ORIGINAL PAPER

Towards a European Green Deal: The evolution of EU climate and energy policy mixes

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Abstract

A growing scholarship argues that decarbonization cannot be achieved with single instruments like carbon pricing alone. A broader mix of reinforcing policies is required. This literature focuses on how policies can accelerate technological innovation, restrict polluting activities, promote green growth, and ensure social justice. Applying the policy mix literature to the European Union (EU), this article examines the development of climate and energy policies from separate and narrow initiatives to coordinated policy packages to achieve increasingly ambitious climate targets, culminating with the European Green Deal. The starting point to explain this policy development is that EU policies will reflect the positions of the 'least ambitious' actors when unanimity is required. Examination of different policy phases shows that EU policy mixes are not only needed to fulfil different transition functions—they also provide opportunities to combine different actor interests to raise climate ambitions. The EU institutions have been instrumental in crafting policy packages that exempt and compensate the least climate-ambitious actors. The Paris Agreement has also provided an enabling context for higher EU ambitions. Looking towards the future, the corona-induced recession has so far mainly been used by the EU as an opportunity to strengthen climate ambitions and the European Green Deal.

Abbreviations

CCS	Carbon Capture and Storage
EGD	European Green Deal
ESR	Effort Sharing Regulation
ETP	European Technology Platform
EU	European Union
EU ETS	EU Emissions Trading System
GDP	Gross Domestic Product
GHG	Greenhouse Gas
JDT	Joint Decision Trap
LULUCF	Land use, land-use change and forestry

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MSR	Market Stability Reserve
MLG	Multi-Level Governance
NECPs	National Energy and Climate Plans
PA	Paris Agreement
SET-Plan	Strategic Energy Technology Plan

1 Introduction

In 2019, the European Commission launched the European Green Deal (EGD) to make Europe the first climate-neutral continent (European Commission 2019). To achieve net-zero greenhouse gas (GHG) emissions by 2050, the EGD aims to decouple economic growth from resource use and ensure social justice by leaving 'no person or place behind'. The goal is not only aiming at a fundamental transition of European energy systems, but also the promotion of new 'green' economic growth and dealing with distributional challenges from decarbonization.

The EGD has emerged from European Union (EU) climate- and related energy policies dating back to the early 1990s. These policies have developed from narrow, separate climate and energy policy initiatives to broader coordinated packages aimed at achieving increasingly ambitious climate targets. From the EU's 8% emissions reduction commitment in the Kyoto Protocol's first commitment period (2008–2012), ambitions have increased to 20% emissions reduction by 2020 and 40% by 2030 (compared to 1990 levels). In December 2020, the European Council agreed to raise the 2030 target to 55% in line with the Paris Agreement's first five-year 'stock-take'.[1]

This development—based mainly on unanimity among the EU leaders—seems puzzling after the accession of Central and East European coal-dependent countries, many of which have opposed more ambitious EU climate policies—notably Poland (Skjærseth 2018). This article examines the long lines in EU climate- and related policy mixes until the European Green Deal, asking how and why EU policies have progressed despite member-state opposition.

A growing scholarship argues that decarbonization cannot be achieved by single instruments like carbon pricing alone. Broader mixes of reinforcing policies are required, to fulfil different functions to accelerate the transition (e.g. Kivimaa and Kern 2016; Rogge and Reichardt 2016; Kern et al. 2019). This article applies this policy mix literature to the EU. It first adds new insight to the policy mix literature by showing how EU policy mixes or packages are not only needed to fulfil different transition functions—they also provide room for combining different actor interests to raise climate ambitions in the first place. Second, drawing also on theories of EU integration and policymaking, this study contributes to the vast literature on EU climate and energy policies that has focused mainly on specific phases or a narrow set of policies (e.g. Jordan et al. 2010; Oberthür and Pallemaerts 2010; Boasson and Wettestad 2013; Dupont and Oberthür 2015; Skjærseth et al. 2016; Wurzel et al. 2017; Dupont et al. 2020).

This article applies qualitative case-study methodology. Data come from multiple sources, including secondary literature, official EU reports and 13 semi-structured

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[1] Including emissions and removal.

interviews with representatives of EU institutions, member-states, and interest organizations in Brussels.[2]

2 Conceptual point of departure: Policy mixes and EU policymaking

The policy mix literature underscores that achieving net-zero emissions requires broader mixes or packages of reinforcing policies. Policy mixes need first to fulfil some key transition functions. One is to decouple GHG emissions from economic growth by aligning policies that 'push' and 'pull' technological change. This is also underlined by the IPAT and Kaya formulas (see Andresen et al. 2021, this Special Feature). Technological change is needed to promote energy saving (so that less energy is consumed while more goods and services are produced), renewable energy and carbon capture and storage (CCS) or other removal and storage options. 'Pull' policies like carbon pricing are aimed at increasing the demand for low-carbon technologies; 'push' policies, at accelerating technological development and cutting costs through research and innovation (Eikeland and Skjærseth 2019). Other functions are to combine the restriction of polluting activities to bring emissions down by creating new business niches and 'green' industries and jobs (Kivimaa and Kern 2016). Policy mixes also need to deal with distributional challenges to ensure public support (Szulecki 2018). Without sustained public support, the EU cannot hope to achieve net-zero emissions.

