EU 2040 Climate Architecture: Target Designs and Framework Options

Discussing design options for the EU 2040 climate framework

Nils Meyer-Ohlendorf (Ecologic Institute)
Deyana Kocher (Ecologic Insitute)
Jakob Graichen (Öko-Institut)
Sabine Gores (Öko-Institut)

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Ecologic Institute

Contact

Dr. Nils Meyer-Ohlendorf
Head, International and European Governance
Ecologic Institute
Pfalzburger Straße 43/44
10717 Berlin

E-Mail: nils.meyer-ohlendorf@ecologic.eu

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Abbreviations

AEA	Annual emission allocation
CAP	Common Agricultural Policy
CARE	Climate Action Regulation for Europe (aka Effort Sharing Regulation)
CBAM	Carbon Border Adjustment Mechanism
ECL	European Climate Law
ESABCC	European Scientific Advisory Board on Climate Change
ESR	Effort Sharing Regulation
ETS	Emissions Trading Scheme
GHG	Greenhouse gas
Gt	Gigatonne
IED	Industrial Emissions Directive
LTS	Long-Term Strategy
LRF	Linear Reduction Factor
MRV	Measurement, Reporting and Verification
Mt	Megatonne
NDC	Nationally Determined Contribution
NECP	National Energy and Climate Plan
RED	Renewable Energy Directive

Executive summary

The EU has to adopt a climate target for 2040. This is a legal obligation enshrined in the EU Climate Law (ECL). The 2040 target is a critical milestone on the EU's path towards reaching climate neutrality by 2050 and net negative emissions thereafter. **Its design and implementation are crucial.** Weak target designs and implementation frameworks make the achievement of the 2040 target less likely and will severely undermine the EU's efforts to achieve climate neutrality.

There are **multiple ways to design the EU's 2040 climate target**. Climate targets can treat emission reduction and carbon removals alike (combined targets), but they can also distinguish between emissions and removals (separate targets). Targets can also vary in terms of time spans, scope, and whether they are legally binding. They can commit the EU as a whole and/or individual Member States. Many of these elements can be combined. Each of these different design option features **distinct advantages and disadvantages**:

- **Combined targets:** Combined targets treat carbon removals and emission reduction units equally. In principle, combined targets can be achieved by 100% reductions and no removals or – theoretically – by zero emission reductions and 100% carbon removals. This range of possible pathways makes climate neutrality targets ambiguous. This ambiguity considerably increases the flexibility in target achievement.

  At the same time, however, combined targets have significant disadvantages. They treat removals and reductions identically, even though they are inherently different. No carbon removal option is as safe as leaving fossil gas, coal, and oil in the ground – the world's best carbon "sinks". Combined targets also increase the risk of delayed emission reductions as they turn removals into an equally valid compliance unit for mitigation. Furthermore, they do not clarify the amount of residual emissions available until 2050 and beyond, which undermines the predictability necessary for investment decisions.

- **Separate targets for emission reductions and removals:** In contrast to combined targets, separate targets distinguish between reductions and removals. Removals cannot be used to meet reduction obligations. Separate targets provide less flexibility for target achievement, but they do address the significant shortcomings of combined targets. They do not risk deterring emission reductions and do not conflate reductions and removals. They define the amount of residual emissions and provide clear guidance on investment needs to reduce emissions and to remove carbon. They act as a safeguard to avoid pathways that dangerously rely on carbon removals.

- **Separate targets for permanent and temporary removals:** This design option sets specific targets for removals with permanent storage and those with temporary storage. Such targets can fully take account of the duration of carbon storage, one of the most critical issues for the integrity of climate action. Separate targets help ensure that carbon removals have the same or similar climate benefits. They can also act as a safeguard to ensure that not only removal options with the lowest short-term costs are implemented, as currently expensive options also need to be developed and deployed.

- **Sector targets at the EU level:** EU-wide sector targets set specific and quantified emission reduction obligations for economic sectors such as transport, buildings, industry, land use, energy production and waste. This target design offers several benefits. It establishes transparency on sector contributions, thereby enhancing sectoral

accountability. As the EU has to achieve climate neutrality by 2050, there will be no sectors with significant amounts of residual emissions. Sector targets help ensure that decarbonisation takes place across all sectors, including sectors that currently lag behind.

While these advantages are crucial for achieving climate neutrality, sector targets also raise concerns. Member States either already have national sectoral targets or are due to set them as part of their NECPs. As EU climate policies have grown considerably more complex, regulatory clarity and simplicity are becoming increasingly important factors for their effectiveness and efficiency.

- **Five-year targets:** Under such a target design, the EU sets climate targets for every five years, i.e., 2035, 2040 and 2045. Such a target cycle would be aligned to the international negotiations and NDC submission, supporting the case for this target cycle.

  However, a five-year cycle effectively translates to constant target negotiations, absorbing resources, and political attention. Transformative investment decisions require certainty and predictability well beyond five years. Furthermore, clearly quantified emission budgets are better suited than reduction targets to communicate the accumulative effects of emissions on atmospheric GHG (greenhouse gas) concentrations and correlating temperature increases.

The design and scope of the 2040 climate target are critical issues, but the **framework for implementation** is possibly even more important. The EU's framework for implementing climate targets consists of many different instruments, such as emission standards for cars and energy efficiency standards in buildings, but the **following issues will shape the overarching framework of implementation**:

- **Continuation of legally binding reduction targets for Member States:** The continuation of national targets under the Climate Regulation for Europe (CARE, aka Effort Sharing Regulation) is one of the central issues of the 2040 implementation framework. On the one hand, CARE can appear redundant because ETS 1 and 2 will already cover about 80% of EU emissions from 2027 onwards. In addition, CARE seems superfluous due to the more robust compliance regime of ETS 2. Cost considerations are also cited as arguments against the continuation of CARE. Moreover, it has been argued that CARE has not been instrumental in cutting emissions from agriculture.

  On the other hand, however, stronger arguments recommend maintaining CARE:

  - First and foremost, a robust climate framework must oblige the most important player in EU climate policies: the Member States. While many EU laws shape Member States' climate commitments, only legally binding climate targets make Member States accountable for their overall climate policies in an understandable and politically meaningful manner.
  - Second, decarbonising the EU's economies is a deeply political endeavour that requires many political choices. Voters must understand these choices and must be able to reverse them. Unlike many other climate instruments, national reductions are straightforward and easily understood, enabling voters to hold their governments to account.
  - Third, the ECL solely establishes collective targets for the EU as a whole for the years 2030 and 2050. It does not impose legally binding targets on individual Member States. This system of collective responsibility can turn into one of collective irresponsibility.

  - Fourth, legally binding national targets under CARE play a crucial role for adopting complementary climate policy at the Member State level if the EU is not on track to achieve its targets.
  - Fifth, national targets and the ETS are compatible, as evidenced by the current design of the ETS 2.
  - Sixth, national reduction targets can act as a safety net in case the ETS 2 would fail to achieve the required emission cuts in a cost-effective manner.

- **Merging ETS 1 and 2:** Merging ETS 1 and 2 in the next decade is another important item within the discussion on the EU 2040 climate framework. Merging both schemes could increase cost efficiency and result in one single market-based, uniform carbon price. This would enhance liquidity and could reduce overall mitigation costs. In addition, merging both systems could, in principle, reduce regulatory complexity, thereby enhancing understanding, trust, and ownership within the framework.

  However, there are also important risks associated with merging ETS 1 and 2. As emissions grow scarcer, carbon prices increase – possibly to levels that overburden lower-income households and companies. Merging ETS 1 and 2 prematurely could also undermine the effectiveness of the ETS 1 and could put the main burden for further emission reductions on the energy and industry sectors. Moreover, the ETS 1 and 2 have inherent differences. While reducing emissions under ETS 2 involves hundreds of millions of citizens, the ETS 1 only covers the emissions of large installations. Accommodating these differences could lead to complex regulatory frameworks. The discussion on merging both systems should draw from the lessons learned from the start of the ETS 2. These, however, will not become available before 2030.

