BRIEFING - JUNE 2024

National climate targets off track:

Six years left to course correct and avoid penalties

Summary

By June 30 2024, EU Member States must submit their final National Energy and Climate Plans (NECPs) to the European Commission. NECPs lay out the measures that countries designed to comply with their national climate targets set by the Effort Sharing Regulation (ESR). The ESR accounts for over 60% of EU emissions, covering GHG emissions in domestic transport, buildings, waste, small industry, and agriculture. If national targets are met, the ESR will reduce emissions in these sectors at EU-level by 40% by 2030 (vs. 2005).

New T&E analysis however reveals that **the EU as a whole is 4.5 percentage points off track to achieve that -40% goal.** 12 countries are so far off track that, without additional policies, it will be impossible to reach their target. 7 more countries are at diverging levels of risk of being non-compliant, meaning any backtracking of policies - or even a very cold winter pushing higher energy consumption - could make them fall in the red zone.

Typically, countries missing their targets can purchase carbon credits from those that do meet them. But if the widespread level of planned failure - primarily driven by the enormous deficits from Germany and Italy - persists, it would lead to a scarcity of credits. If NECPs are not improved with additional measures, some countries will be left with no credits to buy and at risk of lawsuits. **T&E warns of a bidding war for compliance credits between countries in 2030, which could drive up credit prices**.

Germany and Italy are on track to accumulate such a substantial deficit (246 $MtCO_2$-eq) that they alone would eat up all the available surplus in the EU (180 $MtCO_2$-eq). That would leave the other 10 'not compliant' countries with no means to comply with the ESR. It would also result in **high costs for German and Italian taxpayers**. Assuming credits will be traded at the market price of the ETS, which is projected to be €129 in 2030, these countries **might need to disburse €16.2 and €15.5 billion respectively to other EU Member States in 2030**.

Luckily, there are **still six years left for Member States and the Commission to course correct**. They should act now to:

1. **Include new policies into the final NECPs.** Rather than transferring billions to their neighbours for their carbon debt, countries should spend resources on new policies that improve the life of their own citizens, such as insulating houses.
2. **Set up an EU-level gap closing action group** where the Commission proposes new EU-level policies for the ESR sectors - such as electrification targets for large corporate car, van and truck fleets - and laggards are given guidance.
3. **Create an EU-level lending facility, funded with frontloaded ETS2 revenues**, allowing Member States to borrow against their future revenues and implement new policies.

4. Large underachievers should **start negotiating deals with other countries now**, ensuring timely roll-out of additional policies both at home and elsewhere in the EU.

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1. Carbon credit trading under the Effort Sharing Regulation

The ESR sets binding national climate targets for Member States' GHG emissions in domestic transport (excluding aviation), buildings, small industry, waste and agriculture. These so-called non-ETS sectors are responsible for more than 60% of EU emissions.[1] That makes the ESR one of the three central pieces of the EU's climate policy architecture.[2] Targets for 2030 were initially adopted in 2018, with an aggregated EU goal to reduce emissions in ESR sectors by 29% (compared to 2005). In 2023, the ESR's 2030 targets were revised under the Green Deal. If all countries do their agreed share, the ESR should now lead to a 40% reduction at the EU-level (vs. 2005) across road transport, buildings, small industry, waste and agriculture.

Apart from the EU-wide target, the ESR also sets national-level targets for each Member State. This is based on GDP (Gross Domestic Product) per capita and where it is most cost-effective in the Union to reduce emissions. Member States have to comply with both a headline national 2030 target as well as annual emissions limits for each year in between 2021 and 2030 (so-called Annual Emissions Allocations or AEAs, each corresponding to a tonne of CO_2 equivalent). AEAs are calculated on the basis of a linear trajectory, with a number of adjustments. The ESR recognises that it may be difficult for all Member States to achieve their national targets each and every year. It therefore allows a number of flexibilities within a

[1] European Environmental Agency.
[2] Alongside the Emission Trading System (ETS) and the Regulation on land use, land use change and forestry (LULUCF).

country, as well as for Member States to trade deficits and surpluses amongst each other. The price of traded carbon credits can be determined bilaterally between the buyer and the seller.