Second, achieving net-zero emissions requires successively more ambitious targets and policies over time. Our starting point for explaining policy development is that EU policies will reflect the positions of the 'least ambitious' actors when unanimity is required in the absence of issue linkages (Underdal 1980). Building on this key insight from negotiation theory, Scharpf (1988) developed and applied this argument to the EU—positing that a 'joint decision trap' (JDT) limits the EU's capacity to respond effectively to new challenges. Theories of EU integration and policymaking indicate different departures from the 'least ambitious programme' and the JDT that may accelerate policy development (Skjærseth et al 2016; Deters 2018).

According to liberal intergovernmentalism (Moravcsik 1999; Moravcsik and Schimmelfennig 2009), departures from JDT can be expected to include changes in the preferences of the least ambitious member-states. EU climate policies may progress simply because member-state governments opt for greater cooperation and more ambitious policies (Bickerton et al. 2015). 'Positive' or 'negative' policy mix feedback from implementation experiences may affect member-state preferences (Skjærseth 2018; Edmondson et al. 2019). Since the 1980s, the study of policy feedback has focused on how existing policies affect politics and policy development (Béland 2010). Jordan and Matt (2014) define 'policy feedback' as effects flowing from adopted (EU) policies on actors' original preferences and the reformed policy in question.

Multi-level governance (MLG) and supranational approaches place more emphasis on the autonomous role of EU institutions as policy entrepreneurs—particularly the European Commission (see Pollack 1997; Sweet 1997; Skjærseth 2017). Using the MLG approach, we will examine the role of the EU institutions in designing 'integrative' policies and

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[2] Interviews are based on confidentiality and are used as background information for interpreting written sources.

assembling package deals (Sebenius 1983; Skjærseth et al. 2016). Such policies may link issues (and thereby overcome the least ambitious actors), create synergies, and exclude controversial issues that are valued differently by pivotal actors—those whose agreement is needed to change the status quo (Sebenius 1983; Tsebelis 2002).

Theories on the role of exogenous shocks build largely on the insight that established institutions and policies are inherently hard to change (Powell and DiMaggio 1991; Skocpol and Pierson 2002). However, exogenous shocks can be potentially powerful disrupters of such stability, providing moments of openness through 'critical junctures' and windows of opportunity for rapid policy innovation—which may lead to major changes in status quo (Capoccia 2015; Rixen et al. 2016). Crises in the form of external shocks like the corona-induced recession may lead to more ambitious climate policies—or less ambitious ones.

The Paris Agreement (PA) also represent an exogenous international institution that can affect EU policy development in at least two ways (Cortell and Davies 1996; Costa and Jørgensen 2012): First, international commitments may become institutionalized in domestic processes by being incorporated in international law. This legal pathway may affect domestic policy cycles and ambitious. Second, EU actors can invoke international commitments to further their specific interests in internal policymaking. This political pathway may empower the EU institutions, member-states, or non-state actors.

The article covers the development of EU policy mixes for three phases: before the Paris Agreement; after Paris and policies for the long term.

3 Before Paris: from Kyoto to targets and policies for 2020

From 1990 to 2016, EU greenhouse gas emissions (GHGs) decreased by more than 20%—from 5.7 billion tonnes to 4.4 billion tonnes—a decrease of 1.3 billion tonnes (See Fig. 1).[3] In the first years after 1990, reductions in GHG emission from energy industries were related to reform and structural changes in Central and East European countries, including German re-unification. The economic crisis unfolding from 2008 and the fall in economic activity caused a large drop in GHG emissions in 2009 (7.3%) across all source sectors. None of these events was directly related to climate policy. Still, the overall decreasing trend in emissions can hardly be attributed exclusively to this crisis and structural changes—EU Gross Domestic Product (GDP) increased by 43% in the same period as GHG emissions decreased. This indicates that the EU has achieved an absolute decoupling of territorial emissions from GDP and population from 1990.[4]

One important reason is that EU climate and energy policies have contributed to improved energy efficiency and changes in the energy mix (EEA 2019). This includes more energy from renewable sources (particularly biomass), use of less carbon-intensive fossil fuels (switch from coal to gas) and consumption of less energy while more goods and services are produced.[5] Other reasons include a more service-oriented economy with a lower share of energy-intensive industry in total GDP (in addition to structural changes and the

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[3] https://ec.europa.eu/eurostat/statistics-explained/index.php/Climate_change_-_driving_forces.

[4] Includes only territorial emissions – not consumption-based emissions embedded in international trade.

[5] EU-28 CO_2 emissions per unit GDP (ton CO2/1000$) has decreased from 0.37 in 1990 to 0.18 in 2018. https://edgar.jrc.ec.europa.eu/overview.php?v=booklet2019&dst=GHGgdp.

economic crisis) and change in climate conditions (with milder winters on average) which have reduced demand for energy to heat homes.[6]

EU climate and related energy policies date back to the early 1990s (Skjærseth 1994). From 1997 to 2007, EU climate, energy and innovation policies developed largely in isolation and were based on different concerns: climate change, energy security, and economic growth. The main climate policy instrument was the mandatory EU Emissions Trading System (EU ETS) adopted in 2003—initially covering power production and energy-intensive industries—to place a price on carbon. Energy policies focused mainly on energy security and followed a different path. New directives adopted to promote renewable energy and energy efficiency in electricity, transport, and buildings lacked ambition and were generally not legally binding (Skjærseth et al. 2016).

