CLIMATE BRIEF N°52

Mind the gap: Aligning the 2030 EU climate and energy policy framework to meet long-term climate goals

For a better coordination of climate and energy policies through the regulation on the Governance of the Energy Union

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SUMMARY

With the revision of its 2030 climate and energy policy framework, and in particular the negotiations on the Governance of the Energy Union, a **window of opportunity is currently open in the European Union (EU)**. The most should be made of this opportunity to implement a **coherent and ambitious policy mix in the EU to fulfill its climate commitment under the Paris Agreement.**

The EU committed through its Nationally Determined Contribution (NDC) to reduce its GHG emissions by at least 40% in 2030 compared to 1990 levels. This target is to be achieved through two policy instruments: the EU emissions trading scheme (EU ETS) and the Effort Sharing Regulation (ESR). In the EU 2030 climate and energy policy framework, counterproductive interactions create surplus on the EU ETS – in spite of the implementation of the Market Stability Reserve (MSR) in 2019 – and on the ESR, which undermines their effectiveness and jeopardizes the achievement of climate targets. The policy framework as currently negotiated **lacks concrete provisions to mitigate the effect of counterproductive interactions.** An "alignment" of the EU policy framework, by taking into account GHG emissions reductions coming from other policies in setting the EU ETS cap and the annual emissions allocations under the ESR, would **restore their respective effectiveness by 2030 and beyond.**

Furthermore, **the EU 2030 climate and energy framework falls short of its long-term climate ambition**, which should itself be increased to fulfill its commitment under the Paris Agreement. First, EU long-term ambition should be increased in line with the objective of the Paris Agreement and aim at net-zero emissions by 2050. Secondly, the 2030 climate and energy framework should be aligned to this increased long-term ambition.

Ten policy recommendations are defined, to make the EU climate and energy policy framework consistent with the Paris Agreement before 2030, by:

1. Setting the **EU long-term climate targets right**, taking into account the goals of the Paris Agreement;
2. Defining a climate and energy policy framework **aligned with long-term targets at the EU and national levels**;
3. Ensuring the **coherency of the policy framework** and mitigating counteractive interactions.

This climate brief provides a synthesis of key results from a report to be published within the framework of the research program COPEC II (COordination of EU Policies for Energy and CO_2 by 2030). Launched in April 2017, the research program aims at preparing policymakers for the revision of the 2030 climate and energy package. A first report, available online, was already published on the EU ETS reform for the post-2020 period.

The authors take sole responsibility for findings or ideas presented in this report as well as any errors or omissions. This report does not reflect the opinion of any governments or private companies. The authors would like to thank the sponsors of this research program for their financial support. They would also like to thank external experts for their valuable inputs on the report: Jean-Yves Caneill (Independant climate expert), Paula Coussy (IFPen) and Pierre Marion (IFPen).

Outline

Introduction

The **2030 climate and energy policy framework** is currently being negotiated in the EU. The first piece of this policy framework was the **revision of the EU ETS** - the EU emissions trading scheme - for the period 2021-2030 on which an agreement was found between EU institutions in November 2017. An agreement was also found in December 2017 on the **Effort Sharing Regulation (ESR)**, which sets emissions reduction targets for greenhouse gases (GHG) emissions in sectors not covered by the EU ETS. The other legislative pieces of the 2030 climate and energy framework are currently under negotiation. The EU Commission published in November 2016 legislative proposals on energy efficiency, renewable sources of energy, the organization of power markets and on the governance of the Energy Union, a text of particular importance, as it will aim at **ensuring the coherency of EU action on climate and energy**.

A policy window is currently open and the most should be made of this opportunity to **implement in the EU an ambitious policy mix to fulfill its commitment under the Paris Agreement**. As demonstrated by our first COPEC II report, counterproductive policy interactions undermine the functioning of the EU ETS and the trajectory of its emissions cap is not aligned to the EU long-term climate ambition. In order to extend these results, and to feed-in the ongoing negotiations on the Governance of the Energy Union and on other legislative pieces, this climate brief provides:

- An **analysis of interactions between EU energy and climate policies**. The analysis is carried out on historical data (2005-2015) and on projections until 2030
- Options on how to **better align policies to mitigate counteractive interactions** and **meet an increased EU long-term climate ambition** in line with the Paris Agreement.

1. The EU GHG emissions reduction target for 2030 is to be achieved through two policy instruments: the EU ETS and the ESR, which define carbon budgets over 2021-2030

The EU committed through its Nationally Determined Contribution (NDC) to reduce its GHG emissions by at least 40% **in** 2030 compared to 1990 levels. While the EU ETS sets an EU-wide cap on GHG emissions from large-scale facilities in the power and industrial sectors and on flights within the European Economic Area, the ESR sets an annual cap on GHG emissions from non-ETS sectors with the exception of land-use for each Member State -its annual emissions allocations (AEAs). The economy-wide GHG emissions reduction target in 2030 is to be achieved through a reduction in GHG emissions covered by the EU ETS and by the ESR of respectively 43% and 30% compared to 2005 levels in 2030 (see **Figure 1**).

The EU ETS and ESR, as they respectively allow the **carry-over of allowances and AEAs over the period (generally called "banking")**, **define carbon budgets**: cumulated GHG emissions over the period cannot be higher than the cumulated EU ETS cap in ETS sectors and than cumulated AEAs in non-ETS sectors.

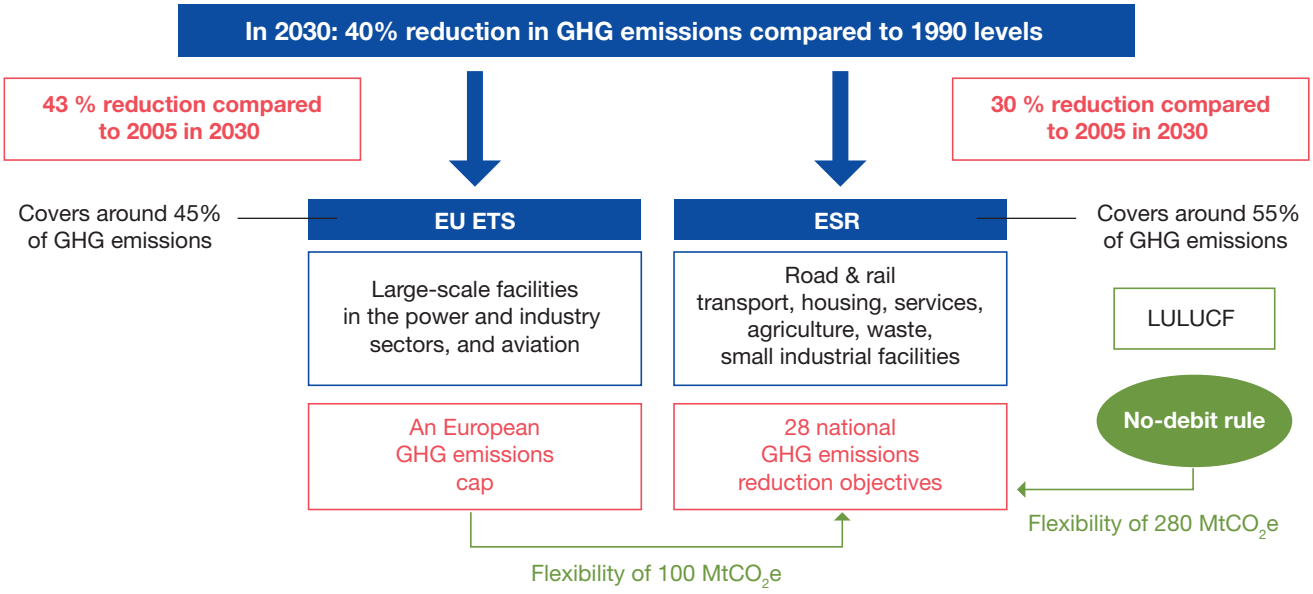
A. The "carbon budget" approach creates some uncertainty: the compliance with the EU ETS and with the ESR does not ensure the achievement of the EU's NDC by 2030

This carbon budget approach makes sense because climate change depends on cumulated GHG emissions and not on the level of GHG emissions in a specific year. However, by definition, **the "budget" approach does not ensure the achievement of a given reduction target in GHG emissions in a specific year** (see **Figure 2**). The devil is the detail of EU legislations: the NDC requires a reduction in GHG emissions in 2030, while the ESR and the EU ETS limit GHG emissions over a given period. This design difference creates **uncertainty about the ability of the EU ETS and the ESR to ensure the achievement of the EU's NDC in 2030**[1].

