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The European Energy Transition and the Energy Crisis: Impacts on the Italian Industrial System

Prof. Marcella Panucci

SUPERVISOR

Gabriele Giannini CANDIDATE

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Introduction

The climate emergency, the ecological transition, the Pandemic and the consequent destruction of global value chains, the war in Ukraine and the very heavy energy crisis connected to it, as well as galloping inflation, are just some of the elements that characterise these last few convulsive and eventful years. This decade, 2020-2030, will be a decisive moment, since it willmark the destiny of Europe and the world, particularly in environmental terms.

In this final dissertation, the aim was to analyse the European energy transition process in a context, such as the present one, of extreme market volatility, especially for gas, due to both cyclical and structural causes.

An attempt has been made to include all the elements that characterise this reality today. A somewhat difficult task, therefore, since it is constantly changing, constantly evolving.

Specifically, the objective and the two research questions of this thesis aim at investigating, through the analysis of the body of legislation on the subject and the study of academic papers, as well as specific case studies and quantitative analyses, the first one, the impact of the European energy transition, in the light of such high energy *commodity* costs, on the European and in particular the Italian production fabric and, the second one, with reference to the energy crisis, the impact of high energy prices, in particular gas prices, on the production costs of each Italian production sector. In this thesis, reference will be made to the point of view of the most representative association of Italian companies, i.e. Confindustria.

Specifically, the first chapter will analyse the individual measures that make up the world's most ambitious package to achieve a 55% reduction in greenhouse gas emissions by 2030, compared to 1990 levels, i.e. the so-called *Fit for 55*. In addition, the status of the work within the European legislator will be followed to monitor its progress within the two co-legislators, the European Parliament and the Council of Ministers of the EU.

In the second chapter, an overview of the gas market in Europe will be given, with particular reference to the energy dependencies of Member Countries and the Italian energy mix, as well as to the importance of hydrogen in decarbonising the so-called "hard-to-abate" sectors.

In fact, following Russia's invasion of Ukraine in February 2022 and the approval in unison of the sanctions' packages against Moscow by the European Member States, the Kremlin has begun to use gas as a tool to pressure national governments, threatening to reduce or completely block gas flows to the most dependent Member States, including Italy. In this regard, the main points of the REPowerEU plan will be summarised critically. In addition, reference will be made to the European

plan on compulsory gas storage and rationing of energy consumption in the event of a complete interruption of gas flow from Moscow.

In the fourth chapter, a real quantitative analysis of the production costs that the various Italian production sectors will have to bear at such high energy prices, as well as a comparison of the weight that this crisis will have on Italy, France and Germany, will be made. We will also analyse the industrial policy instruments that Member States have at their disposal to protect their companies and lower the cost of electricity. Finally, the importance of national industrial policy for taking a medium-to long-term view and protecting the industrial system at a critical time, such as the one just described, will be emphasised. For the purpose of this analysis, an energy policy expert, Gianluca Pischedda from Confindustria's Delegation to the EU, two MEPs, Luisa Regimenti and Carlo Calenda, and an entrepreneur from Northern Italy, owner of a hot steel forging plant, were interviewed on the strategies that the Italian government should implement in the short and long term to ease the burden of the energy bill on companies.

In chapter five, reference will be made to further obstacles to the achievement of the European energy transition. First of all, there is the slowness of European legislative processes that undermines the certainty, predictability, coherence and clarity of environmental measures, discouraging investors to finance *green* projects and investments in innovation, necessary and functional to develop an increasingly decarbonised production chain. Moreover, an often-forgotten issue is related to the cost of the raw materials needed to achieve part of the energy transition based on renewable energies. For example, as far as the cement for the construction of wind turbines or polycrystalline silicon for photovoltaic panels, the question is whether, in case of these raw materials' price increase, will it be economically viable to produce energy from these renewable sources on a large scale as planned.

Finally, a paragraph will be devoted to the virtuosity of Italian industry in terms of sustainability in its production processes compared to other European states, and an industrial policy strategy will be outlined to ensure the resilience of Italian manufacturing in such dark times. In particular, it is hoped that Italy will inaugurate a season of competitive reformism that will open the door to modernising its administrative, legal and bureaucratic system and make it more competitive.

The sixth chapter will report on the strategy developed by the Italian government to achieve the green transition contained in the National Recovery and Resilience Plan (NRRP), particularly for the industrial sector.

Finally, in the conclusions, the importance of finding the right trade-off between environmental protection and maintaining European productivity, to ensure a transition to a decarbonised economy that does not necessarily lead to a desertification of European manufacturing, will be highlighted.

Action must be taken on the environmental front, no doubt about it, but it must be done realistically, intercepting all the benefits, not only in environmental but also in economic terms.

The transition to an economy that is as decarbonised as possible will be a long, gradual and arduous path, in which individuals at risk of energy poverty and businesses will have to be protected equally through European support funds and investments in innovation, R&D and sustainable projects.

However, one has to start this analysis from the basics, i.e. the *European Green Deal*, shown below, and the European Climate Act, through which for the first time in history a continent has legally bound itself to achieve climate neutrality. This can only be achieved if the Union remains united among the Member States that are more or less dependent on fossil fuels.

The European Green Deal

With the *European Green Deal* everything has changed. The name, reminiscent of the American *New Deal* of the 1930s, stands for the incredible feat that European Union has set itself: the achievement of climate neutrality by 2050, via an obligatory paradigm shift in the European mode of production. For the European industry, and specifically the Italian industry, the *Green Deal* marks the watershed from an industrial society heavily dependent on fossil fuels to a decarbonised one with production processes no longer linear (according to the pattern: produce-use-discard), but rather circular (produce-use-discard-reuse/recycle) and in which energy no longer comes from fossil sources but from renewable or low-carbon energy sources.

As highlighted in the Communication presented by the European Commission on 11 December 2019 entitled *The European Green Deal*, which is the Union's response to the challenges just mentioned, «The atmosphere is warming and the climate is changing with each passing year. One million of the eight million species on the planet are at risk of being lost. Forests and oceans are being polluted and destroyed». According to EU Executive, the *Green Deal* «launches a new growth strategy for the EU. It supports the transition of the EU to a fair and prosperous society that responds to the challenges posed by climate change and environmental degradation, improving the quality of life of current and future generations»¹.

A new strategy that mirrors the political movement that emerged victorious over the others in the last European elections of 2019. The European Greens asserted themselves strongly. Even within traditional parties such as European People's Party (EPP) and the Socialists and Democrats (S&D), many MEPs have recently taken up positions closer to environmental sustainability.

The current college of commissioners reflects this political will, closer to environmentalist positions and more inclined, in the long run, to ambitious environmental policies. The Vice-President of EU

¹ European Commission, The European Green Deal, Brussels, 11 December 2019, pp. 2-24.

Executive, Frans Timmermans, is one of the leading proponents of a European post-industrial society. Therefore, it is a fact that politics played a major role in drafting *European Green Deal* which will be analysed more specifically below.

The *Green Deal* aims to make European society modern, resource-efficient and competitive on the market. The ultimate goal: achieving climate neutrality by 2050, i.e. no more net greenhouse gas emissions are to be generated by then.

We could divide the broader environmental plan into two transitions, one encompassing the other. An energy transition with the goal of decarbonising the entire industrial production process, breaking away from dependence on fossil fuels. Thus, a transition from a way of producing based on burning fossil fuels to a way of producing through "clean" and renewable sources which do not release CO2 into the atmosphere; and a broader, ecological transition. The ambition is to change the capitalist production model, using recycled materials while providing more information to consumers about the environmental impact of the products themselves (specifically, we are talking about the Circular Economy package).

For both of the above-listed transitions, substantial investments will be required, not only by the public, but also by the private sector. It is estimated that «EUR 260 billions of additional annual investments, about 1.5% of 2018 GDP»², will be needed.

Specifically, through the *Green Deal*, the European Commission intends to outline a *roadmap*, continually updated as needs emerge, of the policies and measures needed to achieve climate neutrality by 2050, which should be imposed by law, as will be analysed shortly.

As an underlying sub-objective of the *European Green Deal*, discussed in detail in the following chapters, European Commission has imposed an *interim* target of a 55% reduction in greenhouses gas emissions by 2030 compared to 1990 levels. However, to this end, EU Executive has committed itself to review environmental policy instruments at its disposal, including proposing new ones.

According to rationale pursued, these policy reforms will contribute to effective carbon pricing throughout the economy, making it less attractive for investments that should instead be directed towards more sustainable solutions.

Moreover, since EU contributes only a limited percentage to global pollution, there is a risk of *carbon leakage* by European manufacturers relocating their companies outside EU to countries with less stringent environmental constraints. Or even worse, European products could be replaced by more carbon-intensive imported products. Therefore, within the *Green Deal*, European Commission refers to a *Carbon Border Adjustment Mechanism* that will apply to certain sectors, in particular the most energy-intensive ones, such as steel, in order to reduce the risk of *carbon leakage* (European

² European Commission, The European Green Deal, Brussels, 11 December 2019, p. 17

Commission 2019). In other words, it is intended to ensure that imports price more accurately considers their carbon content.

During the energy transition process, with energy production and use accounting for 75% of greenhouse gas emissions, priority will be given to energy efficiency. By developing an energy sector based on renewable sources and ensuring a rapid *phase-out* of coal and a complete decarbonisation of gas, it will be essential to ensure a secure and affordable energy price for consumers and businesses. On industrial side, about half of greenhouse gas emissions and more than 90% of biodiversity loss are determined by resource extraction and transformation processes. Specifically, European industry contributes to the 20% of EU's pollutant emissions. According to the European Commission, European industry «remains too "linear", and dependent on a throughput of new materials extracted, traded and processed into goods, and finally disposed of as waste or emissions. Only 12% of the materials it uses come from recycling»³. Thus, EU Executive will focus on circular economy. In particular, attention will be paid to energy-intensive industries (steel, chemicals, cement) and resource-intensive sectors (textiles, construction, electronics and plastics). The regulatory framework will also be strengthened to prevent unfair consumer practices such as *greenwashing*.

Another sector impacted by the *Green Deal* is transport, which is responsible for a quarter of EU's CO2 emissions. According to the European Commission's strategy, transport sector's emissions should be reduced by 90% by focusing on sustainable, alternative, as well as affordable, forms of transport. In this regard, according to the Communication of 11 December, 75% of road freight transport should be transferred to rail or inland waterways. A prominent role will be reserved to the so-called "multimodal mobility", i.e. the automated and integrated transport, in which consumers will have a wide choice of sustainable transports at their disposal to get around easily, without the complication of having to change several apps or tickets for every means of transport. The long-term goal of the European Commission with regard to private transport would be to achieve the complete electrification of the automobile sector. In this regard, the idea contained in the *Green Deal* is to install around 1 million charging stations for the 13 million low – or zero – emission vehicles expected to circulate on European roads in the next decade (European Commission 2019).

Furthermore, from a fiscal point of view, fossil fuel subsidies will be gradually reduced through the Commission's proposed energy tax reform.

In addition to the chapters on agricultural sector sustainability and quality and on environmental biodiversity protection, which are, however, not the subject of this study, *European Green Deal* concluding part is dedicated to financing and investment needed to support reforms of this magnitude.

³ European Commission, The European Green Deal, Brussels, 11 December 2019, p. 7

In this regard, EU budget will play a key role, together with *InvestEU* fund, an initiative of the European Investment Bank Group (EIB) and the European Commission, aimed at boosting european economy by mobilising private financing for strategic investments.

Furthermore, within the Communication of 11 December, the importance of the so-called European "taxonomy", i.e. the ranking of sustainable, and thus preferred, investments to achieve climate goals, is also emphasised. This strategy aims to offer more opportunities to investors and companies, making it easier to identify sustainable investments and ensuring their credibility.

National budgets will also play a major role in the transition. Therefore, Member States' fiscal reforms should redirect public investment, consumption and taxation towards *green* priorities, away from harmful subsidies.

Private sector too will be instrumental in supporting the *green* transition. A combination of public and private through coordinated investments in R&I will be the key to the *European Green Deal* successful implementation. *Horizon Europe*, the world's largest transnational R&I fund, will play a central role in leveraging public and private investment: 35% of its budget will be made available to finance new solutions to achieve environmental goals.

Partnerships with industry and Member States will catalyze research and innovation in transport, clean hydrogen production, low-carbon steel sectors. High-potential start-ups and SMEs will be able to rely on funds, equity investments and business acceleration services offered by the European Innovation Council, the latter having a budget of EUR 10 billion for the period 2021-2027 (European Innovation Council 2022).

A transition of this magnitude also brings with it the need for new skilled workers. In this respect, *European Social Fund* will play a major role in reskilling European workforce, acquiring the necessary abilities to accompany the reconversion of the most affected sectors by energy transition.

Before any policy decisions are taken, the EU Executive will conduct impact assessments on a caseby-case basis to evaluate the impacts (positive and negative) that the proposals and their implementation will have on industrial sectors, the social costs, especially on the most vulnerable members of society, and the effects on the competitiveness of European industry and SMEs. The aim is to ensure a smooth transition at the lowest possible cost for all involved.

Although the EU, as a whole, contributes less to global pollution than superpowers like China or India, it could force its trading partners to adopt higher environmental sustainability standards. Indeed, as the world's largest single market, EU can exercise a certain *soft power* over its trading partners, setting standards that apply to all global value chains. In economic parlance, such "persuasive" power is called the *Brussels Effect*, and it is perhaps the most powerful weapon in EU hands vis-à-vis international partners. For instance, if the products of a Chinese manufacturer,

wishing to export within the European single market, do not meet European standards, they won't pass the European customs. That Chinese manufacturer would therefore be deprived of a very substantial slice of the market, being EU the world's largest trading power. Therefore, the Chinese company, doing a cost-benefit analysis, would realize that perhaps it would be better to adapt its products to the high sustainability standards set in Europe than to lose such a high profit opportunity, thus conforming to the dictates of Brussels for a more environmentally sustainable world.



Figure 1 Green Deal: Expected Timeline. Source: European Commission, December 2019

The European Climate Law

On 30 June 2021, following the *Green Deal* Communication, the European Parliament and the Council of the European Union approved the Commission's proposed Regulation (EU) 2021/1119 establishing the framework for achieving climate neutrality. Thus, EU binds itself to environmental sustainability targets and the *Green Deal* becomes no longer mere words in the wind, but a *de facto* reality.

This Regulation, which is binding in its entirety and directly applicable in every Member State, establishes «a framework for the irreversible and gradual reduction of anthropogenic greenhouse gas emissions by sources»⁴, and in Article 1 it sets «a binding objective of climate neutrality in the Union by 2050» and also «a binding Union target of a net domestic reduction in greenhouse gas emissions for 2030»⁵. In principle, the Union aims to achieve negative emissions after 2050, binding all Member

⁴ Regulation (EU) 2021/1119, 30 June 2021.

⁵ Ibid.

States to implement policies that can help to achieve this goal. However, Commission has proposed two intermediate emission reduction milestones at 2030 and 2040, with the aim of possibly amending the Regulation if the conditions are no longer met. This proposal was taken up by Regulation (EU) 2021/1119 in the following terms: «the binding Union 2030 climate *target* shall be a domestic reduction of net greenhouse gas emissions [...] by at least 55% compared to 1990 levels by 2030»⁶, marking the birth of what is now known as the *Fit for 55* package, which will be discussed in more detail below. Regarding the second target, however, Article 4.3 sets « a Union-wide climate *target* for 2040. To that end, [...] the Commission shall make a legislative proposal, as appropriate, based on a detailed impact assessment, to amend this Regulation»⁷ if the 2050 climate neutrality *target* is too ambitious.

As an *enforcement* mechanism vis-à-vis Member States, by 30 December 2023, every five years the Commission will assess whether national measures are actually in line with the objectives laid down in *Fit for 55* package and the European Climate Law. If the European Commission assesses that the measures implemented by Member States are not sufficient, it may issue recommendations. «The Member State concerned shall, within six months of receipt of the recommendations, notify the Commission on how it intends to take due account of the recommendations in a spirit of solidarity between Member States and the Union and between Member States; (b) after the submission of the notification referred to in point (a) of this paragraph, the Member State concerned shall set out, in its following integrated national energy and climate progress report submitted in accordance with Article 17 of Regulation (EU) 2018/1999, in the year following the year in which the recommendations were issued, how it has taken due account of the recommendations; if the Member State concerned decides not to address the recommendations or a substantial part thereof, that Member State shall provide the Commission its reasoning»⁸

Article 11 of the Regulation, dedicated to its review, states that within six months of each global budget, the European Commission shall submit to the European Parliament and the Council a *report* on the operation of the Regulation, «(a) the best available and most recent scientific evidence, including the latest reports of the IPCC and the Advisory Board; (b) international developments and efforts undertaken to achieve the long-term objectives of the Paris Agreement».

This is how the European Union has committed itself to a very ambitious target by 2050. However, the dress rehearsal will be 2030, the year by which the Commission intends to pursue a 55% reduction in greenhouse gas emissions compared to 1990 levels through the package of legislative and non-

⁶ Regulation (EU) 2021/1119, 30 June 2021.

⁷ Ibid.

⁸ Article 7, Regulation (EU) 2021/1119, 30 June 2021.

legislative proposals, called *Fit for 55*. The next chapter will be dedicated to this package, together with an analysis of its criticalities within the Italian industrial system.

1. The Fit for 55 package

1.1 The Genesis

The years between 2015 and 2020 were among the hottest years ever recorded. Until 2019, the global average temperature increased by 1.1°C compared to so-called "pre-industrial levels". «The impacts of global warming are beyond dispute, with droughts, storms, and other weather extremes on the rise»⁹, writes the European Commission, forcefully reiterating the urgency of quickly implementing Europe's ambitious 2050 climate *targets*.

In September 2020, the EU Executive published a Communication, entitled "*Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people*", which was accompanied by an impact assessment prepared by the Commission itself to demonstrate that an additional 40% to 55% emissions reduction, compared to 1990 levels, by 2030 is not only economically feasible but also beneficial for Europe.

In fact, according to the Commission, the current framework of European climate policies, without a more ambitious review, would not allow the achievement of climate neutrality by 2050. The Communication states: «Projections show that simply continuing to implement the legislation currently in force would see the EU achieving a 60% reduction of greenhouse gas emissions by 2050»¹⁰. The Commission, therefore, proposed to change the current emission reduction trajectory and thus to amend the Regulation on European Climate Law. This law, being precisely a framework Regulation, enshrines the final objective but requires, in concrete terms, other acts that can specify the various measures to be implemented.

In the impact assessment conducted during 2019, the EU Executive carefully examined the effects of reducing emissions to 55% by 2030 on EU economy, society and environment. In this regard, the Commission carefully examined the different environmental policy instruments at its disposal and how each sector, to a greater or lesser extent, can contribute to the achievement of the 2030 target. According to the EU Executive, therefore, «a balanced, realistic, and prudent pathway to climate neutrality by 2050 requires an emissions reduction target of 55% by 2030»¹¹.

In the impact assessment attached to the September Communication, the European Commission reiterates that further emission reductions are possible in a responsible and socially equitable manner and that such an increase can only stimulate sustainable economic growth and employment, providing certainty for investments and limiting the associated risks over time.

⁹ European Commission, *Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people*, Brussels, 17 September 2020, p. 1.

¹⁰ *Ibid.*, p. 2.

¹¹ Ivi., p. 2.

On the environmental side, the 55% target would contribute, according to the EU Executive's analysis, «to further decrease air pollution, reaching a total reduction of 60% by 2030 compared to 2015», thereby decreasing, according to the Commission, «health damages compared to 2015 levels by at least \in 110 billion. Increased climate action would additionally reduce air pollution control costs by at least \in 5 billion in 2030 and contribute to mitigating other environmental concerns like acidification»¹².

On the industry side, compared to 2015, according to the impact assessment, the European manufacturing sector could see emission reductions of 25% by 2030, according to which «best practices can further reduce greenhouse gas emissions, thus improving overall efficiency, by using waste heat and increasing electrification through continued incremental improvements»¹³.

On the investment side, the European Commission was forced to revise upwards its estimates of the necessary funding in light of the new reduction target to 2030. The EU Executive aims to catalyse both public and private funding. On the public side, the *Just Transition Fund* is designed to accelerate the transition in carbon-intensive regions. On the private side, on the other hand, the *InvestEU* programme aims to attract private investment and at least 30% of its total budget can be used to achieve these ambitious new climate targets. The *Modernisation Fund* will support the energy transition in lower income Member States, together with the *European Regional Development Fund* and the *Cohesion Fund*, which will promote the development of energy efficiency, renewables, innovation and research; the *European Social Fund* will provide support for the poorer classes, and the *Horizon Europe* programme will allocate at least 35% of funds to environmental objectives; finally, the *Innovation Fund* will support the development of revolutionary technologies in the energy and industrial sectors (European Commission 2021). The European Commission also aims to steer private investment towards the green transition through legislative and non-legislative initiatives, such as the aforementioned European taxonomy.

In short, we are talking about a giant amount of investment to finance an even greater reduction in emissions, while trying to limit social costs and maintain the competitiveness of the European industry. This is at least the general idea and objective of the EU Executive.

As was mentioned in the first chapter, the Framework Regulation on the European Climate Act was amended by the Parliament and the Council, following the input of the Commission to include the new emission reduction target of 55% by 2030. These changes were made specifically to Article 1 of the initial proposal, which was amended to include a reference to the new ambitious climate target

¹² European Commission, *Stepping up Europe's 2030 climate ambition. Investing in a climate-neutral future for the benefit of our people*, 17 September 2020, p. 6.

¹³ *Ibid.*, p. 10.

for 2030, along with the adaptation of the *Recitals*. Article 2 was also amended to include the new reduction target in Article 2a(1).

1.2 The package

Although the EU only accounts for 8% of global emissions (European Commission 2021), it is committed to paving the way for increasingly ambitious environmental policies encompassed within the broader *Fit for 55* package, presented by the College of Commissioners on 14 July 2021.

This chapter will analyse the individual proposals that make up the package as presented by the European Commission, and then highlight their critical aspects for Italian industry, based on the problematic points stressed by Italy's largest industrial association, Confindustria. The state of the art of the individual proposals will also be mentioned, i.e. how they have been amended by the European co-legislators, Parliament and Council, and what has been formally adopted so far.

First of all, it is necessary to indicate how the *Fit for 55* is actually constituted. It consists of a package composed of a series of interconnected proposals, all oriented towards the same goal: to ensure a 55% reduction of greenhouse gas emissions by 2030, compared to 1990 levels. Overall, the package strengthens eight existing pieces of legislation and presents five new ones in a number of strategic sectors to combat climate change: climate, buildings, transport, energy and fuels. The chosen policy mix is characterised by a balance between pricing, targets, norms and support measures (European Commission 2021).

As far as pricing is concerned, the proposals presented by the European Commission in the 14 July package include: establishing a more robust Emissions Trading System (ETS), also in the aviation sector; extending emissions trading to the transport sector, both maritime and road, and to the building sector (so-called parallel ETS); updating the energy taxation directive and the proposal to create a new Carbon Border Adjustment Mechanism (CBAM).

As for the new targets outlined in the July package: update the Effort Sharing Regulation and the Regulation on Land Use, Land Use Change and Forestry (all of which we will not cover here); update the target of the Renewable Energy and Energy Efficiency Directive.

Regarding norms and new constraints proposed by the Commission: stricter CO2 performance for cars and vans; a Regulation establishing a new infrastructure for alternative fuels; measures to promote the production of alternative fuels for the aviation and maritime sectors.

Finally, as far as measures to economically support the package are concerned, the EU Executive aims to use all possible revenues and regulations in the European budget to promote innovation and to mitigate the impact on vulnerable people, in particular through the *Social Climate Fund*, the *Modernisation Fund* and the *Innovation Fund*. The *Social Climate Fund* will provide specific funding

to Member States to support citizens at risk of energy poverty (around 34 million according to an estimate by the European Commission), in particular after the possible introduction of the parallel ETS in the private transport and building sectors (European Commission 2021). The Fund will also help to mitigate the costs for those most exposed to fossil fuel price increases during the transition and will provide an additional EUR 72,2 billion to the EU budget for the period 2025-2032, of which 25% will come from parallel ETS revenues, while 50% will come from national contributions, reaching a total amount of EUR 144,4 billion. In addition, Member States with a higher share of fossil fuels in their energy mix (Italy's will be analysed below), higher CO2 emissions, higher energy intensity and lower GDP per capita than the EU average will benefit from the *Enhanced Modernisation Fund*, which can count on 192,5 million additional allowances, according to EU Executive estimates (European Commission 2021) Finally, *the Innovation Fund*, with more than EUR 1,8 billion to invest, will provide grants to help bring pioneering technologies to market in the areas of energy-intensive industries, hydrogen, renewable energy, carbon capture and storage infrastructure, and the production of key energy storage and renewable energy components (European Commission 2021).

Before analysing the individual measures, it is needed to understand how these measures proposed by the European Commission will be financed. To this question, the EU Executive reiterates that the European multiannual budget and the NextGenerationEU post-pandemic recovery package were designed precisely to finance the green transition. Specifically, «30% of programmes under the 2021-2027 Multiannual Financial Framework are dedicated to support climate action, for example through cohesion policy, agriculture, and the LIFE programme for climate and environment», and, in addition to the already mentioned Horizon Europe programme for SMEs, start-ups and spin-outs, «member States' national recovery and resilience plans financed under the Recovery and Resilience Facility need to contribute to the green transition with measures accounting to at least 37% of the plans' allocations». Despite this, the European Commission is aware that public investment will not be enough and, in this regard, «the Strategy for Financing the Transition to a Sustainable Economy will help unlock the private investment needed to finance this transition»¹⁴, in addition to the role that the aforementioned European taxonomy will play. The latter is subjected to an extensive debates among the political forces within European Parliament and among the Member States in the Council, in particular because of the labelling of Gas and Nuclear as sustainable investments useful for achieving climate neutrality, according to the delegated act approved by the European Commission. On 6th July 2022, the European Parliament rejected the resolution proposing to reject this "taxonomy",

¹⁴ European Commission, "Fit for 55": delivering the EU's Climate Target on the way to climate neutrality, Brussels, 14 July 2021, p. 11.

effectively approving the Commission's delegated act. Therefore, when the Council will express its opinion and the delegated act will be definitely approved, new gas and nuclear plants will then be able to receive investor funding, albeit for a limited period of time and only when these plants replace coal-fired power plants.

With regard to the progress of the proposals within the European Parliament and the Council, the dossiers are also attracting a great deal of attention from public opinion and the multitude of interest associations in the various sectors. In this analysis, we will take as a reference the Italian industrial point of view represented by Confindustria and the European industrial association, BusinessEurope, both of which are conducting an intense *advocacy* campaign to protect the interests of Italian and European companies.

Specifically, on the Parliament side, the dossiers have been assigned to different committees: on one hand, the Committee on the Environment, Public Health and Food Safety (ENVI), which is dealing with the reform of the ETS, the Market Stability Reserve (MSR), the CBAM and the revision of the CO2 standards for cars and vans. The Committee on Industry, Research and Energy (ITRE), on the other hand, is working on the revision of the two directives on energy efficiency (*Recast*) and renewable energy (REDIII), while the Committee on Transport and Tourism (TRAN) is dealing with the Alternative Fuels Infrastructure Regulation (AFIR) and the two legislative initiatives to promote the production of alternative fuels for the aviation and maritime sector (*ReFuelEU Aviation* and *FuelEU Maritime*). The revision of the energy taxation directive is subject to a special legislative procedure, whereby the EU Council of Ministers will adopt, and possibly amend, the Commission's proposal unanimously. The Parliament in this case, and in particular the Council is not obliged to follow.

On the EU Council side, technical work continues in the thematically divided working groups to define a common, or broadly shared, position among the multiple interests of Member States. It will therefore be up to the members of the national permanent representations to find cross-party alliances that can then endorse a position in Coreper I and Coreper II. The French rotating presidency of the Council has declared its intention to accelerate on many dossiers in the *Fit for 55*. Despite good intentions, at the end of six months not all files have been discussed extensively and many common positions will have to be found during the upcoming Czech Presidency.

