



THE ITALIAN CLIMATE CHANGE THINK TANK

# A EUROPEAN SOVEREIGN FUND FOR THE CLIMATE TRANSITION

TECHNICAL REPORT  
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## EXECUTIVE SUMMARY

1. The goals for mitigating climate change and decarbonising economies are driving a new industrial revolution based on clean energy, which has set in motion a profound transformation in production systems and a trend towards a reconfiguration of global competition. In the new international geopolitical context, the relative deterioration of Europe's competitive position could rapidly worsen. In the long term, the erosion of capacity for growth potential and of standards of living could threaten social sustainability and compromise the political stability of numerous countries. In Italy, these deficits are particularly marked.
2. In this general context, the European Green Deal is an indispensable strategic platform for competitiveness and for the relaunching of the European project and thus also a unique opportunity for transformation and growth for the Italian economy. However, despite its importance, the current political debate in Europe and Italy appears not to be focused on the themes of its implementation, its possible expansion and above all its refinancing.
3. For the European Union, the estimated investment needed to implement the Green Deal would require a total annual investment in the 2021-2030 period of approximately 1,285 billion per year, equal to 8% of GDP of the EU in 2022. With regards to Italy, according to the NECP, the investment required for energy and climate transition amounts to approximately 118 billion per year (6% of GDP for 2022). Even more financial resources will be needed in later decades in order to achieve climate neutrality by 2050. The European Commission estimates an average annual amount of EUR 1.5-1.6 trillion between 2031 and 2050, which would require public funding on a European level of approximately 975-1,040 billion per year at 2023 prices (i.e., around 5% of EU GDP as of 2050).
4. The magnitude of the financial commitment obviously requires an enormous amount of private resources. However, ecological transition needs the significant contribution of public investments and incentives, above all in order to adapt the Member Country's infrastructure, intervene in areas of lesser market interest and correctly channel private investments. According to estimates by the European Commission, the contribution of public funding represents an average of 64% of overall investment required. An annual public finance commitment of 4-5% of GDP (3.5%-4% net of indirect effects), focused above all on energy and ecological transition, appears essential in order to achieve the Union's climate goals and to defend the standing of the European and Italian economy within the changing context of global competition.
5. However, for many European countries (and certainly for Italy), the entity of the funds required is clearly inconsistent with the need to stabilise public debt and is in contrast with the commitments recently undersigned in the context of the revision of the Stability and Growth Pact. The reform of the Pact, which was approved in April 2024, appears to be incompatible with the entity of the investments necessary to implement the Green Deal. The new obligations set by the new Pact, in fact, require almost all EU countries to adopt restrictive budget policies for the next 4-7 years. With the funds from the NGEU due to run out by 2026, of which only a part is dedicated to climate transition, compliance with the new European budget constraints means

that it will be impossible for many EU countries (and certainly for Italy) to achieve the goals set by the Green Deal.

6. In order to tackle the problem of the limited financial capacity of the most indebted Member States, the setting up of a European Energy and Climate Sovereign Fund could draw inspiration from the technical and legal solutions already adopted and validated by the NGEU, the main innovation of which is the possibility to issue debt on the capital market in order to provide Member States not only with loans, but also – and above all – grants. The legal architecture of the NGEU does not require regulatory reform or a revision of the founding treaties of the Union and can therefore also provide a useful foundation for the new fund. With resources rolled-over every five years, the fund could systematically cover approximately one fifth the overall estimated investments required for the 2031-2050 period, and projections for potential relative direct revenue from the EU budget would be sufficient to guarantee interest payments and the repayment of the debt by the deadline.
  
7. The setting up of a European energy and climate fund is therefore legally and technically feasible, and should be a decisive theme of political debate, particularly in light of the upcoming European Parliamentary elections and the renewal of the Commission. The defunding of the Green Deal, which would be the result of a decision not to continue with the fruitful experience of the NGEU, would not only undermine the possibility to mitigate the climate threat, but would also compromise Europe's competitive global position (and even more so that of Italy), structurally weakening the potential for long-term growth.

# 1 THE STRATEGIC IMPORTANCE OF THE GREEN DEAL FOR EUROPE AND ITALY

## 1.1 A RAPIDLY EVOLVING INTERNATIONAL CONTEXT

The goals for mitigating climate change and decarbonising economies are driving a new industrial revolution based on clean energy, which has set in motion a profound transformation in production systems and a trend towards a reconfiguration of global competition. The International Energy Agency (IEA) estimates, for example, that the global market for clean-energy technology will triple by 2030, from less than EUR 200 billion to more than 650 billion.<sup>1</sup>

China is explicitly aiming for global technological supremacy by mid-century and has already gained a dominant position in key digital and “clean” technology sectors.<sup>2</sup> China has planned to invest around EUR 260 billion in innovative technologies. With the 2022 Inflation Reduction Act, the United States will be mobilising EUR 330 billion in incentives for clean technologies over the next decade.<sup>3</sup> Over the same period, Great Britain has launched a series of initiatives aimed at consolidating its competitive standing in “green” energy (*Powering-up Britain*)<sup>4</sup>; Japan has set up a Green Innovation Fund worth EUR 140 billion to fund the transition; the Republic of Korea has launched its own Korean Green Deal worth 41 billion dollars, and India has launched an intense programme of investments for the production of batteries, electric vehicles and photovoltaic panels.<sup>5</sup>

**Europe has played a role as an international leader in drawing up policies for the containment of greenhouse gases (GHG), but it has not been able to keep up in terms of growth and productivity.**<sup>6</sup> According to a recent analysis by McKinsey<sup>7</sup>, , just a handful of significant indicators are enough to illustrate the European competitive gap; between 2015 and 2022, the return on equity (RoE) of listed European companies was on average 20% lower than that of their American counterparts; over the last decade, gross fixed capital formation for large-scale European businesses has shown practically no growth, while that of American companies has increased by 30%; European companies have invested approximately half the quantity invested by US companies in R&D in relation to their respective revenue; in 2023, European investments in generative artificial intelligence (genAI) was 14 times less (1.7 billion dollars compared to 23); the capitalisation of the leading listed EU businesses is 2.5 times less than their US counterparts.

The incomplete integration of European capital markets, furthermore, tends to limit the potential for innovation and the funding of investments.<sup>8</sup> The defragmentation of the European capital market would require the completion of EU banking and financial regulatory architecture, accelerating the parallel projects of the Banking Union (BU) and of the Capital Market Union (CMU).<sup>9</sup>

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<sup>1</sup> IEA 2021, 2023

<sup>2</sup> Sutter 2023; Mei et al. 2023

<sup>3</sup> Kleimann et. al. 2023

<sup>4</sup> UK Government (2023)

<sup>5</sup> European Commission 2023a; IEA 2023

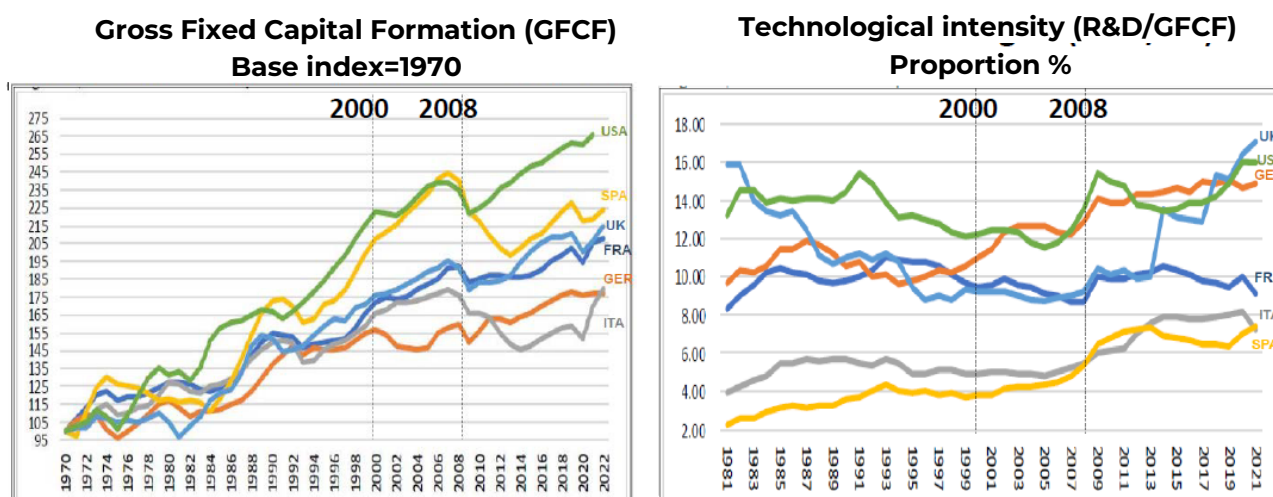
<sup>6</sup> European Commission 2023b

<sup>7</sup> Giordano et al. 2024

<sup>8</sup> European Central Bank 2023a

<sup>9</sup> European Council 2016; Demertzis et al. 2021

In the new context, the relative deterioration of Europe's standing could rapidly worsen. The current technological acceleration and the exposure to international competition is affecting many traditional sectors that form the backbone of European industry (automotive, aerospace, pharmaceuticals, etc.) while bolstering emergent sectors in which Europe is lagging behind (artificial intelligence, quantum computing, etc.). The new phase that began with the war in Ukraine has radically changed the traditional European policy of low-cost energy supply, and growing geopolitical friction has highlighted the vulnerability of international supply chains for raw materials and intermediate goods.<sup>10</sup> Over the long term, an erosion of the growth potential and standards of living could threaten social sustainability and compromise the political stability of many countries. In Italy, these gaps are particularly marked<sup>11</sup> (Figure 1).