1 *In the same way, the compliance with the EU ETS and with the Effort Sharing Directive (ESD) until 2020 does not ensure the achievement of EU's 2020 climate target, which is split between a 21% reduction compared to 2005 in ETS sectors and a reduction of around 10% compared to 2005 in non-ETS sectors. As an order of magnitude, the cumulative surplus of AEAs was equivalent to 744 $MtCO_2e$ in 2015. Using this entire surplus in 2020 – assuming no more surplus is created in 2016-2019 – would allow a* **16% increase** *in covered GHG emissions in 2020 compared to 2005 levels, while complying with the ESD.*

FIGURE 1. SPLIT OF 2030 GHG EMISSIONS REDUCTION TARGET BETWEEN THE EU ETS AND THE ESR

The EU-wide 2030 climate target is to be achieved through GHG emissions reductions in sectors covered by the EU ETS and by the ESR, with accounting flexibilities between the policy instruments

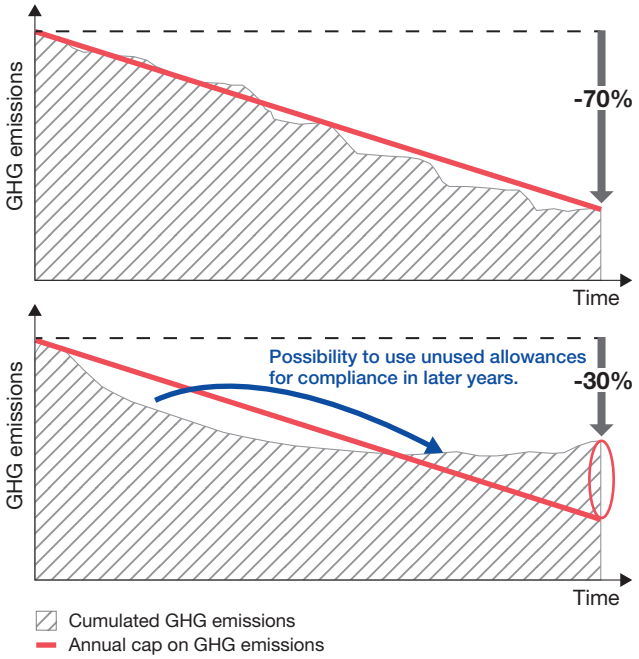


Note: LULUCF stands for "Land Use, Land Use-Change and Forestry". The "no-debit" rule aims at ensuring that accounted CO_2 emissions from land use are entirely compensated by an equivalent removal of CO_2 from the atmosphere through action in the same sector.

Source: I4CE, 2017

FIGURE 2. ILLUSTRATION OF POSSIBLE GHG EMISSIONS TRAJECTORIES RESPECTING THE SAME CUMULATED CARBON BUDGET

A policy instrument defined as a carbon budget does not ensure a given reduction in GHG emissions in a specific year



Interpretation of the graph: in this illustrative situation, a policy instrument defined as an annual cap on GHG emissions is implemented, with the possibility to carry-over unused emission allowances. **In both cases, the constraint on GHG emissions defined by the policy instrument is respected: cumulated GHG emissions are lower than the cumulated cap on emissions**. In the case at the top, GHG emissions are in the last year 70% below their reference level, while they are only 30% lower in the case at the bottom.

Source: I4CE, 2018

B. The carbon budgets defined by the EU ETS and the ESR should be calibrated accurately

The carbon budgets defined by the EU ETS and the ESR should be consistent with long-term global climate goals

In current legislations, the carbon budgets defined by the EU ETS and the ESR depend on historical GHG emissions. To be consistent with climate science, the **EU could evaluate its share of the global carbon budget compatible with an increase in temperatures of 2°C or 1.5°C** – based on the IPCC principles of capability, equality and responsibility. The **translation of this carbon budget and the "net-zero" emissions target in an updated 2050 roadmap** would enable an accurate calibration of the EU ETS and the ESR to achieve climate objectives.

RECOMMENDATION 1: Evaluating the **EU carbon budget** in relation to the 2018 IPCC 1.5°C report, based on the principles of capability, equality and responsibility.

RECOMMENDATION 2: Translating this carbon budget as well as the "net-zero" emissions target in **an updated 2050 EU roadmap**, jointly elaborated with representatives from all sectors through an openly carried out prospective exercise.

This calibration should be done as soon as possible before 2030, using all possible windows offered by the Governance regulation timeline and other review processes. In particular, the agreed review of the EU ETS directive in the context of each global stocktake under the Paris Agreement will be the opportunity to **increase the Linear Reduction Factor (LRF) of the EU ETS cap** to a value compatible with the updated EU 2050 roadmap.

RECOMMENDATION 4: Calibrating **EU policy instruments** (in particular the EU ETS and the ESR) according to the updated 2050 roadmap as soon as possible before 2030, using all possible windows offered by the Governance timeline and other review processes (i.e. for the EU ETS, building on the intended reviews in the light of the implementation of the Paris Agreement to appropriately increase the linear reduction factor of the cap).

The carbon budgets defined by the EU ETS and the ESR should be calibrated so as to limit the formation of surplus in order to achieve 2030 climate target

Ideally, both the total carbon budget and a reduction over time in GHG emissions should be binding. Policy instruments defining carbon budgets should be calibrated so as to **keep within bounds the formation of surplus**. Limiting to a certain extent the intertemporal carry-over of unused allowances (as will be done with AEAs from the first period of ESD which will not be transferrable to the 2021-2030 period) or adequately cancelling excess allowances may be options to get closer to the achievement of GHG emissions reduction targets through policy instruments defining carbon budgets.

The biannual assessment of EU progress towards meeting 2030 targets by the EU Commission proposed in the Governance Regulation is welcomed, as it will give visibility on how to **gradually bridge the gap to the achievement of 2030 climate targets**.

2. In the EU climate and energy framework, counterproductive policy interactions undermine the effectiveness of the EU ETS and the ESR

As shown in **Figure 3**, different legislations aim at achieving EU objectives: reducing GHG emissions, deploying renewable sources of energy, increasing energy efficiency. Other legislative texts than the EU ETS and the ESR aim at reducing GHG emissions in different sectors of the economy.

A. Historically, the increase in energy efficiency and the deployment of renewable energy sources contributed greatly to reducing GHG emissions across the EU

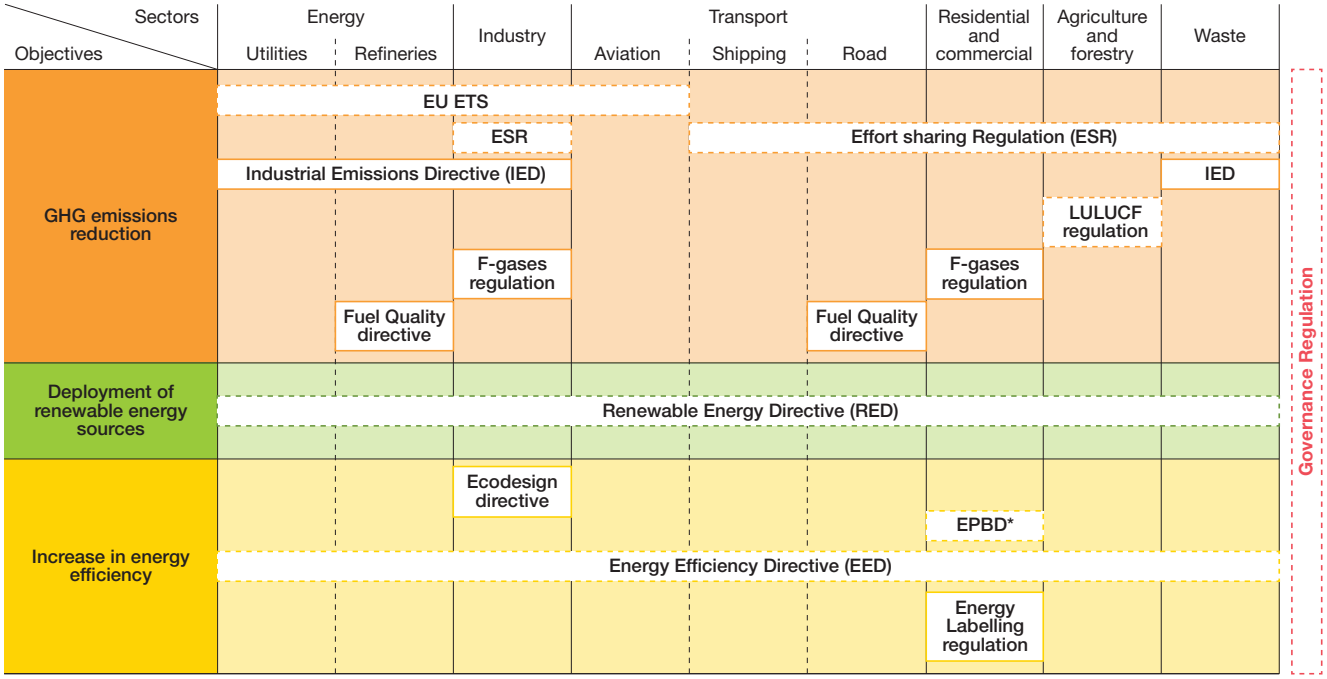
The decoupling of final energy demand and GDP was the most important driver in decreasing GHG emissions in the EU over 2005-2015

