

**Louvain School of Management**

# **The EU's climate ambitions: assessment of the social cost of the Fit for 55 package**

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Academic year 2021-2022  
Dissertation for the master of  
Advanced Master's in European Business and Economic Policy  
Daytime schedule

## Foreword

*I would like to thank Professor Jean-Christophe Defraigne for his availability and his wise advice during the writing of this thesis. I would also like to thank my fellow students for the support, mutual assistance and knowledge sharing we have provided each other during this enriching year. Finally, I want to thank Maxime, my family and friends for their help and support throughout my academic career.*

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## Introduction

On 11<sup>th</sup> December 2019, the European Green Deal was presented by the European Commission as the new strategy of the EU, setting the ambitious target of becoming the first climate neutral continent by 2050. To enshrine this ambition in the EU's legislative framework, the European Climate Law came into force in July 2021 and sets the EU's intermediate target of a 55% reduction in greenhouse gas emissions by 2030 compared to 1990 levels (European Commission, 2021b). To reach this specific target, the European Commission delivered in July 2021 the Fit for 55 package, a set of legislative tools aimed at revising and updating the existing legislation as well as creating new initiatives related to climate, energy, transport, taxation, and land use. This legislative package is currently being discussed within the various Council configurations involved (European Council, 2022).

But the Fit for 55 package raises a lot of questions and concerns among member states and international actors. One of these concerns is related to the social burden that these initiatives could bring on EU citizens and companies. Their adoption would indeed lead to massive investments in infrastructure and technology, rising costs of energy (notably electricity, heating, and transport), need for additional tax revenue and many other side effects. This would therefore bring an extra pressure on already vulnerable households, transport users and micro-enterprises and risk increasing social disparities among member states, considering that already 34 million people are affected by energy poverty in the EU today. As for now, there is no sufficient information on the potential effect of these proposals and the Impact Assessment that has been provided by the European Commission does not cover in depth these social issues. It is however extremely important that these issues are addressed and properly analysed for the institutions to remain transparent and to maintain public support (Piebalgs & Jones, 2021).

The importance of the subject for the future of the EU, its member states and their citizens, as well as the lack of information and analysis until now leads us to elaborate the following research question:

*“Are European member states and their citizens capable of bearing the social costs attached to the new legislative proposals proposed by the European Commission in July 2021 in the framework of the Fit for 55 package?”.*

Answering this question in the framework of academic research could help highlighting the importance of this issue that seems to be neglected in the European Commission's work. A more detailed and in-depth analysis gathering all the existing literature on the subject would therefore provide a realistic account of the social challenges that the EU's climate ambitions could create and would also help to identify the flaws of the package on a social point of view.

This research is structured in four different parts. The first part provides a summary of the Fit for 55 package and its content, notably the proposals that will be studied in this research. Then, the second part gathers the existing literature to elaborate on the proposals that are posing social issues and are therefore questionable on this matter. Some specific indicators linked to these issues will also be explored to better understand the reality of member states in the face of these critical proposals. The third section will then present a more general assessment of the impact of the Fit for 55 package on Member States, based on criteria taken from the literature, complemented by an analysis focusing on the technological, financial, governance and poverty realities in European countries. Finally, some political issues and considerations related to the package will be highlighted, followed by a conclusion on the findings of the research, the limits inherent to this paper and the perspectives for future research.

## 1. What is the Fit for 55 package?

### 1.1 Content of the Fit for 55 package

The aim of this section is to describe the different proposals and the concrete actions proposed by the Commission that are included in the Fit for 55 package.

We can first start with the description of a predominant proposal of the Package, which is the **revision to the EU Emission Trading Scheme**<sup>1</sup>. Launched in 2005, this scheme is almost covering the half of GHG emissions of the EU. When revised in 2018, the ETS was setting a cap for emissions allowances to reach the target of a 40% decrease below the pre-industrial levels of 1990 by 2030. With the Fit for 55 (FF55), the Commission proposes to set higher targets to reach the general objective “to lower the overall emissions cap per economic sector, phase out free emission allowances for aviation, and include shipping for the first time” (Interreg Europe, 2021). More precisely, the proposal is amending the phase 4 of the ETS (2021-2030) by (Erbach, 2022b):

- Extending the scheme to maritime transport (especially ships + 5000 gross tonnage) for intra-EU travels, ships being at berth in the EU or half of emissions coming from extra-EU travels.
- Creating a separate ETS for building and road transport sectors regarding fuel distribution.
- Reducing the cap of emissions allowances and setting a higher reduction factor for greenhouse gas emissions
- Extending the Innovation and Modernisation Funds and fixing new rules on the use of the ETS revenues
- Revising the requirements for the free allocation of allowances, as well as the market stability reserve.

Two main changes from the list above are the creation of emissions trading for road transport and building called “ETS2” and the update of the ETS covering power and industry now extending to the maritime sector and further regulating aviation. These amendments aim at

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<sup>1</sup> Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757;  
[https://ec.europa.eu/info/sites/default/files/revision-eu-ets\\_with-annex\\_en\\_0.pdf](https://ec.europa.eu/info/sites/default/files/revision-eu-ets_with-annex_en_0.pdf)

reducing by 61% the emissions coming from the ETS sectors compared to 2005 levels, which means reducing linear emissions by 4,2% instead of 2,2% annually. An important point of the revision is also the maintenance a certain amount of free allowances used to prevent carbon leakage but which will be reduced with the proposal of a CBAM and a diminishing emissions cap (Erbach, 2022b).

As regards the progress of the negotiations on the ETS, the Council took a position on the Commission's proposals for the revision/creation of the EU ETS, the SCF, the ESR, LULUCF and the CO2 emission performance standards for cars and vans on 29 June 2022. Regarding the ETS, the Council generally agreed on the Commission's initial proposals, while making slight changes on issues such as the Innovation and Modernisation Fund, timing issues and other specific conditions surrounding the proposals. This sets the stage for future negotiations with the European Parliament (Council of the EU, 2022b).

A second proposal is the **amendment of the Renewable Energy Directive**<sup>2</sup>. After being adopted in 2009 with an initial target of 20% renewable energy sources in final energy consumption in 2020, the Renewable Energy Directive is revised in 2018 to increase this target to 32%. Under the FF55, the target is even more ambitious, aiming to reach 40% of renewable energy sources within a decade (2021-2030). To achieve this, the proposal foresees a deployment of RES across various sectors, and particularly in sectors lagging behind in this respect, such as the industrial, transport and building sectors. Many of the targets are also upgraded at EU or national level by 2030 and include (Wilson, 2022c):

- A 1.1% increase in the use of RES in industry
- An increase of 2.1% in the use of RES in district heating and cooling systems
- A 13% decrease in GHG intensity of transport fuels to reach 2.2% of biofuels in this sector
- Achieving 50% RES in hydrogen consumption in the industrial sector, including non-energy uses
- To reach 49% of energy use from RES in the European building sector

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<sup>2</sup> Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652; [https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes\\_en.pdf](https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes_en.pdf)

- An annual increase of 1.1% becoming mandatory for RES use for heating and cooling
- Achieving 2.6% of renewable fuels from non-biological sources for transport

These targets have generally been “approved” by the Council and adopted in their general approaches on 27 June 2022, with sometimes slight modifications to the sector-specific targets and measures (Council of the EU, 2022a).

Other points of revision of the directive are also important to consider. Firstly, it would involve the creation of a new credit system to promote renewable electricity in transport and reduce the obstacles to the admission procedures for RES installations. This would make it easier to establish collective Power Purchase Agreements through new provisions. A new project to strengthen regional cooperation on renewables would also be set up, such as offshore wind farms. Secondly, the Commission suggests banning the use of biomass from forests with high biodiversity, as well as the use of stumps and roots. MS would also be obliged to establish their RES support schemes in line with the cascading biomass principle. These rules are intended to increase the sustainability of biofuels. Thirdly, the revision provides for higher emission reduction ambitions than before for both new and old biomass installations. Finally, the threshold for applying the sustainability criteria will be reduced by three-quarters for small-scale RES installations compared to the 2018 revision (Wilson, 2022c).

The FF55 package also includes an **amendment of the Energy Efficiency Directive**<sup>3</sup>. The last revision of the Energy Efficiency Directive was in 2018, when the energy efficiency target was set at 32.5% improvement by 2030. With the Green Deal and the FF55, these ambitions are further increased and require several changes to the directive. Firstly, primary and final energy consumption must be reduced by 39% for primary energy and 36% for final energy by 2030. This reduction translates into a maximum amount of 1023 million tonnes of oil equivalent (Mtoe) for primary energy and 787 Mtoe for final consumption. These targets are also binding on the MS and supported by a benchmarking system for them to fix their indicative national contribution. Secondly, several measures are proposed by the Commission, in order to protect and empower consumers, protect vulnerable households from energy poverty, encourage investments for more energy efficiency and finally, increase the renovation rates of buildings. Energy saving obligations for MS will have to double within 6 years (2024-2030). In the public

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<sup>3</sup> Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on energy efficiency (recast);

[https://ec.europa.eu/info/sites/default/files/proposal\\_for\\_a\\_directive\\_on\\_energy\\_efficiency\\_recast.pdf](https://ec.europa.eu/info/sites/default/files/proposal_for_a_directive_on_energy_efficiency_recast.pdf)

sector, the annual energy consumption of buildings will also have to decrease by 1.7% each year and 3% of the floor area of public buildings will have to be renovated annually. There will also be more energy efficiency requirements in terms of public procurement procedures. Finally, the revision provides for a new requirement to improve energy efficiency for vulnerable citizens, a legal basis applying the “energy efficiency first” principle and the obligation for MS to publish data on their energy use (Wilson, 2022a).

The Council adopted a position on 27 June 2022 on these provisions, which is following the Commission proposals with some light modifications on some points, but not of major importance for the social impact, studied in the next sections of this research.

Finally, a last revision proposal concerns **the Energy Taxation Directive**<sup>4</sup>, which aims to align the EU's energy and climate policies with the taxation of energy products. This revision can be summarised in four general points. The first suggested change is to tax fuels according to their environmental performance and energy content, rather than on their volume, therefore changing the tax base. This would help guide firms and consumers to make more environmentally and climatically informed choices about their fuel use. Secondly, a simple categorisation of energy products would be implemented to ensure that the most polluting products are taxed. Then, the third suggestion would be to remove some product and home heating exemptions so that fossil fuels are no longer taxed below a minimum rate. And finally, the exclusion of fossil fuels used in intra-EU air transport, fishing and shipping from the scope of EU energy taxation will no longer be an absolute exclusion (Wilson, 2022b).

While the previous proposals were projects of amendments of directives or regulations, the following proposals of the package are new initiatives. Firstly, the FF55 includes the creation of a **Carbon Border Adjustment Mechanism**<sup>5</sup>. The primary objective of the CBAM is to ensure that the EU's climate efforts are not threatened by the relocation of carbon-intensive production activities outside the EU. This tool would equalise the carbon price of domestic products with that of products imported from abroad for specific sectors. It works as follows: if products have been produced outside the EU, European importers will have to pay carbon certificates at a price equivalent to that which would have been paid if the products had been

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<sup>4</sup> Proposal for a COUNCIL DIRECTIVE restructuring the Union framework for the taxation of energy products and electricity (recast); [https://ec.europa.eu/info/sites/default/files/revision\\_of\\_the\\_energy\\_tax\\_directive\\_0.pdf](https://ec.europa.eu/info/sites/default/files/revision_of_the_energy_tax_directive_0.pdf)

<sup>5</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a carbon border adjustment mechanism; [https://ec.europa.eu/info/sites/default/files/carbon\\_border\\_adjustment\\_mechanism\\_0.pdf](https://ec.europa.eu/info/sites/default/files/carbon_border_adjustment_mechanism_0.pdf)

produced within the EU. In the case where the carbon price has already been paid by the non-EU producer, the importer can deduct the full price of the carbon certificates. The implementation of the CBAM would be phased in gradually. From 2026 onwards, importers will have to start providing CBAM certificates corresponding to the emissions of their imported products, gradually replacing the free ETS allowances covering the sectors included in the CBAM. It would initially apply to cement, iron, steel, aluminium, fertilisers, and electricity, which are products with a high risk of carbon leakage during their production process. Another feature of the CBAM is that it represents a potential own source of revenue for the EU and would therefore contribute to the EU budget (Simões, 2022).

Finally, the FF55 provides a new Fund called **Social Climate Fund**<sup>6</sup> which is a supportive measure designed to counter social costs raised by the revision of the ETS and its extension. The proposed amendment of the ETS directive is to add the road transport and building sectors to its scope, creating an additional trading system effective from 2026 being in parallel to the existing system, as seen previously. However, this change could have a negative impact on EU citizens, for example by increasing the cost of heating and cooling for housing and the cost of means of transport. This fund therefore aims to counteract the possible negative social impacts that could be caused by the new emissions trading scheme, by financing temporary direct income support for vulnerable households, and by supporting measures taken by MS trying to reduce emissions from the two sectors concerned (Wilson, 2022d). Such measures can support investments in buildings renovation and energy efficiency, in renewable sources of energy to reduce CO<sub>2</sub> emissions and make citizens pay less for their energy needs, and support investments in clean cooling, heating, and in clean mobility. Note that the Social Climate Fund complement other pre-existing solidarity funds such as the Just Transition Fund, the European Social Fund Plus and the Cohesion Fund (European Commission, 2021a).

The amount planned by the Commission to meet these objectives over a period of 7 years (2025-2032) is 72.2 billion euros (in current prices). It would come mainly from the revenues collected (25% of these) thanks to the new emission trading system for the two new sectors included but also from national contributions of at least 50% (European Commission, 2021a). This amount also represents an increase of 23.7 billion compared to the Multiannual Financial Framework planned for the period and would therefore necessitate an amendment of it. The Own Resource Decision must also be amended to accommodate the new Fund (Wilson, 2022d). In addition,

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<sup>6</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a Social Climate Fund; [https://ec.europa.eu/info/sites/default/files/social-climate-fund\\_with-annex\\_en.pdf](https://ec.europa.eu/info/sites/default/files/social-climate-fund_with-annex_en.pdf)

the Commission suggests in its Communication that Member States complement the new fund with part of the revenues from the emission allowance system for both sectors. Also, some MS that are particularly dependent on fossil fuels, emit high GHG emissions, are energy intensive and have a low GDP per capita could benefit from support from the enhanced Modernisation Fund. The price of carbon would determine the amount of this fund's resources, but it would still be provided with 192.5 million allowances. Finally, the solidarity principle of the ETS and the Effort Sharing Regulation would be relied upon to redistribute one tenth of the allowances for auctioning among the MS (European Commission, 2021a). So far, the final report having been adopted by the Joint Committee on 18 May 2022 has been transferred to the plenary, together with a proposal to start inter-institutional negotiations (Wilson, 2022d).

The remaining proposals of the Package (see *Appendix 1*) will not be studied in this research because they are of less importance to evaluate the social risks and costs in member states.

## 2. Socially critical proposals of the Package

In this second part, we will look at which of the Package's proposals are socially critical in the framework of this research. We will determine what the most sensitive points are in the debate surrounding them based on existing literature and will also use some indicators to illustrate which Member States might be more concerned than others. Among the fifteen proposals making up the package, five are considered particularly sensitive and politically debatable because of the major social issues they may cause. These critical proposals are the ETS, the Renewable Energy Directive, the Energy Efficiency Directive, the Energy Taxation Directive, the CBAM and finally the creation of a Social Climate Fund. Combined, they are the most likely to affect citizens and businesses in the building, transport, industry and hydrogen sectors (Piebalgs & Jones, 2021). Let us look at how these proposals can be problematic for EU citizens and businesses.

### 2.1 ETS

The first critical proposal of the Commission and with no doubt the most problematic socially speaking is the revision of the ETS and especially the creation of an "ETS2" covering the building and road transport, from which several issues can be pointed out. Regarding the existing ETS and its impact on European firms, two controversial changes are the move from a 2.2% to a 4.2% reduction in allowances provided by the scheme and the retroactive adjustment to 2021, as both these measures will drive up ETS prices for sure. Also, a removal of free allowances is planned and gives more incentives for companies to adapt to audit findings or to use Best Available Technology. But these adaptations give competitors an advantage because they do not have this additional investment to bear. If companies choose not to apply these measures, they risk losing 25% of the free allowances. This increasing reduction of allowances and the removal of the free ones represents therefore a risk for the competitiveness of European industry and for jobs (Piebalgs & Jones, 2021).

We assume that countries which are most likely to be the most impacted by this reduction and suppression could be MS where the sectors covered by the ETS are important for the economy. Therefore, the impact of the extension of the ETS to the building, aviation and maritime transport sectors and the consequent increase in environmental taxes levied will particularly affect small EU countries such as Croatia, Malta, Greece, and Cyprus. These countries are indeed highly dependent on the sectors concerned (EIU ViewsWire, 2021).