The Lisbon strategy (2000–2010) entailed a new industrial growth and competitiveness focus for the EU centred on 'sustainable growth', including social and environmental policies. However, this strategy was developed largely independently from climate and energy policies. The EU Framework Programmes for Research and Technological development included renewable energy and energy efficiency, but there were no coherent EU strategies aimed at accelerating low-carbon research and innovation. In 2004, the first European Technology Platform (ETP) was established as industry-led public–private partnerships that also included low-carbon technologies. In short, EU climate and related policies tended to develop separately from each other. This reflected the diversity of interests among the member-states that preferred control over their energy mix and keeping policy development at the national level. In addition came disagreements between the Commissioners for Energy and for Climate/Environment (Skjærseth et al. 2016). However, the European Commission initiated the EU ETS with support from certain industries, largely independent of the member-states that either opposed emissions trading or were indifferent to it (Skjærseth and Wettestad 2008).

In March 2007, EU leaders adopted the 2020 targets: 20% cut in GHGs (from 1990 levels), 20% of EU energy from renewables, and 20% improvement in energy efficiency. In December 2008, the EU linked climate and energy policies by adopting a package for achieving these 2020 targets (Oberthür and Pallemaerts 2010). The package included two cross-sector instruments. The first was a revised EU ETS aimed at reducing emissions by 21% in the ETS sectors, compared with 2005. The revision included a transition from a decentralized system to an EU-wide cap to be reduced annually by 1.74%.[7] A new NER 300 fund was established to fund CCS and renewable energy technology demonstration projects based on sale on ETS allowances.

The second instrument was an effort sharing decision based on binding national targets, to yield a 10% EU reduction from 2005 levels for sectors not covered by the ETS, such as transport, agriculture, waste, and buildings. The package also included legislation on the promotion of renewable energy sources based on binding national targets, and a framework for safe CCS. This framework was related to the EU ambition to construct up to twelve large-scale pilot plants in Europe by 2015.[8] In October 2009, the European Council agreed

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[6] https://ec.europa.eu/eurostat/statistics-explained/index.php/Climate_change_-_driving_forces.

[7] Allocation procedures were altered and harmonized, from free allowances to a system based on payment-by-auctioning as the main principle.

[8] Other policies simultaneously developed by the Commission were adopted according to a different time schedule; these included emissions standards for new cars and the Energy Efficiency Directive, adopted in 2012.
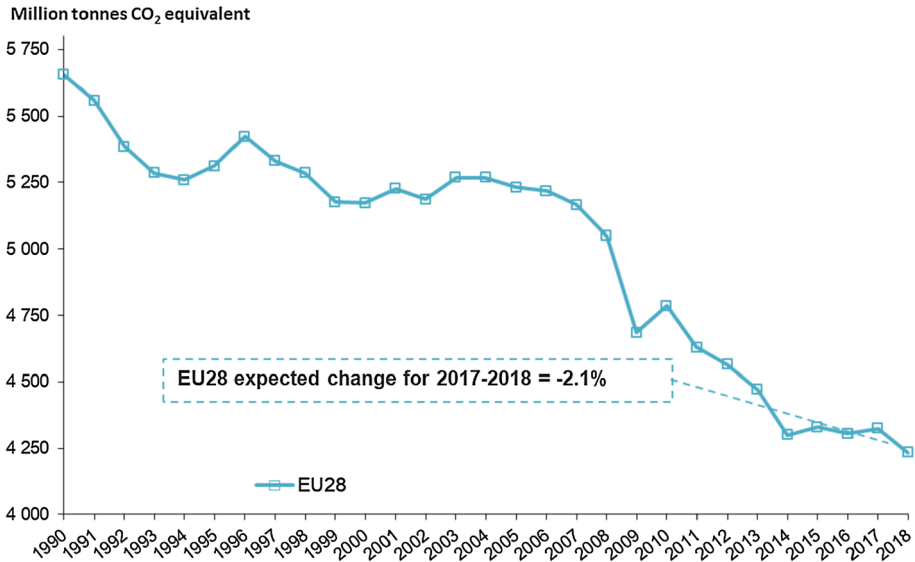
Million tonnes CO$_2$ equivalent

Fig. 1 EU emissions (CO$_2$ equivalent) (https://www.eea.europa.eu/publications/approximated-eu-ghg-inventory-proxy-2018)

to support an EU goal of reducing GHG emissions between 80 and 95% by 2050 compared to 1990 levels (European Council 2009).

In addition to these policies aimed at pulling market deployment of low-carbon technologies, the EU also adopted a complementary technology policy push pillar, aimed at accelerating innovation through the development and demonstration of low-carbon energy technologies that would lower costs. Funding of low-carbon research and innovation increased significantly from 2008 with the EU Strategic Energy Technology Plan (SET-Plan), although it failed to 'pick winners' by concentrating the research and innovation resources to six promising low-carbon technologies: wind, solar, bioenergy, CCS, electricity grid and nuclear fission[9] (Eikeland and Skjærseth 2019). The strategy expanded from the six priority technologies focused mainly on large demonstration projects to encompass other types of projects and several other technology areas, such as energy efficiency. The European Commission was internally split between DG Climate, DG Energy and DG Research, and lacked the competence to align different energy technology interests among the member-states and coordinate various EU funding sources such as NER 300, the Framework Programmes and the European Energy Programme for Recovery that responded to the 2008 financial crisis (Eikeland and Skjærseth 2019). Still, push and pull policies were combined to strengthen the EU's collective capacity for low-carbon energy technology innovation and deployment.

