Implementing the European Green Deal through Transformational Change

A REVIEW OF EU CLIMATE ACTION THROUGH THE LENS OF THE "SIX TRANSFORMATIONS"

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Abstract

The European Green Deal (EGD) is the EU's magnum opus for implementing the Paris Agreement and the United Nations 2030 Agenda. The EGD intends to tackle the climate and environmental crisis, while pursuing economic growth and respecting the Leave No One Behind principle. This paper argues that a systemic approach based on the Six Transformations (Sachs et al., 2019) can enable policymakers to address multiple Sustainable Development Goals (SDGs) and exploit synergies between various policy areas, minimizing trade-offs, identifying priorities, and addressing conflicting agendas. Focusing on an analysis of the EU Energy and Climate Policy, this paper puts forward important policy recommendations to successfully implement the EGD and the SDGs, following the Six Transformations approach. It also highlights the unique opportunities offered by the Recovery and Resilience Facility to overcome the socio-economic challenges caused by the COVID-19 pandemic. In this respect, a case study of the Italian National Recovery and Resilience Plan illustrates how the European recovery can successfully operationalize climate action along the Six Transformation framework. Lessons learned from this experience can be extrapolated and replicated in other EU member states and other regions of the world.

1. EU Energy and Climate Policy: State of the Art

The Evolution of the EU Energy Policy and the European Green Deal

The European Green Deal (EGD) is, to date, the most mature strategy to implement the United Nations 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs). In addressing the urgent climate and environmental crisis, the EGD intends to achieve a more sustainable economy and greater social inclusion. In doing so, it represents the first model framework for addressing multiple SDGs in a coherent strategy that can help policymakers to identify priorities, limiting conflicting agendas. With the ambition of opening a "new path of sustainability and inclusive growth",[1] the EGD also represents the climax of the EU energy policy evolution. To fully grasp the importance of this plan, we should therefore look at that long process in retrospect.

Although the EU's foundations are undeniably rooted in energy, it only gained a comprehensive EU-wide strategic focus following the Lisbon Treaty (2008).[2] The European Commission's Green Paper of 2006[3] claimed for the urgency of an EU energy policy based on three main pillars, namely competitiveness, sustainability and security of supply. Usually depicted as the angles of an equilateral triangle — the so-called "EU energy policy triangle", such goals should have been equally important and, notably, none of them could have been achieved without the other. The first pillar, competitiveness, was regulated in a series of waves by three legislative packages (1996, 2003, and 2009) aimed at progressively liberalizing the national energy sectors to create a truly integrated EU energy market. As for sustainability, to be in line with the Kyoto Protocol, the EU set out new energy and environmental targets for 2020[4], 2030[5] and 2050[6]. Finally, security of supply received due attention only as the EU's growing dependence on Russian gas started to be perceived as a serious vulnerability. Significantly, the "European Energy Security Strategy"[7] of May 2014 was published just a month before Russia cut off the flow of gas to Ukraine,[8] a transit country essential for the EU's gas supply.

The EU energy policy conceived up to that time had, however, two main shortcomings. The first weakness concerns the presence of some non-binding targetsat Member State level. This is surely the case of the energy efficiency target, which has in fact always been merely indicative. The most emblematic example nevertheless concerns the renewables target: from being binding at the national level for 2020, it then became binding only at the EU level for 2030. The problem with voluntary targets is that, while allowing for flexibility and differentiation, they do not guarantee the achievement of the targets and lack any enforcement mechanism. Such a system could potentially undermine the EU's aspiration to become the world leader in the fight against climate change, as this would require each Member State to fully respect all decisions on the matter, be they legal commitments or political promises. It should therefore be clear that, to safeguard the achievement of the commitments undertaken, a governance system at the EU level was needed. Using the Commission's words, the main objective of EU energy governance was to ensure that "policies and measures at various levels are coherent, complementary and sufficiently ambitious."[9] The intention was therefore to coordinate the action of Member States and anchor it in a system managed by the European Commission that would ensure that all national energy and climate targets are met.

The second shortcoming regards the lack of consistency across the different policies of the EU energy triangle: regardless of their effectiveness, they had addressed the three goals separately. To overcome such a "silo-thinking" approach, in 2015 the European Commission proposed the Energy Union strategy. The purpose was to integrate all different dimensions of the EU energy policy and enhance the coordination between policy instruments, measures and levels of governments. In this way, the EU would be able to tackle, within a single broad strategy, the five main energy domains subject to regulation — namely, security of supply, a fully integrated internal energy market, energy efficiency, decarbonization, and research and innovation. The abovementioned dynamics — the need for ensuring compliance with non-binding targets together with the birth of the Energy Union — thus converged in the conception of a governance of the Energy Union. This marked a new step in the integration of energy policy which, until that moment, had been essentially a Member States' prerogative.

In addition, in 2015 the EU signed the Paris Agreement which became the horizon and the compass for the EU's energy policy. This agreement has indeed been a milestone in the fight against climate change, even beyond EU borders: for the first time, all nations have agreed to increase the efforts for reducing global warming with the goal of limiting this to well below 2, preferably 1.5 degrees Celsius, compared to pre-industrial levels. The Paris Agreement does not set binding targets, but it rather relies on the mechanism of the National Determined Contributions (NDCs): each country is expected to communicate internationally its emission reduction target. Subsequently, through a procedure of review and reporting, the NDCs are being adjusted over time.

This series of important changes in the EU and global energy governance led the Commission to update the entire EU energy policy that had been formed up to that time. Thus, the aim was to create a comprehensive policy framework that eventually resulted in Clean Energy for All Europeans Package, a new energy package made up of eight legislative acts, issued in 2016 and completed after that the European Commission put forward the EU's long-term Strategy "A Clean Planet for All" in November 2018. In particular, central to this package — informally called the "Winter Package" — is the Governance Regulation. It aims to improve coordinated action by the EU and Member States and to ensure that the EU energy policy is in line with and achieves the goals set by the Paris Agreement. The proposed Regulation thus provides a framework in which, on the one hand, Member States plan and report, while, on the other hand, the Commission monitors and assesses. This mechanism is primarily based on the National Integrated Energy and Climate Plans (NECPs) which establish, according to a predefined template, targets and policies for the 2021-2030 decade and, thereafter, for subsequent decades (2031-2040, 2041-2050, etc.).

Meanwhile, significant initiatives have been taken globally to raise awareness of the increasingly pressing climate and environmental issues. The US's withdrawal from the Paris Agreement, formally announced in November 2019, posed a serious threat to the deal itself (but thankfully has been rectified by the Biden Administration on 20th January 2021).The European Parliament immediately responded by claiming that all the Commission's proposals should be fully aligned with the aim of containing global warming under 1,5°C.[10] In this context, the newly established Von Der Leyen Commission launched, in December 2019, the European Green Deal. This plan "aims at strengthening and broadening the initiatives included in the Energy Union",[11] but goes beyond the climate objectives set so far.

The Power of the European Green Deal (EDG)

With the EGD, the EU aspires to become the first carbon-neutral continent by 2050. Interestingly, such a major cut in emissions is being pursued at the same time as economic growth. In fact, achieving the environmental targets on the one hand, and realizing a fair and prosperous EU society, on the other, are part of the same comprehensive strategy laid out in the EGD. To live up to these expectations, all synergies across the policy areas involved in this challenge should be aligned. The EGD also calls on the EU to take a leading role in clean technology. Finally, the EGD clearly articulates that the climate and energy transition be guided by the criteria of justice and inclusiveness, acknowledging that the net zero transition will only be successful if it is done fairly.

The EGD also sets new and more stringent climate goals for 2030 and 2050, some of which have already been progressed on by the Commission through specific mechanisms. The proposal for a European Climate Law,[12] issued in March 2020 and followed by a provisional agreement by the Parliament and the Council in April 2021, transforms the climate neutrality target for 2050 into a binding commitment for the EU as a whole. With the aim of setting out the conditions for making Europe the first climate-neutral continent by 2050, this has been the first step to turn the political commitment of the EGD into a legal obligation. In September 2020 the Commission put forward a plan to reduce greenhouse gas emissions for 2030 by, at least, 55% compared to 1990 levels.[13] The European Parliament — which initially aimed to raise ambition level to 60% — accepted the proposal in October 2020,[14] followed by the European Council who welcomed the new target in December 2020.[15] An agreement was reached between the Parliament and the Council in April 2021, setting a reduction target of at least 55% by 2030.[16] Moreover, a cap was set on the contribution of carbon removals from land use, agriculture and forestry to the reduction target, at a maximum of 225 Mt of CO_2 equivalent. This results in a gross emissions reduction target of 52.8% without carbon removals. In order to reach carbon-neutrality by 2050 and respect the EU's obligations under the Paris agreement, a greenhouse gas 'budget' will be designed by the European Commission to inform the reduction target by 2040, with separate calculations for emissions and removals.[17] The EGD further includes a review of all climate policy instruments, i.e. the Emission Trading System, as well as introducing a carbon pricing, and a carbon border adjustment mechanism. After long months of consultations, the Commission published on July 2021 the Fit for 55 Package ("Delivering the EGD" Package), currently being debated.