Member States have to describe how they will meet their targets in their National Energy and Climate Plan (NECP). Draft updated NECPs were due to the Commission by June 2023 - even if some countries failed to meet the deadline - while final versions must be sent by the end of June 2024. These must take into account the Commission's country-specific recommendations.

This briefing examines the alarming level of planned undercompliance with national ESR targets. T&E finds the compliance gaps to the national 2030 climate targets to be so large that not enough carbon credits will be available for all countries to close their gap. Especially the enormous need for credits from Germany and Italy risks leaving the other underachieving countries with no opportunity to comply with the ESR. This will drive up the price of credits for sale, forcing Member States to divert financial resources away from policies benefiting their own citizens such as housing insulation, public transport, etc.

To prevent this outcome and secure the EU's 2030 objective, T&E calls on Member States to substantially improve their final NECPs, even if it requires taking a few more months to finalise them.

2. EU on track to miss 2030 ESR climate target by 4.5%

Based on the draft updated NECPs submitted in June 2023, the European Commission calculated that the measures in countries' plans would deliver only a 33.8% decrease in GHG emissions in the ESR sectors by 2030 (vs. 2005), leaving a troubling 6.2% gap with the -40% Green Deal agreed EU-wide target.[3] In its analysis, the Commission however did not evaluate the size of the overall deficit and the consequent impact on the trading of carbon credits between Member States.

With the deadline for the final NECPs' submission now approaching rapidly, T&E replicated the Commission's calculations and found that, one year later, Member States are still far from having sufficient plans in place for full ESR compliance. Figure 1 shows that, when aggregating 2030 projections[4], emissions would decrease by only 35.5% in 2030 (vs. 2005), still 4.5 percentage points short of the -40% EU target. T&E's main scenario (see Infobox 1 below) estimates that the EU is projected to exceed its overall emissions budget allowed under the ESR trajectory by 194 million tonnes of CO2 equivalent.

[3] European Commission (2023). EU wide assessment of the draft updated NECPs. Link.
[4] Where available, 2030 emissions projections of ESR sectors as compiled in the Commission's analysis of submitted draft NECPs were used in the analysis. Where not available, personal communication with sources close to the government or March 2023 WAM (with additional measures) and WEM (with existing measures) projections were used. For Germany, Sweden and Ireland, more recent projections published by national energy and environment agencies were deemed to supersede the projections from the draft NECPs. See Figure 2 for sources.

The reason for the slight improvement compared to the Commission's assessment from December 2023 is largely due to the latest projections from Germany's Environment Agency (UBA), which show a decrease in the country's deficit for 2030. Still, Germany remains the country that will miss its 2030 target by the largest amount (in absolute terms).