Between 2005 and 2015, GHG emissions in the EU decreased by around 900 $MtCO_2e$ - a decrease of 16.7%. A quantified analysis of the contribution of different drivers to the variations in GHG emissions[2] shows that the **decoupling of final energy demand and GDP** was the most important driver in decreasing GHG emissions in the EU over 2005-2015 and contributed to decrease GHG emissions by more than 950 $MtCO_2e$ in total (see **Figure 4**). The improvement in final energy intensity results from an increased efficiency of energy use, as well as structural changes in the EU economy. The **move towards less carbon-intensive fuels and improvements in the transformation efficiency of energy** also participated in the decrease in GHG emissions over 2005-2015, respectively - 339 and - 94 $MtCO_2e$.

2 *A decomposition analysis was carried out to quantify the contribution of different drivers to the variations in GHG emissions in the EU over the period 2005-2015. The Log Mean Divisia Index (LMDI) method was used. Four LMDI were carried out: one on total GHG emissions in the EU, and three sectoral LMDI, for the power sector, the iron and steel sector and the refining sector. More details on the methodology will be given in the full report to be published after this Climate brief.*

FIGURE 3. MAPPING EU LEGISLATIONS IN THE 2030 CLIMATE AND ENERGY POLICY FRAMEWORK

EU legislations in the 2030 climate and energy framework are strongly interrelated: several legislative texts apply to each sector and several texts aim to achieve each EU objective

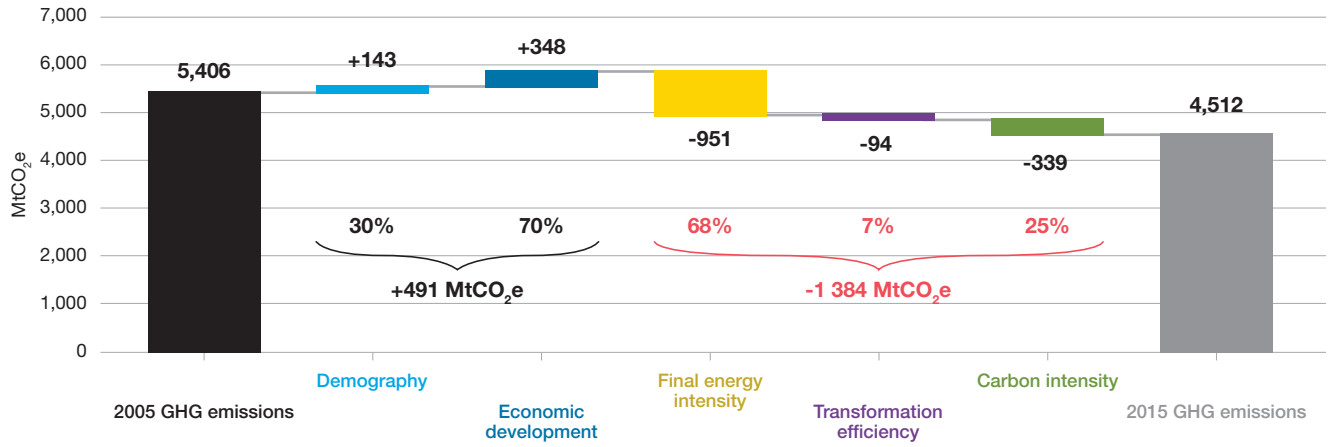


Interpretation of the graph: The different objectives in the left-end column are to be achieved through the legislative texts in the frame with the same color. Those legislative texts apply in the sectors in the respective columns.

Source: I4CE, 2018, based on Ecologic, 2014

FIGURE 4. DRIVERS OF GHG EMISSIONS VARIATIONS IN THE EU28 (2005-2015)

The decoupling of final energy demand and GDP was the most important driver of GHG emissions reductions in the EU over 2005-2015



Source: I4CE, 2017

On the contrary, an increase in the population and in the GDP/capita contributed to an increase in GHG emissions over 2005– 2015: respectively + 143 and + 348 $MtCO_2e$.

In order to better understand the contribution of the different drivers, in-depth sectoral analyses were carried out.

In the power sector, GHG emissions reductions mainly came from the deployment of renewables

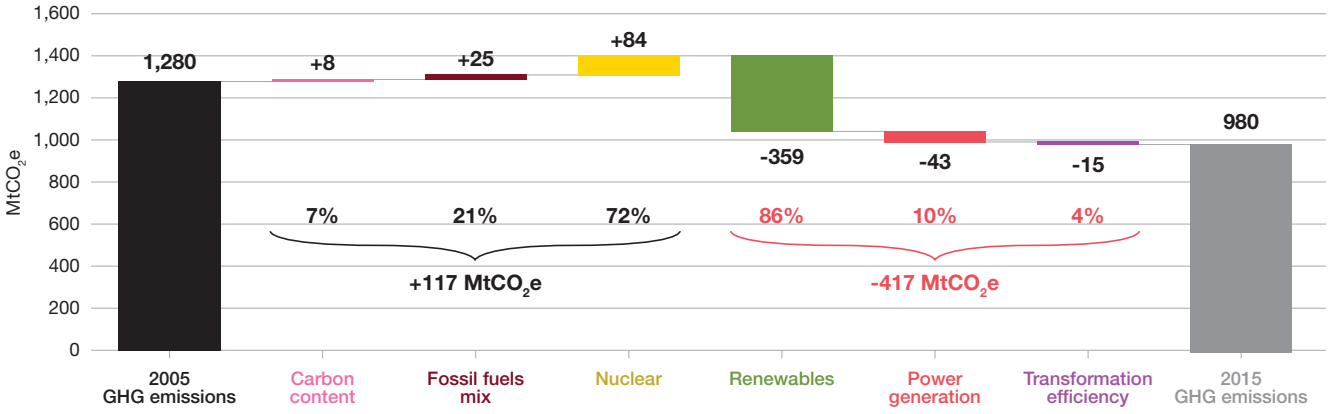
In the power sector, GHG emissions reductions over 2005-2015 mainly came from the **deployment of renewable sources of energy**, which contributed to decrease GHG emissions by 359 $MtCO_2e$ in total (see **Figure 5**). **Wind power** contributed the most to GHG emissions reductions, with an estimated 186 $MtCO_2e$ of cumulated emissions reductions over the period. **Solar power and power from biomass and biofuels** come next, with respectively 73 $MtCO_2e$ and 69 $MtCO_2e$ of emissions reductions. On the contrary, the decrease in the share of nuclear power over the period led to an increase in GHG emissions (+84 $MtCO_2e$).

The **decrease in power generation** was the second most important contributor to GHG emissions reductions (-43 $MtCO_2e$), followed by an **improvement in the fuel efficiency of thermal power plants** (-15 $MtCO_2e$). On the contrary, the **evolution of the carbon content of the different fossil fuels** slightly contributed to increasing GHG emissions (+8 $MtCO_2e$ over the period)[3].