In this context, Confindustria, configuring itself as the major bearer of Italian industrial interests, has in recent months intensified *lobbying* and *advocacy* actions at the European level, thanks to the work of its Delegation located in Brussels, which has moved on two levels. At the Parliament level, it has promoted a constant dialogue with the offices of the Italian MEPs involved. Dialogue that has materialised in recent months with the presentation of several amendments to the Commission's proposals in favour of the Italian industrial fabric, in particular on CBAM, the MSR, and CO2 standards for cars and vans. Confindustria is also in constant dialogue with the European industrial association, BusinessEurope, and is at the forefront in defining the general positioning, organisation and alignment with foreign industrial confederations, in particular the French one, Medef, and the German one, BDI.

Finally, at the Council level, Confindustria continues to raise the Italian government's awareness of the critical issues arising from a total and immediate decarbonisation of industry by holding a constant exchange with the various national ministerial levels and the Permanent Representation of Italy to the EU.

1.3 Proposals to influence pricing

1.3.1 *The EU Emission Trading System (ETS) and the Carbon Border Adjustment Mechanism (CBAM)*

As part of the 14 July package, the European Commission presented a legislative proposal to revise the EU Emissions Trading System (ETS), the main tool used by the European Union to control greenhouse gas emissions from the industrial and aviation sectors internationally, through the monetary quotation of emissions and the trading of emission allowances between different states in order to comply with environmental constraints. According to the 2005 legislation, large emitting installations in the EU cannot operate without a greenhouse gas emission permit. Each licensed installation must annually offset its emissions with allowances (European Union Allowances - EUAs, equivalent to 1 tonne CO2eq) that can be bought and sold by individual operators. Installations can buy allowances at European public auctions or receive them free of charge (for so-called energyintensive sectors, i.e. requiring more energy). Alternatively, they can procure them on the market. Within the market, a cap is set on the amount of emissions that can be generated by ETS participants and within this cap, emission allowances can be traded between operators. The cap decreases over time so that fewer and fewer emissions are allowed, providing incentives for installations to reduce their emissions.

The rate of cap decrease is given by the LRF (Linear Reduction Factor), which is a percentage indicating by how much, year by year, the cap is decreased.

Now, the 2005 legislation must be adapted to the new *target* of reducing emissions of at least 55% by 2030, compared to 1990 levels. Specifically, the EU executive proposes to raise the 18% reduction contribution of the sectors covered by the ETS, through a strengthening of the LRF from 2.2% to 4.2%, and a decrease in the emissions cap. In other words, the aim is to reduce the number of

allowances in circulation, inevitably leading to an artificial increase in CO2 prices and thereby discouraging the use of fossil fuels (Confindustria 2021). This refers, in particular, to the strengthening of the reduction trajectory of allowances and the redefinition of the emission cap through the cancellation of millions of allowances, the so-called cap *rebasing*: the amount of allowances issued annually would be significantly reduced and adjusted downwards in one year and thus the amount of allowances in the market would be significantly reduced with the consequent rise in the price of CO2.

The Commission also proposes to increase the contribution of the aviation sector, as well as to extend emissions trading to the maritime sector and to introduce a new and separate ETS (the so-called "parallel ETS"), aimed at pricing emissions from fuels used in road transport and construction. The parallel ETS should, according to the EU executive's proposal, become operational in 2025 and the social groups most affected by the new measure will be able to count on support from the aforementioned *Social Climate Fund*.

With reference to the ETS framework to protect against *carbon leakage*, i.e. the risk of emissions relocation, even if the Commission assigns to free allowances a prominent role in protecting energy-intensive companies, through the overall reduction of the cap the number of free allowances will be reduced from the second half of the decade. In fact, the maximum annual rate of reduction of benchmark values will increase from 2026, shifting the free allocation towards sectors that are more difficult to decarbonise (the so-called *hard-to-abate* sectors). According to the European Commission's proposal, the allocation of free allowances will also be conditional on the decarbonisation efforts of installations.

Within the ETS, a prominent role is given to the Market Stability Reserve (MSR), which the EU executive wants to reform. The MSR is an instrument that automatically integrates allowances into the reserve or releases them in the event of excessive fluctuations in CO2 prices. It works in reverse to how a central bank would lower the cost of money. For instance, as opposed to a central bank, which when prices are too high and fears an inflationary risk raises interest rates to decrease liquidity within the system and lower prices, the MSR, on the other hand, holds emission allowances in the reserve, decreasing their number in circulation and thus raising CO2 prices. And always contrary to what the central bank does which, when prices are too low and there is a risk of deflation, is able to lower interest rates by encouraging the injection of liquidity into the system and thus raising prices, the MSR, on the other hand, could inject allowances into the market if necessary and thus lower in this way CO2 prices. This is how the mechanism behind the MSR works, in a nutshell.

As far as the CBAM is concerned, its priority objective is to reduce the risk of *carbon leakage* and to push non-EU countries to be more environmentally ambitious. If the EU wants to make such an

energy transition, it must ensure, at the same time, that European industries remain competitive, both in Europe and abroad, and that such ambitious measures do not lead to a *desertification* of European industry. The European Commission has therefore tried not to discourage European companies from making progress in the energy transition, fearing that they will lose a slice of the market and be thrown out of global competition. The chosen tool, which most are in favour of, is the CBAM, which can force European importers to buy carbon certificates at the same carbon price that would have been paid if the goods had been produced according to European standards. In other words, the CBAM would equalise the price of carbon between domestically produced and imported products. This instrument would cover imports of goods from all third countries and, according to the EU executive's proposal, is to be introduced gradually, initially applying only to goods with the highest risk of carbon leakage: iron, steel, cement, fertilisers, aluminum and power generation. The mechanism should become fully operational in 2026, starting to apply to the products concerned only gradually and in direct proportion to the reduction of free allowances allocated under the ETS. In other words, until the full *phase-out* of free allowances expected, according to the proposal, in 2035, the CBAM will apply to that percentage of emission allowances that do not benefit from free allowances. Moreover, the mechanism will only apply to direct greenhouse gas emissions. Only afterwards, the EU executive will evaluate the functioning of the CBAM and decide whether to extend it to more products and services and to include so-called indirect emissions (from electricity used to produce goods).

Having briefly outlined what the Commission's two proposals on ETS and CBAM envisage, the analysis will now focus on the critical aspects of both of them as presented by the College of Commissioners, in particular the potentially negative and distorting effects on the Italian industrial system and the European market. The Confindustria Research Centre has highlighted the most critical issues for Italian industrial sectors.

On ETS, Confindustria highlights how the European Commission is aiming at a reduction of allowances in circulation, with a consequent and inevitable increase in CO2 prices. At the time, this was motivated, according to the impact assessment, by the need to reach a target price of EUR 100 per tonne of CO2 in 2030, thus incentivising the sectors concerned to reduce their emissions. Now, however, the global context has changed dramatically. With the outbreak of war between Russia and Ukraine and the worsening energy emergency in Europe, as we will see later, the reference scenario has completely changed. Today, in fact, the price of CO2, fluctuating in the range of EUR 70-80, is eight years ahead of the European Commission's estimates, thus risking making the industry's decarbonisation path disproportionately costly and weakening the competitiveness of Italian and European companies in the European and global market (Confindustria 2021).

Moreover, the sharp rise in CO2 prices is generating inevitable repercussions on the cost of the final bill of businesses and households. Indeed, the latest report by ACER - Agency for the Cooperation of Energy Regulators - certifies a carbon price impact on high energy prices (ACER 2022). Therefore, more flexibility should be introduced into the functioning of the ETS market, by providing, in the short term, for the rapid release of additional allowances by the MSR onto the market with the aim of calming prices, while curbing financial speculation and, from the medium to long term, effective measures to be implemented in the event of excessive price fluctuations.

Furthermore, as far as the reform of the MSR is concerned, the mechanism should not assess the price effects in comparison to previous years – as is evident from the proposals currently under discussion – but rather inject allowances in a timely manner during the base year whenever the observed price exceeds a considered threshold value. Starting from the impact assessment with which the European Commission had defined an ETS target value of EUR 100/tonne to 2030 – which in fact holds the assumption in terms of costs – the *target* values are linearised from 2022 to 2030. A threshold value, e.g. 20% of the *target* value, is introduced by regulation, above which the Market Stability Reserve automatically intervenes by placing allowances on the market. In other words, additional allowances are sold when the market price exceeds the maximum permissible increase (20% threshold) over the *target* value. In this way, sales of allowances from the reserve continue until the price falls below the tolerated increase, taking nothing away from the European Commission's proposed 2030 targets but avoiding, with market mechanisms, speculative phenomena in real time. The ETS, being a market, could fall prey to financial speculation. However, it will be imperative to keep financial actors out of the ETS market to prevent strong financial speculation from bringing companies and households to their knees.

Moreover, the EU executive's proposed ETS reform envisages the *phasing-out* of free allowances as the CBAM is introduced. This proposal, according to Confindustria, weakens protection against *carbon leakage* at a time when such protection is absolutely necessary due to both rising carbon prices and the massive investments required in low-emission technologies. It is also argued that the allocation of free allowances should not become conditional on investments in energy efficiency by companies, as proposed by the European Commission, in order to avoid double regulation on top of the Energy Efficiency Directive.

Moreover, revenues from ETS auctions should support investments in low-carbon technologies, such as hydrogen, which should also be included in the free allowance mechanism.

On CBAM, penalties on exports to non-EU countries should be avoided and the current measures against *carbon leakage* should be maintained for sectors covered by the mechanism. Furthermore, an exact correlation between the carbon content of imported and produced goods should be provided

for, according to the calculation methods used in the ETS, incentivising importers to use verified emissions and avoiding any form of "double protection" through a strict equivalence regime on carbon pricing systems developed in other countries. Finally, indirect emissions should also be included in the CBAM calculation, taking due account of transport emissions. The proceeds of carbon certificates should then be used to support the decarbonisation of energy-intensive sectors, while also discouraging certain practices of circumventions, such as "resource shuffling": a phenomenon whereby exporting countries use their most sustainable and environmentally advanced plants in the production of goods destined for the EU, while producing with more polluting plants the products destined for domestic trade. In this regard, Confindustria, representing the interests of the Italian industrial sector, is in favour of setting up a central European authority that should supervise the proper functioning of the CBAM mechanism and check whether unfair practices circumventing the Regulation are being conducted.

Turning now to the state of the art of the work on the two files, which are considered to be among the most important of the whole *Fit for 55* package, on 8 June 2022, the plenary session of the European Parliament voted on the ETS reform and the introduction of a carbon tax at the border, the CBAM. However, following the approval of an amendment that envisaged a longer timeline for the mechanism's free allowance reduction trajectory, the Socialists and Democrats (S&D) political group decided to vote against the reform proposal. This decision resulted in the rejection of the report submitted by the ETS rapporteur and its return to the ENVI Committee. Following the unexpected rejection, the Strasbourg Chamber also decided to freeze the CBAM regulation, sending it back to the ENVI, due to the strong interaction with the ETS reform. Nevertheless, the three main political groups - European People's Party (EPP), Socialists and Democrats (S&D) and Renew - met the week after the vote, agreeing on the main sticking points in order to hold a second vote during the miniplenary held in Brussels on 22 and 23 June 2023. This agreement only partly took into account what had been approved in Strasbourg, which represented a better result for the industry, on several points:

Export rebate – On this point, the amendments approved during the first plenary session in Strasbourg would have ensured the extension of free export quotas until the European Commission presents a report and a dedicated and WTO-compatible legislative instrument to prevent the loss of competitiveness of European companies in third markets. On the other hand, the text approved in the Brussels mini-plenary, referring to the need to take into account the 10% of the most efficient companies when the Commission introduces an *export* solution, is difficult to interpret and creates regulatory uncertainty, thus risking penalising any export activity of the sectors covered by the CBAM and undermining the ultimate objective of the proposal, i.e. to avoid *carbon leakage;* *CBAM phase-in and phase-out of free allowances* – The timeline previously approved in plenary (2028-2034) represented a good compromise to protect companies from *carbon leakage*. In fact, in addition to a more gradual *phase-out* of ETS free allowances, a transitional period was foreseen to assess the effectiveness of the CBAM, which is not present in the text of the new compromise reached. However, the new approved timeline (2027-2032) is an improvement on what was proposed by the ENVI Committee.

Finally, with particular reference to the scope of the CBAM, the immediate extension of the scope of the instrument to basic organic chemicals and polymers was approved, without, however, having conducted a prior impact study and evaluation period on the actual effectiveness of the mechanism. Furthermore, the automatic extension of the CBAM to all sectors covered by the ETS by 2030 was approved.

On the Council side, an agreement (or, rather, a general orientation) was reached on only one of the two files - the Regulation establishing the CBAM - on 15 March 2022. Compared to the Commission's initial proposal, the Council opted for greater centralisation of CBAM governance where such centralisation makes sense and contributes to greater efficiency. For instance, it is envisaged to centralise the new CBAM importers' register at EU level. The Council also envisages a minimum threshold exempting consignments with a value below EUR 150 from CBAM obligations. This measure would reduce administrative complexity, as about one third of the consignments entering the Union would fall into this category and its aggregate value and quantity represent a negligible part of the greenhouse gas emissions of the total imports of these products into the Union. In spite of this, the Council has yet to make sufficient progress on a series of issues closely related to the CBAM, but which are not part of the draft legal text of this Regulation. They concern the ETS file, on which instead the game still seems open, as it is difficult to find a widely shared position among Member States (that aim for a more ambitious environmental targets, having a small manufacturing sector compared to those States that see the realisation of the Fit for 55 objectives more realistically and are the European manufacturing backbone, including Italy). Specifically, the issues that still have to be unravelled are those related to the *phasing out* of the free allowances allocated to the industrial sectors covered by the CBAM and to the appropriate solutions for the issue of limiting the potential *carbon leakage* related to exports, so as to ensure economic efficiency, environmental integrity and WTO compatibility of the CBAM (Council of the EU 2022).

Once sufficient progress has been made in the Council, during the trialogue phase, it will start negotiations with the European Parliament, the latter having already agreed on its position.

1.3.2 The Revision of the Energy Taxation Directive (ETD)

In order to adapt European energy taxation legislation to the new 55% emissions' reduction target, the European Commission presented, as part of the *Fit for 55* package, a proposal to revise the 2003 Energy Taxation Directive (ETD). In particular, the EU Executive proposes the introduction of a new tax rate structure outlined on the basis of the energy content and the environmental performance of fuels and electricity and the broadening of the tax base, extending its scope and eliminating some of the current exemptions and reductions. According to the Commission, these two measures will contribute to greater convergence of national tax rates between Member States, while reducing the harmful effects of unfair tax competition in the energy field.

With regard to the new tax rate structure, the proposal provides for a new configuration, which groups energy products and electricity into categories on the basis of energy content and actual environmental performance. The rates have thus been set according to a ranking that takes energy and environmental criteria into account. In other words, the EU executive proposes that: the most polluting fuels, the so-called "conventional fossil fuels" (diesel, petrol and non-sustainable biofuels) should be subject to the maximum level of taxation; natural gas, LPG (Liquefied Petroleum Gas) and non-renewable fuels of non-biological origin, for which the Commission recognises a role in a short-medium term decarbonisation, should be subject to two-thirds of the reference rate; sustainable but not advanced biofuels should be subject to half of the reference rate, while electricity (regardless of use), advanced sustainable biofuels, biogas and renewable fuels of non-biological origin, such as renewable hydrogen, to the lowest minimum rate.

As regards the scope of the tax base, however, the proposal envisages its broadening to include as many energy products or uses as possible, while at the same time eliminating several national exemptions and rate reductions.

Moreover, as both the aviation and maritime sectors are still exempt from fuel taxes today, the European Commission's proposal envisages minimum rates of taxation to encourage a switch to more sustainable fuels in the above-mentioned sectors.

With regard to the ETD revision, Confindustria, while sharing the general objective of reducing taxation for the most virtuous carriers, noted that, in partial contradiction to this same principle, natural gas and LNG (Liquefied Natural Gas) are heavily penalised under this structure. In fact, as we will see shortly, if in the Alternative Fuels and Infrastructure Regulation (AFIR) gaseous fuels are identified as alternative fuels, necessary to make the energy transition, here the European Commission, instead of promoting their use, penalises them, blocking the development of the relative supply chains. In fact, the proposed tax rates for natural gas may discourage the use of renewable gases.

Regarding the state of play within the Parliament, which, as mentioned above, only has an advisory role, as this is a special legislative procedure, the plenary vote is scheduled for September 2022.

In the Council, on the other hand, which has the power to approve the act by unanimity of its members, the ECOFIN (Economic and Financial Affairs Council) deals with it. The French Presidency considers that, given its complexity, further technical discussions will be necessary in the Tax Questions Group, as delegations will have to explore possible compromise solutions on a wide range of issues, including: the delimitation of tax categories and minimum levels of taxation, including the possibility of applying a derogation regime to certain products (such as gas and LPG), the treatment of mixed products, in particular the measurement of their energy content, and links with the other dossiers of the *Fit for 55* package, in particular the Renewable Energy Directive and the Energy Efficiency Directive. The French Presidency, therefore, notes that it is too early at this stage to make definitive comments on the content of a possible compromise agreement with a view to a general approach by the Council on this legislative dossier. Thus, discussions are continuing during the Czech Presidency. (Council of the European Union 2022).

1.4 Targets

1.4.1 The Revision of the Energy Efficiency Directive (recast)

As part of the *Fit for 55* package, the European Commission presented a proposal to revise the 2012 Energy Efficiency Directive (already amended in 2018) in order to adapt the act to the new 2030 emission reduction *target*.

It makes the EU energy efficiency target binding and more ambitious and requires Member States to collectively ensure that energy consumption by 2030 is reduced by at least 9% compared to the 2020 reference scenario (a target revised upwards in the new strategy presented by the European Commission, REPowerEU, in the light of the war between Russia and Ukraine and the worsening energy crisis, which, however, we will discuss later).

In terms of required resources, the EU will have to invest an estimated EUR 392 billion more annually in the energy system than in the period 2011-2020 (European Commission 2021).

Concretely, all energy efficiency gains in the economy will count towards the common target. However, each Member State's indicative contribution to the *target* will be determined on the basis of benchmarks that combine several criteria reflecting the national situation of each country (energy intensity, GDP per capita, energy saving potential). The proposal also foresees strengthened compensation mechanisms in case of delayed contributions. The EU executive also proposes to double the annual energy savings obligation for each Member State individually, from 0.8% to 1.5% between 2024 and 2030.

With specific reference to the promotion of energy efficiency in the public sector, which is considered one of the most polluting due to the size of buildings and the need for millions of workers to heat in winter and work with cooling systems in summer. In this regard, the Commission's proposal envisages an obligation for the public sector (PA) to achieve an annual reduction in energy consumption of 1,7% by requiring member states to renovate at least 3% of the total net floor area of public administration buildings each year (European Commission 2021).

The proposal to update the Energy Efficiency Directive, therefore, foresees that from January 2024 energy savings from measures involving the direct use of fossil fuels will no longer count towards energy efficiency obligations. However, this situation, Confindustria points out, could lead to the exclusion of interventions involving the use of efficient technologies such as natural gas-fuelled cogeneration from the recognition of so-called energy efficiency certificates (TEE). This aspect, if the EU executive's proposal were to pass as it stands, would make much more difficult for the EU to achieve its already very ambitious 2030 targets. It would, in fact, reduce the incentives for member states that rely on coal and oil to take steps to move away from these fuels. Furthermore, the new energy efficiency *target* should not penalise those Member States that have already invested heavily in efficiency policies, such as Italy.

Furthermore, always referring to Italy, the target for energy efficiency and annual renovation of PA buildings is extremely difficult to achieve by 2030, considering the type of structures that are used in the public sector, which are often historical palaces and mansions. It is therefore necessary to take into account the different building stock among the various Member States rather than imposing a single target for 27 extremely different Member States.

In addition, it will be imperative to make the stock of buildings of the poorer sections of society and people potentially at risk of energy poverty more efficient. States will have to start, first of all, with these categories, to upgrade buildings that are far behind in terms of energy efficiency.

Finally, the heating and cooling sectors will be crucial in this energy efficiency challenge. Measures such as thermal insulation, promoted by the Italian government's 110% Eco-bonus, go in the right direction. In this respect, it will be necessary to ensure consistency between the two draft directives on energy efficiency and renewable energies.

As far as the discussions on this issue in Parliament are concerned, the ITRE lead Committee has expressed its opinion on the matter, but debates are continuing in search of a compromise with the Council of the EU. The ITRE proposes annual ESOs of 2 % final energy consumption between 2024 and 2030, a third higher than the Commission's original proposal (1,5%).

Rather, The Council of the EU finally agreed a general approach on 27 June 2022. The general approach supports the energy efficiency *targets* set out in the Commission's original proposal, namely

upper limits on final and primary energy consumption of 787 Mtoe and 1023 Mtoe respectively. National contributions would remain indicative (non-binding) and based exclusively on final (not primary) energy consumption. *Targets* for renovating public buildings would only become binding after four years and limited to buildings owned by public bodies. The increase in annual ESOs would be more gradual than in the Commission proposal, rising in steps from 1.1 % (2024-2025) to 1.5 % (2028-2030), and allowing greater flexibility in accounting between year (Legislative Train Schedule 2022). Trialogues with the Parliament have just begun.

1.4.2 The Revision of the Renewable Energy Directive (REDIII)

Closely related to the Energy Efficiency Directive, the Renewable Energy Directive of 2009 was already amended in 2018. Now, the European Commission has submitted a further proposal to amend this Directive in order to adapt it to the new emission reduction *target*.

Specifically, the EU executive proposes to increase the binding EU-wide target for renewable energy from 32% to 40% (a target that was further increased following the presentation of the REPowerEU package, which we will discuss in the next chapter). The proposal also sets *targets* for the main economic sectors that contribute to energy demand, such as the transport sector. The EU Executive, in fact, argues that electrification will play an important role in road transport, while clean hydrogen, low-carbon synthetic fuels and advanced biofuels will be key to the decarbonisation of the aviation and maritime sectors. The proposal promotes, in particular, the most efficient renewable fuels in reducing emissions, setting a target of 13% for the reduction of transport emission intensity. It also strengthens the targets for advanced biofuels, raising their share of energy consumption to 2,2%, while introducing a 2,6% target for hydrogen and hydrogen-based synthetic fuels (European Commission 2021).

As far as industry is concerned, the proposal envisages a 1,1% annual increase in renewable energy consumption, while, in relation to the building sector, the Commission proposes to introduce specific measures to accelerate the transition from heating and cooling to renewable energies by setting a *target* of increasing the share of renewable energies used in buildings to 49% by 2030 (European Commission 2021). The proposal also makes the current *target* for renewable energy use in heating and cooling mandatory (minimum annual increase of 1,1%). In this regard, the EU executive envisages an increase of the indicative target for the annual increase of renewable energies used in district heating and cooling from the current 1% to 2,1% (European Commission 2021).

Finally, the European Commission proposes to establish an EU-wide certification system for alternative fuels (hydrogen) and to strengthen others to support the development of common *offshore*

renewable energy pilot projects. The sustainability criteria for bioenergy are also further strengthened by the new proposal.

So, it is clear that there are many objectives on the table concerning the renewables front, but how to achieve them is perhaps less clear, starting with the fact that reaching the *target* for renewable energy production by 2030 will require a huge acceleration of the administrative procedures needed to open and establish a plant, which sometimes even take years. Instead, Member States could be obliged to provide clear indications at national level on the eligible areas for the installation of *green* plants and the conditions that potential investors must meet, in order to provide for a simplified authorisation procedure in these areas. Furthermore, Confindustria highlighted the absence of specific targets for renewable gases in the proposal, while the revision of the Directive could instead make the definition of renewable hydrogen more explicit and the requirements for additionality clearer, i.e. that new capacity to produce hydrogen is in addition to (and not cannibalised by) production from renewables and spatial and temporal correlation for H2 produced from electricity taken from the grid.

Referring to the state of discussions in Parliament, according to the ITRE report approved in July 2022, member states should aim for 5% of new installed RES (Renewable Energy Sources) capacity to come from innovative technologies and renewable energy. Furthermore, the ITRE report tightens the sustainability criteria for biomass and accelerates the permitting process for RES installations. Finally, the report proposes several targets in some key sectors that are more ambitious than those in the original Commission proposal. For example, the transport sector should reduce its greenhouse gas (GHG) intensity by 16% by 2030 and take more active measures to promote hydrogen (Legislative Train Schedule 2022).

In contrast, within the Council, the sectoral *targets* set are less ambitious than the Commission proposal (or the ITRE report), but Member States support tightening the sustainability criteria for biomass and accelerating the permitting process for RES (Legislative Train Schedule 2022).

The search for a compromise between a more ambitious Parliament and a moderate Council has only just begun.

1.5 Rules

1.5.1 Regulation on CO2 emissions standards for cars and vans

As part of the *Fit for 55* package, the European Commission has proposed a revision of the CO2 standards for passenger cars and vans in order to accelerate the production and sale of low or zeroemission vehicles and to outline a clear trajectory towards zero-emission mobility in 2050. Specifically, the EU Executive expects the newly registered fleet to reduce emissions by 55% by 2030 and 100% by 2035, compared to the 2021 baseline. While for vans, the new reduction targets are 50% and 100% respectively (European Commission 2021).

According to the Commission's proposal, all manufacturers of passenger cars and light commercial vehicles will have to contribute to the reduction of CO2 emissions, also removing the exemption for small manufacturers (those who sell between 1.000 and 10.000 cars annually) from 2030.

Confindustria, which has many *automotive* and component supply chains represented within it, while reiterating the importance of electric mobility (through renewable electricity and sustainable production of vehicles and batteries) for the realisation of the *Green Deal* objectives, maintains, however, that it will take years for it to be accepted by customers. It will also require an adequate and proportionally distributed charging infrastructure across the EU to meet the Commission's proposed *target*.

The mobility dimension is essential from an environmental point of view; however, it is imperative to ensure a transition to sustainable mobility taking into account the economic and social impact. In order to pursue production independence, the development of a structured battery supply chain to absorb part of the workers dismissed from the sector due to the transition to electric power is of paramount importance. Similarly, it is appropriate to invest in infrastructure for all available low-carbon mobility solutions, not reducing to electric only, without which the ambitious goals set by the *Green Deal* cannot be achieved.

With specific reference to the automotive sector, which employs 1,7 million workers in Europe (PwC Strategy & 2022), an approach aimed at the electrification alone, as currently proposed in the *Fit for 55* package, is at odds with the principle of "technological neutrality", i.e. the principle that it is not right to bet on one technology alone; on the contrary, it is better to provide for a flexible approach to the different technologies available, without one necessarily prevailing over the others. Limiting oneself to a single technology, in this case electrification, runs the risk of disproportionately increasing the economic and social costs of the transition. Instead, integrating electrification with an approach open to all technological solutions would lead to a significant reduction in CO2 emissions, preserving employment levels, creating added value and maintaining the EU's competitiveness in the global market.

Moreover, among the sectors most at risk and most susceptible to the risks of abrupt conversion, is the component supply chain. The most recent study of the European *automotive* components supply chain association (CLEPA), conducted by PwC, shows how automotive sector's electrification, as currently proposed by the EU Executive, will put more than half a million jobs in Europe at risk (PwC & Strategy 2022). These are losses that new jobs related to the development of electric mobility will not be enough to compensate for. The challenge facing the components supply chain is twofold: on the one hand, to remain competitive in traditional technologies that will be globally relevant for decades and, on the other hand, to enter the market for new technologies, which represent an opportunity to be seized. The risk to be averted, however, is that of the discontinuation of many of the component companies, linked to the production of traditionally powered vehicles, not allowing the transformation of the fossil fuel production, storage and distribution sector towards renewable and low-carbon fuels. Large car manufacturers are inclined to invest in electrics, but they will also have to take into account the costs of production chains that are already suffering greatly due to the global semiconductor crisis. Semiconductors, such as silicon, are essential elements in the construction of microchips, fundamental to the functioning of a modern car.