**Figure 1** – Gross fixed capital formation and R&D in leading EU countries and in the USA. Source: our processes of OECD data.

## 1.2 THE RESPONSE PROVIDED BY THE EUROPEAN GREEN DEAL

**In this general context, the European Green Deal is an indispensable strategic platform for the relaunching of the European project and is also a unique opportunity for transformation and growth for the Italian economy.** However, despite its importance, the current political debate in Europe and in Italy appears not to be focused on the themes of its implementation, its possible expansion and above all its refinancing.

Over the last five years, the European Union has implemented a plan of fundamental strategic importance aimed at providing a suitable response to the quadruple challenge of climate crisis, energy sustainability, social stability and industrial competitiveness.<sup>12</sup> The success of the plan and its implementation are determinant not only for hedging the existential risks posed by the radical

<sup>10</sup> Europe imports 55% of its energy needs, China 25%, and the USA is a net exporter. The degree of openness of the European economy is 30% higher than that of America, and 70% higher than that of China. China controls 80% of the global offering of graphite (a key component for batteries and electric vehicles) and 14% of the mining/processing of strategic materials (e.g. rare earth elements), while Europe controls only 2% [Baba et al. 2023];

<sup>11</sup> For the full list, see P. Ciocca (2018).

<sup>12</sup> European Commission 2023c

nature of climate change, but also for bolstering production and employment, and for the institutional completion of the European Union.<sup>13</sup> The challenge of decarbonising economies is, in fact, dictated by the need to save the planet from the climatic harm caused by warming, but there will also be an inevitable need to reallocate international value chains and to redistribute the comparative advantages of the leap in technology required to deal with it; **in other words, this will be the arena in which the global economic hierarchy will be redefined over the coming decades.**<sup>14</sup> It is in this context that the Union as a whole, and each individual participating country, will be required to measure its own ambitions and define its own strategies.

In this light, the European Union has already redefined its priorities in terms of industrial strategy (*GDIP, NZIA, CRMA*)<sup>15</sup> and has implemented an important programme to aid the green transition (*Fit-For-55, RepowerEU*)<sup>16</sup>, allocating significant public resources to support both initiatives. Driven by the COVID-19 pandemic, the Union member states have also introduced significant modifications to the European economic governance, not only temporarily suspending the constraints established by the Stability Pact and rendering State aid more flexible (*Temporary Framework*)<sup>17</sup>, but also adopting a central capacity for the refinancing and governing the recovery after the pandemic (the Next Generation Fund or NGEU).<sup>18</sup> In this context, Italy has benefited from the most generous European allocation, and has set up its own National Recovery and Resilience Plan (NRRP).<sup>19</sup>

The success of these innovations in contrasting the potentially devastating impact of the pandemic has demonstrated their effectiveness and functionality, proof of how it would be worth to adopt the same scheme to manage and govern the transition of European economies over the coming decades. The challenge of climate neutrality has a much more distant horizon than that of the current NGEU: support provided by the fund will end in 2026, but the transformation of the economies requires a commitment that will last until the mid-century and beyond.<sup>20</sup>

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<sup>13</sup> Pisani-Ferry *et al.* 2023

<sup>14</sup> Tagliapietra *et al.* 2023

<sup>15</sup> European Commission (2020a); European Commission (2021b); European Commission (2023a); European Parliament and of the Council Regulation (2023a); European Commission (2023d).

<sup>16</sup> European Commission (2018a); European Commission (2019a); European Commission (2021c).

<sup>17</sup> The Temporary Framework (TCF) that rendered state aid more flexible was originally introduced in 2020 to allow the Member States to react to the pandemic crisis and was later extended and amended various times between April 2020 and March 2022. The TCF ended at the end of 2023 ([https://competition-policy.ec.europa.eu/state-aid/coronavirus/temporary-framework\\_en](https://competition-policy.ec.europa.eu/state-aid/coronavirus/temporary-framework_en)). In March 2023, in light of the energy problems caused by the war in Ukraine, the TCF became the Temporary Crisis and Transition Framework (TCTF), extending the scope of application to also support the strategic sectors indicated in the Green Deal Industrial Plan and the transition to a zero-emission economy ([https://competition-policy.ec.europa.eu/state-aid/temporary-crisis-and-transition-framework\\_en](https://competition-policy.ec.europa.eu/state-aid/temporary-crisis-and-transition-framework_en)). If no further extensions are granted, the TCTF is planned to last until the end of 2025.

<sup>18</sup> The NGEU has an overall capacity for the 2021-26 period of 806 bn at current prices (750 bn at constant prices), of which 421 bn (390 bn at constant prices) in grants. Details on the composition of the NGEU and the MMF (for dedicated funds and spending categories) is shown in the **appendix, Tab. A1a-A1b**. [European Commission 2021a].

<sup>19</sup> Only a part of the funds available from the NGEU has been requested by Member States (approximately 55%); the majority of countries have opted exclusively for RRF and ReactEU grants, and only a few have applied for their full (Italy and Greece) or partial (Portugal, Cyprus and Slovenia) quota of grants and loans. Overall, Italy has been allocated 25% of the NGEU. The Italian National Recovery and Resilience Plan, in fact, is comprised of 204.5 bn from the NGEU (of which 191.5 from the RRF) and a further 30 bn from the Italian budget (Complementary Fund). [Italian Government 2021a]. The NRRP was later reviewed in July of 2023,

<https://www.affarieuropei.gov.it/it/comunicazione/notizie/24-nov-23-pnrr/>

<sup>20</sup> Demertzis *et al.* 2024

## 2 THE FINANCIAL EFFORT REQUIRED TO DECARBONISE THE EUROPEAN AND ITALIAN ECONOMY

Globally, the level of investment required for transition is estimated to be between 6 and 12 trillion dollars per year for the next decade.<sup>21</sup> For the European Union, the implementation of the Green Deal (*Fit-for-55*, *RepowerEU* and the *Green Deal Industrial Plan*) requires an annual investment **to the tune of approximately 1,285 billion per year, (8% of the EU GDP for 2022) during the 2021-2030 period.** Of this, almost 60% is required by the *transportation sector*, which alone accounts for 754 billion per year (4.7% of GDP); net of transportation, the level of investment forecast in the EU (for energy and for the industrial, commercial and residential sectors) amounts to 531 billion per year.<sup>22</sup>

With regards to Italy, according to the NECP<sup>23</sup>, the investment required for energy and climate transition amounts to approximately 118 billion per year (6% of GDP for 2022), of which 75 billion are for transportation alone (3.8% of GDP for 2022). As will be demonstrated below, even more financial resources will be needed from 2030 onwards to achieve climate neutrality by 2050.<sup>24</sup>

**The magnitude of the financial commitment obviously requires an enormous amount of private resources.** To this end, the Union has, in recent years, adopted a wide range of legislative and regulatory initiatives aimed at guiding institutional investors and private finance to support sustainable investments.<sup>25</sup> However, ecological transition needs a significant contribution of public investments and incentives, above all in order to adapt the member countries' infrastructure, intervene in areas of lesser market interest and correctly channel private investments. **According to estimates by the European Commission,<sup>26</sup> the contribution from public finance accounts, on average, for 64% of overall investment needs:<sup>27</sup>** this estimate would require an overall potential commitment of public resources from European Union countries for the next decade of at least 820 billion per year (approximately 5% of the EU GDP for 2022).<sup>28</sup> Re-weighted for Italy, the overall public

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<sup>21</sup> Buchner *et al.* 2023; IEA 2021; Tyler *et al.* 2023

<sup>22</sup> The disaggregated data are presented in the **Appendix, Tab. A3a**. The overall estimate from the Commission is higher than the historical average for the 2011-20 period by approximately 520 billion per year (+3.3 percent of GDP). The value of investments by the Commission in transportation (754 billion per year) represents the full purchase cost of new vehicles, not the incremental cost of transport decarbonisation, and includes spending for the renewal of vehicle fleets (including aircraft and ships) and for fuelling/charging infrastructure. It does not, on the contrary, include infrastructure for intermodality or urban transportation [European Commission 2023e, Annex 1, p.43]. A higher estimate of 100 bn over the historical average (an annual average of 620 billion instead of 520) is, however, provided by the Commission in the 2023 strategic document [European Commission 2023c].