- **ETS 3 for agriculture:** Agriculture accounts for about 15% of the EU's GHG emissions. As ETS 1 and 2 will not cover emissions from agriculture, there will be a major gap in the EU's climate architecture after 2030. An ETS 3 for agriculture or food emissions is one way to close this gap in pricing and capping emissions from this sector. There are various options to design an ETS 3. An ETS 3 could be designed as a downstream system for food industries, or an upstream system for manufacturers and importers of farm animal feed and synthetic fertiliser. As another option, it could cover on-farm emissions. These options can differ widely in terms of monitoring, reporting, and verification. The scope of an ETS 3 could also vary and cover either only direct emissions or including supply chain emissions; either all GHGs or only specific GHGs.

  At this point, there is no advanced political debate on the advantages and disadvantages of these options to designing an ETS 3. In broad terms, an ETS 3 has the benefit to cap and price emissions from a sector that has not achieved relevant emission reductions since 2005. An ETS 3 would facilitate implementing mitigation efforts at the lowest marginal cost, possibly mitigating increases in food prices. It would also generate revenues to support a sustainable transition of the sector. Reforms of the common agricultural policies, however, will be central to reducing agricultural emissions and to boosting potential synergies with other targets like the increase of natural sinks and biodiversity.

1 Introduction

The European Climate Law (ECL) obliges the EU to adopt a **legally binding climate target for 2040**. To this end, the Commission is supposed to present a proposal amending the ECL. The Commission's proposal must consider an indicative EU greenhouse gas (GHG) emission budget for the period 2030-2050[1] as well as several criteria, such as environmental impacts, cost effectiveness, fairness between Member States and international development. It is expected that a communication by the current Commission will prepare this legislative proposal. This communication is anticipated for early 2024, and it is assumed it will outline options and ranges for the 2040 target. A detailed impact assessment will accompany this communication. It will probably be for the next Commission to present the legislative proposals for a new 2040 climate target and an implementation package.

On 15 June 2023, the **European Scientific Advisory Body on Climate Change** (ESABCC) published its **advice on the 2040 climate target**.[2] With this advice**,** the discussion has entered a new phase. The ESABCC recommended an emission reduction target of 90 – 95% (compared to 1990). The ESABCC also recommended an EU emission budget of 11 – 14 gigatonnes (Gt) for the time from 2030 to 2050. 2040 scenarios indicate that net GHG emissions vary between 210 and 691 million tonnes of CO_2 equivalent (Mt CO_2eq), with natural removals ranging from 313 to 601 Mt CO_2eq and technological removals ranging from 46 to 160 Mt CO_2eq. In addition, the Commission's public consultation on the EU's 2040 climate target ended on 23 June 2023. The Commission received 903 submissions.[3]

While the level of ambition of the 2040 target is an essential element of the discussion, **the design of the target and a framework for target implementation are other crucial agenda items**. Weak target designs and implementation frameworks make target achievement less likely. Despite their importance, target designs and implementation frameworks are only beginning to receive the necessary political attention. The ESABCC discusses options for targets designs to a limited extent, highlighting the importance of targets that separate between emission reductions and carbon removals. In response to the Commission's public consultation on the 2040 target, other stakeholders have submitted first ideas on target designs and implementation frameworks.[4]

To contribute to the debate, **this paper provides an overview of possible design options for the EU's 2040 climate target and options for the implementation framework.** This **paper discusses target design options**, such as separate targets for carbon removals, specific targets for technical and natural sinks, sector targets, a target cycle of five years and the scope of the target (Chapter 2). The paper also assesses to what extent the current climate framework of the EU makes provisions for 2040 and identifies its gaps (Chapter 3). Furthermore, the paper explores options for reforming the EU policy framework to make it fit for achieving the 2040 climate target (Chapter 4).

[1] The ECL defines this emission budget as the indicative total volume of net GHG emissions "likely to be emitted during this period without jeopardizing the Union's commitments under the Paris Agreement".
[2] European Scientific Advisory Board on Climate Change, 2023
[3] See https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13793-EU-climate-target-for-2040/public-consultation_en
[4] Bellona, CAN E, CMW 2040 submission

While many instruments will contribute to target implementation, this paper focusses on the *Big Three* of EU climate policies: Emission Trading, Climate Action Regulation for Europe (CARE, aka Effort Sharing Regulation) and LULUCF regulation. Within its **limited scope**, the paper outlines the main issues relevant for target design and implementation within the climate framework and further aims to help initiate a debate on framework options. It does not explore regulatory details nor the energy acquis of the EU.

2 Options to design the EU's 2040 climate target

There are **multiple ways to design EU's 2040 climate targets**. These include:

- **Quantified targets either in volumes or percentage shares:** Climate targets set a quantified commitment. This quantified commitment can be expressed in percentage shares compared to the levels of a given base year. Alternatively, climate targets could set specific amounts in tonnes of CO_2 emissions to be reduced or removed.
- **Combined targets:** Combined targets treat carbon removals and emission reductions equally. Both removals and reductions serve to achieve the target.
- **Separate targets for reductions and carbon removals:** In contrast to combined targets, separate targets distinguish between emission reductions and carbon removals. In this design, removals cannot be used to meet reduction obligations.
- **Removal targets for technical and natural sinks:** As a variation of removal targets, removal targets for technical and natural sinks can differentiate between technical and natural sinks as well as between sinks that provide temporary versus permanent storage of carbon.
- **Time frames:** Climate targets can vary in time frames. They can be based on annual, biannual, or any other time frame - until 2050 or beyond. They also might refer to point targets per year or to budget approaches over different time periods.
- **Sectoral targets:** Sectoral target set quantified reduction obligations for economic sectors such as transport, buildings, industry, land use, energy production or waste.
- **Legally binding or indicative targets:** Climate targets can be legally binding, putting a legal obligation on the EU and/or Member States, or indicative. In the latter case, the target would have political value but no legal force. Only legally binding targets can be enforced in courts, or – in the case of the EU – through infringement procedures.
- **Scope of targets:** Climate targets can vary in scope, covering only specific GHGs or sectors while excluding others.
- **Targets on the EU and/or Member States:** Climate targets can apply to the EU and/or Member States (and subnational regions). Targets can also address private entities, for instance within the industry sector (see ETS1+2 and CO_2 standards for cars).

Many of these **elements can be combined.** Each combination features distinct advantages and disadvantages. Quantified and legally binding climate targets, however, are the EU's most effective target system. A legally binding target with meaningful sanctions in the case of non-compliance represents the highest possible commitment, as exemplified by the different target designs under the ETS and emission values for cars on the one hand and the RED and EED on the other hand.

2.1 Combined climate targets

Combined targets treat **carbon removals and emission reduction units equally**. The EU's 2050 climate neutrality target or the climate neutrality targets enshrined in the climate laws of several Member States[5] are examples of a combined target. According to Article 2 of the ECL, climate neutrality requires that emissions and carbon removals are balanced, thus reducing emissions to *net* zero by that date. In other words, every tonne of GHG emitted into the atmosphere must be removed. Accordingly, climate neutrality targets can be achieved by 100% reductions and no removals or – theoretically – by zero emission reductions and 100% carbon removals. Any other combination that adds up to net zero emissions is also possible.