The European Commission underscored the synergies between climate and energy policies. Largely swept under the carpet were trade-offs such as competition for land use between energy, food production and biodiversity, and potential lower carbon prices caused

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[9] Nuclear energy in the EU is mainly governed by the Euratom Treaty. Construction of nuclear reactors is determined by the member-states.

by renewable energy and energy efficiency targets that could lower the demand for CO_2 allowances in the EU ETS sectors (Skjærseth et al. 2016). Several member-states preferred a single GHG target and carbon pricing based on emissions trading as the main policy instrument.

Action on climate policies was central to new energy policies also aimed at improving energy security by stimulating indigenous renewable energy and energy efficiency, reducing the need for imported fossil fuels (Skjærseth et al. 2016). The package was not directly linked to industrial strategies, but new targets and policies to stimulate renewables, energy efficiency, CCS and energy technological innovation were intended to create new 'green' growth and jobs. Distributional issues mainly concerned fairness among EU member-states that varied significantly in GDP/capita and industrial sectors. No member-state should undertake investments in implementing EU climate and energy policies that diverged too sharply from the estimated average costs for the EU economies. This was to be done by national targets in non-ETS sectors and renewable energy based on GDP/capita as the main principle and by using revenues from the auctioning of EU ETS allowances to compensate lower-income member-states. Energy-intensive industries exposed to international competition would receive free allowances from the EU ETS to prevent carbon leakage.

Most of the ten Central and Eastern European countries that joined the EU between 2004 and 2007 were more concerned about energy security based on fossil fuels than climate change. By contrast, the EU-15 generally favoured a more stringent climate policy. The EU was able to promote agreement on higher climate ambitions for at least two main reasons.[10] First, the European Commission has a unique role in policymaking due to its right to propose new EU legislation. As the EU's main executive body, its chief function in the decision-making process is to propose legislation, which is then adopted (or not) by the co-legislators, the Council of Ministers and the European Parliament. Because climate change is a long-term challenge, one distinctive strength of the Commission lies in its capacity to shape and frame climate policies for the longer term. The Commission is to serve EU interests without being responsible for the financial resources needed for implementation at the member-state level. It is not directly accountable to the electorate, as there is no electoral contest for the basic direction of EU policies, even when members are elected to the European Parliament (Follesdal and Hix 2006). Thus, the Commission can think and act strategically with a more long-range perspective than is possible for most individual member-states (Skjærseth 2017).

Second, the Commission crafted a package of linked policies that exceeded the preferences of the least ambitious actors by giving something to all pivotal decision-makers (Skjærseth et al. 2016). The package was driven by Germany, the UK and France. New policies to increase renewable energy consumption and energy efficiency would reduce EU energy-import dependency (about 50% energy import); they would also be welcomed by the renewables industry and the environmental movement and be particularly attractive to Germany. The focus on CCS was intended to alleviate the trade-off between mitigation of climate change and security of supply for countries highly dependent on indigenous coal, like Germany and Poland. It could also lessen resistance from the oil industry, by giving it opportunities to store emissions from production. The revision of the EU ETS with auctioning of allowances would bring revenues that would be used to subsidize modernization

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[10] EU climate and energy targets and policies have generally been adopted by unanimity. Unanimity has alternately been legally required, politically determined or de facto under the 'shadow of voting' (Skjærseth et al. 2016).

of energy systems in lower-income member-states in Central and Eastern Europe. As noted, the package also aimed to promote distributional fairness among the member-states and industry sectors. Thus, by linking climate and energy policies, the European Commission crafted a policy package that offered ample room for combining different actor interests and securing agreement.

4 After Paris: Reformed targets and policies for 2030

EU GHGs decreased further after Paris to 24% below 1990 levels in 2019.[11] In October 2014, the 28 EU leaders adopted a climate and energy policy framework for 2030, including a new goal of domestic GHG reductions of at least 40% compared to 1990. The leaders also agreed on a 27% increase in renewable energy consumption (binding only at EU level) and a non-binding indicative target of 27% increase in energy efficiency. Further, they agreed to 'revert to' the framework after the 2015 Paris Conference, indicating that the EU targets might be adjusted depending on the outcome. The 40%-by-2030 target served as the EU's Nationally Determined Contribution for the Paris conference.

At the COP21 conference, internal political tensions entailed a real risk of EU division. Poland opposed the EU's negotiating mandate but became isolated (Andresen et al. 2016). Poland's climate-sceptical conservative government initially also threatened to torpedo COP21 but changed its stance conditional on an outcome that would protect the interests of Polish coal. Poland was pleased when references to 'phasing out of fossil fuel subsidies' were deleted from the PA text (CAN Europe 2015). The EU managed to maintain political unity, helping to build the high-ambition coalition that proved instrumental in achieving the 1.5 °C aspirational goal and a dynamic agreement with all big emitters on board.

