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The Challenges of Implementing the European Green Deal

by

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I. Introduction

As the flagship measure of the first von der Leyen Commission, the EGD adopted in December 2019,[1] comprising almost 160 legislative acts, was intended to create the largest shock wave since the creation of the single market in 1986 by turning the European Union (EU) into the first decarbonised (achieving carbon neutrality by 2050) and circular economy in the world aiming at zero pollution. This reform, which is both ambitious and unprecedented, was triggered by alarming reports from the IPCC, climate demonstrations as well as a new geopolitical vision seeking to free the EU from its dependence on energy[2] and natural resources. Moreover, the strategy endorsed by the EU institutions was only further vindicated by the subsequent spike in energy prices in 2022 following the invasion of Ukraine.

The new von der Leyen Commission sees its role more in terms of implementing the 160 legislative instruments adopted during the 2019-24 legislature rather than putting forward new legislative proposals. Implementing the numerous EGD legislative instruments will be a real challenge, as no one has a clear overview of these wide-ranging reforms. Although the various legislation is interconnected and complementary, it nevertheless pursues very different objectives, which can either reinforce or oppose one another. Against this background, four years after its adoption, one might ask whether this Deal is likely to create a new economic model, let alone a 'new societal order'[3] or whether it amounts to little more than "greenwashing" of the internal market, transport, energy, and common commercial policy. Whilst the answer to this question will inevitably be qualified, we shall see that traditional economic interests have largely prevailed over the fight against pollution and the ecosystemic approach, whereas the social pillar of sustainable development risks being the big loser of the green transition.

The article is structured as follows. First, we shall provide a brief analysis of the various sectoral legislative instruments adopted during the previous legislature in order to flesh out the EGD and the Fit-for-55 program. In so doing, we shall highlight the various EGD objectives of climate neutrality, zero pollution, circular economy, ecological resilience, etc. Secondly, we shall assess the added value of these new regulatory schemes. Thirdly and finally, we shall

[1] Commission Communication, The European Green Deal, COM(2019) 640 final.
[2] 89% of the energy concerned in the EU in 2019 originated from fossil fuels.
[3] E. Chiti, 'Managing the ecological transition of the EU: the European Green Deal as a regulatory process', (2022) *CMLRev* 59, pp 19-48.

consider the challenges faced by the new European Commission and the 27 Member States in implementing the 160 legislative instruments.

II. A polycentric reform

1. A bold reform in all respects

The EGD is unprecedented in the history of public policy. Although environmental policy came in through the side door of the European Economic Community competence back in 1986 and for several decades was regarded as something of a poor sibling, in 2019 the Deal placed it centre stage within the policies being pursued by the Union. The 2019 EGD was complemented in 2021 by the Fit-for-55 program[4] that aimed to enable the EU to achieve the -55% GHG emission reduction goals by 2030.[5] Aware of the intertwined nature of the climate change and the environmental crises, the European Commission adopted in 2020-2021 a flurry of strategies (industry, transport, chemicals, finance, biodiversity, forests, farm to fork, etc.) that have set bold GHG climate short-term and long-term climate change objectives, pollution abatement thresholds, and ambitious sustainable development targets. Emboldened by these announcements, the European Commission proposed to EU lawmakers the adoption of almost 160 legislative acts, resulting in a legislative reform that has been producing the greatest shock wave since the creation of the single market in 1986.

The transversality of the EGD can be explained by the fact that climate change is only part of a larger megatrend of environmental degradation linked to overexploitation of natural resources.[6] Resolving such a crisis requires more than an energy transition and climate adaptation measures. Accordingly, the EGD reform has been above all polycentric: the green transition will go hand in hand with the emergence of a decarbonised and circular economy, pollution elimination, the expansion of organic farming, as well as a genuine ecosystemic approach. Futhermore, at the end of 2024, the EDG is prompting a political debate about the inclusion of an Industrial Deal. It is dependent on complex normative processes involving the intersection of directives, regulations, decisions and communications reflecting a plethora of policies, competence over which can vary, which in turn means that institutions act as guarantors of divergent if not antagonistic interests. It is ambitious, with all sectors of society being mobilised in the push to achieve carbon neutrality by 2050. It is costly on account of the major scale of the investments that will need to be made by both public authorities and the private sector. Finally, it has a global vocation, with the Union seeking to externalise, or even globalise, its environmental and climate ambitions.

Without presenting an endless inventory of the numerous individual legislations – which would take up many pages, given the diversity and the technical complexity of the measures concerned

[4]Referred to under the acronym FF55, standing for "fit for 55", due to the target of reducing GHG emissions by 2030, this program consisted of 13 legislative proposals, including 5 directives and 8 regulations.
[5] With the exception of the directive on energy taxation, all these proposals have been adopted.
[6] ESPAS, *Global Trends to 2040. Choosing Europe's future*, G Barry (ed) Publications Office of the European Union, Luxembourg, 2024, p 23.

– we shall take stock of the achievements of the EGD by focusing on a selection of emblematic regulatory measures. A number of these were adopted urgently,[7] whilst others emerged in response to regimes that had not sufficiently proven their worth.[8] Some are incremental, in particular for instance the extension of the carbon market, which has already been overhauled several times. Whereas most of the rules fleshing out the EGD simply modify other provisions already in force, new regulatory techniques have emerged. Several new acts represent a break with the past: carbon neutrality required under the European Climate Law (ECL), [9] the border adjustment measures (CBAM),[10] a new carbon market (ETS 2),[?11] as well as the regulation on nature restoration.[12] Given that it is not possible to provide full details here, we will limit ourselves to outlining the key factors underpinning the various components of the EGD reform and their interactions.

2. Climate neutrality at the heart of the Deal

Europe is the fastest warming continent.[13] As a result of the climate emergency, environmental crises are piling up one after the other. Moreover, rising temperatures and seas do not represent the only problem; the oceans are also acidifying at an alarming rate. During Europe's hottest year ever 2023 (which saw a temperature increase of 1.4°C, i.e. 0.3-0.4°C higher than the 2021 summer temperature), climate records were broken at an alarming and unprecedented rate (reduction of river flow for the 6th year in a row, loss of 5 cubic kilometres of Alpine glaciers, unprecedented aridity in the Mediterranean area and more intense wild fires), plunging our continent into the unknown.[14] The EU is already feeling the direct effects of climate change (longer and harsher heatwaves, droughts, water scarcity, wildfires, precipitations, etc.), and at an accelerating pace. Economic losses due to extreme weather and climate in the EU have been

[7] For instance, the European Commission was able to submit to EU lawmakers within a very short space of time the proposal that would later become Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment [2019] *Official Journal* L 155/1.

[8] Proposal for a Regulation of the European Parliament and of the Council on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC, COM/2022/677 final.

[9] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law') [2018] *Official Journal* L 243/1.

[10] Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism [2023] *Official Journal* L 130/52 (below CBAM Regulation).

[11] Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system [2023] *Official Journal* L 130/134-202.

[12] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration, *Official Journal* L 2024/1991.

[13] J Rockström et al., 'A safe operating space for humanity' (2009) Nature, vol. 461 ; J Rockström et al., 'Planetary boundaries: exploring the safe operating space for humanity' (2009) *Ecology and Society*, vol. 14, no. 2, p 32.

[14] European Commission and Copernicus, 'Copernicus: 2023 is the hottest year on record, with global temperatures close to the 1.5°C limit' (2024), available at: https://climate.copernicus.eu/copernicus- 2023-hottest-year-record.

estimated at EUR 650 billion between 1980 and 2022, but over EUR 100 billion of losses were concentrated in just the last two years of this period.[15] Given that the impacts from climate change are rapidly accelerating, urgent action is needed to keep the 1.5 °C goal within reach and to address the climate crisis.[16]

Despite these challenges, since the 2019 the EU has not given up on its efforts. By obliging the 27 Member States to achieve carbon neutrality in stages by the middle of the century (GHG emissions cut of 55% 2030), the ECL, which was adopted in 2021[17] within the ambit of the Deal, requires a drastic reduction in GHG emissions in a variety of sectors such as industry, transport, energy, agriculture and the heating and cooling of buildings. The aim is to achieve negative emissions after 2050.

The solidarity among the Member States that still remained following the pandemic helped to further the objective of carbon neutrality. In 2021, the EU institutions achieved a historic breakthrough on a budgetary level in enabling the Union to borrow on the international markets. The post-Covid recovery plan (NextGenerationEU) enabled significant financial resources (180 billion euros) to be freed up to boost national investments in the green transition (estimated at 40 billion euros per year). In addition, 300 billion euros were allocated under the REPowerEU plan in 2022, adopted following the invasion of Ukraine with the aim of accelerating the rollout of renewable energies such as green hydrogen, etc.[18] In an attempt to free itself from its dependence on Russian hydrocarbons, with the adoption of the RED III Directive the Union has stepped up its ambitions in the field of energy and in particular the development of renewable energy. [19] As the following table demonstrates, external factors (such as the pandemic and the invasion of Ukraine) have made it possible to square this circle: carbon neutrality, the energy transition, strategic autonomy and the circular economy.