Looking at the ETS2, the main social risk is the increase of inequalities and difficult access to energy for low-income households. Existing literature estimates the loss of disposable income to be 1-2% for low-income countries and vulnerable households across the EU, if the revenues generated by the ETS are not recycled (Gore et al., 2022). These inequalities will for example strongly be reflected in the building sector that the ETS2 would cover. Although the penalties for not meeting the targets are the same for all, it is the initial conditions that differ in this sector. Indeed, the state of insulation of buildings, the geographical position and meteorological characteristics of a region, the infrastructure for heating and cooling, the access to finance for renovation, the energy mix available and many others are all factors creating inequalities from one household to another (Bülbül, 2021). These inequalities and the upcoming difficulties to make ends meet could very likely lead to complaints and discontent from citizens. Movements like the “Gilets Jaunes” in France, caused among other things by plans to impose a fuel tax, could reappear in Europe. European authorities could then be forced to slow down environmental initiatives and reforms, which cannot be afforded in the current climate change context (Liboreiro, 2021). On the other hand, while these vulnerable households will have difficulties coping with increasing prices and access to energy, the high-income ones will likely have more opportunities to adjust to the new requirements and benefit from more support and investments schemes (Bülbül, 2021). In fact, the increase in household expenditure would be 3,5 times higher for low-income households than for high-income households as a result of carbon pricing (BEUC, 2022).

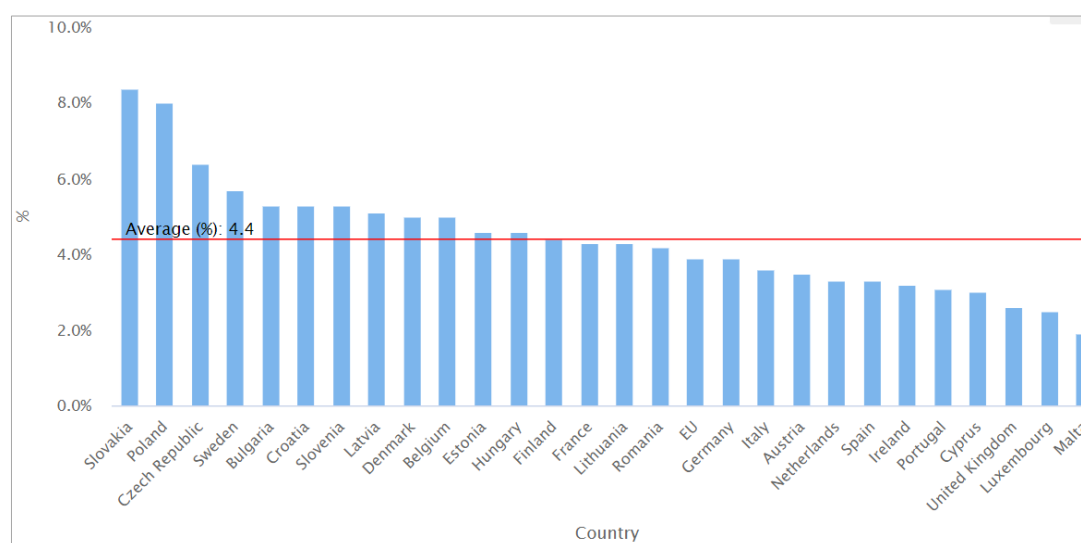
The extension of the ETS to the building sector could for example affect countries whose populations already face difficulties in keeping their homes adequately heated, ranked in the *Table 1* below with Cyprus, Lithuania, and Bulgaria having the highest share of the total population in 2020. We can also observe from this ranking that, despite having colder temperatures, there is a little share of the population of Nordic countries being unable to keep their home adequately warm (Denmark, Sweden, Finland with a share of 3% or under). This shows better living conditions in general, and more help provided by the state to counter cold weather.

*Table 1: Proportion of inhabitants unable to keep home adequately warm (total population) , 2017-2020 - (Eurostat, 2022f)*

|                  |       |                    |      |
|------------------|-------|--------------------|------|
| <b>Bulgaria</b>  | 27,5% | <b>Hungary</b>     | 4,2% |
| <b>Lithuania</b> | 23,1% | <b>Belgium</b>     | 4,1% |
| <b>Cyprus</b>    | 20,9% | <b>Luxembourg</b>  | 3,6% |
| <b>Portugal</b>  | 17,5% | <b>Ireland</b>     | 3,3% |
| <b>Greece</b>    | 17,1% | <b>Poland</b>      | 3,2% |
| <b>Spain</b>     | 10,9% | <b>Denmark</b>     | 3%   |
| <b>Romania</b>   | 10%   | <b>Slovenia</b>    | 2,8% |
| <b>Italy</b>     | 8,3%  | <b>Sweden</b>      | 2,7% |
| <b>Malta</b>     | 7,2%  | <b>Estonia</b>     | 2,7% |
| <b>Germany</b>   | 7%    | <b>Netherlands</b> | 2,4% |
| <b>France</b>    | 6,5%  | <b>Czechia</b>     | 2,2% |
| <b>Latvia</b>    | 6%    | <b>Finland</b>     | 1,8% |
| <b>Slovakia</b>  | 5,7%  | <b>Austria</b>     | 1,5% |
| <b>Croatia</b>   | 5,7%  |                    |      |

The consequences of this increase in prices for housing are also reflected when looking at household expenditures on housing (electricity, gas, and other housing fuels). The graph (*Figure 1*) below provides an overview of this indicator's differences among MS and shows that countries like Slovakia, Poland and Czech Republic pay a particularly high share of housing fuels in their expenditures. This observation means that the new provisions of the ETS could affect their citizens more than in other countries, as they already have a larger financial burden on housing fuel expenditures. Note that Nordic countries such as Sweden and Denmark are also above the EU average, which can be due to other factors such as cold weather and longer winter seasons but does not necessarily mean that they will be more exposed to the new ETS, as these countries have much higher standards of living and they have a low portion of the population being unable to keep their home warm, as seen in *Table 1*.

Figure 1: share of household's expenditures on housing (electricity, gas, and other housing fuels)



For the extension of the ETS to the road transport sector, the social impact would depend mainly on the actual state of the vehicles' fleet, according to Bülbül (2021). Among other factors and characteristics like the model or the age of the car, an estimate of the fleet's state could be the share of vehicles with polluting fuels, illustrated in *Table 2* below. For example, Lithuania, Latvia, France, and Spain have a particularly high share of Diesel vehicles, meaning that the users in these countries have higher risks to suffer from the increasing prices resulting from the ETS2. Note that this table only applies to passenger cars and not bigger vehicles like commercial trucks.

Table 2: Vehicles in use (%), by fuel type, 2019 – Passenger cars (ACEA, 2021)

|                       | Petrol        | Diesel        | Battery electric | Plug-in hybrid | Hybrid electric | Natural gas  | LPG          | Other        | Unknown      |
|-----------------------|---------------|---------------|------------------|----------------|-----------------|--------------|--------------|--------------|--------------|
| Austria               | 43.2 %        | 55.0 %        | 0.6 %            | –              | 1.0 %           | 0.1 %        | 0.1 %        | 0.0 %        | 0.0 %        |
| Belgium               | 47.6 %        | 49.2 %        | 0.3 %            | 0.7 %          | 1.3 %           | 0.3 %        | 0.2 %        | 0.0 %        | 0.3 %        |
| Croatia               | 47.2 %        | 52.4 %        | 0.0 %            | 0.0 %          | 0.2 %           | 0.0 %        | 0.0 %        | 0.0 %        | 0.0 %        |
| Czech Republic        | 62.8 %        | 35.9 %        | 0.0 %            | 0.0 %          | 0.3 %           | 0.2 %        | 0.1 %        | 0.1 %        | 0.6 %        |
| Denmark               | 66.9 %        | 30.9 %        | 0.6 %            | 0.4 %          | 1.3 %           | 0.0 %        | –            | 0.0 %        | 0.0 %        |
| Estonia               | 58.9 %        | 39.6 %        | 0.2 %            | –              | 1.2 %           | 0.2 %        | 0.0 %        | 0.0 %        | 0.0 %        |
| Finland               | 68.6 %        | 27.9 %        | 0.2 %            | 0.9 %          | 1.9 %           | 0.3 %        | 0.0 %        | 0.2 %        | 0.0 %        |
| France                | 40.2 %        | 58.9 %        | 0.4 %            | 0.2 %          | –               | 0.4 %        | 0.0 %        | 0.0 %        | 0.0 %        |
| Germany               | 66.0 %        | 31.7 %        | 0.3 %            | 0.2 %          | 0.9 %           | 0.2 %        | 0.8 %        | 0.0 %        | 0.0 %        |
| Greece                | 91.1 %        | 8.1 %         | 0.0 %            | 0.0 %          | 0.5 %           | 0.1 %        | 0.0 %        | 0.2 %        | 0.0 %        |
| Hungary               | 66.4 %        | 31.5 %        | 0.2 %            | 0.2 %          | 1.0 %           | 0.1 %        | 0.7 %        | 0.0 %        | –            |
| Ireland               | 40.8 %        | 56.1 %        | 0.4 %            | 0.0 %          | 2.4 %           | 0.0 %        | 0.0 %        | 0.4 %        | 0.0 %        |
| Italy                 | 46.0 %        | 44.2 %        | 0.1 %            | 0.0 %          | 0.8 %           | 2.4 %        | 6.5 %        | 0.0 %        | 0.0 %        |
| Latvia                | 30.4 %        | 63.2 %        | 0.1 %            | 0.0 %          | –               | 0.0 %        | 6.3 %        | 0.0 %        | 0.0 %        |
| Lithuania             | 26.1 %        | 69.2 %        | 0.1 %            | 0.0 %          | 1.5 %           | 0.0 %        | 0.0 %        | 0.4 %        | 2.6 %        |
| Luxembourg            | 41.6 %        | 55.7 %        | 0.4 %            | 0.1 %          | 1.3 %           | 0.0 %        | 0.0 %        | 0.0 %        | 0.7 %        |
| Netherlands           | 80.0 %        | 14.0 %        | 1.2 %            | 1.0 %          | 2.4 %           | 0.1 %        | 1.2 %        | 0.0 %        | 0.0 %        |
| Poland                | 53.2 %        | 31.6 %        | 0.0 %            | 0.0 %          | 0.3 %           | 0.0 %        | 13.6 %       | 0.0 %        | 1.2 %        |
| Portugal              | 46.7 %        | 51.2 %        | 0.3 %            | 0.2 %          | 0.5 %           | 0.0 %        | 1.1 %        | 0.0 %        | 0.0 %        |
| Romania               | 55.3 %        | 43.3 %        | 0.0 %            | 0.0 %          | 0.2 %           | 0.0 %        | 0.1 %        | 0.0 %        | 1.1 %        |
| Slovakia              | 51.7 %        | 44.3 %        | 0.1 %            | 0.0 %          | 0.4 %           | 0.1 %        | 2.0 %        | 0.0 %        | 1.4 %        |
| Slovenia              | 49.8 %        | 49.7 %        | 0.1 %            | 0.0 %          | 0.3 %           | 0.0 %        | 0.1 %        | 0.0 %        | 0.1 %        |
| Spain                 | 39.5 %        | 58.7 %        | 0.1 %            | 0.1 %          | 1.4 %           | 0.0 %        | 0.2 %        | 0.0 %        | 0.0 %        |
| Sweden                | 55.1 %        | 35.5 %        | 0.6 %            | 1.4 %          | 2.4 %           | 0.7 %        | 0.1 %        | 4.1 %        | 0.0 %        |
| <b>EUROPEAN UNION</b> | <b>52.9 %</b> | <b>42.3 %</b> | <b>0.2 %</b>     | <b>0.2 %</b>   | <b>0.8 %</b>    | <b>0.5 %</b> | <b>2.7 %</b> | <b>0.1 %</b> | <b>0.2 %</b> |

Also, to judge the progress of countries in terms of household transport, the share of newly registered zero-emission passenger cars in the MS can be observed in *Table 3*. Again, there is a large delay for most eastern countries with Cyprus, Greece and Poland having the lowest rates, while the northern countries and some western and central European countries achieve a relatively high rate. This suggests that the population of the countries lagging furthest behind in this area will find it more difficult to cope with the increase in transport fuel prices but also higher taxation, as their cars emit and consume more than in other more advanced countries.

| Table 3: Share of zero emission vehicles in newly registered passenger cars - (Eurostat, 2022g) |       |                    |        |
|-------------------------------------------------------------------------------------------------|-------|--------------------|--------|
| <b>Cyprus</b>                                                                                   | 0.4 % | <b>Italy</b>       | 2.3 %  |
| <b>Greece</b>                                                                                   | 0.8 % | <b>Slovenia</b>    | 3.1 %  |
| <b>Poland</b>                                                                                   | 0.8 % | <b>Belgium</b>     | 3.3 %  |
| <b>Lithuania</b>                                                                                | 1.1 % | <b>Finland</b>     | 4.3 %  |
| <b>Slovakia</b>                                                                                 | 1.1 % | <b>Ireland</b>     | 4.5 %  |
| <b>Bulgaria</b>                                                                                 | 1.2 % | <b>Portugal</b>    | 5.2 %  |
| <b>Malta</b>                                                                                    | 1.2 % | <b>Luxembourg</b>  | 5.5 %  |
| <b>Croatia</b>                                                                                  | 1.5 % | <b>Austria</b>     | 6.2 %  |
| <b>Czechia</b>                                                                                  | 1.6 % | <b>Germany</b>     | 6.4 %  |
| <b>Estonia</b>                                                                                  | 1.9 % | <b>France</b>      | 6.7 %  |
| <b>Spain</b>                                                                                    | 2.1 % | <b>Denmark</b>     | 7 %    |
| <b>Latvia</b>                                                                                   | 2.1 % | <b>Sweden</b>      | 9.3 %  |
| <b>Hungary</b>                                                                                  | 2.2 % | <b>Netherlands</b> | 20.2 % |
| <b>Romania</b>                                                                                  | 2.2 % |                    |        |

Another problem emerging from the creation of the ETS2 is that such market-based mechanisms create great price instability, with prices potentially rising even more than under the existing ETS. The evolution of the carbon price of the latter is illustrated in the figure below and varies greatly over the years (Defard, 2021).

Figure 2: Carbon allowance price on EU ETS (2005-2021) - (Defard, 2021)



Finally, if we look at the general impact of the ETS extension and rising prices of CO<sub>2</sub>, a price of €100 per tonne would for example result in an increase of almost 25% in the energy bill for transport and heating in the EU. This would only worsen the situation of the nearly 35 million Europeans who cannot afford sufficient heating or cooling comfort, or the 90 million Europeans who cannot afford access to public transport adequate to their needs (Defard, 2021). This example shows that the balance between climate and environmental protection and the protection of low- to middle-class citizens is very unstable and requires even more attention as more drastic environmental measures are put in place (Liboreiro, 2021).

## 2.2 Renewable Energy Directive

The second worrying proposal from a social point of view is the revision of the Renewable Energy Directive. In fact, several changes raise questions about their feasibility and especially their cost. The proposed revision of this directive first foresees changes which will impact the building sector. The first change is an increase in the share of RES of 1.1% per year for the heating and cooling sectors. However, this target can only be reached by installing more heat pumps or using renewable hydrogen. But these installations are very costly and seem difficult to achieve in the short to medium term, and only feasible if sufficiently massive funds are mobilised. The other targets of a 2.1% increase in RES in district heating and the 49% increase in RES for the building sector also require sufficient funds not to pass the costs on to citizens and businesses, even if these targets are not binding (Piebalgs & Jones, 2021). Indeed, even if the impact assessment only foresees on average a 1% increase in energy expenditure of the average household consumption, this percentage is likely to increase considerably for the low income group, increasing income inequalities (Gore et al., 2022). For the industry sector including many energy-intensive industries, the indicative target of 1,1% increase per year in RES also represents either a huge investment or a need for massive subsidies. Achieving this target does not only require improvements but sometimes a complete rethink of the production process (Piebalgs & Jones, 2021).

Overall, the directive also calls for a 40% share of renewable energy sources in the EU's total energy mix by 2030. However, Member States are free to adopt their own action plans and targets. Can this EU ambition therefore be considered realistic? It is difficult to believe this when considering the sometimes very unstable situation in some EU countries, both politically and socially. Indeed, some countries being in greater difficulty should revise their ambitions

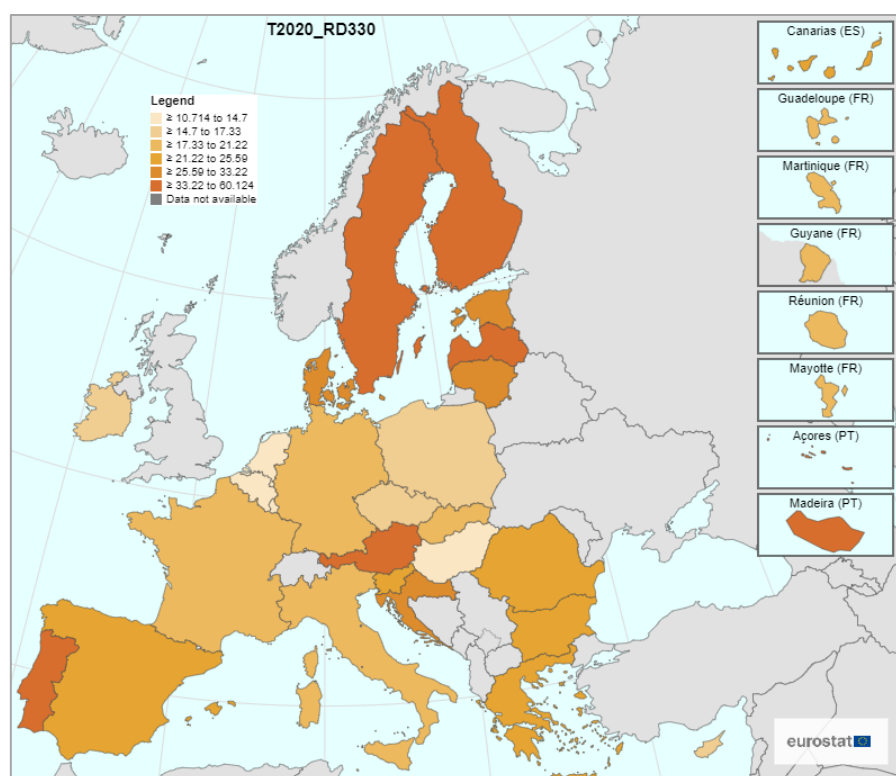
upwards despite this unstable context (for example, the need to accelerate the coal phase-out programmes in Central and Eastern Europe countries). The achievement of this 40% target is also questionable when considering the time needed for a Member State to transpose the Directive into national law. Seven years (2023-2030) seems to be far too short a period to implement the necessary changes (Piebalgs & Jones, 2021), especially when considering that the new target must be finalised in May 2024 and that we cannot therefore really expect capacity additions before 2026 in MS (International Energy Agency, 2021).