<sup>23</sup> Version of the NECP dated 18/7/2023 tab.90 p.411 [Italian Government 2021a]. According to many other sources, the range of investments necessary in Italy is between 106 and 133 bn per year [Andreolli *et al.* 2023]. The data are listed in the **Appendix, Tab. A3c**.

<sup>24</sup> The impact analysis carried out by the European Commission estimates the investments required to reduce emissions by 90% by 2040 and eliminate them completely by 2050 to be an average of EUR 1.5 trillion per year [European Commission 2024]. A similar amount has also been analytically estimated by a pan-European study by the Rousseau Institute in Paris. (Rousseau Institut 2024). The data are listed in the **Appendix, Tab. 3b**.

<sup>25</sup> Moro-Noera 2023; Ainio-Noera 2021

<sup>26</sup> Baccianti 2022

<sup>27</sup> 64% is the average between a minimum of 47% and a maximum of 80% and is the result of sector-based estimates of public contributions forecast by the European Commission in studies into the impact of various measures (SWD 2020/98; RED II COM 2021/557; RepowerEU SWD 2022/230). For detailed data, please refer to the **Appendix, Tab.A4a**.

<sup>28</sup> Unlike for overall investment needs, forecasts regarding transportation do not take into account incentives for private mobility, but only public and rail transportation.



financial commitment would be, in terms of GDP, just slightly less: 4% of GDP, i.e., approximately 75 billion per year.<sup>29</sup>

**An annual public financial commitment of 4-5% of GDP (3.5-4% net of indirect effects)<sup>30</sup>, focused on energy and ecological transition, appears essential in order to achieve the Union's climate goals and to defend the position of both the European and Italian economy within the changing context of global competition.** However, for many European countries (and certainly for Italy), the entity of the funds required is clearly inconsistent with the effort to stabilise public debt and is in evident contrast with the commitments recently undersigned in the context of the revision of the Stability and Growth Pact.<sup>31</sup>

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<sup>29</sup> For Italy, the weighted average public contribution to funding investments is estimated on the basis of European percentages applied to domestic data. For details, please refer to the **Appendix, Tab. 4b**.

<sup>30</sup> A correct estimate of net financial commitment would require also taking into account incremental tax revenue generated by an increase in income from additional investments. However, the entity of these indirect macroeconomic effects depends on many factors, the combination of which may lead to greatly differing outcomes (e.g. the mix of investment types and the weighted average multiplier effect that this may have on GDP; the mix of forms of taxation; the energy mix and the relative costs of energy sources; the evolution of the carbon price; the inclination to import intermediate goods and technology; the evolution of monetary policies and interest rate levels, etc.). For some countries, estimates set these collateral effects at between 0.5% and 1% of GDP [De Mooji, Gaspar 2023].

<sup>31</sup> Blanchard 2023

### 3 THE CONSTRAINTS PLACED ON NATIONAL BUDGETS BY THE NEW STABILITY AND GROWTH PACT

The reform of the Pact, which was approved by the European Council on 21 December 2023 and finalized in April 2024<sup>32</sup> appear to be incompatible with the entity of the investments necessary to implement the Green Deal. **The new obligations set by the new Pact, in fact, require almost all EU countries to adopt restrictive budget policies for the next 4-7 years.**<sup>33</sup> Although the new version of the Pact appears, to some extent, more flexible than the original<sup>34</sup>, Although the new version of the Pact appears, to some extent, more flexible than the original<sup>34</sup>, the compromise signed by the European Council in December 2023 provides for extremely stringent restrictions:

- a) A reduction of the debt/GDP ratio of at least one percentage point per year for countries with a ratio of more than 90% (for example Italy, France, Portugal, Greece and Belgium) and of 0.5 percentage points for countries with a debt/GDP ratio of between 60% and 90%.
- b) For countries with a deficit/GDP ratio of more than 3%, minimal adjustments to the primary deficit of 0.4% per year over a four-year period, and of 0.25% over a seven-year period (excluding interest-related expenses for the 2025-27 period only).
- c) The achievement at the end of the process of a deficit/GDP goal of 1.5% (instead of 3%) as a “safeguard clause”, with the aim of providing governments with “anti-cyclical” room for manoeuvre in the case of unanticipated shocks.

According to estimates from the Bruegel think tank<sup>35</sup>, the application of these rules would result in the maintaining of substantial primary budget surpluses for almost all Union countries in the crucial implementation phase of the Green Deal. In the case of Italy, which currently runs extremely high levels of both debt and deficit (respectively 141% and 4.4%), compliance with the new rules would involve particularly severe long-term restrictions.

- Italy will need to maintain a primary surplus (currently 0.9% of GDP) of between 3.7% (over 4 years) and 3.3% (over 7 years) in order to annually reduce the dept/GDP ratio to the extent indicated (-1 percent per year) and bring the deficit/GDP ratio to 3%.
- Once the goal has been reached, Italy will then have to create a long-term primary surplus of between 4.1% and 4.6% of GDP in order to respect the “safety” margin.

**In order to achieve these goals, the Italian government will have to make annual tax adjustments of 1.15% of GDP (over a 4-year period) or 0.61% (over a 7-year period), i.e., average tax restrictions of either 22 billion or 12 billion per year.**

As well as setting restrictive adjustment processes, the new Pact totally rules out the possibility, hoped for in academic debate<sup>36</sup> and at the time also called for also by the Italian government, to

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<sup>32</sup> <https://www.consilium.europa.eu/en/press/press-releases/2023/12/21/economic-governance-review-council-agrees-on-reform-of-fiscal-rules/>

<sup>33</sup> The possibility to extend the tax-adjustment horizon from 4 to 7 years is provided for in the case of investments and reforms in line with the priorities of the Green Deal.

<sup>34</sup> The Pact in force since 2011 and suspended between 2020 and 2023 due to the pandemic provided for the respecting of a deficit/GDP ratio of 3% and a linear reduction of one-twentieth per year of any excess debt over the 60% threshold. The new pact provides for the joint definition of a long-term process of adjustment agreed between the individual government and the European Commission, bearing in mind the specific nature of each country.

<sup>35</sup> For the analytical data, please refer to the **Appendix, Tab. A5**, from Zettelmeyer (2023)

<sup>36</sup> Darvas, Wolff 2023; Maduro *et al* 2021

exclude “green” investments from the calculation of budget balance to be reduced (golden rule).<sup>37</sup> This setup passes off to national governments the responsibility of conciliating the entity of the investments for ecological transition with the (necessarily restrictive) processes to stabilise public finances.

Furthermore, in combination with the parallel relaxing of European restrictions on State aid, this inevitably leads to asymmetries in the fiscal capacity of the various UE countries on the basis of their varying initial levels of public debt.

Bearing in mind the fact that the resources of the NRRP will run out by 2026, and the fraction of these dedicated to energy and climate transition covers only a small proportion of the overall demand <sup>38</sup>, the application of the new European restrictions imposed by the Stability and Growth Pact renders it impossible for Italy to achieve the goals of the Green Deal.

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<sup>37</sup> The only concession is for an extension from 4 to 7 years of the adjustment horizon in the case of “green” investments.

<sup>38</sup> The entity of NRRP investments dedicated to energy and climate transition (according to the Government’s “green flag”) amounts to an overall total of approximately 72 bn for the 2021-26 period, i.e., an average of 14.4 bn per year [Ainio *et al.* 2023].

