Hub Plan (European Commission 2021e; Third Vice Presidency of the Government and Ministry of Economic Affairs and Digital Transformation 2020; European Commission 2021c).
- **National strategy against the demographic challenge**: aims to assure equal opportunities and the free exercise of citizenship rights throughout the territory, through e.g. the coordination and cooperation of all public administrations, the sustainable use of endogenous resources, and a close public-private collaboration (Ministry of Territorial Policy and Democratic Memory 2019)
- **National Public Procurement Strategy 2023-2026**: with objectives such as to combat corruption, electronic procurement as well as supporting sustainability and innovation in the context of procurement.

Selected measures to address green, digital and just transition objectives addressed as outlined in RRP and the EU Commission's assessment of the initial plans for RRP implementation (European Commission 2021c; Mileusnic 2025):

- Implementation of measures to address **green transition objectives**: e.g. investments in energy efficiency, especially housing renovations, renewable energy (solar, wind, hydrogen), sustainable mobility (urban and long distance), circular economy measures, biodiversity and ecosystem restoration and conservation.

- Implementation of measures to address **digital transition objectives**: e.g. investments in development of digital skills and training, high-speed broadband and 5G Internet, digitalisation of public administration SMEs, and startups, digital transformation and modernisation of strategic sectors such as automative, agri-food, health.
- Implementation of measures to address **just transition objectives:** e.g. investments in reskilling and upskilling programs, measures for the labour market inclusion, support for vulnerable groups and disadvantaged regions (e.g. in terms of employability, financial support for regions, infrastructure updates), targeted youth programs (fostering green and digital skills), social inclusion and care services (e.g. reduction of gender care gap), fast broad-band rollout; assessed application of the DSNH principle throughout the whole RRP.

4.4 Poland

Poland's RRP has a total value of €59.8 billion, which comprises €25.3 billion in grants and €34.5 billion in loans. The Ministry of Funds and Regional Policy is leading the implementation of the Polish RRP. Other ministries were involved in drafting the RRP and contribute to the implementation of measures, such as the Ministry of Finance, Ministry of Economic Development, Labour and Technology, the Ministry of Climate and Environment, the Ministry of Infrastructure, the Ministry of Health, and the Chancellery of the Prime Minister (European Commission 2022a, p. 24). Furthermore, "Poland established a dedicated monitoring committee to oversee the implementation of the RRF. This committee was actually introduced as one of the reforms under the RRF itself, and it has helped improve stakeholder involvement—not just during the negotiation phase but also in the implementation phase." (PL1).

Since the "Polish economy is lagging in bringing emissions reductions and energy sector developments into line with EU targets" (European Commission 2022a, p. 10), the Polish RRP puts a stronger focus on investments supporting the green transition (46.6%) – focusing on the energy and the transport sector (Florczak et al. 2022) – and a, relatively, smaller focus on investments supporting digital transition objectives (21.3%). Key measures for the green transition include changes to the regulatory framework to facilitate the construction of onshore wind energy plants and investments in such plants and terminal infrastructure (€5.1 billion), energy-efficient renovation of buildings (€3.5 billion) and investments in green and smart mobility (€7.5 billion). One focus is on an update to Poland's Clean Air priority programme, supporting lower-income households with renovations and heat source replacements in single-family houses. Measures for the digital transition include investments in high-speed internet access, including access in rural and remote areas (€1.4 billion), the digitalisation of public administration (€100 million) and the digitalisation of education (€1.2 billion). In terms of social policies, Cotta et al. (2025) find that the Polish

national RRP (NRRP) is charachterised by a medium level integration of social and ecological challenges since “prior to the drafting of its NRRP, Poland had a very unfavourable social and environmental policy legacy” (Cotta et al. 2025, p. 7).

Inequality aspects

As Poland is already a “major beneficiary of the EU’s Just Transition Fund” (PL1), the Polish RRP places somewhat less emphasis on just transition aspects. “Instead, Poland chose to approach decarbonisation through a different lens—investing heavily in renewable energy, sustainable mobility, energy efficiency, and the decarbonisation of the heating sector, which is one of the country's most polluting sectors” (PL1). According to Florczak et al. (2022) the Polish RRP fails to directly reference the principles of the European Pillar of Social Rights, only making indirect references to aspects such as gender equity and social and territorial cohesion. The inequality aspects that are actively addressed encompass the development of digital skills and access to high-speed internet, initiatives to reduce the urban-rural gap, efforts to tackle energy poverty, and measures to decrease pollution. However, one interviewee noted that justice concerns were more prominently addressed in areas such as health and education, while they were less evident in green and digital policies (PL1).

Particularly in energy efficiency and housing renovation programmes, investments are specifically aimed at vulnerable communities (PL1). For instance, initiatives such as the Clean Air Programme were established to ensure that low-income households could access funding for renovations and upgrades to heating systems, tackling **energy poverty**. Poland has millions of households still relying on outdated and inefficient coal-based heating systems, which are both costly and harmful to public health (PL1). In this way, the Clean Air Programme also contributes to **environmental justice** aspects.

Another focus was placed on **spatial justice** concerns, particularly regarding the geographical distribution of investments in remote and rural areas. As one interviewee described, the Plan “included binding provisions in the plan to ensure balanced geographical coverage and prevent the concentration of projects in wealthier regions." (PL1). In terms of investments in digitalisation measures, these are aimed to “ to improve social and territorial cohesion, such as investments in the development of network infrastructure to cover ‘white spots’ in broadband access and the development of 5G technology in market failure areas” (European Commission 2022a, p. 30). Reforms within the Polish RRP also address labour rights, particularly concerning issues related to labour migration. For instance, workers in the agricultural sector or those engaged in mobility work are often employed under civil law rather than labour law (PL2). Consequently, the RRP includes legal changes aimed at addressing “increasing labour market segmentation [...] by covering all civil-law contracts by social security contributions and by conducting a study on the single labour contract that might be followed by legislative changes” (European Commission 2022a, p. 36).

Barriers to implementation

Since the beginning of the Polish RRP process, the Polish Government has changed. This governmental shift has been accompanied by a transition from political resistance to green EU policies (PL2) towards a broader engagement of ministries with the European Commission (PL1). Overall, the implementation of the Polish RRP is described as a successful process. In particular, the Clean Air Priority Programme and energy efficiency initiatives are regarded as successes (PL1). Green Urban Transformation Instrument, which supports cities and municipalities in developing climate adaptation plans is mentioned as a successful example (PL1).

Barriers to implementation are associated with **overly ambitious targets**. For instance, measures related to innovative technologies, such as hydrogen investments, are considered too ambitious given that they are still in the early stages in Poland. **Administrative bottlenecks** arise because some reforms and investments require extensive coordination among ministries, which complicates decision-making; the more actors involved, the more challenging it becomes to progress efficiently. Accumulated delays can create a snowball effect, making it challenging to regain momentum once they occur (PL1).

Acceptability

In general, the acceptability of green and digital transition objectives in Poland is regarded as two distinct matters. As one interviewee describes it: “So we are really quite developed when it comes to being used to digital systems. When it comes to Social Security, everything is digitalised so from from that perspective I know that we are far away from other European countries. [...] On the other hand, when it comes to quite everything that is connected to the Green Zone, it is more like the the field is treated as something coming from the EU and as something imposed on us” (PL2). The Polish RRP has received significant media attention and has been highly politicised (PL1). However, one interviewee states the RRP may not be well known to the general public (PL2). Cotta et al. (2025) note that the drafting process of the Polish RRP “was characterised by limited parliamentary debate” (Cotta et al. 2025, p. 8). However, with the change of the Polish government the new Prime Minister Tusk “made unblocking the RRP a political priority, which has increased public and media scrutiny. Previously, when the funds were blocked, the Commission was blamed for the lack of disbursements. Now, with the plan moving forward, the narrative has shifted toward making the plan work effectively” (PL1).

Poland has set up a dedicated monitoring committee to oversee the implementation of the RRF, which is considered a good practice example. NGOs and civil society organisations in Poland have been actively engaged in tracking the development of the RRP process and stakeholders are described as well-informed about the plan, actively monitoring its implementation, and providing feedback (PL1). Cotta et al. (2025), state that stakeholder

consultation within the Polish RRP resulted in the incorporation of more ambitious green and just transition targets. One interviewee concludes: “Overall, public acceptance is very high. The RRP is widely seen as a crucial tool for Poland—not just for post-COVID recovery but for broader economic growth and catching up with other EU Member States. Given Poland’s GDP, the financial impact of the plan is substantial” (PL1).

Synopsis

The implementation of Poland's RRP reveals a stronger focus on investments supporting the green transition, particularly as Poland has been described as lagging behind in relation to EU objectives. Key measures for the green transition include significant investments in renewable energy production, especially in offshore wind farms, as well as initiatives aimed at energy efficiency and the Clean Air Programme. The acceptability of green and digital transition objectives in Poland indicates a higher level of acceptance for digital transition measures, reflecting the perception of green and digital transitions as two distinct matters. In terms of addressing inequality, the RRP primarily targets energy poverty and seeks to enhance access to digital skills, with initiatives like the Clean Air Programme specifically designed to support low-income households.