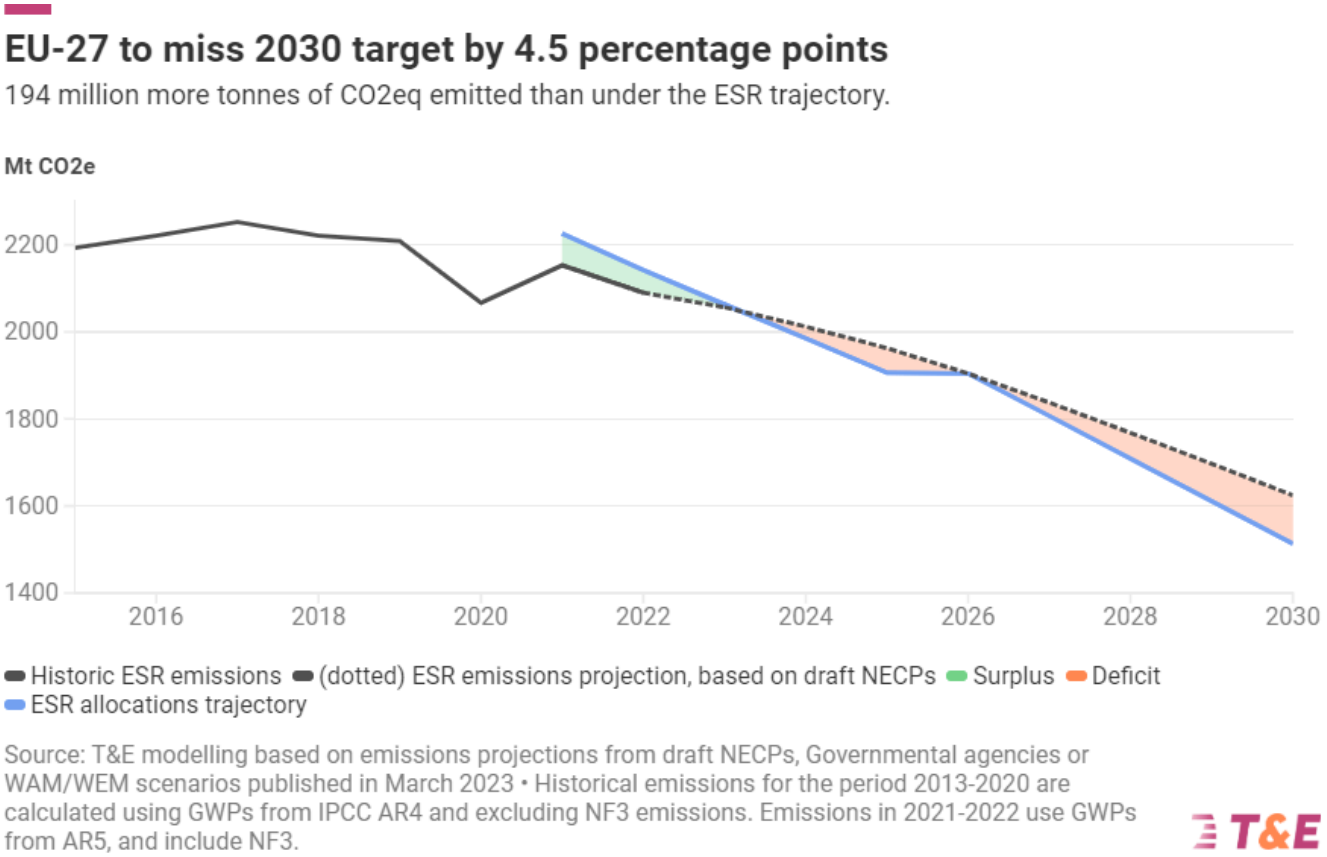


Figure 1. The expected gap between projected reductions and the EU-wide 2030 ESR target

3. Over two thirds of Member States plan to miss 2030 ESR reduction target

The vast majority of EU Member States are currently disregarding their ESR target. As shown by Figure 2, 19 EU countries are openly planning to miss their 2030 ESR reduction target. Only Spain, Greece, the Czech Republic, Luxembourg, Portugal, Hungary, Slovenia and Croatia

currently have a plan in place to meet their target.[5] As a result, the EU as a whole is on track to fail the target all 27 Member States agreed upon just 1.5 years ago.

Out of these 19 Member States, four are not even attempting to reduce their emissions. Bulgaria, Malta, Romania and Slovakia, despite having some of the lowest reduction targets (-10%, -19%, -12.7% and -22.7% respectively), currently plan to pollute more in 2030 than they did in 2022.

But that does not mean those 19 countries will all fail to comply with the ESR regulation. The Regulation is packed with accounting tricks and loopholes, which allow countries to comply even if they fail to meet their headline 2030 target. Considering those so-called 'flexibilities', T&E finds 12 Member States have such a large compliance gap that they run out of flexibilities. These countries, called 'not compliant' (see Infobox 1), will therefore need to resort to purchasing carbon credits from overachieving countries.

But the widespread and deep level of planned failure, primarily driven by the enormous deficits from Germany and Italy, will lead to a scarcity of credits on the allocations market, inevitably leaving some countries with no credits to buy. T&E warns of a bidding war for compliance credits between countries in 2030, which could drive up credit prices.