To identify the countries that would have the most difficulties in contributing to the achievement of the target, we can look at the share of renewable energy in gross final energy consumption<sup>7</sup> (in %) in EU countries in 2020. Based on this map below (*Figure 3*), we see that countries with the highest share of RES are countries in dark orange like Sweden, Finland, Latvia and Portugal while countries with the lowest share are the Netherlands, Hungary, Belgium, Luxembourg and finally Malta with only 10,714% in 2020 (see *Appendix 3* for detailed ranking) (Eurostat, 2022e). We can assume that these countries having a very low share of RES will face higher costs to change their energy consumption than others being more advanced in this area, thus being more impacted by the RED revision. However, even if countries that are not very advanced in RES will face higher costs, their capability to implement the changes necessary to achieve the targets will also strongly depend on other factors such as public finances, governance, technology, etc. For example, the Netherlands shows a promising renewable sector despite their very low share of RES consumption, as the employment in the photovoltaic industry doubled from 2017 to 2018. These factors will be explored in the next part of the research.

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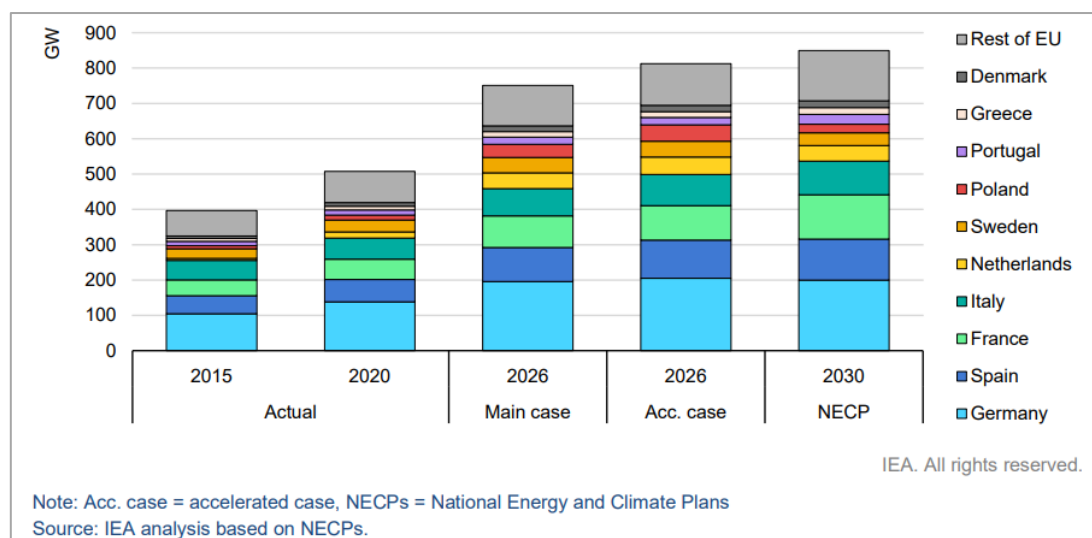
<sup>7</sup> The gross final energy consumption is the energy used by end-consumers (final energy consumption) plus grid losses and self-consumption of power plants. This indicator is calculated on the basis of [Directive 2009/28/EC](#) on the promotion of the use of energy from renewable sources. The calculation is based on data collected in the framework of [Regulation \(EC\) No 1099/2008](#) on energy statistics and complemented by specific supplementary data transmitted by national administrations to Eurostat.

Figure 3: Share of renewable energy in gross final energy consumption, 2020 - (Eurostat, 2022e)



Looking now at a second indicator which is the renewable capacity installations in 2020 and projected to 2030 based on the National Energy and Climate Plans shown in the IEA graph below (2021) (*Figure 4*), we can observe that the countries with a good base of renewable installations are mainly Germany, Spain, France, and Italy. From this observation, we can assume that these countries will face fewer challenges to adapt to the new targets. However, renewable capacity additions can still vary from the estimations because of social acceptance or permitting challenges MS could encounter. Note that data for the other 17 EU MS are missing as they are not members of the IEA. They are nevertheless represented by the grey colour on the graph (International Energy Agency, 2021).

Figure 4: EU member states installed renewable capacity and capacity expected in 2030 based on submitted NECPs (International Energy Agency, 2021)



Another target set by the proposed revision is to achieve a 50% share of renewable hydrogen in total EU hydrogen sales. However, Pielbags & Jones (2021) estimate that this would place an additional burden of €8 billion on sectors at risk of carbon leakage.

Finally, some infrastructures such as grid or storage facilities needed to deal with the increasing share of intermittent electricity generation are also very likely to increase the costs of investment and the difficulties encountered because of the pace of change (Piebalgs & Jones, 2021).

## 2.3 Energy Efficiency Directive

The proposed new provisions for the Energy Efficiency Directive, while showing a certain level of social awareness, still present some social risks. Indeed, although providing for the first time an EU definition of energy poverty, defined as *"a household's lack of access to essential energy services that underpin a decent standard of living and health, including adequate warmth, cooling, lighting, and energy to power appliances, in the relevant national context, existing social policy and other relevant policies"* (Sunderland, 2021), some parts of the proposed revision raise social concerns.

For the building sector, the Energy Efficiency Directive foresees, as we have seen in the first part, to make it compulsory to renovate at least 3% per year of government buildings to near zero standards. It also foresees a reduction in energy consumption of 1.7% of all buildings.

These measures seem difficult to achieve from the point of view of the national tax budget in the long term as they require solid funds. In the short term, however, the costs could be covered by the European Recovery Fund. As for the social impact, even if reducing energy consumption could reduce energy expenditures of households, the potential regressive effects of carbon pricing on heating fuels must also be taken into consideration, as we have seen with the revision of the ETS. Opportunities to fund renovation costs and renewable energies could also be limited among the population and create inequalities as well (Gore et al., 2022). Similarly, meeting the 1.1% annual energy savings target will require a significant amount of funds to convince citizens to renovate or improve their homes (e.g. by installing heat pumps) or to further regulate by forcing them to adapt to the new directive (e.g. refurbishing when selling housing) and thus reduce their freedom of choice (Piebalgs & Jones, 2021). If the incentives to renovate and overcome non-regulatory barriers or low renovation standard are insufficient, low-income households could be locked into fossil fuel dependence (Gore et al., 2022).

Another social impact that is worth noting is related with social housing. Indeed, people living in social housing could benefit less from additional funding schemes and initiatives, as these types of housing are usually centrally managed and could not always be considered as beneficiaries of these schemes. Also, setting higher standards for new buildings could affect the supply of social housing on the long-term and exclude potential beneficiaries (Gore et al., 2022).

Finally, the proposed directive refers to poor households' lack of access to essential energy services, which demonstrates some interest from the Commission in such issues. However, it does not mention the problem of the cost of these services and excludes energy needs for cooking, an important part of household use (Sunderland, 2021).

## 2.4 CBAM

This fourth critical proposal introduces the creation of a Carbon Border Adjustment Mechanism which raises many questions and concerns, especially for the European industry sector. Indeed, one of the expected consequences of its implementation and of the end of the protection of the steel, cement and fertiliser sectors is the drop in competitiveness on the international markets in the short to medium term. Indeed, the prices of these goods will inevitably rise from 2026 onwards and no export support is foreseen in the Commission's proposal to counteract these additional costs (Piebalgs & Jones, 2021). Export support would in fact not be consistent with

environmental ambitions and could lead to carbon dumping instead of preventing carbon leakage (Ruggiero, 2021). This drop in competitiveness would also be due to other factors, such as the price of labour, which would make the price of imported goods usually lower than that of domestic goods. In addition, the price of basic materials for European producers could turn out to be higher than for their foreign competitors, positively impacting the latter (Assous et al., 2021). Finally, European companies in the sectors covered have expressed some concerns about the abolition of free allowances. Replacing them with the CBAM would, according to some, represent a loss of advantages that would not allow them to remain competitive (Assous et al., 2021). These risks must nevertheless be counterbalanced. Some measures could indeed be considered as protectionist towards European companies, protecting them from non-European producers with fewer regulations and environmental standards to adapt to (Defraigne & Nouveau, 2022).

This CBAM proposal is one of the most controversial in the Fit for 55 Package but is more relevant to European and foreign companies trying to maintain their competitiveness than to European consumers and businesses facing social risks, making it less important to this research.

## 2.5 Energy Taxation Directive

The next socially problematic proposal constituting the Package is the revision of the Energy Taxation Directive. The proposal comes from the observation that at present, the minimum energy tax rates proposed by the directive are too low, and indeed lower than all the rates imposed in all EU Member States, and that the energy tax base is no longer adequate to tackle the environmental crisis (Florence School of Regulation, 2022). Some polluting energy sources indeed appear to have a tax advantage compared to more carbon-efficient sources. For example, natural gas is currently more taxed than coal, according to the European Court of Auditors (Simon, 2022). There are also large disparities between EU member states regarding energy taxation, which hampers the EU's environmental transition. More homogeneity would be highly desirable, and is one of the motivations for the revision of the ETD (Florence School of Regulation, 2022; Simon, 2022).

One of the main discussions going on between the Council and the European Parliament on the ETD is that the revision of this directive poses a clear risk of additional costs for businesses and households in the building sector through changes in taxation schemes. Fossil fuels used for

heating will for example, from 2033 onwards, be taxed almost six times more than electricity and as much as oil (Piebalgs & Jones, 2021). But the Commission does not provide any specific measures to prevent the risks associated with increased taxes on energy products. It simply advises MS to design environmental taxes that promote growth, social justice, and employment. It also recommends that some exemptions from taxes on electricity and fossil fuels be introduced for households that cannot afford them (KPMG, 2021). It is therefore up to Member States to create an appropriate taxation scheme to limit the risks associated with this proposed revision of the ETD. These social risks to households are however unlikely to affect the structure of the proposal during the negotiations, but rather the timeframe for the implementation of the new provisions (Florence School of Regulation, 2022). The proposed minimum tax rates for fuels (see *Appendix 4*) can however simply be seen as a signal to investors. It is indeed the decision of the MS on the taxation scheme that really counts.

In general, directives on energy taxation or standards will affect the colder regions of the EU, i.e. again the Baltic and Eastern European countries, which currently still have a high need for heating and fossil fuels, more than the warmer or more temperate countries of the EU (Piebalgs & Jones, 2021). For example, the poorest Slovak and Czech households already spend more than 20% of their revenue to energy spending. This situation could largely be worsened by greener taxation and solutions like redistribution measures or a reduction of other taxes are highly needed to counter these risks (Simon, 2022).

## 2.6 Social Climate Fund

Finally, a last proposal that is open to hard debate in the Commission's Communication is the creation of the Social Climate Fund and its capacity to fulfil the mission to help and protect vulnerable European citizens in the face of the ETS 2. But some comments and research cast doubt on this. We will see what weaknesses of the SCF have been raised since the submission of the FF55 and what the amount of money proposed represents compared to the money spent by MS in environmental expenditures. Finally, some recommendations to counter the shortcomings of the fund will be presented from the literature.

### 2.6.1 SCF weaknesses

Firstly, some studies have indeed been conducted and show that the amount of money released by the fund will not be high enough to meet the need for green investments to enable citizens to adopt low-carbon solutions, as well as to protect the most vulnerable from rising costs (Defard, 2021; Housing Europe, 2021). The European ministers of Greece, Malta, Lithuania, the Czech Republic but also of Poland strongly support the idea that the fund would not be sufficient as well (Taylor, 2021b). As an example of this insufficiency, the renovation of the social housing sector could require additional 13 billion euros annually until 2050 compared to today (Myers, 2021), which means that the amount planned for the SCF would even not be enough for the proposed 8 years (Defard, 2021; Taylor, 2021). Besides, by doing a simple calculation based on the figures provided, we can conclude that the SCF and the states' contribution could bring a sum of 20.6 billion annually ( $72.2 \text{ billion} + \text{MS contribution} = 144.4 \text{ billion over a period of 8 years}$ ). These 20,6 billion euros, allocated to the lowest 20% of citizens, would amount to 230 euros per citizen or a total of 1600 euros for a person considered to be low income. It could be argued that this financial aid is sufficient as financial support for the prices increase, but it is difficult to believe that it is sufficient to decarbonise the renovation of housing and means of transport (Sunderland, 2021).

Secondly, the issue of timing is also a weakness of the fund which needs to be raised, as the launch of the SCF only one year before the implementation of the extended ETS is not enough time for the fund to finance green investments and protect consumers (Defard, 2021; Sunderland, 2021; Taylor, 2021; BEUC, 2022).

Furthermore, the limitation of the fund to a certain amount per capita for each member state could also be problematic. For example, this limit is set at 400 euros in eastern countries, while it does not always reach 100 euros for some western EU states. The cap is set on the basis of gross national income per capita, as well as population size, household emissions, the percentage of households in utility debt, and the population at high risk of poverty living in rural areas (Bülbül, 2021). Based on these calculations, the top beneficiaries of the fund would be Poland (18%), France (11%), Italy (11%), Spain (11%), Romania (9%) and Germany (8%). However, a pitfall of this "calculation" is that it does not take into account the regional level and leaves the entire responsibility for governance to national, not local, governments (Bülbül, 2021). This may not make the distribution of funds as effective as it should be and rich MS with higher inequalities could benefit more than poor MS with a low level of within-country inequality (Galgóczi, 2021).

Also, to protect the weakest from the effects of the ETS2, the revenues it generates should be fully used for the ecological transition (Defard, 2021) according to many researchers and stakeholders, which would allow the resources of the SCF to follow the ETS prices evolution (Thalberg & Defard, 2022). But this does not seem to be the will of the Commission, which is proposing an Own Resource instrument to be adopted unanimously by the Council. This demonstrates the Commission's willingness to keep a share of the ETS revenues to finance the EU budget and potentially use it in the recovery from the covid pandemic. In this case, the Fund would not be properly used and redistributed among the citizens of the European Union who would need it most (Defard, 2021).

A final doubt about its effectiveness can be raised in relation to its structure. Although part of the fund is supposed to provide direct support to vulnerable households, the rest is mostly intended to finance charging infrastructure and incentives for electric vehicles. There is also money to fund the decarbonisation of the building sector. Low-income households will therefore not be the beneficiaries of this part of the fund, and it will benefit rich citizens who can afford to buy electric vehicles, further reinforcing inequalities (Galgóczi, 2021; BEUC, 2022).

The fund is however intended to be supplemented by other financial sources, such as solidarity funds (see Appendix 2) and the resources of the MS. The Commission's proposal also includes a deepening of the Modernisation Fund in addition to the SCF (European Commission, 2021a). However, again, the structure of this fund and its targets are unlikely to be of much use to vulnerable households in the short term. It is mainly dedicated to supporting investments in energy efficiency, storage, RES production and consumption, energy network modernisation and equitable transition for highly carbon dependent regions (European Commission, n.d.-c). In the long term, however, its investments could bear fruit and facilitate the transition of households towards a more energy sustainable way of life.

We can finally try to understand what the 72.2 billion euros represent compared to other climate and environmental expenditures and/or protection of households against the social risks of climate change. Based on data from Eurostat (2022b) exposed in the *Table 4* below, we can observe the expenditures of MS on environmental protection in 2018. The table on the left shows the expenditures for the sector of households only, being the beneficiaries or origin of transfers. The table on the right shows the expenditures for the total economy. In the first table, the figures of interest are those at the bottom, for example for Germany. The latter would have spent an amount of 14,564 million euros in 2018 on environmental protection in the household

sector. This amount spent in only one year represents about one fifth of the amount foreseen in the SCF for 27 member states and over a period of 8 years. If we now look at the table on the right showing environmental protection expenditure for the total economy, we can see once again that Germany has spent around 74 billion euros, which is more than the total amount of the SCF in just one year. These comparisons by proxies again demonstrate the glaring inadequacy of the fund to provide adequate protection for households.