The 1.5 °C aspirational goal was more ambitious than the foundation for the EU targets, which were based on the 2.0 °C goal. This difference provided the PA with the potential to affect EU climate and energy policies. Responses to the PA were immediate and enthusiastic among the EU institutions, member-states and nearly all non-state actors (Andresen et al. 2016). The EU ratified the PA on 5 October 2016. Still, the EU concluded that the 2020 and 2030 targets would remain unchanged (European Commission 2016; European Council 2016). Top priority in following up the PA would be to revise the 2009 climate/energy policy package to attain the new 2030 targets (Kulovesi and Oberthür 2020).

Since 2015, the Juncker Commission made the Energy Union a central priority with a specific vice-president and one Commissioner for joint climate and energy policy execution. These reforms improved coordination of climate and energy policy initiatives within the Commission (Skjærseth 2017). The Energy Union idea developed from initially focusing on energy security to integrative climate/energy policies (Szulecki et al. 2016). The Commission divided the initiation of the new and reformed policy mixes for 2030 between climate and energy policies, but the respective policies were expanded and opened for new links.

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[11] EU-27 (26% reduction for EU-28). *Trends and projections in Europe 2020 — European Environment Agency (europa.eu)*.

4.1 Climate policies

New and reformed EU climate policies responded to the target of 40% emissions reduction by 2030 and rested on three pillars: the EU ETS, the renamed Effort Sharing Regulation (ESR) for the non-ETS sectors and the new land use, land-use change and forestry (LULUCF) regulation. Revision of the EU ETS was proposed in 2015 and adopted in 2018 to reduce emissions from the sectors covered by the system (now also including aviation) by 43% by 2030 from 2005 levels (up from 21%).[12] A key concern for the Commission was to deal with the massive surpluses of allowances that had built up after the financial crisis, depressing the carbon price. Countermeasures adopted include a more ambitious total cap of emissions (2.2% annual linear reduction as against the 1.74%) and a Market Stability Reserve (MSR) that began operating in January 2019.[13] The MSR is to be reviewed within three years and will, together with the revised ETS Directive, align with each global stock-take under the PA, starting in 2023. Partly because of the MSR, the carbon price increased significantly.[14] ETS revision was linked to side-payments to compensate the least climate enthusiastic: revenues from auctioning 2% of the allowances 2021–2030 will go to a Modernization Fund to assist the energy transition in the 10 lower-income Central and East European member-states.[15] This Fund may amount to some €14 billion, depending on the carbon price.[16] The Coal Regions in Transition Platform was also intended to increase acceptance of higher carbon prices among the least wealthy coal-dependent member-states (below).

The revision of the ESR was proposed in 2016 and adopted in 2018 to deliver reductions from the non-ETS sectors of 30% compared to 2005 (up from 10%).[17] National targets for 2030 will be based on GDP/capita as before and will range from 0% to -40% compared to 2005 levels (Peeters and Athanasiadou 2020). As a concession to countries from Central and Eastern Europe, an additional adjustment of 41 million tonnes is provided for the year 2021, and a safety reserve has been added to please Poland in particular.[18] The ESR offers new flexibilities to access some EU ETS allowances for eligible member-states and access to credits from the land-use sector.[19] A limited amount of ETS allowances can be used for offsetting emissions in the effort sharing sectors to level the costs also for higher-income member-states. Formal compliance checks will be organized every five years, which synchronizes the ESR with the PA.

Finally, the LULUCF regulation—proposed in 2016 and adopted in 2018—has been added as a new pillar in EU climate policy.[20] The Kyoto Protocol commits the EU member-states to the 'no-debit rule'—that GHGs from land use are compensated by an equivalent

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[12] Directive (EU) 2018/410.

[13] The MSR was aimed at creating a better balance between allowance supply and demand, by adjusting the amount of allowances to be auctioned https://ec.europa.eu/clima/policies/ets/reform_en.

[14] https://sandbag.org.uk/carbon-price-viewer/

[15] In addition, 10% of the allowances for 2021–2030 will be allocated to a 'solidarity fund' for less wealthy EU member states. The remaining allowances to be auctioned will be distributed to the EU member states based on their verified emissions.

[16] https://ec.europa.eu/clima/policies/budget/modernisation-fund_en

[17] Regulation (EU) 2018/842.

[18] Maximum 105 million tonnes. https://ec.europa.eu/clima/policies/effort/regulation_en

[19] Concerning the land-use sector, member-states may use up to 262 million credits over the 2021–2030 period to comply with their national ESR targets.

[20] Regulation (EU) 2018/841.

absorption of CO_2 from additional action in the sector. In May 2018, the EU adopted the same principle as a binding obligation for each member-states for the period 2021–2030. However, critics have held that the LULUCF regulation does little to incentivize climate-friendly practices in the EU forest sector (Savaresi et al. 2020).