In addition, low-carbon fuels, not just electrification, would at the same time ensure that the industrial system is able to cope with the transition in a sustainable manner, significantly mitigating the employment, social and economic fallout from the pursuit of the European Union's targets, while ensuring that they are achieved within a reasonably acceptable timeframe.

Regarding the state of the art of the dossier in Parliament, on the 8th of June 2022, the political groups reached and approved a compromise text. In the agreement, the methodology for calculating the entire life cycle of emissions is provided for;however, is of limited relevance given the forecast of the entire *automotive* supply chain electrification by 2035. Indeed, the EPP's target of 90% complete electrification of the supply chain by 2035 was rejected. Nevertheless, the *target* to 2025 was reduced from the previous -20% to -15%, and a number of Greens amendments, which envisaged full electrification of the *automotive* sector to 2030 and an intermediate *target* to 2027, were rejected.

As for the *Crediting System* proposal, put forward by the Italian giant ENI and which envisaged a scheme to encourage the marketing of alternative fuels (so-called *biofuels*), it was rejected. On the other hand, the exemption envisaged for small manufacturers, allowing them to negotiate their own emission *targets* with the Commission until 2036, was approved by a solid majority. Furthermore, the so-called IVECO Slope, the current mechanism to ensure fair burden sharing between light commercial vehicle manufacturers, was also approved, as the formula to change it (as proposed by the ENVI Committee) was rejected. Amendment 39, which was dangerous for the Italian *automotive* industry since it envisaged a 2030 emission limit of 123 g/km of CO2, was also rejected.

The Council has instead adopted its general approach on June 2022, following largely what it was proposed by the Commission. Now we are at the trialogue stage.

1.5.2 Regulation on Deployment of alternative fuels infrastructure (AFIR)

In the package of 14th of July, the European Commission also presented a proposal for a Regulation on alternative fuel infrastructure. The transposition of the current Directive into a Regulation will ensure better implementation and *enforcement* of the new *targets*, thus requiring harmonisation of standards in Europe. This proposal fits perfectly into the context of the greening of mobility by 2035 as it promotes an adequate recharging and refueling infrastructure for new energy carriers, which is essential to achieve the energy transition also in the transport sector. The implementation of this Regulation will be the *conditio sine qua non* for the development of a mobility free of fossil fuels and will allow electric or hydrogen vehicles with fuel cells to be easily recharged or refueled throughout the EU, ensuring, moreover, that aircraft and ships have access to electricity supply at major ports and airports.

With regard to road transport, the regulation will ensure that there are sufficient public charging or refueling facilities in each Member State to meet the demand of the growing number of zero-emission vehicles that will be on the market. It will also, according to the Commission, ensure the presence of charging infrastructure throughout the Union at fixed intervals along major transport corridors. According to the proposal, the implementation of electric charging infrastructures is to be accelerated in direct proportion to the expected fleet of electric vehicles on EU roads, which is expected to reach at least 30 million cars by 2030 (European Commission 2021), according to some estimates of the EU Executive. Specifically, targets based on the number of cars will ensure that for every battery electric vehicle registered in a Member State, 1 kW of charging capacity will be installed. On the other hand, in order to ensure full connectivity along the European motorways of the Trans-European Transport Network (TEN-T), it will be necessary to install a capacity of at least 300 kW, provided by fast-charging points, for each 60 km section of the core network by 2025 and a capacity of 600 kW by 2030. For the overall TEN-T network, the same targets will have to be achieved by 2030 and 2035 respectively (European Commission 2021).

For hydrogen refueling, on the other hand, according to the Commission proposal, a filling station should be available every 150 km along the TEN-T core network and at every urban node serving both light and heavy vehicles.

Conversely, for heavy electric vehicles, the EU Executive envisages charging points along the core network every 60 km with a capacity of at least 1400 kW by 2025 and 3500 kW by 2030. For the overall TEN-T network, the same targets are to be reached every 100 km by 2030 and 2035 respectively (European Commission 2021). Charging points will also have to be available in safe parking areas and in the main cities and agglomerations of the TEN-T network (urban nodes) to

enable, in particular, the charging of trucks for urban deliveries. The European Commission also expects that gaps in the LNG refueling infrastructure for trucks will be filled by 2025.

Moreover, the Regulation also covers aviation and maritime sectors. For the former, the EU Executive proposes an obligation to supply grid-sourced or locally generated electricity, instead of aviation fuel, to all aircraft parked at airports in the core and comprehensive TEN-T network. For the second, the new Regulation requires all seaports in the TEN-T network to provide electricity to better meet the needs of container ships and passenger vessels in each port.

Therefore, in line with the already mentioned principle of technological neutrality and in opposition to a single role of electrification, according to Confindustria, the planning of refuelling and recharging infrastructures should be conceived in such a way as to promote vehicles that also use low or zero emission *Well-To-Tank* fuels such as biofuels, bio and renewable gases, hydrogen and synthetic fuels, together with compressed and liquefied gaseous fuels in the short-medium term, especially in *hard-to-abate* transport. As far as the development of recharging infrastructure for electric vehicles is concerned, positive for the Italian *automotive* sector is the greater interoperability of recharging stations in the EU, as proposed by the European Commission.

In Parliament, the one responsible for drafting a report on the dossier in question is the TRAN Committee, which, however, has not yet expressed an opinion on the matter. In fact, the indicative date for the plenary session is scheduled for October 2022.

The Council, on the other hand, adopted its general orientation, retaining the fundamental aspects of the Commission's proposal. However, the guideline modifies some of its aspects. First of all, it adapts the EU Executive's text to a step-by-step approach (encouraging a corridor logic), chosen in terms of infrastructure deployment, which should start in 2025 with the aim of covering all roads of the TEN-T network in 2030. Secondly, in order to ensure that investments in hydrogen refuelling are as effective as possible and to adapt to technological developments, the text focuses the requirements on the implementation of a hydrogen gas refuelling infrastructure along the TEN-T core network, with a focus on urban nodes and multimodal *hubs*. Finally, the text has been clarified and streamlined to specify the obligations of each actor, monitor progress, ensure that users are adequately informed, and provide the sector with common standards and technical specifications (Council of the European Union 2022).

1.5.3 ReFuelEU Aviation and FuelEU Maritime Initiatives

Since 1990, the EU's international emissions from aviation and maritime transport have increased by more than 50% (European Commission 2020), making action in these sectors urgent to achieve climate neutrality in 2050. Precisely for this reason, the European Commission included in its package

of 14 July two new proposals for Regulations concerning aviation fuels (*ReFuelEU Aviation*) and maritime transport fuels (*FuelEU Maritime*).

The first proposal aims to support a rapid transition from fossil fuels to sustainable fuels in air transport, focusing on the most innovative and sustainable aviation fuels, in particular synthetic ones that have an emission reduction potential, according to the EU Executive, respectively of 80% or 100% compared to fossil fuels (European Commission 2021). Specifically, the initiative envisages harmonised EU-wide standards for *Sustainable Aviation Fuels* (SAFs), which will apply to both fuel suppliers and airline operators, who will be obliged, according to the proposal, to blend increasing proportions of SAFs into aviation fuel when taking off from EU airports from 2030 (a 5%) to 2050 (at least 63%).

The second proposal, on the other hand, aims to encourage the adoption of sustainable fuels and zeroemission ship propulsion technologies by setting a maximum level of greenhouse gases for the energy used by ships calling at European ports. Indeed, starting from the assumption that the maritime sector currently uses almost only highly polluting and carbon-intensive liquid hydrocarbons (heavy fuel oil, marine gas oil or diesel oil), the European Commission noted the urgency of reversing course in order to achieve a net emission cut of at least 55% by 2030. More specifically, the proposal sets limits on the intensity of greenhouse gas emissions from energy used on board, reducing them by 2% by 2030 and 75% by 2050 (European Commission 2021). In this regard, according to the proposal, passenger and container ships are required to use electricity on board; in line with the principle of technological neutrality, the proposal allows all renewable or low-carbon fuels, such as liquid biofuels, liquid energy, decarbonised gases (biodiesel and electro-gas), decarbonised hydrogen, decarbonised fuels and electricity.

Confindustria believes that for the aviation sector the use of SAFs will be of fundamental importance in achieving climate goals, also because these products have now reached a level of technological maturity that makes them perfectly compatible with aircraft engines. However, in order to increase the availability of green raw materials for aviation, it is suggested that the definition of SAFs should be extended to all sustainable biofuels. Furthermore, European sustainability policies in the aviation sector should be integrated into the international regulatory framework of the ICAO (International Civil Aviation Organisation), as without such international harmonisation there could potentially be a risk of market distortion with serious damage to the competitiveness of the European aviation industry.

On the other hand, Confindustria strongly supports the recognition of LNG as an alternative fuel for the maritime sector and the affirmation of the technological neutrality principle in the definition of the objectives of the Regulation. However, it would appear from the Commission' proposal that LNG

is placed almost on a par with the more polluting fossil fuels, thus undermining the attractiveness of investment in this technology.

Regarding the progress of the two proposals within the Parliament, the TRAN Committee is responsible for the evaluation of the two Regulations. In particular, through the plenary vote on ReFuelEU Aviation on 7 July 2022, the Parliament decided to increase the ambitions of the Commission's proposal, in particular rising significantly the amount of environmentally friendly fuel (SAFs) in the paraffin blend used by aircraft. In 2050, this is to be 85% blended fuel compared to 63% in the EU executive's original proposal. The Parliament also increased the sub-targets for synthetic fuels to 50% of all aviation fuel by 2050 and proposed the creation of a Sustainable Aviation Fund. Finally, MEPs gave the green light to the inclusion of renewable electricity and green hydrogen in the SAFs mix (Euractiv 2022).

The timeframe for *FuelEU Maritime*, on the other hand, is longer, with the plenary vote scheduled for 10 October 2022.

The Council, on the contrary, on *ReFuelEU Aviation*, adopted its general approach, which however modifies some aspects of the Commission proposal. In particular: it aims at ensuring the possibility for Member States to apply the draft Regulation to airports below a certain traffic threshold; extension of the scope for sustainable aviation fuels and eligible synthetic aviation fuels. Concerning biofuels: the scope is also extended to other certified biofuels complying with the Directive on the promotion of renewable energies; the possibility is introduced for the competent authorities of the Member States to grant an exemption from the provisions on *tankering* for certain flights in the event of serious and recurring operational difficulties or structural difficulties in fuel supply. Finally, the Council text adds new considerations that the Commission should include in its 2027 report, concerning, for example, the impact of the Regulation on connectivity, *carbon leakage*, distortions of competition and the future use of hydrogen and electricity.

As far as *FuelEU Maritime* is concerned, the Council amended some aspects of the EU executive's proposal, including: the scope of the requirements on shore-side electricity supply has been revised in order to focus the obligations on ships at berth; the provisions on the roles of companies, verifiers and public authorities, as well as monitoring, reporting and verification procedures have been clarified and strengthened; the provisions on the calculation of greenhouse gas emission intensity and related penalties and fines have been revised and strengthened, in order to clarify their scope and avoid circumvention of the Regulation. In addition, some provisions, limited in time, were introduced since, in the absence of similar rules at international level, some Member States would be particularly exposed to competition from third country transhipment ports. Finally, some provisions were

introduced to stimulate demand for the best sustainable fuels, in particular renewable fuels of nonorganic origin (Council of the European Union 2022).

The general guidelines adopted will enable the Council Presidency to start negotiations with the Parliament (trialogues) as soon as the latter has approved its position on the dossiers.

After concluding this detailed analysis on those proposals of the *Fit for 55* package that are of most interest to the Italian industrial sector, the next chapter will analyse two other packages of legislative proposals that are fundamental for the research: the one for the decarbonisation of the gas and hydrogen markets and the more recent REPowerEU. In the light of the war between Putin's Russia and Ukraine and the consequent worsening of the energy crisis, the European Commission has presented this package of legislative and non-legislative proposals to overcome dependence on Russian fossil fuels, in particular gas, with all the repercussions that these necessary measures will have on European industrial systems, and in particular Italy's, in whose energy mix gas plays a major role.

2. Gas and Hydrogen Market and the REPowerEU Package

2.1 Package for the decarbonisation of the gas and hydrogen markets

Continuing its work on adapting EU energy and climate legislation to Europe's ambitious new climate *targets*, on 15 December 2021, the European Commission published a package consisting of two legislative proposals on the decarbonisation of gas and hydrogen markets (i.e., a Regulation and a Directive) aimed at redefining the current structure of the European gas market to foster the integration of renewable and low-carbon gas – such as hydrogen – while ensuring integrated, liquid and interoperable EU internal gas markets.

Generally speaking, although the European Commission recognizes the importance of gas as a transitional energy source to achieve climate neutrality in 2050, the key objective of the package is to facilitate the penetration of renewable and low-carbon gases into the EU energy system, thereby facilitating the phase-out of methane.

The EU Executive's proposals include, among other things, rules to facilitate the access of such gases – including hydrogen – to the existing network. This includes the elimination of intra-EU tariffs for cross-border trade, tariffs reduction at injection points, in particular, by granting a 75% discount on entry tariffs and the creation of a certification system for low-carbon gases and its derivatives, applicable to both imported and domestic production. In addition, the Commission proposes measures aimed at: ensuring that small plants connected to the distribution grid have fair conditions of access to wholesale markets; encouraging reverse gas flows or alternative measures to commercially and physically integrate distribution grids with large transmission grids; allowing, under certain conditions, the *blending* of renewable and *low-carbon* hydrogen with natural gas; limiting the time frame for concluding long-term contracts for unabated fossil natural gas, which therefore cannot be extended beyond 2049 (European Commission 2021).

A further priority of the package is to establish an efficient market for the new energy vector that represents the most promising future energy source in Europe, namely hydrogen.

First of all, hydrogen is not an energy source but, properly, an energy vector, which means that its potential role has similarities with that of electricity. Both hydrogen and electricity can be produced from various energy sources and technologies. Both are versatile and can be used in many different applications. No greenhouse gases, particulate matter, sulphur oxide or tropospheric ozone are produced by the use of hydrogen or electricity. If hydrogen is used in a fuel cell, it emits nothing but water and therefore its CO2 emissions are zero. This is why it represents the most promising energy source in the near future, particularly for European industry, which is needed to achieve climate neutrality by 2050 and the effective decarbonisation of European manufacturing sectors.
According to the International Energy Agency (IEA), hydrogen is making a sustained contribution to decarbonising the so-called *hard-to-abate* sectors – for example, the chemical and steel industries and the sector of heavy transport – for which it is difficult to reduce emissions to zero by using only electrification and currently available technologies. Among the most interesting characteristics of hydrogen is its high energy density per unit mass and low volumetric energy density compared to hydrogen is greater than the energy developed by a kilogram of petrol, it occupies a larger volume, thus requiring larger tanks for its storage.

In order to be utilized, hydrogen must be "extracted" from more complex molecules and thus "produced" from one of the compounds in which it is found; this process requires the consumption of energy. At present, hydrogen almost entirely originates from the natural gas processing (so-called *grey hydrogen*), as well as from coal gasification (also known as *black hydrogen*) and from lignite (also known as *brown hydrogen*); this production is associated with large carbon dioxide emissions. In order to make hydrogen's production more sustainable, there are two ways forward, as it can be obtained by capturing and sequestering the CO2 emitted in the process (also known as *blue hydrogen*), as well as by splitting the water molecule (H2O) through the process of electrolysis using renewable electricity (*green* or *renewable hydrogen*).

As an energy vector, hydrogen can also facilitate the penetration of the same non-programmable renewable sources, such as wind and photovoltaics, into the energy system, acting as a grid balancer. This means that the excess electricity produced at peak times by *green* sources could be used to produce hydrogen through the process of electrolysis and could, therefore, be stored in the form of hydrogen, becoming a reserve of energy to be used in times of shortage or increased demand.

To sum up, hydrogen represents one of the most versatile and flexible energy vectors. Its use could therefore also play an important role in the production of CO2-free heat for the decarbonisation of the most energy-intensive industries, such as steel and glass sectors, which require large amounts of industrial heat for production processes.

It will also play a role in the future of sustainable mobility, primarily in heavy and long-haul transport. However, to date, the emergence of a hydrogen economy in Europe is slowed down by obstacles of various kinds, including: the technology gap, high costs, lack of infrastructure, a favourable legal, regulatory and authorisation framework and, above all, lack of adequate investment to finance research and innovation for the development of cutting-edge solutions and technologies.

Obstacles that the package for the decarbonisation of the gas and hydrogen markets aims to overcome. In this regard, the European Commission is proposing measures to create the right conditions to promote investments and enable the development of dedicated infrastructures, outlining rules – designed to be applied in two phases (before and after 2030) – concerning access to infrastructures, unbundling of production activities and pricing. The EU Executive also announced the creation of a *European Hydrogen Network of Network Operators*, i.e. a new *governance* structure with the task of fostering cross-border coordination and the construction of networks, while stipulating that national network development plans should be based on a common scenario for electricity, gas and hydrogen and aligned with national energy and climate plans, as well as with the ten-year European-wide network development plan (European Commission 2021).

Both of these legislative proposals have been evaluated by the European Parliament's ITRE Committee.

Lastly, the package aims to increase the resilience and security of supply of the European gas system through the proposed Storage Regulation approved by the two European co-legislators.

With the outbreak of war between Russia and Ukraine and the European Union's approval of several sanctions' packages against the Kremlin, Moscow, Europe's largest gas provider, has in fact used the threat of blocking gas supplies to European partners as a means of pressure on Western governments. Gazprom – a government-controlled Russian multinational company active in the energy-mining sector and especially in the extraction and sale of natural gas – started as early as June 2022 to cut off gas supplies to Countries such as Poland and Bulgaria and to gradually decrease them to others heavily dependent on Russian gas for their industry, notably Italy and Germany, until it will totally stop gas flows in September 2022, but we will see this later.

For this reason, on 29 June 2022, the Regulation on gas supply and storage in Europe was approved by the European Parliament and the Council by means of an urgency procedure, in which the obligation for Member States that their underground gas storage must be filled to at least 80% of its capacity before the winter of 2022/2023 and 90% before the subsequent winter periods is made explicit. Overall, the EU will strive to collectively fill 85% of the total underground gas storage capacity in the EU by 1 November 2022 (European Parliament 2022). The text also encourages EU Countries to diversify their gas supply sources and take more measures to promote energy efficiency. This Regulation was thus created in response to the worsening energy crisis caused by the war. Italy, for its part, possesses a large underground storage capacity, which as of September 2022 stands

at 82% of its capacity (Snam 2022). The EU target was therefore met and exceeded.

2.2 The REPowerEU Package

For many years now, Russia has been the largest exporter of fossil gas in Europe, particularly for those Countries that are heavily dependent on gas for their production processes, such as Italy and Germany (the Italian situation will be analysed in more detail later). In particular, during 2021, the

EU imported an average of more than 380 million cubic metres of gas per day via pipeline from Russia, amounting to approximately 140 billion cubic metres for the entire year. In addition, about 15 bcm was delivered in the form of LNG. The total 155 billion cubic metres imported from Russia account for about 45% of the EU's gas imports in 2021 and almost 40% of its total gas consumption (IEA 2022).

On 24 February 2022, however, Vladimir Putin decided to invade Ukrainian territory, triggering a war that is still ongoing and causing a prolonged energy crisis on the European continent. The EU has so far adopted six sanctions packages, effectively condemning Moscow for an unjustified war on Ukrainian territory. The Kremlin, in response, is using gas supply to Europe as a weapon to pressure EU governments. For this reason, the European Commission has spearheaded a package of proposals aimed in the short, medium, and long term at overcoming energy dependence on fossil fuels imported from Russia, especially gas, and accelerating the European energy transition to break free from energy dependence in the near future.

The REPowerEU plan, published by the EU Executive on 18 May 2022, is therefore part of this longterm strategy, with a clear objective: i.e. to definitively end energy dependence on Russia by 2027. The package is composed of a series of strategic communications and legislative proposals all pointing in the same direction: reducing the EU's dependence on Russia and strengthening the resilience of the European energy system by increasing energy savings, diversifying sources of supply, accelerating the development of renewables and reducing fuel consumption in industry and transport. This is done through four types of action: measures to curb energy consumption; diversification of energy sources; initiatives to accelerate the development of renewables and promote the *phase-out* of fossil fuels; lastly, short-term energy market interventions and long-term improvements in electricity market design.

2.2.1 Measures to curb energy consumption

In order to curb energy consumption, the European Commission is proposing a reinforcement of longterm energy efficiency measures within the *Fit for 55* package, including increased ambitions to 2030 *target* on energy efficiency, raised from 9 to 13%, and a plan to incentivise short-term behavioural changes aimed at reducing gas and oil demand by 5% (European Commission 2022).

With a specific Communication on energy saving, the EU Executive encouraged Member States to launch specific awareness-raising campaigns aimed at households and businesses, as well as certain fiscal measures to incentivize energy saving, such as reduced VAT rates on energy-efficient heating systems, building insulation (e.g. thermal insulation), household appliances and products. Emergency measures were also proposed in the event of serious supply disruptions, such as a prioritization of

sectors. That is, in the event of a gas shortage, which sectors will be given priority and, therefore, the possibility to continue production, ensuring a constant supply of gas, and which will be forced to temporarily close and cease their activities.

2.2.2 Diversification of energy supply sources

In order to diversify energy supply sources, in addition to the creation of an EU Energy Platform, which enables voluntary joint purchases of gas, LNG and hydrogen by pooling demand, optimizing the use of infrastructure and coordinating requests to suppliers, the Commission undertakes to evaluate the development of a "joint purchasing mechanism" to negotiate and conclude gas purchase contracts on behalf of participating Member States (along the lines of what happened for vaccines during the Pandemic).

The EU Executive also proposes an energy strategy outside the EU, with the aim of facilitating diversification and the creation of long-term partnerships with third countries. In particular, the Commission's strategy aims to strengthen Europe's energetic security by diversifying supply, intensifying the use of energy diplomacy to promote *green* energy globally and supporting trade partners heavily impacted by the Russian invasion – Ukraine, Moldova, the Western Balkans and the Eastern Partnership Countries.

With particular reference to Ukraine, the EU is committed to working with Kiev to ensure security of supply and to rebuild the Ukrainian energy sector, through the REPowerUkraine initiative, also with a view to progressive integration with the European one.

2.2.3 Initiatives to accelerate the development of renewables and promote the phase-out of fossil fuels

Being aware that a rapid shift away from fossil fuels brings with it the need to accelerate the production of energy from renewable sources, the European Commission has published a proposal for a specific revision of the previously analyzed Renewable Energy Directive aimed at increasing the Union's overall target from 40% to 45% by 2030. This will only be possible by speeding up the procedures for granting authorizations, the so-called *permitting*. In this regard, the EU Executive proposes a mapping by Member States of so-called "go-to-areas" and a streamlining of the administrative process, recognizing Renewable Energy Sources (RES) as being of overriding public interest (European Commission 2022). The proposal is accompanied by a recommendation containing guidelines to speed up authorization processes and promote so-called *power purchase agreements*, a long-term power supply agreement between two parties, usually between an electricity producer (*seller*) and an electricity consumer or distributor (*buyer*).

The European Commission also presented a *European Solar Energy Strategy*, setting the goal of doubling photovoltaic capacity by 2025 and installing 600 GW by 2030. At the same time, the EU Executive envisages the establishment of a *European Solar Industry Alliance* to maintain and regain industrial and technological leadership in the sector and the obligation to install solar panels on new public, commercial and residential buildings through the *European Solar Rooftop Initiative*.

The Commission also set a domestic production target of 10 million tonnes of renewable hydrogen and 10 million tonnes of imports by 2030, while encouraging Member States to set sub-targets for specific sectors (European Commission 2022).

Still on the subject of hydrogen, two delegated acts are expected on the definition and production of renewable hydrogen.

Measures are planned to double the rate of heat pump deployment and to integrate geothermal and solar thermal energy into modernized district and municipal heating systems.

In order to reduce the consumption of fossil fuels in transport, the EU Executive is planning to present a package of measures to make freight transport greener, with the aim of significantly increasing energy efficiency in the sector.

Finally, the Commission will undertake to consider a legislative initiative to increase the share of zero-emission vehicles in public and company car fleets above a certain size.

2.2.4 Short-Term Energy Market Interventions and Long-Term Improvements to the Electricity Market Design

With the *Communication on Short-Term Energy Market Interventions and Long-Term Improvements to the Electricity Market Design*, the European Commission intends to intervene in the gas and electricity markets to reduce the impact of high prices on households and businesses, partly caused by the war between Russia and Ukraine; it also identifies actions to be implemented in the event of gas supply disruptions from Russia and outlines future initiatives to optimize the functioning of the European electricity market.

As regards interventions in the gas markets, there is the possibility for Member States to regulate the retail price, to implement emergency liquidity support measures while respecting State Aid rules and to review the limits applied to short-term volatility in the internal *trading* rules of European gas exchanges. Options for intervening instead in electricity markets include reallocating *windfall profits* and congestion revenues to support consumers, temporarily extending regulated retail prices to cover the costs of SMEs and implementing emergency measures to subsidize the cost of gas used for power generation.

In the event of a disruption of gas flows from Russia, the Commission also invites Member States to update their emergency plans, establishing common principles for energy quotas and facilitating the creation of a coordinated plan to reduce demand through voluntary pre-emptive reduction measures. It also retains, as a *last resort*, the idea of introducing an administrative price for gas, for a period limited to the duration of the emergency.

Finally, with particular reference to the future of electricity market design, the EU Executive plans to develop market instruments to protect consumers from price volatility and measures to strengthen *demand-response* by promoting individual self-consumption schemes in the near future.

2.2.5 Recovery and Resilience Facility (RRF) and National Recovery and Resilience Plans (NRP)

How to finance this amount of investment needed to implement the REPowerEU plan? The Commission believes that the Recovery and Resilience Facility (RRF) and National Recovery and Resilience Plan (NRRPs) are best suited. In this regard, the EU Executive proposes targeted amendments to the RRF Regulation in order to allow for the integration of a chapter specifically dedicated to the REPowerEU plan into the existing recovery and resilience plans of Member States. In this sense, the Country-specific recommendations of the European Semester 2022 will in turn contribute to feeding this process.

According to the Commission's estimates, the achievement of the REPowerEU objectives will require additional investments amounting to EUR 210 billion up to 2027 (European Commission 2022); these investments will then have to be realized by the public and private sector at both national and European cross-border level.

To support REPowerEU, the EU Executive proposes to draw on the EUR 225 billion in RRF loans still available (not all Member States have in fact applied for loans for their national plans). As for Italy, which has instead applied for its entire share of loans (6,8% of GDP), it will eventually be possible to reclaim them, thus exceeding the 6,8% limit already reached, only if 30 days after the publication of the new RRF Regulation, the EUR 225 billion have not been used up due to the applications of other Countries (European Commission 2022).

Moreover, the European Commission proposes to increase the RRF budget through:

• EUR 20 billion in grants from the proceeds of the sale of EU ETS allowances currently held in the MSR. This amount will be made available to Member States in the form of nonreimbursable financial support in direct management to exclusively support the reforms and investments included in the REPowerEU chapter;

- EUR 26,9 billion from the cohesion funds: Member States will have the possibility to transfer up to 12,5% of their allocation to the RRF on a voluntary basis (in addition to the 5% transfer possibility already foreseen, the 7,5% transfer possibility for REPowerEU objectives);
- EUR 7,5 billion from the Common Agricultural Policy (CAP): Member States will have the possibility to transfer up to 12,5% of their initial allocation under the *European Agricultural Fund for Rural Development* (EAFRD) to the RRF to support the measures necessary to implement REPowerEU (European Commission 2022).

In addition, as part of the *Connecting Europe Facility* – a European Union fund established in 2014 for EU-wide infrastructure investments in transport, energy, digital and telecommunications projects, aiming for greater connectivity between EU Member States – the European Commission has launched a new call for proposals with a budget of EUR 800 million (European Commission 2022), to be followed by another in early 2023, to fund Projects of Common Interest (IPCEIs) in the area of energy infrastructure. The 2022 budget of the *European Innovation Fund* will also be doubled to EUR 3 billion (European Commission 2022).