Table 4: National expenditure on environmental protection by institutional sector (in million euro), 2018 - (Eurostat, 2022c)

| ↓↑                                               | ⊗ | TIME | 2018 ↑     |
|--------------------------------------------------|---|------|------------|
| GEO ↓                                            |   |      |            |
| Malta                                            |   |      | 0.6        |
| Cyprus                                           |   |      | 38.9       |
| Estonia                                          |   |      | 49.5       |
| Latvia                                           |   |      | 114.3      |
| Lithuania                                        |   |      | 115.6      |
| Luxembourg                                       |   |      | 162.8      |
| Bulgaria                                         |   |      | 189.6      |
| Romania                                          |   |      | 205.4      |
| Slovakia                                         |   |      | 238.7      |
| Slovenia                                         |   |      | 240.7      |
| Croatia                                          |   |      | 265.9      |
| Ireland                                          |   |      | 361.4      |
| Hungary                                          |   |      | 622.2      |
| Portugal                                         |   |      | 638.5      |
| Greece                                           |   |      | 693.4 (p)  |
| Czechia                                          |   |      | 807.1      |
| Austria                                          |   |      | 861        |
| Finland                                          |   |      | 890.6      |
| Belgium                                          |   |      | 1 426.6    |
| Netherlands                                      |   |      | 1 793.3    |
| Sweden                                           |   |      | 2 028.5    |
| Denmark                                          |   |      | 2 188.6    |
| Spain                                            |   |      | 3 208      |
| Poland                                           |   |      | 5 080 (p)  |
| Italy                                            |   |      | 9 714      |
| France                                           |   |      | 11 179.1   |
| Germany (until 1990 former territory of the FRG) |   |      | 14 564 (e) |

| ↓↑                                               | ⊗ | TIME | 2018 ↑       |
|--------------------------------------------------|---|------|--------------|
| GEO ↓                                            |   |      |              |
| Malta                                            |   |      | 175.1        |
| Cyprus                                           |   |      | 304.7        |
| Latvia                                           |   |      | 407.6        |
| Luxembourg                                       |   |      | 624.4        |
| Estonia                                          |   |      | 635.2        |
| Bulgaria                                         |   |      | 711.7        |
| Lithuania                                        |   |      | 858.3        |
| Slovenia                                         |   |      | 917.3        |
| Croatia                                          |   |      | 1 218.5      |
| Slovakia                                         |   |      | 1 536.2 (p)  |
| Romania                                          |   |      | 1 585.3      |
| Ireland                                          |   |      | 2 052.3      |
| Hungary                                          |   |      | 2 123.3      |
| Greece                                           |   |      | 2 198.6 (p)  |
| Portugal                                         |   |      | 3 430.2      |
| Finland                                          |   |      | 3 568.5      |
| Czechia                                          |   |      | 5 775.1      |
| Denmark                                          |   |      | 6 026        |
| Poland                                           |   |      | 9 217.6 (p)  |
| Sweden                                           |   |      | 9 790.2      |
| Austria                                          |   |      | 13 454       |
| Belgium                                          |   |      | 15 292.4     |
| Netherlands                                      |   |      | 18 968       |
| Spain                                            |   |      | 19 494.6     |
| Italy                                            |   |      | 32 758.8     |
| France                                           |   |      | 45 615.6     |
| Germany (until 1990 former territory of the FRG) |   |      | 74 004.5 (e) |

## 2.6.2 Recommendations

As an answer to all these shortcomings, the position of the Bureau Européen des Unions de Consommateurs (2022) seems to be the most representative of the consumers interests, which are at the centre of this paper. The BEUC has taken a position on the SCF and has proposed several recommendations to make it a sufficient instrument to protect consumers. Firstly, the association advises to dissociate the extension of the ETS from the creation of the SCF, as the latter is necessary even without the implementation of the ETS2. Secondly, they advocate redirecting all revenues generated by the ETS2 to consumers, and not only a quarter of the revenues as proposed by the Commission. Revenues should also not go to industry and should

only benefit consumers, even indirectly through infrastructure projects for example. A fourth piece of advice from them is to respect the additionality principle to launch new projects and not finance old ones. Finally, the last three suggestions are to review the timing, considered too tight to make the fund effective, to establish a price corridor for carbon pricing and to use more legislative tools to protect consumers, notably through the ETD or EED proposals (BEUC, 2022).

It should also be noted that redistributive policies could be conceived to make the social burden of the FF55 less onerous for those Member States most vulnerable to the proposals. But nothing of the sort has been envisaged by the Commission, which makes some of the proposals even less realistic and achievable than they are at present in the Commission's plan. However, if such policies were planned, they would have to counter potential competition law problems between member states but also issues of equity. It is indeed unlikely that one richer and more resilient state will help one or some specific countries and not all of them. Providing for redistribution would again require many difficult negotiations but could represent a valid solution to counter some of the negative effects of the package.

To date, the Council has adopted a common position on the SCF, which is mostly in line with that of the Commission. Primarily, the Council wants the Fund to be part of the EU budget, while being able to be complemented by external revenues of up to EUR 59 billion. The institution also agrees with the Commission's proposal and calculations as to the beneficiaries of the fund, but has decided not to maintain the proposal for co-financing by the MS (Council of the EU, 2022b).

### 3. Impact assessment on Member States

This third part of the research provides an analysis of the impact of the Fit for 55 Package and particularly of the combination of its critical proposals on the different EU Member States. Still adopting the perspective of social cost issues, outlined in section 2 of this research, we identify which MS are the most vulnerable and will be impacted the most by the proposals and what are the reasons for these differences in magnitude. We will then be able to judge whether the MS most concerned by the proposals set out in the previous section will be able to overcome the social risks and achieve the objectives set or not.

The methodology used to achieve this objective is firstly to explore existing work on the impact of the FF55 and use it to evaluate the most vulnerable countries. Secondly, we complete these findings by selecting a few general indicators to judge the vulnerability of MS to the FF55 package based on their structural characteristics. These indicators will cover the public finances, technology level, poverty and governance of the MS and will allow us to provide a general picture of the MS ability to face FF55 social risks.

#### 3.1 Member states' vulnerability based on existing literature

Firstly, we can build on a study conducted by Bülbül (2021), which examines the SCF from an energy justice perspective. In this paper, the author provides an analysis of the impact of the FF55, especially of the ETS2 on households and regions. The results about the vulnerability of regions, shown in the first line of *Table 5*, will be used as a starting point to determine most vulnerable countries. The other results of the table concerning households have been in part dealt with in the previous part of the research (energy bills, polluting cars, ...), but others will not be studied as they are very specific, and we would rather favour a holistic approach to judge the social impact on the MS.

| Table 5: Impact of the ETS' extension on vulnerable households and regions - (Bülbül, 2021) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Impacted                                                                                    | Households                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Regions                                                                                                                                                                                                                                                                                         |
| <b>Vulnerability</b>                                                                        | <ul style="list-style-type: none"> <li>- Low- and middle-income households who are or at risk of being energy-poor with a large share of energy bills</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>- Regions that were hit hard by COVID-19</li> <li>- Regions with high employment in carbon-intensive sectors</li> <li>- Regions with the gap between the current emissions and the targets is large</li> </ul>                                           |
| <b>Building</b>                                                                             | <ul style="list-style-type: none"> <li>- Increasing energy bills with limited/no opportunity to move to cleaner technologies or energy-efficient houses, therefore, limiting other household expenses</li> <li>- Tenants with no authority over energy decisions but who have to pay the increasing bills</li> <li>- Tenants/owners who are living in inadequate housing whose situation might be worse off with the increasing prices</li> <li>- Tenants who are at risk of homelessness due to not being able to afford to pay increasing bills</li> </ul> | <ul style="list-style-type: none"> <li>- Regions with building typology that consists of energy-inefficient buildings</li> <li>- Regions with heating system built for carbon-intensive fuels</li> <li>- Regions which only available energy mix for the heating is carbon-intensive</li> </ul> |
| <b>Transportation</b>                                                                       | <ul style="list-style-type: none"> <li>- Households especially in the rural areas with high dependency on personal transportation</li> <li>- Households that are dependent on personal transportation due to extra care that is needed; disabled, sick, or elderly members, or small children</li> <li>- Households with old and highly polluting cars with no financial capability to change their cars</li> </ul>                                                                                                                                          | <ul style="list-style-type: none"> <li>- Regions with an older fleet which needs to be renewed/updated</li> </ul>                                                                                                                                                                               |

According to Bülbül (2021), regions that are the most vulnerable are characterised as regions that have been severely impacted by covid, regions with a high rate of employment in energy-intensive sectors, and finally regions where the gap between current emissions and the target is large. As for the first type of region vulnerability, Marti & Puertas (2021) elaborated a ranking of EU countries' vulnerability to Covid-19 regarding health, society, and work. Their results show that eastern and southern European countries are the most vulnerable to Covid-19, except

for work, where it is central and northern countries (Marti & Puertas, 2021). In the context of our research, it is the countries' vulnerability for society that are of greater concern to us, as they will potentially have more difficulty coping with the changes foreseen by the FF55 and its proposals creating significant social costs. The Netherlands, Sweden and Luxembourg appear to be less vulnerable while the situation is much more precarious for Romania, Croatia, and Bulgaria. Note that Greece and Slovakia do not appear in the table.

Figure 5: Ranking of European countries' vulnerability to COVID-19 - (Marti & Puertas, 2021)

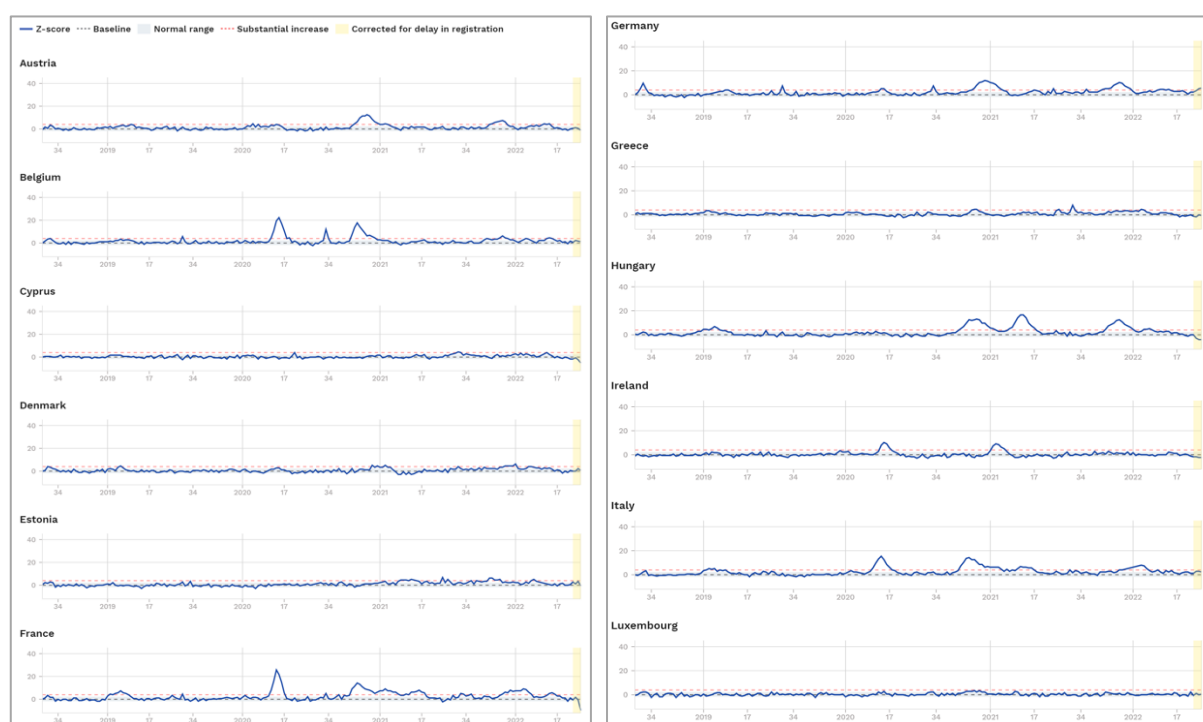
| Health |             |       |    | Society |             |       |    | Work |             |       |    |
|--------|-------------|-------|----|---------|-------------|-------|----|------|-------------|-------|----|
| TR     | Country     | CI    | Q  | TR      | Country     | CI    | Q  | TR   | Country     | CI    | Q  |
| 1      | Switzerland | 0.807 | Q4 | 1       | Netherlands | 0.861 | Q3 | 1    | Bulgaria    | 0.901 | Q1 |
| 2      | Germany     | 0.610 | Q3 | 2       | Sweden      | 0.856 | Q4 | 2    | Czechia     | 0.858 | Q1 |
| 3      | Luxembourg  | 0.570 | Q4 | 3       | Iceland     | 0.828 | Q4 | 3    | Malta       | 0.850 | Q2 |
| 4      | Denmark     | 0.546 | Q4 | 4       | Luxembourg  | 0.801 | Q4 | 4    | Estonia     | 0.849 | Q2 |
| 5      | Austria     | 0.536 | Q3 | 5       | Denmark     | 0.787 | Q4 | 5    | Lithuania   | 0.842 | Q1 |
| 6      | Norway      | 0.526 | Q4 | 6       | Belgium     | 0.758 | Q3 | 6    | Romania     | 0.841 | Q1 |
| 7      | Ireland     | 0.521 | Q4 | 7       | U. Kingdom  | 0.756 | Q3 | 7    | Latvia      | 0.832 | Q1 |
| 8      | Belgium     | 0.510 | Q3 | 8       | Finland     | 0.733 | Q3 | 8    | Hungary     | 0.830 | Q1 |
| 9      | Italy       | 0.508 | Q2 | 9       | Austria     | 0.708 | Q3 | 9    | Ireland     | 0.764 | Q4 |
| 10     | U. Kingdom  | 0.507 | Q3 | 10      | France      | 0.704 | Q3 | 10   | Norway      | 0.763 | Q4 |
| 11     | France      | 0.498 | Q3 | 11      | Norway      | 0.669 | Q4 | 11   | Cyprus      | 0.760 | Q2 |
| 12     | Hungary     | 0.477 | Q1 | 12      | Switzerland | 0.668 | Q4 | 12   | Denmark     | 0.753 | Q4 |
| 13     | Iceland     | 0.466 | Q4 | 13      | Ireland     | 0.663 | Q4 | 13   | Luxembourg  | 0.753 | Q4 |
| 14     | Lithuania   | 0.463 | Q1 | 14      | Germany     | 0.659 | Q3 | 14   | Iceland     | 0.730 | Q4 |
| 15     | Sweden      | 0.461 | Q4 | 15      | Estonia     | 0.651 | Q2 | 15   | Austria     | 0.726 | Q3 |
| 16     | Netherlands | 0.461 | Q3 | 16      | Portugal    | 0.648 | Q2 | 16   | Slovenia    | 0.675 | Q2 |
| 17     | Bulgaria    | 0.459 | Q1 | 17      | Czechia     | 0.643 | Q1 | 17   | Switzerland | 0.637 | Q4 |
| 18     | Romania     | 0.456 | Q1 | 18      | Malta       | 0.628 | Q2 | 18   | Portugal    | 0.637 | Q2 |
| 19     | Poland      | 0.455 | Q1 | 19      | Slovenia    | 0.584 | Q2 | 19   | Finland     | 0.627 | Q3 |
| 20     | Cyprus      | 0.454 | Q2 | 20      | Spain       | 0.582 | Q2 | 20   | Sweden      | 0.624 | Q4 |
| 21     | Croatia     | 0.441 | Q1 | 21      | Poland      | 0.527 | Q1 | 21   | Belgium     | 0.622 | Q3 |
| 22     | Portugal    | 0.411 | Q2 | 22      | Italy       | 0.519 | Q2 | 22   | Germany     | 0.567 | Q3 |
| 23     | Spain       | 0.407 | Q2 | 23      | Cyprus      | 0.512 | Q2 | 23   | U. Kingdom  | 0.564 | Q3 |
| 24     | Malta       | 0.401 | Q2 | 24      | Hungary     | 0.506 | Q1 | 24   | Croatia     | 0.557 | Q1 |
| 25     | Czechia     | 0.397 | Q1 | 25      | Lithuania   | 0.473 | Q1 | 25   | Netherlands | 0.555 | Q3 |
| 26     | Slovenia    | 0.383 | Q2 | 26      | Latvia      | 0.364 | Q1 | 26   | Poland      | 0.547 | Q1 |
| 27     | Estonia     | 0.344 | Q2 | 27      | Romania     | 0.314 | Q1 | 27   | France      | 0.435 | Q3 |
| 28     | Latvia      | 0.279 | Q1 | 28      | Croatia     | 0.305 | Q1 | 28   | Italy       | 0.376 | Q2 |
| 29     | Finland     | 0.267 | Q3 | 29      | Bulgaria    | 0.144 | Q1 | 29   | Spain       | 0.371 | Q2 |

TR: TOPSIS Ranking; CI: Closeness index; Q: Quartile of GDPpc.