Box 9: *Relevant Polish policies in the context of the implementation of the RRP*

Relevant Polish policies in the context of the implementation of the RRP (see: European Commission 2022a):

- **Strategy for Responsible Development (2017): “**The main objective of the Strategy is: To create conditions for increasing incomes of the Polish citizens along with increasing cohesion in the social, economic, environmental and territorial dimension”
- **National Energy and Climate Plan 2021-2030 (2019):** outlining policy objectives and measures for emission reductions, such as “to achieve 29.8 % share of RES in gross final energy consumption by 2030” (Ministry of Climate 2024, p. 16)
- **Poland’s Energy Policy strategy for 2040 (2021):** including national targets related to three pillars of the energy transiti: 1) Just transition, 2) Zero-emission energy system, 3) Good air quality (Ministry of Climate and Environment 2021)
- **Update to the Polish Broadband Plan (2020):** addressing among others the target to developed 5G connectivity on all major transport routes and in urban centres (Ministry of Digital Affairs 2020)
- **Cybersecurity Strategy (2019):** addressing among others the objective to increase resilience to cyber threats (Ministry of Digital Affairs 2019)

Selected measures to address green, digital and just transition objectives addressed as as outlined in the EU Commission's assessment of the initial plans for RRP implementation (European Commission 2022a):

- Implementation of measures to address **green transition objectives**: e.g. climate investments especially related to offshore-wind farms, renovation of buildings, hydrogen infrastructure, district heating systems, sustainable public transport
- Implementation of measures to address **digital transition objectives**: e.g. investments in access to high-speed internet, digital efficiency of the public sector, improving digital skills, digital transition in the agriculture and agri-food sectors especially in Agriculture 4.0 solutions
- Implementation of measures to address **just transition objectives:** e.g. investments in network infrastructure, support upskilling and reskilling in the regions, development of e-health solutions, ensure a better social protection for certain workers, Do No Significant Harm (DNSH) assessment

4.5 Discussion of barriers to implementation and acceptability of twin transition policies

Even though the RRPs of Finland, Spain, Italy, and Poland display significant differences in their approaches and implementation, a commonality is that none of the four countries adopted a twin transition approach that systematically integrates both green and digital transitions. Poland and Finland have placed a stronger emphasis on green transition aspects within their plans, reflecting governmental priorities (in the case of Finland) or challenges faced in the environmental sector (in the case of Poland). In terms of financial scope, the RRPs of Italy and Spain stand out due to having the two largest budgets, thereby attracting significant media attention and public discourse. In contrast, Finland has a smaller RRP that has not generated much public debate. The political landscape also plays a crucial role in shaping the RRPs. For instance, Spain's plan places a strong emphasis on just transitions, reflecting the interests of the ruling parties and the prevailing political climate, while governmental changes in Poland after the drafting of the Polish RRP have reduced resistance to EU green policies.

In terms of inequality aspects, the national RRPs of Finland, Spain, Italy, and Poland address various dimensions of inequality. However, the specific design of these measures to tackle inequalities is perceived differently and sometimes criticised as inadequate. For example, the required stakeholder consultation processes facilitate the integration **of procedural justice** aspects in the drafting and implementation of the plans. In Finland, these processes are characterised as rather technocratic and therefore limiting actual procedural justice, whereas in Poland, they have been deemed successful in refining green and just transition

objectives. Also **horizontal inequalities** are mentioned across RRPs, for example in Poland with measures aimed at closing the gender gap. While similar measures are noted in Italy, they are described as insufficient to adequately address the gender gap, indicating that horizontal inequalities are not sufficiently tackled in either country. A similarity in the plans lies in their approach to addressing aspects of **spatial inequalities**. For instance, the Finnish RRP includes investments in rural infrastructure. Similarly, Italy focuses on investments in the South, while Poland directs funds towards rural and remote areas. Inequalities related to **labour market effects** are more directly addressed, for example the Italian and Finish RRP particularly mention measures targeted at increasing youth employment. Poland focuses on skills development and gender equity in the labour market context. Overall, just transition objectives are described as not sufficiently integrated within the plans. Instead, they are often addressed rather separately (e.g. through the just transition mechanism) indicating a lack of policy integration in the overall twin transition policy mix.

A critical challenge related to the implementation of the RRPs common to all four countries is the very short time horizon for implementation, with a deadline set for August 2026. This is exacerbated by a lack of administrative capacities, leading to **administrative bottlenecks**. This situation may furthermore contribute to a lack of policy integration across different domains (e.g. green, digital, and social policies), as such integration requires significant coordination efforts. For instance, in the case of Italy, long timelines for infrastructural projects and limited administrative capacities at the local level are identified as challenges. Consequently, Italy faces difficulties in fully utilising available funds. In Spain, small and medium-sized enterprises (SMEs) are similarly struggling with insufficient capacities to implement measures within the constrained timeframe. Barriers to implementation also arise from regulatory ambiguity and **weak political prioritisation**, as described in the case of Finland, and from political resistance against EU green policies, which was evident in Poland at the beginning of the RRP drafting and implementation. Additionally, resistance is also apparent from the fossil fuel industry, as seen in the case of Italy. Additional hindrances to the implementation of national RRPs identified across the four countries include **external shocks**, such as the war in Ukraine, increasing energy prices, and inflation.

A key aspect influencing the acceptability of twin transition policies is the substantial financial support associated with the RRPs. Most interviewees reported a high level of acceptance, as these plans involve significant funding for projects that have already been proposed. Consequently, there is little to no public controversy surrounding these measures, as the prospect of financial support is generally welcomed. However, these findings may not be generalisable to other contexts involving twin transition policies. Nevertheless, in the specific country contexts differences in terms acceptability related to different policy objectives were mentioned. For example, Poland shows a disparity in the acceptance of green and digital transition objectives, reflecting public scepticism towards green transition

objectives while digital transition objectives remain rather unquestioned. For Spain and Italy, while there has been criticism regarding specific projects, such as the Triest cable car, there is generally broad acceptance of the RRP. In Finland, the RRP aligns well with existing policy strategies and instruments, contributing to its overall acceptability.

The focus on a specific programme, the RRF, aims to provide a clearer understanding of the barriers to implementation at the national level in Italy, Spain, Finland, and Poland. While the RRF is clearly linked to green and digital aspects, it presents very specific barriers to implementation that might differ from those associated with broader regulations. This is especially because the RRF provides countries with access to substantial funding through grants and subsidies, enabling them to implement plans that may have been previously stalled due to financial constraints. This influx of money tends to diminish controversies and conflicts surrounding green transitions, suggesting that the RRF may not be the ideal case for generating insights into conflicts, ambiguities, and acceptance that extend beyond its context. For instance, our findings indicate a lack of public conflict surrounding the RRF, which may not be representative of the broader challenges associated with twin transitions. Another limitation in analysing inequalities within the RRPs is that inequalities are often mentioned only indirectly, resulting in a rather abstract description of these issues. Additionally, the study is limited by the very small number of interviews conducted, with only two interviews in Poland. To generate more valid and generalisable insights, a broader range of interviews across different sectors and stakeholder types would have been necessary.

Concerning the national implementation of twin transition policy elements as part of the RRF, the following aspects can be derived based on the findings in the four countries:

Box 10: *Summary of insights from the deep dive into the national implementation of the RRF*

Interaction and influence of the RRF on national policies:

- The **level of interaction** with national policies varies between the different country cases along a topical basis (for example, as seen in Spain and Finland where interaction can be found with national policies related to the climate challenges and other green topics).
- In all cases, with the partial exception of Poland due to political circumstances, the measures outlined in the respective national RRPs were translated in the largest part as an **extension of already existing national level policies and goals** (for example by expanding existing policy objectives, as seen in Poland's climate and decarbonisation targets).
- In General, all four cases demonstrate **a perception of the green and digital transitions as two rather separate phenomena** (for example as demonstrated by

the different policy measures implemented as part of the RRP along ministerial structures)

Translation of the EUs green, digital and just transition objectives in the national Recovery and Resilience Plans:

- **Translation of objectives addressing the green transition:** As required, all four cases include the EU's decarbonisation and climate objectives in their respective RRPs with the decarbonisation of transport, the creation of a hydrogen economy and energy savings through renovation of buildings as a shared theme. Differences, however, become apparent in regard to the relative emphasis of decarbonisation and energy transformation in other areas (e.g. Finland focusing on grid modernisation, while Poland puts the buildup of renewable energy sources) and sectoral focus (e.g. Italy and Poland emphasis the agri-food industries)
- **Translation of objectives addressing the digital transition:** All countries, corresponding to EU-policy goals as required, share and define objectives around digital access and availability, increased public-sector digitalisation and the development of digital-skills, the latter being seen in all cases as an issue of social inclusion. While Poland and Spain foreground skill-build up and digitalisation mostly along sectoral lines (especially in the areas of agri-food, mobility and industry), Finland focusses more on system wide integration (e.g. digitalisation of rail services) while Italy seems to follow more generally broad goals with economy wide measures in support of digitalisation.
- **Translation of objectives addressing just-transition:** All national RRPs outline up- and re-skilling as a mechanism to increase inclusion. Similarly, all plans consider, to varying extent, spatial inequalities as a main area in need of increased attention in regard of the effects of especially the digital transition. Overall, across all four cases the emphasis regarding just transition objectives centers squarely around the topics of spatial, employment and skill related inequalities.