This funding can only be used to implement measures to: increase energy efficiency in buildings and decarbonize industry; increase production and deployment of sustainable biomethane and renewable or fossil-free hydrogen and increase the share of renewable energy; address domestic and cross-border bottlenecks in energy transmission and support electrification of transport infrastructure, including railways; retrain the workforce towards *green* skills; strengthen value chains for the production of key materials and technologies related to the *green* transition; improve energy infrastructure and oil and gas facilities, ensuring immediate security of supply.

Finally, the European Commission presented a set of guidelines for Member States on how to amend and supplement their NRRPs and how to prepare the new REPowerEU chapter (i.e. specifying the information that Member States have to submit to the EU Executive on the reasons, objectives and nature of the changes to their national plans). The ambition of the plans cannot, however, be reduced under any circumstances, especially with regard to the implementation of reforms.

2.2.6 Critical Points

As far as the industrial interests at stake are concerned, Confindustria is paying close attention to the proposals put forward within REPowerEU, to the different options in terms of resources and, in particular, to the possibility offered to the Member States to supplement their NRRPs with a chapter expressly dedicated to the financing of energy projects, reforms and infrastructure.

Indeed, it is clear that the achievement of the REPowerEU *targets* will require additional investments beyond those already calculated to address the double *green* and digital transition. With the measures

proposed in the REPowerEU plan, which explicitly lead to an increase in the targets for renewable production (+5%, from 40 to 45%) and energy efficiency (+4%, from 9 to 13%), and the prospects of expanding the contribution to the decarbonisation of the ETS sectors, the medium-term climate *target* (originally at 55% emission reduction by 2030) thus exceeds by several percentage points what was previously set by the *Fit for 55* package, thus calling into question the impact assessment drawn up by the European Commission. In Italy alone, taking the original ambitions of *Fit for 55* as a reference, an investment requirement of more than EUR 1.000 billion by 2030 has been estimated (Confindustria 2022). An amount, therefore, destined to increase in light of the renewed objectives defined in the REPowerEU plan.

A new overall impact assessment on the Italian and European industrial fabric by the EU Executive is therefore necessary. Moreover, taking the *NextGenerationEU* instrument as a model, the EU should equip itself with a European solidarity mechanism that would allow Member States, especially those with financial fragilities like Italy, to quickly adopt measures to support energy transition, while safeguarding European competitiveness, production and employment. Indeed, the resources put in place to finance REPowerEU would seem insufficient to keep up with the required level of decarbonization speed.

In this regard, NRRPs funds will be more essential than ever today. However, there are still some critical issues that undermine the full and effective implementation of the Plan in Italy. The poor administrative capacity of Italian local authorities, especially in the South, weighs heavily, which carries with it the PA's lack of attractiveness for talented young people. It also remains difficult for companies to effectively find the investment opportunities opened up by the NRRPs, some deadlines being rather tight.

The Italian parliamentary bureaucratic process, then, troubled and subject to constant political pressure, proceeds slowly with decree-laws, and the real issues, in particular the reforms needed to fully implement the NRRPs goals, are often postponed. Italian politics is focused exclusively on the short term, when what is needed is a long-term strategic vision that can chart the right trajectory for the Country, implementing reforms and making it more efficient at the European level. Reforms, rather than a desire for change, would seem to be almost a constraint for the political forces within the Parliament. Instead, they represent the key for Italy to achieve the objectives of the NRRPs, *Fit for 55* and the REPowerEU plan.

In order to meet the costs of an unprecedented energy transition, of a worsening energy crisis day by day, with Russia threatening to block gas flows constantly, Italy must regain its lost productivity and attractiveness for investment. It must focus on its SMEs, i.e. the jewel in the crown of the European market.

In addition to the critical issues just mentioned, there are two others of a contingent nature with the complex economic phase that Europe is facing, which we will discuss in more detail in the next chapter: the increase of prices and the lack of materials. With respect to the first issue, some investments may be difficult to realize at current energy and raw material prices, making it impossible for companies to participate in tenders and contracts; with respect to the second critical point, for some materials, especially construction ones, there is a shortage of supply, making it difficult to realize the investments required by the European energy transition on schedule.

In addition to proceeding swiftly with the implementation of reforms, some specific investments need to be revised according to the prices and the new European resources put in place for the REPowerEU plan.

In this regard, Confindustria looks carefully at the proposals put forward, in particular at the various options advanced in terms of resources and the possibility offered to Member States to supplement their respective Recovery and Resilience Plans with a chapter expressly dedicated to financing energy projects, reforms and infrastructure.

Finally, it is clear that achieving the REPowerEU *targets* will require additional investments beyond those already calculated to address the double *green* and digital transition.

In general terms, Confindustria agrees with the objectives of REPowerEU package, such as the diversification of supply sources, the broad and rapid development of renewable and low-carbon energies, hydrogen and alternative fuels, as well as more energy efficiency measures. These are indeed necessary elements to rapidly reduce dependence on fossil fuels imported from Russia.

The plan, however, does not seem to have provided an adequate response to the rise in natural gas prices (which we will discuss in the next chapter), in the absence of a *market-friendly* course of action, coordinated among Member States in a unified manner, which would introduce a reference *price cap* for supply contracts in Europe, both *pipeline* and LNG, on an emergency basis. The option of an EU regulatory strategy would in fact be more effective than autonomous action by the Member States, as the EU would be able to exert more market power over importers.

The energy emergency that Europe now faces also suggests a reflection on the current European natural gas market and electricity market design, which would now appear to be outdated, deficient and inadequate to cope effectively with external shocks.

As far as the gas market is concerned, the current picture denotes a fragmentation of the markets in Europe and the lack of a single European stock exchange platform capable of guaranteeing physical and financial products with short- and long-term price signals for the benefit of greater security of supply in Europe. On the other hand, with reference to the design of the electricity market, we note the persistence of mechanisms that do not allow for an effective valorisation of electricity produced

from renewable sources. Renewable energy production is in fact mainly a *capex* technology without variable costs, so the current marginal reference system, as part of price compensation, is obsolete. It will therefore be necessary to reform both the European gas market and the electricity market design, making them suitable for the new context in which Europe finds itself.

In this regard, it is worth mentioning the proposal, strongly desired by the Italian government, of a ceiling on the price of gas (*price cap*), which would take the form of a sort of sanction to respond to Russia which, following the outbreak of war in Ukraine, is using energy as a weapon.

In practice, the *price cap* would mean putting an upper limit on the purchase price of Russian gas, which European operators would therefore no longer be able to buy above a certain amount. Among the hypotheses circulated is that of a cap of between EUR 80 and 90 per megawatt hour. However, other countries that supply us with gas, such as the US, Algeria, Egypt, Qatar and Azerbaijan, would be excluded from this ceiling. This is because, otherwise, they could be pushed to sell gas to other countries that do not have the cap, e.g. Asian countries.

The Italian request has the support of both the Mediterranean front and France. From Germany, for now, a cold silence filters through (De Ceglia 2022). The fear, in Berlin and in the capitals most dependent on Moscow's gas, is that, in retaliation, Russian President Vladimir Putin will turn off the taps for good. However, the reasoning of the Italian government is based on the assumption that that the taps are closing anyway.

2.3 Save Gas for a Save Winter Communication

On the subject, therefore, of a permanent interruption of Russian gas supplies «Member States shall use their best efforts to reduce their national gas consumption between 1August 2022 and 31 March 2023 at least by 15% compared to their average consumption between 1 August and 31 March during the five years preceding the entry into force of this Regulation ('voluntary demand reduction')»¹⁵. This is the opening line of the regulation proposed by the European Commission in its *Safe Gas for a Safe Winter Communication* of 20 July 2022, in which the EU Executive proposes that governments reduce their national gas consumption by 15% from August until next spring. This would correspond to 45 billion cubic metres of gas (European Commission 2022). The measure – initially characterized by a voluntary basis, with the possibility of making it compulsory in the event of a crisis – is a central part of the announced plan to reduce gas demand in order to prepare the Union for a possible interruption of supplies from Moscow.

At the regulatory level, the proposal put forward by the Commission takes the form of a Council Regulation, for which co-decision with the European Parliament is not required, being sufficient only

¹⁵ Regulation (EU) 2022/0225, 20 July 2022.

the Member States' green light by qualified majority. This choice was dictated by the need to speed up the approval process, in order to make it binding as early as 1 August.

The *target* to reduce gas consumption to 15% will initially be voluntary and will be calculated for each Member State on the basis of the weighted average of gas consumption over the last five years (2017-2021). It may become compulsory in the event of an emergency: on its own initiative or on the proposal of at least three Member States, the European Commission will be able to declare a state of emergency at European level if there is a substantial risk of a serious gas shortage or if there is an exceptionally high demand for gas resulting in a significant deterioration of the gas supply situation (European Commission 2022). The EU alert will then make the demand reduction target mandatory for all.

The proposal for a Regulation, put forward by Brussels, relies on Article 122 of the Treaty on the Functioning of the European Union (TFEU), which calls for greater powers for the EU in the event of serious difficulties in the supply of certain products, particularly in the energy sector. Member States are also required, by the end of September, to update their national energy contingency plans, so as to define and indicate to Brussels which gas demand reduction measures they are planning (e.g. to limit heating in public buildings). It will fall to the national authorities to monitor the implementation of demand reduction measures on their territory and they will report to the Commission the reduction achieved every two months.

However, Member States remain free to decide how and where to cut back and on which economic and industrial sectors to focus according to their own particularities. The Commission has only defined a set of non-binding guidelines and recommendations: priority should go, for example, to replacing gas with renewable and low-carbon energy sources, but the prolongation of the use of coal, oil or nuclear power is allowed and may be considered necessary as a temporary measure. The Plan also defines measures, principles and criteria for coordinated demand reduction, focusing on overall energy savings in all sectors, based on priorities set by certain guiding criteria: social criticality, sectors including health, food, security, refineries and defence, as well as the provision of environmental services; cross-border supply chains, sectors or industries that provide goods and services critical to the smooth functioning of EU supply chains; damage to facilities, to prevent them from resuming production without significant delays, repairs, regulatory approvals and costs; and gas reduction and product/component substitution, the extent to which industries can switch to imported components/products and the extent to which demand for products or components can be met through imports.

Member States are also suggested to promote awareness-raising campaigns to reduce heating and cooling, especially in public buildings.

Brussels is preparing for the worst-case scenario with this plan. Namely, the total cut-off of gas supplies from Russia. Without acting immediately with preventive measures, the EU estimates that the total cut in Russian gas supply could weigh on the European economy a drop in GDP of between 0,9 and 1,5%, in the scenario of a severe winter. Acting now, according to the Commission, the impact would be limited to a drop of 0,6% (European Commission 2022).

The EU Executive then authorizes a series of measures such as auction systems or tenders to incentivize voluntary energy reductions by the most energy-intensive industries, even through real financial compensation such as State Aid.

A controversial issue is the proposal for a uniform 15% demand reduction. Should the 27 Member State Ambassadors fail to reach an agreement before 26 July 2022, the idea is to start with the phase of voluntary gas demand reduction and then continue the discussion on mandatory rationing. Criticism and opposition have been raised by several governments, including Italy. Should the Commission's proposal be adopted, the Country will have to reduce its gas consumption by 8 billion cubic meters from 1 August until 31 March, in order to comply with 15% of the average gas consumption of the last five years.

According to BusinessEurope (BE), the association of European industrialists of which Confindustria is a member, the forced reduction of production would have disastrous economic effects and an oftenirreversible impact on companies, which is why it should only be considered as a very *last resort* option.

Finally, according to the EU Executive's plan, in the event of a supply crisis, a European solidarity system will be triggered with the obligation for the most "supplied" Countries to cede methane quotas to their less well-equipped allies in order to guarantee them the functioning of essential systems, starting with domestic and health systems.

3. The gas markets

3.1 European and Italian energy consumption

As mentioned in the previous chapter, Russia, for Italy and other European Countries, has in recent years been the main supplier of gas (45% of European imports) as well as coal (45%) and oil (25%). In this context, the dramatic ongoing conflict in Ukraine has now made measures aimed at greater European independence from fossil fuels more urgent than ever, an objective that the EU has crystallized within the REPowerEU plan (Openpolis 2022).

This goal of greater energy independence must, however, be assessed in the light of consumption levels in Italy and other European Countries, so that its feasibility can be measured. In this regard, the European statistical office, Eurostat, uses the tonne of oil equivalent – which corresponds to the amount of energy released from the combustion of one tonne of crude oil – as an indicator of the consumption of EU countries.

According to Eurostat, final energy consumption in 2020 was 885,7 million tonnes of oil equivalent in the EU (Eurostat 2022) and the Countries with the highest consumption levels – Germany, Italy and France – are also the most industrialized ones. In fact, 48% of the EU's energy consumption (almost half) is attributable to these Countries.

This data is essential to understand how much energy each State needs and how much it should produce itself to reduce dependence on foreign imports.

Now, for the purposes of our analysis, it is useful to investigate the composition of the Italian energy mix – the set of different primary energy sources from which secondary energy is produced for direct use, such as electricity – in order to understand the extent of Italy's energy needs and the Country's dependence on foreign imports, so that an action strategy can be outlined by the Italian government to reduce this dependence over time so as to become more independent and autonomous.

3.2 The Italian energy mix

First of all, to assess the Italian energy mix, International Energy Agency (IEA) data referring to 2019 were taken as a reference and not those for 2020/2021, years in which, due to the Pandemic, consumption was not exactly in line with the average of previous years (*See Appendix*).

Thus, according to the IEA, most electricity in 2019 came from natural gas (41,8%). Of this percentage, domestic production alone contributes around 3-4%, while the rest of the gas is imported from abroad, especially from Russia, Algeria and Azerbaijan (IEA 2020).

In recent years, the Italian government has therefore decided to rely heavily on natural gas to complete the energy transition to renewable sources. Now, however, it is paying a hefty bill, not least because in the meantime other Countries have had the same idea to achieve the transition, thus rising prices, due to competition on the demand side.

Indeed, natural gas possesses unique attributes for energy generation. It has numerous advantages as a fuel for heating and cooking, while also playing a key role in the production of cement, fertilizers, glass and many other production processes. In addition, natural gas has a relatively low emissions profile, with about half the CO2 emissions of coal. Finally, it is the cheapest fossil source on the market (at least at one time).

This strategy has now proved to be a loser, as the suppliers on whom Italy relied have proved to be extremely unreliable, with all that this has entailed in terms of soaring gas prices.

In second place in the Italian energy mix is oil at 34,4%. Despite its rather high value, it should be pointed out that since the 1990s its use has been in constant decline. The same applies to coal, which today stands at 4,4% but its trend is downward (IEA 2020).

As mentioned above, the goal of energy independence can only be achieved through greater recourse to renewables, which, however, still only account for a minority share of the energy consumed in Italy. Specifically, the sum of biofuels, hydroelectricity, solar and wind power cover only 19,4% of national energy demand with biofuels in the lead (10,2%), followed by solar and wind power (a total of 6,5%) and hydroelectricity (2,7%). Despite being in a minority position compared to classical fossil fuels, renewable energy consumed has recorded the largest increase, amounting to 23 million tonnes equivalent in almost thirty years, surpassing fossil fuels, which fell by around 8 million tonnes in 2000 (IEA 2022).

In contrast, among fossil fuels, the only source that saw its consumption increased over the period was gas, growing by around 22 Mtoe, only slightly less than renewables (23 Mtoe).

As a result, Italy's energy dependence on foreign Countries (especially Russia) is very marked. The *Istituto Superiore per la Protezione e la Ricerca Ambientale* (ISPRA) has defined Italy level of energy dependence starting from the *ratio* of imports from abroad to domestic energy availability, identifying a 78% dependence of Italy on energy imports to meet its needs. In fact, with the exception of oil, Italy has become more dependent on imports over the years for all the other sources considered. This is particularly true for gas: if, in fact, in 1990 dependence was 64,3%, in 2019 it stands at 93,6%, in which, compared to previous decades, Italy has found itself in a profoundly more unbalanced context towards Russian supplies in recent years (Confindustria 2021).

In 2006, it was in fact Algeria that was the leading gas supplier for Italy with a share of 28%, followed by Russia at 26% and Northern Europe, particularly Norway, at 20%. A considerable share of gas also came from domestic production, accounting for about 12% of total supply (Confindustria 2021).

2012 was the first year, however, in which Algeria lost the primacy of gas supplies to Italy, but still accounted for 27% of the total, while Russia had reached a weight of 31%. The share of gas from Northern Europe had also decreased to 12% of the total, while levels from Libya and domestic production were stable.

Since then, Russian supplies have significantly increased their market share, reaching 41% of the entire gas supply in Italy in 2020, a share reduced to 38% in 2021 thanks to supplies from Azerbaijan via the *TAP* pipeline (Confindustria 2021).

In July 2022, in the face of Russia's unreliability and the REPowerEU goal of energy sources' diversification, Italy managed to rely more on other international partners for gas imports. In particular, 68,55% of the gas used in Italy today comes from Algeria, 49,94% from Norway, 32,84% from Azerbaijan, 6,23% from Libya and, finally, 8,98% from domestic production, compared to still 25,55% from Russia (Mattera & Scozzari 2022). From 2021 to 2022, we therefore see a reduction of 12,5 percentage points in gas imports from Russia.

Now, in a situation of extreme urgency due to the war, gas has become the most fearsome weapon used by Moscow against European governments, which, as we have seen, are closely tied to Russian imports. But then, what are the energy infrastructures that transport gas from Russia? And which others is the Italian government trying to focus on, as required by the REPowerEU plan, to compensate for the reduction in flows imposed by the Kremlin?

3.3 Italy's energy infrastructure and future plans to upgrade it

First of all, Russian gas arrives in Italy via three pipelines. The 4.450 km long *Urengoy-Pomary-Uzhgorod*, which starts in Siberia, passes through Ukraine and almost reaches Slovakia. From there, the gas, via *Transgas*, arrives in Austria and is fed into the *Tag* (Trans Austria Gas), controlled by Snam – the italian energy infrastructure company active in the transport, storage and regasification of methane – which transports it to the Tarvisio plant in the province of Udine and close to the Austrian and Slovenian borders.

Now, the Italian government is aiming to diversify its sources of supply by upgrading, first of all, existing infrastructures. Such as *TransMed*, a 2.000 km long structure, which transports gas from Algeria, crosses Tunisia and arrives at the Sicilian plant of Mazara del Vallo. From Libya, on the other hand, the gas arrives via the 520 km long *Greenstream* pipeline. In this case, the landfall is the Gela plant.

Three pipelines are needed to bring gas from Azerbaijan to Italy: the *Scp* (South Caucasus Pipeline), 692 km long, connecting Baku, the Azerbaijani capital, with Turkey; the *Tanap* (Trans Anatolian

Pipeline), transporting gas for 1,840 km to Greece; and finally starting from there, the 878 km of the aforementioned *TAP* (Trans Adriatic Pipeline), transporting gas to Apulia.

Finally, from Northern Europe, the gas travels the 293 km of *Transitgas* and connects to the national grid in Piedmont, particularly at Passo Gries (MISE 2022).

Another way of importing natural gas, on which the Italian government is relying heavily, is to do so in liquid form via tankers. In 2021, Italy imported 9,97 billion LNG, constituting 13,1% of the gas that is consumed. It comes mainly from Qatar, with which both the Italian government and the European Commission are making agreements to increase supplies. To be transported by ship, the gas is cooled to 162°C, a temperature at which it becomes liquid and thus transportable by sea. Before it can be reused, it must be regasified. And in Italy there are no less than three regasification plants, in Panigaglia (near La Spezia, which contributes 9,29% of the total gas used in Italy), in Livorno (14,09% of the total gas) and in Rovigo (27,09% of the total gas), with more planned for the near future (Snam 2022). Recent news is Snam's purchase of a regasifier ship that will be anchored in Piombino and that could contribute, along with all the other measures, to the rapid end of dependence on Russia.

The entire Italian system is in fact engaged on this front: supplying the Country in the short term in the light of an imminent blockade of Russian supplies.

For the immediate future, in view of next winter, as previously indicated, Italian gas storages are 82% full and Snam has at the same time purchased two regasifier ships: *BW Singapore* and *GolarTundra* to use LNG. The agreements signed with Algeria, Angola, Qatar, Azerbaijan and, in prospect, Mozambique by the Italian government all point in the same direction: ensuring households and businesses a continuous supply of gas necessary in the short term to run the system.

The goal of the Minister for Ecological Transition is to overcome dependence on Russia by 2023, thereby replacing all 30 billion cubic metres per year that Italy received from Gazprom (MITE 2022), which became even more urgent after *Nord Stream 1* was stopped for "maintenance", reopening on 21 July 2022 with a capacity, however, of only 40%, and its subsequent closure "indefinitely" in September 2022.

From this point of view, the project currently being discussed in the government to double the *TAP* pipeline becomes very important, and in this respect its deliveries have already increased from 8,1 billion cubic metres in 2021 to the planned 12 billion in 2022 (Mattera & Scozzari 2022), the work on the Egyptian *Zohr* field and the Israeli *Tamar* and *Leviathan* fields.

To date, gas from the Jewish State already goes to Cairo, which then exports it to Europe. However, many would like a direct *pipeline* connection. The crux of the matter, therefore, is to build Edison's new *EastMed* pipeline, for a direct connection between Israel and Europe, passing through Cyprus,

Crete and Greece and joining the final part of the *TAP*. In fact, Israel counts on doubling its gas production by 2026, while remaining aware that it is and will remain a source of transition to renewables. This is why Israel wants to make the new pipeline compatible with hydrogen, of which it intends to become a major producer.

Other projects indicated by the Ministry of Economic Development (MISE) are those to increase the inland south-north gas transport capacities in Italy on what is called the *Adriatic line* and for which Snam is the promoter, the inland transport capacities in Apulia (the *Matagiola - Massafra* pipeline), and, in addition, the *offshore pipeline* from Greece to Italy (currently called the *Poseidon* pipeline). Furthermore, the Italian government signed an agreement in July 2022 with Algeria, which has the largest natural gas reserves in the whole of Africa. Algeria, which has already become the Italian government's leading supplier of fossil gas, represents the short-term answer for Italian supply in the event of a disruption of flows from Russia. In April, in fact, the North African Country – already a partner of the ENI group – assured the Italian government of a supply of 9 billion additional cubic metres between now and 2024, of which 3 billion already for this winter. However, the Algerian State company Sonatrach has announced that it will send an additional 4 billion cubic metres by winter 2022 (Mattera & Pagni 2022).

In this way, Algeria is confirmed as the main exporter of natural gas to Italy. The strong relationship between ENI and Sonatrach, however, is not just a mere commercial alliance: thanks to the aforementioned *TransMed*, Algeria and Italy could form a kind of Mediterranean bridge to guarantee raw material also to Northern European Countries. The ambition is to make gas travel to Europe no longer on the northern and eastern routes (and thus, from Russia), but on the southern route, thus making Italy increasingly able not only to push gas from north to south, but also in the opposite direction, the so-called *reverse flow*, occupying the role that Germany played at the time with Russia. The investment should also concern the extraction of hydrocarbons and the production of natural gas, possibly to be transported later in liquefied form, given the current limitations of the *TransMed* pipeline. Among the Algerian government's intentions in the medium to long term is to become Europe's leading supplier of solar energy and electricity too.

In the light of this new agreement with Algeria, Italy will therefore become one of the Countries with the largest gas reserves, thanks to its large storage capacities and new flows from North Africa and Azerbaijan.

Italy could therefore use this competitive advantage to bring to the attention of the more reluctant governments the urgency of introducing a *price cap* to the gas price, which we discussed earlier, on the typical scheme of simple *quid pro quo*.

As we said, Germany and the northern European Countries still do not want to know. However, the argument used to defend their veto – that of not distorting the market – is becoming weaker and weaker. In fact, with the Commission's proposal for 15% reductions in gas consumption, contained in the above-mentioned Communication *Safe Gas for a Safe Winter*, market logic is already being affected. Not to mention that the war in Ukraine itself is the biggest factor disrupting the economy. In parallel, Brussels' manoeuvres to free itself from Russian gas also continue. In this regard, European Commission President Von der Leyen signed a draft agreement in July 2022 in Azerbaijan, specifically in Baku, which includes a commitment to double the capacity of the so-called *Southern Corridor*, bringing it to at least 20 billion cubic meters per year by 2027, the year in which the EU executive envisages the complete end of energy dependence on Putin's Russia (Mattera & Scozzari 2022).

As far as domestic gas production is concerned, according to data updated to 2021 by MISE, Italy extracts 4,4% of the gas it consumes. In other words, only 3,34 billion cubic meters of natural gas are produced against 76,1 billion consumed (MISE 2021).

Towards the end of the 1990s and the beginning of the new century, extraction was six times higher, reaching 20 billion cubic meters per year. There are in fact between 70 and 90 billion cubic meters of proven reserves, but they could not be extracted in one fell swoop. There are 1.300 active deposits, but only a little over 500 are continuously used (MISE 2021).

Indeed, Law No. 133 of 2008 imposed bans on gas extraction in the northern Adriatic area, where the largest gas reserves are concentrated. The reason is to avoid the risk of subsidence, i.e., the lowering of the ground level. Furthermore, Italy has renounced *fracking* (hydraulic fracturing) due to environmental risks, in particular seismic risks. Finally, for a long time, it was cheaper to import gas than to extract it. Now the situation has drastically changed.

Of more than four billion cubic meters of Italian gas, 54,6% comes from gas fields at sea and the rest from the mainland, in particular from Basilicata, which alone is worth 34% of that 45% coming from onshore wells. At sea, on the other hand, the area of origin of gas is the northern Adriatic before Veneto, Emilia-Romagna and Marche (MISE 2021).

The goal outlined in the Italian Ministry for Ecological Transition's *Piano per la transizione energetica delle aree idonee* (Pitesai) would be to add another 2,2 billion cubic meters to Italy's domestic gas production, bringing the total to over 5 billion. Especially the fields in the Sicilian Channel, from where 80% of the new gas should come. Another 15% will be added from other sites in front of Emilia-Romagna and Marche. The last 5% will be taken in the Ionian Sea near Crotone (MITE 2019).

In the aftermath of the Russian invasion of Ukraine, hypothesizing what the future balance will be means knowing whether or not it is worth resuming drilling in Italy. It is no longer an economic choice so much as a strategic one. Deciding in practice whether we should depend on other Countries for a primary source like gas, or increase our production capacity and stocks. Remembering that energy independence means investment and therefore costs. Costs for a fossil source that will be needed as a *bridge* to achieve energy transition and climate neutrality by 2050.

On the other hand, the only alternative is to resort to coal, which pollutes much more, or to renewables, which however alone do not seem to be enough, at least in the short term. And since it is the short term that we now have to worry about, with Moscow's threat to cut off gas supplies, more sustained domestic production could ease the burden of energy dependence on external actors, which make us more vulnerable to the price market, causing electricity and gas bills for households and businesses to soar.

3.4 High utility bills: the causes

Among the reasons for the high bills in Italy, there are some structural historical ones in the Country's system, others clearly cyclical, from the Pandemic to the war between Russia and Ukraine.

Those of a historical-structural nature include, first and foremost, the 1987 referendum on nuclear fission power, which sanctioned Italy's definitive renouncement of this energy source, and the 2016 referendum that instead blocked oil and gas drilling and extraction in the Adriatic. This prevented the Country from diversifying its sources of energy supply. Moreover, over the years, it would have been more appropriate to have more regasifiers for a wider use of LNG and more storage.

On the subject of nuclear power, it must be said that, in the 1980s, Italy had a very high level of technological *know-how* in this field, which, however, was inevitably lost due to the public's fear of a Chernobyl-type accident, despite the fact that Italy is surrounded by nuclear reactors, from France to Germany and Spain.