## 4 THE NEED FOR A EUROPEAN ENERGY AND CLIMATE SOVEREIGN FUND

The need for a reform of European economic governance that reconciles fiscal sustainability with the support of suitable public investment in “green” transition and energy security has been subject, over time, to much academic and institutional analysis that has stressed the importance of central institutional bodies designed on the model of the NGEU.<sup>39</sup> The idea of setting up a European Sovereign Fund was also expressed by the European Commission itself in the communication of the Green Deal Industrial Plan in February 2023<sup>40</sup>, after a number of commissioners had already spoken of the need over the previous months.<sup>41</sup>

However, the plan to set up a European fund dedicated to energy and the climate, which was supposed to be examined as part of the EU long-term budget review in the summer of 2023 in parallel with the reform of the Stability Pact has never returned to being a central theme of the European political agenda, and all traces have been lost. In its place, has been adopted the so-called STEP (Strategic Technologies for Europe Platform), with the aim of placing priority on support for strategic technologies and value chains. STEP, which has been presented as an intermediate test with a view to possible further steps towards a European Sovereign Fund, in reality represents nothing more than a revision and simplification of the way to access existing European funds, with very limited further allocations.<sup>42</sup>

### 4.1 THE LEGAL FRAMEWORK

**In order to tackle the problem of the limited financial capacity of the most indebted countries , the setting up of a European Sovereign Fund dedicated to energy and the climate should instead draw inspiration from the technical and legal solutions already adopted and validated by the NGEU,** the main innovation of which is the possibility to generate debt on the capital market in order to provide Member States not only with loans, but also – and above all – grants<sup>43</sup>. The legal framework of the NGEU is based on three main pillars:<sup>44</sup>

1. The authorisation for the Commission to issue debt on the capital market, and an increase in the EU’s own resources (the Own Resources Decision, or ORD), to guarantee the coverage of

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<sup>39</sup> Maduro *et al.* (2021); Arnold *et al.* (2022); Pisani-Ferry *et al.* (2023)

<sup>40</sup> European Commission 2023a p.13 “*For the mid-term, the Commission intends to give a structural answer to the investment needs, by proposing a European Sovereign Fund in the context of the review of the Multiannual Financial Framework before summer 2023*”

<sup>41</sup> In October 2022, the commissioners Paolo Gentiloni and Thierry Breton proposed the setting up of a mechanism inspired by SURE [European Council 2020]

<sup>42</sup> EPRS 2023; European Commission 2023f STEP rationalises and simplifies the methods of accessing the various existing funds drawn from the European budget (cohesion funds; RRF; RepowerEu; Modernization Fund; Innovation Fund; Social Climate Fund; InvestEU; Horizon; Digital Europe Program and European Defence Fund), in order to facilitate the funding of strategic technologies and sectors [Appendix, Tab. A6]. In the Commission’s original proposal, in addition to the resources already available through the various programmes, STEP was also designated a further budget of just 10 bn, which was then reduced to 1.5 bn in later negotiation with the Council and the Parliament.

<sup>43</sup> The NGEU has an overall funding capacity over a five-year period (2021-26) of EUR 800 bn (724 at constant prices), of which 338 bn is in grants. The NGEU can obtain resources from the capital market by issuing bonds to the value of 250 bn (of which 30% are green bonds), with these being refunded in the 2028-58 period [European Commission 2021d]

<sup>44</sup> European Council Legal Service (2020); Grund, Steinbach (2023); Abraham *et al.* (2023)

liabilities of the NGEU until the date set for their complete repayment.<sup>45</sup> This possibility is legally compatible with the obligation to balance the EU budget in consideration of the extraordinary circumstances that the fund is called on to respond to, of the definition *ex-ante* of the overall entity of the debt, and of its temporary nature (with the repayment start and finish dates clearly stated).<sup>46</sup>

2. The implementation of the “solidarity clause”<sup>47</sup> for the institution of a Recovery Instrument that defines the allocation of the funds among the EU spending programmes, in order to align the performance of the fund with the long-term EU budget (Multiannual Financial Facility or MMF), attributing the status of “external assigned revenues” to the resources collected issuing debt and assigned to the Member States.<sup>48</sup>
3. The definition of specific and dedicated programmes for the execution and allocation that provide precise indications on methods for approval and spending.<sup>49</sup>

These elements render the overall impact of the NGEU different from other schemes adopted by the EU to gain funds on the market (such as the EFSM fund<sup>50</sup> or the SURE fund<sup>51</sup>) which are based instead on the principle according to which the EU fund assumes debt and issues “back-to-back” loans on the basis of voluntary guarantees from the Member States (instead of having them covered through dedicated increases in the long-term ORDs for the EU budget). These alternative “back-to-back” funding schemes, which can in any case be adopted as complementary to the architecture of the NGEU, do not however resolve the problem of the limited fiscal capacity available to the most indebted Member States: they, in fact, facilitate access of the latter to the market (presumably under more favourable conditions), but they do not contribute to limiting the overall debt, something that is achieved, instead, through grants from the NGEU.

It is certain that the characteristics of the climate crisis and energy transition respond to the requirements that have rendered the creation of the NGEU a legally viable reaction to the pandemic: the exceptional nature of the reasons, the extraordinary nature of the funding, and the temporary nature of the financial commitment:<sup>52</sup>

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<sup>45</sup> European Council 2020b

<sup>46</sup> Article 310 of the TFEU states that “the revenue and expenditure shown in the budget shall be in balance”, however, the increasing of the Own Resources Decision (ORD) to an amount sufficient to cover repayment of the principal and interest on liabilities of the NGEU, the allocation of these additional resources (external assigned revenues) to a dedicated area of the budget, and the precise definition of the amount and time horizon, guarantee compatibility with the integrity of the EU budget. The ORD ensures that the repayment of the debt by the EU is guaranteed by the cap on the “own resources” of the EU, providing an irrevocable, definitive and enforceable guarantee (European Council Legal Service 2020 p 7-41).

<sup>47</sup> Art. 122 of the TFEU states that “(...) the Council, on a proposal from the Commission, may decide, in a spirit of solidarity between Member States, upon the measures appropriate to the economic situation, in particular if severe difficulties arise in the supply of certain products, notably in the area of energy. (...) Where a Member State is in difficulties or is threatened with severe difficulties caused by natural disasters or exceptional occurrences beyond its control, the Council, on a proposal from the Commission, may grant, under certain conditions, Union financial assistance to the Member State concerned. (...)”.

<sup>48</sup> External assigned revenues (EAR) are specifically aimed at underpinning specific spending programmes provided for in the budget and cannot be used as a general means of EU funding; they are in addition and complementary to, and therefore formally in line with, the items in the approved budget (Abraham).

<sup>49</sup> The main programmes of the NGEU are, for example, the Recovery and Resilience Facility (RRF), the Just Transition Fund (JTF), set up on the basis of art. 173 (3) of the TFEU, which provides the EU with flexibility to spend beyond the structural funds to preserve social and territorial cohesion, and ReactEU, which amends the allocation of cohesion funds (on the basis of arts.177 and 322 of the TFEU). Other programmes benefiting to a lesser measure of the resources of the NGEU are the Rural Development Fund (RDF), Horizon Europe, Health4EU and RescEU.

<sup>50</sup> European Council (2010)

<sup>51</sup> European Council (2020a)

<sup>52</sup> Abraham et al. 2023; Grund, Steinbach 2023

- The climate crisis is a pervasive emergency that affects all the Member States to varying degrees, independent of their policies and their ability to react. It is therefore a collective crisis that affects the general purpose of the Union (art. 3 of the TEU)<sup>53</sup> and that falls within the scope of the obligations regarding solidarity (art. 122 of the TFEU). Furthermore, both the irregular nature of the impact and the differing needs and capacity for investment of the various Member States require the allocation of resources where they best generate common benefits.
- Action to contrast climate change is urgently needed and cannot be postponed. It concerns goals and deadlines that are binding for all Member States and for the Union as a whole (carbon neutrality by 2050) on the basis of the international commitments assumed (2015 Paris Agreement) and rendered legally binding through the European Climate Law.<sup>54</sup>
- It has a defined horizon and goals (GHG emissions halved by 2030 and carbon neutrality by 2050) and requires the multiannual use of public resources to be quantified *ex-ante*.

## 4.2 THE EU'S OWN RESOURCES

The Union's budget, which is worth approximately 2% of the total public spending of the Member States, makes a distinction between "*own resources*" and "*other revenue*": the "*own resources*", which represent the main source of funding for the EU budget, are identified in detail in the so-called *Own Resources Decision (ORD)* unanimously adopted by the European Council and approved by all the Member States, many of which are calling for ratification by national parliaments, while the role of the European Parliament is merely advisory<sup>55</sup>. Union spending, on the other hand, is approved jointly by the Council and by the European Parliament in relation to the long-term budget (MMF or *Multiannual Financial Framework*)<sup>56</sup> and the annual EU budget.<sup>57</sup>

The so-called "*other revenue*", on the other hand, include - together with other minor items - revenue from the emission of debt instruments. The obligation to balance the EU budget<sup>58</sup> does not, therefore, exclude the possibility for the Union to assume debt, but rather obliges it to identify future availability of resources for repayments and interest. From this point of view, EU debt can take two forms: (1) in the first, if the debt is assumed in order to subscribe the debt of one or more Member States, the latter provide *de facto* guarantees for repayments and interest (back-to-back borrowing); (2) in the second, the Union's budget assumes responsibility, allocating its "*own resources*" to cover the obligations.<sup>59</sup>

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<sup>53</sup> Art. 3(3) TEU: "*The Union (...) shall work for the sustainable development*" based, among other aspects, "*on a high level of protection and improvement of the quality of the environment*", and on "*solidarity between generations (...). It shall promote economic, social and territorial cohesion, and solidarity among Member States (...).*"

<sup>54</sup> European Parliament and Council (2021)

<sup>55</sup> The ORD obliges Member States to make contributions in the various forms provided for, up to a pre-established amount (*ceiling*), which represents the maximum contribution required from each country (TFEU art.311).