To sumarise, the findings from the deep-dive into the national implementation of the RRF in Finland, Italy, Spain, and Poland indicate that an integrated approach to the twin transition only partially translates into national implementation of policies. National measures and legislation related or implemented as part of the RRF rather follow established sectoral and ministerial boundaries. While the EU's objectives for green and digital transitions are being translated into policy measures at the national level, the resulting policy mix the resulting policy mix does not sufficiently articulate a twin transition approach. EU's social principles in relation to the twin transition are implemented selectively with a strong focus on inequality effects related to the employment markets, skill development or spatial inequalities with other areas of potentially rising social inequity being only selectively addressed.

5 Synergies and commonalities in twin transition policies

This report has provided an analysis of twin transition EU policies, focusing on their relevance for achieving the twin transition objectives, the inequalities they address, and the barriers to their implementation, particularly through the lens of the RRF. From a policy mix perspective, twin transition policies should not be regarded as isolated initiatives but rather as a complex interplay of various interacting policy measures, encompassing both the processes for developing and adapting instruments and the overarching long-term strategies for setting policy objectives.

To answer the research question regarding which EU policies are of highest relevance for the twin transition, a quantitative text mining approach was used and a keyword-based 'twin transition score' was developed. The quantitative exploration identified key policies relevant to the twin transition, including the InvestEU programme, the European Pillar of Social Rights Action Plan, and the RRF. These documents have been classified as strategic, legislative or other policy documents that are part of the political decision-making process. The quantitative exploration revealed a complex policy landscape with very different policy measures covering economic, industrial and social issues and including various types of policies such as regulations, strategies and financing instruments. One finding of the quantitative exploration is that keywords relating to social aspects and inequality tend to occur less frequently in documents with a high twin transition score. The qualitative content analysis also identified green, digital and social policy objectives that aim to achieve competitive sustainability while ensuring that 'no one is left behind'. However, when it comes to more specific objectives, green, digital and just transition objectives tend to be treated separately and are rarely integrated into a common approach. A policy mix for a just twin transition therefore requires greater integration of policy objectives into coherent strategies and specific instruments.

To address the research question of how the identified twin transition policies tackle inequalities, the qualitative content analysis has shown that, although some aspects of inequality are being addressed, significant gaps remain. There is a strong focus on issues related to skills, market-driven inequality, and labour market effects, while aspects of environmental or procedural inequality receive less attention. This highlights the need to design policy processes in a more inclusive manner to better address procedural justice aspects. Furthermore, certain mechanisms of inequality often tend to reinforce one another. In such cases, a single policy solution targeting specific groups or sectors is usually insufficient. Instead, in line with the policy mix approach, the interplay of different measures is crucial.

The in-depth analysis of the RRF has shown that there is also a lack of more systematic integrated approaches to the objectives of a green, digital and just transition in the implementation of the RRF at national level. Some countries, for example, have placed

greater emphasis on green transition objectives or addressed targets for a just transition through separate policy initiatives. Nevertheless, the national RRPs of Finland, Spain, Italy and Poland address various dimensions of inequality – such as aspects related to procedural and environmental (in)equity, spatial and horizontal inequalities, and impacts on the labour market – but the effectiveness of their measures is often considered insufficient. Furthermore, interviews with stakeholders from Finland, Italy, Spain, and Poland revealed barriers to implementation and acceptability, including limitations in administrative capacity, variations in political prioritisation, and the complexities involved in aligning diverse regional needs with overarching EU objectives. Despite these obstacles, the RRF has generally been well-received, primarily due to the substantial funding it provides, which has enabled the execution of long-standing plans that previously faced financial constraints.

Based on the combined results from the different steps of the analysis some conclusions can be drawn regarding synergies and commonalities in policies, strategies and programmes related to twin transitions in EU policies.

1. The quantitative keyword-based analysis as well as the qualitative content analysis of the policies most relevant to twin transitions have shown a certain level of shared language and **discursive alignment** concerning twin transition and inequality dimensions (e.g. referring to the overall aim to accelerate the twin transition to achieve competitive sustainability or to address the 'leave no one behind' principle). However, based on the insights gained as part of READJUST's D1.2, this alignment seems to remain rather rhetorical. Despite a general shared awareness of the phenomenon and its potential social effects, twin transition policies themselves interact mostly on the highest strategic level, i.e. in the overarching policy strategies which outline overarching intentional plans (as for example the outlines to the New Growth Model strategy). Once diving deeper into different components of the twin transition policy mix, i.e. towards the level of concrete legislation or measures, the topical integration seems to be less pronounced so far.
2. Beyond a discursive alignment in strategic policy documents, **funding programmes** such as the RRF, InvestEU or Horizon Europe explicitly refer to green, digital and just transition objectives. Especially the RRF clearly refers to twin transition objectives while also highlighting the need for ensuring social cohesion. However, the deep dive into the national implementation of the RRF in four countries has shown that green and digital transition objectives have scarcely been addressed in an integrated twin transition approach. Therefore, our analysis suggests that the RRF could improve in addressing potential synergies between green, digital and just transition objectives. The RRF furthermore illustrates **implementation gaps** on the national level with green and digital transition objectives for the most part being implemented

separately, rather than being translated into national level policies for a more integrated twin transition approach.

3. Regarding the approach to addressing of inequalities, some commonalities related to **procedural justice** in the implementation of EU-level policies can be found (mostly through increased participatory measures as required as part of the RRPs). However, while policies often refer to cross-cutting principles ('leave no one behind') concrete policy objectives regarding just transitions appear to be less clearly formulated and integrated in the analysed twin transition policies. A partial exception can be found in issues regarding skills, spatial and work-place based injustices and inequalities which are more explicitly reflected in the context of twin transition policies than other inequality dimensions.

In summary, the analysis shows that while some synergies and commonalities demonstrably exist in the complex relation between different policies addressing the twin transition, gaps remain, particularly in their integration and prioritisation. This signals the need for greater coherence in addressing the twin transition objectives, and the importance of promoting synergies to ensure a more equitable and effective transition for all. Future research could enhance insights into the policy mix by examining the national, regional and local level policy mix, allowing for the integration of both top-down policies from the EU and bottom-up initiatives at local levels. Additionally, a process perspective would allow to analyse the formulation and implementation dynamics of these policies, particularly the role of public consultations and political contexts.