While aware that "the cost of transition will be big",[18] the President of the Commission Von Der Leyen warns that "the cost of non-action will be much bigger".[19] In concrete terms, EU action on global warming, in line with the Paris Agreement, is built on nine policy areas covered by the EGD. The first area is dedicated to clean energy, which can be achieved through a combination of energy efficiency, renewable energy and other sustainable solutions. The Hydrogen Strategy published in July 2020 contributes significantly to this challenge, emphasizing in particular that green hydrogen, sourced from renewables, has a central role to play in the transition. At the same time, the Commission has published the EU Energy System Integration Strategy, aimed at designing a more efficient energy system through sector coupling to support decarbonisation and to build a climate neutral EU by 2050.[20] The EGD stresses that, in addition to being clean, energy should also be affordable and secure. This recalls the EU energy policy triangle introduced by the 2006 Green Paper, yet with a clearly more holistic view.

Secondly, the EGD proposes a more sustainable industry, well-detailed by the Industrial Strategy and the Circular Economy Action Plan of March 2020, which should help realize the twin green and digital transition. Then, emphasis is put on the necessity of building and renovating efficiently to address energy poverty. A document with regards to Renovation Wave for Europe released in October 2020. It establishes an integrated strategy that involves

a wide range of sectors and actors on the basis of principles like "Energy-efficiency first", life-cycle thinking and circularity, and affordability. Moreover, the Sustainable and Smart Mobility Strategy issued in December 2020 aims to reach a sustainable mobility and ensure that the EU's transport system follows the environmental targets. With the Farm to Fork Strategy released in May 2020, a central focus is on the food system, which should be fair, healthy, and environmentally friendly. The EGD also highlights the importance of biodiversity: the Biodiversity Strategy for 2030 traces a path for recovering and protecting the ecosystem and, thus, benefitting people, climate and nature. Following the list of priorities, the zero-pollution action plan for air, water, and soil — adopted in May 2021 — offers fundamental guidelines for eliminating pollution and creating a toxic-free environment. Another issue addressed by the EGD is the common agricultural policy, where a combination of social, economic, and environmental aspects should lead to more sustainable agriculture. Finally, the climate action scope, mentioned earlier in connection with the new proposed 2030 emission reduction target, is not only an internal EU policy but also a key pillar of its diplomacy. Since climate change is a global issue, the EU wants to be the leader for a global solution.

Converging the European Green Deal with the Sustainable Development Goals

With the EGD, the Commission has acknowledged the importance of undertaking a holistic and cross-sectoral approach to achieve its energy, climate and environmental objectives. Then, it went a step further by showing its strong intention to integrate the implementation of the EGD in deep synergy with the policies of the SDGs. In this respect, the Commission staff working document "Delivering on the UN's Sustainable Development Goals – A comprehensive approach"[21] is a first attempt to propose the "whole of government approach" to implement the SDGs.[22]

This approach aims to coordinate and implement a range of EU actions and policies as a single whole.[23] The energy transformation is most directly related to SDG 7 (affordable and clean energy) and SDG 13 (climate action). However, it contributes to many other SDGs, by directly targeting, reinforcing or enabling their achievement.[24] For example, the positive effects on clean air and water of the increased use of sustainable energy directly contributes to the achievement of SDG 3 (good health and well-being) and SDG 6 (clean water and sanitation). While the ministries of energy, environment, transport and buildings/construction will play a key role in the energy transformation, a whole of government approach is thus essential to maximise synergies and minimise trade-offs with other SDGs.[25]

While emphasizing the need for systemic transformation to achieve a just, healthy, prosperous, and sustainable society remains central, the most important question is: "how we are doing this fairly and consistently across Europe?" One significant measure, for example, is to anchor the implementation of the SDGs in the European Semester, as will be discussed below. Analysis by SDSN's EGD Senior Working Group has shown that while the EU has largely mainstreamed SDGs in its strategic priorities, a number of SDG challenges are still not covered by the European Semester.[26] One of the key findings from that work was an efficiency ratio estimate of 70%, meaning that currently the European Semester Process can capture approximately 7 out of 10 weaknesses identified by the 2020 Sustainable Development Report. In addition, implementing the Green Deal fully will require specific policies such as building infrastructure (e.g. smart electricity grids, EV chargers) that must be coordinated across Member States. Many challenges and unseen problems could be encountered; therefore, it becomes essential that the EU institutions and Member States learn from each other about what works and what can be improved. In this respect, the Six Transformation approach (Sachs et al., 2019) presented in this policy brief provides policy recommendations aimed at realizing an efficient and effective joint implementation of the EGD and the SDGs.

EU Measures to Recover from COVID-19 Pandemic

In March 2020 when the Commission pushed forward the first European Climate Law, Europe was hit by the health crisis due to the COVID-19 pandemic that caused dramatic consequences on all the economies due to social distancing measures and lockdowns. A few months later (July 2020), European leaders agreed to implement a comprehensive package of more than €1.8 trillion,[27] which combines the enhanced 2021-2027 long-term EU budget and the Next Generation EU (NGEU) program. In particular, the climate action would be integrated in the financed programs and EU leaders also agreed that around 30% of the total allocated resources (around 500 €billion) would have to target climate-related projects. In principle, all EU spending should be consistent with the objectives of the Paris Agreements.

The financial resources can be used by Member States as a tool to recover from the socio-economic consequences of the Covid-19 pandemic and to help transform Europe in a green, digital and resilient continent. NGEU is financed by loans (€360 billion) and grants (€390 billion) and is implemented through the following seven programs:

- Recovery and Resilience Facility: €672.5 billion
- ReactEU: €47.5 billion
- Horizon Europe: € 5 billion
- InvestEU: €5.6 billion
- Rural Development: €7.5 billion
- Just Transition Fund: €10 billion
- RescEU: €1.9 billion

The Recovery and Resilience Facility (RRF) is the bulk of NGEU and in order to use it, Member States had toprepare National Recovery and Resilience Plans setting out their investment agenda for the years 2021-2023. The plans are now being assessed by the Commission based on a set of criteria, including — as preliminary conditions — the effective contribution to the energy transition and digitalization.[28] In this way, the new measures undertaken by the European Union would need to be implemented in the framework of the EGD, which is consistent with the SDGs and the Paris Agreement. Considering NGEU to a certain extent can be seen as powerful as the Marshall Plan, Europe has a once-in-a-generation opportunity to accelerate the transformation to sustainable societies. The importance of addressing sustainability is also reiterated in the facility that was called “Next Generation EU” to underline that funds have to be invested with the overarching objective of repairing the damage paving the way for future generations. This huge opportunity must not be wasted.

Sustainability in a Time of Crisis: The Unique Opportunities Offered by the Recovery Fund

The EU's plan to bounce back stronger after the Covid-19 crisis, outlined in the previous box, has the potential to build a better future.[29] The NGEU program, in particular, could play a pivotal role in operationalising the green transition while meeting the SGDs. However, while the Recovery Fund will have an important immediate impact in the EU, part of the literature doubts it will be a real "game changer"[30] capable of addressing the future increase of public debt or the slowness of regional growth.[31] On the contrary, we argue that a profound systematic transformation is feasible, but this is only possible if Member States take responsibility for it. Instead of settling for an "incremental change"[32] consisting of subsidies or short-term investments, national plans should be geared towards a "transition trajectory."[33] This is crucial to avoid that an excessive public debt becomes an unbearable burden on younger generations.