Crises	**EU responses**	**Legal instruments**
2021–COVID-19 pandemic	2021 NextGenerationEU	Recovery and Resilience Facility (RRF) - Regulation (EU) No 2021/24

[15] D Armstrong McKay et al., 'Exceeding 1.5°C global warming could trigger multiple climate tipping points' (2022) *Science*, vol. 377, no. 6611, doi: 10.1126/science.abn7950.
[16] UNFCCC, 'Outcome of the first global stocktake' in Decisions adopted by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (2024) Decision 1/CMA.5, FCCC/PA/CMA/2023/16/Add.1, para 5.
[17] ECL, supra, note 10.
[18] European Commission Communication, *REPowerEU Plan*, COM (2022) 230 final. The RepowerEU strategy, which aims to free the EU from dependence on Russian gas, is based on four pillars: saving energy, replacing Russian fossil fuels with other hydrocarbons, promoting renewable energies and investing in new infrastructure such as liquefied natural gas (LNG) terminals.
[19] Directive (EU) 2023/2413 of the European Parliament and of the Council of 18 October 2023 amending Directive (EU) 2018/2001, Regulation (EU) 2018/1999 and Directive 98/70/EC as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 [2023] *Official Journal* L 243/1-77, Art 3 (1). (below RED III)

2022–Energy vulnerability	2022 REPowerEU	RED III, Energy Efficiency Directive, chapters REPowerRRF
2022–Supply from clean technologies	2023 Green Deal Industrial Plan	Critical Raw Materials Act; Net-Zero Industry Act

3. Strengthening the EU carbon market

The carbon market, which at present only covers 45% of GHG emissions in the EU, is regarded as the spearhead of its climate policy. Within a few years, it will end up covering 80% of the EU's GHG emissions. The ETS 1 target is to achieve a 62% reduction in GHG emissions by 2030 relative to 2005 instead of the previous 43% target. To achieve this target, the conditions for the free allocation of emission allowances are tightened considerably. The phasing out of the free allocation of emission allowances is made possible by Carbon Border Adjustment Measures (CBAM) regulation that limits 'carbon leakage'.[20] Thanks to CBAM, which will be fully applied from 2026, undertakings that are competing with third country undertakings will have to purchase their GHG allowances at auctions[21] whilst importers of competitor products (cement, aluminium, electricity, fertiliser, hydrogen, iron and steel sectors) will have to cover the emissions embodied in their imported carbon-intensive products by purchasing certificates with a value equivalent to a weekly allowance average price. The phasing out of free allocation is accelerated for aviation and the linear reduction factor by which the emission ceilings decrease annually is increased (in 2024-2027 the reduction factor is of -4,3% per year).[22] The scope of EU ETS 1 has been further extended to include maritime shipping within the EU. Furthermore, the obligation to use renewable and low-carbon fuels in maritime and air transport should help to reduce their environmental footprint.[23]

Finally, as the icing on the cake, undertakings marketing fuels supplied to the built environment, road transport and some other sectors, such as small industries will operate on a parallel carbon market based on the 'cap-and-trade' principle. The system will be introduced gradually over the next few years. EU ETS2 has a GHG reduction goal of 42% by 2030 compared to 2005 to be achieved by 2030.[24] Within the EU ETS2 system, not the end-consumers (building users, vehicle drivers) who are the ultimate emitters but the suppliers of fuels have an obligation to surrender allowances. As they will not be obliged to contribute to the public finances in the

[20] CBAM Regulation (EU) 2023/956, supra, note 11.
[21] At an average auction price of 83.24 euro in 2023.
[22] Directive (EU) 2023/958 of 10 May 2023 amending Directive 2003/87/EC as regards aviation's contribution to the Union's economy-wide emission reduction target and the appropriate implementation of a global market-based measure [2023] *Official Journal* L 130.
[23] Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC, *Official Journal* L 234/48 ; Regulation (EU) 2023/2405 of the European Parliament and of the Council oof 18 October 2023 on ensuring a level playing field for sustainable air transport (ReFuelEU Aviation), *Official Journal* L 2405/1.
[24] Directive (EU) 2023/959, supra, note 12.

form of increased excise duty on energy products due to the failure of efforts to revise the directive harmonising these duties, the end-consumers will be confronted with an increase in the price of hydrocarbons from 2027 within the ambit of the ETS2.[25] These two carbon markets will be complemented by the ban on selling vehicles with internal combustion engines by 2035 as well as the obligation to construct passive buildings,[26] coupled with the reinforcement of polluting emissions standards, known as Euro 7.[27]

Given that the scope of both ETS is limited, the Effort Sharing Regulation (ESR) requires a target of cutting 2005 emissions levels by 40% that will have to be met by 2030 throughout the EU for those sectors of the economy that do not fall within the scope of the two carbon markets (domestic transport (excluding aviation), buildings, agriculture, small industry and waste (incineration)).[28] Annual emissions allocations for each Member State for the years from 2021 to 2030 are set out by Commission implementing acts. These targets vary from -50 % for Sweden to -10 % for Bulgaria.[29]

4. *The rise of a renewable energy-based economy*

Almost three-quarters of the EU energy system relies on fossil fuels. Oil dominates the energy mix.[30] By way of illustration, industry accounts for 25 % of the Union's energy consumption, and is a major consumer of heating and cooling, which is currently supplied 91 % by fossil fuels.[31]

In order to achieve climate neutrality by 2050, the green transition will require a renewable, decarbonised energy-based economy entailing the electrification of entire parts of the economy. This should lead to a sharp increase in electricity produced from renewables (biomass, solar, wind, hydro).[32] As a result, energy infrastructure will have to be adapted to accommodate low-carbon energy sources through the expansion of grids and energy storage facilities. Accordingly,

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[25] In effect, ETS2 will cover GHG emissions upstream. As a result, fuel suppliers, rather than end consumers (households or car drivers) will be required to purchase the allowances covering their downstream emissions.

[26] Directive (EU) 2024/1275 of the European Parliament and of the Council of 24 April 2024 on the energy performance of buildings (recast) *Official Journal* L 2024/1275.

[27] Regulation (EU) 2018/858 of the European Parliament and of the Council of 30 May 2018 on the approval and market surveillance of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles, amending Regulations (EC) No 715/2007 and (EC) No 595/2009 and repealing Directive 2007/46/EC [2018] *Official Journal* L 151/1-218. On December 18, 2023, the European Parliament and the Council reached a provisional agreement on the amending regulation.

[28] Regulation (EU) 2023/857 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement, and Regulation (EU) 2018/1999 [2018] *Official Journal* L 111/1.

[29] Amended Regulation (EU) 2018/842, Article 4 (3). See Commission Implementing Decision (EU) 2023/1319 of 28 June 2023 amending Implementing Decision (EU) 2020/2126 to revise Member States' annual emission allocations for the period from 2023 to 2030, *Official Journal* L 163/9.

[30] M Leonard and al., 'The geopolitics of the European Green Deal' (2021) *Policy Contribution* 04/2021, Bruegel, p 3.

[31] RED III, supra, note 20, Preamble n° 59.

[32] L Hancher and A de Hauteclocque, 'Strategic autonomy, REPowerEU and the internal energy market: Untying the gordian knot' (2024) *CMLRev* 61, p 59.

this shift in energy production and consumption will require a deeply coordinated approach based on solidarity and strategic autonomy.[33]

Due to the constant reduction in auctioned allowances, the 8,500 industries covered by ETS 1 will continue to invest in clean technologies. Given that the energy sector currently contributes over 75 % of total GHG emissions in the Union, its decarbonisation requires structural transformation, based on phasing out fossil fuels, to be replaced by renewable and low-carbon energy sources, improving energy efficiency, all the while ensuring adequate energy supply and price affordability. Given that 75 % of the Union's building stock has a poor energy performance,[34] the building sector has also been identified as a key target of the EU climate policy. Buildings are responsible for about 40 % of the Union's total energy consumption and for 36 % of its GHG from energy.[35] Although buildings have a large untapped potential to contribute to the reduction in GHG emissions in the Union, progress on the use of renewable energy for heating and cooling has been stagnant over the last decade. The decarbonisation of heating and cooling in buildings is thus crucial to reach climate neutrality by 2050.

Three amending directives adopted in 2023 are set to play a key role with respect to energy production and consumption. The revised Renewable Energy Directive (RED III), the amended Energy Efficiency Directive and the Energy Performance of Buildings Directive set targets for renewables in consumption, energy efficiency that includes building renovations.[36] For instance, in virtue of RED III, the proportion of energy produced from renewable sources (wind, solar, geothermal, hydroelectric, biomass, etc.) will have to reach at least 42.5%, and ideally 45%, of the energy mix by 2030.[37] The Union target of 32 % for the overall share of energy from renewable sources in the Union's gross final consumption of energy is increased to 42,5 %.[38] The recast Energy Performance of Buildings Directive (EPBD) will increase the rate of building renovations.[39] While hydrocarbons and gas are still the main sources of energy in 2024,[40] electrification of energy production will have to be accelerated to reach 42.5% of the energy mix by 2030.

	Legal Act	**Scope**	**Targets for 2030**
Energy efficiency	Directive (EU) 2023/1791	Combustible fuels, heat, renewable energy, electricity, or any other form of energy	Reduction of energy consumption of at least 11,7 % compared

[33] Ibid., p 56.
[34] Directive (EU) 2023/1791 amending Directive (EU) 2018/2001, Preamble n°13.
[35] Ibid., Preamble n°42.
[36] Given that this wave of renovation could have disastrous consequences for Europe's historical and cultural heritage, 'buildings officially protected as part of a designated environment, or because of their special architectural or historical merit' are not subject to the yearly renovation requirement of 3 % (Article 6(2)). However, this exception does not cover heritage in the broad sense, but only buildings of architectural or historical interest.
[37] RED III, supra note 32, Art 3 (1).
[38] Directive (EU) 2023/1791, supra, note 35, Art 3(1).
[39] Directive (EU) 2024/1275, supra, note 27.
[40] E Letta, *Much more than a market. Speed, Security, Solidarity* (April 2024) 62.

			to the projections of the 2020
RED III	Directive (EU) 2023/2413	Energy produced from renewable sources	At least 42.5% of the energy mix
EPBD	Directive (EU) 2023/1275	Public and private buildings	National building renovation plan, minimum energy performance requirements

Besides, transport is responsible for more than 30 % of final energy consumption.[41] The Sustainable Transport Package that aimed to reduce GHG and pollutants emissions from this sector has been reinforcing the EU's leadership in the global fight against climate change. A flurry of general EGD measures deal with transport: extension of ETS 1 to large ships of 5 000 gross tonnage and above, cancellation of the free allowances for the aviation sector, creation of ETS 2 subjecting fuel suppliers to surrender allowances, support for the most vulnerable households through the Social Fund for Climate. To supplement these measures, ambitious legislations have been enacted in 2023:

- regulation setting stricter CO2 performance standards for cars and vans,[42]
- regulation on sustainable aviation fuels (ReFuelEU),[43]
- regulation on cleaner shipping fuels (FuelEU),[44]
- regulation on a new alternative fuels infrastructure, including improving the public charging network for electric cars.[45]

Despite their highly technical nature, these new regulations should not be overlooked. The use of renewable fuels and renewable electricity in the transport sector can contribute to the decarbonisation of the Union transport sector.[46] For instance, more than 30 million electric vehicles are expected in the Union by 2030.[47] Given that the increasing number of electric vehicles will require the optimalisation of recharging operations, the RED III directive enhances the system integration of renewable electricity, in reaching higher shares of renewable electricity in a cost-optimal manner.