4.2 Energy policies

The EU also reformed its energy policies towards 2030, to deliver on new renewable and energy efficiency targets and to make the internal energy market more adapted to renewable energy. In 2016, the Commission proposed the 'Clean energy for all Europeans package' consisting of eight legislative proposals (Roberts 2020). Negotiations centred first on the internal energy market and then on renewables, energy efficiency and governance—legislation—adopted in 2018 and early 2019. In contrast to climate policies, the negotiations on energy policies led to more ambitious EU level targets than previously agreed among the EU leaders in 2014 and proposed by European Commission in 2016. The European Parliament was a main driving force here—also invoking the Paris Agreement to further its interests.[21] Brexit did not significantly affect these negotiations.[22]

The revised Renewable Energy Directive sets a 32% EU level target for 2030, with an upwards revision clause by 2023 in line with the PA.[23] Binding national renewable targets were abolished. The 32% target, more ambitious than the 27% agreed by the EU leaders and proposed by the Commission, represents a compromise between the European Parliament and some member-states pushing for more than 32% and others calling for less.[24] Further changes include a new design for support schemes, regulatory framework on self-consumption, increased ambitions for the heating/cooling sector and transport, as well as stricter sustainability criteria for biofuels and bioenergy.

Negotiations on the revised Energy Efficiency Directive also led to a more ambitious non-binding indicative target—32.5% by 2030 with an upwards revision clause by 2023, in line with the PA.[25] This was more ambitious than the 30% proposed by the European Commission. The revised Directive sets an annual energy-saving obligation for each member-state of 0.8% of final energy consumption from 2021 to 2030.[26]

To promote implementation of policies and measures necessary for achieving the energy and climate targets, a new *governance* regulation was adopted that provides the European Commission with instruments to ensure enforcement (Monti and Romera 2020).[27] This regulation will also bring reporting in line with the PA from 2021. The governance system is based on integrated national energy and climate plans (NECPs) covering a ten-year period starting from 2021. The NECPs align 'push' and 'pull' policies at national level by defining how the member-states are to address research and innovation on the one hand and energy efficiency, renewables, GHG emissions, and interconnections on the other.

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[21] https://www.europarl.europa.eu/factsheets/en/sheet/69/energy-efficiency; https://www.europarl.europa.eu/factsheets/en/sheet/70/renewable-energy.

[22] This was underscored by most of the interviewees.

[23] Directive (EU) 2018/2001.

[24] https://www.theguardian.com/business/2018/jun/14/eu-raises-renewable-energy-targets-to-32-by-2030.

[25] Directive (EU) 2018/2002. Compared to projections of the expected energy use in 2030. https://ec.europa.eu/energy/en/topics/energy-efficiency/targets-directive-and-rules/energy-efficiency-directive.

[26] An updated Directive on energy performance in buildings was also adopted.

[27] Regulation (EU) 2018/1999.

All member-states have submitted their NECPs; their combined commitments for renewable energy are estimated to be above the 32% target (ca. 33%), below the 32.5% energy efficiency target (ca. 29%) and roughly in line with the 40% GHG reductions target (ca. 41%).[28]

A supplementary part of the 2030 policy package features an updated design of the EU electricity market to deal with more variable renewable energy from wind and solar, making it more flexible and market-oriented.[29] The electricity regulation also constrains polluting activities by reducing the role of coal in the EU energy mix.[30] Due to more variable energy from renewables, capacity-remuneration mechanisms are established to subsidize new and existing power plants to ensure adequate electricity capacity and security of supply. The new regulation introduces a new limit for power plants eligible for subsidies to emitting less than 550gr CO_2/kWh.[31] This limit will exclude coal plants from subsidies; the outcome was a compromise between 'clean power interests' and 'coal interests'—the latter fronted by Poland.[32]

The EU has also decided to step up technology 'push' policies and 'green' growth through more funding to a range of low-carbon research and innovation projects. The EU Strategic Energy Technology Plan has developed from 'picking winners' to a more technology neutral approach—from its original six priorities to 14 Implementation Plans covering specific technology areas such as concentrated solar, batteries and ocean energy.[33] Under the revised ETS for 2021–2030, the EU has adopted a follow-up low-carbon demonstration technology programme to the NER 300—the Innovation Fund. The new programme is to continue with revenues from auctioning of emission allowances as the funding source, now expanded to 450 million allowances, with a potentially higher budget and thus new opportunities for selecting larger-scale technology projects. The Innovation Fund also widens the scope to energy-intensive industry projects and energy storage.[34]

The negotiations on revised policies were related to member-state experiences with the implementation of policies for 2020. Implementation of both the CCS Directive and the 2009 Renewable Energy Directive had led to mixed or negative experiences that fuelled opposition to new binding national renewables targets and more ambitious CCS policies (Skjærseth et al. 2016; Skjærseth 2018). None of the planned CCS pilot projects had been realized in the EU. Conversely, implementation of the ETS and ESD became less costly due to the drop in emissions following the financial crisis. This contributed to low-carbon prices which made the EU ETS less threatening to coal, for example in Poland, in turn making it politically easier for the EU to step up ambitions.

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[28] https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en.

[29] This element consists of four legal acts: a new electricity regulation, and amended electricity directive, a regulation on the role for the Agency for the Cooperation of Energy Regulators (ACER) and risk preparedness.

[30] Regulation (EU) 2019/943.

[31] https://ec.europa.eu/commission/presscorner/detail/en/IP_18_6870;   https://www.fni.no/getfile.php/1310034-1561035809/Filer/Publikasjoner/REMAP%20Insight%205%20-%202019.pdf.