As far as gas is concerned, following the referendum in 2016, no more investments were made in domestic gas exploration and extraction, and instead the preference was to be dependent on imports from abroad. However, being heavily dependent on foreign gas means that when gas prices rise, the price of electricity rises in turn. In Italy, in fact, 40% of the electricity produced comes from gas-fired power stations, which means that when the cost of gas rises, so does the cost of electricity. The production of the latter, over the years, has mainly come from the use of non-renewable energy sources, such as fossil fuels, and to an increasing extent, today, from renewable sources. In this respect, the replacement of oil by natural gas as fuel for thermoelectric power stations has increased the cost of bills for households and businesses in recent times (See Appendix).

In addition to an excessive dependence on foreign supplies, another reason why Italy pays a hefty energy bill is due to the burden of taxes and, in particular, the so-called "charges" on the bill, also known as system charges. These are nothing more than additional components laid down by law, the revenue from which is earmarked for particular purposes. There are: charges for the *decommissioning* of nuclear power plants; incentives for renewable energy sources (which make up the largest share); tariff concessions for the railway sector; subsidies for energy-intensive industries; promotion of energy efficiency, etc. In other words, a variety of items to be lavishly remunerated that follows the pattern of excise duties on petrol. They account for a very large part of the total cost of the energy bill and the percentage of expenditure on system charges in an electricity bill, for example, has risen considerably over the last fifteen years to 20/25% (Menichella 2022).

It is a fact that, in Italy, industries and SMEs pay a lot for electricity, while households pay more for light and gas. In this regard, it is worth mentioning the PUN – Prezzo Unico Nazionale (Single National Price) – the reference price of electricity on the Italian Power Exchange. It is the result of auctions that cover the energy demand forecast, hour by hour, by the various operators (Enel Energia, A2A, ACEA, Sorgenia, etc.). Starting with the Bersani Decree of 1999, in fact, a dismantling of the existing monopoly in the field of electricity began, with other operators also entering the market. Since 2007 – the year of the Bersani bis decree and the birth of the Electricity and Gas Exchange – the energy market has therefore been completely liberalised with the aim of fostering competition and, consequently, lower prices (Decreto Legislativo n. 79 1999).

Another extremely decisive factor in the surge in energy prices is the rapid growth in global demand for natural gas over the past decade. Together with the post-Pandemic economic recovery, demand for gas has increased dramatically. In fact, following an anomalous 2020, 2021 represented a return to a ten-year historical trend. However, although demand increased, the global gas supply remained essentially flat, putting upward pressure on prices. Coal prices have also risen globally and the increase in electricity, gas and fuel bills, therefore, is due to rising international demand for gas, oil and its derivatives. A situation made even more drastic by speculation on the part of financial investors, who are not interested in "physical" delivery but rather exploit the so-called "contango" effect, i.e., taking the example of oil, allowing some investors to buy a quantity today, store it, lock in that price and sell it months later at a huge profit.

Finally, the production costs of power plants, which are forced to continue operating even though they are inefficient, old and more polluting, together with inefficient power lines, as the laying of new infrastructure many times remains blocked, are among the other structural causes of rising energy bills. To these are added cyclical factors: Russia's reduction of gas exports due to the Russian-Ukrainian war; the fact that China and India have reverted before Europe and the US to pre-Pandemic industrial production, thus increasing consumption and demand for energy commodities and thus driving up prices; finally, the rising costs of CO2 auctions in the ETS market, which are also on the rise due to European energy transition legislation and the reform of the ETS market which, as we mentioned earlier, aims at increasing CO2 prices.

To solve the fateful issue of high utility bills, governments are proposing several solutions. One of these is to reduce and shift system charges to general taxation. Charges that, as we have seen, in the past have reached as much as 25% of the electricity bill and 5% in the case of gas, while heavy State excise duties affect the gas bill, ranging from 15 to 18% of the total cost (Menichella 2022).

Another important element is VAT, which affects the two bills differently: electricity is taxed at 5% VAT for domestic consumers. In the case of gas, on the other hand, VAT is doubled to 10%.

Therefore, moving these elements to general taxation could decouple consumption from these burdens and not overburden struggling households and businesses (Menichella 2022).

As part of this strategy, the Italian Council of Ministers approved a new bill decree on 30 June 2022, allocating an additional EUR 3 billion for the extension of certain measures to contain electricity and gas costs. In the text we find, *inter alia*: the zeroing of electricity and gas system charges for the second quarter of 2022 and the cut of VAT on gas to 5%. The funds earmarked amount to around EUR 8 billion, 5,5 billion of which are earmarked to combat high energy bills, while the remainder goes to support production chains in order to lower the costs of energy bills and prevent further crises in the future (Degreto Legge n. 80 2022).

4. The cost impacts of energy crises on the Italian industrial system

This chapter aims to analyse the effects that the disruption of the energy market, firstly due to the Pandemic, then to global geopolitical dynamics and the European policies on energy transition, as well as to the disruption of global value chains, are exerting on Italian industry.

4.1 Analysis of Italian industrial sectors in the aftermath of the Pandemic

This section will analyse the state of Italian industry in 2021, following the most acute phase of the Pandemic.

It will be noted how Italian manufacturing sectors were recovering strongly. However, the unexpected was just around the corner and upward estimates for all subsectors were revised as a result of global geopolitical tensions over energy and the outbreak of war in Ukraine.

According to a study carried out by the Italian consulting firm Prometeia for the Intesa Sanpaolo group, as the Pandemic waned, thanks to the vaccination campaign, the Italian manufacturing industry was able to intercept the opportunities offered by domestic and international economic recovery, confirming, in 2021, growth rates among the most lively in the European panorama. In fact, the industrial production index recorded a trend increase of 13,5% for the first months of 2021 as a whole (Intesa Sanpaolo 2022).

What helped was, first of all, the demand from the domestic market, which recorded a positive development in the first three quarters of 2021, thanks, above all, to the boost of investments of +18,1% trend, according to National Accounts data, which, supported by the construction sector, exceeded pre-Covid levels (+3,9%). After last spring's forced interruption due to the Pandemic, the construction cycle got off to a fast start (+24,5% investments in construction compared to 2020) supported by the numerous incentive measures put in place by the Italian government.

The investment component in machinery and intangible assets (+13,6% year-on-year in the first three quarters of 2021) also exceeded pre-crisis levels, driven by incentives towards the digital transition of the national economic fabric. Less brilliant, on the other hand, was the trend in investments in transport equipment and consumption (+3,8% trend in the first three quarters of 2021).

Italian companies, then, managed to achieve brilliant results on foreign markets: *exports* of manufactured goods were up 18,2% year-on-year from January to October 2021. A comparison with the main European manufacturers shows, therefore, how Italy is at *export* values well above the precrisis level (+5% compared to January-October 2019), together with Spain (+6%), compared to +1,4% for Germany and -5% for France (Intesa Sanpaolo 2022).

The largest contribution to growth came from the European single market, which accounted for half of the increase in foreign sales, although there were also very positive performances in the US and Asia. Driving *exports* were both the construction industry and the typical *Made in Italy* sectors. In particular, *export* levels above pre-Covid in double figures were reported for Household Appliances, Chemical Intermediates, Food and Beverages. The complete recovery of the losses suffered in 2020 accumulated in many sectors, with the exception of the Fashion System, where the good dynamism of extra-EU sales, especially in China, was not enough to replicate the pre-Covid results (a -6% drop in turnover compared to 2019 was recorded), except for the top *luxury players*, which in some cases exceeded pre-Covid turnover levels.

An important driver of sales growth also came from rising sales prices, which accelerated progressively during 2021 in all major European economies, reflecting historically unprecedented flare-ups in international *commodity* prices. These increases are the result, as we have seen, of a supply side that has failed to adapt to the fast rebound in demand and of bottlenecks that have emerged in global value chains due to the effects, in many cases, of logistical blockages induced by the continuing Pandemic containment measures.

The final part of 2021 witnessed a weakening of the pace of the Italian manufacturing sector, both on a cyclical basis, as the rebound effect of the recessionary peak of 2020 wore off, and on a tendential basis, in comparison with a second half of 2020 that was already a brilliant recovery. Moreover, with the spread at the end of 2021 of the Delta and Omicron virus variants, which forced some Countries to adopt local restrictions, there was a progressive increase in uncertainty and new slowdowns in international logistics, causing operational tensions for Italian companies too.

Among the factors hindering the recovery path of manufacturing activities, companies have already revealed critical issues in terms of procurement, delivery times and prices, in the face of a demand context, both internal and external, that continues to be judged favorable, thanks to the support of stimulus plans in all the major world economies, including Italy, which is grappling with the implementation of the NRRP. In fact, it represents a unique opportunity to close those structural and competitiveness *gaps* at the basis of the Italian economy's constant growth differential with its European partners.

However, Italian manufacturing companies are now grappling with structurally higher energy prices, due, as shown in the previous chapter, to a large share of electricity produced from natural gas power plants, the prices of which have risen dramatically.

The persistence of rising energy prices, largely caused by the Russian-Ukrainian war, is in fact exacerbating price tensions along all production chains, with negative effects on the competitiveness of Italian manufacturing in international markets, as well as on domestic market trends. An increase

in inflation beyond critical thresholds, as it has already occurred in recent months, is undermining the already fragile path of recovery in demand and penalising Italian growth.

In the following paragraphs, in the light of current economic indicators, we will analyse the costs that the Italian industrial system faced immediately after the global crisis of "biblical" proportions – quoting Professor Mario Draghi – caused by the Pandemic.

4.2 The development of gas markets after the Pandemic and the effects of rising *commodity* prices on the industrial sector (end of 2021)

The price of natural gas, which had remained low until the first months of 2021, gradually soared from May onwards: +423% over the course of 2021 until December, the price thus increased fivefold. Moreover, the jump in gas prices led to a strong *spillover* effect on oil, with an increase in October 2021 from USD 75 to USD 84 per barrel (Beccarello & Rapacciuolo 2022).

As we have repeatedly said, the jump in gas is to some extent due to geopolitical issues, namely the tensions between the EU and Russia: in Europe +723% from the pre-crisis level (December 2019), while in the US, less affected by the crisis, just +66% (Beccarello & Rapacciuolo 2022). This added to a real shortage in the physical market, with stocks in Europe at their lowest. The price increase is therefore partly structural and partly related to extra-economic causes.

Since gas is the most favoured fossil source in the Italian energy mix, it has been observed that Italy is the European Country most exposed to the rising price of this *commodity* and, since the level reached by renewables in our country -18,5% of energy consumption - is not enough, gas and oil's role remain crucial (Beccarello & Rapacciuolo 2022).

The impact of higher energy costs, however, falls mainly on industrial companies. Based on *input-output tables*, the Study Center of Confindustria identifies the sectors in which energy weighs most heavily: the processing of Non-Metallic Minerals (cement, ceramics, etc., with an energy cost of 8% of total production costs), Metallurgy (11%), Chemicals (14%), Paper and Wood processing (5%), and Rubber-Plastics (5%). For these sectors, therefore, as it is difficult to pass on all price increases downstream, the high energy costs result in a strong erosion of operating margins. In the long run, however, the drive to pursue ever greater energy efficiency in production increases.

To sum up, the Italian manufacturing sectors have been facing an increase in energy *commodity* costs since the last months of 2021, with particular reference to the price of natural gas and electricity. For example, in December 2021, the price of electricity reached the highest monthly average since the Italian stock exchange was set up, exceeding EUR 280 per MWh, an increase of +450% compared to its value in January 2021.

With regard to the natural gas market, the price rose from around 20 c€8/Smc in January 2021 to 120 c€/Smc in December 2021, with daily peaks reaching a record high of 180 c€/Smc (Beccarello & Rapacciuolo 2022).

As analysed above, a further *driver* in determining a substantial increase in energy *commodity* and, consequently, in the electricity vector, is the price of ETS allowances, which amounted to almost \notin 90/tCO2 in the last weeks of December. In fact, it is precisely the price of natural gas and CO2 allowances that determine the evolution of electricity prices in the Italian electricity market. In other words, although production from renewable sources is continuously increasing, the wholesale price of electricity, with the *System Marginal Price* mechanism, is mainly determined by gas-fired thermoelectric production.

Moreover, if one compares the prices of the main European power exchanges, it might appear that wholesale prices show a rather homogeneous and converging upward trend, i.e. that the price of energy in Italy increases like that of the two European Countries with the most developed manufacturing sector, France and Germany. However, this comparison on wholesale prices is misleading. Many European Countries, in fact, by more or less covert measures have adopted instruments to protect their industrial sectors. In France, for example, industrial consumers and wholesalers have been allocated by law about 100 TWh by the government in October 2021, which constitutes 25% of French electricity production. This results in an average supply price of 100 \notin /MWh for the French industrial enterprise in 2022, when the market price on the exchanges is 200 \notin /MWh (Beccarello & Rapacciuolo 2022).

Moreover, further reflection is needed with reference to the emissions market, a relevant instrument for the implementation of the new European objectives related to the *Green Deal* and the *Fit for 55* package. CO2 prices in ETS auctions have a twofold effect on production sectors: the first, indirect, by increasing the cost of energy supplies; the second, direct, related to the process emissions that must be purchased by installations. The current phase of the CO2 market shows the prevalence of speculative policies accelerated by the tightening of the current EU policies for greenhouse gas emissions' containment in the *Fit for 55* package. Since 2020, there has been a marked development of speculative positions in the CO2 market and an unprecedented growth of financial investors. This has also been strongly induced by the announcement effects of the European Commission, which has repeatedly called for a CO2 *target* value of 100 \notin /tonne.

This dramatic evolution of the energy scenario, therefore, entails for the Italian manufacturing industry a very strong increase in energy supply costs, which will rise from around \in 8 billion in 2019 to \in 21 billion in 2021 and \in 37 billion in 2022. This is a total cost increase of +368% in 2021 and more than 5 times the costs incurred in 2020 (Beccarello & Rapacciuolo 2022).

These cost increases are unsustainable in terms of competitiveness for Italian companies. It is therefore crucial for the Italian government to intervene, since there is a real risk of irreversibly losing market share in many sectors. In this regard, it would be appropriate to develop a strategic vision capable of integrating energy policy with industrial policy. As the EU Executive itself has suggested, Member States must take all possible measures compatible with internal market discipline and State Aid guidelines. In the Italian case, given the particular structure of energy production and supply in the electricity and gas market, a series of both conjunctural and structural measures are possible in the immediate future.

Amongst the conjunctural interventions, EU framework allows to intervene on the fiscal and parafiscal components of the electricity and natural gas bill by increasing the level of exemption for manufacturing sectors, with particular reference to energy-intensive sectors at risk of delocalisation (e.g. by increasing, as in the German case, the reduction of parafiscal charges paid by industrial users to cover subsidies for renewable sources). Still on the cyclical side, it is possible to strengthen the instruments of *demand-side* participation in the security services of the electricity and gas market (e.g. interruption service and/or *demand-side management*). With regard to rising CO2 prices, the Commission could also take anti-speculative measures for derivative instruments (e.g. in terms of margins or by acting with reference to the Market Stability Reserve in order to calm prices).

However, structural intervention measures are also possible. As far as natural gas is concerned, it would be appropriate – with zero-sum effect on the environment – to increase domestic production and rebalance the Country's supply structure geopolitically. Finally, regarding the electricity market, as mentioned above, a reform should be promoted rapidly in order to decouple the valorisation of the growing production of renewable energy from the cost of thermoelectric gas production.

To conclude, given that much of the inflation and rising costs for businesses originate from *commodity*, it is crucial, going forward, to understand whether upstream price increases will be temporary or permanent. All indications, however, are that this situation will continue over time, but we will see this in the next paragraphs.

4.3 The outbreak of war in Ukraine and the consequences on global and Italian economic indicators

On the 24th of February 2022, Russian tanks entered Ukrainian territory, effectively starting a war that is terribly shifting the world's geopolitical and economic balance. The Russian-Ukrainian war, in the aftermath of the economic crisis caused by the Pandemic, has only further burdened European global economies and industrial systems already severely weakened by these recent years of crisis.

Added to this is the EU's and, in particular Italy's, strict energy dependence on Russia, which the war has highlighted in all its weakness.

In this regard, the Confindustria's Study Center has drawn up an impact assessment of a possible total blockade of Russian gas *imports* to the Italian industrial system.

The possible interruption of natural gas *imports* from Russia could have a very strong effect on the Italian economy, already weakened by Covid-19. Such a shock would cause a major shortage of gas volumes for industry and services and an additional increase in energy costs. The total impact on GDP in Italy, in the 2022-2023 horizon, is estimated at almost -2,0% on average per year (Centro Studi Confindustria 2022).

In terms of gas volumes, the impact of a blockade should be assessed in the situation that would be created month by month, not in terms of aggregate annual consumption.

The scenario is built on a number of assumptions: monthly consumption at 2021 values; zero gas imports from Russia (29,1 mmc) and also from *Passo Gries* (2,2 mmc) from June 2022; various alternative sources of supply gradually available by next winter (for a total of 15,5 mmc), based on the various agreements and projects that Italy has already initiated. In this scenario, it is estimated that the supply shortage, over the twelve months between April 2022 and March 2023, would be the 18,4% of Italian consumption (Centro Studi Confindustria 2022). According to this estimate, gas shortage would not all occur in the peak months of consumption (between December 2022 and January 2023, however, 40% is concentrated), but is also spread over the months before and after.

The temperature limits recently imposed by Italian government for public buildings only $(-1^{\circ}$ in winter, $+1^{\circ}$ in summer, excluding private buildings) do not improve the scenario, as they can only reduce annual consumption to a limited extent.

Considering the order of possible rationing established by the Italian gas contingency plan (first industry, then services followed by residential and, lastly, health care) and the estimated total shortage, industry would be deprived of all gas supply it needs (i.e. the 9,5 mmc per year consumed so far), while services would suffer a reduction in gas supplies of 4,5 mmc out of 7,8 (Centro Studi Confindustria 2022).

Even assuming that, due to the gas shortage, only in the energy-intensive sectors would there be a reduction in activity (total or partial according to the "gas consumption/added value" *ratio*), it is estimated that there would be a loss of added value in industry equal to 9 billion euro over the 12-month period, to which must be added that in services equal to another 9 billion. The total impact of gas shortage on the Italian economy, therefore, is estimated at -1,0% of GDP between spring 2022 and winter 2023, an estimate close to that drawn up by the European Commission. In the remaining nine months of 2023, in which other alternative sources (6 mmc) could be available, the supply

shortage would be lower and would only affect industry, with an additional impact of about -0,4% on GDP (Centro Studi Confindustria 2022).

Add to this, the impact on the economy that would result from a potential further increase in energy *commodity* prices on the international markets, as a consequence of a blockade of gas supplies from Russia, has been investigated.

Let us assume that this happens for gas (over 200 euro/mwh from June 2022) and also for oil (almost 150/barrel). Simulating with the econometric model the effects of these assumptions, according to the Centro Studi di Confindustria, in 2022 the impact on GDP would be limited (-0,2%), because the price difference would only weigh in the second half of the year. In 2023, on the other hand, when prices would be double the *baseline* scenario for the entire year, the impact on GDP would be much more significant (-2,2%).

Furthermore, as regards the economic situation in June 2022, inflation in Italy continued to rise (+8,0%) to values not seen since 1985, after the oil shocks. European Countries are affected to differing degrees: +6,5% in France, +8,2% in Germany and +10,0% in Spain. The average for the Eurozone in September, +9,1%, is more than four times above the ECB threshold of +2% (Centro Studi Confindustria 2022).

The run-up in inflation is mainly driven by high energy and food *commodity* prices, which are even more tense due to the war in Ukraine. In Italy, the price rises translated into a 48,7% annual increase in consumer energy prices and an 8,7% increase in food prices, explaining a good 5,7 out of 8,0 points of inflation (Centro Studi Confindustria 2022). The so-called *core inflation*, net of these prices, remains more contained: +3,1% in Italy (+3,7% in the Eurozone). However, it has risen in recent months, a sign that price increases are slowly being passed on to other prices (+7,2% for transport services, still only +2,6% for industrial goods).

The continued weakening of the euro, which collapsed to USD 1.01 per euro on average in July 2022 from USD 1.22 in May 2021, is also fueling inflation in Europe. The significant devaluation trend (-17%) is, in fact, increasing the cost of imported *commodities* in Italy and other Eurozone Countries, almost all of which are priced in dollars (except natural gas, priced in Amsterdam). The price of oil, for example, in July 2022 rose by +44% per year in dollars, but by as much as +66% in euros (Centro Studi Confindustria 2022).

The trend of producer prices in Italy (intermediate goods +23,3% per year to May 2022, capital goods +8,1%, consumer goods +8,2%) remains, however, much more limited than that of *commodity* prices (+87% energy, in dollars, over the same period). The attempt of Italian companies to avoid a further strong erosion of margins, which would be unsustainable, will spill over into various consumer prices, keeping inflation high (Confindustria Study Centre 2022).

Until a few months ago, most forecasters expected the surge in inflation to be temporary and that, once the *commodity* tensions subsided, a rapid decline would be seen. However, now inflation scenario is worsening in the Eurozone.

According to the ECB's early June 2022 forecast, inflation would be at +6,8% this year and drop to +3,5% next year: too high, too long (even worse for the European Commission: +7,6% and +4,3%). *Core inflation* is expected at +3,3% in 2022 and again at +2,8% in 2023 (ECB 2022).

With the aim of calming the upward race of inflation, the ECB announced that it would raise interest rates by +0,50, a move which, according to the Central Bank, will help curb inflation expectations and could limit the transfer of price increases to industrial goods. Energy and food prices, however, depend on exogenous factors outside the ECB's control: their path, at this particular stage, is linked to the uncertain development of the Russian-Ukrainian conflict. Nevertheless, in September 2022, ECB Governing Council decided to raise the three key ECB interest rates by 75 basis points. Thus, the interest rates on the main refinancing operations, the marginal lending facility and the deposit facility will be raised to 1,25%, 1,50% and 0,75% respectively, with effect from 14 September 2022 (ECB 2022).

For households, moreover, higher final prices translate into higher spending, volume being equal, also considering that energy and food are difficult to compress. This may prompt them to postpone or reduce the purchase of certain goods and services, which are deemed non-essential. In the opposite direction, savings accumulated by households during the Pandemic period are some resources that some (though not all) households are able to draw on in the face of increased spending on goods and services. The net effect of these two opposing forces will be that the expected rebound in consumption in Italy during 2022 will be dampened compared to what it would have been without the jump in prices. Moreover, the shield represented by the extra savings will tend to be gradually exhausted if the price increases do not abate: once those resources run out, consumption (and therefore demand) could be severely affected, with a negative impact on industrial sectors as well.

In this context, gas in Europe soared to 171 euro/mwh in July 2022 (106 in June 2022), above the average values of March, as a result of the drop in Russian supply (Centro Studi Confindustria 2022). In September 2022, on the other hand, the \notin 340/megawatt-hour gas price dropped below \notin 200 in view of the possible approval of the new measures planned by the European Commission to tackle the energy emergency, following a new total blockage of the *Nord Stream 1* gas inflow, as we will see below.

As far as industry is concerned, however, the indicators continue to give mixed signals. The PMI, which informs investors about domestic market conditions, is falling (50,9 in June 2022, from 51,9), now close to stagnation; the Bank of Italy survey also points to worsening demand and greater

uncertainty during the second quarter (Q2); manufacturing business confidence shows a small recovery in June, after a long decline. Industrial production, which fell in May as expected, is on the rise in the average of Q2 (-0,7% in Q1), with a dynamic in the first half of 2022 that, although slowing down, is well above that of Germany and France (Centro Studi Confindustria 2022). Industrial companies are therefore showing resilience. The expansion trend in construction continues, which also supports the flow of investments; recently, however, there have been some signs of deceleration in this last sector too.

The *export* value, on the other hand, is increasing due to price growth. In volume, however, the dynamic was flat in March-April. Non-EU sales increased in May 2022 (+4,7%), with a strong contribution from the US market, where Italian goods are favoured by the weakening euro; sales to Russia and China, on the other hand, fell (Centro Studi Confindustria 2022).

The outlook is difficult: a major drop in June 2022 in foreign orders in the manufacturing PMI and weak world trade (-0,3% in February-April); *imports* from the US and the UK are expanding, from the Eurozone are stable, rather from China are falling. The scenario for trade is negative: global PMI on manufacturing orders in recession for the fourth month in June 2022 (Centro Studi Confindustria 2022). But there are signs of loosening supply bottlenecks, thanks to the resumption of activity in Chinese ports in May 2022 and the rise in manufacturing in China in June (only +0,4% GDP in Q2). Finally, despite the critical aspects of the conflict and inflationary pressures, Italy's GDP grew by +0,6% in Q1. However, economic *sentiment*, as measured by the ESI indicator (-5,9% in Q2), continued to fall, pointing to very weak growth in the Eurozone in the coming months. The deterioration in confidence is common to all major countries, especially France and Spain (-5,9% and -5,7%), followed by Germany (-4,5%). A deterioration was also seen in employment expectations at -2,3% in Q2 (Centro studi Confindustria 2022).

4.4 The impact of rising energy prices on production costs: a comparison between Italy,

France and Germany

Using the *input/output tables*, it is possible to estimate, without taking into account any corrective measures implemented by the public operator to mitigate increases in energy costs for businesses, the effect of increases in energy raw material prices on production costs resulting from both the purchase of the raw material (direct effect) and the purchase of energy produced with those energy raw materials and refined petroleum products (indirect effects).

Having obtained an estimate for the direct cost item and an average of the two estimates for the indirect cost items, it is possible to calculate the increase in total energy costs for each sector and the change in their incidence on the total sectoral production costs by weighting its increases by their

respective share in the total production costs of each sector, obtained from the *input-output tables*. With this procedure, we can take into account both the different nature of the production process of the individual sectors, which entails a greater or lesser energy intensity, and the dual channel of transmission of energy *commodity* prices on the economy: direct consumption of energy raw materials and consumption of refined oil and electricity-gas. In the absence of further information – which is not available to date – it is not possible to assess the cascading impact of energy price increases on other cost items not directly related to energy (from wages, to the prices of other non-energy *commodities*, to those of semi-finished products). It is also not possible to incorporate in the estimates the effects of corrective public interventions over the past year to calm energy cost increases for businesses. The estimates, therefore, are to be understood at unchanged pre-crisis policies.

In light of what has been said so far, the dynamics of energy *commodity* prices are affecting European Countries in particular, but the Centro Studi of Confindustria' estimates reveal that, compared to France and Germany, Italy is the Country where the energy crisis is likely to cause the most damage. With unchanged pre-crisis policies, the incidence of energy costs on total production costs for the Italian economy is estimated to reach 8,8% in 2022, while in France it stands at 3,9% and in German at 6,8%. This would widen Italy's cost competitiveness *gap* with its main European partners (Felici, Puccioni, Rapacciuolo & Romano 2022). And this would be the case for all the main sectors of the economy: from the primary sector to industry and services.

With the recent increase in energy *commodity* prices, already in 2021, the gap in Italy's energy cost incidence from Germany had exceeded 1 percentage point (p.p.) and 2,6 points from France. In 2022, with further price flare-ups exacerbated by Russian-Ukrainian conflict, the gap is estimated to reach +2,1 p. p. compared to Germany and +4,9 p. p. compared to France. Italy's higher energy cost burden, as a proportion of total costs incurred, is also generalised to all sectors of the economy, affecting the primary sector as well as the manufacturing and tertiary sectors (Felici, Puccioni, Rapacciuolo & Romano 2022).

Focusing now on manufacturing, Italy's competitive *gap* is mainly in the comparison with France, while the distance to Germany grows to a much smaller extent, still remaining non-marginal.

By 2022, it is estimated that the incidence of energy costs could reach 8,0% of production costs for Italian industry (from 4,0% in the pre-Pandemic period), compared to 7,2% for German industry (from 4,0%) and 4,8% for French industry (from 3,9%).

The lower estimated impact of rising energy raw material prices on firms' energy costs observed in France compared to Italy is generalised across all manufacturing sectors (Felici, Puccioni, Rapacciuolo & Romano 2022).