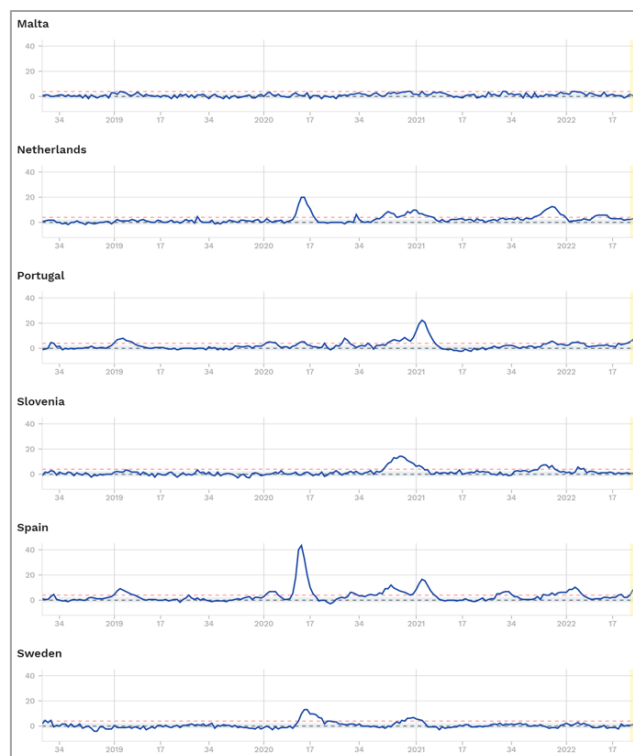
Another indicator for judging which states have been most impacted by the covid-19 pandemic is the excess mortality indicator, calculated by EuroMOMO on a weekly basis in the countries participating in the network. This indicator would be one of the most robust and comparable indicators for estimating covid mortality and therefore the most affected countries, although other factors than covid-19 obviously affect the scores obtained. For example, a low score of excess mortality could be due to the geographic position of a country, being either at the centre of the continent and therefore more exposed to the spread of the virus or being at the periphery, more isolated and protected from the disease such as Malta or Cyprus. Also, the score may be affected by the effectiveness of rules that have been taken by governments to contain the spread. A Member State with a low score and therefore a low number of excess deaths may therefore be the result of more restrictive rules (borders closed, lockdowns, ...), which does not

necessarily represent the quality and efficiency of the health and care system. Some indicators of health quality can be found in *Appendix 6*, providing additional information (loss of health expectancy and number of physicians and hospital beds) about health in the member states and especially following the Covid-19 pandemic. These exogenous factors must therefore be taken into consideration when analysing a country's vulnerability to the COVID-19 and therefore to the new environmental laws to come. By looking at the graphs from EuroMOMO below, countries with high z-scores<sup>8</sup> from 2019 to 2022 are Belgium, France, Hungary, Italy, the Netherlands, and Spain. These countries have a varying curve with sometimes high peaks, which means they have been seriously impacted by the pandemic. Note that 9 European MS are missing from the EuroMOMO network, making the global picture uncomplete.

Figure 6: Graphs of the weekly z-score at the national level in the EuroMOMO partner countries and subnational regions - (EUROMOMO, 2022)

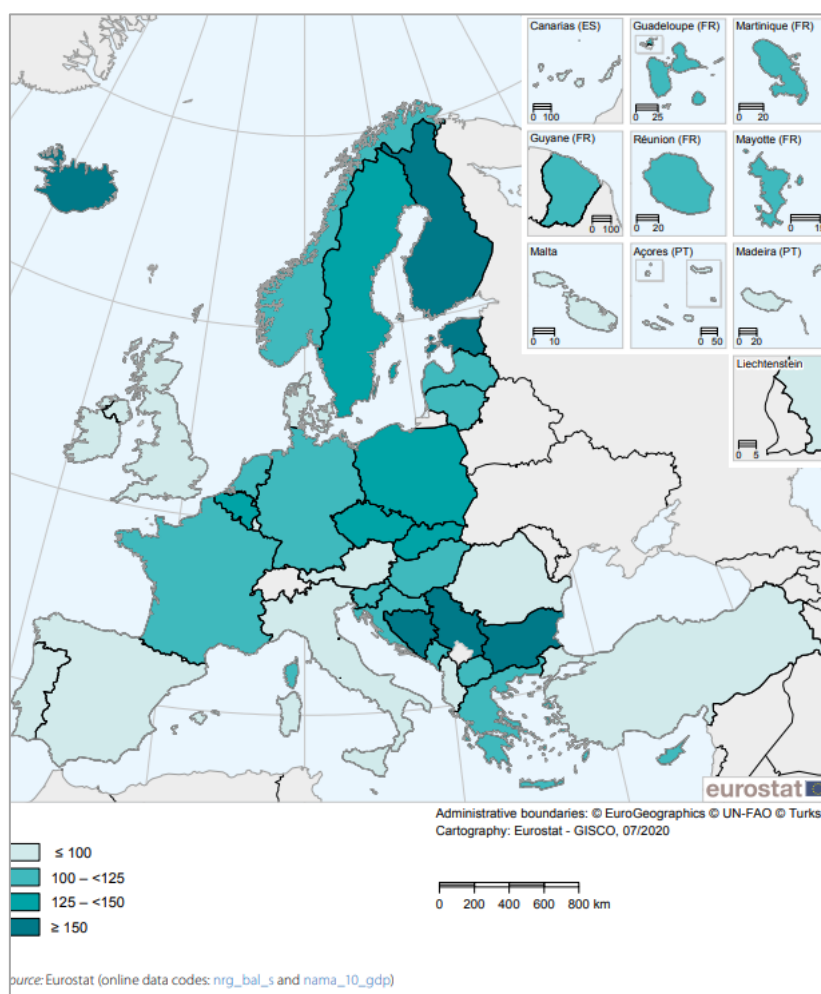


<sup>8</sup> "Z-scores are used to standardize series and enable comparison mortality pattern between different populations or between different time periods. The standard deviation is the unit of measurement of the z-score. It allows comparison of observations from different normal distributions. In general,  $Z\text{-score} = (\text{x-mean of the population}) / \text{Standard deviation of the population}$ , which could be approximated in our context by  $S\text{-score} = (\text{number of deaths} - \text{baseline}) / \text{Standard deviation of the residuals (variation of the number of deaths around the baseline)}$  on the part of the series used to fit the model, used as the standard unit." (EUROMOMO, 2022)



A second vulnerability indicator proposed by Bülbül (2021) is the employment rate in energy intensive sectors. Due to the lack of data on the employment rate in these sectors per country, we can nevertheless study the energy intensity of the MS economy to deduce a high or low employment rate. *Figure 7* provides an overview of the energy intensity of countries and shows that Bulgaria is the most energy intensive economy in terms of kilos of oil equivalent per 1000 euros of GDP-Chain volumes, followed by Estonia and the Czech Republic looking at the most recent data from 2017. Having an energy-intensive economy is also a sign of low energy efficiency, which can be caused by a higher number of production sectors compared to services sectors, energy-intensive production methods and activities, or inefficient production units. It can therefore be deduced that the above-mentioned regions with a high energy intensity of their economy will also have a relatively high employment rate in the sectors and therefore represent countries/regions at risk from the ETS2 and the other measures of the package.

Figure 7: Energy intensity of the economy (kilogram of oil equivalent per thousand euro PPS), 2018 - (Eurostat, 2020)



Finally, MS that are particularly vulnerable to a change in the allowances policy of the ETS would be the ones having a large gap between their current emissions and the target level. The targets of MS expressed by a percentage of reduction compared to 2005 or 1990 levels of emissions are summarized in *Appendix 5* and are a good proxy to judge the national ambitions of MS. The targets are classified depending on whether they cover emissions from non-ETS, ETS sectors or other sectors (Effort Sharing regulation) or are general objectives for the economy. The most prominent observation that can be made based on these targets are that countries are fixing their reduction objectives depending on their ability to effectively reduce their emissions. Therefore, small countries being less advanced in sustainable technologies allowing for a reduction of emissions set lower targets than their counterparts being more advanced. For example, Bulgaria does not have any target for emissions covering non-ETS sectors and Romania will try to reduce its non-ETS emissions by only 2%. On the other hand,

countries like Belgium, Austria, Germany plan to cut non-ETS emissions by around 30%. Note that some countries have however a high target even if they are among the poor countries of the EU (Greece, Czech Republic, ...). This observation suggests that the gap between current emissions and national targets is not the most appropriate to judge the country's vulnerability. We would rather choose the advancement in infrastructures and technologies to judge if a MS will face more risks adapting to the FF55. These infrastructure and technologies will be observed in the next part of the work.

## 3.2 Structural characteristics of the member states

### 3.2.1 Public Finances

Having pointed out the countries being more vulnerable based on Bülbül's (2021) research on energy justice, we can start an analysis of some general indicators, looking first at the public finances of the Member States. A first indicator used is the share of total net social expenditure (public and private) as a percentage of GDP by country. These OECD data are only available for 22 MS and date from 2017 but nevertheless give a good overview of the groups of countries that dedicate a smaller share of their budget to social expenditure. This indicator was chosen because it gives a good estimate of the importance of social protection and support provided to the population, whether for the ecological transition or other causes. We therefore interpret a low percentage of GDP allocated to social spending as a weakness in the face of the changes envisaged by the FF55 and particularly the proposals impacting the bills of the most vulnerable households. The *Table 6* below showing the data informs us that central-western, southern, and northern European countries devote almost around a fifth or quarter of their GDP to social spending, while the Baltic and eastern countries are generally at the bottom of the table, indicating a lower share of social spending.

*Table 6: Social expenditure – Aggregated data: Net Total Social Expenditure, in % GDP by country, 2017 - (OECD, n.d.)*

|                    |       |                       |       |
|--------------------|-------|-----------------------|-------|
| <b>France</b>      | 31,2% | <b>Greece</b>         | 21,1% |
| <b>Belgium</b>     | 26,6% | <b>Slovenia</b>       | 19,6% |
| <b>Germany</b>     | 25,2% | <b>Czech Republic</b> | 17,9% |
| <b>Denmark</b>     | 25,2% | <b>Luxembourg</b>     | 17,4% |
| <b>Italy</b>       | 24,7% | <b>Hungary</b>        | 17,4% |
| <b>Netherlands</b> | 24,7% | <b>Poland</b>         | 17,2% |
| <b>Finland</b>     | 24,5% | <b>Slovakia</b>       | 17,1% |
| <b>Sweden</b>      | 24,4% | <b>Ireland</b>        | 14,7% |
| <b>Austria</b>     | 24,3% | <b>Estonia</b>        | 14,5% |
| <b>Spain</b>       | 22,5% | <b>Lithuania</b>      | 14,4% |
| <b>Portugal</b>    | 22,3% | <b>Latvia</b>         | 13,7% |

Secondly, a country with a broad tax base is a country that will potentially be more resilient to legislative changes, as it has enough money to meet the needs of education, health, security and research and technology, etc... If we take a closer look at the environmental taxes, which are likely to increase with the introduction of the revised energy taxation directive, we see that countries on the left of the axis of *Figure 8* are the ones paying the most environmental taxes as share of taxes and social contributions, being either taxes on energy, transport or pollution and resources. The population of these countries is likely to suffer more from an increase in taxation, as they already spend a lot on these types of expenditures. Secondly, if we analyse the share of these environmental taxes in the GDP of the country, all countries have more or less the same share, with Romania and Ireland taxing a bit lower. This does not allow to make assumptions and rankings on the capacity of MS to resist changes through the package based on their taxation on environmental issues. However, the overall taxation base in MS is higher in Nordic and central countries than in eastern ones as shown in *Figure 9*.

Figure 8: Environmental tax revenue by category as share of taxes and social contributions and GDP, 2018 (%) - (Eurostat, 2022a)

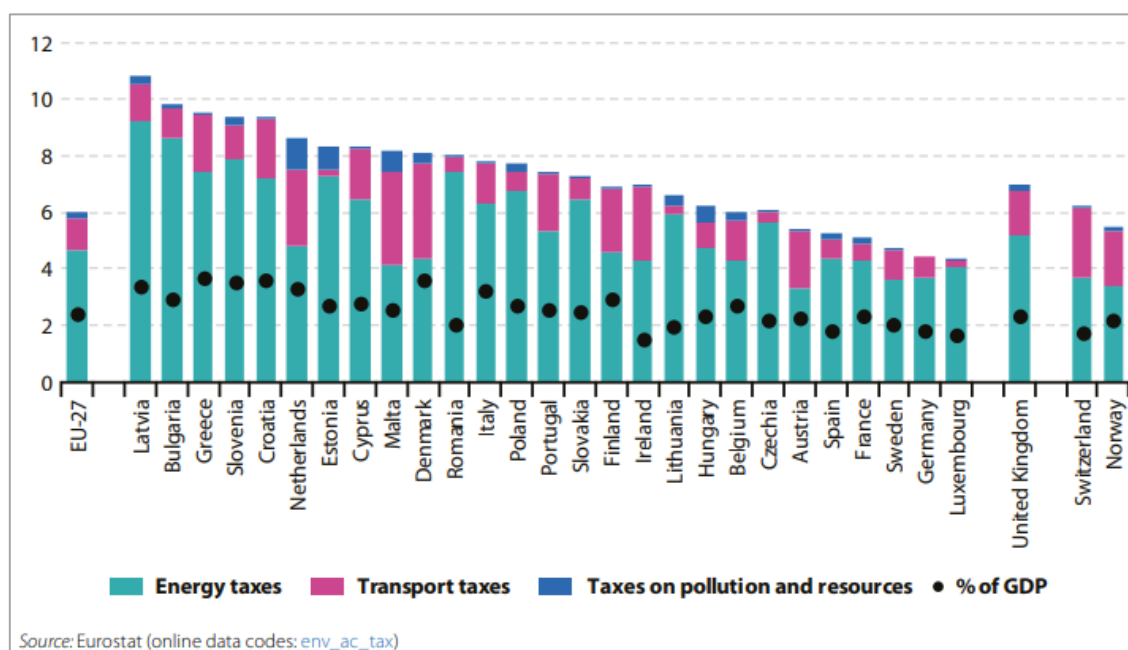
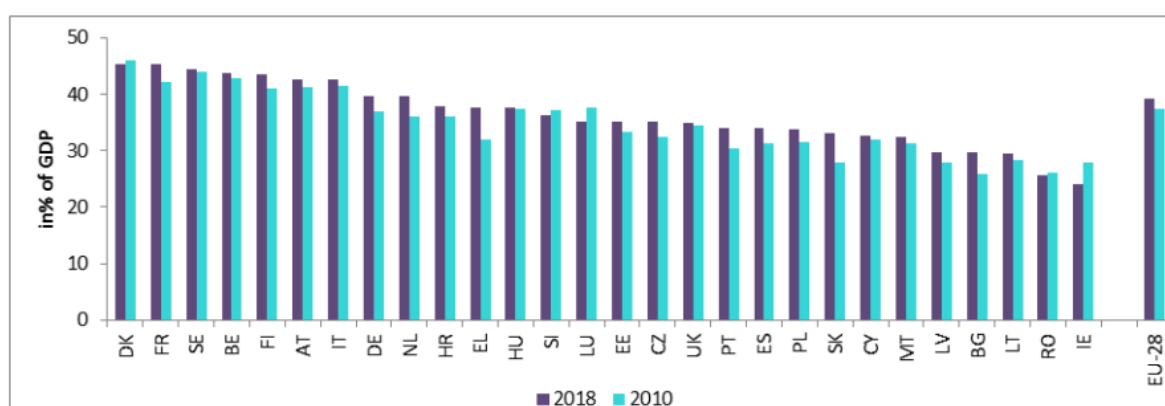


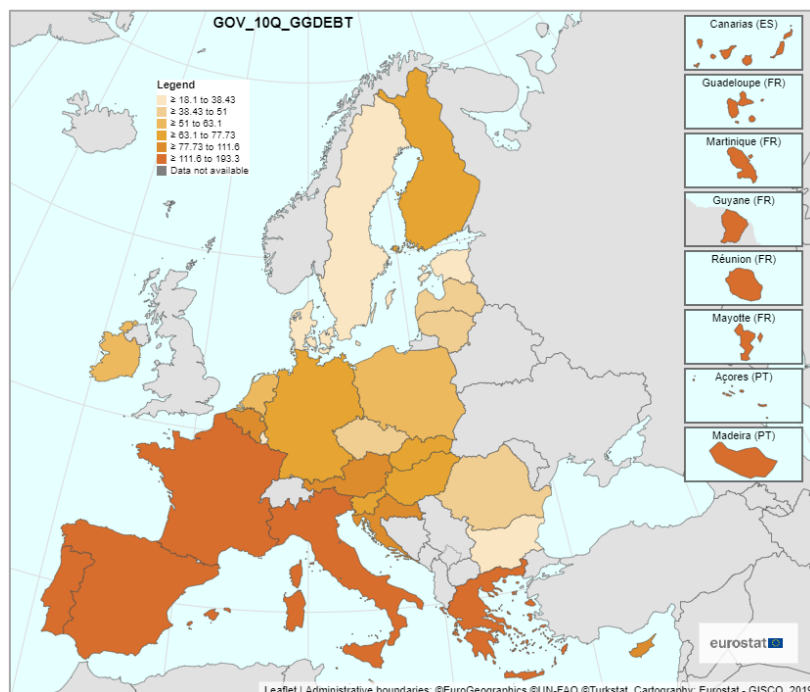
Figure 9: Total tax burden in EU countries as a percentage of GDP, 2012 and 2018 - (European Commission, 2017)



Finally, a last public finance indicator not to be neglected is the level of public debt recorded by the MS as a percentage of GDP. Indeed, a high level of public debt makes a state more vulnerable to future expenditures, including those expected because of the FF55 legislative proposals that are mainly social, technological, and environmental spending. By simply looking at the map below (Figure 10), illustrating the level of public debt in the last quarter of 2021, it can be deduced that the southern countries of the European Union have the highest level of government debt, while the eastern and northern countries of Europe have a lower level of debt, making them less vulnerable and more able to adapt to the FF55 in the future regarding this

indicator. Estonia is the country with the lowest level of government debt while Greece is the record holder with a percentage of 193.3% of GDP (Eurostat, 2022d).