6 Appendix

6.1 Full list of EU-policies analysed

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Artificial intelligence, platform work and gender equality	Other EU documents	6122	784	8936	4220	Source
Horizon Europe. Work Programme 2021–2022. 7 Digital, Industry and Space	EU instruments	7311	3814	35391	3968	Source
Towards a Green, Digital and Resilient Economy: our European Growth Model	Non-binding EU Policies	463	428	22381	106	Source
Towards a Sustainable Europe by 2030	Other EU documents	1175	2106	11570	1779	Source
Strategic Dialogue on the Future of EU Agriculture	Other EU documents	266	981	2173	1387	Source
Business Innovation Observatory	Other EU documents	449	553	9679	1255	Source
InvestEU	EU Legislation	969	1215	19385	548	Source
The European Pillar of Social Rights (Action Plan)	Non-binding EU Policies	418	371	13122	1104	Source
Recovery and Resilience Facility	EU Legislation	495	604	11030	490	Source
SMEs and the Environment in the European Union	Other EU documents	377	3672	4977	892	Source
Ecodesign for Sustainable Products Regulation	EU Legislation	693	537	9680	379	Source
Towards a green and digital future	Other EU documents	4028	3534	115887	822	Source
A Competition Policy Fit for New Challenges	Non-binding EU Policies	319	282	9616	65	Source
European Chips Act	EU Legislation	553	446	9316	271	Source
Horizon Europe Research & Innovation Framework Programme	EU Legislation	631	891	8917	581	Source
Energy Performance of Buildings Directive (EPBD)	EU Legislation	425	623	5554	745	Source
A Renovation Wave for Europe	Non-binding EU Policies	373	533	5139	184	Source
Transition pathways for European industrial ecosystems	Other EU documents	1023	1858	9932	571	Source
Sustainable and Smart Mobility Strategy	Non-binding EU Policies	619	1506	5093	238	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Update to the 2020 New Industrial Strategy for Europe	Non-binding EU Policies	406	619	4952	78	Source
Annual Report on European SMEs	Other EU documents	349	1207	2824	528	Source
Pact of Amsterdam	Non-binding EU Policies	160	189	4193	89	Source
Directive on open data and the re-use of public sector information (2019/1024)	EU Legislation	106	96	4024	354	Source
A New Industrial Strategy for Europe	Non-binding EU Policies	393	280	4017	139	Source
Digitalisation in the Construction Sector	Other EU documents	5654	807	8614	486	Source
European Regional Development Fund	EU Legislation	314	475	3863	462	Source
Effective outreach to NEETs	Other EU documents	281	154	1491	436	Source
Energy Communities	Other EU documents	196	1146	1896	419	Source
Digital Services Act	EU Legislation	3062	228	3819	1067	Source
Artificial Intelligence Act	EU Legislation	701	380	3636	3833	Source
MaaS4EU - Mobility as a Service for European Union	Other EU documents	317	717	2668	400	Source
Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast)	EU Legislation (Proposal)	404	1667	3397	805	Source
Digital Economy and Society Index	Other EU documents	2281	317	3436	367	Source
Digitalising the Energy System – EU Action Plan	Non-binding EU Policies	994	400	3271	139	Source
Trade for All: Towards a More Responsible Trade and Investment Policy	Other EU documents	175	275	2021	348	Source
Annual Activity Report 2021 (DG Regio)	Other EU documents	359	552	4299	327	Source
Green Deal Industrial Plan	Non-binding EU Policies	348	751	3004	70	Source
The future of jobs is green	Other EU documents	836	3149	6867	321	Source
An SME Strategy for a sustainable and digital Europe	Non-binding EU Policies	521	297	2994	197	Source
Strategy for financing the transition to a sustainable economy	Non-binding EU Policies	286	525	2747	84	Source
Social innovations for a fair green and digital transition (ESF-2022-SOC-INNOV)	EU instruments	288	314	13918	309	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Renewable Energy Directive (2018/2001)	EU Legislation	257	1731	2680	306	Source
Proposal for a Regulation of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products, amending Regulation (EU) 2019/1020 and repealing Regulation (EU) 305/2011	EU Legislation (Proposal)	237	378	2677	311	Source
Energy performance of buildings (recast)	EU Legislation (Proposal)	328	871	2643	678	Source
Energy Taxation Directive (2003/96/EC)	EU Legislation	122	150	2620	29	Source
Internal Market for Electricity	EU Legislation	345	220	2537	243	Source
Energy Efficiency Directive (EED) (2012/27/EU)	EU Legislation	234	387	2529	243	Source
Guidelines for the Waste Audits before Demolition and Renovation Works of Buildings	Non-binding EU Policies	71	80	2497	39	Source
Resilience dashboards for the social and economic, green, digital and geopolitical dimensions	Other EU documents	303	395	5317	246	Source
Common rules for the internal market in electricity and repealing Directive 2003/54/EC (2009/72/EC)	EU Legislation	71	80	2459	531	Source
Supporting public administrators in EU Member States to deliver reforms and prepare for the future	Non-binding EU Policies	502	263	2454	253	Source
A European Strategy for Key Enabling Technologies	Non-binding EU Policies	176	136	2418	74	Source
Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations	EU Legislation (Proposal)	296	906	2370	320	Source
A hydrogen strategy for a climate-neutral Europe	Non-binding EU Policies	74	1980	2212	41	Source
Industry 5.0 - Towards a Sustainable, Human-centric and Resilient European Industry	Other EU documents	821	368	3115	215	Source
European data spaces	Other EU documents	1223	299	2510	212	Source
EU Cyber Resilience Act	EU Legislation (Proposal)	1618	159	2165	323	Source
Digital Europe Programme	EU Legislation	1343	211	2131	285	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
A European strategy for data	Non-binding EU Policies	839	266	2128	307	Source
Innovation Fund	EU Legislation	42	45	2114	7	Source
Digital Education Action Plan	Non-binding EU Policies	1587	137	2052	179	Source
Public Sector Loan Facility under the Just Transition Mechanism	EU Legislation	176	277	2024	124	Source
Digital Finance Strategy for the EU	Non-binding EU Policies	734	249	1996	112	Source
The European Green Deal	Non-binding EU Policies	246	819	1979	97	Source
European Social Fund plus	EU Legislation	320	188	1961	849	Source
A Secure and Sustainable Supply of Critical Raw Materials in Support of the Twin Transition	Non-binding EU Policies	121	164	1918	94	Source
An Integrated Industrial Policy for the Globalisation Era	Non-binding EU Policies	227	514	1914	259	Source
CAP Strategic Plans (2023-2027)	EU Legislation	233	692	1867	245	Source
A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy	Non-binding EU Policies	225	731	1803	114	Source
100 climate-neutral cities by 2030 - by and for the citizens	Other EU documents	1889	2273	45076	157	Source
European climate pact	Non-binding EU Policies	201	408	1799	77	Source
Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change	Non-binding EU Policies	210	698	1692	88	Source
EU Solar Energy Strategy	Non-binding EU Policies	134	1077	1556	178	Source
Trade Policy Review – An Open, Sustainable and Assertive Trade Policy	Non-binding EU Policies	148	250	1556	189	Source
Data Act	EU Legislation	1265	83	1538	893	Source
Soil Monitoring Law	EU Legislation (Proposal)	126	1035	1482	281	Source
Stepping up Europe's 2030 climate ambition	Non-binding EU Policies	150	882	1452	80	Source
Council Recommendation on ensuring a fair transition	Non-binding EU Policies	171	717	1443	499	Source
Supporting sustainability transitions under the European Green Deal with cohesion policy	Other EU documents	112	392	908	136	Source
Social Climate Fund	EU Legislation	114	1001	1404	416	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Critical materials for strategic technologies and sectors in the EU	Other EU documents	264	408	3153	132	Source
Powering a climate-neutral economy: An EU Strategy for Energy System Integration	Non-binding EU Policies	162	657	1354	92	Source
Governance of the Energy Union and Climate Action	EU Legislation	166	596	1352	189	Source
Resource Efficiency Roadmap	Non-binding EU Policies	83	951	1232	74	Source
Establishment of a framework to facilitate sustainable investment, and amending Regulation	EU Legislation	138	652	1216	148	Source
CEF Transport (Call for Proposals)	EU instruments	109	367	878	117	Source
Digital Decade	EU Legislation	958	77	1215	141	Source
REPowerEU: A Plan to Rapidly Reduce Dependence on Russian Fossil Fuels and Fast Forward the Green Transition	Non-binding EU Policies	139	519	1141	45	Source
A New Circular Economy Action Plan: For a Cleaner and more Competitive Europe	Non-binding EU Policies	131	314	1083	62	Source
EU Cybersecurity Act	EU Legislation	331	132	1078	192	Source
State of the Union 2020. The EC President's Address	Other EU documents	150	189	2908	99	Source
Establishing a Programme for the Environment and Climate Action (LIFE) and Repealing Regulation	EU Legislation	123	262	1069	78	Source
Review of the Sustainable Development Strategy	Other EU documents	28	351	444	95	Source
Carbon Border Adjustment Mechanism (CBAM)	EU Legislation	94	717	1055	26	Source
Energy Union Strategy	Non-binding EU Policies	126	328	1023	111	Source
A Digital Single Market Strategy for Europe	Non-binding EU Policies	612	102	1001	212	Source
Multiannual Financial Framework 2021–2027	EU Legislation	29	33	979	6	Source
Survey on the contribution of ICT to the environmental sustainability actions of EU enterprises	Other EU documents	1543	2556	16584	86	Source
EU Cybersecurity Strategy	Non-binding EU Policies	611	88	936	142	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Proposal for a Regulation of the European Parliament and of the Council amending Regulations (EU) 2018/841 and (EU) 2018/1999	EU Legislation (Proposal)	96	571	936	71	Source
EU 'Save Energy'	Non-binding EU Policies	112	268	925	33	Source
Closing the Loop - An EU Action Plan for the Circular Economy	Non-binding EU Policies	99	187	922	70	Source
Fit for 55' package	Non-binding EU Policies	74	641	902	53	Source
Protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)	EU Legislation	310	112	896	772	Source
Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision	EU Legislation	100	275	805	55	Source
Biodiversity Strategy to 2030	Non-binding EU Policies	71	538	793	68	Source
A Farm to Fork Strategy	Non-binding EU Policies	88	379	752	209	Source
The Raw Materials Initiative: Meeting our Critical Needs for Growth and Jobs in Europe	Non-binding EU Policies	34	42	732	134	Source
Just Transition Fund	EU Legislation	89	282	714	121	Source
Proposal for a Regulation of the European Parliament and of the Council on foreign subsidies distorting the internal market	EU Legislation (Proposal)	87	301	700	117	Source
European Data Governance (Data Governance Act)	EU Legislation	159	74	632	510	Source
Digitalising European Energy and Transport Networks through Operational Digital Platforms	EU instruments	549	200	1612	68	Source
A Global Strategy for the European Union's Foreign and Security Policy	Non-binding EU Policies	203	74	594	185	Source
Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest	EU Legislation	52	93	524	38	Source
Critical Raw Materials Resilience: Charting a Path towards Greater Security and Sustainability	Non-binding EU Policies	56	116	492	47	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
Environment action programme to 2030	EU Legislation	41	338	485	127	Source
European Council resolution on the European Youth Strategy 2019–2027	Non-binding EU Policies	240	56	476	212	Source
Strategy for Plastics in a Circular Economy	Non-binding EU Policies	53	181	428	59	Source
On making sustainable products the norm	Non-binding EU Policies	52	155	419	39	Source
European Declaration on Digital Rights and Principles for the Digital Decade	EU Legislation	357	18	416	197	Source
Integrated Product Policy	Non-binding EU Policies	7	345	367	73	Source
EU eGovernment Action Plan	Non-binding EU Policies	154	44	358	61	Source
European Climate Law	EU Legislation	21	260	330	37	Source
State of the Union Address 2021	Other EU documents	160	67	555	45	Source
Proposal for a Regulation concerning the respect for private life and the protection of personal data in electronic communications	EU Legislation (Proposal)	159	34	297	222	Source
Tackling the Challenges in Commodity Markets and on Raw Materials	Non-binding EU Policies	32	83	263	80	Source
Benchmarking smart metering deployment in the EU-27 with a focus on electricity	Other EU documents	119	10	151	41	Source
Setting the Course for a Sustainable Blue Planet	Non-binding EU Policies	14	213	260	42	Source
A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development	Non-binding EU Policies	21	163	238	142	Source
Trade, Growth and World Affairs: Trade Policy as a Core Component of the EU's 2020 Strategy	Non-binding EU Policies	26	126	231	187	Source
European Pillar of Social Rights	Non-binding EU Policies	10	13	211	416	Source
EU Principles for Sustainable Raw Materials	Non-binding EU Policies	25	74	201	76	Source
Sustainable Industrial Policy Action Plan	Non-binding EU Policies	18	133	199	34	Source
EU Recovery Instrument NextGenerationEU	EU Legislation	23	59	188	21	Source
Rating scheme for data centres	EU Legislation	19	38	172	25	Source
Conservation of natural habitats and of wild fauna and flora	EU Legislation	20	85	167	35	Source
Public procurement for a better environment	Non-binding EU Policies	4	150	163	10	Source