Beyond those 12 countries for whom compliance appears impossible - unless they implement new policies - 2 countries are found to barely reach compliance and 5 more Member States (the Netherlands, France, Hungary, Latvia and Belgium) are found to have such a tiny margin that they are at high risk of non-compliance.[6] Belgium for example can only comply when using ETS credits. This is a flexibility mechanism where allowances notified for compliance with the ESR are subtracted from those that would have been auctioned under the EU ETS (see Infobox 1). But this does not come without repercussions: a further reduction in the availability of ETS allowances for national industries (the number of allowances is already set to diminish due to the ETS decreasing cap) increases the price of the remaining ones. As a result, Belgian industries subject to the ETS will face higher costs due to the reliance on this mechanism.

[5] Sweden did not include a quantification of its ESR reduction in its NECP. The Commission's assessment of Dec 2023 instead used Sweden's WAM scenario (With Additional Measures) as submitted in March 2023, which projected a reduction of 61.9% in 2030 (vs. 2005). The Commission therefore found Sweden to be compliant with its -50% ESR target. Sweden's ESR emissions have however since been revised upwards by the Swedish Energy Agency (in April 2024), and are now projected to result in a reduction of only 41.5% in 2030. This is used in our analysis as the most likely projection to be featured in the final NECP, hence Sweden's absence from the list of countries that meet their 2030 target. Conversely, the Czech Republic was not listed in the Commission's Communication as one of the 7 Member States that were set to meet their 2030 target, but was found to overachieve its 2030 target by 7.2 percentage points in the Commission's factsheet published in February 2024.

[6] More details are provided in the Annex.

Member State	ESR sectors emissions among all GHGs (%)	2030 ESR target	Draft NECP ambition	Percentage point difference (>0, more ambitious)	Meet 2030 target ?	Compliance over 2021-2030 period	Source for 2030 projection
Spain		-37.7%	-44.7%	7.0%	Yes	compliant	EC
Greece		-22.7%	-35.5%	12.8%	Yes	compliant	WEM submitted in March 2023
Poland		-17.7%	-14.1%	-3.6%	No	compliant	EC
Czechia		-26.0%	-33.2%	7.2%	Yes	compliant	EC
Luxembourg		-50.0%	-57.8%	7.8%	Yes	compliant	EC
Finland		-50.0%	-46.4%	-3.6%	No	compliant	WAM submitted in March 2023
Portugal		-28.7%	-35.0%	6.3%	Yes	compliant	Personnal communication
Bulgaria		-10.0%	2.1%	-12.1%	No	compliant	WAM (NECPR March 2023)
Netherlands		-48.0%	-38.7%	-9.3%	No	at risk	EC
France		-47.5%	-46.4%	-1.1%	No	at risk	EC
Hungary		-18.7%	-23.8%	5.1%	Yes	at risk	EC
Latvia		-17.0%	-6.6%	-10.4%	No	at risk	EC
Belgium		-47.0%	-42.6%	-4.4%	No	at risk	EC
Slovenia		-27.0%	-28.8%	1.8%	Yes	unlikely to comply	WAM submitted in March 2023
Lithuania		-21.0%	-20.9%	-0.1%	No	unlikely to comply	EC
Croatia		-16.7%	-17.1%	0.4%	Yes	not compliant	EC
Malta		-19.0%	46.3%	-65.3%	No	not compliant	WEM submitted in March 2023
Estonia		-24.0%	-11.4%	-12.6%	No	not compliant	EC
Slovakia		-22.7%	-11.6%	-11.1%	No	not compliant	WAM submitted in March 2023
Cyprus		-32.0%	-23.1%	-8.9%	No	not compliant	EC
Denmark		-50.0%	-39.5%	-10.5%	No	not compliant	EC
Austria		-48.0%	-35.0%	-13.0%	No	not compliant	Personnal communication
Sweden		-50.0%	-41.5%	-8.5%	No	not compliant	Swedish Energy Agency
Ireland		-42.0%	-25.0%	-17.0%	No	not compliant	Environment Protection Agency
Romania		-12.7%	4.4%	-17.1%	No	not compliant	WAM submitted in March 2023
Italy		-43.7%	-36.0%	-7.7%	No	not compliant	EC
Germany		-50.0%	-40.0%	-10.0%	No	not compliant	German Environment Agency
EU27		-40%	-35.5%	-4.5%	No	unlikely to comply	/

Source: T&E modelling based on emissions projections from draft NECPs, Governmental agencies or WAM/WEM scenarios published in March 2023. • A member state can be found compliant over the ten year period while missing its target for the year 2030, by banking surplus accumulated in early years.