On the other hand, comparing the Italian data with the ones of Germany, the picture appears varied: among the energy-intensive sectors, in fact, the run-up in the prices of energy raw materials is estimated to have a greater impact for Italian manufacturing especially in the wood sector (with a change in the cost impact of +6,3 p. p. compared to the pre-Pandemic vs. +2,3 p.p. German), rubber-plastics (+5,6 p.p. vs. +3,2 p.p.), non-metallic minerals (+8,8 p.p. vs. +7,3 p.p.) and chemicals (+4,5 p.p. vs. +3,6 p.p.), while for metallurgy, despite the fact that the Italian sector is the hardest hit by the energy crisis, inflation would be even higher in Germany (+12,4 p.p. vs. +14,4 p.p.). German manufacturing is also estimated to be more affected than Italian manufacturing in the paper and printing macro sector (+5,0 p.p. vs. +5,7 p.p.).

Overall, despite the fact that raw material price increases have a significant impact on energy costs in all sectors and for all Countries, the Italian system emerges as the most affected (Felici, Puccioni, Rapacciuolo & Romano 2022).

In monetary terms, according to the estimates of the Confindustria Study Center, this impact would translate into an increase in Italy's energy bill of between EUR 5,7 and 6,8 billion on a monthly basis, depending on the assumptions underlying the estimates, i.e. an increased burden of between approximately EUR 68 and 81 billion on an annual basis. Looking at the manufacturing sector alone, the increase in energy costs is quantifiable at between EUR 2,3-2,6 billion per month, or between EUR 27,3-31,8 billion on an annual basis. For metallurgy alone, an increase of between EUR 8,5 and 9 billion per year is estimated, which is almost one third of the total (Felici, Puccioni, Rapacciuolo & Romano 2022).

For Germany, on the other hand, the increase in energy costs is estimated at between EUR 7,7 and 8,0 billion per month (91,9-95,7 per year) for the total economy and around EUR 3,7-3,8 billion per month (45,9-47,2 per year) for manufacturing alone, while for France the estimates are between 1,7 and 1,8 billion per month (20,2-21.8 per year) for the total economy and about 0,6 billion per month (7,5 billion per year) for manufacturing alone (Felici, Puccioni, Rapacciuolo & Romano 2022).

It is clear that, as the Country most affected, Italy must ensure that the competitive advantage with France is not reduced by too much, by outlining a serious industrial policy.

This heterogeneity between European Countries can be explained, as already mentioned, first of all by the different mix of energy sources used, both those demanded directly by companies to carry out their economic activity and those purchased indirectly through the supply of energy.

In particular, on the basis of elaborations of Eurostat data that allow for a detailed breakdown of the various energy sources' consumption by individual user sector in Italy and in other European Countries, natural gas is Italian predominant source of consumption both for the energy distribution sector (around 49% in 2019) – which then supplies it in the form of gas and electricity to other sectors

of the economy – and for manufacturing (76%). In contrast, the weight of natural gas is marginal as a source of consumption for the energy sector both in Germany (15% vs. 44% for coal) and France (4% vs. 83% for nuclear), while in both Countries, for manufacturing the weight is much lower than in Italy (Felici, Puccioni, Rapacciuolo & Romano 2022).

The surge in gas, and thus, in electricity prices, is therefore having a proportionally greater impact on the Italian manufacturing sector than on the French and German industry.

To conclude, as far as Italy is concerned, it must be considered that, over the last few years, domestic companies' recourse to long-term contracts for natural gas supply has decreased in favour of greater purchases on the spot market, thus increasing operators' exposure to energy raw material's variations in the spot prices.

4.5 Interview with an energy policy expert, two politicians and an entrepreneur

In this section, we report on a field interview with an energy policy expert, two politicians from two different parties and an industrialist from Northern Italy, who were asked the same two questions in order to understand their different points of view.

The two questions are:

- In your opinion, what would be some policy recipes that the Italian government should implement to alleviate the cost of energy bills borne by companies in the short term?
- In your opinion, what would be some policy recipes that the Italian government should implement to alleviate the cost of energy bills borne by companies in the long run?

1)The two questions were first put to Mr. Gianluca Pischedda, responsible for energy policies at the Confindustria Delegation to the EU. Dr Pischedda replied as follows:

- «In the short term, lowering the cost of energy bills would require a generalised price cap, not just on Russian gas, to give businesses a breather. In addition, activating the Market Stability Reserve to issue emission allowances in the ETS market would lower the cost of CO2, thus lowering the cost of energy bills on businesses as well».
- 2. «In the long run, however, a revision of the gas market structure in Europe would be desirable, moving towards a regulated market developing a common European purchasing platform. While in the electricity market, a decoupling of the gas price market from the electricity market will be necessary».

2) Subsequently, the two questions above were put to two MEPs from two different European camps.

The first, thanking her for her availability, the Honourable Luisa Regimenti of the European People's Party and member of the ENVI Commission of the European Parliament, who replied as follows

- 1. «In the short term, some interventions have already been made, for example with 8,8 billion for households and to cope with the staggering increase in household utilities, with the instalment plan for bills. Others will have to be adopted as soon as possible, such as the instalment plan for small and medium-sized enterprises, which are on the verge of collapse due to soaring energy prices. It is absolutely necessary to increase national gas production immediately, and it must be envisaged that the gas produced domestically is used exclusively for consumption and electricity generation in our Country. Finally, renewable energy sources must be unblocked, bureaucracy must be eliminated, and gas storages must be used at capped prices. These measures must be taken immediately. Finally, a structural energy policy must be put in place that serves the medium and long term».
- 2. «In the long run, the strategy to avoid being overwhelmed by similar energy crises is first and foremost to achieve self-sufficiency by doubling domestic gas production to compensate for the sharp reduction in imports from Russia. We need investments to build renewable energy plants: wind, solar, hydro and pelagic, geometric and bioenergy, also introducing clean fourth-generation mini-nuclear power. It is also necessary to make a deep impact on the unbureaucratisation of our Country, in order to simplify the installation of photovoltaic systems on private buildings and to envisage a national plan to equip public buildings with these systems as well. The waste cycle is also an important source of energy. Therefore, the circular economy must be promoted as a model to reuse and recycle materials and products, turning undifferentiated waste into energy, and differentiated waste into raw material. This can only be achieved with waste-to-energy plants, for the total recovery not only of undifferentiated waste, but also of agricultural and forestry waste for energy purposes. However, one cannot invest in the waste cycle without introducing separate waste collection in all municipalities in Italy, incentivising it through premiums on disposal rates».

For the second, I had the good fortune to interview the Honourable Carlo Calenda, whom I thank enormously for his availability, of Renew Europe, a full member of the ECON Commission and deputy of the ENVI Commission of the European Parliament, who replied as follows:

1. «In the short term, the target is to achieve independence from Russian gas, which is why I consider it necessary to: complete with extraordinary procedures the construction of two floating regasifiers that will allow the import of LNG to replace Russian gas; increase domestic gas production by reactivating and upgrading existing plants; strengthen the

strategy on renewable energy, also by completing the process of identifying areas suitable for the installation of electricity generation plants from renewable sources in order to speed up the process of localisation and authorisation; complete the simplification of authorisations for plants; schedule the new RES auctions; enhance hydroelectricity as a strategic asset for the Country; encourage the development of hydrogen; help companies to reduce electricity bill costs by incentivising the production of renewable energy for self-consumption (including storage systems) with a State guarantee; promote a price cap on all imported gas in the EU to reduce the cost of electricity as well. Alternatively, I think it is necessary to introduce more efficient and effective ways to pass on the real extra revenue of energy companies – including traders – to poor households and energy-intensive businesses. Finally, it is imperative to take action on the CO2 price charged to companies (including energy companies). In this regard, it is therefore necessary for the European Commission to use the allowances of the Market Stability Reserve to reduce the CO2 price until the end of the crisis».

2. «In the medium term, I believe it is necessary to decouple the price of energy produced from renewable sources from the price of energy from fossil fuels in order to reduce the average price and prevent the current crisis from recurring, including by making the energy market more efficient. For example, it is necessary to define a platform for the exchange of long-term contracts for energy produced from renewable sources. Finally, I propose to relaunch the role of the so-called "Prosumer" both at the level of Energy Communities (households and Public Administration) and at the level of industrial districts (SMEs and large enterprises) through priority access to areas suitable for "renewable installations" for citizens and enterprises. This will structurally reduce the cost of energy while promoting competitiveness and accelerating the decarbonisation process.

In the long run, however, generating all the electricity needed by 2050 with variable renewable technologies alone would cause electricity system costs to soar by 50%. This requires the right generation mix, including renewables and nuclear, using the best available technologies. To achieve this goal, we need to define right now the regulatory framework that governs the deployment over time of the necessary technologies at the best economic conditions».

3) Subsequently, the above two questions were put to the direct interested party, an entrepreneur, whose name I will not mention, owner of a steel hot stamping plant in the province of Como, specialising in the design, production, and marketing of accessories for steel ropes and chains,

eyebolts, welding points, lifting straps and anchoring systems, slingbars, blocks and electric, telephone and railway lines. Products made by hot stamping, casting and cold-bending processes. A business, therefore, that has been severely impacted by the crisis in the energy markets. To the two questions put to him, he replied as follows:

- «In the short term, companies should immediately receive incentives or tax bonuses on energy costs, whatever they may be, as they would be the only viable lever that would have an immediate impact on production costs, especially for energy-intensive companies such as steel mills. It is unthinkable, in the short term, to lose competitiveness to Countries with lower energy costs, such as France, which pose a threat to Italy's productivity and employment, triggering heavy recessionary drifts».
- 2. «In the long run, given that the cost of energy is the product of mistakes made in the past, what is needed today is the immediate development of alternative energy sources, one of which is nuclear power; the immediate construction of gasifiers and regasifiers; a European price cap for gas and electricity, to give small and medium-sized companies the opportunity to have viability and cost certainty and thus to know how to act in the markets».

In the short term, common points among the interviewees include structural interventions on the cost of bills in the immediate term, either by instalments or by providing tax relief for the most energy-intensive companies; the construction of suitable energy infrastructures, such as regasifiers; as well as the imposition of a generalised *price cap*, not only on Russian gas, which would give cost certainty to companies.

In the long run, most agree on the development of new technologies, such as fourth-generation nuclear power, and domestic gas production. In addition, authorisation procedures for renewable energy plants should be speeded up, and a reform of the electricity market to decouple the gas price market from the electricity one should be implemented.
5. Obstacles to the energy transition

5.1 The close relationship between gas markets and the European and global energy transition

The volatility of the gas markets, which has already been widely analysed, is also closely linked to the energy transition that many world governments, including the Chinese and the European ones, have the intention to pursue.

As far as the Chinese way to energy transition is concerned, in 2020, President Xi Jinping announced China's commitment to reach peak CO2 emissions by 2030, thereby reducing its *carbon intensity* and achieving climate neutrality by 2060, according to a model of *state led environmentalism*.

More precisely, according to IEA data, growth in gas consumption in China could reach 526 bcm in 2030, peaking at around 650 bcm in 2035, and then decline to around 550 bcm by 2050 (IEA 2021). A large part of China's demand in the coming years – around 70% – is thus related to the replacement of coal by gas in the industrial and residential sectors, and the remaining 30% in the transport sector, thus pursuing the government's goal of a drastic reduction in emissions by 2060.

From a gas demand of just 28 bcm in 2000, China has already become the third largest consumer in the world (behind only the US and Russia) in 2010. Moreover, although domestic production between 2013 and 2020 almost doubled (+92%), pipeline imports increased by about 71% and LNG imports about quadrupled (+275%). According to the latest data, China would become the first LNG importing Country in the first 10 months of 2021 (IEA 2021).

This outsized increase in demand for gas by China – the Country with the highest GDP in the world – in pursuing its own energy transition, substituting a predominant use of coal for gas, has clearly resulted in increased price volatility within gas markets.

The European market, on the other hand, already suffering from a reduction in its own domestic production, is destined to suffer more than in the past from the strength of demand from Asian Countries, including in LNG supplies. All this is already having an impact on the European production fabric, which is also grappling with its own internal energy transition and which presents many problems.

In this regard, European governments have pursued in recent years a somewhat contradictory energy policy: on the one hand, they have endorsed, at Germany's insistence, the construction of the *Nord Stream 2* pipeline, which would have definitively sanctioned Europe's energy dependence on the Kremlin, while on the other hand they pursue a decarbonisation which will lead to an impoverishment of Russia.

Another structural factor linked to the European energy transition that impacts the volatility of gas markets is the *gap* between European *targets* for reducing CO2 emissions and developing renewables and the concrete ability of Member States to achieve them. There are indications that the renewable capacity installed in Europe is not proving sufficient to limit the use of gas and electricity generation to a limited number of hours. Against this backdrop, therefore, continuing to invoke more effective decarbonisation policies as a solution to rising prices ignores the difficulties in achieving the *targets* (difficulties due primarily, as we have seen, to the slowness of authorisation processes).

The high costs that both individuals and companies will have to bear are, moreover, the simple consequence of an excessively slow European energy transition. Indeed, if one looks at the environmental policy put in place by the European Commission from the perspective of uncertainty level it generates in operators, it is necessary to admit that European process of modifying and introducing instruments to achieve the emission reduction *targets* is usually long and complex, having to reconcile positions and interests of various actors at several levels (Commission, Parliament, Council) interests, moreover, rarely converging given Member Countries' different production structures and energy systems.

Looking at what has been approved so far, one immediately becomes aware of the so-called "long lead time problem" of the implementation of the mechanisms and instruments supporting the *targets*. With respect to these and the *roadmap* outlined within the *Green Deal* presented in December 2019, an initial implementation phase has begun. However, they are still far from being approved and the precise definition may change during the legislative process.

In particular, in March 2020, the EU Executive had presented the legislative proposal on the European Climate Law, which, in turn, outlined a *roadmap* to achieve even greater emission reductions by 2030 through a series of measures. These proposals were only presented on 14 July 2021, 15 months after the publication of the *European Green Deal*. Thus, although the main policy instruments and their respective timeframes have been clarified, there is still a significant *time lag* between announcements, legislative acts (Regulations and Directives) and the actual implementations that will be adopted at national level.

Emblematic is the aforementioned case of the European taxonomy, a project initiated even before the announcement of the *Green Deal* and approved in 2020. Since 2019, the European taxonomy has undergone several additions, and only three years later, at the end of 2021, the European Commission approved a delegated act and a further complementary act in February 2022, sanctioning its final form.

The delegated act, already approved by the European Parliament in early July 2022, must then receive the green light from the Council.

Other instruments whose adoption has been and still is characterised by very long lead times include Phase 4 of the EU ETS, for which the proposal for revision was initially announced during 2014 and for which about two and a half years elapsed between the presentation of the proposal by the Commission and the actual adoption at the end of the discussion process with Parliament and Council. Similarly, the first revision of the Renewable Energy Directive (RED II) was initially announced in 2014, followed by the 2016 proposal for the Directive, which was approved after about two years at the end of 2018, with a deadline for national transposition by July 2021. In this regard, as mentioned above, the European Commission has submitted a further proposal for a revision of the Directive (RED III) in light of the increased European ambition towards achieving climate neutrality.

Thus, the European Union is an elephantine bureaucratic machine, in which 27 different Member States often have to agree on highly nationally sensitive matters. Hence, a timeframe's expansion for implementing European legislation happened, during which vetoes, diktats, ultimatums are imposed, or where fragile alliances have to be forged between Member States, each in pursuit of its own national interest. It is therefore easy to see how the European legislative process is constituted as slow and complicated, sometimes unable to keep up with the times.

Another aspect that indirectly contributes to uncertainty is the principle of *Do not Significant Harm* (DNSH), which is likely to undermine or slow down the transition and reduction path to 2030 and 2050. In fact, although the DNSH principle is intended to ensure that progress in a given environmental objective should not be achieved at the expense of other objectives, some more restrictive requirements could contribute to increased uncertainty for gas investments.

To sum up, the continuous revision of environmental *targets*, the not-always-defined modalities of their implementation, and authorisation delays generate uncertainty for operators with a strong impact on their investment choices. In particular, if operators believe that a government will implement a *policy* to reduce emissions but are not clear on either the *timing* or the instruments to achieve it, and there is also the possibility that these *targets* will be revised, their decisions will certainly be affected. Already an emissions reduction policy in itself lowers the expected return on investment in fossil fuels compared to renewable energies; if the content of such an environmental policy is also uncertain, the disincentive effect on investment may be reinforced (Fried, Novan & Peterman 2021).

5.2 The risks of a disorderly Energy Transition

In order to limit global average temperatures rise to 1,5°C, as stipulated by COP26 in Glasgow, according to the *Intergovernmental Panel on Climate Change* (IPCC) report, average annual emission reductions of around 7% would be required (IPCC 2018).

In the absence of more stringent climate policies, emissions are set to grow inexorably with the risk of necessitating even more drastic mitigation policies in the future or, even worse, of reaching a point of no return in climate emergency. If emissions continue to rise, temperatures could rise by 3° by 2100 compared to the pre-industrial era, causing irreversible damage to the Earth's ecosystem and causing a collapse in global GDP estimated at -25% (Group of Thirty 2020).

The transition to a more sustainable economy is, however, a complex process that requires radical structural, technological and, above all, behavioral changes. The transition to a sustainable production model brings with it many opportunities, but it also entails risks, especially in the absence of clarity about the objectives to be pursued, the timeframe for achieving them, and the economic policy instruments available to promote change in a way that ensures economic and financial stability at the same time.

In order to reduce the risk of transition and favour gradual structural change, it is crucial to outline a clear mitigation strategy that is both ambitious, forward-looking, predictable, credible and globally coordinated. In other words, energy transition must take place in an orderly manner. With these characteristics, the market is able to anticipate the effects of climate policies and to support transition process: companies gradually change their production model; research and development is redirected towards the realisation of *clean* technologies; investors are put in a position to assess the risks and changes associated with the transition and, thus, to change the composition of their financial portfolio in favour of investments in environmentally sustainable activities. In this context, consumers would also be put in a position to make their consumption choices in a manner consistent with medium- and long-term climate objectives. Think of choices regarding the heating system of houses, the energy class of household appliances or the type of car. Market prices and returns would simultaneously reflect the change taking place and the expectations of economic agents which, in turn, stabilised by predictable and credible climate policies. The credibility of climate policies would thus make it easier to achieve their objectives and reduce the probability of sudden losses in the value of financial assets. At the same time, the risk of inflationary pressures would be reduced and inflation would be stabilised. The gradualness and predictability of the transition process would, in fact, help reduce macroeconomic uncertainty by stabilising expectations and implicitly regulating price formation.

Conversely, in a scenario in which the implementation of climate policies is discontinued, delayed or sudden (e.g. as a reaction to an increased frequency of adverse weather events), market participants would be surprised and asset prices and returns would suddenly adjust, putting financial stability at risk.

Overcoming the credibility problems of climate policies and triggering a progressive and gradual *green* transition mechanism requires action on several fronts. Firstly, consensus must be built around

the fight against climate change, making civil society aware of the risks involved, while the *targets* to be achieved must be clear and communicated effectively. Secondly, climate policies must be supported by all political parties, involving majority and opposition in decision-making processes. This would ensure the continuity of the emission reduction strategy over time, increase consensus around the measures taken and thus the credibility of the *targets* set. Thirdly, intermediate *targets* must be set in order to make political forces accountable in the short and medium term. Civil society as well must be put in a position to assess and monitor the performance of political forces and institutions in the fight against climate change.

In conclusion, this fight concerns all economic and financial policy makers, and especially governments, which remain primarily responsible for taking measures to reduce emissions and drive the transition. Ambitious emission reduction policies that are gradual, clear, credible and internationally coordinated would be able to induce a *green* transition that can both contain climate change and limit economic and financial risks.

5.3 Raw material costs to finance the transition to renewable energy

A potential obstacle to the energy transition process could come from the high costs of raw materials needed to produce wind turbines, photovoltaic panels and batteries, which would make it difficult to meet climate *targets*. It is an often-forgotten issue since a surge in their prices could make the transition to *clean* sources very difficult and economically unsustainable.

As of 2021, for example, the price of wind turbines and photovoltaic panels is rising sharply. The reason is simple: the prices of the raw materials for their production – steel, copper, polycrystalline silicon – have skyrocketed.

In this respect, the effects on the photovoltaic and wind power sectors are impressive: more than 50% of the production costs of a photovoltaic module are determined by the price of materials, while in the case of a wind power plant the share can be as high as 70% (Mariutti 2021).

Thus, the question that arises is, in light of what has been said about raw material price increases: how sustainable in economic terms is the need for materials to build turbines, panels and batteries? In one of its recent reports, the IEA estimated that the production of critical minerals will have to at least quadruple in order to guarantee the material requirements necessary to finalise the ecological transition (IEA 2021). To give an example, a wind turbine consists of steel, plastic polymers and zinc; conversely, a photovoltaic plant is made of silicon, glass and aluminium; a battery consists of nickel, lithium, cobalt and rare earths (Mariutti 2021). However, as the demand for these raw materials increases, we will be forced to look for them in every remote places and deposits. All this, of course, will raise production costs to the point where, in the absence of corrective and incentivising policies

by governments, these costs will become economically unsustainable. In short, long before we come up against the physical limits of raw material exploitation (availability in nature), we will come up against the aforementioned economic limits, i.e. how much it costs to extract a tonne of material. Nevertheless, the node of critical materials needed for any renewable source is not the only obstacle that the ecological transition is running up against. Coal prices, in fact, are at ten-year highs, as we have largely covered. Therefore, since turbines, panels and batteries are made of steel, copper and a dozen other metals, this increase in the price of coal – the basis of the metallurgical industry – will cause a further increase in production costs. Moreover, as wind turbines, panels and batteries travel the world several times before reaching Europe in the form of raw materials, semi-finished products and components, clearly the rise in the price of crude oil – anchored to the price of coal – will also further increase production costs: ships, trains and trucks are still largely powered by fuel oil and diesel. Not to mention the cost of sea freight to transport containers, for example from China.

Simplifying, we are estimating the costs of an energy transition without keeping in mind that it is energy itself that underpins the economy. Once the cost of energy changes, the production costs of all goods change (and, in energy system powered by technological devices and not by raw materials, every time the production costs of wind turbines and photovoltaic panels increase, the cost of the energy they generate will implicitly increase as well).

5.4 Challenges and strategies for Italian industrial policy

Italian industry faces the challenge of environmental sustainability already having one of the highest environmental performances internationally. This conclusion is corroborated by further statistical indicators (referring to the entire economy). The composite index of resource use efficiency constructed by the European Commission, which measures the intensity of raw material consumption as well as the economic value generated by them, placed Italy second in the EU ranking of 2017 (Romano 2021). Furthermore, the material productivity index is 3,3 euros of GDP for every Kg of resource consumed. The EU average is 2,2 euros of GDP. Italy also ranks top in Europe in the circularity rate of resources, with a recycling share of the total resources used by the economy of 19,5% in 2019 (Romano 2021).

In the decade 2005-2015, CO2 emissions in Italy went from 581 Mtonnes to 433 Mtonnes (*See Appendinx*) and the concentration was particularly in the industrial sectors subject to the ETS mechanism compared to the residential, tertiary and transport sectors (Romano 2021).

Italy has also outperformed other European manufacturing Countries in efficiency, with an energy productivity (GDP over consumption) of \notin 10,3 per tonne of oil equivalent (Toe) consumed, considerably higher than the EU average (\notin 8.4/Toe). Renewable energy sources have also grown

exponentially in recent years, reaching over 18% of all final energy consumption (*See Appendix*), as it was afro-mentioned (Romano 2021).

In terms of CO2 emissions intensity – the so-called *carbon footprint* – according to the Confindustria Research Centre data of 2020, Italy ranks among the world's manufacturing systems with lower environmental impact, in particular thanks to the improved efficiency of industrial processes, rather than a specialisation of production in less polluting sectors (*See Appendix*).

Moreover, according to data collected by ISTAT in the last Census, more than two-thirds of Italian manufacturing companies with at least three employees in 2018 had voluntarily undertaken – in addition to legal obligations – actions to reduce the environmental impact of their industrial activities. Among these, circularity in the use of resources is particularly frequent (65,4%), followed by the adoption of strategies aimed at improving energy efficiency and oriented towards a greater use of energy sources with a low environmental impact (Romano 2021).

Even on the specific front of the circular economy, the efforts required of Italian companies are significant, but also significant is the contribution that industry has already made and could continue to make on the sustainability front.

That of the ecological transition is an increasingly decisive entrepreneurial and organisational challenge, which can also offer a series of opportunities, as we will see below, that the Italian production system is demonstrating it can seize. An example of this is the performance in terms of the circular economy of Italian industry, which, in addition to what was mentioned earlier, sends over 79% of the special waste produced for recycling (ISPRA data), almost double the EU average (39,2%), and recycles 73% of packaging waste (CONAI data), surpassing the European target of 65% by 2025 well in advance (Romano 2021).

Therefore, on the side of adopting a behaviour compatible with environmental sustainability, Italian industry can count on a *first mover* competitive advantage over many of its international partners, having long since come to terms with a "responsible" approach to production and resource consumption. Moreover, the transition to a production model with a lower environmental impact is already being used by many Italian manufacturing companies.

However, to date Italian industrial system has also shown an objective difficulty in intercepting the environmental challenge on the side of endogenous development of *green* technologies. According to information gathered by Confindustria, the industrial supply chain connected to electrical and thermal renewables is still modest in terms of economic value activated in the Country, despite the strong public incentives to demand for them in Italy for more than a decade.

Even the well-known Italian difficulty in translating innovative efforts into patenting capacity does not appear mitigated when looking specifically at *green* technologies. In fact, according to OECD source data (Romano 2021), if on the one hand the European Union as a whole is at the top of the world ranking in terms of number of inventions related to environmental protection (25,3% of the total in 2016), on the other hand the distribution of European patents is very unbalanced in favour of Germany (43,1% of European share), while Italy is in a position of relative marginality (4,6%).

In order for Italy to be at the forefront in defining new technological trajectories linked to environmental sustainability, it is essential to bridge the enormous gap that still divides the public research and the industrial innovation ecosystems. The contribution of the public research sector (universities and research centres) is in fact considered an almost irrelevant partner for the commitment of scientific exploration and experimentation for industrial purposes. This is an anomaly that is not mirrored in other European Countries. In concrete terms, it is necessary to adopt an approach of knowledge cogeneration between public and private research, which is guided by application contexts and thus with foreseeable technical-productive spin-offs. The definition of these contexts requires a clear medium-to long-term strategic vision of the Country that is consistent with the development trajectories that are being defined at the European level, around which to build a public investment plan that is able to act as a *driver* for private investment. This also includes strengthening the use of *public procurement* as a strategic industrial policy tool to stimulate companies' technological innovation processes, including those in the field of eco-innovation. However, it is also necessary to ensure speed and effectiveness in its implementation through integrated *governance* that provides for institutional coordination between public and private actors involved in the projects able to define, for each context of application, annual work programmes, indicating actions, timeframes and expected and monitorable results.

Another priority of national industrial policy, complementary to the one just outlined, must be to increase the endowment of qualified human capital within manufacturing companies, by directing education and continuous training courses to the creation of technical and managerial skills needed, incorporating new *green* and digital technologies within business processes. Italian economy, in fact, is characterised by a number of employees with tertiary qualifications that is among the lowest in Europe and, at the same time, by the highest level of *mismatch* between the level of skills acquired through study and the level of skills required for employment. Manufacturing is unfortunately no exception and this represents a brake on its ability to transform the industrial renewal required by the ecological transition into widespread development opportunities in the Country.

To conclude, among manufacturing systems, the Italian one has the opportunity to play a leading role in the ecological transition both because, as the seventh industrial power on the Planet, its investment choices can have a direct positive effect on the environment and because the excellent environmental performance already achieved today makes it a virtuous model that could be followed by other Countries. This can only happen as part of a European strategy that is able to transform the ambition to reaffirm the EU's role as a global leader in environmental protection (starting with the fight against climate change) into an opportunity for *industrial renaissance*, and thus lay the foundations for development that is also economically sustainable.