These different pathways for target achievement make **climate neutrality targets ambiguous**. This ambiguity is – on the one hand – an advantage of this target design. It significantly increases flexibility in target achievement, thereby making it easier to garner political support. On the other hand, however, this design has significant disadvantages:

- **Undermining the environmental integrity of climate policies:** Combined targets treat removals and reductions alike although they are very different.[6] None of the various carbon removal options is as safe as keeping gas, coal and oil in the ground, the world's best carbon "sinks". Temporary removals are inherently distinct from emission reductions as they only store carbon for a certain period that is much shorter than the time during which emitted CO_2 stays in the atmosphere. While temporary removals can only store carbon for up to a few decades or, in exceptional cases, for a few centuries, carbon partly stays in the atmosphere for millennia.[7]
  While geological sinks can potentially store carbon for such timespans, they have shortcomings that reductions do not have. They depend on the availability of significant additional amounts of clean energy, and they may have negative impacts on ecosystems, water, and land. Some uncertainties remain concerning leakage risks. Furthermore, the actual carbon removal potential of current technical options is insignificant and uncertain.[8] If life-cycle emissions of technical installations for capture and energy production, investment costs for capture technologies and transport and energy inputs are considered, their removal potential can shrink even further.
- **Risks to delay or deter emission reduction:** If not properly governed, combined targets can make carbon removals an equally valid currency for target achievement risking delaying emission reductions. Depending on the calculation, some temporary removal options, such as afforestation or reforestation, currently appear significantly cheaper than many reduction options, possibly delaying emission reductions (see below). Such delays are a significant problem because – compared to emission reductions – carbon removals are the weaker form of climate protection. It is essential that the ECL requires the EU and Member States to prioritise "*swift and predictable*" emission reduction.
- **No clarity on residual emissions:** Combined targets do not provide clarity on the amount of residual emissions available until 2050 and beyond – because they neither specify the amount of eligible emission nor the volume of permissible removals. The amount of residual emissions, however, is a key issue in the EU's journey towards climate neutrality. Without clarity on the amount of residual emissions, the needs for

[5] Ecologic Institute, 2023
[6] Meyer-Ohlendorf, 2023
[7] German Environment Agency, 2023
[8] German Environment Agency, 2023

investment in mitigation and removals remain unclear. In addition, projecting carbon prices becomes even more challenging. This lack of clarity can undermine investment decisions.

- **Risks to lock in high GHG concentration triggering climate tipping points:** Combined targets that allow the unlimited use of any removal may inadvertently promote reliance on removals. This poses a significant risk since over-reliance on removals, rather than prioritising emission reductions, can lead to emission pathways that hinder the achievement of the 1.5°C target. Relying on temporary removals can result in high concentrations of GHGs in the atmosphere and temperature increases that may trigger climate system tipping points. These tipping points could set off additional emissions and accelerate the pace of climate change.[9]
- **Achieving climate neutrality in a robust manner:** There are various ways to attain combined targets. They can feature either high reductions and minimal contributions from removals or vice versa. Each scenario results in target achievement but has important differences in terms of climate protection. Only the scenario with high reduction shares, low removal contributions, and removals only encompassing permanent storage represents a high level of climate integrity. Combined targets do not ensure that targets are implemented with such high levels of climate integrity.

2.2 Separate targets for carbon removals and emission reductions

In contrast to combined targets, **separate targets distinguish between reductions and removals**. Removals cannot be used to meet reduction obligations. The **EU's climate target for 2030** is an example of a separate target. It differentiates between reductions and carbon removals from LULUCF. Article 4.1 of the ECL requires a reduction of net GHG emissions by at least 55% compared to 1990 levels by 2030. The second part of Article 4.1 places a cap on the contribution of net removals towards achieving the target at 225 $MtCO_2eq$, establishing a separate target for carbon removals. In addition, the EU's LULUCF legislation establishes a target of 310 Mt of removals by 2030 and distributes it among the 27 Member States. The **climate law of Portugal** also establishes a separate climate target. It requires Portugal to reduce its emissions by 95% until 2050 and remove the remaining 5%. The **climate law of Germany** formulates a quantified amount of emissions and a separate amount of removals from the LULUCF sectors in tonnes.

Separate targets provide less flexibility for target achievement, but they **address the significant potential shortcomings of combined targets**. They do not conflate reductions and removals. They clarify the amount of residual emissions and provide clear guidance on investment needs to reduce emissions and to remove carbon. They can act as a safeguard to avoid pathways that dangerously rely on carbon removals. They also help clarify that the EU aims to achieve net negative emissions after 2050.

Against this backdrop, the 2040 climate target is expected to be a separate target. The EU's **2030 climate target could serve as a model** for the EU's 2040 climate target, if expanded to cover all removals.

[9] IPCC, 2021

2.3 Separate targets for specific removal activities

There is a large variety of different carbon removal activities. Each removal activity has its own particular features with **distinct advantages and disadvantages** in terms of storage duration, costs, removal and storage potentials or technical readiness. Technical removal options such as DACSS, BECSS or enhanced weathering can – in principle – store carbon permanently. Their removal potentials, however, are very limited. They are also expensive and can have negative impacts on ecosystems, in particular in the case of BECCS. Carbon farming has the potential to remove larger amounts of carbon but its carbon storage is not permanent and expected to decline as climate change undermines the storage capacities of ecosystems. In the long run, these options can become expensive and harmful to ecosystems. This will make the management and governance of removals more complex compared to emission reductions.

In principle, it is possible to set **specific targets for each removal option**. Removal targets could require quantified amounts of removals by specific removal activities. The Swedish government report "The road to a climate-positive future"[10] could serve as a model for this target design. According to it, specific removal options, such as BECCS, DACCS or afforestation, are supposed to remove specifically quantified amounts of carbon in 2045, when Sweden aims to be climate neutral.

However, this **approach faces significant problems**. First and foremost, it is difficult to distinguish between the different removal solutions. Nature-based solutions, for example, often overlap. Second, targets for specific removals would significantly decrease flexibility in achieving targets. Third, such targets add another layer of policymaking to an already complex system.

While these are important concerns that require further discussion, there are also strong arguments **in favour of** targets that do not differentiate between specific removal options but **between permanent and temporary removals:**

- **Serving their purpose to counteract the warming effect of accumulating emissions:** It is the fundamental purpose of carbon removals to counteract the warming effects of emissions. As CO_2 partly remains in the atmosphere for more than 1000 years, carbon removal must counteract the warming effect of these emissions for the same period. Removals can only fulfil this purpose properly if they keep CO_2 out of the atmosphere for the same period. Temporary removals only have temporary effects.[11] Separate removal target make a clear distinction between the two.
- **Ensure carbon removals have the same climate value:** A combined removal target would allow both temporary and permanent storage removals equally to be used for target achievement – despite the fact that their climate benefits are different. Specific targets for permanent removals ensure that all removal units have the same climate benefits and are not conflated with credits of significantly lower climate value. Therefore, it is crucial that the related transparent Measurement, Reporting, and Verification (MRV) and accounting system will be capable of accurately mirroring the differences in storage duration of the various CO_2 removal options.
- **Diversification:** A combined target might have the effect that only the removal options with the lowest short-term costs are implemented. In the medium term their potential might be used up as other removal options remain underdeveloped and unable

[10] SOU, 2020
[11] Cullenward, Hamman, Freeman, 2020

to fill the gap. This calls for a technological development and innovation for CO_2 capture technologies and additional incentives to promote diversification.

- **Data quality:** Accounting of nature-based carbon removals is more challenging than accounting of technical sinks.
- **Avoid growing the carbon debt:** The capacity of ecosystems to store carbon can decline drastically[12] as temperatures increase and as droughts and other extreme weather events occur more often and more severely. The transformation of the Amazon from a carbon-rich rainforest to a savannah that only allows for low carbon storage is one example that illustrates the impact of climate change on the carbon storage capacity of ecosystems. For this reason, relying on removals with high reversal risks could seriously undermine efforts to keep the 1.5°C goal within reach.[13] Separate targets for permanent and temporary removals help addressing this problem.

2.4 Sector targets at the EU level

EU-wide sector targets would set specific and **quantified emission reduction obligations for economic sectors** such as transport, buildings, industry, land use, energy production and waste.