Policy document name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score	Link
(LULUCF) Inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework	EU Legislation	2	151	156	12	Source
Global Europe: Competing in the World	Non-binding EU Policies	8	118	146	137	Source
Communication on Data, Information and Knowledge Management	Non-binding EU Policies	39	17	140	59	Source
European Circular Economy Stakeholder Platform	Other EU documents	38	4	53	19	Source
Centres of Vocational Excellence	EU instruments	37	18	164	17	Source
EU Emissions Trading System Directive (2003/87/EC)	EU Legislation	6	114	134	31	Source
The Power of Trade Partnerships: Together for Green and Just Economic Growth	Non-binding EU Policies	10	99	131	68	Source
Destination Earth	EU instruments	109	32	261	14	Source
Framework for the setting of ecodesign requirements for energy-related products (2009/125/EC)	EU Legislation	6	110	130	31	Source
Eco-innovation index	Third party policy documents	34	59	345	10	Source
Binding Annual Greenhouse Gas Emission Reduction	EU Legislation	10	76	110	7	Source
European Interoperability Framework	Non-binding EU Policies	73	4	86	17	Source
Screening of foreign direct Investments into the Union	EU Legislation	10	43	83	17	Source
The EU Charter of Fundamental Rights	EU Legislation	13	4	34	148	Source
Common European Reference Framework for Energy-Saving Applications	Third party policy documents	0	10	10	0	Source
Buildings codes (Eurocodes)	EU Legislation	0	7	7	0	Source

6.2 Methodology used in the quantitative text analysis

The first step of the quantitative text analysis used in this study consisted of a pre-treatment of the text corpus (cf. section 2.1), i.e. the documents were converted into plain text format and subjected to lemmatization while common English stop words, white spaces

and other non-content relevant formatting were removed. Next three separate keyword lists for “digital transition”, “green transition” and “social/justice relevance” were generated based on the initial keywords used in the search strings for the academic literature. These lists were further expanded using a combination of generative large language model[10] and peer input by project researchers to verify the results. Subsequently the keywords were in turn lemmatied in preparation for application[11].

Based on the pre-processed documents and keywords a keyword score, i.e. the term frequency of keywords in each document, was calculated by the following equation:

$$Keyword\_Score_i = \sum_{j \in K} TF_{i,j}$$

Where i represents the document scored, j represents a keyword in the relevant (digital, green or social) keyword list K, and $TF_{i,j}$ is the term frequency of keyword j in document i.

Additionally, a keyword diversity score, i.e. the count of unique keywords in each document, was calculated by the following approach:

$$Diversity\_Score_i = \sum_{j \in K} \mathbb{I}(TF_{i,j} > 0)$$

Where i represents the document scored, j represents a keyword in the relevant (digital, green or social) keyword list K, $TF_{i,j}$ is the term frequency of keyword j in document i and $\boldsymbol{I}$ is an indicator function (1 if keyword j appears in document i, 0 otherwise).

Subsequently a *combined score* for each digital transition, green transition and social relevance was calculated in which the diversity score serves as a logarithmic multiplier to the term frequency:

$$Combined\_Score_i = Keyword\_Score_i \times (1 + \log(Diversity\_Score_i + 1))$$

Lastly a *twin transition index* was calculated as the total sum of the digital and green transition scores divided by the absolute relative distance between the two:

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[10] For this purpose, the OpenAI ChatGPT4o was posed the following prompt after being given the initial keywords from the previous search: „Formulate a keyword list of 50 words on [specific list theme] based on these initial terms, which will be used in a text analysis of EU policy documents to gauge their relevance to [specific list theme]”.

[11] The resulting key word lists can be found in appendix 6.3)

$$Twin\_Transition\_Index_i = \frac{Digital\_Combined_i + Green\_Combined_i}{\left|\frac{Digital\_Combined_i - Green\_Combined_i}{Digital\_Combined_i + Green\_Combined_i}\right|}$$

6.3 Keyword lists used in the quantitative text analysis

Digital Transition	**Green Transition**	**Social Relevance**
digital	sustain	inequal
tech	decarbon	poverti
automate	renew	discrimin
data	circul	exclus
net	green	access
cyber	energi	equit
cloud	effici	marginal
blockchain	carbon	dispar
smart	climat	segreg
machine	emiss	justic
algorithm	biodivers	divers
platform	recycl	inclus
skill	conserv	racism
infra	ecosystem	prejudic
IoT	environ	gender
connect	neutral	bias
innov	solar	incom
econom	wind	disabil
virtual	hydrogen	educ
comput	bioenergi	opportun
softwar	geotherm	employ
hardwar	water	healthcar
IT	agricultur	hous
app	finance	welfar
e-commerc	low-carbon	right
robot	captur	class
code	vehicl	privileg

analyt	clean	social
govern	resourc	mobil
city	infra	barrier
transformat	eco-friend	underprivileg
cloud	transport	vulner
VR	wast	minor
AR	adapt	inequit
metavers	greenhous	system
fintech	zero	disadvantag
scienc	natur	homeless
divide	pollut	labor
finance	job	disempow
5G	resilienc	wealth
big	technolog	distribut
learn	grid	exploit
twin	storag	access
manufactur	impact	migrant
e-govern	capital	unemploy
secur	innovat	depriv
skill	footprint	gentrif
AI	city	affirm

6.4 Further reference tables for the quantitative text analysis

Top 20 Non-binding EU-policies and legislation by social score

Policy Document Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
Artificial Intelligence Act	EU Legislation	701	380	3636	3833
The European Pillar of Social Rights (Action Plan)	Non-binding EU Policies	418	371	13122	1104
Digital Services Act	EU Legislation	3062	228	3819	1067
Data Act	EU Legislation	1265	83	1538	893
European Social Fund plus	EU Legislation	320	188	1961	849
Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast)	EU Legislation (Proposal)	404	1667	3397	805

Policy Document Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
Protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)	EU Legislation	310	112	896	772
Energy Performance of Buildings Directive (EPBD)	EU Legislation	425	623	5554	745
Energy performance of buildings (recast)	EU Legislation (Proposal)	328	871	2643	678
Horizon Europe Research & Innovation Framework Programme	EU Legislation	631	891	8917	581
InvestEU	EU Legislation	969	1215	19385	548
Common rules for the internal market in electricity and repealing Directive 2003/54/EC (2009/72/EC)	EU Legislation	71	80	2459	531
European Data Governance (Data Governance Act)	EU Legislation	159	74	632	510
Council Recommendation on ensuring a fair transition	Non-binding EU Policies	171	717	1443	499
Recovery and Resilience Facility	EU Legislation	495	604	11030	490
European Regional Development Fund	EU Legislation	314	475	3863	462
Social Climate Fund	EU Legislation	114	1001	1404	416
European Pillar of Social Rights	Non-binding EU Policies	10	13	211	416

20 most twin transition relevant non-binding EU Policies by twin transition score

Policy Document Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
Towards a Green, Digital and Resilient Economy: our European Growth Model	Non-binding EU Policies	463	428	22381	106
The European Pillar of Social Rights (Action Plan)	Non-binding EU Policies	418	371	13122	1104
A Competition Policy Fit for New Challenges	Non-binding EU Policies	319	282	9616	65
A Renovation Wave for Europe	Non-binding EU Policies	373	533	5139	184
Sustainable and Smart Mobility Strategy	Non-binding EU Policies	619	1506	5093	238