Figure 2. The widespread undercompliance with ESR targets

Over the 2021-2030 period, Spain, Greece and Poland are the countries which, if draft NECPs are not deteriorated, will accumulate the largest annual surpluses. They could sell those to the

numerous underperforming countries. However, final ESR targets for Poland and Greece were set so low (-17.7% and -22.7% in 2030, respectively) that annual compliance may be achieved with minimal reduction efforts. Still, underperforming countries could reward them with €2.7 and €4.8 billion respectively (see chapter 4).[7] This begs the question if the allocation key under the ESR should be revised under its next review.

German and Italian taxpayers will bear the brunt of this expenditure: their national governments, which are currently on track to miss their final targets by 10 and 7.7 percentage points respectively, won't have enough banked allowances over the 2021-2030 to cushion the shortfall.

Infobox 1: How compliance was assessed

Compliance is defined in this analysis as the ability of a Member State to surrender as many Annual Emissions Allocations (AEAs) as tonnes of CO_2 equivalent emitted each year in the Effort Sharing sectors, before resorting to trading. This includes the use of:

- *Banking*: In our analysis, we assume that a surplus in early years is automatically banked to be used in future years if needed, i.e if emissions are projected to exceed the annual allocation. In the case where 2021-2030 cumulative emissions remain below the cumulative allocation under the ESR trajectory, a Member State has a net surplus of allocation and will be able to sell them on the market.
- *ETS flexibilities*: nine Member States can use a certain amount of ETS allowances for offsetting emissions in the effort sharing sectors. Among them, the Netherlands and Sweden have notified the Commission that they will not resort to their ETS flexibilities.[8] For the seven remaining countries, we assume that the ETS allowances are only used in case of an allocation net deficit, to either 1) reduce their deficit (this is the case for Malta, Denmark, Austria and Ireland) or 2) reach compliance (this is the case for Belgium). Luxembourg and Finland are not modelled to resort to their ETS flexibility since they are projected to comply without (see Table 2 in Annex for more detail).

The LULUCF flexibility is only available if the LULUCF sector complies with its own commitments and if such compliance results in net removals. Since the EU is currently not on track to meet the 2030 net removal target,[9] our scenarios do not take into consideration this flexibility.

In a nutshell, a **Member States is defined as compliant, if its cumulative emissions over 2021-2030 remain below its cumulative allocations, or if the ETS flexibilities notified to the European Commission are sufficient to offset the deficit**. (See the Annex for more information about flexibilities.)

[7] Based on a price of €129 per allowance.
[8] Under the old ESR rules, Member States had to notify the Commission by 2019 of any intention to use this flexibility mechanism. The revised ESR however allows them to revise the notified percentage once by 2024 and once by 2027, meaning NL, SE and BE (which had notified to only use a share of its ETS flexibility) could still change their mind.
[9] European Commission (2024). Link.

In our main scenario, the cumulative emissions from ESR sectors are calculated as the emissions under a curve[10] starting from estimated 2023 ESR emissions, and heading to the 2030 ESR emissions projected in the NECPs. To show the sensitivity of the compliance to the cumulative emissions and the underlying assumptions (2023 ESR sectors emissions, shape of the trajectory, ESR trajectory[11]) and in order to discriminate between countries that plan to significantly exceed (or respect) their budget from those where compliance is only a matter of thin margin, compliance (and non-compliance) were broken further down into 2 categories each:

- If a Member State complies in our main scenario, and is projected to still accumulate a net surplus even under a sensitivity where its cumulative emissions would be 1% higher than modelled in the main scenario, it is qualified as *compliant*. If the sensitivity leads to a net deficit in allocation, the Member State is qualified as *at risk of non compliance*.
- If a Member State is found not to comply in our main scenario, and is equally projected to accumulate a net deficit under a sensitivity where its cumulative emissions would be 1% lower than in our main scenario, it is qualified as *not compliant*. If that same sensitivity leads to a net surplus in allocation, the Member State is qualified as *unlikely to comply*.