Member States' frameworks can inform this approach. Some national climate laws feature or have featured specific targets for sectors. The German Climate Law, for example, features targets for the energy, transport, buildings, industry, and agriculture sectors as well as removals from the LULUCF sectors. The Long-Term Strategies (LTSs) of many Member States also include sector targets. Member States are also encouraged to define sector targets in their National Energy and Climate Plans (NECPs) as well as sectoral policy instruments to achieve these targets.

EU-wide sector targets **can also be informed by existing EU climate policies**. The Emissions Trading Scheme (ETS) 1 sets emission caps for energy, industry, aviation and shipping. The ETS 2 sets a multisectoral legally binding cap covering transport, buildings and small (energy) industry. The LULUCF legislation sets an overall removals target that is broken down to individual Member States. During the negotiations on the ECL, the European Parliament adopted a position in support of a target for agricultural emissions. The EU has estimated that transport emissions will need to be cut by roughly 90% until 2050 and emissions of the construction sector by around 60% or more compared to 2015 levels.[14] Sector targets, however, have been a **contested issue especially if set at Member State level**.

Against this backdrop, there are various arguments supporting EU wide sector targets:

- **Transparency and accountability:** They establish clarity on the quantity of emission reductions from a given sector and on the time frames in which sectors must achieve these emission reductions. As such, they increase transparency[15] and sectoral accountability.
- **Environmental integrity:** The EU is obliged to achieve climate neutrality within the next 27 years. This objective necessitates practically full decarbonisation efforts across all sectors. To achieve the required emission reductions, all sectors must undergo profound change as quickly as possible; there will be no sectors with significant

[12] IPCC, 2018
[13] Swedish Presidency of the Council of the European Union, 2023
[14] European Commission, 2020
[15] NGO 2040 submission

amounts of residual emissions left in the next decades. Sector targets help ensure that decarbonisation takes place in all sectors and across the whole economy. They can also help trigger the necessary reductions in laggard sectors, such as road transport or agriculture.

- **Compliance system:** If designed as a legally binding obligation, sector targets can be the basis for infringement procedures – in principle the EU's strongest compliance mechanism.

While EU-wide sector targets help build a target system of high transparency and hence environmental integrity, there are also several arguments **against** them:

- **Double regulation:** Many Member States already have national sector targets or are supposed to set them as part of their NECPs. To some extent, this makes setting binding EU sector targets superfluous although there is significant difference between politically binding targets set out in NECPs and those enshrined in law.
- **Less flexibility to meet the overall climate targets and possibly higher costs:** In theory, sector targets can increase costs because they are less flexible. This argument assumes that sector targets hinder a system where one sector with cheaper mitigation potentials support other sectors with higher abatement costs to achieve overall emission reductions. Consequently, sector targets make climate action more expensive. Given the need to decarbonise all sectors within the next decades, however, this argument appears largely theoretical.
- **Sector targets are superfluous as the EU nears climate neutrality and as the ETS covers nearly all EU emissions:** As the EU nears climate neutrality, residual emissions inevitably decrease in all sectors. The climate neutrality target automatically requires steep emission reductions from all sectors, even if there are no quantified sector targets. Moreover, the revised ETS will cover around 80% of EU emissions, leaving essentially only agriculture, non-road transport and waste unregulated by a quantified target after 2030. It is questionable whether the sectors not covered by the ETS warrant a dedicated target. At the same time, however, sector targets can also quantify residual emission in the given sector, thereby increasing transparency and accountability.
- **Regulatory complexity:** Clarity and simplicity are essential factors for well-functioning climate policy. As EU climate policies have grown considerably more complex over the last decades, there needs to be a strong case to add another layer of regulation.

2.5 Five-year climate targets?

In principle, climate targets can be based on annual, biannual time frames, or any other **time frame** – until 2050 or beyond. The Decision 1/CMA.3 on "common time frames" under the Paris Agreement encourages Parties to communicate updated nationally determined contributions (NDCs) that cover a period of five years.[16] These NDCs should be communicated five years in advance. Accordingly, the EU is expected to communicate an NDC for 2035 in 2025, and an NDC for 2040 in 2035.[17] The NDC for 2045 would be due in 2040. It is also possible that the EU communicates targets for both 2035 and 2040 in 2025, with the 2035 target seen as a waypoint towards the 2040 target. In contrast to this five-year cycle under the Paris Agreement,

[16] UNFCCC, 2021
[17] ESABCC, 2023

the EU climate targets are based on decades – 2020, 2030, 2050 and – soon – 2040. It should be noted that the five-year target cycle stipulated in the Paris Agreement constitutes only a political commitment rather than a legal obligation.

Several stakeholders have argued in favour of a five-year cycle.[18] Some have made the case that such a target cycle would be aligned to the international negotiations and NDC submission.[19] They have also pointed out that the ECL already links the EU rules to the international negotiations. According to Article 4.7 ECL, the law's provision must be reviewed to the "outcomes of international discussions on common time frames for nationally determined contributions". In addition, more frequent monitoring and policy review would provide for additional opportunities to adapt to new developments. The five-year target cycle is also part of the EU political reality.

While these arguments make a strong case for a five-year cycle, there are also **several arguments against this cycle**:

- **Constant target negotiations:** Considering the length of negotiations of EU climate targets – usually spanning several years from the beginning of the discussion until publication in the official gazette –, a five-year cycle would translate to constant and uninterrupted target negotiations. These negotiations would absorb many resources and much political attention that might be better invested in implementing measures.
- **Increased uncertainty for business:** Transformative investment decisions require certainty and predictability. Therefore, the private sector prefers policy that is "long, loud and legal". The combination of targets of at least ten years with five-year milestones/targets or even annual targets seems to be preferable in this respect.
- **NDC and targets in EU law are not the same:** The NDCs' five-year cycle is different from setting targets under EU law. While the NDC constitutes a political commitment, targets in EU law establish a legal requirement. Unlike an NDC update, new targets in EU law have resulted in legally binding targets for Member States and large implementing packages that revise or overhaul the EU's climate acquis.
- **Political feasibility seems low:** It is very likely that a shorter target cycle would be faced with significant political opposition – from Member States and important groups in the European Parliament and elsewhere.
- **Emission budgets are better suited to address the underlying issue:** As CO_2 accumulates in the atmosphere, it is the total amount of emissions and removals over time that drives levels of atmospheric GHG concentration and hence temperature increases. The current focus on reductions achieved as of a specific moment in time disguises this correlation. An even shorter cycle of target revision could draw even more attention to emission levels at a specific moment in time. Emission budgets that limit the total amount of permissible emissions for a specific time frame could address this problem.[20] Emission budgets that are likely to be in line with the temperature goals of the Paris Agreement would make a shorter policy cycle obsolete.
- **Not clear whether level of ambition will be increased, and not decreased:** A five-year cycle opens additional opportunities to revise targets, including decreasing the level of ambition. Despite an accelerating climate crisis, this is not an outlandish scenario, because increasing abatement costs could lead to mounting political pressures to slow down decarbonisation efforts. Article 4.3 of the Paris Agreement only acts as

[18] Climate Action Network Europe, 2023
[19] Climate Action Network Europe, 2023; Carbon Market Watch, 2023
[20] Meyer-Ohlendorf, 2020

a safeguard against such backsliding to some extent as its wording does not constitute an unambiguous legal obligation.[21]

2.6 Scope of targets: International transport and targets for non-CO_2 GHG emissions?

The ECL applies to anthropogenic emissions by sources and removals by sinks of the GHG listed in Part 2 of **Annex V to the Governance Regulation**. This Annex lists CO_2, Methane, Nitrous Oxide, Sulphur hexafluoride, Nitrogen trifluoride, as well as specific Hydrofluorocarbons and Perfluorocarbons. It also covers all Member States in the same geographic scope as under the UNFCCC (i.e. without Greenland, the Faroe Islands and overseas countries and territories).