[32] New plants built after the Regulation enters into force emitting more than 550gr CO_2/kWh cannot be remunerated. After 2025, the same rules will apply also to existing plants. However, a 'grandfathering' clause was introduced: all contracts concluded before the end of 2019 may be exempted from the rules.

[33] https://setis.ec.europa.eu/actions-towards-implementing-integrated-set-plan/implementation-plans.

[34] https://ec.europa.eu/clima/policies/innovation-fund_en#:~:text=%20Innovation%20Fund%20grants%20can%20be%20combined%20with,Just%20Transition%20Fund%207%20Private%20capital%20More%20.

Thus, the reformed targets and policies for 2030 became 're-packed' and generally more ambitious. The policy mix itself continued to provide room for compromise among the member-states, based not only on compensation and special arrangements for the 'least ambitious' actors but also to ease the costs for high-income member-states that had to adopt the most ambitious obligations. The main structure and ambitions of the reformed climate policies followed the 2014 agreement by the EU leaders, giving the outcome an intergovernmental flavour. Negotiations on renewables, energy efficiency and governance policies became more influenced by the EU institutions, particularly the European Parliament.

The Paris Agreement affected EU climate and energy policies legally by institutionalizing the PA's dynamic five-year cycles. The EU and the PA are highly synchronized (Torney and O'Gorman 2020). The latter also became important for raising EU energy policy ambitions as it empowered the European Parliament's efforts at raising energy efficiency and renewable energy ambitions.

5 Comprehensive policies for the long term in times of crisis: Green or Grey Deal?

In November 2018, the European Commission presented its long-term vision 'A Clean Planet for all'.[35] It did not propose a specific strategy but examined various pathways compatible with the PA's 'well below 2 °C and 1.5 °C'. The EU leaders moved on with the most ambitious net-zero emissions target by 2050. In June 2019, however, agreement failed because of opposition from Poland, Hungary, the Czech Republic and Estonia.

In December 2019, the new Commission launched the European Green Deal (EGD) as a green-growth strategy emphasising innovation, new 'green' jobs, and sustainable transformation (Commission 2019). For the first time, the Commission placed climate and environmental policies at the centre of a comprehensive plan catering to wider sustainability, industrial, innovation, and societal ambitions. The EGD has three goals for 2050:

- no net emissions of greenhouse gases
- economic growth decoupled from resource use
- no person or place left behind.

The EGD roadmap includes 47 'key actions' consisting of a mix of 'hard' legal and 'soft' actions, specific and general actions, and new and old ones (Commission 2016). The Commission faces at least two major challenges in realizing the EGD: First, it will be expensive to ensure a socially just transition that leaves no one behind (Commission 2016). For example, compensation or new jobs will be needed for more than 230 000 coal workers in 31 coal regions in 11 member-states. Second, the Commission's EGD needs support from the 27 member-states and the European Parliament for all 'hard' measures that involve changes in legislation. The European Parliament has expressed general support for the EGD, but the preferences of the member-states vary widely.

The main initiatives on climate/energy policies involve raising the 2030 GHG reduction target and strengthening the newly adopted climate/energy policies to achieve a new target. The Commission announced a new 'superpackage' proposal in June 2021 including a more

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[35] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0773&from=EN.

ambitious and expanded emissions trading system, effort sharing for non-ETS sectors, a carbon border tax, more stringent accounting rules for forests and land use, more ambitious renewable energy directive and energy efficiency directive, and more stringent emissions performance standards for cars/vans. These 2030 initiatives will also serve as stepping-stones towards the new 'net-zero emissions' by 2050 target, now in principle supported or accepted by all member-states. There are also several other climate/energy-relevant initiatives linked to green investments, energy security, industrial strategy, circular economy, mobility, and cross-cutting policies such as state aid rules. In March 2020, the Commission presented a new industrial strategy, followed by hydrogen- and offshore renewable energy strategies for a climate-neutral Europe.[36] The Commission has also proposed a new Climate Law Regulation that includes the 2050 net-zero emissions target. Finally, the EGD aims to strengthen the EU's ambitions as a global climate leader.

The consequences of the corona-induced recession for the EGD initiatives will depend on the length and depth of the crisis. EU responses so far indicate that the crisis has been used chiefly as an opportunity to strengthen the EGD and climate policies. In December 2020, the European Council agreed on the new GHG-reduction target by 2030 of at least 55% (compared to 1990) emissions and removals (Commission 2020). Adding removals will make the target easier to achieve. 'Removals' refer to the land use and forestry sector that both emits GHGs and absorbs CO_2. In the EU, more is currently absorbed than emitted. The new 2030 target is to be submitted to the PA, as the EU's first ambition increase according to the PA's five-year cycles.

There has been an ongoing battle for 'grey' or 'green' recovery packages. In late May 2020, the Commission proposed a €750-billion recovery plan whereby a quarter was intended for investments in line with EGD: renovation of buildings, renewables, and other low-carbon technologies, sustainable mobility, and a just transition. In July, the EU leaders adopted the recovery package 'Next Generation EU' and the Multiannual Financial Framework for 2021–2027, with a combined weight of over €1.8 trillion. It was decided to dedicate at least 30% to EGD-relevant spending, but actual spending will depend on implementation in the member-states' recovery and resilience plans. Observers have raised concerns that many of the Central and East European countries will channel money from the recovery fund to fossil fuel companies (ENDS 2020).