For long-term investments to be well planned, however, certain conditions are needed. The first is "speed" which, in the aftermath of an economic crisis, is an essential element for investments to have a boosting effect on the economy, otherwise their impact is reduced. The Commission indeed urged Member States to deliver their recovery and resilience plans quickly, pushing them to work under great pressure. The first challenge, therefore, was to resolve the trade-off between "speed" and "quality".[34] Secondly, good planning requires the active involvement of all stakeholders, from Governments to private business, in a dialogue which refrains from the sterile juxtaposition of politicizing decisions vs market forces. This means that both policy and regulatory tools, as well as market-based instruments, were called to take part in shaping the plans: in fact, such hybrid solutions would increase their political viability. Long-term investments should therefore be borne by the State, in the new role as "entrepreneurial State",[35] capable of bonding public and private forces for building an investment plan based on an "overarching transformation strategy".[36] As a result, the socio-economic system of the EU could thus undergo a systemic transformation which, away from the "cyclical push of Keynesian demand,"[37] has the potential to "to trace a new path of economic development".[38]

The SDSN's 2020 Europe Sustainable Development Report also calls on Member States to make additional investments, as the EU's budget is insufficient to achieve systemic transformation. Indeed, the total EU budget under the MFF adopted on 21 July 2020 amounts to only around 1% of EU GDP, making it insufficient to meet the wide critical investments required for achieving the SDGs across the EU. According to the Report, the European governments should further empower the EU to raise its own resources. By empowering the EU to borrow from the financial market, the RRF sets a historic precedent, yet it remains an isolated example. To successfully implement the SDGs, Member States should eventually "agree to raise their budgetary contributions to the EU beyond the MFF, empower the EU to issue bonds along the lines of the RFF, or entrust the EU with additional revenue sources".[39]

The SDGs provide a global framework for the future we want which should guide both Member States, in their National Recovery and Resilience Plan, and the EU, in its coordination. It is worth noting that the European Economic and Social Committee (EESC) has pushed to integrate the SDGs into all EU policies and to increasingly involve civil society in the decision-making process. Indeed, all sectors of society should be considered, in order to ensure that the interests of minorities, lower-income households and peripheral regions are taken into account. The SDGs therefore, much more than defining specific targets, become a tool for solidarity: the "leave no one behind" principle should lead the implementation of each and every SDG. Energy poverty, for instance, is a prior issue when addressing inequality, poverty, and unaffordability.

Nevertheless, questions should be raised on how the EU and its Member States, in applying policies consistent with the SDGs, intend to address the remaining inequalities present both within and across countries in Europe. When measuring the level of inequality within countries, the Leave no one behind (LNOB) Index,[40] introduced by SDSN's Europe Sustainable Development Report 2020, depicts Europe as "the 'most equal' continent"[41] while, at the same time, some specific indicators move in the wrong direction. This is the case of the share of people in work but at risk of poverty, which increased in the EU between 2010 (8.6%) and 2019 (9.3%).[42] Regarding inequalities across countries, the Report points out that European countries diverge widely in achieving the goals set by some SDGs. The largest spread in performance concerns SDG9 (Industry, Innovation, and Infrastructure), but also SDG4 (Quality Education), SDG7 (Affordable and Clean Energy) and SDG10 (Reduced Inequalities) see a significant divergence across countries.[43] In addition, consistent implementation of the SDGs should also focus on how to close the gap between capital cities on the one hand, and rural areas on the other. However, all of these reflections lead us to the most important question: how should these inequalities be addressed in the context of the COVID-19 pandemic? It seems all policies implemented so far need to be revised in order to assess their resilience against climate and environmental shocks. Indeed, if the 2020 Sustainable Development Goals Report shows that, until the pandemic, the EU general trends toward the achievement of the SDGs by 2030 were overall positive,[44] the challenge is now maintaining the same trends in spite of the crisis.[45] However, individually assessing each of the 17 SDGs becomes complicated when considering the various and broad domains covered can easily lead to overlap and trade-offs. A systems approach, such as the Six Transformations (Sachs et al., 2019), allows for better performance assessment and full coherence across all SDGs.

In facing this double challenge of driving the energy and climate transition while recovering from the pandemic, sustainable finance can surely play a pivotal role. This essentially means that financial decision-making, while supporting economic growth, should also take into account sustainability and social considerations. Sustainable finance has firstly found its concretization in the Action Plan on Sustainable Finance issued by the Commission in March 2018. Subsequently, in light of the EGD adoption, important initiatives have been taken to direct both public and private investments toward a truly sustainable direction. Firstly, the EU Taxonomy Regulation entered into force in July 2020, providing a clear and common definition of "environmentally sustainable" economic activities and setting a framework for an EU green classification system. In order to be considered environmentally sustainable, economic activities must contribute substantially to one of six environmental objectives: 1) climate change mitigation, 2) climate change adaptation, 3) the sustainable use and protection of water and marine resources, 4) the transition to a circular economy, 5) pollution prevention and control, and 6) the protection and restoration of biodiversity and ecosystems.[46] On 21 April 2021, the European Commission published a first delegated act, setting out the technical criteria for economic activities to contribute to the objectives of climate change mitigation and adaptation.[47] A second delegated act for the remaining objectives will be published in 2022.

Then, the Commission also announced the creation of a Renewed Sustainable Finance Strategy and a series of stakeholder consultations have taken place between April and July 2020. It is interesting to note that this strategy will be shaped during the health system crisis: here, financial support for economic growth must therefore meet the need for sustainable recovery. Furthermore, it is worth mentioning that the Renewed Sustainable Finance Strategy will also set clear parameters for the Green Bond Standard and define its legal nature. Green bonds, which are debt instruments to finance climate and environment-related projects, can be issued both by governments and private companies. One issuance, amounting to €750 million and with a maturity horizon of 5 years, took place in 2020 as the COVID-19 pandemic evolved, and it is targeted to finance renewables in Mexico[48] and the UK. In Greece, the National Bank of Greece issued

in 2020 a six-year Green Bond and raised €500 million to fund green economy projects such as hydropower, wind parks, and photovoltaic parks. Among private companies, Enel has been a pioneer in launching in September 2019 the world's first "general purpose SDG linked bond", with an interest rate linked to SDG 7 and to the Group's ability to achieve, by December 31st, 2021, a percentage of installed renewable generation capacity (on a consolidated basis) equal to or greater than 55% of total consolidated installed capacity.

Achievements and Challenges of the EU Energy and Climate Action

EU action in the energy and climate domain has clearly evolved during the years, through an incremental process that resulted in an expansion of the EU competencies and policy tools on these subjects. This resulted in some remarkable achievements that made the continent the global leader in the energy transition domain. While the EU has thus seen its prerogatives extended and improved, it however still lacks a strong unified approach. This weakness is, in fact, attributable to misaligned interests and priorities that vertically cross all levels, from EU down to macro-regional, national and local, and that sometimes become difficult to streamline despite institutional efforts. Among these, political-electoral priorities of government and lawmakers (often adopting short-sighted policies to maximize electoral returns), industrial and occupational interests, social and local acceptance concerns, and bureaucratic and administrative inefficiencies should certainly be mentioned. The sum of these factors, present at every level, ends up slowing down the entire process of energy transformation in the EU, which is already complex in itself. To get a sense of how those political and economic variables contribute to shaping the overall European energy policy, we focus on their EU, national and local level impact.

Starting from the national level, where the resonance of the conflicting parties is greatest, this situation is reflected in some National Energy and Climate Plans (NECPs) submitted by governments to the European Commission. Some degrees of inconsistency between national policies as well as between EU and national energy action contained in the plans are due to the fact that, while there is substantial agreement on the overall EU objectives for the future, there is still great diversity in national energy systems. Indeed, in order to preserve the interests of national stakeholders, Member States tend to make full use of the sovereignty over decisions regarding their national energy mix. This prerogative, guaranteed by Art. 194 of the Lisbon treaty, allows Member States to act to ensure their energy security, to protect their internal energy sector and to promote socio-economic national and local interests (e.g. sectoral occupational levels). Therefore, the EU's (albeit growing and improved) role in this area has nevertheless been limited, as a result of the shared competencies between European Institutions and its Member States, resulting in hindering and delaying policy enforcement, as in the case of the creation of the single European energy market. National governments, indeed, are in charge of translating into practice specific energy policy objectives adopted at the EU level, transposing directives and implementing internally European rules.[49]

To summarize, while the energy and climate policies of the EU have evolved so far and therefore bode well, it is clear how misaligned the interests of national stakeholders are in the various countries. The performances of the EU and its Member States against the 2020 energy and climate targets is a case point, with positive results obtained at the bloc's level accompanied by significant differences (and delays) at the national one. Looking at the emissions target, since 1990 the EU has been able to reduce its GHG emission level by 24%, well above the 20% agreed in the 2009 package. However, according to preliminary estimates provided by the EU, in 2020 emission levels remain greater than national annual targets in 12 out of 27 European countries.[50] Similar results apply to the renewables target, with data suggesting that the EU-27 achieved a total share of energy consumed from renewable energy sources of 19.4 % in 2019,

being on track to the 2020 target of a minimum 20 % share. But, still 14 Member States[51] lag behind and need to make significant efforts to reach their 2020 target levels. The situation is particularly critical in the energy efficiency domain, where even the EU as a whole risk not meeting its overall target, given the fact that only 9 Member States[52] out of 27 are on track toward their respective 2020 final energy efficiency targets. This raises concerns for the implementation of the European Climate Law, which sets a legally binding target for the EU to achieve carbon-neutrality as a whole, rather than in each Member State. While this provides the flexibility to reduce carbon emissions at the lowest socio-economic costs, the lack of accountability at the Member States level may hinder its effective implementation. The Climate Law foresees an assessment by the Commission of the consistency of national measures with the reduction targets, and the possibility to formulate recommendations in case of inadequate national measures.[53] However, these recommendations are not binding and the Regulation explicitly allows Member States to disregard them, as long as a reasoning is provided.