To take into account this sensitivity, only “compliant” and “not compliant” countries are considered in the trading analysis (chapter 4).

[10] Mimicking the reduction pace of the WAM projection submitted in March 2023 (see Annex for more details).
[11] See Annex for more detail.

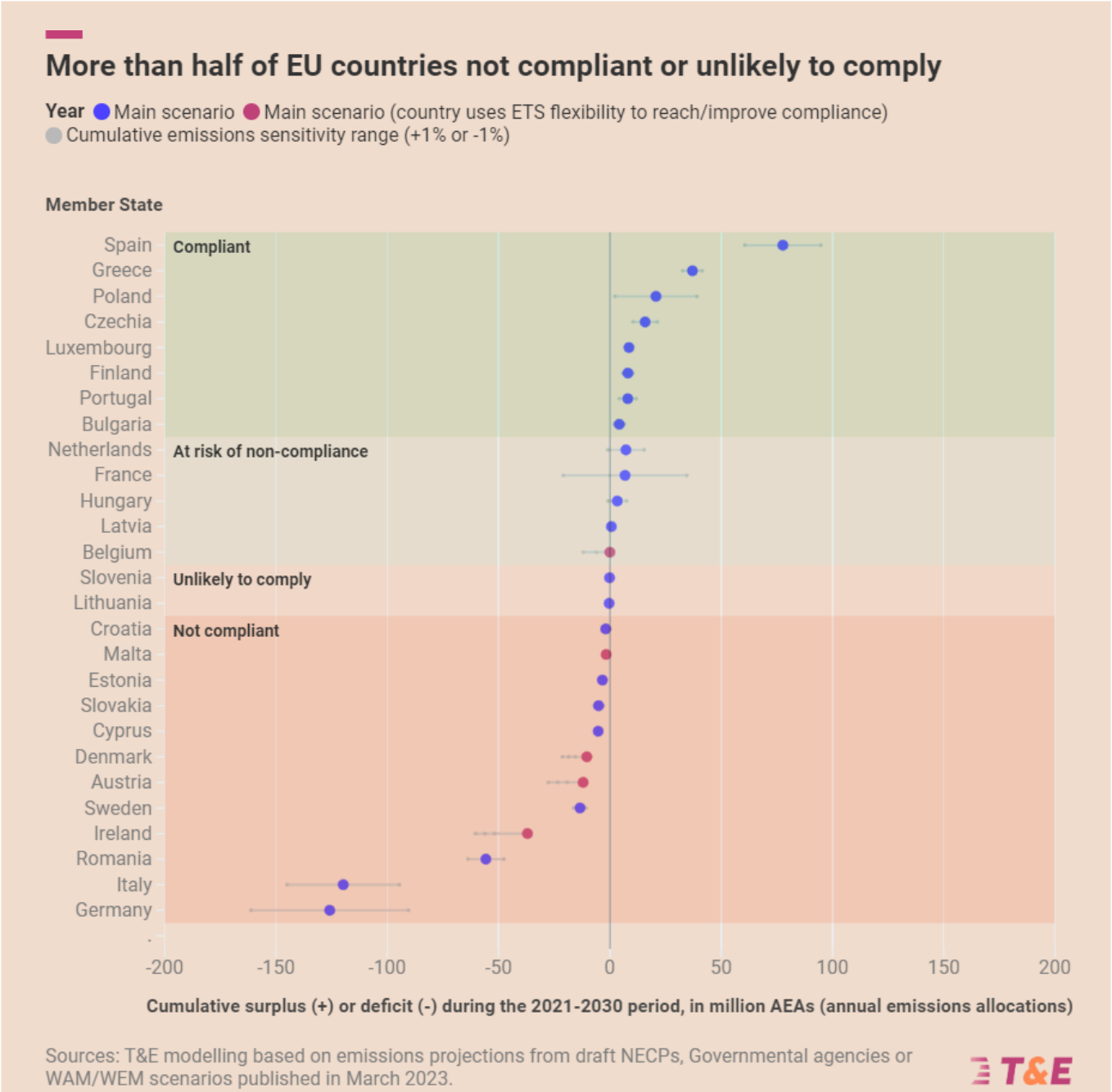


Figure 3: Member States ESR compliance

4. Germany and Italy could eat up entire surplus, leaving 10 MS to face court cases

When a Member State reduces its emissions more than it is required to under the ESR, the Regulation allows that Member State to sell its surplus as carbon credits to other Member

States.[12] The aim of this trading mechanism is to incentivise emissions reductions where they are most cost-efficient. For example, Central and Eastern European Member States are given relatively low ESR targets, while the marginal cost of abatement is generally lower in those countries. The idea of the ESR is that these financially more restrained countries could receive money to implement additional policies from Member States with higher targets, allowing them to overachieve their targets. In exchange, the 'paying' Member State would receive carbon credits. In that sense, trading presents an opportunity for low-income Member States. In practice however, deals between Member States tend to only be made in 2030 when non-compliance is determined, rather than incentivising the receiving Member State to implement additional policies and plan for those years ahead.

As a result, with the EU as a whole risking undercompliance, there is a high risk of insufficient credits in 2030 to plug the whole of all underachieving countries. As shown in Figure 1, according to our main scenario, there will be a gap between supply and demand of 194 million tonnes of CO_2 equivalent[13] in 2030. This substantial failure is not only a severe climate concern but also means that the number of available allowances in the market will be insufficient to cover the high demand, resulting in a significant financial burden on non-compliant Member States. The less ambitious the NECP is, the higher the cost.