The Just Transition Fund received only €17.5 billion of the €40 billion that the Commission has indicated as necessary. Critics also fear that support will go to coal-dependent member-states that have no intentions of phasing out coal. After the 2008/2009 financial crisis, some 2% of the EU's recovery budget was allocated to 'climate-friendly' measures, mainly gas and electricity infrastructure (Eikeland and Skjærseth 2019).

The need for a socially fair transition has gradually become more important as EU climate policies have become more ambitious.[37] Distributional concerns in the EU have developed from fairness among member-states and industry sectors, to regions and citizens—note the Yellow Vests movement in France.

Actors differ in their ideas as to what is socially 'fair' or 'just'. At the level of the individual citizen, the Commission links fairness to the principles under the European Pillar of

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[36] https://ec.europa.eu/energy/sites/ener/files/hydrogen_strategy.pdf; https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593086905382&uri=CELEX:52020DC0102; *EU strategy on offshore renewable energy | Energy (europa.eu).*

[37] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0773&from=EN

Social Rights.[38] It also argues that the challenge of vulnerable energy customers should be addressed by the member-states' social policy—not by regulated energy tariffs in the EU internal energy market.[39] Attention has as noted focused mainly on coal regions in lower-income member-states in Central and Eastern Europe.[40]

Carbon leakage among energy-intensive industries has been dealt with by providing free allowances and compensation for increase in electricity prices because of the EU ETS. The EGD aims to develop a carbon border mechanism that taxes products imported from countries with more lenient climate policies. If adopted, the carbon border tax may provide incentives for other countries like the US and China to step up their climate ambitions.

6 Concluding remarks

This article has examined how and why EU climate and related policies have progressed despite member state opposition, developing from separate climate and energy policies to coordinated policy mixes or packages. As climate ambitions have increased, these policy mixes have expanded in scope to fulfil more transition functions related to low-carbon innovation, 'green' industrial growth and just transition. The European Green Deal aims to mainstream climate and sustainability policies into all economic sectors.

Our main conclusion is that the EU policy mixes have themselves provided ample room for combining different concerns and actor interests to raise climate ambitions. The development of EU policy mixes has served the twin purposes of promoting political feasibility and transition functions. The EU institutions have been instrumental in crafting policy packages that exempt and compensate the least climate-ambitious actors. Still, the driving forces behind this development vary in different phases and between issues that shift between policies propelled mainly by the EU institutions and the member-states. Policy feedback from implementation experiences has emerged as a mechanism for changes in member-state preferences as climate and energy policies have progressed. These observations indicate that theories of multi-level governance/supranationalism and liberal intergovernmentalism are genuinely compatible.

External factors have also been important. The Paris Agreement has affected EU climate and energy policies legally by synchronizing reporting and stepping up ambitions. It has also been used politically to raise ambitions for 2030 and beyond. The corona-induced recession has coincided with the new Commission's climate ambitions expressed in the European Green Deal. The consequences will depend on the length and depth of the crisis. EU responses thus far have mainly indicated that the crisis has been used as an opportunity to strengthen climate policy and the EGD—a preliminary observation in line with theories focusing on exogenous shocks as windows of opportunity for stepping up ambitions.

Future research on policy mixes could examine not only how combinations of policies promote political feasibility but also how they can cause 'policy trouble' that may lead to deadlock. The literature on issue and policy linkage underscores that bringing the 'wrong' issues into policy packages may make negotiations more complex and splitting, instead of

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[38] This non-legal initiative has been criticized for diffusing responsibility. See: https://www.greeneurop eanjournal.eu/who-is-in-charge-of-the-european-pillar-of-social-rights/.

[39] The reason is that regulated energy tariffs can distort market signals.

[40] Until the Just Transition Fund, the Cohesion Fund, European Regional Development Fund and Social Fund have been available to support projects linked to Coal Regions in Transition Platform.

unifying actor interests. The fate of the EU climate/energy 'superpackage' announced for 2021 and the European Green Deal may hinge on putting the 'right' issues and policies into sub-packages that reduce complexity and increase political feasibility.

Appendix 1: Interviews 2019, Brussels

- Balke, Joachim. Cañetes cabinet, 25.02.
- Engquist, Rasa. Permanent Representation of Sweden to the EU. 25.02.
- Will, Francis. Permanent Representation of the UK to the EU. 25.02.
- Graziani, Francesco. European Commission. DG Energy. 26.02.
- Hujber, Andreas. European Commission. DG Energy. 26.02.
- Kiela-Vilumsone, Lelde. European Commission. DG Energy. 26.02.
- Robert, Sylvain. European Commission. DG Energy. 26.02.
- Rudnicka, Barbara. Permanent Representation of Poland to the EU. 27.02.
- Rullaud, Louise. EURELECTRIC. 27.02.
- Runnel, Reesi-Reena. Permanent Representation of Estonia to the EU. 26.02.
- Salay, Jürgen. European Commission. DG Climate. 04.04.
- Tonitz, Matthias. Permanent Representation of Austria to the EU. 25.02.
- Zeitoun, Jérémie. European Parliament, the Greens. 26.02.

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