This complexity is reflected in the institutional debates and dynamics at the Council of the EU, where the policy proposals of the Commission are negotiated by Member States. Here, the level of ambition is generally revised and balanced according to the different priorities, interests and sensitivities of national representatives. Such "conservativism" of Member States, and especially of the most reliant on coal, is often counterbalanced by the European Parliament, which is traditionally progressive in terms of energy, climate and sustainability policies, but whose decisional powers are constrained in the current institutional setting of the EU.

Finally, the local level also rises in importance, as regions, cities and local administrations in Europe often have power over critical energy areas, such as transport, energy efficiency of buildings or renewables development. On the one hand, a supplementary layer for decision-making and policy-implementation risks to add complexity and slow down the effectiveness of the transformations promoted by the EU. On the other hand, however, local actors often proved to be progressive vis-à-vis energy and sustainability policies, as demonstrated by the close link with the European level they have established through the Covenant of Mayors, signed by more than 7,300 entities, cities and regions of all sizes committing to implement the EU energy objectives in their jurisdictions.

The difficulties encountered at the various levels, however, have not prevented the EU from winning important victories. For example, the EGD recalls that the EU has been able to pursue economic growth and reduce emissions: between 1990 and 2018, emissions have been reduced by 23% while the economy had grown by 61%.[54] Likewise, the "progress on clean energy competitiveness report" underlines that "in terms of GDP, the clean energy sector is gaining importance in the EU economy, whereas the importance of conventional energy sources is decreasing."[55] The EU industry, in particular, benefits from a first move advantage in wind, green hydrogen and ocean technologies while the smart grid industry is expected to significantly increase over the next decade.[56] As for the socio-economic side of the energy transition, the indicator of energy poverty evolved favourably on average in 2010-2018.[57]

The Importance of Governance for Implementing the EU Energy and Climate Policy

If EU energy policy has so far been described in chiaroscuro terms, we however would like to offer a view in which the various nuances, taken together, are a richness to the whole picture. In particular, while the heterogeneity of interests at all levels may create complexity, they should nevertheless be seen as a valuable resource for the EU. National differences, for instance, should not be perceived simply as an obstacle or a challenge to greater EU energy policy ambition but should rather be used as an opportunity for a coherent European action in this domain and for ensuring cost-efficiency in implementing energy and climate policies. Indeed, we can take advantages of those solutions that are less costly and whose potential remains high. Twenty-seven diverse voices are a real asset for Europe if their strengths can be combined in a coordinated and constructive manner, becoming concrete factors to promote mutual cooperation and to reduce common vulnerabilities. Already in the framework of the Energy Union, as said above, the EU equipped itself with new governance schemes that might help institutions to increase their policy-guidance and their leverage on Member States, while urging the latter to adopt more responsible behaviours and more effective policies. Now, this effort becomes essential in light both of the definition of the 2030 and 2050 energy and climate targets and the adoption of the European Green Deal, which significantly increased the level of ambition and broadens the scope of the EU action, requiring greater compliance, alignment and commitment from national governments.

As previously highlighted, in addition to the more stringent climate goals, the EGD also connects the European energy policies to a broader set of sectors and subsectors that have direct and indirect impact on the EU energy performances. While there is the risk that the EU energy action will be fragmented across sectors, the EGD offers the opportunity to overcome silo approaches, exploit synergies and address energy issues from a holistic perspective. Indeed, as the "2020 report on the State of the Energy Union" reminds, the "Energy Union objectives are clearly intertwined with the broader objectives of the Green Deal."[58] A multi-level governance system coordinated by the EU and creating a dialogue between different interests and stakeholders, as envisaged by the governance of the Energy Union, should therefore be the key to make all actions converge towards an effective implementation of the EGD.

Energy, therefore, can become the pillar of a process aimed at making the entire EU socio-economic processes green and sustainable. This means to foster major shifts not only in the energy sector, but in general in the European social, economic and industrial structures. The EU and its Member States cannot afford to miss the chance to turn the energy transition into a socio-economic opportunity for Europe. In order to maximise the benefits of these historical transformations, coherent action and political efforts are needed to define an ambitious industrial innovation policy that helps European workers and businesses to lead the global clean energy race. This industrial reform should, in turn, be accompanied by innovative social schemes and economic incentives aimed at maximising societal gains such as job creation and social inclusion, eradication of energy poverty, and improving circularity and material and resource effiency, while slashing of air pollution and environmental degradation.

Given their magnitude and their impact, it is clear that the energy transition – and the related green socio-economic and industrial transformation — cannot be implemented exclusively at the national level. EU-wide supervision is therefore required to align (and possibly exploit the synergies of) the multitude of green industrial policy initiatives — generally not coordinated, possibly even in conflict – developed at the regional and national levels. A lack of level playing field and a fragmented EU single market for green technologies, applications and services would indeed prevent European companies from scaling up in the way that their United States and Chinese competitors do on their domes-

tic markets, with negative industrial, socio-economic and environmental effects. This becomes even more important, considering the huge financial commitment of the EU institutions in order to meet (and benefit from) the extraordinary transformations currently in place.

Indeed, EU investments are fundamental for financing and realising the green transition, including by mobilising funds from national budgets and the private sector. As recalled, the decision to devote 30% of the EU 2021-2027 budget and 37% of Next Generation EU funding to climate action and energy transformation is an unprecedented push to enhance political engagement at the national level and incentivize policy implementation. The availability of these funds will — along with supporting the post-Covid19 recovery — put the sustainable transformation of the energy sector at the core of the European reconstruction process.

This is something exceptionally new, which has no comparison in the previous European efforts to implement energy policies and transform the European energy sector. The availability of recovery funds focused on energy policies, along with the great emphasis put by the EGD on the socio-economic implications of the energy transformation (social inclusion, job creations, just and fair transition, energy equity) offer clear and unprecedented incentives for Member States to all act in the same directions. However, the availability of these funds determines also a number of risks, such as rent-seeking and political capture to increase popularity and support at the domestic level. In this context, effective European governance mechanisms — which go beyond administrative monitoring and reporting — appear necessary to address these risks, by defining a clear set of targets and milestones and well-structured procedures of accountability and transparency. The research and innovation community could be involved and contribute to a science-based, transparent assessment procedure, enhancing the science-policy interface.

2. Implementing the EGD through the Six Transformations

System Transformational Change: An Opportunity for the EGD

As seen, the SDGs and the Paris Agreement call for deep transformations in every country that require complementary actions by governments, civil society, science, and business. While significant progress is being made on some goals, no country is currently on track towards achieving all SDGs according to SDSN's 2021 SDG Index.[59] Also, many scientific articles have been published which highlight both the synergies and trade-offs in addressing various SDGs, for example the growth of agriculture outputs versus the adverse effects that fertilizers have on local waterways and marine biodiversity. A systemic approach must be taken in order to identify and minimize these tradeoffs if any country is going to achieve the SDGs. The EGD acknowledges the need for a systemic approach in its introductory text, as highlighted in section 2.1 where it calls for "designing a set of deeply transformative policies". In this context, we will apply the learnings from the paper "Six Transformations to Achieve the SDGs"[60] which was published in August 2019 in the journal Nature Sustainability[61] as well as SDSN's 2020 Europe Sustainable Development Report, as both papers offer an interpretive key to systemic transformations.[62]

As described by one of the paper's primary authors Nebojsa Nakicenovic, "The six transformations provide an integrated and holistic framework for action that reduces the complexity, yet encompasses the 17 SDGs, their 169 Targets and the Paris Agreement. They provide a new approach to shift from incremental to transformational change; to identify synergies using sustainable development pathways; formulate actionable roadmaps; and a focus on inter-relationships to uncover multiple benefits and synergies". By understanding how to link and address multiple goals within a comprehensive framework, a country or business can develop more robust pathways and more efficiently apply resources to make progress on sustainable development efforts.