3 *This variable does not reflect a switch from one fuel to the other (i.e. a coal-to-gas switch), but the variation in the average carbon content of each fuel, for example due to a variation in the relative shares of lignite and brown coal used for coal power generation.*

FIGURE 5. DRIVERS OF GHG EMISSIONS VARIATIONS FROM THE POWER SECTOR IN THE EU (2005-2015)

Over 2005-2015 GHG emissions reductions in the power sector mainly came from the deployment of renewable energy sources in the EU



Source: I4CE, 2017

As for the **evolution of the fossil fuels power mix**, while it contributed to reducing GHG emissions between 2005 and 2010, it was a net contributor to the increase in emissions from 2011 on. Indeed, during the period 2005-2010, the relative share of coal in power generation from fossil fuels decreased at the advantage of gas, and **the trend reversed from 2011 on**, with coal accounting in 2015 for two-thirds of power generation from fossil fuels. In total over 2005-2015, the **evolution of the fossil fuels mix was a net contributor to the increase in GHG emissions** (+25 $MtCO_2e$).

In both the iron and steel and the refining sectors, the decrease in demand and an increased energy efficiency greatly contributed to reducing GHG emissions

Equivalent analyses were carried out in the iron and steel sector and in the refining sector. In both cases, the **decrease in the demand** – respectively for iron and steel and for refined products- greatly contributed to the decrease in GHG emissions. In the iron and steel sector, **energy efficiency** was the most important driver in decreasing GHG emissions over 2005-2015, followed by the **relocation of production** outside the EU. In the refining sector, an **increased energy efficiency** also contributed to reducing GHG emissions, but this decline was counterbalanced by an increase in GHG emissions coming from the **growing complexity of refined products**[4].

4 *More details on the analysis will be given in the full report.*

B. Energy efficiency and renewable energy policies are expected to continue to significantly contribute to reducing GHG emissions in the post-2020 period

In total over 2021-2030, **energy efficiency and renewable energy policies are estimated to contribute to a reduction of 2.2 $GtCO_2e$** in GHG emissions covered by the EU ETS (see **Figure 6**)[5], under the assumption that specific policies are implemented to achieve 2030 targets for energy efficiency and renewable sources of energy. Over the EU ETS Phase IV, it is equivalent to 1.5 years of allowances– around 15% of the cumulated cap[6].

In sectors covered by the ESR, **energy efficiency and renewable energy policies are estimated to contribute to a reduction of 2.1 $GtCO_2e$** in GHG emissions over 2021-2030, which represents around 10% of cumulated AEAs[7].

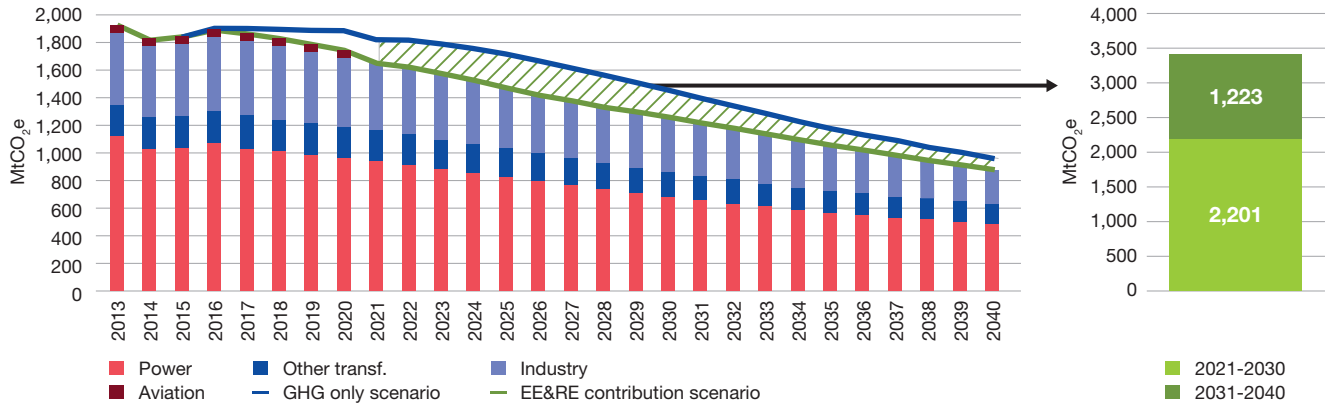
5 *The contribution of energy efficiency policies and renewable energy policies on GHG emissions covered by the EU ETS and by the ESR is estimated as the difference in GHG emissions between two scenarios: the GHG only scenario, in which the only EU policy instruments are the EU ETS and the ESR and an intermediate scenario ("EE&RE contribution scenario") in which the EU ETS and the ESR function as if they were the only policy instruments but in which EU targets for renewable energy and energy efficiency are achieved.*

6 *The contribution of renewable energy and energy efficiency policies to GHG emissions reductions represents almost 95% of reductions required from ETS sectors over its Phase IV, calculated as the difference between cumulated GHG emissions in the "No Policy" scenario -a counterfactual scenario in which no climate and energy policies are implemented – and the cumulated EU ETS cap over 2021-2030.*

7 *The contribution of renewable energy and energy efficiency policies to GHG emissions reductions represents more than 2.5 times the amount of reductions required from non-ETS sectors over 2021-2030, calculated as the difference between cumulated GHG emissions in the "No Policy" scenario -a counterfactual scenario in which no climate and energy policies are implemented – and the cumulated AEAs over 2021-2030.*

FIGURE 6. GHG EMISSIONS COVERED BY THE EU ETS (LEFT) AND CONTRIBUTION OF ENERGY EFFICIENCY AND RENEWABLE ENERGY POLICIES TO GHG EMISSIONS REDUCTIONS IN ETS-SECTORS OVER 2021-2040 (RIGHT)

In total over 2021- 2030, energy efficiency and renewable energy policies are estimated to contribute to a reduction of 2.2 $GtCO_2e$ in GHG emissions covered by the EU ETS



Source: Enerdata, 2017

BOX 1. THE ACHIEVEMENT OF EACH EU 2030 CLIMATE AND ENERGY TARGET CONTRIBUTES TO THE ACHIEVEMENT OF OTHERS

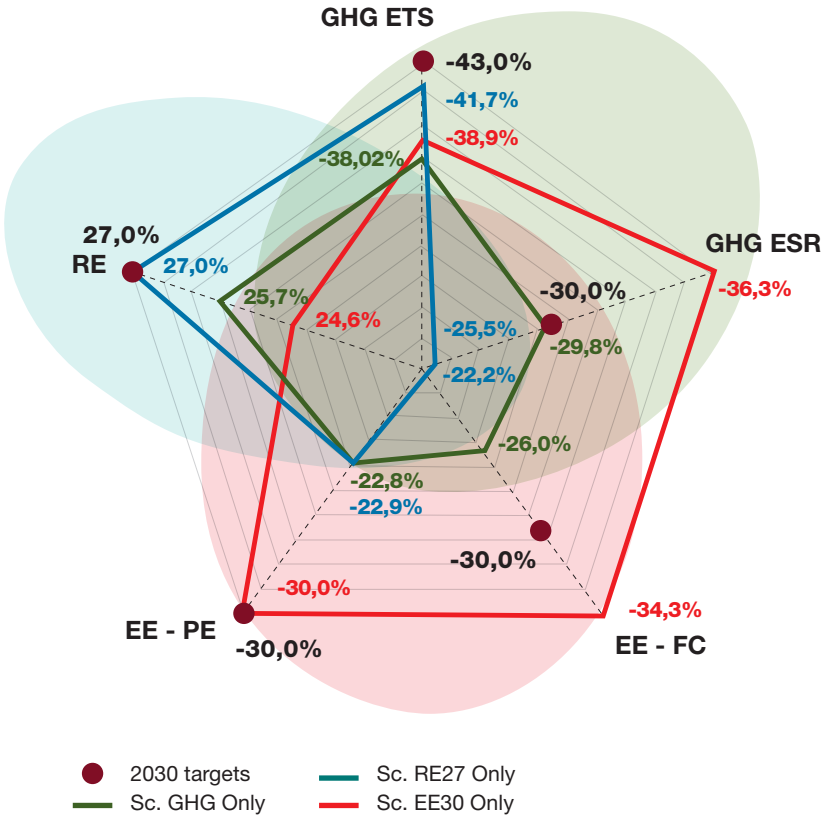
Understanding the interactions between EU 2030 climate and energy policies requires assessing the **contribution of the achievement of one target to the achievement of others**. The modelling of three theoretical scenarios with POLES[8] is used to evaluate the contribution of targets and policies to the achievement of 2030 climate and energy targets:

- **"GHG only"**: in this counterfactual scenario, there are no EU targets for the deployment of renewables nor for energy efficiency. Only the EU ETS and the Effort Sharing Regulation are implemented.
- **"RE27 only"**: in this counterfactual scenario, there are no EU targets for energy efficiency and the EU ETS and the Effort Sharing Regulation are not implemented. It is assumed that specific policies are implemented to achieve a share of 27% of renewable energy sources in gross final consumption by 2030.
- **"EE30 only"**: in this counterfactual scenario, there are no EU targets for renewable energy sources and the EU ETS and the Effort Sharing Regulation are not implemented. It is assumed that specific policies are implemented to achieve a target of 30% of energy efficiency by 2030 (for both primary and final energy consumption).