Within the space of three years, the EU energy policy has not only become more European but also more sustainable. However, one train may hide another. In order to prevent the acceleration of the energy transition from increasing the Union's dependence on critical raw materials (rare

[41] Directive (EU) 2023/1791 on energy efficiency, Preamble n°13.
[42] Regulation (EU) 2023/851 of the European Parliament and of the Council of 19 April 2023 amending Regulation (EU) 2019/631 as regards strengthening the CO2 emission performance standards for new passenger cars and new light commercial vehicles in line with the Union's increased climate ambition, *Official Journal* L 110/5.
[43] Regulation (EU) 2023/2405, supra, note 24.
[44] Regulation (EU) 2023/1805, supra, note 24.
[45] Ibid.
[46] RED III, supra, note 32, Preamble n° 72.
[47] Ibid., Preamble n° 50.

earth metals, lithium, manganese, etc.) – of which it does not have any deposits, but which are essential in producing key technology – the 2023 Green Deal Industrial Plan, as the final plan of this reform, is set to reinforce its strategic autonomy through the development of a net-zero emissions industry and regulation of critical raw materials.

The following table provides an overview of the two carbon markets as well as the additional rules covering installations and products not falling within the scope of these markets.

	Legal Act	Scope	Targets for 2030
ETS1	Dir. 2003/87/EC modified by Dir. 2023/958	Major industries, aviation, maritime transport	- 62% GHG emissions compared to 2005 levels
ETS2	Dir. 2003/87/EC modified by Dir. 2023/958	Fuel combustion in buildings, road transport and additional sectors (SMEs) not covered by the ETS 1	- 42% GHG emissions compared to 2005 levels
CBAM	Reg. (EU) 2023/956	Cement, aluminium, electricity, fertiliser, hydrogen, iron and steel	None
Effort Sharing	Regulation (EU) 2018/842 amended by Regulation (EU) 2023/857	Domestic transport (excluding aviation but including domestic navigation), buildings, agriculture, small industry and waste	– 40 % in 2030 compared to 2005 level. Binding national targets for each Member State.
RED III	Directive (EU) 2023/2413	Renewable energy	Share of renewable energy in the EU's overall energy consumption up to 42.5%
LULUCF	Regulation (EU) 2018/841	Land use, land use change and forestry	310 million tonnes of CO_2 equivalent net removals. Binding national targets for each Member State.

5. The last and most challenging piece of the puzzle, the Green Deal Industrial Plan

Considered in abstract terms, the EGD should open up major opportunities for undertakings, with the prospect of an overall average annual investment of at least €813 billion, or 5.1% of EU GDP,[48] over the coming years. However, the energy transition will require massive use of clean technologies, the related components and rare materials (lithium, graphite, cobalt, nickel, manganese, etc.), which will have the effect of exacerbating the vulnerability of an EU that is

[48] C Calipel, A Bizien and T Pellerin-Carlin, 'Déficit d'investissement climat européen : une trajectoire d'investissement pour l'avenir de l'Europe' in *European Climate Investment Deficit Report. An investment pathway for Europe's Future* (Institute for Climate Economics 2024).

already highly dependent on external markets. If the world is to reach net zero by 2050, demand for minerals for clean energy technologies will grow six-fold by 2040 compared to 2020, driven especially by electric vehicles and battery storage.[49] As such, demand for batteries for storing electricity and for sustainable transport is set to increase fourfold by 2030, and sevenfold by 2035.[50] Moreover, the International Energy Agency anticipates an explosion in global demand for copper by 40% by 2040. Supply will be unable to keep up with demand, and prices will rise accordingly. The energy transition, which will be indispensable in order to achieve carbon neutrality by 2050, will thus have to deal with geo-strategic and geo-economic tensions. Moreover, the growing exploitation of minerals and rare earth metals outside Europe will heighten environmental pressure, with mining companies having to extract increasingly large quantities in order to obtain the same quantities of metal.

Against this background, the EGD strengthens the relevance of shifting the traditional industrial model into a new decarbonised and circular industrial model that reckons upon clean technologies as well as sustainable and smart mobility.[51] Furthermore, this new industrial model should also deliver sustainable products and services. So far, the "industrial" pillar of the EGD is implemented through two unprecedented Acts designed to counter the risk of shortages in the supply of certain raw materials and technological products, and to reduce price volatility. These two Acts should enable the EU to implement both the climate transition as well as the digital transition. First of all, taking account of the primary importance of critical raw materials - non-energy and non-agricultural raw materials - for the climate and digital transitions, which are largely imported,[52] the Critical Raw Materials Act should enable the EU to reduce its dependence,[53] diversify its imports and reinforce its strategic autonomy.[54] Secondly, the Net-Zero Industry Act[55] will aim to secure supply chains and the production of those technologies where the Chinese economy plays a major role.[56] As far as "strategic projects" for the raw materials sectors[57] and the net-zero sectors[58] are concerned, which have "priority status", the EU as a whole – and not Member States individually – must achieve, according to the two

[49] R Way et al., 'Empirically grounded technology forecasts and the energy transition', (2022) *Joule*, vol. 6, no. 9, pp 2057-2082.
[50] IEA, *Clean energy supply chain vulnerabilities* (Energy Technology Perspectives 2023).
[51] E Chiti, supra, note 4, pp 27 and 33.
[52] 97% of magnesium is imported from China, and 63% of cobalt used in batteries throughout the world is extracted in the DRC.
[53] The obligations in terms of circularity and recovery of raw materials set out in articles 25 to 28 of the critical materials regulation will not succeed in reversing the trend towards greater dependence on materials extracted outside the EU.
[54] Regulation (EU) 2024/125 of the European Parliament and of the Council establishing a framework for ensuring a secure and sustainable supply of critical raw materials, *Official Journal* L 1252/1 (Critical Raw Materials Act).
[55] Regulation (EU) 2024/1735 of the European Parliament and of the Council of 13 June 2024 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem, *Official Journal* L 2024/1735. (Net Zero Industry Act).
[56] China controls 90% of the solar panel components market. See Goldman Sachs, *China may reach energy self-sufficiency by 2060,* 2023.
[57] Critical Raw Materials Act, supra, note 55, Art 10.
[58] Net Zero Industry Act, supra, note 56 Art 10 to 12.

proposals, a range of key targets by 2030. The following table highlights some of the targets to be achieved by 2030 with regard to minerals.

Sectors	***Targets to be achieved by 2030***
Mineral extraction capacity	10% of annual consumption of strategic minerals
Mineral transformation capacity	40% of annual consumption of strategic minerals
Mineral recycling capacity	25% of annual consumption of strategic minerals

Last, in order to facilitate the fulfilment of these targets, the two Acts will "rationalise" authorisation procedures by setting mandatory time limits,[59] that will come in for considerable environmental NGOs criticisms.

Clearly, these two Acts will not be enough to meet the expectations of EU undertakings facing strong international competition. Considering the investment planning that will be required to achieve the energy transition, which generally covers periods longer than ten years, industry federations anticipate that their members will be unable to keep up with such a fast pace of reforms, in particular as regards the target of reducing GHG emissions by 90% by 2040.[60] In their Antwerp Declaration, 916 signatories including industrial giants Ineos and Bayer called for action to be taken to combat "over-regulation" in ten urgent steps.[61] The signatory undertakings and associations thus hope that the Green Deal Industrial Plan will feature prominently in the legislature 2024-2029. Following on from this, the November 2024 Budapest Declaration on the New European Competitiveness calls for a simplification revolution 'ensuring a clear, simple and smart regulatory framework for businesses' . Will their calls be answered? Will the Union be able to act on this shopping list of demands? Will it be feasible to provide European financial support to major industrial factories that is not conditioned by environmental and social requirements? The future European Commission is planning to adopt a more ambitious legislation. Whether it be up to the challenge remains to be seen.

[59] Critical Raw Materials Act, supra, note 55, Art 10 (1) and (4).
[60] European Commission Communication*, Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society*, COM/2024/63 final.
[61] Antwerp Declaration for a European Industrial Green Deal.

6. Circular economy: how to square the circle?

As it does not have sufficient fossil fuels and mineral resources to ensure its growth, within a world in which natural resources are becoming scarcer, the Union has every interest in becoming self-sufficient as the first decarbonised and circular economy in the world. Accordingly, the "extract–produce–discard" model, of which fast fashion and planned obsolescence are emblematic, will need to be replaced by a circular economy, spelling the end of the wasteful society.[62] This economic model should therefore make it possible to "close the loop" by transforming residual materials into secondary raw materials. If they are forced to innovate, EU undertakings will become more competitive as compared to their foreign competitors, which will ultimately fall victim to the poor management of natural resources. The circular economy should thus reinforce the EU's strategic autonomy. Thanks to the EGD, a number of advances have been made in recent months in terms of both textile recycling as well as in two sectors that consume large quantities of resources,[63] namely (waste) packaging[64] and batteries.[65] In addition, recycling, which is essential for bringing secondary raw materials to market, is set to increase as a result of restrictions on waste exports outside the EU (e.g. a ban on exports of plastic waste to non-OECD countries).[66] Furthermore, a new ecodesign regulation has been adopted with a view to 'improving the environmental sustainability of products … and to reduce the overall carbon footprint and environmental footprint of products over their life cycle'.[67] However, will this progress be up to the challenge posed by the transformation from an economy with a profligate approach to natural resources towards a virtuous economy?[68]

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[62] European Commission Communication, *A new Circular Economy Action Plan For a cleaner and more competitive Europe*, COM/2020/98 final.