System Transformations is becoming popular jargon among governments and multilateral agencies who are working to address some of the most pressing resource and environmental challenges ever faced by humankind, as our growing population continues to push beyond our planetary boundaries.[63] However, given the gravity and scope of the challenge at hand it is imperative that this terminology be strictly defined and applied. In order for a solution or effort to be transformational, it requires the underlying causation of a problem to be identified and addressed with a comprehensive set of solutions, not simply the resolution of the symptoms. Additionally, systemic transformation requires that something be progressive, systemic, and long-term. The globalization of the world economy no longer allows for short-sighted policy planning given the actions of any one country can and often does impact the economy, environment, or society of others due to integrated global markets and supply chains. Further, the challenge of climate change extends beyond borders. Nations must share in the responsibility to balance and manage the global carbon budget which has significant implications for our energy systems and land use strategies. Therefore, we now require more comprehensive policy which can address various challenges and targets while minimizing the negative spillover effects within and among countries.

A key aspect of the six transformations methodology is to link and group efforts together in new ways in order to maximize impact, identify conflict, and ensure that progressive efforts are pursued to make the best use of available resources and time. According to Sachs et al. (2019) SDGs can be categorized into transformations by following these five rules. The Transformations must be: 1) mutually exclusive and collectively exhaustive; 2) systems-based; 3) aligned with government organization; 4) easily communicable; 5) few in number. Further, in order to design strategies to support these transformations, each transformation must 1) set transformative, quantified, time bound targets; 2) design long-term pathways and intermediate strategies in collaboration with key stakeholders; and 3) strengthen monitoring mechanisms. These three aspects should be carefully considered as the EU formalizes its implementation processes for realizing their EGD goals. No transformation or goal can be realized if efforts cannot be measured, tracked, and calibrated.

The Six Transformations and the EGD: Focus Area

European institutions recognize the importance of undertaking a holistic and cross-sectoral approach to implement the EGD successfully. In particular, the social and economic dimensions of the Green Deal are critical for pursuing the SDGs without leaving anyone behind. For this reason, it will be important to consider the Six Transformations (Sachs et al., 2019) with equity in mind: equity within-countries; equity across EU Member States; and equity between generations.

As described in detail in the 2020 Europe Sustainable Development Report,[64] several EU specific transformations are covered by the EGD such as: education, skills, and innovation; sustainable energy; sustainable food, land, and ocean use; sustainable communities, mobility, and housing; and a clean and circular economy with zero pollution.[65] These transformations are closely related and must be coordinated, but they are also sufficiently distinct to be designed and implemented in parallel. By grouping the policy priorities together, synergies among efforts can be identified, and trade-offs minimized. Further, by grouping various policy areas together in the transformation matrix, new linkages between specific industries, sectors, and government agencies can be identified to ensure that joint-planning is accomplished and resource efficiencies are achieved. In this context, it should be noted that not all transformations are covered by the EGD, such as the transformations in gender equality or health. While the Leave No One Behind principle allows to address some of the trade-offs between the EGD and other transformations, an integrated strategy would enable the EU to fully exploit synergies and minimize trade-offs. With the EGD only partially covering the six Transformations, coordination with other Commission portfolios will be crucial in the implementation of the EGD. For example, the efforts of European Commissioner Helena Dalli in the area of equality can play a key role in the implementation of the Leave No One Behind principle, if closely coordinated with the initiatives under the EGD. This applies particularly to the energy transformation, where decarbonization can help to tackle inequalities, for example in terms of access to energy, if synergies are properly harnessed and effective policy measures implemented, or reducing the health gap, if we consider the negative consequences of local pollution.

The sustainable energy transformation aims to promote energy efficiency, achieve zero- carbon power generation, decarbonise industry, and create new jobs. Long-term frameworks are critical to advance in this transformation. This underlines the importance of the European Climate Law (see pag. 4), as this legislative decision can ensure continuity in the years ahead, incentivising long-term investment decisions. Such investments are needed, notably to develop an integrated power system for the EU. The EGD rightly emphasises the need for such integration and several technical analyses exist, such as the European Commission's "A Clean Planet for All".[66] Smart integrated power grids will reduce the need for Europe to build additional power-generation capacity. For example, Southern

Member States have an advantage in generating solar power and could supply electricity to their Northern partners. However, as seen, current investments in renewable power generation and smart distribution systems do not yet reflect this European vision of an integrated power system. More emphasis should be placed on burden-sharing and competitive advantages across the EU, moving away from an energy system dominated by national considerations, to an EU-wide integrated system.[67] The Trans-European Network-Energy Regulation, as part of the EGD, will be a crucial step in this direction. At the same time, the EU Just Transition Fund can play a key role in ensuring that the transformation to an integrated energy system is not only systemic, but also fair and inclusive.[68] This is all the more important as this transformation is likely to affect certain regions and sectors more heavily than others, such as the coal and heavy industry sectors. The transformations should be designed as such that particularly the poor and marginalised are supported and that the effects on these groups are compensated.

In this context, the "E-quality" study carried out in 2020 by Enel Foundation and Eurelectric provides important recommendations that should be put in place to avoid the increase of inequality in Europe and to reverse the regressive effects of the decarbonisation policies needed to achieve the goal of carbon neutrality by 2050.[69] Firstly, recycle carbon pricing revenues to reduce indirect taxes, such as value-added taxes or taxes on electricity can help ensuring that the most vulnerable groups do not carry an unequitable share of the financial burden; in alternative, these revenues can be used as direct lump-sum refunds. A second policy option is to target energy efficiency measures, whose upfront investment costs are usually unaffordable for low-income households: in this way, the social group targeted by this fund can benefit in terms of reducing energy consumption and thus the related costs. The study also proposes preventive measures such as the implementation of retraining and upgrading programs for workers, in particular for those employed in industries most affected by decarbonization policies. Finally, innovative low-carbon technologies should be incentivized both by subsidies funded through general taxation and by funding from carbon revenues.

In this vein, the Commission is proposing a Social Climate Fund to support vulnerable households. This fund will be financed with the revenues from the proposed future separate ETS on transport and buildings, as proposed by the Fit For 55 Package of July 2021.

Policy Recommendations to Successfully Implement the EGD

The technologies needed to clean up Europe's energy grid are known and the role of smart technologies and the internet of things provides huge opportunities for considerable efficiency gains and interconnection. However, a rapid scale up of the project pipeline and the flow of investments into the necessary infrastructure should be the focus in the years ahead. A comprehensive pathway to understand the capacity goals needed from various technologies will be a key part of the strategy to accelerate this transformation, in addition to progressive policies that ensure proper incentives. With an EU-wide pathway, Member States should ensure that their National Climate and Energy Plans are aligned with and instrumental to an EU-wide strategy in line with the Paris Agreement's objective of limiting global temperature rises to 1.5 degrees Celsius above pre-industrial levels.

In this context, more headline attention should be placed on benchmarks for the technological and systems changes needed to transform Europe's economy and energy system in line the Paris Agreement's objective. Such benchmarks have strong scientific support and can play a critical role in driving Europe's industrial strategy and sector transformations.[70] For example, in the Fit For 55 Package, the European Commission proposed a phase-out for the registration of new light-duty vehicles that are not carbon neutral by 2035. The construction of new fossil-fuel power plants should stop immediately and existing phase-out plans for coal power

must be accelerated. These time-bound benchmarks should be integrated into Europe's New Industrial Strategy for the SDGs.[71]

Besides the internal policy issues outlined above, Europe should also take into account international spillover effects for its energy strategy to become truly transformative. As the Europe Sustainable Development Report notes, the Commission has not put forward targets for the international dimensions of the Green Deal and has done little to ensure coherences across internal and external policies.[72] Negative spillover effects of Europe's economy and energy system should be limited, while the positive spillover effects of the EGD should be maximised through Green Deal diplomacy. In doing so, the EU should support other regions in their transformation towards sustainability. A positive example is certainly given by the Africa-EU Green Energy initiative, launched by the Commission as part both of the EGD and of the Africa-EU Energy Partnership launched in 2007. However, three broad sets of action should still be undertaken by the EU to fully address the international dimension of the EGD:

- Policy coherence should be sought across trade, investment, development cooperation, and industry regulation to promote sustainable supply chains and reduce negative spillovers. Such coherence should be a central pillar of the EU Strategy for Energy System Integration, the Farm to Fork Strategy, the Circular Economy Action Plan, and other components of the EGD.
- The EU should strengthen tax cooperation and transparency, as the loss of tax revenues is one of the most pervasive negative SDG spillovers in both developed and developing countries.[73] In this regard, new tools may be needed to ensure a level playing field with international competitors, such as a Carbon Border Adjustment Mechanism. If differences in levels of climate ambition worldwide persist, such measure could lessen the risk of carbon leakage in the EU's Emissions Trading System.[74]
- The EU and its Member States should lead by example by applying domestic standards to its exports too. Many European countries export agricultural chemicals that are banned inside the EU and this is inconsistent with the commitment to achieve the SDGs worldwide.[75]

Given the growing international competition and demand for clean energy technologies, there is a massive opportunity for the EU to continue as a global leader in these markets. In addition to an improvement in the policy tools we already have available, an advancement in the European Industrial Policy is needed to realize the energy transformation needed. Given the scale of the opportunity at hand globally, there is an equally large need for research, development, demonstration, and deployment (RDD&D) budgets. As the 2020 Europe Sustainable Development Report points out, 'the proposed New Industrial Strategy for Europe rightly identifies the digital revolution, alongside the transition to climate neutrality, as the defining challenge and opportunity for securing long-term well-being and prosperity in Europe.' Digital and clean energy technologies are indeed essential for implementing the EGD and achieving the SDGs, for example through m-health, e-learning, e-government, digital finance, precision agriculture, artificial intelligence for novel materials, and so forth.[76] With the U.S. and China making up the majority of large-scale tech companies, European firms will need to be strategically supported throughout the EU in order to make room in the advanced clean technology industries. For example, Tesla — the leading producer of plug-in electric vehicles — is now more valuable than Volkswagen, the largest carmaker in the EU, showing the potential disrupting effect of new technologies on established industries. Supporting European technology companies, for example through public-private partnerships for RDD&D, will require a shift in mindsets for the EU's state aid and competition rules, from an intra-EU competition perspective to a more global context.[77] Integrated public-private strategies, for example in the form of Important Projects of Common European Interest (IPCEIs), can play a crucial role in this regard, in addition to research funding under the Horizon Europe programme.

It should be noted that, in addition to a comprehensive review of policies and investments in RDD&D, investments in training, education, and public awareness will be critical to leave no one behind in the transformation. The New Industrial Strategy for Europe identifies key industries and technology areas, including renewable power, robotics, microelectronics, high-performance computing and data cloud infrastructure, blockchain, quantum technologies, photonics, industrial biotechnology, biomedicine, nanotechnologies, pharmaceuticals, advanced materials and technologies.[78] It will be critical for European research and knowledge institutions to be on the cutting edge of research, education and training in those areas, by tailoring these activities to the needs of the future we want. Simultaneously, detailed pathways are needed to facilitate the demand for these jobs and the growth of these sectors across Member States and into the decades ahead.

The EGD marks a significant step towards implementing elements of transformative change, by including numerous sectors into a comprehensive strategy. In this regard, it is noteworthy that the European Climate Law includes an obligation for the European Commission to 'assess any draft measure or legislative proposal in light of the climate-neutrality objective'.[79] While this enables policy coherence across sectors and branches of government (horizontal), coherence should also be sought between levels of government (vertical) and through time (temporal).[80] In terms of vertical coherence, it will be critical that the implementation of the Deal is coordinated at the local, national and EU level to ensure that targets, trajectories, and pathways are aligned and that gaps are avoided across strategies. SDSN Europe's Senior Working Group for the Energy Transition has recently published a report, identifying exactly these overlaps and gaps between the EGD, the SDGs, the European Semester and the RRF.[81] The report found that a number of issues identified by the 2020 Sustainable Development Report as major or significant challenges in implementing the SDGs are not yet captured by European Commissions Country Specific Recommendations (CSRs), issued to each Member State in the context of the European Semester. The European Semester is a yearly cycle of economic and fiscal policy coordination within the EU. It allows EU Member States to discuss their economic and budget plans with the Commission and monitor progress at specific times throughout the year. Since 2019, the Commission has repeatedly stated that the European Semester will be refocused into an instrument that integrates the SDGs in the process.[82]

By refocusing it towards the SDGs and the 6 Transformations, the European Semester process can play a central role to coordinate actions at EU level and across Member States. Firstly, the Semester allows the Member States to align their macroeconomic policies with broader transformations, including the transformation towards energy decarbonization. This increases policy coherence at the level of the Member States, where most investments and accompanying policies are designed and implemented.[83] Secondly, the Semester allows to coordinate and monitor policies across the EU. This enables Member States to work together on common challenges and opportunities such as the installment of cross-border infrastructure, e.g. power grids.[84] It also enables the Commission to ensure consistency in targets across Member States and to flag areas in which the sum of national ambitions might fall short of EU-wide objectives.[85] Thirdly, the Semester process has the potential to involve stakeholders, including civil society and academia, in the coordination of transformational policies through multi-stakeholder consultations.[86] Besides the National Energy and Climate Plans, the European Semester thus has the potential to guide and coordinate efforts in the energy transformation.[87]

In the context of the COVID-19 recovery, the European Semester has become intrinsically linked with the RRF. The assessment of the Member States' recovery and resilience plans will be checked against the country-specific recommendations, with the result that the plans should also explain their alignment with the SDGs. The financial incentives of the RRF should give the European Commis-

sion additional leverage to promote the integration of the SDGs into the Semester process.[88] The national recovery and resilience plans, submitted in the context of the RRF, present a window of opportunity to align large-scale public investments with long-term transformations. In this regard, attention should be paid to the issue of policy coherence through time (temporal coherence). In many Member States, the time-pressure for developing a national recovery and resilience plan has come at the cost of stakeholder engagement and the involvement of the public in the preparations for the plan. However, these types of engagement are crucial to ensure the necessary societal buy-in for the temporal coherence of the recovery plans, and the transformations addressed by it. This experience should offer lessons for the further implementation of the EGD: in order to ensure societal buy-in and long-term public support for the transformations of the EGD, multi-stakeholder engagement and public discussions should be guaranteed. The European Climate Pact is a welcome initiative to this end, yet should be complemented by structural engagement of stakeholders in the design and implementation of EGD policies.

While there has been progress on ESG metrics and reporting in the financial industry, greening the financial sector will not come about on its own and new mechanisms for 'patient' financing need to be developed.[89] At the Member State level, national budgets and investments can play a key role. However, this requires coordination with other Member States through the European Semester, especially for the integrated energy grid and decentralized clean power sources. Additionally, the European Central Bank (ECB) has set up the climate change centre to strengthen and bring together the banks work on climate.[90] This is just one step in mobilizing the capital needed for the energy transformation. But it is a step in the right direction towards clean, affordable and reliable energy.

In light of the capital needed for the energy transformation, the importance of the EU taxonomy on sustainable finance cannot be overstated. By providing a uniform definition of 'environmentally sustainable' economic activities, the taxonomy allows investors to direct long-term investments and capital flows into a sustainable direction. With the adoption of a first delegated act, setting out technical criteria for economic activities contributing to climate change mitigation and adaptation, the Commission has provided guidelines for both financial stakeholders and governments in other regions to support the shift to sustainable finance. However, this exercise has also shown the highly politicised, and precarious nature of the taxonomy. Natural gas, nuclear energy and the agricultural sector were left out of the scope of the delegated act, due to their controversial nature, which leaves companies in these sectors at risk of losing access to the financial resources needed for the transformation towards sustainability.[91] On the other hand, bioenergy and forestry were included in the scope, which NGOs claimed are against the science-based recommendations of the Technical Expert Group (TEG). Consequently, a group of NGOs have suspended their participation in the European Commission's Sustainable Finance Platform, responsible for informing the design of the taxonomy.[92] This indicates the challenge of ensuring an appropriate science-policy interface, essential for safeguarding the coherence and sustainability of the transformation ahead.

3. Applying the Six Transformations Framework to Achieve the EGD Objectives: The Case of the Italian National Recovery and Resilience Plan

This section is an analysis of the Italian National Recovery and Resilience Plan[93] (hereinafter "NRP"): it highlights how the NRP has been designed to recover from the socio-economic crisis caused by COVID-19 and designed to achieve the objectives of the EGD at the same time. In particular, we intend to illustrate how the NRP operationalizes climate action and some of the SDGs along the Six Transformation framework.