8 *For more details on POLES model, please consult Enerdata's website.*

FIGURE 7. ACHIEVEMENT OF EU 2030 TARGETS IN DIFFERENT SCENARIOS

Policies implemented to achieve an EU target contribute to the achievement of the others



Legend:

GHG ETS	Reduction in GHG emissions from ETS sectors (compared to 2005 levels)
GHG ESR	Reduction in GHG emissions from non-ETS sectors (compared to 2005 levels)
RE	Share of renewable energy in gross final consumtion
EE - FC	Decrease in final energy consumption compared to 2007 Baseline scenario
EE - PE	Decrease in primary energy consumption compared to 2007 Baseline scenario

Source: Enerdata, 2017

- The achievement of the 2030 renewable energy target strongly reduces GHG emissions in ETS sectors and to a lesser extent in non-ETS sectors. As for the energy efficiency target, it strongly reduces GHG emissions in non-ETS sectors, and to a lesser extent in ETS sectors. Its achievement in terms of primary energy leads to the overachievement of the target in terms of final energy consumption.
- Conversely, the EU ETS and the ESR by themselves contribute to the achievement of 2030 renewable energy and energy efficiency targets. By construction, in the "GHG only" scenario, the EU ETS and the ESR are complied with (i.e. carbon budgets defined by European texts are respected). However, GHG emissions reduction targets for 2030 in ETS and non-ETS sectors are not achieved due to the design of the EU ETS and the ESR: for the EU ETS, the possibility to use the surplus of allowances and the release of additional allowances from the MSR on the market, and for the ESR, the possibility to carry-over unused AEAs throughout the 2021-2030 period (see **section 1**).
- Additionally, the achievement of the renewable energy target contributes to the energy efficiency target in terms of primary energy. As for the achievement of the energy efficiency target, it contributes to the renewable energy target, as it decreases the absolute production of renewable energy required to achieve the 2030 target expressed as a share of gross final energy consumption.

Note: The central point of the figure corresponds to the achievement of the different 2030 targets in the « No Policy » scenario, a counterfactual scenario in which no climate and energy policies are implemented (-27% for ETS GHG emissions, -25% for ESR GHG emissions, 23% for renewable energy sources, -22% for final energy consumption, and -19% for primary energy consumption).

C. These policy interactions undermine the effectiveness of the EU ETS and the ESR

A two-fold role can be expected from the EU ETS: **driving GHG emissions reductions** through its carbon price signal and **guaranteeing the achievement of climate targets** by setting a cap on GHG emissions.

Historically, the EU ETS had a minor impact on GHG emissions reductions - at least in the power sector

The ex-post impact of the EU ETS on GHG emissions reductions is difficult to assess as many factors come into play – e.g. the carbon price signal, the anticipations of stakeholders… In our quantified analysis of the historical contribution of different drivers to the variations in GHG emissions, we only evaluated the impact of the EU ETS on GHG emissions reductions in the power sector. It was estimated as **GHG emissions reductions coming from a coal-to-gas switch** in the years in which the price of EU allowances (EUAs) was within the range of the coal-to-gas switching price.

Given the relative coal and gas prices, and taking into account a large range of possible thermal efficiencies for coal and gas power plants, **the price of EUAs could only trigger a coal-to-gas switch in the 2005-2011 period** (see **Figure 8**). Consequently, only the reductions in GHG emissions coming from the evolution of the fossil fuels mix in this period can be attributed to the carbon price signal induced by the EU ETS: around 50 $MtCO_2e$, which were more than offset by additional GHG emissions stemming from a gas-to-coal switch after 2011.

The depressed carbon price signal on the EU ETS is partly due to counteractive interactions with renewable energy and energy efficiency policies, which contributed to create an imbalance between supply and demand.

Because of counteractive interactions, the EU ETS is not expected to drive GHG emissions reductions in the post-2020 period

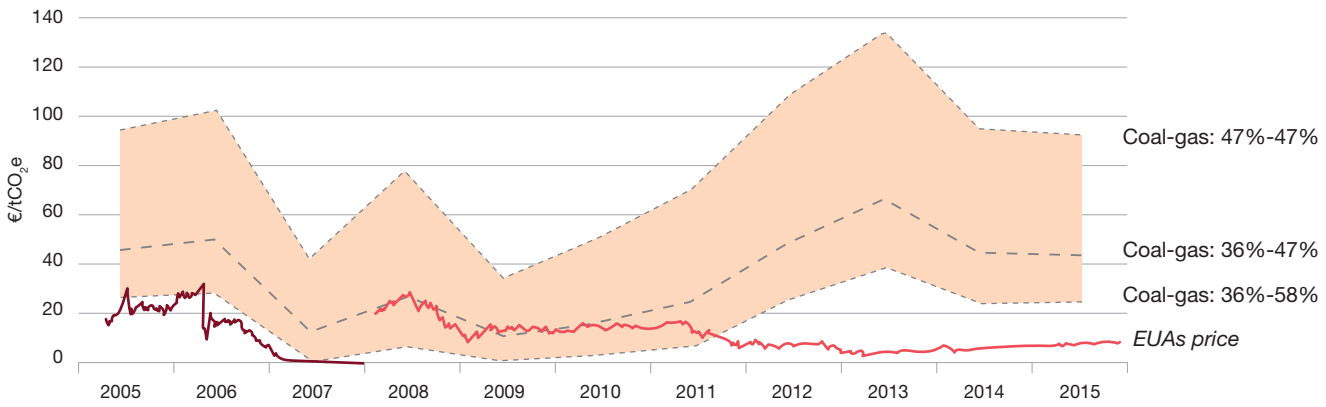
Looking ahead to the post-2020 period, and taking into account the design parameters of the EU ETS in its Phase IV[9], **GHG emissions reductions coming from renewable energy and energy efficiency policies will be sufficient to respect the EU ETS cap in its Phase IV** – under the assumption that specific policies are implemented to achieve 2030 targets.

As GHG emissions reductions coming from other policies will be sufficient to respect the EU ETS cap, **its carbon price signal will be depressed** and it will not be able to drive low-carbon investments. Even the cheapest abatement options – such as switching from coal to gas in power generation for example – will be disregarded.

9 *A 2017 Baseline scenario is modelled with POLES, representing the deal on the EU ETS reform agreed on in November 2017 and the Commission's proposals from November 2016 on 2030 targets for renewable energy and energy efficiency.*

FIGURE 8. CARBON SWITCHING PRICE FOR DIFFERENT COAL AND GAS GENERATION EFFICIENCY IN THE EU28 IN COMPARISON WITH THE EU ETS PRICE

From 2011 on, the price of EUAs has been well below the price level which would have triggered a coal-to-gas switch in power generation



Source: I4CE, from BP 2017 (Gas: Heren NBP Index; Coal: IHS Northwest Europe); and from ICE futures Europe (forward dec 2007 for EUAs price phase I and spot price for phases II & III)

Counterproductive interactions continue to jeopardize the achievement of EU ETS climate targets by 2030

As described in section 1.C, compliance with the EU ETS does not guarantee the achievement of 2020 and 2030 climate targets. Counteractive interactions, as they contribute to the formation of the surplus of allowances, emphasize this effect.