Figure 10: Quarterly Government Debt, 2021 - (Eurostat, 2022d)



### 3.2.2 Technology

We can now look at the capacity of member states in terms of technology and research and development. Indeed, the ability of states to advance technology, particularly green technology in this research, enables them to adapt better and faster to expected changes in energy and carbon-intensive industries. It also allows for more affordable technologies to be made available to the public and for them to benefit from greener technologies for transport and housing. A country's progress can for example be illustrated by the amount it spends on R&D. Data taken from Eurostat show in *Table 7* the share of GDP that states allocate to R&D in all areas from 2017 to 2020. It can be seen from this data that the division between northern, western-central, and eastern countries is somewhat less marked than for other indicators, with some countries allocating a relatively small share of their GDP to R&D compared to what one would expect, such as Luxembourg and Ireland. However, the countries with the largest share are those that also have good indicators in the rest of this research, i.e. the northern countries (Sweden, Denmark, Finland) and the central countries (Belgium, Germany, France and the Netherlands), with the addition of Austria in the top category. These countries will potentially be the most

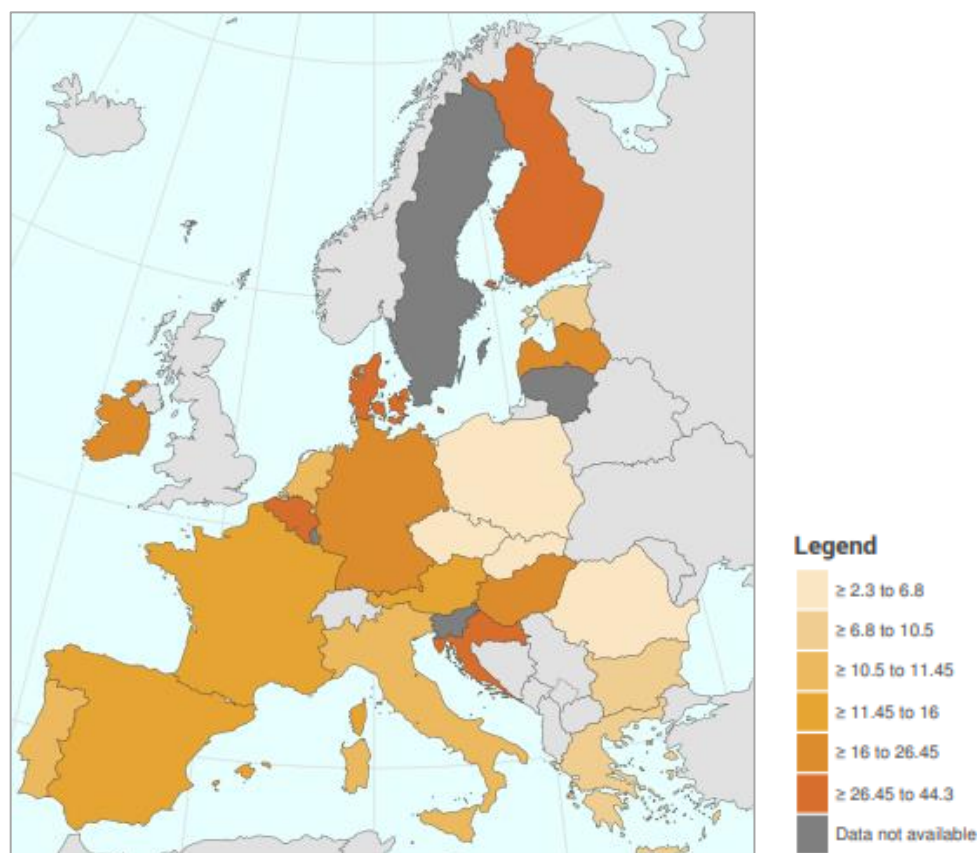
reactive in adjusting their technology. On the contrary, Romania, Malta, Latvia, Cyprus, Bulgaria, and Slovakia will potentially be latecomers if technologies have to be quickly adjusted to new environmental laws.

*Table 7 : Gross Domestic Expenditure on R&D (GERD) by sector of performance and type of R&D (% of GDP), 2020 - (Eurostat, 2022b)*

|                   |       |                    |       |
|-------------------|-------|--------------------|-------|
| <b>Romania</b>    | 0,47% | <b>Hungary</b>     | 1,61% |
| <b>Malta</b>      | 0,67% | <b>Portugal</b>    | 1,62% |
| <b>Latvia</b>     | 0,71% | <b>Estonia</b>     | 1,79% |
| <b>Cyprus</b>     | 0,82% | <b>Czechia</b>     | 1,99% |
| <b>Bulgaria</b>   | 0,85% | <b>Slovenia</b>    | 2,15% |
| <b>Slovakia</b>   | 0,91% | <b>Netherlands</b> | 2,29% |
| <b>Luxembourg</b> | 1,13% | <b>France</b>      | 2,35% |
| <b>Lithuania</b>  | 1,16% | <b>Finland</b>     | 2,94% |
| <b>Ireland</b>    | 1,23% | <b>Denmark</b>     | 3,03% |
| <b>Croatia</b>    | 1,25% | <b>Germany</b>     | 3,14% |
| <b>Poland</b>     | 1,39% | <b>Austria</b>     | 3,2%  |
| <b>Spain</b>      | 1,41% | <b>Belgium</b>     | 3,48% |
| <b>Greece</b>     | 1,5%  | <b>Sweden</b>      | 3,53% |
| <b>Italy</b>      | 1,53% |                    |       |

Still looking at research and development indicators, a country's performance in terms of high-tech, which is often necessary to make the ecological transition efficiently, is also a criterion to be considered. To judge this, we can look at the percentage of expenditure in high-tech sectors on total R&D expenditure of EU companies per country, with data from 2017 (*Figure 11*). On this map, Croatia has the highest percentage with 44,3% high-tech spending, followed by Belgium, Finland, and Denmark. At the bottom of the ranking are the Czech Republic, Poland, Romania and finally Slovakia with only 2,3% spending, indicating a low capacity to develop the necessary advanced technologies inherent in the implementation of the FF55 and particularly the revisions of energy-related directives. Again, this also indicates a lower capacity to offer efficient technologies to citizens willing to adapt to new ecological requirements at an affordable price or with financial support.

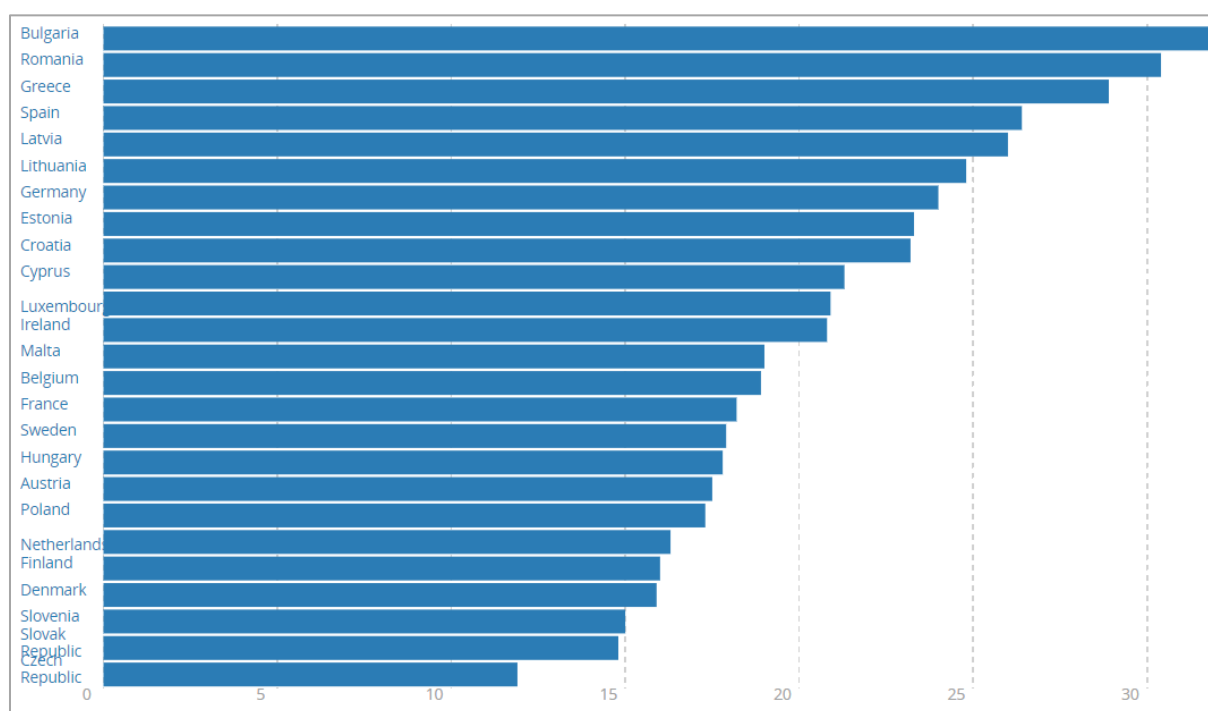
Figure 11 : Business enterprise R&D expenditure in high-tech sectors (% of total)- NACE Rev. 2 - (Eurostat, 2021)



### 3.2.3 Poverty

Assessing the level of poverty in a country is also a good way of estimating the social impact of the FF55 proposals on the population. Indeed, a country that already has a large proportion of its population considered poor or at risk of poverty is less likely to be able to achieve the objectives of the package without social damage and without risking public discontent and the associated political and monetary costs. To assess the level of poverty in EU countries to determine which will be the most vulnerable, we can examine the Multidimensional Poverty Headcount ratio in % of the population, provided by the World Bank databases. This indicator is usually calculated using different methodologies depending on the country. In the European Union, the methodology used is to consider people as “at risk of poverty or social exclusion” if they are either “living in a household with a very low work intensity”, “at risk of poverty” or “severely materially deprived” (World Bank, 2022). *Figure 12* below provides a ranking from countries with the highest share of the population being multidimensionally poor to the countries with the lowest share of poverty being Slovenia, Slovakia, and Czech Republic with less than 15% of the population.

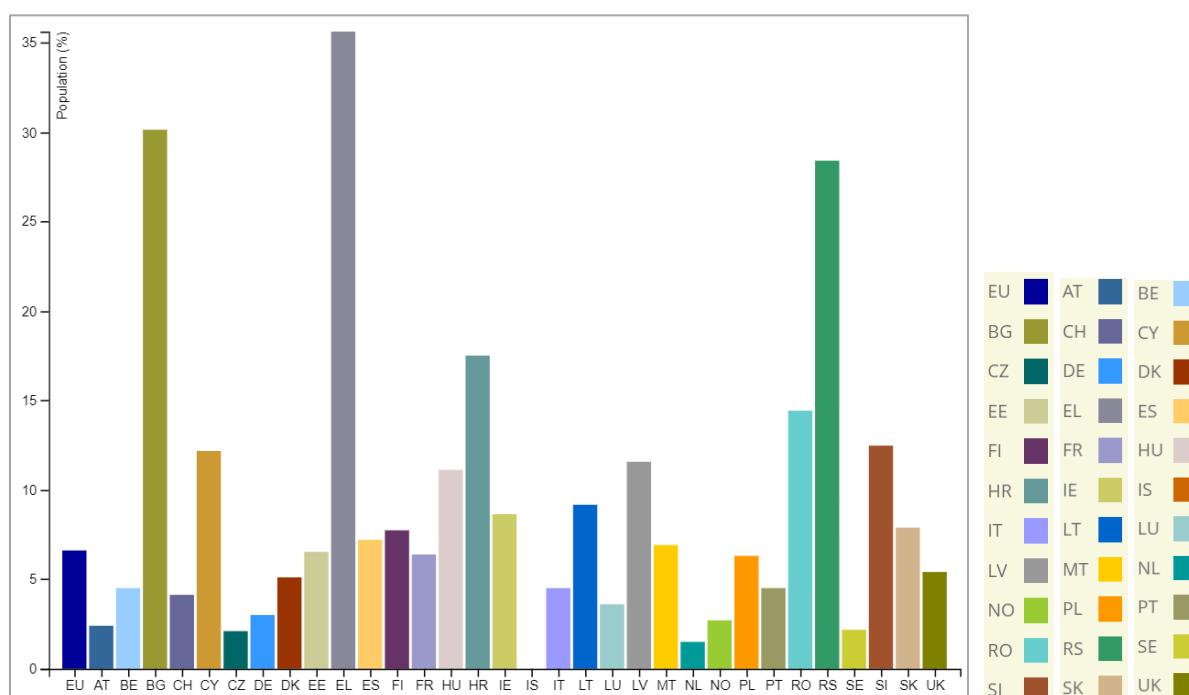
Figure 12: Multidimensional poverty headcount ratio (% of total population) - (World Bank, 2022)



Note that this ranking highlights some differences from the usual trends observed in this research. It shows that some Eastern countries have the smallest share of the population in "multidimensional" poverty, which could lead one to believe that they are less likely to experience increased poverty because of the FF55. However, many of the indicators seen above indicate that these countries may well face difficulties, notably in terms of energy intensity and technology for the Czech Republic for example.

Secondly, another sign of vulnerability linked to poverty could be revealed by looking at the indicator "arrears on utility bills" used by the Energy Poverty Advisory Hub (EPAH), which can provide a ranking of the MS regarding energy poverty in their population. The graph below (*Figure 13*) shows the percentage of the population of each MS that answers positively to the question "In the last twelve months, has the household been in arrears, i.e. has been unable to pay on time due to financial difficulties for utility bills (heating, electricity, gas, water, etc.) for the main dwelling?" (SILC, 2020). It shows that the share of the EU population in this situation is 6,6% in 2018, and that the EU countries with the highest share of the population in this situation in 2018 were Greece, Bulgaria, and Croatia in the top three, and countries such as the Netherlands, Sweden, Czech Republic, and Austria doing much better with less than 3% of the population.

Figure 13: Arrears on utility bills in Europe in 2018 - (SILC, 2020)



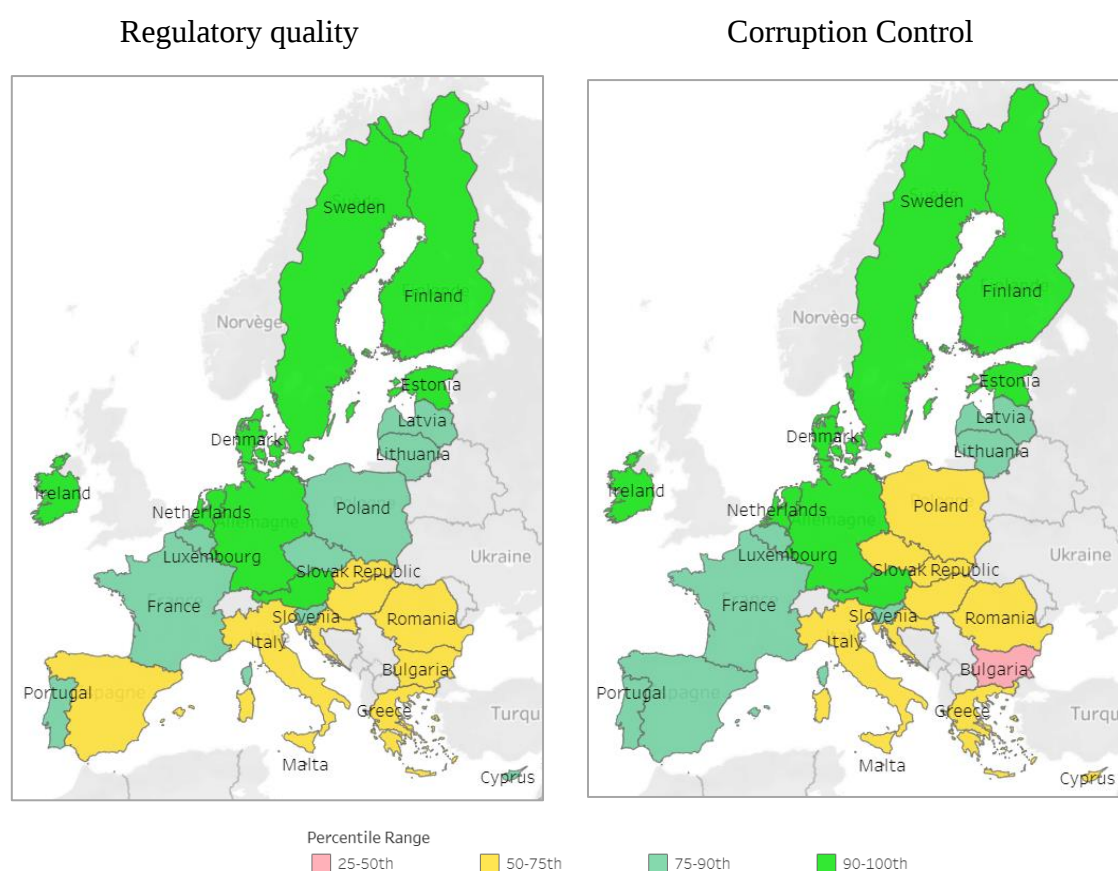
### 3.2.4 Governance

Finally, it is interesting to study the level and quality of governance of the member states to judge their capacity to apply and adapt to the FF55 but also to judge their capacity to carry out the transition in a socially just and fair way for the population. To achieve this, we can use the World Bank's Worldwide Governance Indicators and look at four governance indicators, respectively regulatory quality, control of corruption, government effectiveness and state voice and accountability. The importance of these indicators for the development of a union capable of delivering the climate and environmental objectives for 2030 is indeed affirmed in a study conducted by Alsaleh et al. (2021) on the link between these indicators and the bioenergy industry. Good governance would, among other things, strengthen public acceptance and the legitimacy of European countries in the decarbonisation process, as well as fostering trust in politics.