The Plan defines six areas of intervention, just as there happen to be Six Transformations put forward by Sachs et at. Such interventions, called Missions, are respectively 1) digitalization, innovation, competitiveness, culture, and tourism; 2) green revolution and ecological transition; 3) infrastructure for sustainable mobility; 4) education and research; 5) inclusion and cohesion; 6) health. These Mission can be seen as the local translation of the six Transformations: they cover all main components of the six Transformations framework, while taking into account the local needs in Italy. By defining six overarching Missions, the Italian Recovery and Resilience Plan provides an example of a transformational approach, where synergies can be exploited and trade-offs minimised.

In a truly systemic transformative approach, the NRP also identifies two horizontal reforms of cross-cutting interest to all the Plan's Missions (the reform of the Public Administration and of the Judiciary system) and measures how all these Missions transversally have an impact on women, young people, and regional socio-economic gaps (between Northern and Southern Italy). Also, worth mentioning are those measures aimed to ensure the implementation of the Plan (the so-called "enabling reforms") which intend to remove those administrative, regulatory, and procedural bottlenecks that affect economic activities and the quality of services provided.[94]

If we analyse the NRP through the lens of the Six Transformation approach, we can observe that, while Transformation 3 (energy decarbonisation and sustainable industry) can be immediately mirrored in Mission 2 ("Green Revolution and Ecological Transition"), all Missions of the Plan are characterized by a great attention to the issue of "sustainability". An evident example is given by Mission 3, dedicated to "infrastructures for a sustainable mobility", which intends to make the Italian infrastructural system in line with the EGD and more specifically to the "Sustainable and Smart Mobility Strategy – putting European transport on track for the future"[95] approved in December 2020. Among other reforms, this Mission intends to improve both the climate and seismic resilience of bridges and viaducts as well as reduce pollutant emissions from ports. A second example is evident in Mission 5, devoted to "inclusion and cohesion", which includes the launch of an innovative programme on quality of housing. Precisely, the Plan intends to construct new public housing facilities and redevelop degraded areas focusing mainly on green innovation and sustainability. Overall, 40% of the funds in the Plan are dedicated to investments to combat climate change, 27% to digitalisation, and more than 10% to social cohesion.[96] Interestingly, the examples provided already illustrate how the various measures in the Plan are able to respond simultaneously to many of the Six Transformations. A closer look at a few of the Missions below will further exemplify this.

Focusing now on Mission 2 (green revolution and ecological transition), it is worth mentioning the investments estimated by the Plan to increase the share of renewable energy. Italy's current renewable energy target for 2030 is 30% of final consumption, however this will certainly be raised by the ongoing revision of the current NECP to align with the new climate targets set by the Commission. Besides acknowledging that Italy can leverage the abundance of renewable resources available, namely wind and solar, and with mostly mature technologies, the NRP points out the main measures to be taken. On the one hand, it is necessary to unlock the potential of utility-scale plants, which are already cost-competitive with fossil fuels but still require reforms of authorisation mechanisms and market rules, as well as enhanced development of agro-voltaic opportunities.[97] On the other hand, the development of energy communities and small-scale distributed systems should be accelerated.[98] Finally, the Plan encourages several innovative solutions, such as integrated and offshore solutions.[99] The idea is to combine technologies with high development potential with more experimental technologies (such as systems that exploit the wave motion), innovative designs and integrated with storage systems.

All these measures constitute the cornerstone of Transformation 3 (energy decarbonisation and sustainable industry), but for such Transformation to be implemented in practice and within a reasonable timeframe, the Plan put forward a specific programmatic "pathway" to operationalize specific solutions. As a first line of action, the NRP proposes to draw a reform to simplify authorisation procedures and permitting for renewable energy installations and make them homogeneous throughout the country. This also includes the introduction of a new legal framework to support renewable energy production and the extension of the existing support schemes both in terms of time and eligibility.[100] In the second line of action, the NRP aims to foster domestic and foreign investments in Italy, strengthening existing partnerships and promoting new ones, in search of innovative solutions that are increasingly smart and efficient. Through the integration and coordination of energy management applications, the aim of such solutions is to improve and act more quickly on various processes to achieve, for example, benefits on energy security, energy efficiency and energy savings.

Special attention is given to a third line of action regarding digitalisation and technology as key-enablers of sustainability development, in line with Transformation 6 (digital revolution for sustainable development, in line with Transformation 6 (digital revolution for sustainable development). Indeed, the Plan intends to upgrade[101] and digitalise the electricity grid infrastructure in order to accommodate the increase in production from renewable sources reducing bottlenecks, but also to improve resilience to increasingly frequent extreme weather phenomena characterising the "New Normal".[102] Other investments are aimed at promoting competitive supply chains in renewable generation technologies (e.g., innovative PV modules, new-generation, and medium-to-large wind turbines) in order to reduce dependence on imports. Green energy technologies will open the door to more jobs: this is much needed in a country whose unemployment rate is the highest of Europe (around 11% in 2021)[103] and where socio-economic inequalities persist; in addition, as recently reported by the ISTAT, the percentage of women losing their jobs in 2020 is almost double with respect to the men:[104] the rise of gender inequality is another inauspicious consequence of COVID-19 that must be addressed by the NRP. New investments in the energy transition could then have important social implications, contributing to Transformation 1 (education, gender and inequality).

Renewables in the NRP also contribute to Transformation 5, which has sustainable cities and communities at its core. For instance, the NRP takes great account of small municipalities, which often suffer from depopulation. In order to support their economy and strengthen social cohesion, specific investments are intended to promote renewable energy for both self-consumption and energy communities — defined as "a way to 'organise' collective energy actions around open, democratic

participation and governance and the provision of benefits for the members or the local community".[105] According to the Plan, this investment aims to secure the resources needed to install around 2,000 MW of new electricity generation capacity in a distributed configuration by renewable energy communities and self-consumers of renewable energy acting jointly.[106] Still in the frame of Transformation 5, the Plan also pays much attention to large urban areas to make them healthier and greener. Among other measures, it aims to develop more sustainable local transport, including an adequate network of public electric charging infrastructure (development of 7,500 charging points on motorways and around 13,750 charging points in town centres).[107] Interestingly, technologies to promote sustainable mobility in cities, e.g. batteries for the transport sector and electric buses, are located at the intersection of Transformation 3 (energy decarbonisation and sustainable industry), Transformation 5 (sustainable cities and communities) and Transformation 6 (digital revolution for sustainable development). Therefore, the NRP demonstrates that it is able to address interconnected challenges in a truly systemic approach.

An important role within the Mission 2 (green revolution and ecological transition) is reserved for hydrogen and, specifically, for the green hydrogen. Italy, in line with the European Hydrogen strategy, intends firstly to develop flagship projects for the use of hydrogen in hard-to-abate industrial sectors,[108] starting with the steel industry and, secondly, to foster the creation of "hydrogen valleys" in areas with brownfield sites.[109] Although the hydrogen transition is part of Transformation 3 (energy decarbonisation and sustainable industry), its implications will to a large extent involve other Transformations: with hydrogen deployment, the Plan aims to develop skills and new technologies in a competitive way, thus responding to Transformations 6 (digital revolution for sustainable development) and 1 (education, gender and inequality). However, recognizing that this energy carrier is a novelty in the energy landscape, the Plan foresees that a gradual "pathway" is needed to achieve the hydrogen transition, consisting of two main reforms. The first concerns administrative simplification and regulatory reform to enable hydrogen deployment, while the second reform aims to introduce measures to promote hydrogen competitiveness, such as fiscal incentives to support the production of green hydrogen.[110]

Still in full line with Transformation 3 (energy decarbonisation and sustainable industry), Mission 2 also includes energy efficiency and renovation of buildings. Italian buildings account for more than a third of the country's energy consumption and most of them were built before the adoption of energy saving criteria and related legislation. Addressing this issue therefore means, on the one hand, reducing consumption and cutting CO_2 emissions[111] and, on the other, tackling Italy's exposure to seismic risk. Importantly, these kinds of reforms and investments intend to improve the population's housing conditions and alleviate the problem of energy poverty. Therefore, the principle of Leave No One Behind, encapsulated both in the EGD and in the Six Transformation Approach, also returns here in the NRP.