Policy Document Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
Update to the 2020 New Industrial Stratgey for Europe	Non-binding EU Policies	406	619	4952	78
Pact of Amsterdam	Non-binding EU Policies	160	189	4193	89
A New Industrial Strategy for Europe	Non-binding EU Policies	393	280	4017	139
Digitalising the Energy System – EU Action Plan	Non-binding EU Policies	994	400	3271	139
Green Deal Industrial Plan	Non-binding EU Policies	348	751	3004	70
An SME Strategy for a sustainable and digital Europe	Non-binding EU Policies	521	297	2994	197
Strategy for financing the transition to a sustainable economy	Non-binding EU Policies	286	525	2747	84
Guidelines for the Waste Audits before Demolition and Renovation Works of Buildings	Non-binding EU Policies	71	80	2497	39
Supporting public administrators in EU Member States to deliver reforms and prepare for the future	Non-binding EU Policies	502	263	2454	253
A European Strategy for Key Enabling Technologies	Non-binding EU Policies	176	136	2418	74
A hydrogen strategy for a climate-neutral Europe	Non-binding EU Policies	74	1980	2212	41
A European strategy for data	Non-binding EU Policies	839	266	2128	307
Digital Education Action Plan	Non-binding EU Policies	1587	137	2052	179
Digital Finance Strategy for the EU	Non-binding EU Policies	734	249	1996	112

20 most twin transition relevant EU Legislations by twin transition score

Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
InvestEU	EU Legislation	969	1215	19385	548
Recovery and Resilience Facility	EU Legislation	495	604	11030	490
Ecodesign for Sustainable Products Regulation	EU Legislation	693	537	9680	379

Name	Type	Digital-Score	Green-Score	Twin Transition-Score	Social Score
European Chips Act	EU Legislation	553	446	9316	271
Horizon Europe Research & Innovation Framework Programme	EU Legislation	631	891	8917	581
Energy Performance of Buildings Directive (EPBD)	EU Legislation	425	623	5554	745
Directive on open data and the re-use of public sector information (2019/1024)	EU Legislation	106	96	4024	354
European Regional Development Fund	EU Legislation	314	475	3863	462
Digital Services Act	EU Legislation	3062	228	3819	1067
Artificial Intelligence Act	EU Legislation	701	380	3636	3833
Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast)	EU Legislation (Proposal)	404	1667	3397	805
Renewable Energy Directive (2018/2001)	EU Legislation	257	1731	2680	306
Proposal for a Regulation of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products, amending Regulation (EU) 2019/1020 and repealing Regulation (EU) 305/2011	EU Legislation (Proposal)	237	378	2677	311
Energy performance of buildings (recast)	EU Legislation (Proposal)	328	871	2643	678
Energy Taxation Directive (2003/96/EC)	EU Legislation	122	150	2620	29
Internal Market for Electricity	EU Legislation	345	220	2537	243
Energy Efficiency Directive (EED) (2012/27/EU)	EU Legislation	234	387	2529	243
Common rules for the internal market in electricity and repealing Directive 2003/54/EC (2009/72/EC)	EU Legislation	71	80	2459	531
Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework for Ensuring a Secure and Sustainable Supply of Critical Raw Materials and Amending Regulations	EU Legislation (Proposal)	296	906	2370	320
EU Cyber Resilience Act	EU Legislation (Proposal)	1618	159	2165	323

6.5 Full list of deductive codes

Code	Memo
FIRST LEVEL CODE: Components of the Twin Transition	
Fair	Which aspects of just / fair transitions are described? This code is less about the inequalities that might arise, but broader summarises the objectives of a just transition. This can be quite general (e.g. "we need to include everyone").
Digital	Which technologies are described that can contribute to the digital transition? This code can also include broader descriptions of digital transitions and their objectives (e.g. "digital technologies will help Europe's economic competitiveness")
Green	Which technologies are types or processes are mentioned to describe sustainability transitions? This code can also include broader descriptions or objectives (e.g. "we need to reach climate protection targets and therefore invest in sustainable technologies").
Twin Transition	How are twin transition processes described? Are there implicit objectives described as part of twin transition processes? You can also code the terms that are used to described twin transition when used in combination (green, digital, smart, sustainable etc.)
SECOND LEVEL CODE: Relation to inequalities	
Accessibility	The Code 'Accessibility' is informed by the following aspects identified in the mobility and agri-food sector: • access to sustainable mobility • digital connectivity • digital divide • socio-economic barriers
procedural inequality	The Code 'Planning and Decision-making' is informed by the following aspects identified in the mobility and agri-food sector: • Equitable planning and decision-making • enhanced mobility advocacy • Epistemic injustice • Digital divide in mobility advocacy • Ethical and privacy concerns
Environmental (in)justice	The Code 'Environmental (in)justice' is informed by the following aspects identified in the mobility and agri-food sector: • advancing environmental justice • reduced environmental Impact • equitable subsidy distribution
Market driven Inequalities	The Code 'Market-driven inequalities' is informed by the following aspects identified in the mobility and agri-food sector: • Dominance of private companies

		• Ownership of mobility data • Market Power Imbalance • Data Exploitation • Dependency on Technology • Economic Inequalities
	Labour Market Effects	The Code 'Labour Market Effects' is informed by the following aspects identified in the mobility and agri-food sector: • Job Displacement • Skills gap • Precarious working conditions • Access to Training and Skill Development • Improved Working Conditions • Economic and social benefits for Small Farms and Rural Communities • Labour Exploitation
	Horizontal inequalities	READJUST's Multidimensional Inequality Monitoring Framework mentions the following aspects as horizontal inequalities: • Age • Gender • Race / ethnicity • Disability • Sexual orientation • Religion • Language
	Spatial inequalities	READJUST's Multidimensional Inequality Monitoring Framework mentions the following aspects as spatial inequalities: • Global • National • Regional • Local / Neighbourhood
THIRD LEVEL CODE: Policy and Sector		
	Mobility	Are there any references to transition processes in the mobility sector? Are policies described as part of it?
	Agri Food	Are there any references to transition processes in the agri-food sector? Are policies described as part of it?

6.6 Interview guide

PART 1: BACKGROUND AND ROLE

- Could you briefly **introduce** yourself?
  - Your name
  - Professional activity / position
- Could you provide some **background on your work** with (your country's) Recovery and Resilience Plan (RRP)?

- *For EU project officers:* What is your role at EC RECOVER in relation to the national RRP?
- *For national contact points:* What was your role in the process of developing your country's RRP?
- *For national contact points:* What is your role in implementing your country's RRP?

PART 2: POLICY FORMULATION PROCESS OF NATIONAL RRPS

- How were the **priorities for the RRP determined** in your country?
  - Were there significant trade-offs between different priorities (e.g. green transition vs. economic recovery)?
  - In READJUST, we are especially interested in the food and mobility sector. If so, how does the RRP address goals in these two sectors?
- How were the **green priorities** established?
- How were the **digital priorities** established?
- Which measures combine both green and digital goals – i.e. **'twin transition' measures**? To what extent are they framed as integrated?
- Which **actors / institutions** played a key role in drafting the RRP?
  - Which ministries and agencies were involved?
  - What was the role of regional and local governments in shaping the plan?
- If so, which **stakeholder groups** were consulted (e.g. industry groups, civil society, labor unions, environmental NGOs)?
  - At what stage of the policy formulation process?
  - Were there any tensions of conflicts between different groups?

PART 3: IMPLEMENTATION

- How do you assess the **implementation** of (your country's) RRP?
- Which areas or measures have been particularly **successful** so far, and why?
  - What are lessons learned or best practices in the implementation of national RRPs?
- Which aspects of the national RRP have been more **challenging** to implement?
  - What are the main barriers?
  - For instance, what role do fundings issues, administrative capacity, political resistance or technical/infrastructural gaps play?
- What are the main obstacles to translating the RRP from **national policy** into action at the **regional or local level**?

PART 4: PUBLIC AND STAKEHOLDER ACCEPTANCE

- How do you assess the **public acceptance** of the RRP?
  - Have there been public debates about this? Which aspects were debated?

    - Have there been social pushbacks? If so, what were the main concerns (e.g. affordability, job losses)?
- How have different **interest groups** (e.g. industries, unions, NGOs) responded to the RRP?
    - Have any groups strongly opposed certain measures of the plan? If so, why?
    - Have any groups strongly pushed for certain measures of the plan?
- Have any measures been delayed, blocked, or weakened due to **resistance/opposition** from stakeholders?

PART 5: INEQUALITIES

- Were equity and **justice concerns** actively debated during the **formulation** of the RRP?
    - If so, which aspects were most discussed?
    - Which priorities emerged from justice debates? Which actors pushed for them?
- Have there been **disagreements or resistance** regarding how RRP funds are distributed among different regions, industries, or social groups?
    - Has the RRP faced criticism for failing to protect certain vulnerable groups or regions?