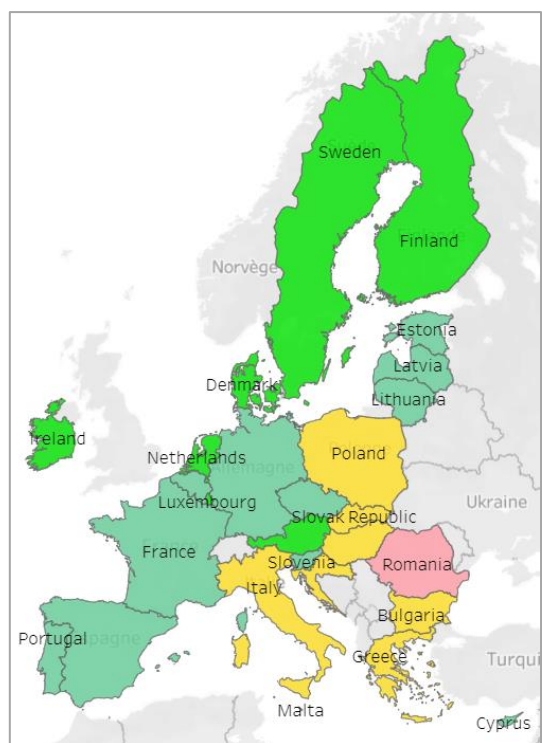
The four indicators are represented on the maps below (*Figure 14*), where countries are coloured according to their percentile range. The higher a country's percentile is, the better it is in the indicator concerned. For example, when assessing the regulatory quality of a Member State, countries such as Finland, Sweden and Denmark are in the 90-100th percentile, indicating a high regulatory quality of the country. Several observations can be made based on these maps. Firstly, northern countries as well as the Netherlands and Ireland are in the highest percentiles,

which indicates a good level of governance in these countries, which will therefore be better able to cope with the changes brought by the FF55 and to respect social justice. Secondly, the Central-Western and Baltic countries tend to fall into the 75-90th percentile category, meaning that they also have good governance indicators. Finally, the eastern countries are in the lowest percentiles, indicating that they will have more difficulties in conducting the transition to the FF55 in a fair way, as well as in meeting the targets set. Control of corruption is particularly weak in Bulgaria and Romania is very poor in government efficiency, which is unfortunately likely to be felt by households and businesses as prices and standards rise (World Bank, 2020).

Figure 14: World Bank's Worldwide Governance Indicators - (World Bank, 2020)



## Government effectiveness

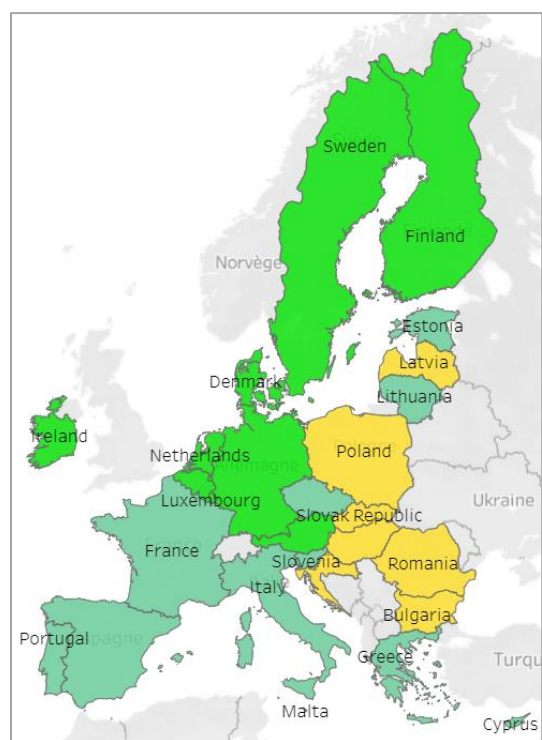


Percentile Range

25-50th

50-75th

## Voice and accountability



75-90th

90-100th

## 4. Political issues and considerations

This final part of the research will address some political issues and considerations that may arise from the negotiations on FF55. Indeed, we have seen the extent to which some states will be more affected than others in the previous sections, which will allow us in this section to estimate the potential coalitions and oppositions that could form during the negotiations and votes to adopt the proposals. We will also look at the challenges associated with FF55, which are mainly the potential for public rejection if the measures are not implemented sensitively, and the opposition of far-right political parties.

### 4.1 Coalitions and oppositions among Member States

The many changes that the Fit for 55 package will potentially bring are not likely to be welcomed unanimously among member states, favouring coalition and opposition groups on some of the proposals. These groups are keen to negotiate the proposals keeping in mind the protection of their country from a social and economic impact that would be too difficult to bear, and their interests are usually directly linked to the dominant sectors of their economy. We have seen throughout this research what potential difficulties some countries might face and to which proposals in the package they might be most vulnerable. This section highlights the position of some countries on the Fit for 55 Package and its legislative proposals, being very clear for some while others were more reserved or did not express an opinion on the subject at all.

Among the countries that expressed an opinion were the Czech Republic and Poland. The opinion of the former was notably communicated by spokespersons, notably the spokesperson of the Minister of Finance. He expressed the country's concerns about the proposals, which could lead to an increase in energy and electricity prices, given the large number of European households in precarious energy situations. MEP Ondřej Kovařík of the Renew Europe group also warns of the possibility of massive public resistance if the proposals are implemented too quickly and too drastically. Poland also expresses concern about the impact on the poorest households in Europe. Moreover, in view of the unstable situation linked to the dispute over the independence of Polish judges, the country has reportedly threatened to veto the reforms foreseen in the FF55 package as long as the payments to Warsaw, suspended by the EU, have not been made (Simon, 2022). Earlier this year, Polish Prime Minister Jacek Sasin was also quoted as saying that Poland would “take all steps in Brussels and Poland to protect Poles

against the effects of the wrong policy served by the European Commission”. With this announcement, the country is also trying to build a coalition against the FF55 and particularly against the creation of the ETS2, as well as the target of a 1.1% increase in renewables in the heating sector, judging the target to be far too ambitious. According to a polish news website, Poland has already obtained partial or full support from MS such as Bulgaria, Czech Republic, Cyprus, Estonia, Denmark, Finland, Greece, Hungary, Latvia, Portugal, Slovakia, Spain and Sweden (Krzysztozek, 2022). Among those countries, we could consider it surprising to find Finland, Denmark, and Sweden, which are much less vulnerable to the entry into force of the FF55 than Eastern European countries such as Poland. Indeed, we have seen that on many indicators of social vulnerability, the Nordic countries are at the top of the rankings and have many resources to deal with it in good conditions. But other elements can certainly explain their opposition. For example, Finland is opposed to the creation of a social climate fund, as the country considers that there are already enough European instruments to fulfil this support function. Also, their concerns are more focused on the proposals relating to forest management as well as to fuels used in the maritime sector, two very important sectors in the country that could be affected by the New EU Forest Strategy or the ETS covering the maritime sector (Konohovs, 2021). The other countries that could oppose themselves or are resisting to some of the proposals or to the FF55 in its whole could be countries with a poorer economy being more vulnerable to climate laws, countries with a high level of poverty or countries that could be seriously impacted by the new laws in their exports or imports pattern.

A very sensitive issue is also the Social Climate Fund, for which member states have difficulties finding common ground. Some of the richest countries, such as the Netherlands, Denmark, and Germany want to reduce the size of the fund, while Austria and others should only receive less than 1% of the fund. On the other hand, the poorer countries in Eastern and Central Europe want to increase the fund, and they will not consider approving the carbon market without this condition being met (Euractiv, 2022).

## 4.2 Political and public issues at stake

Like any legislative project of this magnitude, the Fit for 55 could bring political and public issues among EU Member States. A first very worrying issue to be expected following the potential adoption of the Fit For 55 Package is social unrest from the population and a loss of trust in the European institutions in reaction to the coming changes in terms of costs and lifestyle. Indeed, governments are nowadays increasingly required to take measures to

counteract the worst effects of climate change. However, these measures are often taken at the expense of social spending, which generally constitutes the largest share of spending in developed countries. A new dimension of social divides in Europe has thus emerged, the ecological dimension (Otto & Gugushvili, 2020). Therefore, a lack of communication on the part of the European institutions could lead to a bad understanding on the part of citizens and a feeling of deception if the transition operations are not carried out in a progressive and transparent manner. A prime example of the risks of citizen discontent with new energy measures is the Yellow Vests movement that broke out in France in 2018, when a carbon tax increased the price of diesel and petrol at the gas station. According to members of the European Court of Auditors, the challenge is therefore to find the right mix between financial and regulatory measures to avoid the refusal of tax reforms from the population and rising discontent (Simon, 2022). However, the right mix is not likely to be found, when considering the position that the Council adopted on 29<sup>th</sup> June. They agreed on an extension of the carbon market on households from 2027 and postponed the implementation of the fund to 2027 instead of 2024, further increasing the risks encountered by the population when they will be facing the new climate laws. The MP Aurelia Beigneux also added that we can expect social dumping in case carbon taxation is not fair and equal among European MS (Messad, 2022).

A second risk for the smooth running of the negotiations and a socially just implementation of the FF55 is the opposition shown by the right-wing parties in the Parliament, according to the MEPs of the left-wing parties. An alliance has indeed been formed between the far-right parties and the big business entities, protecting the interests of the latter at the expense of the climate and the population, conspiring with their lobbies to achieve this. This attitude is reflected in their attempt to postpone the implementation of CBAM and the related abolition of allowances, even though this has not been successful (Giese, 2022). The concerns related to this risk are therefore more environmental than social since a reduction in CBAM and ETS measures would affect businesses more than households.

## Conclusion

This paper focused on the Fit for 55 package and on the question of *whether the EU member states and their citizens were able to bear the social costs of the new legislative proposals* making up the package. To answer this question, the first part of the research was dedicated to a brief description of the package's proposals and their technical specificities.

Then, the second part highlighted the proposals that can be considered as critical from a social point of view, meaning that they can have a significant impact on the way of life of European citizens and companies. From the information gathered from the literature, we observed that the extension of the ETS and the creation of an ETS2 for the transport and housing sectors will strongly affect countries that are dependent on these sectors, but also countries that have a vulnerable population in terms of access to energy, whether it is to obtain affordable fuel for their vehicles or to heat their homes according to their needs. Countries such as Cyprus, Greece, Poland, as well as other eastern states or Baltic countries will be mainly affected by this proposal. These countries and regions of the EU are also more affected when talking about renewable energies, while consumption and installation capacities for renewables are much higher in northern and central-western European countries. Regarding the revision of the energy efficiency directive, countries can expect to encounter budgetary difficulties if the share of buildings in need of renovation and not energy efficient is particularly high. With the energy taxation directive, the impact will be higher on countries from the east, which are already struggling to pay energy bills. Finally, this second part contained an evaluation of the Social Climate Fund, highlighting the flaws in its design. There is no doubt that the fund is inadequate to fulfil its function of supporting the most vulnerable households. A comparison with the expenditure on environmental protection of the MS has also allowed us to draw this unpleasant conclusion. As proposed in the European Commission's Communication, the SCF represents only a minimal contribution and therefore cannot really be considered as a tangible solution to the problems highlighted in this research.

The third part of this paper illustrated in a more general way the vulnerabilities of MS to future climate legislation based on criteria from the literature but also on some structural indicators specific to the MS. The first vulnerability criteria that we chose to observe suggested that the countries that were particularly vulnerable to the arrival of a legislative package such as the FF55 were those countries that were severely impacted by covid-19, that have highly energy-intensive sectors and that have a lot of catching up to do in terms of technology and

infrastructure in order to be able to set emission reduction targets on a par with those of the EU. The results of our observations show that for Covid-19, the most vulnerable are not only the eastern countries but also certain countries in the centre and south of the EU, such as Belgium, the Netherlands, Italy, and Spain, as identified by Marti & Puertas (2021) in their study and the EuroMOMO indicator. However, these observations should be taken with caution when interpreting them in the context of the social costs of the FF55. Indeed, some countries may seem more fragile because they were more severely impacted by the pandemic, but the reasons for this fragility could be different from an inability to manage the virus and could be of a geographical or managerial order. Then, by looking at the energy efficiency of the MS, we observed that the Eastern countries had the most energy intensive sectors, which will certainly penalise them in the future, as well as the workers of these industries. Making a transition to more efficient industries is therefore of high importance for countries such as Bulgaria, Estonia or the Czech Republic that have been identified as the most energy intensive countries. The criterion of the gap between the current emissions and the environmental targets has been less taken into consideration, as we consider that the state of infrastructure and technologies is more appropriate to show vulnerability to climate change.

These criteria from the literature were complemented by an analysis of financial, technological, poverty and governance indicators. This analysis and observation of data coming mainly from Eurostat showed that the FF55 was likely to have a very different impact from one MS to another. However, trends can be observed for certain groups of countries. Whether in terms of social spending, taxation, high technology, for some, poverty, and finally governance in general, the eastern EU countries and their populations will undoubtedly be the most seriously affected, followed closely by the Baltic countries. This harsh reality is also felt in the negotiation processes, where some of these countries generally show strong opposition to the package, or at least to some of the more socially critical proposals. Groups of coalitions could therefore form to try to counteract the most damaging effects on their citizens and their economies. The southern EU countries will not be spared either, as they are weakened by high levels of debt and are not particularly advanced in terms of technology or governance, ranking roughly in the middle. These countries could also form alliances during the negotiations to avoid being overly impacted by the new proposals but to still benefit from new development perspectives. Finally, the countries of central Europe and especially the northern countries, which are richer and better equipped than the rest of Europe to deal with climate ambitions, are among the most fortunate. However, even if these countries are the most equipped to face the

social costs, other economic self-interests may come into play for their positioning during the FF55 negotiations. We have seen an example of this with Finland, defending commercial interests on some proposals.

The fourth and final part of this paper dealt with some political issues and considerations. It highlighted some of the MS positions that were opposed to a FF55 that was so difficult for citizens and businesses to bear. These different views on FF55, sometimes optimistic and confident about its completion, sometimes negative and worried, demonstrate the complexity of the subject within the institutions, and the difficulty of finding common ground among the 27 member states, each of them being preoccupied with divergent individual interests rather than focusing on the main objective of FF55. This should be neither a commercial nor a leadership objective, but an environmental and climate objective, to be achieved in the most fair and equitable way possible for the benefit of citizens. If this objective is not achieved this way, and we are currently clearly not on the right track, the many fears that have been expressed about a potential loss of credibility of the European institutions and the loss of confidence of citizens may materialize, in the form of public discontent and large-scale social crises. The answer to our research question would hence be that some European MS and their citizens will definitely not be able to bear the social costs of the Fit for 55.

Some limitations inherent to this research can be identified. Firstly, the FF55 package was created only one year ago, making it a very recent topic. This very short time between the creation of the package and the conduct of the research implied a gradual collection of data, which may alter the comprehensiveness of our analysis. Also, the FF55 is a hot topic with many stakeholders involved in the negotiations trying to influence the outcome. The multitude of opinions, the evolution of positions over the months and negotiations, the lack of transparency and communication from some countries, and the difficulty of collecting data from different sources represent therefore a second limitation. Finally, this research has been carried out considering only those proposals that create a social risk for Europeans and European firms, with each one studied apart from the other proposals constituting the package. However, it should be born in mind that the FF55 Package has been designed as a whole, with proposals that complement each other. Our specific approach constitutes therefore a final limitation.

On an end note, it is also important to note that although this research only highlights the “negative” and risky social aspects of the FF55 package, there are many very positive outcomes that can be drawn from it. Indeed, the package has been described by many as ambitious and having the potential to make a significant difference to our climate and environment. To form

an opinion on the value of the package, it is therefore necessary to consider the whole bunch of consequences that it may have. These consequences can be either positive or negative, but also environmental, economic, or social, this paper focusing only on the latter. Future research on the subject could also explore other aspects of the package and obviously evolve during negotiations until a common position is agreed within the institutions and the proposal is adopted or not.

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## Appendix

### 1. Other proposals composing the FF55 Package

The proposal to **revise to the Regulation on Land Use, Land Use Change and Forestry**<sup>9</sup> is establishing an overall EU goal to use natural sinks to remove carbon and is setting targets for MS. Breaking down this overarching objective, five main objectives can be identified in the Commission's proposal. These are a reversal of the downward trend in carbon removal from the land sector, the removal of 310 million tonnes of CO<sub>2</sub> equivalent from the regulated sectors, the simplification of reporting obligations, the achievement of a fully climate-neutral land sector by 2035 and the promotion of synergies through new energy and climate frameworks (Jensen, 2022).

The second proposal is a **revision to the Effort Sharing Regulation**<sup>10</sup>, which objective is to assign higher reduction targets of GHG emissions in agriculture, waste, building and road (included in another emission trading scheme in parallel), domestic maritime transport, and small industry sectors in the MS. These areas account for 60% of EU emissions and are not covered by the ETS. With this amendment, the Commission plans to increase the target of emissions reductions to 40% in these sectors (compared to emissions levels in 2005) (Yougova, 2022). Reduction targets would continue to be set on the basis of GDP per capita but would also take into account cost efficiency and the national context (European Commission, 2021a). The cost of these ambitions would amount to 1 750 000 euros, in order to provide capacity building support measure to MS (Yougova, 2022).