To enhance energy efficiency in the building sector, a pivotal role will be played by economic measures such as the financing of programmes for the energy efficiency of public buildings or the incentives granted by the "Superbonus" — a 110% tax deduction benefit for households for expenditures on energy efficiency and seismic upgrading works.[112] In particular, the bonus foresees that the costs can be advanced by the State itself, so they will not be borne by the less well-off, who will also benefit from the resulting energy savings. This instrument has therefore the potential to reduce socio-economic inequalities, which brings us back to the heart of Transformation 1 (education, gender and inequality). Importantly, the Superbonus also addresses the "gender inequality" component of this Transformation: the NRP itself argues that "housing shortages reflect differently on men and women because of their different family roles and the fact that most single-parent families are headed by women."[113]

However, the Plan also acknowledges that the implementation of the Superbonus still meets many bureaucratic obstacles, and its implementation can be successful only if it is combined with measures aimed at overcoming the non-economic barriers that are currently reducing investment choices in energy requalification interventions in buildings or slowing down the execution of works.[114]

Finally, the NRP aims to raise public awareness on the issue of climate change. The focus for the effort lies in educating citizens, especially the younger generation, on the options available for adopting more sustainable lifestyles and consumption behaviour. The educational challenge included in Transformation 1 (education, gender and inequality) will be effective to the extent that it is adequately supported not only by technological tools but also by maximum digital inclusion, both of which underpin Transformation 6 (digital revolution for sustainable development). Indeed, the NRP maps out to, firstly, develop omni-channel content on ecological transition issues (e.g., podcasts) and, secondly, to provide an open platform accessible to all that contains the most relevant educational material on environmental issues.[115] These fits within the idea of increasing public awareness and societal buy-in for sustainability issues, ensuring more long-term support for the necessary reforms.

Other countries can draw from this case study of Italy to support their efforts in developing a holistic strategy aligned with multiple objectives and goals. Societies today are connected more than ever both physically and technologically. It is up to national and local governments to revise the systems within which our communities are governed to enable and protect our connected world. Given the novel technologies being pursued and the scales of the transformations undertaken, there are sure to be missteps, unintended consequences, and unknowns yet to be known. We must follow this example from Italy, extract the replicable lessons, fill in any gaps along the way, and build on this experience to meet the goals the European Green Deal.

Endnotes

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2. With the important exceptions of the Coal and Steel Community (1952-2002) and the Euratom Treaty (1957). Energy also featured as a trans-European network in the Maastricht Treaty (1992).
3. COM. 2006. 105 final of 8 March 2006.
4. COM. 2010. 2020 of 3 March 2010. "The 2020 Energy Strategy" set, for 2020, a reduction of greenhouse gas emissions by at least 20% compared to 1990 levels (binding at the national level); an increase of the share of renewables in final energy consumption to 20% (binding at the national level); and a 20% increase in energy efficiency (indicative).
5. COM. 2014. 015 final of 22 January 2014. The "2030 Climate and Energy Framework" calls for reducing greenhouse gas emissions by at least 40% from 1990 levels (binding at the national level), increasing the share of renewable energy in total final energy consumption by at least 27% (binding at the EU level), and increasing energy efficiency by at least 27% (indicative).
6. COM. 2011. 0885 final of 15 December 2011. "The Energy Roadmap 2050" foresaw a reduction of greenhouse gas emissions to 80-95% below 1990 levels by 2050.
7. COM. 2014. 0330 final of 28 May 2014.
8. The halt of gas in June 2014 is one of the three "fronts" of the Russo-Ukrainian war, started in February 2014 with the Euromaidan revolution. The other war fronts can be identified in the annexation of Crimea to Russia (March 2014) and the conflict in the Donbass region (broke out in April 2014).
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12. COM. 2020. 80 final of 4 March 2020.
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14. 2021. Europarl.Europa.Eu. https://www.europarl.europa.eu/doceo/document/TA-9-2020-0253_EN.pdf. The European Parliament would have increased the emissions cut to even 60%.
15. 2021. Consilium.Europa.Eu. https://www.consilium.europa.eu/media/47296/1011-12-20-euco-conclusions-en.pdf .
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17. This intermediate 2040 target will be proposed by the Commission at the latest within six months after the first global stocktake carried out under the Paris Agreement, which will take place in 2023. See Council of the EU. Press Release of 21 April 2021. https://www.consilium.europa.eu/en/press/press-releases/2021/04/21/european-climate-law-council-and-parliament-reach-provisional-agreement/

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19. Ibid.
20. COM. 2020. 299 final of 8 July 2020. Powering a climate-neutral economy: An EU Strategy for Energy System Integration.
21. 2021. Ec.Europa.Eu. https://ec.europa.eu/info/sites/info/files/delivering_on_uns_sustainable_development_goals_staff_working_document_en.pdf.
22. According to the UN, the “whole of government,” “one-stop government” or “joined-up government” refers to “the movement from isolated silos in public administration to formal and informal networks.” It is “a global trend driven by various societal forces such as the growing complexity of problems that call for collaborative responses, the increased demand on the part of citizens for more personalized and accessible public services, which are to be planned, implemented and evaluated with their participation, and the opportunities presented by the Internet to transform the way the government works for the people.” United Nations. 2012. “Taking A Whole- Of-Government Approach”. https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2012-Survey/Chapter-3-Taking-a-whole-of-government-approach.pdf., 55.
23. Precisely, the “whole of government approach” that the EU intends to adopt goes from the design and implementation of deeply transformative policies, to the European Semester, the Multiannual Financial Framework and the “Next Generation EU” recovery tool, as well as better regulatory tools. It also includes policy coherence for sustainable development, EU engagement in the world, monitoring and reporting and, finally, engagement of civil society, the private sector, and other stakeholders.
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33. Ibid.
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35. 2021. Marianamazzucato.Com. https://marianamazzucato.com/entrepreneurial-state/.
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37. Jean Pisani-Ferry, “Europe’s Recovery Gamble ,” Bruegel, 2020, https://www.bruegel.org/2020/09/europes-recovery-gamble/.
38. Ibid.
39. 2020. Europe Sustainable Development Report 2020. https://s3.amazonaws.com/sustainabledevelopment.report/2020/europe_sustainable_development_report_2020.pdf
40. The Leave no one behind Index includes 29 indicators that track gaps in income and wealth across population groups; unequal access to public services and infrastructure; gender inequalities; and inequalities in access to food, health, education and other human-development measures. All indicators included in the European LNOB Index are also part of the SDG Index and Dashboards. See 2020, Europe Sustainable Development Report 2020.
41. 2020, Europe Sustainable Development Report 2020, 7.
42. Ibid.
43. Ibid, 9.
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45. To be specific, the Europe Sustainable Development Report 2020 found that progress was happening before COVID-19 on the SDGs as a whole in the EU. However, accelerated action by the EU and member states was needed, as they were off track on many targets (including SDGs12-15) and were falling behind on some others (e.g. SDG2).
46. Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32020R0852
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49. Another sector where Member States keep strong political and policy control is energy taxation. In this domain Member States can veto – in force of the unanimity vote rule applied to the subject - decisions adopted at the EU level. To be precise, the problem with energy taxation is really about the lack of a single EU tax policy, while banks in some countries - as Netherlands, Luxembourg, Cyprus, and Malta – play a role in facilitating tax evasion and transparency avoidance: 2021. Ec.Europa.Eu. https://ec.europa.eu/info/sites/info/files/dp_055_en.pdf.
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51. Austria, Belgium, France, Germany, Hungary, Ireland, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovakia, Slovenia and Spain.
52. Finland, Greece, Italy, Latvia, the Netherlands, Portugal, Romania, Slovenia and Spain
53. COM. 2020. 80 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX-:52020PC0080.
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57. COM. 2020.951 based on Eurostat [nrg_pc_202_c]. The average shares of European households experiencing 'problems to keep their homes warm' and 'arrears in their utility bills', fell from 11% to 8% and from 10% to 7%, respectively.
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64. SDSN and IEEP. 2020. The 2020 Europe Sustainable Development Report: Meeting the Sustainable Development Goals in the face of the COVID-19 pandemic. Sustainable Development Solutions Network and Institute for European Environmental Policy: Paris and Brussels
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101. The Plan aims to increase capacity of the electricity grid by 6GW. Moreover, up to 4,000 km of the existing electricity grid will be modernized, increasing system resilience. Ibid., p.128.
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114. The proposal consists of three sets of reforms, divided into four lines of action: making the National Portal for the Energy Efficiency of Buildings operational; strengthening the activities of the Information and Training Plan for the civil sector; updating and strengthening the National Energy Efficiency Fund; accelerating the implementation phase of projects financed by the PREPAC programme.
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