PART 6: END

- Is there anything else you would like to share with us regarding the implementation of national RRPs?
- Who could we ask for an interview on this topic?

Thank the interviewee for their time. Offer to share findings from the study, if interested.

7 Publication bibliography

Aranguiz, Ane (2022): National Recovery and Resilience Plan: Spain. Italian Labour Law e-Journal, Vol. 15 No. 1S (2022): Special Issue - The NextGeneration EU in Action: Impact on Social and Labour Policies. In *ILLeJ* 15 (1S). DOI: 10.6092/issn.1561-8048/15682.

Benner, Maximilian; Trippl, Michaela; Hassink, Robert (2024): Sustainable and inclusive development in left-behind places. In *Rev Reg Res* 44 (3), pp. 237–249. DOI: 10.1007/s10037-024-00216-w.

Carrosio, Giovanni; Cicerone, Gloria; Faggian, Alessandra; Urso, Giulia: How place-sensitive are the national recovery and resilience plans? Edited by Recovery Watch. Foundation for European Progressive Studies; Friedrich-Ebert-Stiftung. Europabüro. Brussels (Policy study). Available online at https://iris.gssi.it/bitstream/20.500.12571/26804/1/HOW%20PLACE%20SENSITIVE%20ARE%20THE%20NATIONAL%20RECOVERY%20AND%20RESILIENCE%20PLANS.pdf, checked on 7/10/2025.

Cotta, Benedetta; Domorenok, Ekaterina; Graziano, Paolo; Panov, Trajche (2025): Varieties of Ecosocial Policies in the EU : The Case of the National Recovery and Resilience Plans. In *Regulation & Governance*, Article rego.70057. DOI: 10.1111/rego.70057.

Council of the European Union (6/27/2022): Council Recommendation of 16 June 2022 on ensuring a fair transition towards climate neutrality 2022/C 243/04, revised 6/16/2022. Source: OJ C 243, 27/06/2022, p. 35–51. Available online at https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32022H0627%2804%29, checked on 7/14/2025.

ESF (2022): ESF-2022-SOC-INNOV — Social innovations for a fair green and digital transition. European Social Fund+, revised 5/25/2022. Available online at https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/esf-2022-soc-innov, checked on 7/30/2025.

European Commission (9/20/2011): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. Roadmap to a Resource Efficient Europe, revised 9/20/2011. Source: COM(2011) 571 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0571, checked on 7/14/2025.

European Commission (2016): Establishing the Urban Agenda for the EU 'Pact of Amsterdam'. Agreed at the Informal Meeting of EU Ministers Responsible for, 5/30/2016. Available online at https://ec.europa.eu/regional_policy/sources/policy/themes/urban-development/agenda/pact-of-amsterdam.pdf, checked on 7/14/2025.

European Commission (2019): Towards a sustainable Europe by 2030 (Reflection Paper). Available online at https://op.europa.eu/en/publication-detail/-/publication/3b096b37-300a-11e9-8d04-01aa75ed71a1/language-en.

European Commission (12/11/2019): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. The European Green Deal, revised 12/11/2019. Source: COM/2019/640 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1576150542719&uri=CELEX%3A52019DC0640, checked on 7/14/2025.

European Commission (2020a): Digital Education Action Plan 2021-2027. Resetting education and training for the digital age. Available online at https://education.ec.europa.eu/sites/default/files/document-library-docs/deap-communication-sept2020_en.pdf.

European Commission (2020b): European Skills Agenda for sustainable competitiveness, social fairness and resilience. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0274.

European Commission (3/10/2020): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. A New Industrial Strategy for Europe, revised 3/10/2020. Source: COM/2020/102 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0102, checked on 7/14/2025.

European Commission (10/14/2020): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives., revised 10/14/2020. Source: COM/2020/662 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1603122220757&uri=CELEX:52020DC0662, checked on 7/14/2025.

European Commission (12/19/2020): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. Sustainable and Smart Mobility Strategy – putting European transport on track for the future, revised 12/19/2020. Source: COM/2020/789 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0789, checked on 7/14/2025.

European Commission (2021a): Analysis of the recovery and resilience plan of Finland. Accompanying the document Proposal for a COUNCIL IMPLEMENTING DECISION on the approval of the assessment of the recovery and resilience plan for Finland. European

Commission (COMMISSION STAFF WORKING DOCUMENT). Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52021SC0284.

European Commission (2021b): Analysis of the recovery and resilience plan of Italy. Accompanying the document Proposal for a COUNCIL IMPLEMENTING DECISION on the approval of the assessment of the recovery and resilience plan for Italy. European Commission (COMMISSION STAFF WORKING DOCUMENT).

European Commission (2021c): Analysis of the recovery and resilience plan of Spain Accompanying the document Proposal for a Council Implementing Decision on the approval of the assessment of the recovery and resilience plan for Spain. Commission Staff Working Document. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021SC0147.

European Commission (2021d): Building an economy that works for people: an action plan for the social economy. Available online at https://ec.europa.eu/social/BlobServlet?docId=24986&langId=en.

European Commission (3/4/2021): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. The European Pillar of Social Rights Action Plan. Source: COM/2021/102 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52021DC0102, checked on 7/14/2025.

European Commission (3/9/2021): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. 2030 Digital Compass: the European way for the Digital Decade, revised 3/9/2021. Source: COM/2021/118 final. Available online at https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:52021DC0118.

European Commission (5/5/2021): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe’s recovery, revised 5/5/2021. Source: COM/2021/350 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:350:FIN, checked on 7/14/2025.

European Commission (2021e): Proposal for a Council implementing decision on the approval of the assessment of the recovery and resilience plan for Spain. COM/2021/322 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0322, checked on 8/28/2025.

European Commission (11/18/2021): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. A competition policy fit for new

challenges., revised 11/18/2021. Source: COM/2021/713 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0713&qid=1721673832583, checked on 7/14/2025.

European Commission (2022a): Analysis of the recovery and resilience plan of Poland. Accompanying the document Proposal for a COUNCIL IMPLEMENTING DECISION on the approval of the assessment of the recovery and resilience plan for Poland (COMMISSION STAFF WORKING DOCUMENT). Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022SC0161.

European Commission (2022b): Horizon Europe Work Programme 2021-2022 - 7. Digital, Industry and Space, revised 5/10/2022. Available online at https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-7-digital-industry-and-space_horizon-2021-2022_en.pdf, checked on 7/30/2025.

European Commission (3/2/2022): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. Towards a green, digital and resilient economy: our European Growth Model. Source: COM/2022/83 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0083&qid=1655798743597, checked on 7/14/2025.

European Commission (10/18/2022): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Commitee and the Commitee of the Regions. Digitalising the energy system - EU action plan., revised 10/18/2022. Source: COM/2022/552 final. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022DC0552, checked on 7/14/2025.

European Parliament (2021a): Regulation (EU) 2021/1057 of the European Parliament and of the Councial of 24 June 2021 establishing the European Social Fund Plus (ESF+) and repealing Regulation (EU) No 1296/2013. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1057&from=EN.

European Parliament (2021b): Regulation (EU) 2021/817 of the European Parliament and of the Council of 20 May 2021 establishing Erasmus+: the Union Programme for education and training, youth and sport and repealing Regulation (EU) No 1288/2013. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0817.

European Parliament (2021c): The right to disconnect. European Parliament resolution of 21 January 2021 with recommendations to the Commission on the right to disconnect

(2019/2181(INL)). Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021IP0021.

European Parliament; European Commission (2/18/2021): Regulation (EU) 2021/241 of the European Parliament and of the Council of 12 February 2021 establishing the Recovery and Resilience Facility, revised 2/12/2021. Source: OJ L 57, 18.2.2021, p. 17–75. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0241, checked on 7/14/2025.

European Parliament; European Council (12/9/2019): Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Text with EEA relevance), revised 11/27/2019. Source: OJ L 317, 9.12.2019, p. 1–16. Available online at https://eur-lex.europa.eu/eli/reg/2019/2088/oj/eng, checked on 7/15/2025.

European Parliament; European Council (3/26/2021): Regulation (EU) 2021/523 of the European Parliament and of the Council of 24 March 2021 establishing the InvestEU Programme and amending Regulation (EU) 2015/1017, revised 3/24/2021. Source: OJ L 107, 26.3.2021, p. 30–89. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32021R0523, checked on 7/14/2025.

European Parliament; European Council (5/11/2021): Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240 (Text with EEA relevance), revised 4/29/2021. Source: OJ L 166, 11.5.2021, p. 1–34. Available online at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R0694&qid=1623079930214, checked on 7/15/2025.

European Parliament; European Council (5/12/2021): Regulation (EU) 2021/695 of the European Parliament and of the Council of 28 April 2021 establishing Horizon Europe - the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination, and repealing Regulations (EU) No 1290/2013 and (EU) No 1291/2013, Horizon Europe, revised 4/28/2021. Source: L 170/1. In : Offical Journal of the European Union.

European Parliament; European Council (6/30/2021): Regulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund, revised 6/24/2021. Source: OJ L 231, 30.6.2021, p. 1–20.