It is a challenge that is far from easy to face, requiring first of all an international agreement with the other major global economic powers to jointly define the rules of the game and, secondly, a different approach in the way of conceiving cooperation in the economic sphere between EU Member States, oriented towards risk-sharing (which, in a process of transition towards a new development paradigm, is very high) or public investments (which are a fundamental component, together with private ones, to support the transition). The outbreak of the Pandemic has allowed an unexpected acceleration in this direction, making clear, even in Brussels and in the more reluctant Countries, the need for greater sharing of resources and political guidelines for the common management of crises, from health to environment.

It will therefore be crucial for Italy in this delicate historical moment to have "broad shoulders" and be led by strong governments, backed by solid majorities that can go to Europe to forge alliances with the most industrialised Countries, particularly France and Germany. In this regard, Italian government should develop a clear and solid industrial policy strategy in the short, medium and long term, in line with the European one, protecting at the same time the most important industrial interests.

Careful *advocacy* action in Brussels will also be required by all those associations representing European industry, first and foremost the Italian one. The task of Confindustria's Delegation to the EU is precisely the latter, to bring the demands of Europe's second most important industrial sector to Europe, making its voice heard even within the European industrial association, BusinessEurope, and forging alliances with the French one, Medef, but especially with the German one, BDI, during the multilateral meetings.

All this must be accompanied by the inauguration of a season of cautious *competitive reformism* that Italy has been waiting for thirty years, during which a government backed by a large and solid parliamentary majority is able to approve the reforms necessary to make the Country more competitive.

6. The Italian government's strategy for energy transition and safeguarding the industrial system: The National Recovery and Resilience Plan

After analysing the European *Green Deal* from a business perspective, this chapter will look at the Italian government's plan to follow up on the *Fit for 55* package and the decarbonisation goals of the entire economy, namely the National Recovery and Resilience Plan (NRRP).

6.1 The Reforms

The National Recovery and Resilience Plan (NRRP) is a reform plan, with the aim of digitally, sustainably and administratively modernising Italy, making the Country more competitive.

A conspicuous part of the NRRP is dedicated to the ecological transition, i.e. all those strategies put in place by the Italian government to finalise and guarantee the *green* revolution that Italy has committed itself to in a timely manner and, at the same time, protect the resilience of the industrial system during the transition from a fossil fuel-based economy to one that is as decarbonised as possible.

With this aim, however, a series of reforms will be needed to stimulate entrepreneurial activity in Italy and, above all, investments, also from abroad.

Moreover, since businesses need legal certainty and, in a Country like Italy, it is necessary to wait at least eight years before obtaining a final judgment, investments are discouraged.

The numerous investments envisaged in the Recovery and Resilience Plan must be accompanied by reforms aimed at improving the regulatory and organisational framework conditions and steadily increasing the Country's competitiveness. Reforms must therefore be considered an integral part of the Plan itself, a *catalyst* for its implementation.

In this respect, three types of reforms are envisaged: horizontal, enabling and sectoral, as well as accompanying reforms.

Horizontal reforms consist of structural innovations in the legal system, of cross-cutting interest to all the Plan's Missions, suitable for improving equity, efficiency and competitiveness. Specifically, they are the reform of the Public Administration (PA) and the reform of the judicial system.

The enabling measures, on the other hand, consist of those interventions functional to guarantee the implementation of the Plan and, in general, to remove administrative, regulative and procedural obstacles that condition economic activities and the quality of services in the Country. These include measures to simplify and streamline legislation and to promote competition.

Within the two main Missions of the NRRP, namely the digital and the ecological one, is possible to find sectoral reforms, i.e. those innovative measures designed to introduce more efficient regulatory and procedural regimes in the respective sectoral areas.

The first of the two horizontal reforms concerns the Public Administration: the NRRP intends to promote an ambitious reform agenda, in order to reinforced PA through the digitalisation of processes and services, as well as the strengthening of management capacity and the provision of the necessary technical assistance to central and local administrations, specifically in the southern part of the Peninsula, which are essential to promote the rapid and efficient use of public resources. Moreover, the PA, in order to meet the challenges of the ecological transition, must be able to intercept and develop innovative projects, accompanying them through to their final implementation.

The second of the two horizontal revolutions concerns justice, which, as already briefly said, is crucial for attracting investment and stimulating economic growth in the medium to long term.

As already mentioned, the slowness of the Italian justice system undermines the competitiveness of businesses and the propensity to invest in the Country. The aim of the reform is to increase the transparency and predictability of the duration of civil and criminal proceedings. The slowness of trials must be contained by procedural and legal reform measures.

Furthermore, the enabling reforms include simplification and competition. For the former, access to laws and their lack of clarity hinder economic initiatives. The simplification of legislation is therefore necessary for the growth of the Country.

To conclude very briefly, another set of reforms aimed at mitigating the economic and social consequences of the crisis and strengthening the Country's economic and social cohesion are the so-called "accompanying reforms", including tax reform. The enormous fragmentation of italian tax legislation, resulting in an articulated and complex tax system, has been a brake on investments, including those from abroad. In this regard, it is desirable to compile and rationalise tax legislation into a single tax code. This would lead to measures to simplify the system and implement legal certainty, stimulating the investments necessary for the growth of the Country and the realisation of the ecological transition.

All this must be accompanied by a serious and tough fight against tax evasion, which in Italy has reached incredibly high levels in recent years.

6.2 Green Revolution and Ecological Transition

Mission 2 of the NRRP is entitled: Green Revolution and Ecological Transition, It consists of four components: sustainable agriculture and circular economy; renewable energy; hydrogen; sustainable grid and mobility; energy efficiency and building rehabilitation; land and water protection.

With regard to the development of renewable energies, Italian government is placing great emphasis on production chains. The goal is to develop international industrial and knowledge *leadership* in the main transition chains, promoting the development in Italy of competitive *supply chains* in the fastest growing sectors, reducing dependence on imported technologies and strengthening research and development in the most innovative areas, i.e. photovoltaics, electrolysers, batteries for the transport and electricity sectors, and means of transport.

6.3 Development of Renewable Energies

In order to reach the target of 45% increase in production from renewables by 2030, Italy can certainly leverage the abundance of renewable resources at its disposal and predominantly mature technologies, such as investments in agro-photovoltaic development.

Indeed, the agricultural sector is responsible for 10% of Europe's greenhouse gas emissions. In this regard, Italian government's investment strategy is to install a production capacity from agro-voltaic plants of 1,04 GW, which would produce about 1.300 GWh per year, with an estimated reduction in greenhouse gas emissions of about 0,8 million tonnes of CO2 (Piano Nazionale di Ripresa e Resilienza 2021). This is to make the agricultural sector more competitive by reducing supply costs and improving climate-environmental performance at the same time.

Another strategy of the Italian government for renewables sector focuses on supporting energy communities and collective self-generation facilities. According to the government, this investment aims to secure the resources needed to install about 2.000 MW of new electricity generation capacity. The realisation of these interventions would produce about 2.500 GWh per year, contributing to an estimated emission reduction of 1,5 million tonnes of CO2 per year (Piano Nazionale di Ripresa e Resilienza 2021).

Finally, Italian government, on the renewables front, intends to promote innovative plants (including *offshore* plants). The aim is to support the construction of *offshore* renewable energy generation systems, which combine technologies with high development potential with more experimental technologies (such as the exploitation of wave motion). The intervention, therefore, aims to build plants with a total installed capacity of 200 MW from RES (Renewable Energy Sources). The construction of these would produce about 490 GWh per year, which would contribute to an estimated emission reduction of 286.000 tonnes of CO2 (Piano Nazionale di Ripresa e Resilienza 2021).

Among the various clean energies, one cannot fail to mention biomethane – obtained by maximising the energy recovery of organic residues – the development of which is strategic for the enhancement of a circular economy based on reuse, as it is also a key element in achieving European decarbonisation *targets*. If channelled into the gas grid, biomethane could contribute to the

achievement of the European 2030 *targets* with overall greenhouse gas savings compared to fossil methane lifecycle of 80 to 85% (Piano Nazionale di Ripresa e Resilienza 2021). Finally, the reform aims to promote the development of biomethane in the transport sector and its production and use in other sectors, such as agriculture.

In line with EU directives on permitting green sources, Italian government aims to simplify authorisation procedures for *onshore* and *offshore* renewable plants and to establish a new legal framework to support production.

The reform has several objectives, including: a homogenisation of authorisation procedures throughout the Country; a simplification of procedures for the construction of *offshore* renewable energy generation plants and environmental impact procedures; the identification and development of areas suitable for establishing a renewable energy plant. In concrete terms, the reform envisages the creation of a simplified and accessible regulatory framework for RES plants and the issuing of a discipline, shared between the regions and State administrations, aimed at defining the criteria for identifying suitable areas.

6.4 Upgrading and Digitalisation of network infrastructures

The Italian government has reserved a chapter of the NRRP to the strengthening of the so-called "smart grids", i.e. a set of electricity information and distribution networks capable of integrating the actions of all connected users (whether producers or consumers), in order to efficiently deliver sustainable, economic and secure electricity supplies. The purpose of smart grids is to optimise the distribution of electricity by decentralising power plants.

Electricity distribution infrastructures are therefore an enabling factor for the energy transition, as they will have to be able to handle a generation system that is radically different from the past. Indeed, achieving the ambitious decarbonisation *targets* requires a fully resilient, digital and flexible electricity distribution network. This would ensure an optimised management of renewable energy production and enable the transition of energy consumption to the electricity carrier.

The intervention, which consists of two project lines, will be aimed at increasing the amount of energy produced from RES fed into the distribution network, thereby promoting greater electrification of consumption.

The first project line aims to increase the grid capacity to host and integrate additional distributed generation from renewable sources by 4.000 MW, including through the implementation of *smart grid* interventions on 115 primary substations and their underlying grid (Piano Nazionale di Ripresa e Resilienza 2021).

The second, on the other hand, concerns the increase in capacity and power available to utilities to encourage the electrification of energy consumption (electric mobility, heat pump heating), with an impact on an estimated 1.850.000 users who will thus have greater capacity to connect distributed generation in highly concentrated areas such as large metropolitan cities (Piano Nazionale di Ripresa e Resilienza 2021).

Finally, through the interventions that will be made on the climate resilience of the grids, the government aims to increase the resilience of the electricity system, with a reduction of the probability of the duration and of the magnitude of power outages in the event of stress resulting from extreme weather phenomena. The investment, specifically, is aimed at improving the resilience of about 4.000 Km of grid (Piano Nazionale di Ripresa e Resilienza 2021).

6.5 The Italian government's strategy on hydrogen

Another energy vector with enormous potential is hydrogen. As previously mentioned, it can help decarbonise *hard-to-abate* energy-intensive sectors that lack scalable electrification options, such as the chemical and oil refining industries. Current hydrogen production in Italy is about 0,5 Mton per year, representing in fact one of the most promising sectors to start using *green* hydrogen and develop the market (Piano Nazionale di Ripresa e Resilienza 2021).

As seen, other *hard-to-abate* sectors include steel, cement, glass and paper. Since steel is the sector where, however, hydrogen could play a relevant role in a decarbonisation perspective and since Italy is one of the largest steel producers second only to Germany in Europe, Italian government aims at the progressive decarbonisation of the steel production process. In this regard, Italian government has outlined a proper Italian hydrogen strategy.

First of all, within the NRRP, reference is made to its production and the areas used to perform this task: the project aims to promote local production and use in industry and local transport, with the creation of hydrogen valleys, i.e. industrial areas with a hydrogen-based economy.

Italian government's plan is also to use hydrogen for road transport. Long-haul truck transport is in fact one of the most polluting segments of the sector, responsible for about 5-10% of CO2 emissions (Piano Nazionale di Ripresa e Resilienza 2021). The intervention aims to promote the establishment of hydrogen refuelling stations. The stations will be suitable for trucks and cars. Through these investments it will be possible to develop about 40 refuelling stations, giving priority to strategic areas for heavy road transport such as the ones close to inland terminals and routes most densely crossed by long-haul trucks, such as the *green* and *digital* Brenner corridor (Piano Nazionale di Ripresa e Resilienza 2021).

Another area of interest for hydrogen is the railway sector, particularly passenger transport. In Italy, around one tenth of the railway network is served by diesel trains, which very often have a very advanced average age and are due for replacement in the next few years. This is therefore the right time to switch to hydrogen, particularly where electrification of trains is not technically feasible nor competitive, as in regions characterised by high passenger traffic and heavy use of diesel trains, such as Lombardia, Puglia, Sicilia, Abruzzo, Calabria, Umbria and Basilicata (Piano Nazionale di Ripresa e Resilienza 2021).

Regarding research and development of a hydrogen network, it is necessary to enact, not only at the European but also at the national level, a reform that promotes: an administrative simplification for the construction of small green hydrogen production plants through the establishment of a one-stop shop for the granting of authorisations; a system of guarantees of origin for renewable hydrogen in order to give price signals to consumers issued by the Energy Regulator (ARERA) and the Gestore dei Servizi Energetici (GSE); measures to allow the construction of hydrogen refuelling stations at motorway service areas, ports, logistic warehouses, etc.

Along with these measures, the Italian plan includes other actions to stimulate the production and consumption of hydrogen, which should facilitate its integration into the energy system, as, for example: tax incentives to support the production of green hydrogen, given its neutral environmental impact; measures to spread its consumption in the transport sector through the transposition of the European RED II Directive. All of this is topped off with a good deal of investment in research for the production, development, transport and storage of green hydrogen, as well as to improve the resilience of current infrastructure in the event of its widespread use.

Finally, to develop the hydrogen market, it is necessary to install around 5 GW of electrolysis capacity in Italy by 2030 (Piano Nazionale di Ripresa e Resilienza 2021), thus consolidating proprietary competences in strong synergy with external suppliers and creating a European chain in the production and use of hydrogen.

6.6 Developing more sustainable local transport

In Italy, in 2019, at least 2 out of 3 people used a car every day. The use of private cars out of the total number of journeys is more than 60%, while the use of public transport systems is only about 10%, resulting in pollution problems.

That being said, Italian plan envisages the construction of about 570 Km of urban and metropolitan cycle paths and of about 1.250 km of tourist cycle paths (Piano Nazionale di Ripresa e Resilienza 2021).

In addition, with the goal of shifting at least 10% of private car traffic to the public transport system, Italian government envisages the construction of 240 Km of equipped network for public rapid transport infrastructure divided into metro (11 km), tram (120 km), trolleybuses (120 km) and cable cars (15 km). The focus of the intervention will be mainly on the metropolitan areas of major Italian cities (Piano Nazionale di Ripresa e Resilienza 2021).

Furthermore, in order to meet European decarbonisation *targets*, a fleet of as many as 6 million electric vehicles is expected by 2030, for which an estimated 31.500 public fast-charging points are needed. Consequently, the Italian plan aims to develop 7.500 fast charging points on motorways and 13.755 in urban centres, as well as 100 experimental charging stations with energy storage technologies (Piano Nazionale di Ripresa e Resilienza 2021).

6.7 The Italian industrial plan to develop international leadership in the main *green* transition sectors

The sectors in which the largest public and private investments are expected are the solar and *onshore* wind power ones. For example, the total photovoltaic installed capacity is expected to increase from 21 to 52 GW by 2030 in Italy alone (Piano Nazionale Integrato per l'Energia e il Clima 2019), in a market dominated, however, mainly by Asian and Chinese manufacturers that cover 70% of the global panel production, compared to the only 5% covered by Europe.

This expected growth represents, however, an opportunity for the EU to develop its own industry in the sector that can compete globally. This is particularly relevant for Italy which, thanks to its leading role in the Mediterranean, in a more favourable context than the European average, could become the nerve centre of a new market for renewables and hydrogen.

It will also be crucial to develop a battery supply chain in Europe, breaking away as much as possible from the strong dependence on Asian powers. Therefore, Italian plan envisages the strengthening in Italy of the photovoltaic, wind and battery supply chains for electricity and transport sectors, together with the development of new jobs, investment in high-tech industrial infrastructure and automation, R&D, patents and innovation, as well as the training of human capital with new skills and competences.

In conclusion, the key word at this historic moment is "innovation", i.e. an indispensable element to enable and accelerate the ecological transition. Italy, in this sense, offers particularly fertile ground for the development of green start-ups. However, at the same time, it suffers from an obvious market failure in terms of transferring scientific research into patents and innovative businesses, thus placing limits on the development of innovative solutions at scale to facilitate the *green* transition.

The Italian government's strategy intends therefore to encourage and stimulate the growth of an innovation ecosystem, with a particular focus on *green* transition sectors, through direct and indirect Venture Capital (VC) investments. To this end, the Italian NRRP envisages the introduction of a

dedicated fund – the "Green Transition Fund" (GFT) – with an investment strategy focused on specific sectors and covering the various stages of development, with investments in the most relevant Venture Capital funds with a *green* focus, in start-ups and supporting the most relevant VC managers and operators in the system.

6.8 The National Plan for Energy Efficiency and Renovation of Buildings

Considering the sectoral shares of final energy use, in 2018, transport (35,6 Mtoe) and residential (31,2 Mtoe) were confirmed as the most energy-intensive sectors, 31,1% and 28% of total consumption (*See Appendix*), respectively, followed by industry with 24,3 Mtoe, or 21,2% of final energy consumption (MISE 2020).

Focusing on residential buildings, the related Italian's stock, accounting for more than one third of the Country's energy consumption, were built before the adoption of energy saving criteria. For this reason, the NRRP envisages the implementation of a programme to improve the efficiency and safety of the public building stock, with interventions concerning in particular schools and judicial citadels. Italian government also intends to introduce a temporary incentive for the energetic requalification of private housing stock and social housing, through tax deductions for the costs incurred for interventions, as was the case with the 110% Superbonus. The plan also envisages the development of efficient district heating systems.

As in all the other areas we have discussed, achieving greater energy efficiency in the national building stock involves simplifying and accelerating procedures. In addition, economic measures, such as the incentives granted by the Superbonus or the financing of energy efficiency programmes for public buildings, could also stimulate greater efficiency in buildings.

Moreover, to cope with the long payback periods for building renovations, to stimulate the construction sector, and to meet the challenging European energy saving and emission reduction *targets* for 2030, Italian government intends to extend the 110% *Superbonus* measure from 2021 to 2023. The support will be provided in the form of a tax deduction equal to 110% of the expenses incurred, usable over a five-year period and available to those who intend to carry out energy renovations of residential buildings (Piano Nazionale di Ripresa e Resilienza 2021). The investment will also stimulate local economies through the creation of jobs in the construction and housing supply chain.

Numerous interventions are included in the measure, such as insulation solutions, efficient window frames, replacement of heating and air conditioning systems and installation of renewable energy generation systems. However, the eligibility of interventions will be conditional on an improvement

of at least two energy classes of the building, equivalent to an average energy saving of about 240 kWh/sq m and an expected saving of 30-40% (Piano Nazionale di Ripresa e Resilienza 2021).

The investments will allow the renovation of more than 100.000 buildings when fully operational, for a total upgraded surface area of more than 36 million sq m. The energy savings expected from the *Superbonus* is approximately 191 ktoe/year with a reduction in emissions of about 667 KtonCO2/year (Piano Nazionale di Ripresa e Resilienza 2021).

In conclusion, as part of the energy mix that will have to ensure the achievement of the environmental goals of the next decade in the heating and cooling sector, district heating will play a key role.

To this end, part of the NRRP resources will be used to finance projects relating to the construction of new networks or the extension of existing district heating networks. In this respect, priority is given to the development of efficient district heating, i.e. district heating based on the distribution of heat generated from renewable sources, waste heat or co-generated in high-efficiency plants.

The target is to develop 330 km of efficient district heating networks and build 360 MW of waste heat recovery plants or connections. Achieving this *target* would result in energy-environmental benefits of 20 Ktoe per year of fossil primary energy saved and 0,004 MtCO2 of greenhouse gas emissions avoided in the ETS sectors each year (Piano Nazionale di Ripresa e Resilienza 2021).

6.9 Infrastructure for sustainable mobility: investments on the Italian railway network

From an environmental point of view, the transfer of passengers and freight traffic from road to rail, with the consequent reduction of road congestion, will have important impacts on the reduction of greenhouse gas emissions. Specifically, it is estimated that an increase in the share of passengers using rail from 6% to 10% will result in annual CO2 savings of 2,3 million tonnes (Piano Nazionale di Ripresa e Resilienza 2021).

Firstly, measures are planned to speed up the main passenger lines and increase the capacity of rail transport for goods, along the Country's priority North-South and East-West axes, to promote the connectivity of the territory and the transfer of traffic from road to rail over long distances. In particular, in the North of the Country, the Milano-Venezia, Verona-Brennero and Liguria-Alpi railway lines will be upgraded, improving connections with the ports of Genova and Trieste; in the centre of the Country, two east-west axes (Roma-Pescara and Orte-Falconara) will be strengthened, significantly reducing journey times and increasing the capacity of goods trains; the Adriatic line from North to South will also be upgraded and speeded up (Piano Nazionale di Ripresa e Resilienza 2021).

High-speed rail links will also be extended to the South, with the completion of the Napoli-Bari route, the further advancement of the Palermo-Catania-Messina route and the construction of the first

functional lots of the Salerno-Reggio Calabria and Taranto-Potenza-Battipaglia routes (Piano Nazionale di Ripresa e Resilienza 2021).

In conclusion, special attention will be paid to regional railways, for which *upgrading*, electrification and investments to increase their resilience will be carried out: these interventions, particularly in the Mezzogiorno, are aimed at homogenising and raising the performance standards of existing infrastructures for both passenger and freight traffic, integrating them with the national high-speed network.

All the measures analysed so far, in this last chapter, are part of the Italian government's strategy to complete the ecological transition and thus have the possibility of utilising funds from the European Recovery and Resilience Facility. Whether these measures will be sufficient for a substantial reduction of emissions in 2030 and 2050, we will only find out in the near future.

Moreover, the question is whether these measures will lead, in the medium term, to a weakening of Italian manufacturing in the world and in Europe. Issues to which the final considerations will be devoted.

Conclusions

It is plain for all to see that climate change is now a very serious threat that world governments cannot and must not underestimate. The extraordinary weather events of recent will now accompany us as a constant.

Fires, periods of drought, floods, melting glaciers, changing seasons, rising sea levels will become part of our everyday lives in the coming years and indeed will be especially perceived in developing Countries, where poverty and political instability are the order of the day.

The role of the EU will be crucial in this historic period. The Union is already on the right track: as analysed in relation to the *European Green Deal*, the European climate law, the *Fit for 55* package, as well as the gas decarbonisation and hydrogen development packages, represent the most impressive response a continent has ever given to the issue of climate change.

As the internal market and the united EU is the world's largest trading power, with 500 million people, the Union will have the task of exercising its soft power to influence and encourage the most polluting trading partners to be more virtuous and to embrace environmental sustainability as the paradigm of a new production model, which is slowly imposing itself on others.

That said, it is necessary to highlight that the conditions under which the aforementioned European packages were conceived were very different from those of today. The extreme volatility of the gas markets, due to both cyclical and structural causes, such as the Russian war against Ukraine and the ensuing energy crisis in Europe linked to Russia's halting of the flow of gas via the *Nord Stream 1* pipeline, prostrates businesses and citizens to energy poverty. The former, with such high energy prices, find it no longer worthwhile to continue producing, while the latter, also considering galloping inflation, often find themselves unable to pay high bills.

However, the situation is constantly changing. It was indeed difficult to include within this analysis all the elements that make up a reality that is constantly changing.

For example, the European Commission is preparing now a plan to reduce energy consumption, in addition to the former Communication *Save Gas for a Safe Winter* and the *REPowerEU* plan.

First of all, the EU Executive intends to set a mandatory target for the reduction of electricity consumption during peak hours, when the price peaks occur. The target proposed by the Berlaymont would be set at 5% (European Commission 2022).

Secondly, according to the Commission, it is time to propose a cap on the revenues of power companies that make unbelievable profits by having significantly lower production costs, especially low-carbon companies that use renewables and are earning windfall revenues that do not reflect their production costs. These revenues should be redirected to those at risk of energy poverty.

Furthermore, Brussels will propose the same for windfall profits of fossil fuel companies. Member States should invest these revenues to support vulnerable households and in clean energy sources of their own production.

The fourth initiative will concern liquidity support by Member States for energy companies to cope with market volatility. In this regard, the EU Executive has assured an update of the temporary framework to allow for a faster use of State Aid.

Finally, the Commission gave the green light to the proposal for a *price cap* on gas imported from Russia to reduce the revenue with which the Kremlin is financing the war in Ukraine. The *price cap* on Russian gas is a measure demanded, as we have seen, on several occasions by the Italian government, to deal with rising electricity bills and to assert the power of the European Union as the main buyer of fossil fuels imported from Moscow (because a cap on Russian gas alone would result in an indirect sanction against Russia, the EU's main gas supplier). However, the discussion of this proposal has been postponed, by reason of the reluctance of Northern European Countries such as the Netherlands and Germany.

Italian government, in line with European objectives, has also developed a strategy to curb energy consumption. The Italian plan aims at a 15% saving in gas consumption, reaching 8,2 billion cubic metres in 243 days: from 1 August to 31 March 2023 (MITE 2022).

The Italian plan includes four pillars. First of all, push coal, oil and biofuel power plants to produce electricity instead of gas. Secondly, radiators should be turned on for fewer hours, fewer days and fewer degrees in homes and offices (but not also in hospitals and RSAs). Thirdly, tips should be given for consuming less energy: from taking a shower that is less hot and less long to lowering the heat under the boiling pot, to unplugging electronic appliances by switching them off, not leaving them on stand-by. The fourth pillar concerns the voluntary containment of consumption in the industrial sector, on which a discussion with the production categories is open. Confindustria has long been calling for "big industry" to be exempt from rationing cycles. In this regard, the text of the Plan also refers to safeguarding strategic productive sectors for the Country, which will have priority in the use of gas.

Thus, on the one hand, in the light of this situation, the EU is right to push the accelerator on the energy transition, focusing on renewables and thus breaking free from any energy dependency. At the same time, however, companies must be protected from this extraordinary situation characterised by skyrocketing prices with pure industrial policy instruments, such as State Aid or by cutting bills. In this regard, the Italian government has a duty to outline a solid short, medium and long-term industrial policy, focusing on diversification of sources and on the construction of strategic energy infrastructures for the Country's development. A hydrogen strategy and the rediscovery of a renewed,

safe nuclear power of a new generation are essential components of this new industrial policy, for which the Italian government must take the lead.

The decarbonisation targets for 2030 and 2050 are clear, but at the same time we need to be realistic, especially in light of the current circumstances, so as not to cause a *desertification* of European manufacturing and place a too heavy burden on the shoulders of the industrial sector. Environmental benefits must be balanced against the survival of the European manufacturing system together with social protection for the weakest groups at risk of energy poverty.

It is interesting to introduce the study *Italy's Turning Point - Accelerating New Growth On The Path To Net Zero*, conducted by the consultancy firm Deloitte, which shows the significant opportunities arising from a rapidly decarbonised national economy.

First of all, over the next 50 years, according to the study, the failure to combat climate change could cause Italy up to EUR 1,2 trillion economic damage, with 21 million fewer jobs (Deloitte 2021).

On the contrary, a rapid decarbonisation of the Country, in a context of global warming limited to 1,5°C, could lead by 2070 to a positive annual GDP differential of 3,3%, or EUR 115 billion, and 470.000 more jobs than in a scenario with global warming around 3°C (Deloitte 2021). In fact, according to the International Renewable Energy Agency's (IRENA) 2020 report, there are now about 11,5 million *green* workers worldwide. These jobs are primarily concentrated in China, the US and the EU, with a predominance in the renewable energy sector. In this regard, according to IRENA's Global Renewables Outlook 2020, the renewables sector alone will produce around 42 million jobs by 2050, four times as many as today (IRENA 2020).

Returning to the report prepared by Deloitte, it also presents estimates of the damage caused by climate change and identifies 2043 as the turning point, i.e. the moment when the benefits of the ecological transition will begin to outweigh the costs. At this moment, with adequate investment in technological innovation and R&D over the next decade, Italy would be one of the first Countries in Europe to reap the economic benefits of the ecological transition, the average European tipping point, according to Deloitte, would be the year 2050 (Deloitte 2021).