[63] European Parliament legislative resolution of 13 March 2024 on the proposal for a directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste, COM (2023)0420 – C9-0233/2023 – 2023/0234(COD). On March 13th, 2024, the European Parliament raised food waste reduction targets to 20% for the consumption level (retail, distribution, restaurants and food services as well as households) and to 40% for food processing and manufacturing – a 10% increase compared to the Commission's proposal.

[64] Directive (EU) 2024/1785 of the European Parliament and of the Council of 24 April 2024 amending Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control), *Official Journal* L 2024/1785.

[65] Regulation (EU) 2023/1542 of the European Parliament and of the Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020, *Official Journal* L 191/1.

[66] Regulation (EU) 2024/1157 of the European Parliament and of the Council of 11 April 2024 on shipments of waste, *Official Journal* L 2024/1157.

[67] Regulation (EU) 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products, *Official Journal* L 2024/1781, Art 1(1). See also Commission Regulation (EU) 2023/826 of 17 April 2023 laying down ecodesign requirements for off mode, standby mode, and networked standby energy consumption of electrical and electronic household and office equipment [2023] *Official Journal* L 103/29-47.

[68] EEA, *Accelerating the circular economy in Europe. State and outlook 2024* (EEA Report 13/2023).

7. "Zero pollution"

Although they might be less well known to the public than the reforms adopted as part of the EU energy policy, the new environmental rules that have been adopted, in line with the "zero pollution" action plan,[69] should not be underestimated. Without being exhaustive, we can mention the new rules on industrial emissions,[70] urban wastewater treatment,[71] quality of drinking water[72], and air quality,[73] as well as mercury,[74] some of which may significantly improve ecosystems. New consumer protection rules are set to be adopted in order to counter the risk of greenwashing,[75] or even fraud as occurred in the Dieselgate scandal,[76] which is omnipresent and likely to manifest itself owing to the fluid nature of concepts such as "sustainable development", "carbon neutrality" and "net zero".

Nevertheless, following the initial euphoria, a feeling of disillusionment has become more widespread in 2024. Accordingly, on 6 February the Commission announced the withdrawal of its proposal seeking to reduce the spraying of pesticides by half[77] and the eagerly awaited reform of the law on chemical substances (REACH)[78] was kicked into the long grass. Furthermore, lawmakers significantly weakened the Soil Monitoring Law.[79] Although only a fraction of chemicals across European water courses is currently regulated under the EU's Water Framework Directive (WFD),[80] the proposal of the Commission of adding some substances of known concern (PFAS ('forever chemicals'), glyphosate and pharmaceuticals) to the lists of pollutants that Member States are required to monitor in surface and groundwater and ensure that legal thresholds are not exceeded has not yet been adopted. The same music was playing

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[69] European Commission Communication, *Pathway to a Healthy Planet for All EU Action Plan: 'Towards Zero Pollution for Air, Water and Soil'*, COM/2021/400 final.
[70] Directive (EU) 2024/1785 supra, note 65.
[71] Proposal for a directive of the European Parliament and of the Council concerning urban wastewater treatment (recast), COM/2022/541 final. Provisional agreement by Parliament and Council on January 29, 2024.
[72] Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast) [2020] *Official Journal* L 435/1.
[73] Directive (EU) 2024/2881 of the European Parliament and of the Council of 23 October 2024 on ambient air quality and cleaner air for Europe (recast), *Official Journal* L, 2024/2881.
[74] Proposal for a directive of the European Parliament and of the Council amending Regulation (EU) 2017/852 of the European Parliament and of the Council of 17 May 2017 on mercury as regards dental amalgam and other mercury-added products subject to manufacturing, import and export restrictions, COM/2023/395 final.
[75] Directive (EU) 2024/825 of the European Parliament and of the Council of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information ("Greenwashing Directive") [2021] *Official Journal* L 825/16.
[76]Case C–100/21, *Mercedes–Benz Group* [2023] EU:C:2023:22.
[77] Proposal for a of regulation the European Parliament and of the Council on the sustainable use of plant protection products and amending Regulation (EU) 2021/2115 COM/2022/305 final.
[78] Commission Communication, *Commission work programme 2024*, COM (2023) 638 final**.**
[79] Proposal for a Directive of the European Parliament and of the Council on Soil Monitoring and Resilience, COM/2023/416 final. Approved by the European Parliament on 10 April 2024.
[80] The original 2015 WFD good ecological status and good chemical status deadline has been extended to 2027 but data suggests this is on track to be missed by a wide margin. See European Environmental Agency, *Europe's state of water 2024: the need for improved water resilience,* EEA report 07/2024.

last November when the Commission renewed its approval of the active substance Glyphosate,[81] despite the WHO's IARC regarding it as a class 3 carcinogen.[82]

8. Nature, on the winning side or the big loser?

More species are threatened with extinction than at any time in history.[83] Whilst some animals seem to be adapting to changing conditions, the vast majority of species are unable to cope with rising temperatures and changes in precipitation patterns, which are causing the weather to become less predictable and more extreme. All in all, primary production, ecosystemic service stability and resource availability are all affected by this phenomenon. So far, hundreds of local losses of species have been driven by increases in the magnitude of heat extremes.[84]

Despite five decades of nature protection policy, Europe has unfortunately not escaped this negative trend. In the EU, 81 % of the natural habitats included in the Natura 2000 network are deemed to be in an unfavourable condition.[85] Although insects play a pivotal role in how ecosystems function, the drastic decline in insect biomass, even in protected areas, caused by urban sprawl and agriculture intensification[86] is altering food webs, nutrient recycling, pollination and pest control. However, ecosystems are gasping for air, restored and diversified ecosystems could capture significant quantities of carbon, and would be more resilient to extreme climate events (flooding, drought and heatwaves). In virtue of the reformed LULUCF Regulation, for the first time a net carbon absorption target has been set for land, specifically 310 million tonnes of CO2 equivalent by 2030.[87] The amended directives on quality of soils,[88] and the improvement of ambient air quality[89] certainly represent clear progress for oligotrophic habitats. Last but not least, at the end of the legislature, the flagship instrument for the "biodiversity" and "farm to table" strategies,[90] the nature restoration regulation was adopted

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[81] Commission Implementing Regulation (EU) 2023/2660 of 28 November 2023 renewing the approval of the active substance glyphosate in accordance with Regulation (EC) No 1107/2009 of the European Parliament and of the Council and amending Commission Implementing Regulation (EU) No 540/2011, C/2023/8101.
[82] IARC, *IARC Monographs Vol. 112: Evaluation of five organophosphate insecticides and herbicides* (Lyon, WHO 2015).
[83] IPBES, *Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*, ES Brondízio et al. (eds) (Bonn, IPBES secretariat 2019).
[84] IPCC, '2023: Summary for Policymakers' in The Core Writing Team, H Lee and J Romero (eds) *Climate Change 2023: Synthesis Report* (Geneva, IPCC 2023), para A.2.3.
[85] European environmental agency, Conservation status of habitats.
[86] J Uhler et al., 'Relationship of insect biomass and richness with land use along a climate gradient' (2021) *Nature Communication* 5946 ; CS Svenningsen et al., 'Flying insect biomass is negatively associated with urban cover in surrounding landscapes', (2022) *Diversity and Distributions* 28, pp 1242–1254.
[87] In order to reduce net GHG emissions by at least 55% compared with 1990 levels, the land use, land-use change and forestry (LULUCF) sector must absorb 310 million tonnes of CO2-equivalent net removals by 2030 (Regulation (EU) 2023/839), compared with the previous target of 225 million tons in virtue of Regulation (EU) 2018/841.
[88] Proposal for a directive of the European Parliament and of the Council on Soil Monitoring and Resilience (Soil Monitoring Law), COM(2023) 416 final.
[89] Directive (EU) 2024/2881, supra, note 74.
[90] Proposal for a Regulation, COM/2022/305 final, supra, note 78; Regulation (EU) 2024/1991 on nature restoration, supra, note 13.

against all odds.[91] Given that its aim is to reverse the trend towards ecosystem degradation, this regulation does not lack ambition. By way of illustration, Member States will have to restore 30% of degraded habitats to good condition by 2000, 60% by 2040 and 90% by 2050. In addition, the planting of 3 billion native trees is planned by 2030.[92]

However, against the backdrop of European Parliament pre-election tensions of spring 2024, which were particularly heightened in rural areas, the proposal for a regulation on plant protection products has been put on the back burner. As regards natural habitats included within the Natura 2000 network, Member States have been encouraged, and not obligated, to increase the surface area of their sites.[93] In contrast to the various climate funds, the "Life Nature" budget is absolutely tiny: 2.14 billion euros dedicated to nature protection.[94] In addition, there is a widespread conviction that, to the delight of investors, the acceleration of investments in renewable energy will require a "predictable and simplified regulatory environment",[95] which could lead to a decline in the level of environmental protection granted to people living near renewable energy installations as well as wild animals (bats,[96] migratory birds,[97] etc.). For example, the strict time limits applicable to the issue of administrative authorisations provided for under the new RED III Directive do not take account of the fact that an extended period of time is required in order to assess the impact of wind turbines on migratory birds[98] or of hydroelectric installations on ichthyofauna. From a more symbolic perspective, with Noah's Ark on the brink of capsizing, as is shown by the acceleration in the rate of extinction of wild animal species, the Council has decided to water down the protected status granted to the wolf,[99] a mammal that is emblematic of rewilding. To make things worse, nature protection has become a scapegoat for some agricultural lobbies. As a result, greening will not feature in the Common Agricultural Policy (CAP) for the period 2023-2027,[100] which yet again will continue to favour

[91] The adoption of the proposal for a Nature Restoration Regulation has been fraught with controversies. The adoption of a common position by the Council of Ministers in July 2023 was disrupted by farmers' demonstrations. Political agreement between the European Parliament and the Council was reached in November 2023. However, the EPP voted against the proposal, fearing the farmers' anger, widely relayed by certain political parties on the eve of the European elections. Finally, the regulation was again threatened by Hungary's surprise withdrawal, which meant that a qualified majority was no longer obtainable for its adoption. Following the European elections, the Council reached an agreement on 17 June 2024.