<sup>56</sup> Cf. TFEU art. 312

<sup>57</sup> Cf. TFEU art.314

<sup>58</sup> Cf. TFEU art. 310

<sup>59</sup> "Own resources" may include the so-called Assigned Revenues, i.e., funds dedicated to specific purposes, such as internal revenues (i.e., part of the Union budget), or external revenues (i.e., from other sources). External Assigned Revenues are not subject to the standard budget procedures set out in art.314 of the TFEU and represent the cases to which NGEU debt relates.

The European Energy Climate Fund (EECF) should be set up on the basis of the ex-ante identification of “own resources” to be dedicated to future repayment and to the service of the debt issued. The entity of the own resources available constrains the overall financial capacity of the fund, which should be able to bridge the gap in investments required on a European level.

The “own resources” of the EU budget consist mainly of contributions from Member States in proportion to their Gross National Income (GNI), of a portion of the income from VAT in each State, from custom duties and from a number of specified targeted levies such as those on non-recycled plastic packaging.<sup>60</sup> To support the NGEU (July 2021) and the EU budget (MFF 2021-27), the European Council has set in motion a process aimed at extending the Union’s own resources by identifying three potential additional sources: revenues from the extension of the ETS (Emission Trading System), tariffs from the CBAM (Carbon Border Adjustment Mechanism) and the introduction of new taxes on business profits.<sup>61</sup> According to the Commission’s estimates, the additional resources from these combined new sources, at standard parameters, will amount to 36 billion per year at constant prices (i.e., extrapolating an estimate for the 2026-30 period, a cumulative figure of approximately 144 billion, and for the entire 2025-50 period, a cumulative figure of approximately 900 billion).<sup>62</sup>

The ETS could, prospectively, become the main source of additional EU “own resources”.<sup>63</sup> In the event of an evolution in carbon prices in line with carbon-neutrality goals by 2050, the Bruegel think

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<sup>60</sup> From current EU own resources: (a) GNI remains the main source of EU revenue (approximately 2/3). (b) 75% of custom duties collected at the foreign borders of the Union feed directly into the EU budget (the Member States withhold 25% to cover management costs). (c) The EU is paid a standard tax of 0.3% on sums subject to VAT by each Member State. (d) The levy on plastic waste is statistically calculated on the quantity of unrecycled plastic for each country (€ 0.80 per kg) with adjustments for below-average GNI. Cf. European Commission, *Own Resources*, [https://commission.europa.eu/strategv-and-policy/eu-budget/long-term-eu-budget/2021-2027/revenue/own-resources\\_en](https://commission.europa.eu/strategv-and-policy/eu-budget/long-term-eu-budget/2021-2027/revenue/own-resources_en)

<sup>61</sup> The roadmap defined by the European Council in 2020 (EUCO 10/20 of 21/07/2020) and later perfected through an interinstitutional agreement (OJ L.4331 22/12/2020) to provide the EU budget with new sources for own resources in the face of Fit-For-55 and to cover the debt of the NGEU (June 2023) provides for two regulatory packages, one fully operative from 2023 and a second one to be implemented by 2026. The first package (December 2021) provides for: (a) application as of 2024 to the existing ETS and the extension from 2028 of the system for negotiation for ETS emissions certificates to certain sectors that are currently excluded, in particular residential and transport (ETS2) and the designation of 30% of ETS revenue to the EU budget ([https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets\\_en](https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en)); (b) designation to the EU budget of 75% of CBAM revenue from tariffs applied to imports from non-EU countries that do not adopt a carbon-pricing system similar to the ETS ([https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism\\_en](https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en)) (c) designation to the EU, on a statistic basis, of 0.5% of the notional amount of the operating profit of companies operating in each Member State, calculated by Eurostat (until the coming into force in 2024 of the similar BEFIT agreement at an OECD/G20 Pillar1 level on the application of a standard rate of 15% on the profits of multinationals reallocated to the Member States). The proposal from the Commission regarding the second package is expected by June 2024, and should include a tax on financial transactions and the development of contributions based on business profits.

<sup>62</sup> 19 bn per year from the ETS (assuming a carbon price of € 80 per ton). 1.5 bn per year from CBAM tariffs (from 2028). 16 bn per year from business profits (from 2024). [https://ec.europa.eu/commission/presscorner/detail/en/qanda\\_23\\_3329](https://ec.europa.eu/commission/presscorner/detail/en/qanda_23_3329)

<sup>63</sup> The ETS is the largest global market for carbon certificates and is organised on the basis of the so-called “cap & trade” system: an annual GHG emission target level is determined for the group of sectors covered by the system (energy, energy intensive industries, air and maritime transport) and maximum emission levels are indicated for each individual system in line with the goals (*cap*). The cap is reduced every year. Certificates representing tons of CO<sub>2</sub> (allowances) can be negotiated on the ETS market. Every year, a certain number of certificates (currently approximately 40%) are allocated freely to systems covered by the scheme; this number represents the GHG emissions (in tons) permitted without incurring costs. Respect for the cap, however, requires either a reduction in emissions or the purchasing of additional certificates via market auctions. Business with emission levels higher than the maximum permitted will be net purchasers of certificates on the ETS market, while businesses with emissions lower than the cap will sell their excess certificates. The interaction between supply and demand will determine the price of carbon. However, there is a mechanism (MSR, or Market Stability Reserve) with which authorities set the price range.

tank estimates that the overall total of resources generated by the ETS system over the 2021-2050 period could range from a minimum of EUR 1.1 trillion to a maximum of EUR 1.5 trillion.<sup>64</sup>

On the contrary, the contribution that could potentially derive from the CBAM is more uncertain and controversial. The CBAM system is one of the pillars of the Fit-For-55 package, and is aimed at compensating the disadvantages that may be suffered on an international level by European producers due to costs deriving from the greater commitment to decarbonisation imposed by EU regulations.<sup>65</sup> The CBAM is a mechanism for the equalisation of the price of carbon between domestic products and imported goods: a tariff is applied to goods imported from non-EU countries that reflects their “differential carbon footprint”, calculated on the basis of the difference between the ETS “carbon price” and that of the product’s country of origin. The efficiency of the system in promoting decarbonisation is proportional to the extent to which the “carbon price” reflects the effective “carbon footprint” of production; it therefore presumes the progressive reduction (towards zero) of the freely assigned ETS certificates.<sup>66</sup>

The CBAM entered its initial experimental application phase in September 2023, and is for the moment applicable to six high-emissions sectors (cement, steel, aluminium, fertilisers, electricity and hydrogen). In the experimental phase, importers of these goods are required to calculate and report both the volume of their imports and the “carbon footprint” (in terms of unit emissions of GHG) of the imported products, without being required to make any financial adjustments. The experimental phase is, in fact, seen as a period for learning and fine-tuning of the mechanism before it is fully adopted, a step due to take place from 2026. From that moment on, importers will be required to purchase a number of carbon certificates equal to the GHG content of the goods imported.<sup>67</sup>

The development and the efficiency of the CBAM therefore depends on the balance between internal and foreign decarbonisation processes, on the level of harmonisation of carbon-pricing systems at an international level, and on the volume of certificates freely assigned by the ETS system. The fewer free ETS certificates allocated, the higher the price of domestic carbon. In the near future, the allocation of free certificates should progressively fall, and eventually stop altogether (reflecting the effective carbon content of goods produced), thus increasing the taxable base of the ETS system. The extent to which importers transfer the increased costs of carbon balancing to the price of imported goods could lead to imports being substituted in favour of domestic goods, thus reducing the CBAM

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<sup>64</sup> Fuest, Pisani-Ferry 2020. The possibilities are: the progressive substitution of freely allocated certificates with certificates put up for auction (from 40% to 80%), a correlated increase in the price of carbon (from € 50/tCO<sub>2e</sub> in 2030 to € 85/tCO<sub>2</sub> in 2050) and the extension of the system to new sectors (residential, agriculture and transport).

<sup>65</sup> Excessive decarbonisation-related costs between the EU and other countries could also lead to production being shifted to the latter.

<sup>66</sup> Horm-Sapir 2019. The CBAM has drawn criticism for its asymmetrical application (in the sense that it is applied to imports but not to exports), and is therefore in effect a protectionist measure that, if not properly planned, may contrast with WTO regulations, which require that foreign producers are not discriminated in comparison with domestic producers. Theoretically, a levy on carbon could, instead, be applied in a balanced manner, i.e., to both imports and exports with the same criteria and to the same extent. Thus, while the price of good imported would be increased due to tariffs applied for their higher “carbon content”, European exporters should be compensated for the increased cost of carbon from domestic production over that of foreign production. In this case, however, on the basis of the geographic composition and category of goods related to foreign commerce, the revenue from imports would be either entirely or partially compensated (or even more than compensated) by disbursements on exports, reducing (or cancelling) the net cash flow deriving from the application of the tariff compensation system. Furthermore, the symmetrical application of tariffs could even compromise the decarbonisation of domestic producers to the extent that these produce exclusively or mainly for exportation.