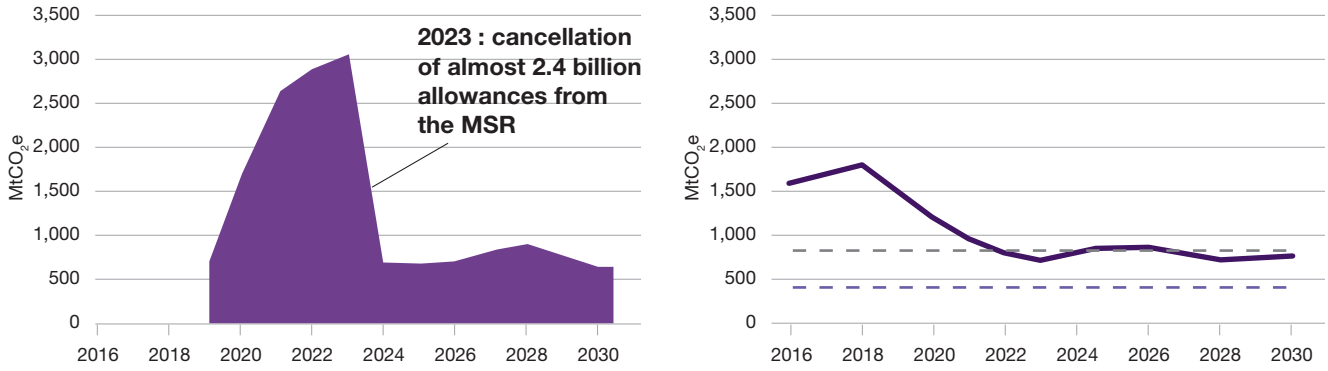
In the post-2020 period, we estimate that **the MSR will not be able to mitigate the effect of other policies on the EU ETS while absorbing the historical surplus** (see **Figure 9**). Because of this surplus, the achievement of the 2030 climate target will not be guaranteed.

Counterproductive interactions reduce the incentive for additional GHG emissions reductions in non-ETS sectors

The situation is different for the ESR, but in the same way as GHG emissions reductions from energy efficiency policies and renewable energy policies will lower the price of EUAs and the incentive for additional emission reductions, they will **reduce the incentive for GHG emission reductions in non-ETS sectors and some abatement options may be disregarded**. Furthermore, the formation of a surplus of AEAs will **jeopardize the achievement of 2030 climate targets**.

FIGURE 9. VOLUME OF THE MSR (LEFT) AND EVOLUTION OF THE SURPLUS (RIGHT) IN THE "2017 BASELINE" SCENARIO BY 2030

In spite of the doubling of its withdrawal rate until 2023, the MSR is not able to mitigate the effect of other policies on the EU ETS during its Phase IV while absorbing the historical surplus of EUAs



Notes: The "2017 Baseline" scenario represents the deal on the EU ETS reform agreed on in November 2017 and the Commission's proposals from November 2016 on 2030 targets for renewable energy and energy efficiency.

Source: Enerdata, 2017

3. An enhanced governance approach to the EU climate and energy framework is required

A. Assessing the impact of policies on others is a necessary step

In the current climate and energy policies package, only the energy efficiency directive includes the requirement to assess its impact on other policies (see **Figure 10**).

The proposed regulation on the Governance of the Energy Union, as **it aims at ensuring that the objectives of the Energy Union are met while ensuring policy coherency**, is a first interesting step. It would require in particular the assessment of interactions between policies and measures at the level of Member States. The EU Parliament is in favor of additionally requesting the assessment of interactions with Union climate policies and measures – in particular the EU ETS. However, the text in discussion today still **lacks concrete provisions to better align the policy package**.

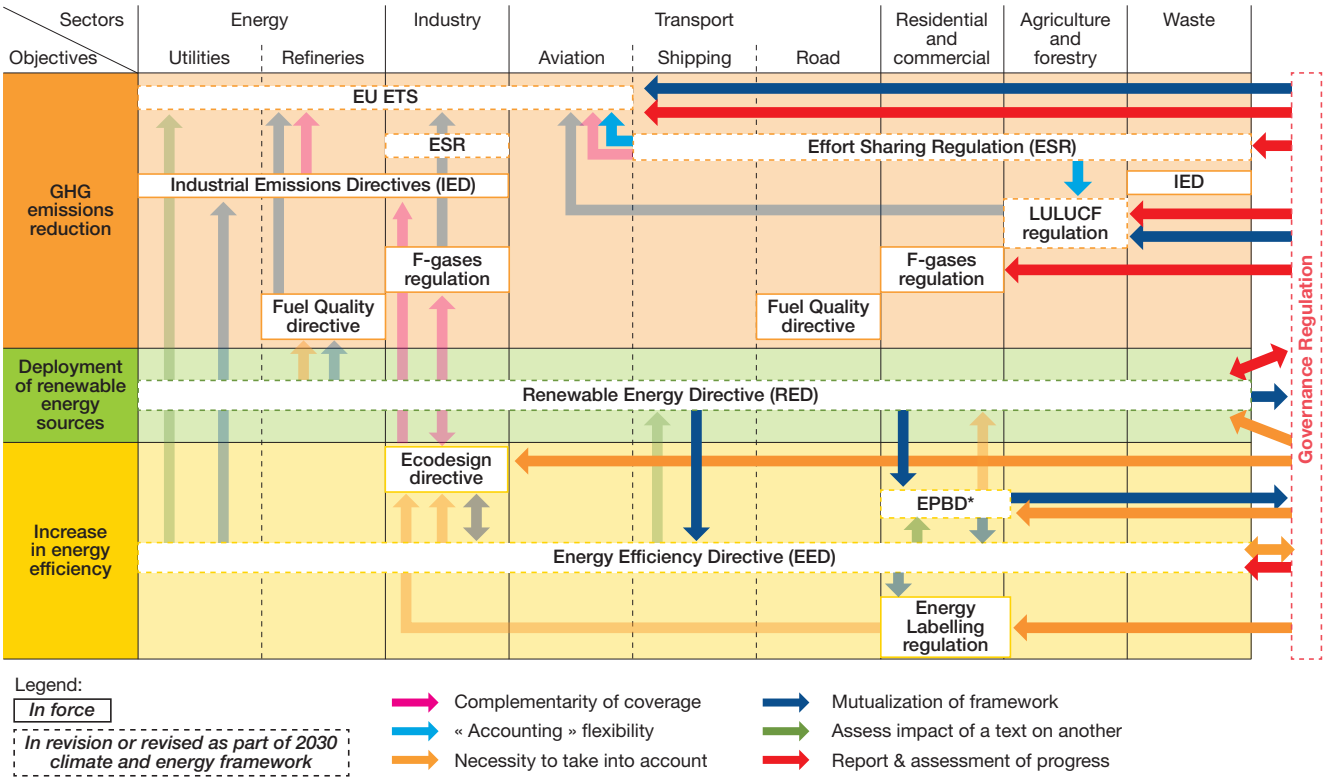
It would be necessary to **carry out an ex-ante assessment of the interactions between energy and climate policies – at the national and EU levels, as well as annual ex-post assessments**. Provisions to adapt policies accordingly should be introduced – directly at the EU level and through recommendations by the Commission for an adaptation of policies in the Member States' Integrated National Energy and Climate Plans (INECPs)[10].

10 According to the proposed regulation for the Governance of the Energy Union, Member States will be responsible for drafting ten-year Integrated National Energy and Climate Plans (INECPs) describing their targets as well as policies and measures aimed at achieving these targets.

RECOMMENDATION 9: Carrying out an **ex-ante assessment** of the interactions between energy and climate policies – at the national and EU levels, as well as **annual ex-post assessments.**

FIGURE 10. INTERACTIONS BETWEEN THE LEGISLATIVE TEXTS OF THE CLIMATE AND ENERGY FRAMEWORK

In the current climate and energy framework, only the energy efficiency directive requires the assessment of its impact on other policies. The proposed regulation on the Governance of the Energy Union is a first step towards a more coherent policy package but it does not include requirements to assess the impact of policies on one another at EU level



** EPBD: Energy performance of buildings directive.*

Interpretation of the graph: The arrows represent the interactions between the different legislative texts of the climate and energy framework. The colors represent the nature of the interactions. Nontransparent arrows represent interactions which were introduced with the revision of the 2030 climate and energy framework.