[92] Regulation (EU) 2024/1991 on nature restoration, supra, note 13, Art 13.

[93] European Commission Communication, Bringing nature back into our lives EU. 2030 Biodiversity strategy, 2020.

[94] Regulation (EU) 2021/783 of the European Parliament and of the Council of 29 April 2021 establishing a Programme for the Environment and Climate Action (LIFE), and repealing Regulation (EU) No 1293/2013 *Official Journal* L 172/53.

[95] European Commission Press release, *The Green Deal Industrial Plan*, IP/23/510, 2023.

[96] R Barclay, EF Baerwald and JC Gruver, 'Variation in bat and bird fatalities at wind energy facilities: Assessing the effects of rotor size and tower height' (2007) *Canadian Journal of Zoology* 85, pp 381- 387.

[97] Case C-144/14, *Commission v Bulgaria* [2016] EU:C:2016:8.

[98] G Marx, *Le parc éolien français et ses impacts sur l'avifaune. Étude de suivi de mortalité réalisé en France de 1997 à 2015*, (Rochefort, LPO France and Birdlife International 2017).

[99] Council Decision (EU) 2024/2669 of 26 September 2024 on the submission, on behalf of the European Union, of a proposal for the amendment of Appendices II and III to the Convention on the conservation of European wildlife and natural habitats and on the position to be adopted, on behalf of the Union, at the 44th meeting of the Standing Committee to that Convention, *Official Journal* L 2024/2669

[100] Regulation (EU) 2021/2115 of the European Parliament and of the Council of 2 December 2021 establishing rules on support for strategic plans to be drawn up by Member States under the common

intensive agriculture.[101] The institutions have caved in as far as environmental conditionality arrangements are concerned.[102]

Absent a more ambitious regulatory approach, will these improvements be sufficient to reinforce ecosystem resilience? In a sense, the mere fact of asking this question means that we know what the answer is.

9. Finance to the rescue of carbon neutrality

With a trillion euros set to be invested in the green transition, which will be particularly costly in the energy sector, a financial pillar will interact with the energy pillar. Here too, progress has been spectacular.[103] The 2022 Corporate Sustainability Reporting Directive (CSRD),[104] which from 2025 will regulate reporting on non-financial performance by more than 50,000 European companies, should make undertakings that have adapted to a low-carbon world more attractive, whilst rendering access to capital more complicated for the others.[105] The reliability, comparability and transparency of environmental, social and governance (ESG) investment ratings will be improved.[106] Adopted with the aim of bringing order to the sustainable investment sector, the 2021 Taxonomy Regulation[107] defines eligible investments ("construction and real estate", "energy", "manufacturing industry") with reference to six environmental objectives. Last but not least, the Corporate Sustainability Due Diligence Directive (CSDD) will oblige within a three-year period business with a workforce exceeding 1000 employees and EUR 450 million turnover (net) worldwide to ensure that their value chains

agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013 [2021] *Official Journal* L 435/1.

[101] N de Sadeleer and M Fauconier, 'L'écoconditionnalité de la politique agricole commune mise à l'épreuve: entre productivisme et dérive environnementale', *Annuaire de droit européen,* 2024, forthcoming.

[102]Regulation (EU) 2024/1468 of the European Parliament and of the Council of 14 May 2024 amending Regulations (EU) 2021/2115 and (EU) 2021/2116 as regards good agricultural and environmental condition standards, schemes for climate, environment and animal welfare, amendment of the CAP Strategic Plans, review of the CAP Strategic Plans and exemptions from controls and penalties, *Official Journal* L 2024/1468.

[103] Regarding the accountability of central banks in relation to climate change policy, that won't be addressed in this article, see A Smolenska, A-M Weber, M Opoka, 'Greening Central Banking in the EU: Closing the judicial accountability gap' (2024) *E.L.Rev.* 49, pp 319-407.

[104] Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting [2022] *Official Journal* L 322/15.

[105] Under the CSRD, larger companies will have to adopt a sustainability report as part of their annual report from fiscal year 2024, which must include the company's impact on sustainability issues, as well as information needed to understand how sustainability issues affect the company's development, performance and position.

[106]Proposal of a regulation of the European Parliament and of the Council on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities, COM(2023) 314 final. Approved by the European Parliament on April 24th, 2024.

[107] 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 [2020] *Official Journal* L 198/13.

are compliant with international obligations in the area of fundamental rights and environmental law.[108] The following table sets out the main information requirements under these new acts.

Acts	**Scope**	**Sustainability reporting**
Corporate sustainability reporting Directive	Large EU companies and all listed companies	Retrospective and prospective information on the company's impact on sustainability issues
Sustainable finance Directive	Financial market players offering investment products, and financial advisers	Information on sustainability risks and main negative impacts
Transparency and integrity of Environmental, Social and Governance (ESG) rating activities Regulation	Investment funds	Transparency of ESG rating characteristics
Taxonomy Regulation	Companies subject to the CSRD	Information on environmental sustainability
CSDD Directive	Companies subject to the CSRD	Due diligence obligations

As these new obligations are procedural rather than substantive, investors are not subject to a rigid regulatory straitjacket imposing a gradual reduction in their polluting activities.

10. The external dimension of the EGD addressing globalisation

The EU is currently responsible for only 6.7 % of global GHG emissions, as a result of a long-term decreasing trend.[109] Consequently, the fact that the EU will achieve climate neutrality by 2050 is likely to have a limited effect on global phenomena, unless the EU's efforts are followed

[108] Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859, *Official Journal* L 2024/1760.
[109] European Environment Agency, *Economic losses from weather- and climate-related extremes in Europe*, 2024.

by non-EU countries. Having refrained from taking on a political–military leadership role, as the largest trading block in the world the EU is seeking to reinforce its credibility by positioning itself at the forefront of the green transition by reducing its carbon footprint, with a particular focus on value chains for products imported from third countries. The level of ambition of the EGD should therefore foster the global leadership position for the EU in climate and environmental matters.

Given the impossibility of concluding multilateral agreements laying down precise rules for the exploitation of natural resources used to produce consumer goods that could threaten sensitive natural environments (vulnerable fish stocks, tropical forests), the EU is taking the lead in adopting unilateral measures. Due diligence obligations have been laid down regarding the imports of products and commodities (cocoa, coffee, timber, etc.) leading to deforestation and forest degradation (EUDR)[110] and regarding major companies' operations across their global value chains (CSDDD).[111] With respect to the climate policy, the carbon border adjustment measures[112] aims at adjusting the common playing field and at suppressing carbon leakage with respect to different energy-intensive products (steel, cement, nickel, etc.). This regulatory approach has been criticised by many non-EU countries, which see it at best as a protectionist undertaking, and at worst as a post-colonial one. Some trade partners consider the new measures to be protectionist and may challenge them before the WTO and thus obtain financial compensation, or authorisation to adopt countermeasures. That may be said, it might be a rough ride. In November 2024, the entry into force of the EUDR was postponed for a year.

III. The EGD achievements (2019-2024): the successes outweigh the failures

Certain crises have actually proved to be lifesaving for Europe. The aggression in Ukraine and the effects of the COVID-19 pandemic, for example, have led to a surge in energy prices across the Union, thus highlighting the need to accelerate Europe's drive towards energy independence.[113] By the same token, the shortage of natural resources, particularly rare earths, is forcing Europe to achieve much more ambitious levels of reuse and recycling to ensure the long-term viability of its production chains.

Against this background, it is fair to say that, although the internal market rules at the heart of the economic integration project remain unchanged,[114] the EGD has led to major advances. Overall, most of the proposals of the European Commission have been adopted. This is indeed

[110] Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation, *Official Journal* L 150*, p 206.*
[111] Directive (EU) 2024/1760, supra, note 109.
[112] CBAM Regulation (EU), supra, note 11.
[113] RED III, supra, note 32, Preamble n° 4. See L Hancher and A de Hauteclocque, supra, note 33, pp 55-92.
[114] Chiti, supra, note 4, p 30.

the most ambitious, extensive and cohesive package of climate change legislation anywhere on the globe.[115]

First and foremost, the energy component of the EGD surpassed the expectations of its framers. Thanks to the changes made in energy efficiency, in the promotion of renewable energies (RED III) and in the extension of the carbon market to the aviation sector and marine transport (ETS1) and the creation of a new market encompassing companies trading in hydrocarbons (ETS2), the energy performances of buildings, the "energy" pillar of the reform has delivered on all of its promises. While it is certainly the energy-climate regulatory approach that stand out, with a high level of ambition dictated by the obligation to achieve climate neutrality by 2050, the fact remains that numerous directives and regulations covering other fields provide for ambitious measures. These include the extension of producer responsibility to the pharmaceuticals and cosmetics sectors for financing quaternary wastewater treatment systems,[116] higher recycling and re-use rates,[117] nature restoration measures,[118] stricter operating conditions for large industrial plants,[119] control of value chains for a gamut of products (EUDR),[120] etc. Whereas until now environmental policy, whether at international or national level, has mostly been defensive,[121] the approaches endorsed under the EGD are proactive. The implementation of the EGD will lead in any case to a major change in the history of the EU, involving the progressive incorporation of the negative externalities associated with numerous polluting substances as well as GHG into the prices of numerous goods and services in accordance with the polluter pays principle.[122]

Despite these successes, several failures must be acknowledged: no revision of REACH and the directive on pesticide spraying, the abandon of reforming the Marine Strategy Framework Directive, the absence of clear legal rules on the expansion of the Natura 2000 network, etc. Given that the Climate Law does contain no phase out for fossil fuels, dominant oil and gas producers are still expected to prosper for decades during the transition, due to the volatility of prices and the concentration of production among fewer actors.[123]

In addition, the targets to be achieved are expressed in different ways . While most targets have to be achieved individually, some require collective action. Various scenarios therefore need to be distinguished from one another. First, in the area of energy efficiency, Directive 2023/1791 requires a collective effort,[124] which is mitigated by corrective measures set out in Annex I. Secondly, in the fields of nature restoration and climate neutrality, the objectives set by the EU

[115] D Chalmers et al., *European Union Law* (Cambridge, Cambridge University Press 2024), p 1006.
[116] Proposal for a Waste Water Directive, supra, note 72.
[117] Proposal for a Packaging and waste Packaging Regulation, supra, note 9.
[118] Regulation 2023/851, supra, note 43.
[119] Directive (EU) 2024/1785, supra, note 65.
[120] Regulation (EU) 2023/1115, supra, note 111.
[121] L Krämer, *EU Environmental Law,* 8th ed. (Mytholmroyd, Sweet & Maxwell 2016) pp 488-489.
[122] TFEU, Art 191(1).
[123] Fusion Industry Association, *The global fusion industry in 2023: fusion companies survey by the Fusion Industry Association* (Washington DC, Fusion Industry Association 2023).
[124] Directive (EU) 2023/1791, supra, note 42, Art 4(1).

acts must be achieved individually.[125] By way of illustration, the global removal by forest and agricultural sinks of 310 million tonnes of CO_2 equivalent net of GHG for 2030 has to be achieved thanks to binding national targets defined for each Member State. Thirdly, the Effort Sharing Regulation (ESR) that establishes binding annual GHG targets from 2021 to 2030 differentiate the targets according to Gross Domestic Product (GDP) per capita. As a result, the targets range from -47 % for Belgium to -16,7 % for Croatia. Of course, it will be easier for the European Commission to verify whether a given Member State has achieved a given objective within a given timeframe than to assess whether the 27 Member States have collectively achieved a single objective.