<sup>67</sup> Cf. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_23\\_4685](https://ec.europa.eu/commission/presscorner/detail/en/ip_23_4685)



taxable base. In this case, an increase in ETS revenue would correspond to a correlated reduction in CBAM revenue.

Even without considering other sources of a statistical nature (VAT, percentage of profits), which are in fact comparable to transfers by Member States similar to those parameterised in line with the GNI, the potential projection of the cumulative total of the EU's "own resources" appears to be in line with a suitable amount for a new sovereign fund to be set up on the basis of the NGEU.

### 4.3 THE ENDOWMENT OF THE SOVEREIGN FUND FOR POST-NGEU PERIOD

**The residual financial resources needed for *Fit-for-55* (2027-2030).** The BCE estimates that a possible EU Climate and Energy Fund able to support the investments required by 2030 could amount to EUR 500 billion<sup>68</sup>, but could possibly be as much as 800-1000 billion, approximately 30% of which would be through debt financing.<sup>69</sup> In the first case, the fund would cover approximately a fifth of the Union's overall investment needs for the 2027-30 period (1.3 trillion for 3 years), and in the second, it would cover just over a quarter.<sup>70</sup> As with the NGEU, half of these funds could be allocated in the form of grants.

Estimates by the Commission relative to the Union's own potential revenue deriving from the planned reforms for the ETS and CBAM, and to business profits (36 billion per year overall) would be more than enough to guarantee amortisation and payment of interest over the mid-to-long term.<sup>71</sup>

**Financial needs beyond 2030.** The Fund would, however, also need to face up to the need to accompany and complete the transition in the longer term<sup>72</sup>, at the same time guaranteeing the fiscal stability of Member States. In abstract, the first-best solution would be a reform of EU economic governance; this solution would require modifications to be made to secondary regulations and, if the decision is taken to create common fiscal capacity, would also require adjustments to be made to the Treaties.<sup>73</sup> Alternatively, a second-best but possibly more pragmatic and politically viable solution could be a renewal of the legal framework of the NGEU within each five-year period of approval of the EU long-term budget (MFF), without any substantial changes to its regulatory framework.

In all cases, the overall magnitude of the fund for the 2031-2050 period should be commensurate with an estimate of the average annual investments required. **In February 2024, the European Commission published a proposal to set a goal for 2040 for a 90% reduction in greenhouse gas levels on the basis of 1990 levels. The impact study attached to the proposal estimates an**

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<sup>68</sup> Abrahm et al. 2023

<sup>69</sup> The NGEU originally provided for the emission of EU Bonds for the sum of 250 bn, i.e., 31% of the overall nominal amount allocated. Cf. [https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/nextgenerationeu\\_en](https://commission.europa.eu/strategy-and-policy/eu-budget/eu-borrower-investor-relations/nextgenerationeu_en)

<sup>70</sup> On the basis of the same estimate of overall investment needs (6.5 tn overall for the 2021-26 period), the 800 bn of the NGEU guaranteed potential overall coverage of the investment needs of 12% (of which 5% in grants). For the original composition of the NGEU, please refer to the **Appendix, Tab.A1a**

<sup>71</sup> Reimbursement of the NGEU is set out over a period of 30 years (2028-58), with an average annual cost of EUR 10-15 bn. Spread over a similar period, the amortisation of capital and interest for the new fund would presumably require no more than 15-20 bn per year.

<sup>72</sup> Demertzis et al. 2024

<sup>73</sup> Maduro et al. 2021

**average annual amount of EUR 1.5-1.6 trillion between 2031 and 2050, which would require public funding on a European level of approximately 975-1,040 billion per year at 2023 prices (i.e., around 5% of EU GDP as of 2050). The overall demand for public resources on a rolling 5-year horizon would therefore be approximately 5 trillion.<sup>74</sup>**

If the EECF were to have resources (renewable every five years) in line with those of the current STEP (originally indicated by the Commission as an intermediate step towards the setting up of a sovereign fund), the fund could systematically cover a fifth of the overall European need for the investments estimated for the 2031-2050 period.<sup>75</sup>

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<sup>74</sup> European Commission 2024; Rousseau Institut 2024. Detailed data are listed in the **Appendix, Tab. 3b**. The amount covered by public funding has been estimated by applying the same average percentage applied to the 2021-30 period (65%).

<sup>75</sup> European Commission 2023f. The reconstitution of the STEP funds dedicated exclusively to green transition currently amounts to 1112 bn **[cf. Appendix, Tab A6]**.

## 5 CONCLUSION

**The setting up of a European energy and climate sovereign fund is legally and technically feasible, and should be a decisive theme of political debate, particularly in light of the upcoming European Parliamentary elections and the renewal of the Commission.** The defunding of the Green Deal, which would be the result of a decision not to continue with the fruitful experience of the NGEU, would not only undermine the possibility to mitigate the climate threat, but would also – perhaps irreversibly – compromise Europe’s competitive global standing (and even more so that of Italy), structurally weakening the potential for long-term growth.

## APPENDIX

bn €	NGEU	NGEU
	Total 2021-26 bn €	yearly avg bn €
RRF*	723,0	120,5
of which: Loans	365,8	
of which: Grants	338,0	
ReactEU (grants)	50,6	8,4
Horizon Europe (grants)	5,4	0,9
InvestEU (grants)	6,1	1,0
Rural Development (grants)	8,1	1,4
JTF**(grants)	10,9	1,8
RescEU (grants)	2,0	0,3
<b>TOTAL NGEU</b>	<b>806,1</b>	<b>134,4</b>
of which: Grants	440,3	73,4

[https://commission.europa.eu/strategy-and-policy/recovery-plan-europe\\_en](https://commission.europa.eu/strategy-and-policy/recovery-plan-europe_en)

**Tab. A1a** – NGEU original funds breakdown

Heading #		MFF	NGEU	MFF	NGEU
		2021-27 Total bn €	2021-26 Total bn €	2021-27 yr avg bn €	2021-26 yr avg bn €
1	Single Market Innovation and Digital	149,5	11,5	21,4	1,9
2	Cohesion Resilience and Values	426,7	776,5	61,0	129,4
3	Natural Resosurces & Environment	401,0	18,9	57,3	3,2
4	Migration & Border Management	25,7		3,7	
5	Security & Defence	14,9		2,1	
6	Neighbourhood & the World	110,6		15,8	
7	European Public Adeministration	82,5		11,8	
	<b>TOTAL</b>	<b>1210,9</b>	<b>806,9</b>	<b>173,0</b>	<b>134,5</b>

[https://commission.europa.eu/strategy-and-policy/recovery-plan-europe\\_en](https://commission.europa.eu/strategy-and-policy/recovery-plan-europe_en)

**Tab. A1b** – EU MFF 2021-27 and NGEU Original programs' headings (2020 current prices)

	European Commission (1) (July 2021)	ECB (2) (April 2022)
Reference area	EU (27)	Euro Area (19)
Program	NGEU (total)	RRF (90% NGEU)
Financial size	100% of NGEU grants allocated (400 bn) + 46% RRF loans (166 mld) from 6 applying Countries	100% of RRF grants allocated (338 bn) + 46% RRF loans (166 mld) from 6 applying Countries
Timeframe	Yearly amount financed (a) high speed scenario (4 yrs) (b) slow speed scenario (6 yrs)	Based on the specific timeframe of each of 25 NRRPs
Eligible investments	100% RRF considered as productive investments	Based investments of each of 25 NRRPs 80% productive investments; 20% social transfers
Additionality	100% RRF grants + 50% loans additional to national public expenditures (average = 84%)	Based on each of 25 NRRPs ( 77% additional to national public expenditures)
Models	QUEST (multicountry integrated with spillover effects)	EAGLE (ECB General Equilibrium Model) ECB-MC (ECB semi -structural model)
Transmission channels	Fiscal Cross-country spillover (+0,3%)	Fiscal (+0,4%) Lower risk premium (+0,2%) Structural reforms (+1%)
Impact on GDP	UE GDP +1,2% at 2024 + 0,8 at 2026	EA GDP +1,4% at 2024 + 1,5 at 2026

(1) P.Pfeiffer et al. "Quantifying Spillovers of NGEU", EC Discussion Paper 144 (July 2021)

(2) K.Bankowsky et al. "The Economic Impact of NGEU: a EuroArea Perspective", ECB Occasional Paper 291 (April 2022)