Some uncertainty remains about the scope of **emissions from international transport**. Based on the ECL, the 2050 EU climate target covers all EU-wide greenhouse gas emissions and removals regulated in EU law. This means that for international shipping and aviation the target would apply to:

- Shipping:
  - CO_2 emissions covered by the EU ETS;
  - Emissions of CH_4 and N_2O which will enter the ETS in 2027;
  - Possibly black carbon if included in the ETS in the future; and
  - Potentially covering the entire scope of the Shipping MRV regulation.
- Aviation
  - CO_2 Emissions in the EU ETS;
  - Non-CO_2 emissions and effects in the EU ETS if the upcoming revision leads to this;
  - CO_2 emissions from European operators outside of the EU ETS but covered by CORSIA; and
  - Possibly emissions addressed by ReFuelEU aviation which limits the fossil fuel content of all fuels sold for aviation in the EU.

The ECL does not define the scope of the 2040 target. Similarly, the 2030 NDC target does not refer to the scope of the 2040 target. Regardless of this gap, **the scope of the 2040 target should be identical to the scope of the climate neutrality target** and consistent with the international commitments of the EU under the Paris Agreement. This would help ensure that all sectors are on the path towards the same target.

Emissions from international transport will become increasingly important as their share of total emissions increases over time, while emissions from fossil fuel use in other sectors decrease. In addition, emissions from international transport are projected to increase, because of the steady increase of the activity and a less intensive uptake of the use of alternative fuels. Therefore, the inclusion of these increasing emissions into the target setting is important and has a relevant effect on the ambition.

Considering the above-mentioned possibilities for the setting of the scope for international aviation, there is a **challenge for targets which refer to 1990 as their base year**: The target scope has to be taken into account for both the base year and the target year. While data are available for emissions covered under EU law in the target year, their calculation might be unambiguous for the base year. An additional layer of challenge would occur if CORSIA flights were to be covered by the EU target: One could argue that the EU 'accounts' for the use of

[21] Meyer-Ohlendorf, 2017

CORSIA credits. Such accounting would imply that the EU no longer achieves its NDC and/or Climate Law target domestically. This also relates to the question of how the responsibility for emissions is shared between the EU and other countries: If no consistent rule is used by countries on the accounting of emissions from international transport, gaps and overlaps of emissions might occur.

Accounting of international transport emissions as reported in the **GHG emission inventories** to the UNFCCC, applying harmonised rules across countries, could be a viable way to integrate the international transport emissions into GHG targets. It would also provide information about the situation in the base year and allow for the allocation of emissions between the EU and other countries without additional rules. The future inclusion of non-CO_2 effects of international transport in GHG inventories via a revision of the IPCC guidelines for emission reporting is a possibility to better account for the impact of these activities. For a further increase in ambition and for the scope as defined for the 2050 target under the ECL to be fulfilled, the scope needs to be set even broader and the need for base-year information is no longer a valid argument.

2.7 Targets for climate action outside the EU?

The ESABCC recommends that the **EU contributes to direct emission reductions outside the EU**, "in the light of the shortfall identified between the feasible pathways and fair share estimates". Against this backdrop, it is conceivable that the EU's 2040 climate target could include emission reduction and removal targets to be achieved outside the EU. Such targets could quantify emission reductions and removals achieved by the EU through its support for climate action in third countries.

However, such an approach has **several problems**. First, it is difficult to quantify the amount of emission reductions and removals that the EU has achieved through its activities abroad. Second, the track record of mitigation project outside the EU is often poor. The success of these projects depends on fairly strong governance in the host country. Corruption can be a particular problem. Third, double counting and corresponding adjustment are another challenge. Fourth, the EU has little or no leverage over climate action outside the EU. Fifth, it might undermine domestic efforts of international partners.

3 Implementation framework for 2040: Which requirements exist, and which gaps persist?

3.1 What does the current policy framework regulate for 2040?

The EU has yet to adopt a climate target for 2040. Nevertheless, its **existing climate framework already incorporates several provisions that significantly shape emission reduction requirements for the year 2040**. First and foremost, the ETS establishes significant requirements for 2040 and beyond; with its currently expanded scope it will cover around 80% of the EU's total emissions. Second, there are several rules regulating sectoral policies that will be in force in 2040. Examples include rules on energy efficiency, emission values for cars or industrial installations. Third, CARE and LULUCF Regulations contain provisions relevant for climate policies in 2040 although these are mostly procedural with no substantive effects on emission reductions.

In more detail, the **ETS Directive, CARE and LULUCF Regulation contain the following provisions relevant for the 2040 climate framework** of the EU:

- **ETS 1:** According to the revised ETS Directive, the Linear Reduction Factor (LRF) is increased from 2.2 to 4.4%. The LRF of 4.4% means that the ETS 1 will run out of allowances in 2039. In other words, sectors covered by the ETS 1 will not be allowed to emit in 2040, unless they have banked allowances or the MSR releases allowances into the market.[22] However, it is likely that a number of industries, as well as aviation and shipping will still have residual emissions, e.g., from chemical processes that might not be able to be fully captured and stored or marginal abatement costs are prohibitively high. In addition, it should be noted that free allocation of allowances will only be available to some industries after 2034, including refineries, some chemical processes and non-ferrous metals. A Carbon Border Adjustment Mechanism (CBAM) will serve the purpose to protect EU industries and to avoid carbon leakage for the other sectors as of 2026.
- **ETS 2:** The revised ETS Directive introduces a new ETS for emissions from buildings, road transport and other sectors, the so-called ETS 2. The ETS 2 establishes an annual LRF of 5.38% (Article 30c). Under this LRF, allowances for buildings and road transport would reach zero in 2043.[23] Unlike the ETS 1, the ETS 2 does not cover large installations downstream but upstream fuel suppliers. End consumers are not subject to the reduction obligations under the ETS 2 but are affected by the partial or full pass through of the carbon price. The ETS 2 includes a Market Stability Reserve and a price stabilisation mechanism.
- **CARE:** While CARE remains legally valid after 2030, its regulatory efficacy depends on its reduction targets, which are only set until 2030. Consequently, if the targets are not extended beyond 2030, the Regulation will become practically void after 2030. However, a few rules will continue to have regulatory effects even if the EU does not adopt new national targets after 2030:
  - The ESABCC may issue reports on EU measures, climate targets, annual emission levels and flexibilities under CARE. The Commission must consider these reports “in particular as regards future measures aiming at further greenhouse gas emission reductions in the sectors covered by CARE”. These reports may also assess the efficacy of policies in the past and explore adequate policies for the time after 2030 (Article 15a).
  - CARE does not regulate the formula for distributing national targets but recital 19 specifies that the previous formula based on GDP was largely applied to the 2030 targets, as was the case for 2020. Legally this has little impact on the 2040 targets, but politically it is of considerable relevance (see below).
- **LULUCF:** Like CARE, the new LULUCF Regulation will remain legally valid after 2030, but its practical impact is equally limited as it only regulates emissions and removals from the land sector until 2030. Nevertheless, a few provisions of the Regulation, such as monitoring rules and rules on ESABCC advice, will continue to be in effect in 2040. Additionally, the Regulation requires the Commission to assess whether current emission trends and future projections are consistent with the EU’s climate neutrality objective and the EU’s intermediate climate targets set out in the ECL.