Regarding the legal instruments, in several sectors, the EU lawmaker has abandoned the use of directives, which played a dominant role in environmental policy for 50 years,[126] in favour of regulations, which are directly applicable. This is particularly the case in waste management, with the replacement of the batteries and packaging and packaging waste directives by two regulations.[127] With the proliferation of regulations, centripetal forces are thus prevailing over centrifugal forces. However, in some instances there has been a mismatch between regulations and directives. For example, when it comes to due diligence, the CSDDD applies to the largest undertakings, while the EUDR lays down rules for companies importing certain commodities that cause forest degradation.

There are also glaring inadequacies. Airlines operating intra-EU flights[128] and shipping companies that sail ships from one European port to another will have to purchase allowances at auctions in order to cover their GHG emissions. However, flights into or out of Europe will fall under an as yet untested global scheme for offsetting CO2 emissions (CORSIA), whilst offshore ships will be covered partially and belatedly by the carbon market. In addition, a derogation from the requirement starting in 2035 to market zero-carbon-emission vehicles has been established for combustion vehicles produced in small quantities that are powered by synthetic fuel (the so-called "Ferrari" amendment).[129] The 27 finance ministers have been unable to reach agreement on the increase in the minimum excise duty levied on energy products used as fuels and within transportation, as well as on electricity.[130] As a symbol of energy independence, green hydrogen, which is set to replace natural gas,[131] continues to have Holy Grail status as production and distribution costs are still very high. The methane strategy does not address the mains sources of its emissions: agriculture and the waste sector. Finally, by moving the emphasis away from energy conservation practices, the energy pillar reflects an

[125] ECL, supra, note 10, Art 4(1).
[126] N de Sadeleer, *EU Environmental law and the internal market* (Oxford, OUP, 2010) p 171.
[127] Regulation (EU) 2023/1542, supra, note 66, p 1 ; Proposal for a regulation, COM/2022/677 final, supra, note 9.
[128] Directive (EU) 2023/958, supra, note 25, L 130/115.
[129] Regulation (EU) 2023/851, supra, note 43, para 28.
[130] Proposal for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast), COM/2021/563 final.
[131] European Commission Communication, *A hydrogen strategy for a climate-neutral Europe*, COM/2020/301 final.

unshakable faith in infinite energy resource growth, decoupled from its impacts on the environment and the climate.

In addition, there is no shortage of contradictions given the challenge in achieving zero-pollution, climate neutrality and biodiversity protection all at the same time. By way of illustration, stricter incineration standards imply higher energy consumption, which is likely to give rise to more GHG emissions. The ambition of carving out a common market for waste in line with regulations on cross-border movements of waste[132] will increase the distances covered by fuel-powered transporters, and therefore increase GHG emissions. The phasing out of sales of internal combustion engine (ICE) cars by 2035[133] only applies to the internal market and not to the export of ICE cars. The aspiration of achieving food security in Europe could imply that more agricultural land will be intensively exploited, which would then play a reduced role in carbon storage.[134]

IV. Challenges in implementing the EGD (2024-2029)

Such a significant transformation of our economy and society through 160 regulations raises a gamut of challenges. If the Member States are to play their part in the game (1), their various policies must be supported by an array of EU funds (2), to ensure among others a 'just' transition (3). Finally, in terms of competitiveness, the reform is a double-edged sword (4). On the long term, information and communications technology (ICT) will also play a role (5).

1. Centripetal v centrifugal forces

Ultimately, the centripetal forces should prevail (uniform standards for vehicles and fuels, harmonisation of energy standards, centralisation of the carbon market). This phenomenon is underpinned by the delegated powers vested in the European Commission to define both sustainable investments as well as green hydrogen. The flip side of the coin is that the implementation of complementary yet indissociable strategies in the fields of sustainable mobility, the extensification of agriculture, nature protection, and the elimination of pollution fall under the purview of the Member States due to the simple fact that they fall under competences that have been classified as "shared" in the treaties establishing the Union.

Accordingly, the decarbonisation of the transport sector will require more than the banning of the marketing of combustion vehicles by 2050; the pursuit of national policies on alternative transportation (alternative transportation, car sharing, speed limits) and land-use planning, both of which fall under Member State competence,[135] will be indispensable. It comes as no surprise

[132] Regulation (EU) 2024/1157, supra, note 67.
[133] Regulation 2023/851, supra, note 43.
[134] Regulation (EU) 2024/1991, supra, note 13.
[135] In virtue of Article 192 (2) TFEU, land planning harmonisation is subject to the special legislative procedure.

that the climate policy is divisive among Member States given that the central European countries have to carry out a great deal of effort to reduce their GHG emissions.[136]

Since environmental and climate governance is indeed multilateral, the 27 Member States will be forced to bear the lion's share of the financial costs associated with the green transition. Facing other fiscal constraints, it is to be feared that the Member States will be moving at a senatorial pace. By way of illustration, the Member States' progress on the circular economy is too slow to have any hope of achieving the new recycling and reuse targets. The European Court of Auditors has been noting that funding is largely used for waste management, to the detriment of design.[137]

Whether the traditional command and control instruments that characterise the reform will be correctly implemented by 27 Member States with diverging interests remains to be seen. There will be tensions between the ambition of the EGD and the traditional regulatory instruments. [138] Despite the new obligations relating to environmental offences, law enforcement policy,[139] which is essential for combating burgeoning environmental crime, remains dependent on State resources and the willingness of public prosecutors to prosecute offences. The EU's objectives will not be achieved unless the 27 Member States implement additional measures.

2. Are European funds up to the task?

It is undeniable that the green transition will be costly, particularly for materials. Public and private investments in the environmental transition, whether focusing on infrastructure (storage, interconnection, etc.) or the modernisation of the industrial base (decarbonisation of steelworks, paper mills, etc.) represent thus a massive challenge. According to several economic reports, the level of investment will need to be doubled in order to achieve the a reduction of 55% GHG objective set for 2030.[140] EU financial resources are not sufficient to achieve all the targets that have been set. Indeed, the EU 'plastic-based own resource' (€0.8 per kilogram of non-recycled plastic packaging waste) has not worked smoothly since it was introduced in 2021[141] and it is not sure that the resources provided by the CBAM will be sufficient.

In addition, high interest rates, high energy costs and the shortage of qualified workers are also exerting a chilling effect on private investment in the energy transition.

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[136] See the actions for annulment lodged by Poland against various clean energy measures. C-442/23, *Poland v. Parliament and Council* [2023] *Official Journal*, C 304 ; C-443/23, *Poland v. Parliament and Council,* [2023] EU:C:2023:859.

[137] European Court of Auditors, *Special report 17/2023: Circular economy – Slow transition by Member States despite EU action* (Luxembourg, OPUE, 2023/17).

[138] E Chiti, supra, note 4, p 42.

[139] Directive (EU) 2024/1203 of the European Parliament and of the Council of 11 April 2024 on the protection of the environment through criminal law and replacing Directives 2008/99/EC and 2009/123/EC, *Official Journal* L 2024/1203.

[140] C Calipel, A Bizien and T Pellerin-Carlin, supra, note 45.

[141] European Court of Auditors, *Challenging start for the EU's revenue based on non-recycled plastic packaging waste* (European Court of Auditors 2024).

That said, the chances of success of the EGD are perhaps greater than with previous strategies. Whereas the Lisbon Strategy adopted in 2000 was unable to achieve its objectives due to the failure to establish a specific financial programme alongside it, the EU institutions have set up various financial schemes for implementing the EGD. These funds should encourage private investors to jump on the bandwagon, but also to avoid a social divide. It is therefore necessary to juggle with different funds with varying objectives that seek to reinforce solidarity among the Member States, their regions and their citizens. To this must be added the role that the European Investment Bank which put climate action and environmental sustainability at the heart of its activities.