**Tab. A2** – NGEU macroeconomic impact on GDP 2024-26 (EU and ECB estimates)

Yearly avg	Historical	Ff55	RepowerEU	NZIA	2023-	Ff55+RepEU+NZIA	Δ over
	2011-2020	2021-2030	2021-2030		30	2023-30	historical
	bn € (2022)	bn € (2022)	bn € (2022)	bn € (2022)	bn € (2022)	bn € (2022)	bn € (2022)
<b>SUPPLY SIDE</b>	<b>55</b>	<b>148,4</b>	<b>20,1</b>			<b>168,5</b>	<b>113,5</b>
- Power Grid & storage	15	55,4	3,9			59,3	44,3
- Power plants (incl.boilers and new fuels)	40	93,0	16,2			109,2	69,2
<b>DEMAND SIDE</b>	<b>160</b>	<b>339,3</b>	<b>9,7</b>	<b>13,1</b>		<b>362,1</b>	<b>202,1</b>
- Industrial sector	12	34,0	4,1	13,1		51,2	39,2
- Residential	102	202,3	5,6			207,9	105,9
- Tertiary	46	103,0				103,0	57,0
<b>TOTAL ENERGY SYSTEM</b>	<b>215</b>	<b>487,7</b>	<b>29,8</b>	<b>13,1</b>		<b>530,7</b>	<b>315,7</b>
- Transport	549	754,0				754,0	205,0
<b>TOTAL ENERGY SYSTEM+TRANSPORT</b>	<b>764</b>	<b>1241,7</b>	<b>29,8</b>	<b>13,1</b>		<b>1284,7</b>	<b>520,7</b>
of which: additional investments		477,7				520,7	

Source: EC NZIA SWD (2023) 68 final Annex 1 p.43; EC RepowerEU, EC SWD(2022) 230 final 18/5/2022 Tab.4 p.16

**Tab. A3a** – UE – Investment needs 2021-2030

Yearly avg	Scenario	Scenario S3(2)	Scenario S3(2)	LIFE (2)	LIFE (2)	Rousseau (3)
	55% (1)	-92%	-100%	2031-2040	2041-2050	2023-2050
	2021-2030	2031-2040	2041-2050	bn € (2022)	bn € (2022)	bn € (2022)
<b>SUPPLY SIDE</b>	<b>168,5</b>	<b>341,0</b>	<b>281,0</b>	<b>282,0</b>	<b>267,0</b>	<b>219,0</b>
- Power Grid & storage	59,3	96,0	75,0	81,0	73,0	53,4
- Power plants (incl.boilers and new fuels)	109,2	151,0	133,0	123,0	127,0	124,6
- Other		94,0	73,0	78,0	67,0	41,0
<b>DEMAND SIDE</b>	<b>362,1</b>	<b>373,0</b>	<b>338,0</b>	<b>330,0</b>	<b>321,0</b>	<b>614,0</b>
- Industrial sector	51,2	48,0	22,0	41,0	19,0	25,0
- Residential	207,9	248,0	230,0	236,0	234,0	342,0
- Tertiary	103,0	57,0	67,0	53,0	68,0	92,0
- Agriculture		20,0	19,0			155,0
<b>TOTAL ENERGY SYSTEM</b>	<b>530,7</b>	<b>714,0</b>	<b>619,0</b>	<b>612,0</b>	<b>588,0</b>	<b>833,0</b>
- Transport	754,0	856,0	882,0	694,0	797,0	689,0
<b>TOTAL ENERGY SYSTEM+TRANSPORT</b>	<b>1284,7</b>	<b>1570,0</b>	<b>1501,0</b>	<b>1306,0</b>	<b>1385,0</b>	<b>1522,0</b>
of which: additional investments over 2021-2030	520,7	285,3	216,3	21,3	100,3	237,3
% GDP	8,1%	8,1%	6,7%	6,7%	6,2%	7,3%
Real GDP (period avg)	15.906	19.444	22.369			20.907

(1) EC NZIA SWD (2023) 68 final Annex 1 p.43; EC RepowerEU, EC SWD(2022) 230 final 18/5/2022 Tab.4 p.16

(2) EC SWD(2024) 63 final (6/2/2024) p.56

(3) Rousseu Institut, Road to Net Zero (Jan 2024)

**Tab. A3b** – UE – Investment needs 2031-2050

YEARLY AVERAGE 2020-30 (bn €)								
	ECCO (2023)		RSE 2021 (1)	Confindustria 2023 (2)	ENEL F.- Ambrosetti 2022 (3)	NECP (PNIEC) 2019 (4)	NECP (PNIEC) 2023	PNRR (2021) (5)
	ECCO -55% yearly avg 2020-30 min (a) mld €	ECCO -55% yearly avg 2020-30 max (b) mld €	Ff55 yearly avg 2020-30 mld €	Scenario NZE yearly avg 2020-30 mld €	Scenario NZE yearly avg 2020-30 mld €	Scenario -40% yearly avg 2017-30 mld €	Scenario -55% yearly avg 2023-30 mld €	Green flag yearly avg 2021-26 mld €
<b>TOTALE</b>	<b>122,0</b>	<b>133,7</b>	<b>112,8</b>	<b>116,3</b>	<b>105,6</b>	<b>91,8</b>	<b>118,5</b>	<b>14,4</b>
Residential & Comm (*)	34,2	34,2	28,1	31,4	23,6	20,8	26,3	3,6
Industry (**)	3,3	7,2	2,4	2,6	1,1	2,5	1,8	2,7
Transport	66,9	74,8	67,4	67,0	65,2	58,4	75,0	5,9
Energy	17,5	17,5	14,9	15,3	15,7	10,1	15,5	2,2
- Power plants	14,5	14,5	10,2	9,9	10,5	6,5	9,9	1,4
- Power grid & storage	3,0	3,0	4,7	5,3	5,2	3,5	5,5	0,8

(1) RSE, Studi a supporto della governance del sistema energetico nazionale (dic 2021)

(2) Confindustria, Scenari e valutazioni di impatto economico degli obiettivi Fii-for-55 per l'Italia (marzo 2023)

(3) Enel Foundation-Ambrosetti, "Net Zero E-economy 2050" (Aug 2022)

(4) PNIEC (2019) tab.78 p.287 PNIEC

(5) PNRR+FC: tot. green tag =72,7 mld

**Tab. A3c** – Italian investment needs 2020-2030. Meta comparison among main estimates

SHARE OF PUBLIC INVESTMENTS IN EU (yearly avg)	Ff55+RepEU+ NZIA 2021-30		Public Share (2021-30)	
	Tot-Inv. bn€	Min (bn€)	Max (bn€)	Mean (bn€)
<b>SUPPLY SIDE</b>	<b>168,5</b>	<b>38,7</b>	<b>84,3</b>	<b>61,5</b>
- Power Grid (1)	59,3	5,9	29,7	17,8
- Power plants (incl.boilers and new fuels) (1) (2)	109,2	32,8	54,6	43,7
<b>DEMAND SIDE</b>	<b>362,1</b>	<b>119,1</b>	<b>222,6</b>	<b>170,8</b>
- Industrial sector (1) (2)	51,2	10,2	20,5	15,4
- Residential (1) (2)	207,9	72,8	135,1	104,0
- Tertiary (1)(2)	103,0	36,1	67,0	51,5
<b>TOTAL ENERGY SYSTEM</b>	<b>530,7</b>	<b>157,8</b>	<b>306,9</b>	<b>232,3</b>
- Transport [National rail & public](3)	754,0	452,4	716,3	584,4
<b>TOTAL ENERGY SYSTEM+TRANSPORT</b>	<b>1284,7</b>	<b>610,2</b>	<b>1023,2</b>	<b>816,7</b>
of which: additional investments (bn €)	521	<b>247,3</b>	<b>414,7</b>	<b>331,0</b>
<b>% over total investment needs</b>		<b>47%</b>	<b>80%</b>	<b>64%</b>

Fonte: C.Baccianti ch.8 Greening Europe (2022)

(1) EC RepowerEU SWD(2022) 230

**Tab. A4a** – EU public investment share 2021-2030. Estimates of public investment over total needs.

SHARE OF PUBLIC INVESTMENTS IN ITALY (yearly avg)	NECP (PNIEC)	Public Share (2021-30)		
	2021-30 bn€	Min (bn€)	Max (bn€)	Mean (bn€)
<b>SUPPLY SIDE</b>	<b>15,4</b>	<b>3,5</b>	<b>7,7</b>	<b>5,6</b>
- Power Grid (1)	5,5	0,6	2,8	1,7
- Power plants (incl.boilers and new fuels) (1)	9,9	3,0	5,0	4,0
<b>DEMAND SIDE</b>	<b>28,1</b>	<b>9,6</b>	<b>17,8</b>	<b>13,7</b>
- Industrial sector (1)	1,8	0,4	0,7	0,5
- Residential+Tertiary (1)	26,3	9,2	17,1	13,2
<b>TOTAL ENERGY SYSTEM</b>	<b>43,5</b>	<b>13,1</b>	<b>25,5</b>	<b>19,3</b>
- Transport [National rail & public] (1) (2)	75,0	45,0	71,3	58,1
<b>TOTAL ENERGY SYSTEM+TRANSPORT</b>	<b>118,5</b>	<b>58,1</b>	<b>96,8</b>	<b>77,4</b>
of which: additional investments (bn €)	<b>22</b>	<b>10,8</b>	<b>18,0</b>	<b>14,4</b>
<b>% over total investment needs</b>		<b>49%</b>	<b>82%</b>	<b>65%</b>