[22] Pahle et al., 2023
[23] Öko-Institut (forthcoming): Supply and demand in the ETS 2

3.2 What are the gaps in the current framework for 2040?

The ETS already shapes the EU's 2040 climate framework significantly. Apart from its provisions, however, the EU's climate framework has considerable regulatory gaps for the time after 2030:

- **The future of CARE and national reduction targets:** It is unclear to what extent national reductions targets under CARE will continue after 2030. CARE contains no mechanism that would facilitate the continuation of national targets. It only requires the Commission to *report* on the suitability of the national GHG emission reduction targets contained in *Annex I* to this Regulation as regards their contribution to the EU's climate objectives and to the goals of the Paris Agreement. Without targets, CARE not only loses its actual regulatory purpose but also renders its compliance mechanism and flexibilities void. These are exclusively geared towards the 2030 target.
- **Merging ETS 1 and 2:** It is not clear whether and to what extent ETS 1 and 2 will merge at some point in the future.
- **LULUCF and the role of land-based carbon removals after 2030:** The new LULUCF Regulation only sets out an overall EU-level removal target as well as legally binding removal targets for Member States for the year 2030. The Regulation's various flexibilities and its compliance mechanism are based on the 2030 target and become meaningless after 2030. Land-use emissions are also strongly influenced by other EU legislation, e.g., REDIII (biofuels), biomass under the ETS, sustainability provisions for biomass.
- **Lack of an effective regime for agriculture:** Various rules impact emissions from agriculture, in particular the Common Agricultural Policy (CAP), yet agriculture is the only large sector that lacks a quantified emission reduction target beyond 2030 and regulatory measures on how to achieve such a target.
- **Lack of a regulatory framework for the potential use of carbon dioxide removal certificates:** The Commission proposal for the certification of carbon dioxide removals is still subject to inter-institutional negotiations. If adopted, the framework will clarify the certification of carbon removals, but it will not regulate the uses of carbon removal units in a robust manner – a key component of the 2040 climate framework.

4 Possible options for the EU 2040 climate framework

A **wide range of instruments will help implement the EU's new climate target for 2040**. These include sectoral instruments such as emission values for cars, requirements for industrial installation under the Industrial Emissions Directive (IED) and performance standards for buildings. They also include EU spending programmes like the CAP, Just Transition Fund, Innovation Fund, Modernisation Fund, and the Social Climate Fund as well as provisions under the EU nature conservation polices. There are many more examples. While all these policies are important for the implementation of the EU's new 2040 climate target, the following issues are essential for the design of the EU's general framework that primarily serves for the implementation of the new target:

- The future of national reduction targets for Member States: Should CARE continue or not?

- If the national targets continue, which reforms of CARE are necessary?
- The future of ETS 1 and 2: Should both systems merge or not?
- Should the EU establish an ETS 3 for emissions from agriculture?
- What are necessary reforms of the LULUCF Regulation?

Other issues pertinent for an adequate implementation framework include rules that regulate and incentivise **carbon removals**. These issues can have a significant impact on the design of targets and the implementation framework. Examples of removal policies with impacts on the EU climate framework include measures to integrate removals into the ETS or separate removal trading schemes. These issues, however, are addressed in a separate forthcoming paper on the role of carbon removals within the 2040 climate framework.

4.1 Should national reduction targets under CARE continue?

The **continuation of CARE and legally binding reduction targets for Member States** is one of the central issues of the climate framework after 2030. It is also a contested issue. Some have voiced opposition against the continuation of CARE, while other players have argued that national targets under CARE must remain a central pillar of the EU's climate architecture.[24]

These are the **main arguments for abolishing CARE and national reduction targets**:

- **ETS 2 makes national targets redundant:** From 2027 onwards, ETS 1 and 2 will cover about 80% of EU emissions. This means that legally binding reduction obligations for the lion's share of current emissions are already in place. Only emissions from agriculture, some F-Gases, fugitive emissions from fuel production, non-CO_2 emissions from fuel combustion, non-road transport and waste are not subject to quantified reduction obligations. Given this context, the continuation of CARE seems redundant. It would duplicate existing reduction obligations, introducing an additional layer of regulation without contributing to emission reductions in a meaningful way.
- **Uniform ETS 2 targets versus differentiated CARE targets:** The ETS 2 cap is an EU-wide restriction resulting in similar emission reductions across the EU. In contrast, the CARE targets differ considerably between Member States. The result will be that some Member States are likely to overachieve their CARE targets due to the ETS 2 while others will either have to implement additional measures in the covered sectors or buy emission quantities from other Member States. For Member States with above-average CARE-targets, it will be difficult to impossible to achieve the CARE targets domestically. At the same time, this will lead to higher financial transfers to poorer Member States under CARE and a convergence of emissions.
- **ETS 2 already has a compliance regime:** ETS 2 has a more robust compliance regime than CARE. Unlike CARE, ETS 2 holds individual companies directly accountable on an annual basis, enabling more efficient and prompt sanction mechanisms. The ETS 2, therefore, provides a higher level of assurance that required emission reductions in covered sectors will be achieved.
- **Costly and inefficient:** Sectors regulated through national targets in the LULUCF, and CARE have significant differences in the marginal reduction costs.[25] As these sectors are subject to one single target, decarbonisation becomes more costly.

[24] Consultations on the EU 2040 climate target
[25] Submission of Denmark to the consultations on the 2040 climate target

However, this can be largely counteracted by the built-in full flexibility within the two regulations and the regulated flexibility across the two regulations.

- **National targets are ineffective:** To date, national targets – often non-binding or binding with very weak consequences in the case of non-compliance – have demonstrated lower efficiency in achieving emission reductions. They suffer from inadequate transparency and ineffective monitoring and compliance mechanisms.

However, there are **several strong arguments for maintaining CARE**:

- **Facilitating a democratic path to climate neutrality:** The decarbonising the EU's economies is a deeply political endeavour that requires many political choices. Voters must understand these choices and must be able to reverse them. Unlike many other climate instruments, national reduction targets are transparent and easily understood. They enable voters to hold national politicians to account for their overall climate policies. As citizens generally have better knowledge of national politics than EU affairs, national reduction targets are an important element of a democratic decarbonisation agenda.
  Moreover, reduction targets garner significant political attention, feature prominently in election manifestos, and foster public debates about a country's overall climate policies. To this extent they differ from other EU climate policies that also commit Member States but are often only known to experts and are not a matter of public interest. The ETS is an example of such an instrument that is familiar to experts but not to most voters.
- **Maintain Member State responsibilities in a politically meaningful manner:** EU climate policy has many players, but no player is as important as Member States.[26] They are the legislators and implementers of EU law. Achieving national EU climate targets depends on them. It is therefore crucial for Member States to remain responsible and accountable for the implementation of their national targets through national climate policies in a politically meaningful way.
  While various EU rules on energy and climate policies oblige Member States, only national reduction targets ensure that Member States can be held accountable for their *overall* climate policy efforts in a politically effective manner.
- **Maintain national ownership of climate policies:** Implementation of EU policies by Member States is a fundamental principle of the EU and its constitutional order. It is an established method to take account of the different circumstances of the individual Member States and to ensure Member States' ownership. But this principle of national ownership should not result in free riding. National reduction targets strike a balance between national ownership and appropriate contributions from all Member States. In other words, legally binding national reduction targets and national ownership are two sides of the same coin.
- **Collective responsibility easily turns into collective irresponsibility:** The ECL only sets collective targets for the EU for the years 2030 and 2050, without imposing legally binding targets on individual Member States. Consequently, this legislation alone does not guarantee individual and legal responsibility for Member States after 2030. This poses a problem because collective responsibility can quickly turn into collective irresponsibility. In the absence of legally binding national targets under CARE, effective infringement procedures – the EU's primary compliance mechanism – cannot be employed to ensure compliance with such national targets.