The Commission also proposed to **amend the regulation setting CO<sub>2</sub> emission standards for cars and vans**<sup>11</sup>. The new regulation would require the average emissions of new cars to fall by

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<sup>9</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2018/841 as regards the scope, simplifying the compliance rules, setting out the targets of the Member States for 2030 and committing to the collective achievement of climate neutrality by 2035 in the land use, forestry and agriculture sector, and (EU) 2018/1999 as regards improvement in monitoring, reporting, tracking of progress and review; [https://eur-lex.europa.eu/resource.html?uri=cellar:ea67fbc9-e4ec-11eb-a1a5-01aa75ed71a1.0001.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:ea67fbc9-e4ec-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF)

<sup>10</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement; [https://ec.europa.eu/info/sites/default/files/proposal-amendment-effort-sharing-regulation-with-annexes\\_en.pdf](https://ec.europa.eu/info/sites/default/files/proposal-amendment-effort-sharing-regulation-with-annexes_en.pdf)

<sup>11</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulation (EU) 2019/631 as regards strengthening the CO<sub>2</sub> emission performance standards for new passenger

55% between 2021 and 2030 and emissions of new vans to decrease by 50%. Both types of vehicles must reach net-zero emissions by 2035. These requirements are set to reach three objectives, which are of course contributing to the climate objectives of 2030 and 2050, bring new benefits to EU citizens such as better air quality and energy savings thanks to the broadening of zero-emission vehicles, and finally the strengthening of the EU leadership in terms of technology and of the innovation in zero-emission vehicles (Erbach, 2022a).

The next proposal is a **revision to the Alternative Fuels Infrastructure Directive**<sup>12</sup>. In general, the proposal is to turn the directive into a regulation to set national targets for the deployment of new infrastructure in the EU, allowing road vehicles, ships, and parked aircraft to benefit from sufficient and more accessible alternative fuels (Soone, 2022b).

Two other initiatives which are related are the **ReFuelEU Aviation Initiative**<sup>13</sup> and the **FuelEU Maritime Initiative**<sup>14</sup>. The first one is meant to ensure a level playing field for sustainable air transport in the EU. It mainly regulates fuel tinkering practices and sets minimum requirements for fuel suppliers to increase progressively the supply of biofuels and synthetic aviation fuels to EU airports and their operators. Penalties can also be charged if no compliance with the obligations (Soone, 2022a). The second initiative, applying in this case to the maritime sector, introduces new carbon intensity restrictions on energy use for large ships by 2025. Vessels under the scope of the initiative are those with a commercial purpose and weighing 5 000 gross tonnes or more. The rules would apply when the vessel is stationed at a European port or for voyages within the European territory and apply to 50% of the energy for voyages to or from a European port. The objectives of this initiative are to reduce the carbon intensity of maritime transport by 6% by 2030. Compliance with these rules must be ensured by the shipping companies themselves (Kiss, 2022). These requirements should stimulate the uptake of zero-emissions technologies and more sustainable maritime fuels (Interreg Europe, 2021).

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cars and new light commercial vehicles in line with the Union's increased climate ambition;

[https://ec.europa.eu/info/sites/default/files/amendment-regulation-co2-emission-standards-cars-vans-with-annexes\\_en.pdf](https://ec.europa.eu/info/sites/default/files/amendment-regulation-co2-emission-standards-cars-vans-with-annexes_en.pdf)

<sup>12</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council ; <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021PC0559>

<sup>13</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on ensuring a level playing field for sustainable air transport ; [https://ec.europa.eu/info/sites/default/files/refueleu\\_aviation\\_-\\_sustainable\\_aviation\\_fuels.pdf](https://ec.europa.eu/info/sites/default/files/refueleu_aviation_-_sustainable_aviation_fuels.pdf)

<sup>14</sup> Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC ; [https://ec.europa.eu/info/sites/default/files/fueleu\\_maritime\\_-\\_green\\_european\\_maritime\\_space.pdf](https://ec.europa.eu/info/sites/default/files/fueleu_maritime_-_green_european_maritime_space.pdf)

Finally, a new initiative which is not really part of the FF55 but that has been presented in July 2021 together with it is the **New EU Forest Strategy for 2030**<sup>15</sup>. The objectives of this new strategy are to promote sustainable management, protection, and restoration and to improve the monitoring and planning of forests in Europe. Financial, regulatory and voluntary measures are foreseen to achieve these objectives, as well as a commitment to plant an additional 3 billion trees across Europe by 2030 (Caprile, 2022).

## 2. Solidarity Funds

The SCF is an additional fund being added to other existing solidarity funds dedicated to the same aim to support the ecological transition in MS. The **Cohesion Fund** is a first instrument whose objective is to help countries whose gross national income per capita is below 90% of the European average. For the next period (2021-2027), the countries benefiting from it are Slovenia, Croatia, Slovakia, Romania, Portugal, Greece, Estonia, Cyprus, Latvia, Hungary, Malta, Poland, Lithuania, Bulgaria and Czech Republic. The fund provides aid in the fields of environment and transport infrastructure and amounts to 392 billion for the same period, and more if contributions from the MS are added (European Commission, n.d.-b).

Secondly, the **Just Transition Fund** is a €17.5 billion fund adopted on 7<sup>th</sup> June 2021 and dedicated to a just and inclusive environmental transition. The fund aims to help communities in the EU that are highly dependent on fossil fuels or have carbon-intensive industries. This would help to alleviate the socio-economic costs of this dependence. The money for the fund comes partly from the budget contribution for the period 2021-2027 equivalent to €5.5 billion, as well as from the Next Generation EU clawback instrument which will be available until next year. This can contribute up to 10 billion to the fund. There is also a planned contribution from the MS and they can transfer part of the resources from the European Regional Development Fund and the European Social Fund Plus which can unlock up to €30 billion of investment (European Council - Council of the European Union, 2022);

Thirdly, the **European Social Fund Plus** is dedicated to tackle the socio-economic crisis we have been enduring because of COVID-19 pandemic, by supporting a digital, green and resilient recovery of the society. The fund would amount to 99 billion for the period 2021-2027

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<sup>15</sup> COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS New EU Forest Strategy for 2030; [https://ec.europa.eu/info/sites/default/files/communication-new-eu-forest-strategy-2030\\_with-annex\\_en.pdf](https://ec.europa.eu/info/sites/default/files/communication-new-eu-forest-strategy-2030_with-annex_en.pdf)

and will be largely managed on a shared basis by the MS. The money will therefore be allocated by the competent authorities in each country to projects that meet the specific needs of the country in question or of a particular region (European Commission, n.d.-a).

### 3. Share of renewable energy in gross final energy consumption (in %) in EU countries, 2017-2020

| ↓↑                                               | ⊕ | TIME | 2017 ↓ | 2018 ↓ | 2019 ↓ | 2020 ↓ |
|--------------------------------------------------|---|------|--------|--------|--------|--------|
| GEO ↓                                            |   |      |        |        |        |        |
| European Union - 27 countries (from 2020)        |   |      | 18.412 | 19.096 | 19.885 | 22.090 |
| Belgium                                          |   |      | 9.136  | 9.472  | 9.929  | 13.000 |
| Bulgaria                                         |   |      | 18.695 | 20.581 | 21.546 | 23.319 |
| Czechia                                          |   |      | 14.799 | 15.140 | 16.239 | 17.303 |
| Denmark                                          |   |      | 34.387 | 35.160 | 37.020 | 31.681 |
| Germany (until 1990 former territory of the FRG) |   |      | 15.476 | 16.660 | 17.266 | 19.312 |
| Estonia                                          |   |      | 29.538 | 29.970 | 31.730 | 30.069 |
| Ireland                                          |   |      | 10.520 | 10.942 | 11.979 | 16.160 |
| Greece                                           |   |      | 17.300 | 18.001 | 19.633 | 21.749 |
| Spain                                            |   |      | 17.118 | 17.023 | 17.852 | 21.220 |
| France                                           |   |      | 15.847 | 16.384 | 17.174 | 19.109 |
| Croatia                                          |   |      | 27.280 | 28.047 | 28.466 | 31.023 |
| Italy                                            |   |      | 18.267 | 17.796 | 18.181 | 20.359 |
| Cyprus                                           |   |      | 10.478 | 13.873 | 13.777 | 16.879 |
| Latvia                                           |   |      | 39.008 | 40.019 | 40.929 | 42.132 |
| Lithuania                                        |   |      | 26.038 | 24.695 | 25.475 | 26.773 |
| Luxembourg                                       |   |      | 6.194  | 8.942  | 7.046  | 11.699 |
| Hungary                                          |   |      | 13.556 | 12.549 | 12.634 | 13.850 |
| Malta                                            |   |      | 7.219  | 7.914  | 8.230  | 10.714 |
| Netherlands                                      |   |      | 6.507  | 7.394  | 8.886  | 13.999 |
| Austria                                          |   |      | 33.137 | 33.784 | 33.755 | 36.545 |
| Poland                                           |   |      | 11.059 | 14.936 | 15.377 | 16.102 |
| Portugal                                         |   |      | 30.611 | 30.203 | 30.623 | 33.982 |
| Romania                                          |   |      | 24.454 | 23.875 | 24.290 | 24.478 |
| Slovenia                                         |   |      | 21.658 | 21.378 | 21.968 | 25.000 |
| Slovakia                                         |   |      | 11.465 | 11.896 | 16.894 | 17.345 |
| Finland                                          |   |      | 40.855 | 41.182 | 42.723 | 43.802 |
| Sweden                                           |   |      | 53.390 | 53.916 | 55.785 | 60.124 |

(Eurostat, 2022e)

#### 4. Proposed minimum tax rates by the EC

| Proposed minimum tax rates                                                            |                                                       |                                                                                    |
|---------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------------------|
| Fuel types                                                                            | Example fuels                                         | Minimum Tax Rate                                                                   |
| Conventional fossil fuels and non-sustainable biofuels                                | Gas oil, petroleum                                    | 10.75 euros/GGJ                                                                    |
| Fossil-based fuels supportive of decarbonization in the short term                    | Natural gas, liquefied petroleum gas (LPG)            | For the first 10 years 7.17 euros/GGJ for motor fuel and 0.6 euros/GGJ for heating |
| Sustainable but not advanced biofuels*                                                | Food crop derived biofuels Wood mass derived biofuels | 5.38 euros/GGJ for motor fuel and 0.45 euros/GGJ for heating                       |
| Electricity, advanced sustainable biofuels, biogas and renewable non-biological fuels | Renewable hydrogen                                    | 0.15 euros/GGJ                                                                     |

Source: KPMG 2021

\* The EU should define the term "sustainable but not advanced" biofuels

(KPMG, 2021)

#### 5. Emissions reduction targets

|                       | Reduction of non-ETS GHG emissions                                           | Reduction of ETS GHG emissions                                                                                                                                                                                                           | Other or non-specified targets                                                                                            |
|-----------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Ireland</b>        | 30% reduction by 2030 in non-ETS greenhouse gas emissions (from 2005 levels) | 7% annual average reduction in greenhouse gas emissions between 2021 and 2030 (NECP will be revised to bring in line with the 7% trajectory and to include policies and measures currently being developed to achieve the 7% trajectory) | The Climate Action Plan states the Government's ambition to support the adoption of a net zero target by 2050 at EU level |
| <b>Bulgaria</b>       | 0%                                                                           | -                                                                                                                                                                                                                                        | -                                                                                                                         |
| <b>Portugal</b>       | 17%                                                                          | -                                                                                                                                                                                                                                        | 45% - 55% emissions (without LULUCF, compared to 2005)                                                                    |
| <b>Malta</b>          | -                                                                            | -                                                                                                                                                                                                                                        | 19% GHG emissions reduction target under the Effort Sharing Regulation                                                    |
| <b>Slovakia</b>       | 20% compared to 2005                                                         | 43% compared to 2005                                                                                                                                                                                                                     | -                                                                                                                         |
| <b>Spain</b>          | -                                                                            | -                                                                                                                                                                                                                                        | 23%                                                                                                                       |
| <b>Czech Republic</b> | 30%                                                                          | -                                                                                                                                                                                                                                        | -                                                                                                                         |
| <b>Italy</b>          | 33%                                                                          | -                                                                                                                                                                                                                                        | -                                                                                                                         |
| <b>Slovenia</b>       | 20%                                                                          | 43%                                                                                                                                                                                                                                      | 36% reduction of GHG emissions compared to 2005                                                                           |
| <b>France</b>         | 37% compared to 2005                                                         | -                                                                                                                                                                                                                                        | 40% compared to 1990 (Effort Sharing Regulation)                                                                          |
| <b>Romania</b>        | 2%                                                                           | 43.9%                                                                                                                                                                                                                                    | -                                                                                                                         |
| <b>Lithuania</b>      | 9% compared to 2005                                                          | 43%                                                                                                                                                                                                                                      | -                                                                                                                         |

|                    |                                                                                                                                       |                              |                                                                        |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------------------------------------|
| <b>Netherlands</b> | -                                                                                                                                     | -                            | 49%                                                                    |
| <b>Finland</b>     | -                                                                                                                                     | -                            | Effort Sharing sectors 39%<br>55% by 2030<br>carbon neutrality by 2035 |
| <b>Germany</b>     | 38%                                                                                                                                   | 55%                          | -                                                                      |
| <b>Luxembourg</b>  | 55% compared to 2005                                                                                                                  | -                            | -                                                                      |
| <b>Greece</b>      | 35,4%                                                                                                                                 | 70% compared to 2005         | 56% compared to 2005<br>42% compared to 1990                           |
| <b>Latvia</b>      | 6% compared to 2005                                                                                                                   | -                            | 65% compared to 1990                                                   |
| <b>Poland</b>      | 7%                                                                                                                                    | -                            | -                                                                      |
| <b>Hungary</b>     | 7% compared to 2005                                                                                                                   | -                            | Reduce GHG emissions by at<br>least 40 % by 2030 compared to<br>1990   |
| <b>Estonia</b>     | -                                                                                                                                     | -                            | 70%                                                                    |
| <b>Denmark</b>     | -                                                                                                                                     | -                            | 70% by 2030 (as compared to<br>1990) and net zero emissions by<br>2050 |
| <b>Croatia</b>     | At least 7%                                                                                                                           | At least 43%                 | -                                                                      |
| <b>Belgium</b>     | For non ETS Sector:<br>35% Belgium, 37%<br>Wallonia, 35%<br>Flanders, 32.6%<br>Bruxelles;<br>By 2050: 80-95%<br>reduction in Wallonia | -                            | -                                                                      |
| <b>Sweden</b>      | -                                                                                                                                     | -                            | Net greenhouse gas emissions to<br>zero by 2045                        |
| <b>Austria</b>     | 36% compared to 2005                                                                                                                  | -                            | Effort Sharing Regulation: 27%<br>compared to 2005                     |
| <b>Cyprus</b>      | 20.9% as compared to<br>2005                                                                                                          | 24.9% as compared to<br>2005 | -                                                                      |

(WindEurope, 2022)

## 6. Quality of Health

|           |             | <b>Lost health<br/>expectancy (%),<br/>2019</b> | <b>Physicians per 10<br/>000 people, 2010-<br/>2018</b> | <b>Hospital beds per 10<br/>000 people, 2010-<br/>2019</b> |
|-----------|-------------|-------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------|
| <b>1</b>  | Ireland     | 14.6                                            | 33.1                                                    | 30                                                         |
| <b>2</b>  | Germany     | 14.1                                            | 42.5                                                    | 80                                                         |
| <b>3</b>  | Sweden      | 13.8                                            | 39.8                                                    | 21                                                         |
| <b>4</b>  | Netherlands | 13.6                                            | 36.1                                                    | 32                                                         |
| <b>5</b>  | Denmark     | 13.8                                            | 40.1                                                    | 26                                                         |
| <b>6</b>  | Finland     | 14.1                                            | 38.1                                                    | 36                                                         |
| <b>7</b>  | Belgium     | 14.4                                            | 30.7                                                    | 56                                                         |
| <b>8</b>  | Slovenia    | 13.5                                            | 30.9                                                    | 44                                                         |
| <b>9</b>  | Luxembourg  | 14.4                                            | 30.1                                                    | 43                                                         |
| <b>10</b> | Spain       | 13.8                                            | 38.7                                                    | 30                                                         |
| <b>11</b> | France      | 13.7                                            | 32.7                                                    | 59                                                         |
| <b>12</b> | Czechia     | 13.7                                            | 41.2                                                    | 66                                                         |
| <b>13</b> | Malta       | 13.9                                            | 28.6                                                    | 45                                                         |
| <b>14</b> | Estonia     | 12.7                                            | 44.8                                                    | 46                                                         |
| <b>15</b> | Italy       | 14.3                                            | 39.8                                                    | 31                                                         |
| <b>16</b> | Greece      | 13.6                                            | 54.8                                                    | 42                                                         |
| <b>17</b> | Cyprus      | 13.5                                            | 19.5                                                    | 34                                                         |
| <b>18</b> | Lithuania   | 12.7                                            | 63.5                                                    | 64                                                         |
| <b>19</b> | Poland      | 12.8                                            | 23.8                                                    | 65                                                         |
| <b>20</b> | Latvia      | 12.6                                            | 31.9                                                    | 55                                                         |
| <b>21</b> | Portugal    | 14.1                                            | 51.2                                                    | 35                                                         |
| <b>22</b> | Slovakia    | 12.8                                            | 34.2                                                    | 57                                                         |
| <b>23</b> | Hungary     | 12.8                                            | 34.1                                                    | 70                                                         |
| <b>24</b> | Croatia     | 13.3                                            | 30                                                      | 55                                                         |
| <b>25</b> | Romania     | 12.1                                            | 29.8                                                    | 69                                                         |
| <b>26</b> | Bulgaria    | 12                                              | 40.3                                                    | 75                                                         |
| <b>27</b> | Austria     | 14.1                                            | 51.7                                                    | 73                                                         |

(United Nations, 2020)