Source: I4CE, 2018, based on a visual concept by Ecologic, 2014, and on the legislative texts/proposals of the climate and energy framework

B. Aligning EU climate and energy policies in the 2030 policy framework enables to mitigate counteractive interactions

To mitigate counteractive interactions, **an "alignment" of the EU ETS and of the ESR to account for GHG emissions reductions coming from other policies is proposed**: the idea is to remove from the EU ETS cap and from ESR AEAs the contribution of other policies to GHG emissions reductions[11].

The alignment of the EU ETS cap within the EU 2030 energy and climate framework restores its effectiveness: the surplus is quickly resorbed and the EU ETS becomes a driver of abatement

On the one hand, with the alignment of the EU ETS cap, **the surplus of EUAs is very quickly resorbed** and goes below the lower threshold of the MSR from 2023. On the other hand, the carbon price signal induced by the "Aligned" EU ETS leads to **a deployment of renewable energy sources sufficient to achieve EU 2030 target**[12]. Furthermore, it leads to an **immediate switch to less carbon-intensive energy sources** and for example, it further drives down the share of coal in power generation. In 2030, GHG emissions in ETS sectors are 7% lower than in the situation without the "alignment" of the EU ETS cap, which corresponds to a reduction of 47% compared to 2005 levels.

In practice, this "alignment" of the EU ETS could be achieved through **provisions in the Governance Regulation to adapt policies directly at the EU level**. The reviews of the MSR in 2021 and 2026 will also be the opportunity to adapt the EU ETS to the effect of other policies on GHG emissions.

The alignment of AEAs incentivizes additional GHG emissions reductions in sectors covered by the ESR

Withdrawing from AEAs the contribution of energy efficiency and renewable energy policies to GHG emission reduction in non-ETS sectors makes the ESR stringent from 2021[13]. This stringency would incentivize Member States to **further reduce GHG emission reductions in non-ETS sectors**. In 2030, GHG emissions in non-ETS sectors are 3% lower than in the situation without the "alignment" of AEAs, which corresponds to a reduction of 37% compared to 2005 levels.

RECOMMENDATION 10: Introducing provisions to adapt policies accordingly as soon as possible – directly at EU level and through recommendations by the EU Commission for an adaptation of policies in the INECPs.

C. Aligning the EU 2030 policy framework to an increased long-term ambition sets the EU on a pathway more compatible with the goals of the Paris Agreement

Increasing EU long-term ambition in line with the objective of the Paris Agreement

EU current climate and energy policies and targets fall short of its commitments under the Paris Agreement (see **Figure 11**). On the one hand, the EU set itself an objective of reducing GHG emissions by 80-95% in 2050 compared to 1990 levels. This objective was set in 2009, before the Paris Agreement and its objective of limiting the global average temperature increase to well below 2°C above pre-industrial levels. EU long-term ambition should be **reviewed accordingly and aim at net-zero emissions by 2050**.

Aligning the EU 2030 climate and energy framework to its increased long-term ambition

On the other hand, GHG emissions trends defined by the **2030 climate and energy framework as currently negotiated fall short of the EU 2050 objective**. Efforts would need to increase after 2030 to even enable the achievement of a reduction in GHG emissions of 80% in 2050 (see **Figure 12**). To have a sustainable decarbonisation pathway, an **anticipation of the suitable transformation of the energy system** to achieve drastic GHG emissions reductions in the long-term is required, as well as a **timely deployment of low-carbon solutions**[14].

An update of the 2050 roadmap consistently with the EU carbon budget and the "net-zero" emissions target, as described in section 1.B, would **inform the adequate adaptation of climate and energy policies, at the EU-level and at the national level**.

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11 An additional scenario is modelled with POLES, the Aligned scenario, in which the annual ex-ante estimated contribution of energy efficiency and renewable energy policies is removed from the EU ETS cap and from Member States' AEAs in the period 2021-2030. In total, 2.2 billion allowances are cancelled from the EU ETS and cumulative AEAs are reduced by 2.1 $GtCO_2e$. In reality, this assessment should be carried out dynamically to evaluate the effective impact of renewable energy and energy efficiency policies, as well as other policies (i.e. emission standards, coal phase out).

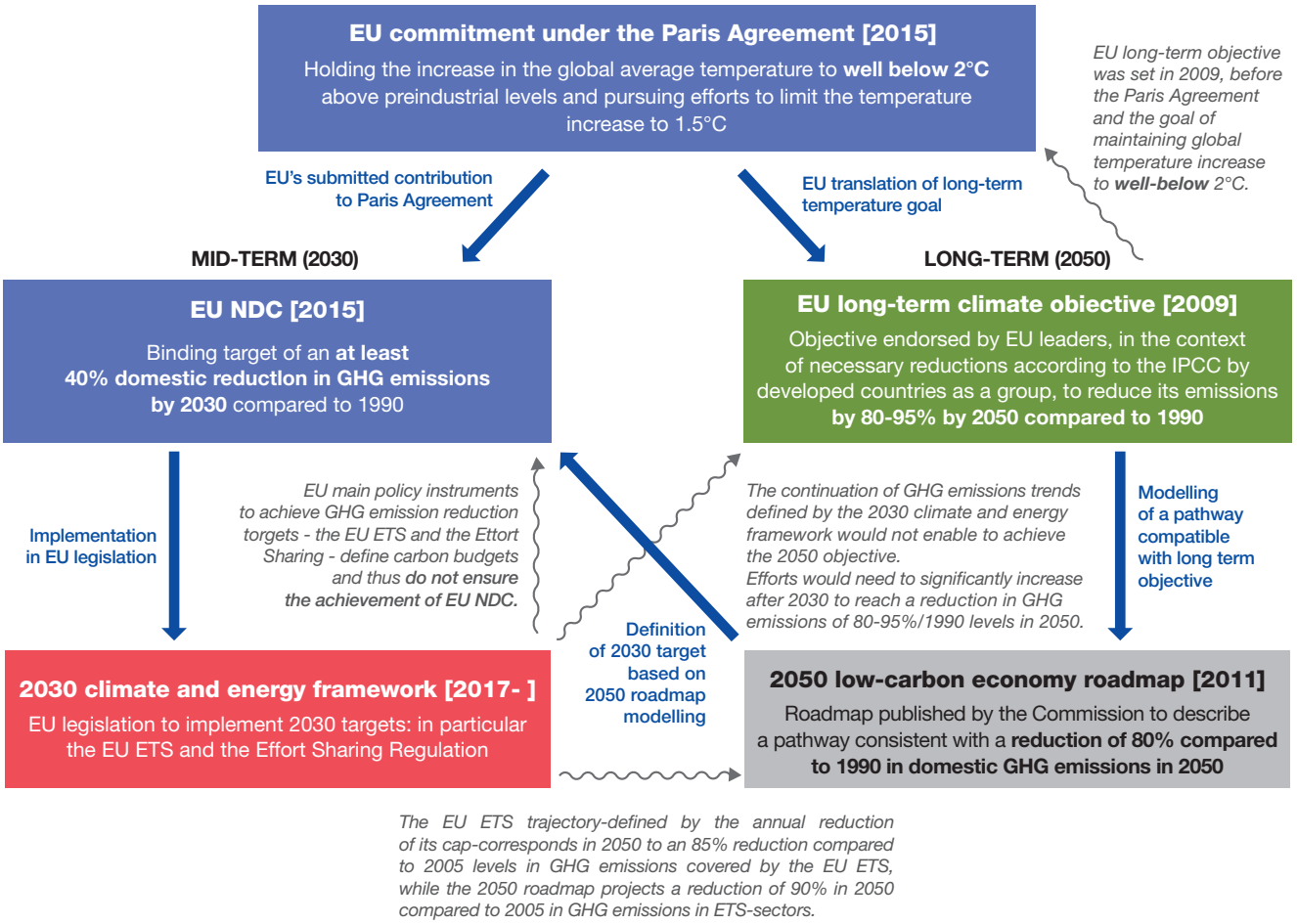
12 One of the outcome of POLES modelling is the carbon value, which is not the EU ETS market price. It represents the cost of GHG emissions reductions required to respect the constraint set by the EU ETS considering a sliding 5-years carbon budget. While in the 2017 Baseline scenario, the carbon value stays at 0 until the end of Phase IV – revealing that GHG emissions reductions coming from other policies are sufficient to respect the constraint set by the EU ETS, in the Aligned scenario, the carbon value increases from 2018 to reach 44€/tCO_2e in 2021.