[26] Huszár, 2021

- **Different capacities of Member States to accommodate carbon prices under the ETS 2:** Member States and citizens have very different capacities to handle energy and carbon prices. While a given carbon price might have little impact on high-income Member States, the same price may have a disproportionately higher impact on lower-income Member States.[27] For instance, the impact of a carbon price of 55 EUR/t CO_2 is approximately twice as high in the lowest-income Member States compared to the highest-income ones.[28] The 2022 energy price crisis has also shown that Member States have very different capacities to cushion the effects of very high prices and shield vulnerable consumer groups from such prices.[29]
- **Only very high carbon prices can achieve required emission reductions:** According to a recent study conducted in Germany, even a carbon price of 200 EUR/t CO_2 in 2023, escalating to 350 EUR/t CO_2 in 2030, would result in emissions reductions in the transport sector of only approximately 17% (compared to a carbon price of 23 EUR/t CO_2). Similarly, the emissions reduction in the building sector would fall by around 14% in the years in question compared to the base case with a carbon price of 125 EUR/t CO_2 for those respective years.[30] These findings highlight that rising carbon prices only have a limited impact. They demonstrate that additional measures are necessary to achieve the required emission reductions.
- **CARE and ETS do not duplicate but complement each other:** The CARE and ETS 2 commit distinct entities. CARE places obligations on Member States, while ETS 2 holds fuel suppliers responsible. As a result, these regulations do not duplicate, but rather complement one another. Additionally, the availability of allowances within ETS 2 is derived from the amount allocated under CARE, ensuring the consistency between the two instruments in the aggregate. However, achieving this consistency at national level will be a new challenge: Compliance with CARE is independent of compliance with the ETS 2. Member States might need to buy emission quantities under CARE for which the private sector has already paid under the ETS. This could become difficult, especially taking into account how far current projections are away from the required target paths. It might not be possible for them to buy sufficient quantities due to a lack of supply.
- **National targets are tested and a well-functioning system:** Legally binding national targets under CARE play a crucial role in driving the adoption of additional climate policy at the Member State level. They also provide justification for more sectoral EU action. Since the adoption of the Kyoto Protocol in 1997, national reduction targets have taken centre stage in EU climate policymaking.
- **Safety net:** National reduction targets can act as a safety net in case the ETS 2 does not perform its function. It is conceivable, for example, that the ETS 2 is *de facto* discontinued or weakened considerably if carbon prices exceed specific cost thresholds. Different capacities of Member States to handle energy and carbon prices increase the likelihood of this scenario.

[27] Duwe, 2023
[28] Fiedler et al., 2022
[29] Sgaravatti et al., 2023
[30] Harthan et al., 2020

4.2 Reforming the Climate Action Regulation: Fit for 2040

If CARE and national reduction targets would continue after 2030, there are strong arguments that CARE cannot continue in its existing form. **Significant reform** would be required to make the instrument a strong driver for meeting the EU's new 2040 climate target and its climate neutrality target for 2050.

Options for reform include:

- **Current formula to distribute targets among Member States is not fit for purpose:** The current formula for determining reduction targets under CARE is primarily based on GDP per capita. Consequently, 14 out of the 27 Member States have reduction targets of no more than 20% compared to the 2005 levels by 2030. However, to achieve EU-wide climate neutrality by 2050, all fossil fuel uses in all CARE sectors of all Member States will need to be phased out.[31] As there is only limited potential for carbon removals to offset remaining emissions, a large spread between the targets of individual Member States would make achieving climate neutrality impossible.[32] Moreover, poorer Member States could already have higher per capita emissions than the EU average by 2030.
  Against this backdrop, national targets should be based on a new formula. This formula should take into account decarbonisation needs and potentials – in addition to cost-effectiveness and economic capacities. Intermediate targets should be based on the required pathway to avoid excessively challenging annual emission reductions closer to 2050. The new formula should narrow the spread of national targets, thereby increasing convergence between Member States.
- **Flexibilities:** CARE contains various flexibilities, designed to help Member States meet their targets. These flexibilities include borrowing, banking, annual emission allocation (AEA) transfers between Member States as well as a link to emission trading. Other flexibilities include the so-called safety reserve and a LULUCF flexibilities. While borrowing, banking and AEA trading are not contested, they are likely to play a bigger role in the next decade. Given the inherent differences between reductions and removals – temporary removals in particular – the LULUCF flexibility should be discontinued.[33]
- **Compliance:** The compliance regime of CARE mainly consists of an abatement factor, suspension of using flexibility instruments, a corrective action plan and an assessment of this plan by the Commission. Infringement procedures are another element. The new CARE contains a reformed compliance regime, enhancing transparency. The CARE compliance regime has worked in the past decade as all Member States have so far fulfilled their obligations and stayed within the limits of the cap. The current system strikes a good balance between ownership by Member States and independent assessment of corrective action plans by the Commission.

4.3 Merging ETS 1 and ETS 2

The merging of ETS 1 and 2 in the next decade is another important item in the discussion on the EU 2040 climate framework. Given the significant differences between both

[31] Duwe, 2023
[32] Duwe, 2023
[33] Meyer-Ohlendorf et al., 2016

systems, it is advisable to allow ETS 2 to go through a learning phase and not to merge them in the early years. However, it is very likely that this discussion will soon gain traction. Several stakeholders advocate already now for merging both ETSs into one single system.

Proponents argue primarily that merging both schemes would increase **cost efficiency**.[34] A merger would result in one single market-based, uniform carbon price. This will enhance liquidity and is expected to reduce the overall costs associated with emissions reductions. Moreover, merging both systems would **reduce regulatory complexity** and ultimately undesirable strategic behaviour in the choice of technical solutions. A system based on a single ETS and a single carbon price is less complex and more comprehendible than two systems and two prices running in parallel. As climate policies have grown considerably more complex and therefore less user-friendly over time, reducing its complexity is an important item on the 2040 climate agenda. A simple ETS also enhances understanding, trust, and ownership.

In addition, some proponents of merging the two systems have pointed out that complementary regulation should become less relevant over time. As barriers to the effectiveness of a carbon price are reduced and climate-friendly technologies become readily accessible in the market, carbon pricing should be strengthened, while the need for complementing regulation diminishes. This would require the carbon price to reflect the marginal abatement costs and to function as a cost-effective leading instrument.

However, there are also **important risks associated with merging ETS 1 and 2**. These include:

- **Transformation is much more complex in sectors covered by the ETS 2:** Instead of transforming around 10,000 high-emitting installations, reducing emissions under ETS 2 involves several hundred million tenants, homeowners, car owners each responsible for small sources of emissions. Many of these individuals face significant challenges in responding to an increase in carbon price due to limited financial resources, lack of knowledge, or lack of viable alternatives. For instance, tenants may be unable to modify the heating system or improve the insulation of their rented buildings, and numerous rural areas lack adequate access to public transport. These differences are unavoidable and will continue, making merging both systems challenging.
- **Socially unfair:** Recent carbon price levels in ETS 1 have reached hights of over 80 EUR/t CO_2. Imposing such a price on the ETS 2 sectors burdens lower-income households disproportionately. These households already spend a considerable portion of their income on energy and transportation expenses. Climate policy should not exacerbate social inequalities. The Social Climate Fund was created to address these social issues.
- **Integrity of ETS 1:** Experience with the ETS 1, but also in the Regional Greenhouse Gas Initiative in California, has shown that it is difficult to set the cap in a way that ensures a functioning ETS without a structural imbalance between supply and demand. In the ETS 1, it took around 15 years along with many reforms and changes before this imbalance was eliminated. Reporting and verification of ETS 2 emissions will not start until 2025 and the ETS 2 in 2027. Merging ETS 1 and 2 before sufficient experience has been gained in the ETS 2 could undermine the effectiveness of the ETS 1, considering that both ETSs will be of a similar size by 2030. This is an argument against an early merger, not against merging the two systems at a later date.

[34] Weimann, 2021

- **Unintended consequences:** Demand for emission allowances from road transport and buildings might be more inelastic while non-economic barriers (see above) might delay mitigation in these sectors. As a result, the carbon price could rise to levels which would jeopardise EU industry and jobs. This potential possibility should be an incentive for Member States to establish flanking policies, such as investing in charging infrastructure and refurbishment programmes.

4.4 ETS 3 for agriculture?

With the notable exception of emission from agriculture, ETS 1 and 2 will cover nearly all EU emissions. In consequence, agriculture remains the last large sector not subject to an explicit carbon price and emission cap. If CARE were not continued after 2030, it would not be subject to any quantified reduction requirements. Accounting for more than 15% of current EU emissions, this would **be a major gap in the EU's climate architecture** – especially as the share of agricultural emissions in total EU emissions is expected to increase as other sectors mitigate. An ETS 3 for agriculture or food is a possible approach to closing this gap. Reforms to the CAP and the taxation of emissions from agriculture are other important policy measures to reduce emissions from this sector.