Fund	**Objectives**	**Beneficiaries**	**Amounts**
Recovery and Resilience Facility - Regulation (EU) No 2021/24	Solidarity - Covid-19 pandemic	MS - depending upon the impact of the pandemic	Climate change component 37% 2021-27: 72.3 billion euros
Just Transition Regulation (EU) No 2021/1056	Inter-regional solidarity	Regions dependent on heavy industry and coal	2021-27: 7.5 billion euros
Social Climate Fund Regulation (EU) No 2023/955	Citizen solidarity	Disadvantaged households - SMEs	2026-32: revenues from the auctioning of allowances from the ETS2 and 50 million allowances from the existing EU ETS
Modernisation fund ETS Directive 2023/87	Inter-state solidarity	10 MS with the lowest revenue levels	60 billion euros, although variable as dependent on ETS (2% of total amounts allocated over 2021-2030)
Strategic Technologies for Europe Platform (STEP) Regulation (EU) No 2024/795	Support for clean technologies	Enterprises	10 billion euros
Life Regulation (EU) No 2021/1783	Support for the protection of ecosystems	NGOs, public authorities	2021/2027: 5.45 billion euros

This variety of funds calls for several observations. At this stage, there is clearly no clear strategy for aligning and streamlining available funding in accordance with the priorities set

under the various legislative instruments. EU financial resources are not sufficient to achieve all the targets that have been set. Half of revenues of ETS1 (in 2023, it generated 43.6 billion euros) have to finance climate and energy policy: the Innovation Fund, the Modernisation Fund, and the Social Climate Fund. However, the resources allocated to support the just transition appear not to be commensurate with the issues at stake.[142]

As these funds appear to be insufficient to successfully complete the energy transition, let alone to secure the protection of natural habitats, the Member States will have to supplement them. They will thus operate alongside State aid schemes,[143] which will undoubtedly lead the EU to loosen the budgetary constraints of the Stability and Growth Pact that are now applicable once again and which calls in principle for fiscal austerity. So far, the European Commission is willing to be more flexible when it comes to State aid,[144] at the risk of fragmenting the internal market.

3. What role for social justice?

In addition, the green transition could fall foul of other pitfalls. The objective of sustainable development[145] is based on three pillars: economic growth, the pursuit of a high level of environmental production and the social dimension. Consequently, the EDG strives also for sustainable and inclusive growth.[146] Will the "social" pillar of the Deal, which is based on an estimated 86.7-billion-euro Social Climate Fund for the period 2026–2032, be sufficient to mitigate the socio-economic impact of the energy transition on the most vulnerable households and on small and medium-sized enterprises? It is clear that this fund will not be sufficient to provide retraining for the 180,000 workers who, according to the European Commission, are set to be made redundant in the mining sector by 2030. Moreover, it would have to be quintupled in order to cover the renovation of the real estate occupied by the 35 million people comprising the most deprived segment of the population.[147] Similarly, the Just Transition Mechanism, worth 55 billion euros over the period 2021-2027,[148] will not be sufficient to enable regions dependent on fossil fuels to adapt to a decarbonised economy. By way of comparison, the 80 billion euros in transfers to the new Eastern Länder following the reunification of the two Germanies did not enable them to achieve the same level of development. In addition, the EGD could further exacerbate the polarisation between an urban population (85% of Europeans in 2050) that is more attuned to the objective of carbon neutrality and rural populations that feel

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[142] L Chabason and D Kling, *Quel avenir pour le Pacte vert pour les citoyens ?* (Paris, CESE 2024).
[143] Proposal for a regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials, COM/2023/160 final, Art 14 (1).
[144] European Commission Communication*, Guidelines on State aid for climate, environmental protection and energy for 2022,* COM C/2022/48.
[145] TUE, Art 3(3).
[146] J van Zeben, 'The European Green Deal: The future of apolycentric Europe?' (2020) *Eur Law J.* 26, pp 312-16.
[147] C. Defard, 'Energy Union 2.0. to deliver the EGD: stronger governance, common financing and democratic tools' (2023) *Notre Europe* 127, p 95.
[148] Regulation (EU) 2021/1056 of the European Parliament and of the Council of 24 June 2021 establishing the Just Transition Fund [2021] *Official Journal* L 231/1.

that they are not understood by urban elites. Accordingly, unless there is a strong social dimension, this vast regulatory project risks running aground.

Last, the gains achieved on the energy efficiency[149] and technological progress fronts could be cancelled out by unrestrained consumption of cheaper products (rebound effect) and the energy divide arising due to artificial intelligence (data storage, servers, etc.).

4. Is the green transition boosting or undermining competitiveness?

Growth in the EU has been mainly driven by services, and much less by industry. The decarbonisation process, launched by the EGD and Fit-for-55, thus represents an opportunity in terms of industrial growth for European industry. For many EU companies, private investment will be decisive in achieving public goals. Indeed, industrial investment decisions today will determine future industrial processes as well as the energy options that can be considered by industry. Accordingly, the investment in clean, energy- and materials-efficient technologies should make the industry more sustainable as well as more competitive in the long run than their competitors. At the outset, the EU industry is well placed. More than a fifth of the world's clean technologies are produced in the EU. As the EU is currently a world leader in clean technologies [150] such as wind turbines, electrolysers, and low-carbon fuel oil, it is 'well equipped to step up and seize the net-zero opportunity'.[151]

However, in order to guarantee industrial productivity, EU industry will have to remain competitive. It is certain that competitiveness will suffer if companies in third countries do not make the same efforts that European undertakings are obliged to make. So far, energy is the key driver of competitiveness.[152] Accordingly, the lack of competitiveness of European companies compared to US companies is particularly linked to very high electricity prices, given that the price of natural gas is 4-5 times higher. These high prices are mainly due to the lack of natural resources in the EU. Furthermore, the fact that energy prices are highly volatile compounds uncertainty for investors, who may prefer to import goods from third countries with lower energy prices but with a higher carbon content.

Finally, EU undertakings are likely to face significant competition from Chinese companies in clean tech and electric vehicles, thanks to a very generous industrial policy of subsidies, innovation, control of raw materials, and the ability to produce on a continental scale.[153] China has made subsidising clean tech innovation and manufacturing a priority under its Five-Year

[149] Directive (EU) 2023/1791, supra, note 42.
[150] M Draghi, *The Future of European Competitiveness* (European Commission 2024) p 36.
[151] European Commission Communication, *A Green Deal Industrial Plan for the Net-Zero Age,* COM/2023/62 final.
[152] M Draghi, supra, note 151, p 4.
[153] Ibid., p 3.

Plan.[154] By way of illustration, the ban on the sale of internal combustion vehicles has given rise to palpable tensions with China. The imposition by the European Commission, within the regulation on foreign subsidies distorting the internal market,[155] of countervailing duties should eliminate the competitive advantage enjoyed by Chinese battery electric vehicle producers. On another note, Chinese investment, particularly in Central Europe, can contribute to technological development and the creation of high skilled jobs.[156] However, these investments threaten the EU' strategic autonomy.

The EU's claims to climate neutrality and sustainability thus clash with its roots in a globalised economy. The dilemma is as follows.

First, is it technically possible to produce in Europe using only secondary raw materials produced thanks to a circular economy, without any inputs from other continents? One can imagine how difficult that would be, not least because of the slow rise of the circular economy.

Secondly, can we expect European consumers to consume goods that are certainly cleaner and more environmentally friendly, but more expensive than products from countries with laxer health and environmental standards? Opinions on this matter are divided.

This leads us to ask the following questions: How can the EU protect European businesses from unfair competition while remaining open to the rest of the world? Is the EU capable of becoming a world leader while remaining competitive with less assiduous trading partners?

Mario Draghi takes the view that Europe faces a trade-off: on the one hand, it may be cheaper at first sight to import Chinese technologies in order to achieve decarbonisation targets more efficiently.[157] On the other hand, such an approach would increase the dependence of European companies on Chinese undertakings and, in the long term, threaten various companies, and indeed the automotive industry as a whole. As such, the current European dependence on fossil fuels would be substituted by another type of dependence.

5. Is the reform sufficient to enable the Member States to comply with their human rights obligations in the realm of climate change?

Although the reform prompting a green transition looks on the face of it very technocratic, human right are nevertheless not absent. In fact, the EGD reform was envisioned by the European Commission began before the judgment in *KlimaSeniorinnen* was handed down by the European Court of Human Rights (ECtHR) on 9th of April 2024. In *KlimaSeniorinnen* the Court imposed a full catalogue of obligations on the Swiss Confederation in terms of

[154] *A Green Deal Industrial Plan for the Net-Zero Age*, supra, note 152, p 1.
[155] Regulation (EU) 2022/2560 of the European Parliament and of the Council of 14 December 2022 on foreign subsidies distorting the internal market, *Official Journal* L 330, p. 1.
[156] M Draghi, supra, note 151, p 16.
[157] Ibid., p 37.

programming its policy against climate change. In virtue of Article 8 ECHR,[158] it is the Member State's 'primary duty is to adopt, and to effectively apply in practice, regulations and measures capable of mitigating the existing and potentially irreversible, future effects of climate change'.[159] It follows from article 8 ECHR that a State has a positive obligation to do 'its part' to protect its citizens from the adverse effects of dangerous climate change. This judgment makes remarkable advances regarding the limited margin of appreciation available to the States parties to the Council of Europe in determining the general objectives of climate policy. Consequently, in order to avoid to breach Article 8, the EU Member States will have to implement substantive measures of a preventive nature (timetable for achieving carbon neutrality, intermediate reduction targets, updating of these targets, etc.)[160] as well as procedural measures (information, participation, expertise)[161] in order to achieve 'a comprehensive and profound transformation in various sectors' of our economies and ways of life.[162] Last but not least, intergenerational burden-sharing assumes particular importance both in regard to the different generations of those currently living and in regard to future generations.[163]

Implementing a coherent climate policy is a real challenge for State authorities. In the context of climate change, the key characteristics and circumstances of the causes and the impacts of the phenomenon are significantly different than the ones of toxic pollution.[164] In fact, the issue is more a question of the accumulation of GHG in the atmosphere due to mass production, globalisation and free trade, intensive agriculture, along with increased transportation by road and air, than of emissions from a limited number of industrial plants whose pollution can be easily controlled and reduced. In other words, greenhouse gas (GHG) emissions arise in the context of basic activities in human societies.[165] Unlike pollution control, targeted action is not an option. As we know, the impacts of climate change are undeniably distant in time and space than in the case of other emissions of specific toxic pollutants. Consequently, mitigation measures cannot generally be localised or limited to specific installations from which harmful effects emanate.[166] Furthermore, while the causal link between anthropogenic GHG emissions and the damage that will be suffered by certain categories of victims - in particular young children and the elderly - is certain, it is nevertheless difficult to predict the extent to which one victim will be more affected than others. Accordingly, the individual nature of fundamental rights is not adapted to the effects of climate change, where the risk is essentially collective in