European Parliament; European Council (12/19/2022): Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030 (Text with EEA relevance), revised 12/14/2022. Source: OJ L 323, 19.12.2022, p. 4–26. Available online at https://eur-lex.europa.eu/eli/dec/2022/2481/oj, checked on 7/15/2025.

European Parliament; European Council (5/8/2024): Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings, revised 4/24/2024. Source: L series. In : Offical Journal of the European Union. Available online at https://eur-lex.europa.eu/eli/dir/2024/1275/oj/eng, checked on 7/30/2025.

European Union (2020): A Farm to Fork Strategy for a Fair, Healthy and Environmentally-friendly Food System. Office of the European Union. Brussels, Belgium.

Feás, Enrique; Steinberg, Federico (2021): The climate and energy transition component of the Spanish National Recovery and Resilience Plan. Elcano Royal Institute. Available online at https://media.realinstitutoelcano.org/wp-content/uploads/2021/07/ari64-2021-feas-steinberg-climate-and-energy-transition-component-of-spanish-national-recovery-and-resilience-plan.pdf?_gl=1*qsbxwc*_up*MQ.*_ga*MjIwNzI4OTcxLjE3NTMyMDAwNjM.*_ga_DR7R0Z3Q4L*czE3NTMyMDAwNjMkbzEkZzAkdDE3NTMyMDAwNjMkajYwJGwwJGgw.

Flanagan, Kieron; Uyarra, Elvira; Laranja, Manuel (2011): Reconceptualising the 'policy mix' for innovation. In *Research Policy* 40 (5), pp. 702–713. DOI: 10.1016/j.respol.2011.02.005.

Florczak, Izabela; Piszczek, Anna; Stefański, Krzysztof (2022): National Recovery and Resilience Plan: Poland. Italian Labour Law e-Journal, Vol. 15 No. 1S (2022): Special Issue - The NextGeneration EU in Action: Impact on Social and Labour Policies. DOI: 10.6092/issn.1561-8048/15703.

Greenpeace (2024): Finland's famous climate target under threat. NGOs take the state to court. Available online at https://www.greenpeace.org/finland/tiedotteet/ilmastonmuutos/finlands-famous-climate-target-under-threat-ngos-take-the-state-to-court/, updated on 7/1/2025, checked on 7/1/2025.

Kivimaa, Paula; Lukkarinen, Jani; Lazarevic, David (2023): Analysis of COVID-19 recovery and resilience policy in Finland: a transformative policy mix approach. In *Science and Public Policy* 50 (4), pp. 681–694. DOI: 10.1093/scipol/scad016.

Kovacic, Zora; García Casañas, Cristina; Argüelles, Lucía; Yáñez Serrano, Paloma; Ribera-Fumaz, Ramon; Prause, Louisa; March, Hug (2024): The twin green and digital transition: High-level policy or science fiction? In *Environment and Planning E: Nature and Space* 7 (6), pp. 2251–2278. DOI: 10.1177/25148486241258046.

Kuckartz, Udo (2018): Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung: Beltz Verlagsgruppe.

Marcolin, Carla Bonato; Diniz, Eduardo Henrique; Becker, João Luiz; Oliveira, Henrique Pontes Gonçalves de (2023): Who knows it better? Reassessing human qualitative analysis with text mining. In *QROM* 18 (2), pp. 181–198. DOI: 10.1108/QROM-07-2021-2173.

Mayring, Philipp (2015): Qualitative Inhaltsanalyse. Grundlagen und Techniken. 12., überarbeitete Auflage. Wieselburg.

Mayring, Philipp; Fenzl, Thomas (2014): Qualitative Inhaltsanalyse. In Nina Baur, Jörg Blasius (Eds.): Handbuch Methoden der empirischen Sozialforschung. Wiesbaden: Springer VS. Available online at 543-556.

Mileusnic, Marin (2025): Spain's National Recovery and Resilience Plan. European Parliamentary Research Service. Available online at https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2022)698878, checked on 7/25/2025.

Ministry for Ecological Transition and Demographic Challenge (2020): Spanish Circular Economy Strategy. Circular Spain 2030. Available online at https://www.miteco.gob.es/content/dam/miteco/es/calidad-y-evaluacion-ambiental/temas/economia-circular/espanacircular2030_def1_tcm30-509532_mod_tcm30-509532.pdf, checked on 8/28/2025.

Ministry of Climate (2024): National Plan in the field of Energy and Climate by 2030 (2019 update of NECPs). Available online at https://commission.europa.eu/document/download/5118b15e-d380-49ae-b8bb-41cc81a28e15_en?filename=PL_NECPupdate_Projekt_EN.pdf.

Ministry of Climate and Environment (2021): Energy Policy of Poland until 2040. Extract. Available online at https://www.gov.pl/web/climate/energy-policy-of-poland-until-2040-epp2040.

Ministry of Digital Affairs (2019): Cybersecurity Strategy of the Republic of Poland for 2019–2024. Available online at https://www.dziennikustaw.gov.pl/M2019000103701.pdf.

Ministry of Digital Affairs (2020): National Broadband Plan. Available online at https://www.gov.pl/web/cyfryzacja/narodowy-plan-szerokopasmowy---zaktualizowany.

Ministry of Finance; Ministry of Social Affairs; Ministry of the Interior (2020): Government proposal for health and social services reform and related legislation proceeds to Parliament. Press Release. Edited by Finnish Government. Available online at https://valtioneuvosto.fi/en/-/1271139/government-proposal-for-health-and-social-services-reform-and-related-legislation-proceeds-to-parliament, checked on 8/28/2025.

Ministry of Territorial Policy and Democratic Memory (2019): Estrategia Nacional frente al Reto Demográfico. Available online at

https://mpt.gob.es/dam/es/portal/reto_demografico/Estrategia_Nacional/directrices_generales_estrategia.pdf.

Ministry of the Environment (Finland) (2022): Climate Act - Translation from Finnish, revised (423/2022). Available online at https://www.finlex.fi/api/media/statute-foreign-language-translation/17591/mainPdf/main.pdf?timestamp=2022-06-10T00%3A00%3A00.000Z.

Ministry of Transport and Communications (2019): Turning Finland into the world leader in communications networks. Digital Infrastructure Strategy 2025. Ministry of Transport and Communications. Helsinki (Publications of the Ministry of Transport and Communications, 2019:7). Available online at https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/161434/LVM_7_19_Digital_Infrastructure_WEB.pdf, checked on 8/28/2025.

Ministry of Transport and Communications (2020): Roadmap to fossil-free transport. Government resolution on reducing domestic transport's greenhouse gas emissions. Ministry of Transport and Communications. Helsinki (Publications of the Ministry of Transport and Communications, 2020:19). Available online at https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/163260/LVM_2021_19.pdf?sequence=1&isAllowed=y.

Muench, Stefan; Stoermer, Eckhard; Jensen, Kathrine; Asikainen, Tommi; Salvi, Maurizio; Scapoo, Fabiana: Towards a green & digital future. Key requirements for successful twin transitions in the European Union. Luxembourg: Publications Office of the European Union (JRC science for policy report, 31075).

OECD (2020): Continuous learning in working life in Finland. Paris: OECD (Getting skills right).

Rogge, Karoline S.; Reichardt, Kristin (2016): Policy mixes for sustainability transitions: An extended concept and framework for analysis. In *Research Policy* 45 (8), pp. 1620–1635. DOI: 10.1016/j.respol.2016.04.004.

Rutkowski, Rachel A.; Lee, John D.; Coller, Ryan J.; Werner, Nicole E. (2022): How can text mining support qualitative data analysis? In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 66 (1), pp. 2319–2323. DOI: 10.1177/1071181322661535.

Stadler, Maria; Widdel, Linda; Afghani, Nof; Hummler, Andreas (2024): Report on existing inequalities in the Agri-food and mobility sectors and at different spatial levels. READJUST Deliverable No. D1.1. Available online at https://www.readjust.eu/user/pages/06.outputs/01.project-reports/READJUST_deliverable_D1_1_FINAL_20241121.pdf.

Third Vice Presidency of the Government; Ministry of Economic Affairs and Digital Transformation (2020): Digital Spain 2025.

Tukiainen, Taina (2023): Finland. In : OECD Economic Outlook. Place of publication not identified: OECD Publishing (OECD Economic Outlook). Available online at https://osuva.uwasa.fi/bitstream/handle/10024/17029/Osuva_Tukiainen_2023.pdf?sequence=2&isAllowed=y, checked on 7/1/2025.

United Nations (2015): Transforming our World: The 2030 Agenda for Sustainable Development. A/RES/70/1. Available online at https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf?ref, checked on 7/23/2025.

Wei, Yehua Dennis (2015): Spatiality of regional inequality. In *Applied Geography* 61, pp. 1–10. DOI: 10.1016/j.apgeog.2015.03.013.

Wiedemann, Gregor (2015): Text mining for qualitative data analysis in the social sciences. Dissertation. Wiesbaden: Springer Fachmedien Wiesbaden (Kritische Studien zur Demokratie).