(1) PNIEC (2023)

(2) Estimated share of public transports = 20% (RSE 2021)

**Tab. A4b** – Italian public investment share 2021-2030. Estimates of public investments over total needs.



	European Commission forecasts for 2024			Min. SPB required by DSA criteria		Min. SPB required by 3% deficit cap		Min. SPB after applying debt sustainability safeguard		Min. SPB after applying deficit resilience safeguard		Minimum SPB satisfying all criteria		Average annual fiscal adjustment need		Long-term SPB after applying deficit resilience safeguard beyond adjustment period	
	Debt	Fiscal balance	SPB	4-year adj.	7-year adj.	4-year adj.	7-year adj.	4-year adj.	7-year adj.	4-year adj.	7-year adj.	4-year adj.	7-year adj.	4-year adj.	7-year adj.	4-year period	7-year period
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)=max (4,6) or (8,10)	(13)=max (5,7,9) or (9,11)	(14) = ((12)- (3))/4	(15) = ((13)- (3))/7	(16)	(17)	
Greece	152	-0.9	2.0	1.7	1.6	1.8	1.9	...	...	3.2	3.5	3.2	3.5	0.29	0.21	3.6	3.5
Italy	141	-4.4	-0.9	3.7	3.3	3.6	3.3	...	...	...	...	3.7	3.3	1.15	0.61	4.1	4.6
France	109	-4.4	-2.4	1.0	0.7	0.7	0.7	...	...	...	0.9	1.0	0.9	0.86	0.47	1.8	2.4
Spain	106	-3.2	-1.0	2.1	2.4	1.5	2.0	2.5	3.0	...	...	2.5	3.0	0.88	0.56	2.5	3.0
Belgium	106	-4.9	-2.4	2.4	2.6	2.0	2.1	...	...	...	...	2.4	2.6	1.19	0.71	2.4	2.6
Portugal	100	0.1	2.1	2.8	2.6	1.6	1.1	...	...	...	...	2.8	2.6	0.16	0.07	2.8	2.6
Finland	77	-3.2	-1.0	0.5	0.4	-0.5	-0.6	2.2	...	...	...	2.2	0.4	0.79	0.20	2.2	0.4
Austria	76	-2.4	-0.7	1.1	1.2	0.2	-0.2	...	...	...	...	1.1	1.2	0.44	0.26	1.1	1.2
Hungary	72	-4.3	1.0	2.6	3.2	1.9	2.4	...	...	...	...	2.6	3.2	0.40	0.32	2.6	3.2
Cyprus	71	2.1	3.4	0.0	-0.3	-0.3	-0.4	...	...	...	0.5	0.0	0.5	-0.86	-0.42	0.4	0.5
Slovenia	68	-3.3	-1.1	1.6	2.0	1.9	2.1	...	...	...	...	1.9	2.1	0.74	0.45	1.9	2.1
Germany	64	-1.6	-0.2	0.8	0.7	-0.1	-0.4	...	...	...	...	0.8	0.7	0.25	0.13	0.8	0.7
Slovakia	60	-6.5	-5.1	1.5	2.0	1.1	1.4	...	...	...	...	1.5	2.0	1.65	1.01	1.5	2.0
Croatia	59	-1.8	-1.2	...	...	-0.2	-0.1	...	...	0.4	0.6	0.4	0.6	0.40	0.25	0.8	0.8
Malta	56	-4.6	-2.7	-0.2	0.1	-0.5	0.0	...	...	...	...	-0.2	0.1	0.63	0.39	0.6	0.6
Poland	54	-4.6	-1.8	0.0	0.3	-0.1	0.0	...	...	0.2	1.0	0.2	1.0	0.50	0.39	1.4	1.5
Romania	49	-5.3	-3.0	1.5	2.3	1.4	1.8	...	...	...	...	1.5	2.3	1.12	0.76	1.5	2.3
Netherlai	47	-1.8	-0.5	...	...	1.8	1.5	...	...	...	...	1.8	1.5	0.57	0.29	1.8	1.5
Czech Re	45	-2.4	-0.1	...	...	0.6	0.9	...	...	...	...	0.6	0.9	0.17	0.14	0.6	0.9
Latvia	42	-3.1	-1.7	-1.4	-1.1	-1.5	-1.4	...	...	-0.1	0.0	-0.1	0.0	0.40	0.25	0.3	0.0
Ireland	41	0.6	0.8	...	...	-1.3	-1.3	...	...	-0.4	-0.2	-0.4	-0.2	-0.29	-0.15	-0.4	-0.2
Lithuania	38	-2.3	-0.5	...	...	-0.6	-0.7	...	...	0.3	0.4	0.3	0.4	0.20	0.13	0.3	0.4
Sweden	30	-0.7	1.5	...	...	-1.1	-1.0	...	...	0.0	-0.4	0.0	-0.4	-0.38	-0.27	0.0	-0.4
Luxembo	29	-2.1	-0.6	-0.6	-0.6	-0.1	-0.1	...	...	...	...	-0.1	-0.1	0.12	0.07	-0.1	-0.1
Denmark	28	1.8	2.9	...	...	-1.4	-1.6	...	...	0.1	-0.7	0.1	-0.7	-0.70	-0.51	0.1	-0.4
Bulgaria	24	-3.0	-2.7	-2.1	-1.4	-1.0	-0.7	...	...	...	...	-1.0	-0.7	0.42	0.29	0.2	0.1
Estonia	21	-2.4	0.0	...	...	-2.5	-2.4	...	...	0.6	0.6	0.6	0.6	0.15	0.08	0.6	0.6

Source: Bruegel based on European Commission November 2023 forecasts, Bloomberg and ECB. Note: Methodology based on European Commission (2023). Yellow shading marks binding criteria for respective adjustment period. Columns (4)-(11) account for any frontloading implied by the EDP.

**Tab. A5** – Fiscal adjustments according to the new Stability and Growth Pact (December 2023)

STEP FUNDS	Total amount	Green & Energy	Digital	Instruments	Sources	Timeline	Focus
	mld €	mld €	mld €				
<b>COHESION POLICIES</b>	<b>348,4</b>	<b>311,8</b>	<b>36,6</b>				
-Cohesion Funds (CF) (1)	146,6	110	36,6	Grants	EU Budget	2021-27	Geographical cohesion
-European Regional Development Fund (ERDF) (1)	85	85		Grants	EU Budget	2021-27	"
-Just Transition Fund (JTF) (2)	17,5	17,5		Grants Loans	EU Budget EAR	2021-27	Socio-economic costs of
-European Social Fund Plus (ESF+) (1)	99,3	99,3		Grants	EU Budget	2021-27	Geographical cohesion
<b>NEXT GENERATION FUND</b>	<b>801,0</b>	<b>313,2</b>					
- Recovery and Resilience Facility (RRF) (2)	723,8	267,8	456,0	Grants Loans	EU-Bonds (30%GB)	2021-26	Digital & Green Transition
- Invest EU(1) (2)	26,2	13,7	2,0	Guarantees	EU Budget	2021-27	Digital & Green Transition
-Horizon Europe (1)	51	31,7	19,3	Grants	EU Budget NGEU	2021-27	R&D
Repower EU (2)	298	298,0		Grants Loans	RRF	2022-26	Energy & Green Transition
Digital Europe Program (1)			7,6	Grants Procurement	EU Budget	2021-27	Digital Transition
European Defence Fund (1)			8,0	Grants	EU Budget	2021-27	R&D
<b>FUNDED BY ETS ALLOWANCES (*)</b>	<b>189</b>	<b>189</b>					
Innovation Fund (1)	43	43		Grants Blending	EU ETS	2021-27	Low-carbon technologies
Modernization Fund (1 & 2) (1)(2)	60	60		Grants	EU ETS	2021/2024-30	Energy systems & efficiency
Social Climate Fund (1)	86	86		Grants Loans	EU ETS 2	2026-32	Cushion against ETS 2 extension
<b>TOTAL</b>	<b>1.636,4</b>	<b>1.112,0</b>	<b>36,6</b>				

(1) European Commission, Step Proposal COM(2023) 335 20/6/2023

(2) Bruegel (2024), Demertzis et al., Accelerating Strategic Investments, Appendix 1

(3) Bruegel, A New Governance Framework to Safeguard the EU Green Deal (2023) Tab.1 p. 10

(\*) under the assumption of carbon price = 80€/CO<sub>2</sub>e ton

**Tab. A6** – STEP (Strategic Technologies for Europe Platform)

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THE ITALIAN CLIMATE CHANGE THINK TANK

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