[158] Article 2 ECHR regarding the right to life cannot be excluded. Both the Dutch Supreme Court in Urgenda and the Brussels Court of Appeal in Klimaatzaak reviewed the Dutch and the Belgian climate change policies in the light of the fundamental rights to life (Art 2) and private and family life (Art 8).
[159] *Klimaseniorinnen v Switzerland*, Appl. n° 53.600/20, para 545. On the one hand, the margin of appreciation is reduced with regard to the setting of overall objectives for the reduction of GHG emissions (paras 450 and 543). On the other hand, it is much wider when it comes to choosing the means to achieve these objectives (paras 538 and 549).
[160] *Klimaseniorinnen v Switzerland*, supra, note 160, paras 450 and 543.
[161] Ibid., para 550.
[162] Ibid., para 419.
[163] Ibid., para 420. See also BVerfG, 24 mars 2021, BvR 2656/18, 78/20, 96/20 and 288/20 (*Neubauer et al.*), BVerfGE 157, 30.
[164] See *Klimaseniorinnen v Switzerland*, supra, note 160, paras 416 to 419.
[165] Ibid., para 418.
[166] Ibid.

nature and the causal link distended. All in all, climate change is a challenging polycentric issue.[167]

Formal implementation of the numerous legislative instruments embodying the EGD will clearly be insufficient on the grounds that the ECtHR requires human rights to be effectively respected.[168] The ambitious objectives set out within the legislation commented on above will only be achieved if the Member States give themselves the means to do so. At this stage, it will of course be difficult to determine whether all of the targets will be achieved on time Nonetheless, a breach of Article 8 may result from a lax or chaotic national climate policy, which may be compounded by delays in transposing the directives concerned or poor application of the various regulations. As regards the numerous infringement proceedings that have been brought before the CJEU for incorrect application of EU environmental law, there are fears that the implementation of the much more ambitious EGD reform will be fraught with pitfalls.

Last but not least, the energy transition will require not only taking measures to reduce demand for fossil fuels in increasing renewables, but also limiting the supply of fossil fuels. Although the obligations of companies to combat dangerous climate change appear to be exhaustively regulated in the EU climate legislation, the question arises as to whether there is still room left for the civil court to rule that, based on a civil liability due diligence standard, there is an additional obligation for major oil corporations to reduce their CO2 emissions. In *Shell Plc*, the The Hage court of appeal held that Articles 2 and 8 ECHR (right to life and right to privacy and the home), which a lax climate policy is likely to breach,[169] can give substance to the social standard of care.[170]

6. ICT to the rescue of the green transition

The Commission takes the view that digital technologies can play a key role in achieving climate, neutrality.[171] In its industrial strategy for Europe, the Commission is of the view that ICT is closely related to the implementation of the EGD.[172] However, the question arises as to

[167] Ibid., para 419.
[168] GA Serghides, 'The Principle of Effectiveness in the European Convention on Human Rights, in Particular its Relationship to the other Convention Principles'**,** (2017) *Hague Yearbook of International Law / Annuaire de La Haye de droit international* 30 pp 1-16.
[169] *Klimaseniorinnen v Switzerland*, supra, note 160 ; See also *Urgenda Foundation v. The State of the Netherlands*, 19/00135, 20 December 2019, ECLI:NL:HR:2019:2007.
[170] Accordingly, under Dutch law, companies which contribute significantly to the climate problem and have it within their power to contribute to combating it, have an obligation to limit CO2 emissions in order to counter dangerous climate change, even if this obligation is not explicitly laid down in (public law) regulations of the countries in which the company operates (*Shell Plc*, 12 November 2024, ECLI:NL:GHDHA:2024:2100, para 7.27). However, while Shell may have obligations to reduce its scope 3 emissions, no concrete reduction obligation can be imposed on Shell on the ground that 'such a percentage does not apply to every country and every business sector individually'. Such a standard cannot be established based on scientific consensus defined by the Intergovernmental Panel on Climate Change (para 7.111).
[171] Commission, Communication on the EGD, supra, note 2.
[172] Commission Communication on Updating the 2020 new industrial strategy. Building a stronger single market for Europe's recovery, COM/2021/350 final.

whether twining the green and digital transitions in a new geopolitical context would be such an easy task.[173] Technological progress is a double-edged sword when it comes to climate change. On the one hand, IT is likely to support the decarbonisation of the economy. For instance, the forthcoming digital product passport will enhance end-to-end traceability of a product throughout its value chain. Among other things, this passport is expected to enable consumers to obtain and to share information about the products life cycle, and make better informed choices.[174] On the other hand, the use of artificial intelligence, blockchains, big data will become a major source of energy consumption.[175] Will the increased share of renewable energy in electricity production (RED III) be able to offset the expected increase in electricity demand? Furthermore, many ICT devices are not compatible with a circular economy given that they contain non-renewable and non-recyclable components that can cause significant environmental damage.[176]

V. Conclusion: Blind to a paradigm shift?

Our analysis shows that the level of ambition pursued by EU institutions in areas as diverse as the carbon market, maritime and land transport, aviation, fuels, buildings, industry, hydrogen, pollution reduction, nature restoration and the fight against atmospheric pollution is unprecedented. Given that the EU is unlikely to set ambitious new targets in the course of the new legislature, all efforts will be focused on implementation of the 160 legislations

Considering these achievements, it is fair to say that the EU is the only organisation to make a serious attempt at achieving a green transition. The EU cannot therefore be accused of greenwashing. Does this mean that this swath of new legislation represents a paradigm shift for European society and its economy?

Firstly, the pathway to achieving carbon neutrality, zero-pollution and to ecosystem resilience in such a short space of time remains beset with pitfalls. The stumbling blocks that the EU and the Member States will have to overcome are manifold: financing investment in the green transition, difficulties in combining the climate, zero pollution and ecosystem resilience objectives, and in striking a balance between the economic, environmental and social dimensions, obstacles in linking up genuine climate change legislation with energy legislation, challenges in convincing non-EU countries to embark on similar reforms, and the urgent need to address the climate crisis. The clock is well and truly ticking as humanity is currently on the

[173] Commission Communication, Strategic foresight report. Twining the green and digital transitions in the new geopolitcial context, COM/2022/289 final.
[174] Regulation (EU) 2024/1781, supra, note 68, Preamble n°32.
[175] In 2024, the ICT sector was responsible for 5 to 9 % of the world's total electricity use and more than 2 % of GHG global emissions. In 2018, data centres accounted for 2,7 % of the electricity demand in the EU-28. Directive (EU) 2023/1791, supra, note 42, Preamble n°13.
[176] I Kawka, "E-government and environmental protection. Towards greater sustainability", in A Sikora and I Kawka (eds*.) The European Green Deal and the impact of Climate Change on the EU Regulatory Framework* (Brussels, PUSL, 2024) p 73.

track to transition to a warmer world, given that the limiting global warming to 1.5°C[177] is beyond reach. In almost all cases new information results in more pessimistic forecasts. Whilst in 2020 the average temperature has only increased by around 1°C above pre-industrial levels, the situation has already become critical within the regions that are most exposed to risks of drought, heat waves and flooding. When the timelines of climate action are so short, and the paths towards climate stability so narrow, any setback will spell disaster.[178]

Secondly, the energy transition at an accelerated pace has confronted the EU with a twofold dilemma: on the one hand, it will remain dependent on fossil fuels over the short term, whilst on the other hand over the medium term it will have to secure its supply of critical raw materials and technologies.[179]

Thirdly, the EU's success in reducing GHG emissions is likely to be wiped out by the increase in emissions from non-EU countries. As a result, the EU will face the challenge of striking the right balance between acting with others when it can and reinforcing its capability to act independently when it wishes or is obliged to do so.[180] Given the prevailing uncertainty, the regulatory response in order to prevent temperature rises has been repeatedly delayed.

Fourthly, whereas decoupling GHG emissions reduction from economic growth has been successful, it is far from certain that decoupling of economic growth and natural resources consumption will succeed.[181]

Furthermore, as stressed as above, the EGD reform is characterised by its "climate-centrism", with the ecological crisis being reduced to the level of the climate and energy transition. By putting its faith in new technologies (carbon capture, large-scale production of green hydrogen, etc.), which should mitigate the impact of climate change – but that have not yet proved their worth – the Union has not called into question the dominant economic paradigm,[183] in spite of the fact that the climate and environmental crises have in part originated from the over-consumption of goods and services.[184] A successful green transition will undoubtedly require far more fundamental changes. Achieving climate neutrality will thus need a lot more action to be taken than that envisioned under the EGD: a quick end to the burning of fossil fuels, strict protection of ecosystems, such as forests and wetlands, reduction of meat consumption, etc. [185]

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[177] Paris Agreement, Art 2.1(a). Historical cumulative net carbon dioxide emissions already account for about four fifths of the total carbon budget for a 50 per cent probability of limiting global warming to 1.5 °C.
[178] D Wallace-Wells, 'How climate is losing its political grip' (2024), *NYT,* p 1.
[179] C Defard, supra, note 148, pp 45 and 67.
[180] ESPAS, supra, note 7, p 5.
[181] J Hickel and G Kallis, 'Is Green Growth Possible?', (2020) *New Political Economy* 25(4), pp 469-486 ; European Environmental Agency, *Growth without economic growth*, 2021.
[183] E Chiti, supra, note 4, 30.
[184] On June 17 2024, in approving the mid-term review of the 8th environment action programme, the ENVI Council noted that current regulatory instruments will not be enough to reduce unsustainable consumption levels and achieve the objectives of the EAP.
[185] F Krepelka, "Instruments of the EU climate policy", in A Sikora and I Kawka (eds) *The European Green Deal and the impact of Climate Change on the EU Regulatory Framework* (Brussels, PUSL, 2024) p 34.

And therein lies the rub, thus fuelling the global uncertainty within the climate balance sheet for future generations.

To conclude, the challenge of bringing about a thorough transformation of the European economy and of European society in order to make it climate neutral, resilient and fairer will be a tough nut to crack.