There are **various options for the design of an ETS 3**. Options vary in terms of emissions and compliance entities covered. Covered emissions could include, for instance, emissions from livestock (enteric fermentation and manure management), as well as nitrous oxide emissions soils, which includes fertiliser use, as well as carbon emissions from soils (although these also fall under the LULUCF).[35] Emissions associated with other inputs, such as animal feed and on-farm energy use, could also be considered. Compliance entities could be set at the farm level, downstream at food industries (e.g., meat and dairy processors) or the upstream industries (fertiliser and feed producers or importers). All these options can be combined. The discussion on an ETS 3 has been ongoing for several years,[36] but it has not, with a few exceptions,[37] reached the level of specific design options and regulatory details.

In **more detail**, possible options for an ETS 3 include:

- **ETS for food industries (downstream ETS, option 1):** Option 1 would define an EU-wide cap of emissions for the food industries, cooperatives, or retailers above a certain threshold. It would allocate emission allowances to covered entities. Emission allowances would decrease according to a specific LRF. Covered emissions could include emissions directly associated with their operations or emissions caused along the value chain. Allowances could be allocated based on – for example – relatively simple emission factors for products such as beef, dairy or on more accurate and complex factors. Imported goods could be subject to the same system or, alternatively, a mechanism like the CBAM.
- **Manufacturers and importers of farm animal feed and synthetic fertiliser (upstream ETS, option 2):** Under option 2, feed/fertiliser importers/producers are compliance entities. They are obliged to return emission credits equivalent to agricultural (i.e. on farm) emissions associated with use of their inputs.

[35] European Environment Agency, 2022; Isermeyer, 2019
[36] Lünenbürger, Umweltbundesamt, 2013
[37] Isermeyer, 2019

- **ETS 3 for farmers (option 3).** Under this option, the ETS 3 could cover on-farm emissions. It could either cover all on-farm emissions or only parts thereof (livestock emissions, nitrous oxide from the use of mineral and organic fertilisers or land-use emissions, for example). Free allocation at the start and *de minimis* rules are possible measures to facilitate the introduction of the ETS 3.

In general terms, **proponents of an ETS 3 have argued that an ETS for agricultural emissions introduces a cap and price for emissions**, thereby implementing the Polluter Pays Principle. Moreover, an ETS 3 would ensure the implementation of mitigation efforts at the lowest marginal costs, which has significant benefits for both farmers and consumers. It would help to mitigate increases in food prices – a particularly important aspect of the ETS 3 discussion. It would generate incentives for technology developers and innovative processors to produce meat/dairy at lower emissions and pass on the lower prices to consumers. It would generate revenues to support a sustainable transition of the sector. It would also address emissions of a sector which has not, despite significant efficiency improvements, achieved relevant emission reductions in recent years.

However, the ETS 3 also **raises several concerns**:

- **Consumer prices:** An ETS 3 could increase food prices for dairy products, beef, and lamb, but price increases depend on many factors and are difficult to project. In a theoretical scenario of an EU agriculture market closed to imports and a CO_2 price of €100 per tonne, increases of production costs for beef and milk at the farm gate could be around 15%.[38] However, in a scenario of open markets, the consumer prices hardly increase because imports are expected to compensate for the decrease in domestic production.[39]
- **Leakage concerns:** Agriculture is a highly traded sector. Because of this high exposure to international competition, an ETS 3 raises leakage concerns. Depending on the design of an ETS 3, its main effect could be a shifting of production and associated emissions to countries that do not yet have CO_2 pricing in place.[40] These leakage concerns could be addressed by measures, such as border adjustments or free allocation of allowances.
- **Environmental impacts:** An ETS 3 could incentivise intensive agriculture because – in some cases – it emits less GHGs than comparable practices of extensive farming. While some forms of intensive agriculture decrease GHG emissions per unit, they can also harm soils, water, and biodiversity.
- **Administrative feasibility:** Because of the great number of farms in Europe and the lack of adequate data on emissions from individual farms, option 3 obliging farms seems currently to be unworkable.[41] Europe has about 10.5 million farms, and a farm's average size in Europe is 34 hectares, with a herd size of 47 livestock units.[42] Proponents of an ETS 3 acknowledge these practical impediments. If it were to be implemented, like under ETS1, *de minimis* rules or thresholds would be essential to manage the administrative load for regulators and transaction costs for smaller farmers. MRV remains challenging at farm level but can be improved over time.

[38] Isermeyer, 2019
[39] Isermeyer, 2019
[40] Isermeyer, 2019
[41] Isermeyer, 2019
[42] Eurostat, 2021

Against this backdrop, **option 1 – an ETS for food industries – has garnered more political support**. This option has several advantages. First, the EU's food market is highly concentrated in a few hundred companies. Second, these companies are very likely to have the administrative capacity to operate an ETS 3. Third, they often have data of the required quality.[43] Fourth, although an ETS 3 would only cover a small number of companies, it could cover a large share of agricultural emissions, depending on the extent to which emissions along the supply chain are included. It could generate incentives for processors to process meat/dairy at lower emissions.

While these are important advantages, option 1 also has **disadvantages**. First, it only gives farmers a limited ability to mitigate on-farm emissions and only has a limited potential to reduce on-farm emissions. Second, it is a relatively blunt price signal for farmers, making its impact on food prices uncertain. A system with high reduction requirements is likely to cause higher food prices than a system with lower ambition. Third, double regulation must be avoided. The relationship between CARE and ETS 2 can be a model to avoid double regulation (see above).

4.5 Reform of the LULUCF Regulation

There is a variety of measures and policies to enhance the **sink performance of LULUCF**, ranging from restoring carbon stocks in forests, afforestation, rewetting, and protection of organic soils to the expansion of agroforestry. All these measures must be seen in the context of the potentially dramatic impacts of climate change on the sector. The projections indicate only a minimal improvement in the sector's sink performance, but the impact of climate change on the sector is not sufficiently taken into account in the projections, even though climate change is very likely to have dramatic impacts. If Member States want to maintain and enhance the sink capacity of the of their land-use sectors, they must pursue aggressive adaptation policies in parallel.

The **LULUCF Regulation** sets the overall framework for the sector. The revised Regulation includes a net removal target for the EU of 310 MtCO2Eq by 2030. In addition, it sets legally binding targets for the Member States for 2030 (Annex IIa) and defines emission budgets for the years 2026 to 2029. For compliance, Member States can use flexibilities that result either from overfulfillment in other sectors or Member States (Article 12) or if deviations from the target can be attributed to climate change impact (Article 13b). The regulation includes rules for monitoring, verification, and compliance. If a Member State misses its target for the period 2026-2029, the deviation is multiplied by a factor of 1.08 and added to the country's target for 2030. If the Commission determines in its progress assessment that a Member States is not making sufficient progress, it will require a corrective action plan. The revised Regulation does not set targets for 2040 or 2050.

As the LULUCF Regulation has only been revised in 2023, there still is no experience of the functioning of the revised regulation. However, with the adoption of targets, a stronger compliance system and simpler monitoring rules, the new **LULUCF regulation has been improved significantly**. Given the inherent differences between temporary and permanent removals, the LULUCF Regulation should continue to regulate removals from the LULUCF sector separately.

[43] A crucial point is the level of detail in the emission calculation: The more general and simpler it is, the less it can reflect and reward mitigation actions taken but the more it can enhance administrative feasibility. For example, if there was an emission factor for milk independent of management practices, it would not necessarily lead to incentives on the production level.

The revised Regulation does not establish a AFOLU sector, as proposed by the Commission. This proposal would have allowed the compensation of emissions by removals from the sector, thereby deterring emission reductions. To better address diverging trends in the LULUCF sector with respective targets and measures, a separate treatment of emissions and removals in this sector would be beneficial.

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