13 It is assumed that the surplus accumulated on the ESD in the period 2013-2020 hides the upcoming stringency of the ESR.

*14 An "AmbitionPlus" scenario is modelled with POLES, in which 2030 targets for renewable energy and energy efficiency are increased: respectively 35% and 40%. In this scenario, renewable energy and energy efficiency solutions are quickly scaled up, which sets the EU on a pathway more compatible with long-term climate ambition (see **Figure 12**). In such a configuration, counteractive interactions with the EU ETS and the ESR would need to be mitigated to avoid a lock-in of carbon-intensive technologies, as described in section 3.B.*

FIGURE 11. EU CLIMATE AND ENERGY POLICIES BROUGHT INTO COMPARISON WITH ITS CLIMATE COMMITMENT UNDER THE PARIS AGREEMENT

EU current climate and energy policies and targets fall short of its commitments under the Paris Agreement: currently negotiated climate and energy policies are not sufficient to meet EU long-term ambition, which itself is not consistent with the global temperature goal of the Paris Agreement



Source: I4CE, 2018

In particular, the roadmap would enable setting **appropriate long-term targets for the EU ETS and the ESR**, as well as **intermediate 2040 targets**, which would give more visibility to stakeholders while making the long-term target more tangible. This roadmap could also be used to **elaborate a corridor of trajectories for the social value of carbon in the EU**, which economic stakeholders could use as a reference, and on which public policies could lean.

RECOMMENDATION 3: Setting **appropriate and realistic 2050 targets for sectors covered by the EU ETS and the ESR** with intermediate 2040 targets.

RECOMMENDATION 5: Calculating a corridor of social values of carbon in the EU until 2050, aligned with long-term climate ambition, which economic stakeholders could use as a reference and on which could lean public policies.

At the national level, the Member States' INECPs and their long-term low carbon strategies- as required by the proposed regulation on the Governance of the Energy Union - should also be **consistent with the updated EU 2050 roadmap**.

Finally, the policy framework should allow a **periodic ratcheting up of ambition** in line with the stocktakes of the Paris Agreement.

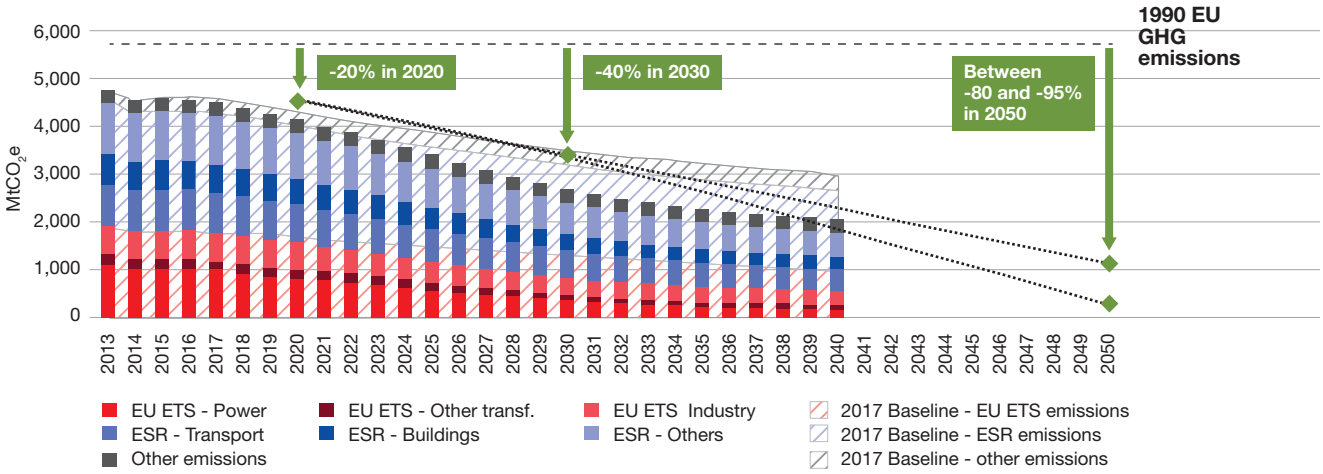
RECOMMENDATION 7: Calling for an alignment of **Member States' long term low-carbon strategies to the 2050 low-carbon roadmap.**

RECOMMENDATION 8: Making sure Member States' 10-year **integrated national climate and energy plans (INECPs) are aligned to their long-term low-carbon strategy and to the 2050 EU roadmap.**

RECOMMENDATION 6: Assessing regularly EU progress towards meeting its targets and introducing provisions to allow a **periodic ratcheting up of ambition** in line with the stocktakes of the Paris Agreement.

FIGURE 12. GHG EMISSIONS IN THE EU PARALLELED WITH EU CLIMATE TARGETS PATHWAY

GHG emissions trends defined by the 2030 climate and energy framework as currently negotiated fall short of the EU 2050 objective. A timely deployment of low-carbon options is necessary to set the EU on a pathway more compatible with long-term ambition



Notes: The "2017 Baseline" scenario represents the deal on the EU ETS reform agreed on in November 2017 and the Commission's proposals from November 2016 on 2030 targets for renewable energy and energy efficiency. In the "AmbitionPlus" scenario, 2030 targets for renewable energy and energy efficiency are increased: respectively 35% and 40%.

Source: I4CE and Enerdata, 2018, with data from the European Environment Agency

Conclusion and policy recommendations

The negotiations on the EU 2030 climate and energy framework, and in particular on the Governance of the Energy Union, are the opportunity to **implement in the EU a coherent and ambitious policy mix to fulfill its commitment under the Paris Agreement**.

The legislative texts as currently negotiated lack adequate provisions to mitigate **counterproductive interactions** which undermine the effectiveness of the 2030 climate and energy framework and jeopardize the achievement of climate targets. Furthermore, they fall short of the EU long-term ambition, which is itself insufficient to respect its commitment under the Paris Agreement.

A **two-fold alignment of the policy package is thus required**: within the 2030 climate and energy framework to mitigate counteractive policy interactions and with an increased long-term ambition.

10 POLICY RECOMMENDATIONS TO MAKE THE EU CLIMATE AND ENERGY POLICY FRAMEWORK CONSISTENT WITH THE PARIS AGREEMENT BEFORE 2030

STEP 1: Setting the EU long-term climate targets right

1. Evaluating the **EU carbon budget** in relation to the 2018 IPCC 1.5°C report, based on the principles of capability, equality and responsibility.
2. Translating this carbon budget as well as the "net-zero" emissions target in an **updated 2050 EU roadmap**, jointly elaborated with representatives from all sectors through an openly carried out prospective exercise.
3. Setting **appropriate and realistic 2050 targets** for sectors covered by the EU ETS and the ESR with **intermediate 2040 targets.**

STEP 2: Defining a climate and energy policy framework aligned with long-term climate targets

At the EU level:

4. **Calibrating EU policy instruments** (in particular the EU ETS and the ESR) according to the updated 2050 roadmap as soon as possible before 2030, using all possible windows offered by the Governance timeline and other review processes (i.e. for the EU ETS, building on the intended reviews in the light of the implementation of the Paris Agreement to appropriately increase the linear reduction factor of the cap).
5. Calculating a corridor of **social values of carbon in the EU** until 2050, aligned with long-term climate ambition, which economic stakeholders could use as a reference and on which could lean public policies.
6. Assessing regularly EU progress towards meeting its targets and introducing provisions to allow a **periodic ratcheting up of ambition** in line with the stocktakes of the Paris Agreement.

At the national level:

7. Calling for an alignment of Member States' **long term low-carbon strategies** to the 2050 low-carbon roadmap.
8. Making sure Member States' **10-year integrated national climate and energy plans (INECPs) are aligned to their long-term low-carbon strategy and to the 2050 EU roadmap.**

STEP 3: Ensuring the coherency of the different pieces of the climate and energy policy framework

9. Carrying out **an ex-ante assessment** of the interactions between energy and climate policies – at the **national and EU levels, as well as annual ex-post assessments.**
10. **Introducing provisions to adapt policies accordingly** as soon as possible – directly at EU level and through recommendations by the EU Commission for an adaptation of policies in the INECPs.

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