The transformation of the Italian economy is already underway. According to Deloitte's model, from 2021 to 2030, public and private investment in innovation and R&D will be key to accelerating technological transformation and creating the market conditions for large-scale decarbonisation. From 2021 to 2030, Italy will be able to rethink its current dependence on imported fossil fuels to power mainly its manufacturing sector, with a decline in oil and coal consumption and a parallel increase in solar energy, which should account for 45% of total energy needs in 2030, according to the renovated European *target*. A coordinated and rapid transition would however minimise the negative impact on Italy's GDP, leading to a contraction of just 0,3% in 2030 (Deloitte 2021).

According to Deloitte model forecasts, transition costs for Italy would decrease every year from 2030 onwards. Renewable energy production would increase at an average annual rate of 6% from 2031 to 2050. During this period, Italy would experience an increase in employment in the clean energy sector as well as in the construction sector. At the same time, after 2045, the manufacturing industry would benefit from a reduction in production costs due to the falling costs of renewable energy, while production from fossil fuels would continue to decline (Deloitte 2021).

From 2041 to 2050, the decarbonisation process would be almost complete for all the main economic sectors in Italy, with a global temperature contained well below 2°C. The Country's GDP would register a positive differential of 0,9% above a world characterised by a temperature 3°C above preindustrial levels. In particular, the construction sector, previously slowed down by transition costs, would gain significantly from the future need to further decarbonise buildings and infrastructure, while public and private services would see 100.000 new more workers in 2050 (Deloitte 2021).

Finally, after 2050, major economies globally would reach the net-zero emissions scenario, limiting average global warming to around 1,5°C by the end of the century. In this period, according to Deloitte, the Italian economy would be completely transformed and characterised by the presence of multiple interconnected low-emission systems ranging from the energy sector to services, transport, manufacturing and agriculture. The labour-intensive and less energy-intensive service sectors would continue to grow rapidly: for example, by 2070 there would be employment growth in private and public services, as well as in retail trade and tourism of 625.000 and 215.000 respectively, up to 2070, where the model, as seen above, estimates a 3,3% increase in GDP (Deloitte 2021).

Thus, it is clear that the benefits of the ecological transition are first and foremost environmental. However, they will also have a positive impact on economy and society, as the aforementioned Deloitte study demonstrates.

Inevitably, every structural change brings with it a cost, which the European productive fabric will have to be prepared for. It will have to be prepared to soften the blow of this "tidal wave", as inaction will cause even more costs.

The right trade-off will have to be found between ambitious but feasible environmental *targets* and the resilience of the industrial system, which must be given time and tools, such as investment and resources, to gradually decarbonise its business.

One thing is certain: the planet is the most valuable asset and resource we possess. We must be confident of the innovative solutions that human ingenuity can find to the problem of climate change, as is already happening.

To date, the continued development of renewables, including biofuels and hydrogen, is providing industries with serious and concrete answers to ensure the feasibility of the decarbonisation process.

Furthermore, in addition to the development of alternative energies, the circular production model could contribute to a drastic change in the way we consume and produce: reuse, recycling, and reparability of consumer products will have to become the norm in our economy and therefore we will no longer have to strive for overproduction, but to reuse as much as possible the few remaining resources available. Businesses themselves will benefit from the economic advantage of increased reuse and recycling of production materials.

The challenge of our time will be to find the right compromise between environmental protection and the resilience of the European manufacturing sector, therefore between the right to the environment, the right to health and the fundamental right to work, allowing companies to gradually decarbonise but at the same time continue to produce, secure new jobs and grow the economy.

No one can be left behind, now more than ever. The first few years will be tough, but the State and the European Union will come in, injecting liquidity into the system to invest in innovation and R&D and to protect the weaker categories through the different European Funds at disposal.

«One small step for man, one big step for mankind»¹⁶ said the one who first touched the lunar sound in 1969, inaugurating the season of space exploration, of technological innovation: it is precisely innovation, research, and investments that will save us from this situation. Nevertheless, each of us has the duty to do our part.

¹⁶ Neil Armstrong, *Moon Landing*, 20 July 1969.

Appendix

In this appendix, graphs drawn up by the International Energy Agency (IEA) dedicated to Italy have been reported, which could help the reader to visually understand the different energy indicators that characterize the Italian system and which were discussed during the course of the dissertation.

In particular, the first image (Figure 1) refers to the change in the Italian energy mix from 1990 to 2020 between: oil, gas, coal, renewable sources (photovoltaic, wind power, etc.) and biofuels.

The second figure (Figure 2) shows the number of emissions by sector from 1990 to 2019, with the transport sector and electricity and heat generation and in the lead. The industrial sector, among the most virtuous in recent years, has been surpassed in CO2 emissions from the residential sector from 2008 onwards.

In the third image (Figure 3), instead, reference is made to the reduction of CO2 emissions in Italy from 1990 to 2020, with a more marked decrease occurring between 2007 and 2008.

In the fourth image (Figure 4), instead, reference is made to the energy intensity of the manufacturing sector from 1990 to 2020. In this regard, it can be seen that it has been steadily decreasing since 2002, thanks to the virtuosity of the Italian industry in making its production processes more sustainable.

In the fifth image (Figure 5), as we have analyzed several times in this thesis, those sources from which the generation of electricity in Italy was relied on from 1990 to 2020 are examined, with a predominant role of gas already at the end of the 90s.

As regards the share of renewables in final energy consumption from 1990 to 2019, the sixth image (Figure 6) demonstrates a continuous growth of them in the Italian energy mix, an acceleration that occurred in particular both in 2004 and with greater intensity from 2012 onwards and which continues even today.

Total energy supply (TES) by source, Italy 1990-2020



Figure 1







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Manufacturing energy intensity, Italy 2000-2018









Source: International Energy Agency (IEA), graph charts available at: <u>https://www.iea.org/countries/italy</u>.

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Summary

Climate changes are now among the most serious threats to our global community. Increasingly frequent floods, droughts, continuous extraordinary weather events, and rising sea levels are what is now most frightening and what governments are beginning to fear.

Not only irreversible environmental damage, but on an economic level, if measures are not taken in a globally coordinated manner, there will be irreparable losses.

The *Interngovernmental Panel for Climate Change* has estimated that to keep the earth's temperature in the 1,5°C range would require an annual global emissions reduction of 7%. Whereas, a +3°C rise in temperatures by 2100, compared to pre-industrial levels, would cause global GDP to fall by 25%. In Italy alone, according to a study published by Deloitte, inaction on climate change would cause economic damage of 1.200 billion euro and 21 million fewer jobs in the next 50 years.

This is why the European Union has committed itself to an unprecedented ecological transition on two fronts: that relating to the circular economy, and thus the way in which we produce, abandoning the linear production method in favour of a circular one in which resources are recycled and reused as much as possible; and the energy front, for which the EU proposes a real energy transition from an economy based on the combustion of fossil fuels to one characterised by non-emitting renewable sources (photovoltaic panels, wind turbines, hydroelectric, geothermal energy), renewable gases such as hydrogen, biofuels, with all that this will imply for European industry, especially the two most important ones Germany's and Italy's.

Nevertheless, the transition will have to take place in a coordinated manner, ensuring predictability, clarity, certainty and speed of the policies to be implemented by providing investors with all the conditions to be able to finance the *green* transition

This will to change, embraced in such a serious way for the first time by a continent, has been crystallised by the *European Green Deal*, published in 2019 and outlining a *roadmap* for Member States to follow on the circular economy and energy front, and the European Climate Law (i.e. a Regulation). It effectively binds, for the first time in history, EU Member States to achieve climate neutrality by 2050, but first by a 55% reduction in emissions by 2030 compared to 1990 levels, an intermediate step enshrined in the Regulation itself.

In this regard, the European Commission presented in July 2021 the package that has now gone down in history for its significance and the impact it will have on the European production system, *Fit for 55.* In it, several proposals to revise certain Regulations and Directives are flanked by new proposals from the Commission with the aim of decarbonising the economy and, at the same time, safeguarding the competitiveness of the European industrial system.

Within the *Fit for 55*, there are several measures: some aimed at setting a carbon price; others that intend to impose binding *targets* to be achieved; and finally, still others that set rules to be followed by all European Countries on standards and emission reductions. These measures are accompanied by the funds put in place by the EU and its Member States to support this energy transition process of immense scope.

Measures to fix carbon prices include the reform of the European Emissions Trading System (ETS), the introduction of a Carbon Border Adjustment Mechanism (CBAM), and the reform of the Energy Taxation Directive.

The first is generally intended to raise the price of CO2 by EUR 100 per tonne by 2030, thereby discouraging large industries from emitting. Emission allowances would be drastically reduced, the cap would be lowered and the linear reduction factor of allowances' allocation increased, thus artificially raising the price of CO2 and incentivising companies to adopt more virtuous behaviour in terms of sustainability. The number of free allowances allocated to the most energy-intensive sectors will also be drastically decreased until they are completely eliminated as the CBAM comes into force. Clearly, this measure will have a very heavy impact on the costs to be borne by European companies and, if poorly designed, will undermine the competitiveness of the European manufacturing sector in relation to industries in third countries that have no constraints on emissions. Moreover, in a historical period like this, characterised by unprecedented energy market volatility, the price of CO2 has already risen by ϵ 70-80 per tonne of CO2 produced, some eight years ahead of the target of ϵ 100 per tonne by 2030 set by the European Commission. This is also due to financial speculation within the ETS market. For this reason, according to Confindustria's proposal, it should be possible to use the Market Stability Reserve to inject additional allowances into the market, thereby increasing their number and lowering artificially the price of CO2.

In order to safeguard European industry's competitiveness from other trading partners' unfair competition, the Commission proposes to establish a Regulation for the creation of the CBAM, i.e., in a simplified manner, a kind of carbon tax on products imported from abroad, which are manufactured using highly polluting fossil fuels and which enter the European internal market. According to the EU Executive, a European importer would have to pay for the amount of carbon contained in that imported product as if it had been manufactured according to European standards. According to the Commission, this measure would safeguard the competitiveness of European industry, to be applied initially to energy-intensive sectors, in parallel with the cancellation of the free allowances allocated to them. According to Confindustria, however, first the effectiveness of the CBAM should be assessed with certainty, then, only after 2035, applied in parallel with the cancellation of the free allocation of allowances. Furthermore, the CBAM should not penalise our

exports, but rather safeguard them in order not to undermine the competitiveness of vibrant European *exports* market. According to the Commission, this instrument would also not be contrary to the *Most Favoured Nation* principle of the WTO, as it would apply equally to European and third-party producers.

Finally, the energy taxation reform envisages higher rates for the most polluting fuels, scaling up to renewable fuels that will not initially be taxed to incentivise their production, such as hydrogen. For Confindustria, however, taxing gas, LPG, and LNG at rates almost at the level of the most polluting fossil fuels (oil, diesel) would discourage the use of these energy sources as bridging technologies to help industry decarbonise.

As for the *targets* outlined in the *Fit for 55* package, the two proposed revisions of the Energy Efficiency and Renewable Energy Directive set very ambitious 2030 *targets* for Member States.

Regarding the former, the Commission has imposed a binding energy efficiency *target* of 9%. Furthermore, with regard to the energy efficiency of public administration buildings, the most polluting as they require a large amount of energy for both heating and cooling, the EU Executive has imposed a *target* of 3% per year for the renovation of PA buildings. Not taking into account, however, that there are Countries, such as Italy, where many PA buildings are historical palaces and mansions, and the *target* would therefore seem too ambitious.

In this regard, Italy's energy efficiency plan, outlined in the NRRP, aims at large-scale energy efficiency in PA buildings, school buildings and court citadels. With regard to private buildings, on the other hand, measures such as the 110% *Superbonus*, a form of tax deduction equal to 110% of the expenses incurred for environmental interventions in the residential sector, such as thermal insulation or heat pumps, have been planned. Another strategy of the Italian government in this sense is to extend the kilometres of network covered by district heating.

Instead, the proposed revision of the Renewable Energy Directive aims to achieve the target of 40% production from *clean* sources by 2030, mainly by speeding up the authorisation procedures to install a plant. Within the Directive, the Commission intends to regulate all *green* sources, from photovoltaics to wind power, from the development of biofuels such as biomethane to renewable hydrogen. In this sense, the Italian government aims to speed up the administrative procedures of so-called *permitting*, creating a collaboration between the State and local and regional authorities to jointly decide on the areas suitable for establishing a renewable plant. The administrative conditions must be created so that there is a development of a renewable energy supply chain also *offshore* to decarbonise the italian economy as soon as possible.

On the other hand, with regard to the rules outlined in the *Fit for 55* package, the European Commission intends to establish a Regulation for the automotive sector to be fully electrified by 2030.

The endothermic engine, according to the EU Executive, should therefore soon be replaced by the electric one. According to Confindustria, such a drastic move so close in time would jeopardise the entire component supply chain upstream of the major automotive manufacturers, with job losses estimated at several million. Rather, according to Confindustria, the Commission should make the principle of technological neutrality its own, according to which one should not only bet on the electrification of the sector as the only technology, but also on biofuels, which will have to play a strategic role during the transition to sustainable mobility.

To meet the recharging needs of more than one million electric vehicles estimated for 2035, adequate charging infrastructure will then be required. This is where the proposed Regulation for alternative fuels infrastructures comes in. The EU Executive aims at equipping urban nodes and motorways with intermediate charging stations. According to Confindustria, not only electric but also gas, especially LPG, and biofuels will have to play a key role in the transition to more sustainable mobility.

In this regard, the Italian government in the NRRP estimates that 31.500 public fast-charging points will be needed. Accordingly, the Italian plan aims to develop 7.500 fast charging points on motorways and 13.755 in urban centres, as well as 100 experimental charging stations with energy storage technologies.

The last measures of the *Fit for 55* package under consideration are the two initiatives aimed at decarbonising the aviation and maritime sectors as much as possible.

For the former, the Commission has proposed the introduction of so-called Sustainable Alternative Fuels (SAFs), which are to be blended in increasing proportions with classic fuels. This measure is also intended to reduce emissions from the aviation sector. For Confindustria, however, this standard should be harmonised with the ICAO in order to safeguard the competitiveness of the European aviation sector.

With regard to fuels in the maritime sector, among the most polluting today, there is talk of the development of a sustainable fuel chain and the use of electricity generation necessary for ships moored in port. Confindustria welcomes this possibility, but emphasises the need to use LNG and methane gas as engine propulsion to promote a reduction in polluting emissions in the maritime sector as well.

In addition to the individual proposals, *Fit for 55* refers to the many European and national funds allocated to help achieve the energy transition, including the *Social Climate Fund*, the *Modernisation Fund* and the *Innovation Fund*.

The former will provide specific funding to Member States to support citizens at risk of energy poverty (around 34 million according to an estimate by the European Commission). Furthermore, Member States with a higher share of fossil fuels in their energy mix, higher CO2 emissions, higher
energy intensity and lower GDP per capita than the EU average will benefit from the *Enhanced Modernisation Fund*, which could count on 192,5 million additional allowances.

While the *Innovation Fund*, with over EUR 1,8 billion to be invested, will provide grants to help bring cutting-edge technologies to the market in the fields of energy-intensive industries, hydrogen, renewable energy, carbon capture and storage infrastructure and the production of key energy storage components and renewable energy. Moreover, the European multiannual budget and the post-Pandemic NextGenerationEU recovery package were designed precisely to finance the *green* transition. In particular, 30% of the 2021-2027 multiannual budget is dedicated to supporting climate action, e.g. through cohesion policy, agriculture and the *LIFE* programme, as well as the *Horizon Europe* programme for SMEs, start-ups and spin-outs.

Given the magnitude of the *Fit for 55* package and the impact it will have on the Italian manufacturing system, Confindustria, and in particular its Delegation located in Brussels, is intensifying its monitoring and *advocacy* activities so that the demands of the industrial system are represented to the European institutions and so that the proposals thus devised by the Commission are amended in a more industrial direction. In this regard, it will be necessary to secure a strong consensus within the European confederation of industry, BusinessEurope, in particular with Germany, Europe's leading manufacturing Country and its Confindustria BDI, and France, the industrial association of which Medef is the leader.

In addition to the broader *Fit for 55* package, in December 2021 the Commission also published two packages for the decarbonisation of gas markets and the development of a market for hydrogen, an energy vector with enormous potential for decarbonising *hard-to-abate* sectors such as the steel industry. It is produced in different ways. Renewable hydrogen is produced from water molecules (H20), through an electrolysis process in which hydrogen is separated from oxygen emitting 0 emissions.

The package for the decarbonisation of gas markets and the development of one for hydrogen aims to remove all regulatory and administrative barriers that hinder, or discourage, the penetration of renewable or low-carbon gases within the European energy network.

The Italian government, in this regard, has outlined a strategy for hydrogen production, recognising its other potential to decarbonise energy-intensive sectors that are not able to rely too much on renewables, such as the steel industry, or the glass and ceramics sector, which require very high temperatures for their production processes. The Italian government's idea is to transform disused industrial areas near strategic companies into hydrogen production hubs. In addition, the Italian government also aims to use this energy vector in the transport sector, particularly in the rail and truck sectors, with the installation of charging stations along Italian road infrastructure.

During the approval process of the individual measures contained in the packages, however, a sudden event hit the European economy. Thus, on 24th February, the Russian army invaded Ukrainian territory, starting a war that still rages today and has caused an unprecedented energy crisis in Europe in recent years.

Until 2021, Russia was in fact the largest exporter of gas to the EU (40%), especially for those Countries heavily dependent on it such as Italy and Germany.

With the sanctions packages approved from time to time by the EU Council, the Kremlin started to use gas as a tool to pressure Western governments, first by decreasing the gas flow by 40%, then by blocking it almost completely in September 2022.

For this reason, the Commission has devised a plan, entitled REPowerEU, which envisages three different strategies of action that in the medium to long term should break Europe's dependence on Russian energy: reducing energy consumption by at least 5%, including through greater energy efficiency. In fact, the target of the European Directive on this subject has been increased from 9 to 13%. With regard to the 5% reduction in energy consumption in the short term, the Commission intends to pursue the target through a change in consumption and individual habits. Subsequently, when the risk of a Russian supply disruption became more and more acute, the Commission presented a Communication entitled Save Gas for a Safe Winter, in which it proposed a voluntary 15% reduction in energy consumption from August 2022 to March 2023. Furthermore, for those energy-intensive industries that want voluntarily to reduce their energy consumption, they will be able to make use of State Aid. Along these lines, the Italian Ministry of Ecological Transition has set out a consumption reduction plan that aims to save 15% in gas consumption, reaching 8,2 billion cubic metres by 31st March 2022, by developing the biofuel chain and biomethane, reducing the days and degrees of heating systems, as well as encouraging citizens to take shorter less hot showers and not to leave electronic appliances on stand-by. Furthermore, the industrial sectors involved were prioritised to reduce their energy intensity, in agreement with Confindustria. For companies whose production is of high national interest, an exemption from this energy quota is proposed.

The Plan's second measure consists of a greater diversification of energy suppliers internationally, both for LNG and pipeline gas, thus compensating for the decrease in flows from Russia. The Commission also encourages Member States by activating a common platform for gas supplies, modelled on the vaccines during the Pandemic, to facilitate the joint purchase of gas.

The third measure provides for the further development of renewable energies. In this regard, the Commission has raised the *target* of the Renewables Directive from 40 to 45%, with specific recommendations addressed to individual Countries to speed up the authorisation procedures for

plants. The intention is to increase not only production from conventional *green* sources, but also biomethane and hydrogen.

The REPowerEU plan will be financed with additional European funds, including the cohesion, agriculture and regional structural funds, and through the NRRP itself, in which a specific chapter is to be included to finance the REPowerEU plan, also at national level.

According to Confindustria, however, the investments needed for Italy alone would amount to an estimated EUR 1 trillion, so those made available by the Commission and the RRF would not be sufficient. In addition, this plan would have to be accompanied by a series of reforms that would allow the Country to modernise from an administrative, bureaucratic and legal point of view, as well as providing fertile ground for the investments needed to complete the plan.

Together with the presentation of the REPowerEU, in order to ensure energy security in Europe, the EU executive made it mandatory to fill gas storage at least 80% by November 2022, and 90% by next winter. Italy as of mid-September 2022 is at 82% of storage filling, having the good fortune to be able to count on a large storage capacity at territorial level. The same could not be said for the dependencies to which Italy is exposed. In the Italian energy mix, gas accounts for almost 42% of the total energy sources available and used to produce electricity. Gas is mainly imported from Russia, Azerbaijan and Algeria, as well as from Norway. Gas production in Italy is at 3-4% due to choices made in the past when it was more convenient to import gas than to extract it.

Now, however, with the outbreak of war in Ukraine, Italy has found itself dealing with a supplier that is no longer as reliable as it once was. Thus, within a few months, the Italian government made agreements with numerous international partners, in particular Algeria, which became the largest gas supplier to Italy.

Therefore, due to structural factors, such as the choice of the Italian government and public opinion to abandon nuclear power and stop domestic gas production, and conjunctural factors, such as the situation of geopolitical tension with Russia and an exponential growth in global demand for energy *commodities* post-Pandemic, especially on the Asian side, the price of natural gas gradually soared from May 2021: +423% over the course of 2021 until December 2021. Over the course of 2022, it rose to 171 euro/mwh in Europe in July 2022 (106 in June 2022), above the average values of March, due to the drop in Russian supply. In September 2022, on the other hand, the 340 euro/megawatt-hour gas price is below 200 euro, still very high.

And since it is mainly from gas that electricity is generated in Italy, the price hike causes an automatic increase in the price of electricity and energy bills, both on companies and ordinary citizens. Unlike France, which is able to rely also on nuclear power for electricity generation, and Germany, which is able to rely on both coal and nuclear power.

In this regard, the Italian government approved a decree-law in June 2022, allocating an additional EUR 3 billion for the extension of certain electricity and gas cost containment measures. In the text we find: the zeroing of system charges for electricity and gas for the second quarter of 2022 and the cut of VAT on gas to 5%. The earmarked funds amount to about EUR 8 billion, of which EUR 5,5 billion is earmarked to combat high energy bills, while the remainder is intended to support production chains to lower the costs of energy bills and prevent further crises in the future.

And it is precisely the energy-intensive manufacturing sectors that suffer the most serious consequences of this exponential rise in gas prices, such as metallurgy, especially steel, chemicals, plastic rubber, but also glass and ceramics.

In particular, the impact in terms of costs on national productivity, according to the estimates of the Confindustria Study Centre, would translate into an increase in Italy's energy bill of between EUR 5,7 and 6,8 billion on a monthly basis, depending on the assumptions underlying the estimates, i.e. an increased burden of between approximately EUR 68 and 81 billion on an annual basis. Considering the manufacturing sector alone, the increase in energy costs is quantifiable at between EUR 2,3-2,6 billion per month, or between EUR 27,3-31,8 billion on an annual basis. For metallurgy alone, an increase of between EUR 8,5 and 9 billion per year is estimated, which is almost one third of the total energy costs.

That said, it is good for the Italian government to arm itself with a solid industrial defence policy, like France and Germany, aiming in the medium to long term at investments in renewables and hydrogen. However, thinking of the short term, in the Italian case, given the particular structure of energy production and supply in the electricity and gas market, a series of both conjunctural and structural measures are possible in the immediate term.

Among cyclical interventions, the EU framework allows for intervention on the fiscal and parafiscal components of the electricity and natural gas bill, increasing the level of exemption for manufacturing sectors with particular reference to energy-intensive sectors at risk of delocalisation (e.g. by increasing, as in the German case, the reduction of parafiscal charges paid by industrial users to cover subsidies for renewables). Also on the cyclical side, it is possible to strengthen demand-side instruments for electricity and gas market security services (e.g. interruptible service and/or demand-side management) and to establish a *price cap* on gas imported from Russia.

However, structural intervention measures are also possible. As far as natural gas is concerned, domestic production should be increased and the Country's supply structure geo-politically rebalanced. Finally, as far as the electricity market is concerned, a reform to decouple the valuation of the increasing production of renewable energy from the cost of thermoelectric gas production should be promoted quickly.

In this regard, an energy policy expert, Gianluca Pischedda of Confindustria's Delegation to the EU, two MEPs, Luisa Regimenti and Carlo Calenda, and an entrepreneur, owner of a hot steel forging plant, were interviewed on the strategies to be implemented in the short and long term to lighten the burden of energy bills on businesses.

In the short term, the points in common among the interviewees are structural interventions on the cost of bills in the immediate term, with instalments or tax relief for the most energy-intensive companies; the construction of adequate energy infrastructures, such as regasifiers; the imposition of a generalised price ceiling, not only for Russian gas, which would give cost certainty to companies. In the long run, most agree on the development of new technologies, such as fourth-generation nuclear energy and domestic gas production. In addition, authorisation procedures for renewable energy plants should be accelerated and a reform of the electricity market should be implemented to decouple the gas price market from the electricity market.

Moreover, in order to make Italy a leader and frontrunner in defining new technological trajectories related to environmental sustainability, it is crucial to bridge the huge gap that still divides the ecosystems of public research and industrial innovation. In fact, the contribution of the public research sector (universities and research centres) is considered an almost irrelevant partner in scientific exploration and experimentation efforts for industrial purposes. It is therefore necessary to adopt an approach of knowledge co-generation between public and private research, which is driven by application contexts and thus with foreseeable technical-productive spin-offs. The definition of these contexts requires a clear medium- to long-term strategic vision of the Country around which to build a public investment plan that could act as a *driver* for private investment. This also includes strengthening the use of *public procurement* as a strategic industrial policy tool to stimulate companies' technological innovation processes, including in the field of eco-innovation. However, it is also necessary to ensure speed and effectiveness in its implementation through integrated *governance* encompassing institutional coordination between public and private actors involved in the projects.

Another priority of Italian industrial policy, complementary to the one just outlined, must be to increase the endowment of qualified human capital within manufacturing companies. In conclusion, among manufacturing systems, the Italian one has the opportunity to play a leading role in the ecological transition both because, as the Planet's seventh industrial power, its investment choices are able to have a direct positive effect on the environment, and because the excellent environmental performance already achieved today makes it a virtuous model that could be followed by other Countries.

This challenge calls for a different approach in the way of conceiving cooperation in the economic sphere between the EU Member States, oriented towards risk-sharing (which, in a transition process towards a new development paradigm, is very high) or public investment (which is a key component, together with private investment, to support the transition). The outbreak of the Pandemic has allowed an unexpected acceleration in this direction, making the need for increased resource sharing evident in Brussels.

It will therefore be crucial for Italy in this delicate historical moment to have "broad shoulders" and be led by strong governments, supported by solid majorities that are able to go to Europe to forge alliances with the most industrialised Countries, particularly France and Germany. All this must be accompanied by the inauguration of a season of *competitive reformism* that Italy has been waiting for thirty years, in which a government supported by a large and solid parliamentary majority is able to approve the reforms needed to make the Country more competitive. First and foremost, public administration reform, to make national, regional and local public administrations capable of planning, implementing and carrying out a project, and justice reform, capable of making the Country more attractive to investment and business start-ups.

In conclusion, the challenge of our time will be to find the right compromise between environmental objectives and the resilience of the Italian and European production system, i.e. between the protection of the right to the environment and health, and the right to work that a productive Country must guarantee.

The key word will be innovation. Fertile ground must be created for investments in R&D, innovation, and advanced technologies in order to ensure that European industry could achieve a feasible decarbonisation process and, at the same time, remain competitive in the market.

Every transition brings with it a cost, and the current circumstances make it necessary to be ambitious, yes, but on the other hand to give all the necessary support, including public one, to companies in difficulty that have the ambition to become more sustainable and to citizens at risk of energy poverty. Support that must be guaranteed by European and national funds.

It is possible to decarbonise our economy. To date, the continued development of renewable energies, including biofuels and hydrogen, is providing industries with serious and concrete answers to ensure their feasibility, however, we must also change our production paradigm, embracing one that is increasingly circular in its use of resources.

Everyone will have to play their part.