Prices for trading AEAs are determined bilaterally between Member States. During the previous compliance period (2013-2020), prices were very untransparent but generally low. At the time ESR targets were set very low though, with 12 Member States still allowed to even increase their emissions. For the current period, we expect trading prices to be higher due to stricter emission targets and the market dynamic of a supply shortage. Given the high demand for credits, it seems likely that selling Member States would try to come to a 'fair price-setting' approach, by setting the price on an objective basis. We have identified three possible scenarios for such a 'fair price-setting' approach:

- In the lower price scenario, Member States would set the price at the equivalent to the ETS2 price. Given the soft price ceiling under the ETS2, this is expected to be €45 per allowance in 2030.[14]
- As the ETS2 only covers road transport and buildings, we also looked at the marginal abatement cost (MAC) of the ESR sectors as a whole, including buildings, agriculture, small industries and waste. Based on a literature review, we expect a MAC of about €260 to reduce one ton of CO2e in the ESR sectors by 2030.[15] This would arguably be the most objective price for an AEA;

[12] A Member State may transfer up to 10% of its AEAs for a given year to other Member States in the 2021-2025 period, and up to 15% in the 2026-2030 period.
[13] This is the deficit accumulated under the main scenario, therefore including the surplus/deficit of countries qualified as "at risk"/"unlikely to comply". In the rest of the section, we only look at trading flows between "compliant" and "not compliant countries".
[14] Note that the price ceiling under the ETS2 is only a 'soft' ceiling, meaning it is dependent on the ability of the MSR to continue to insert credits into the market. Note also that the price ceiling is adjusted for inflation, meaning already in today's (2024) prices, the €45 price cap agreed in 2022 is actually €55.
[15] Statistic Norway (2019), Marginal abatement costs under EU's effort sharing regulation. See Annex for more detail.

- Alternatively, as a more mature and very transparent existing carbon market, prices could also be based on the ETS1. In this analysis, we follow Bloomberg's projection and assume an ETS1 allowance is worth €129 in 2030.[16]

Of course it is also possible to make a political arrangement, where carbon credits are sold at a lower price in exchange for another concession of one country to another. The Commission should therefore work to improve transparency on price-setting and bilateral agreements.

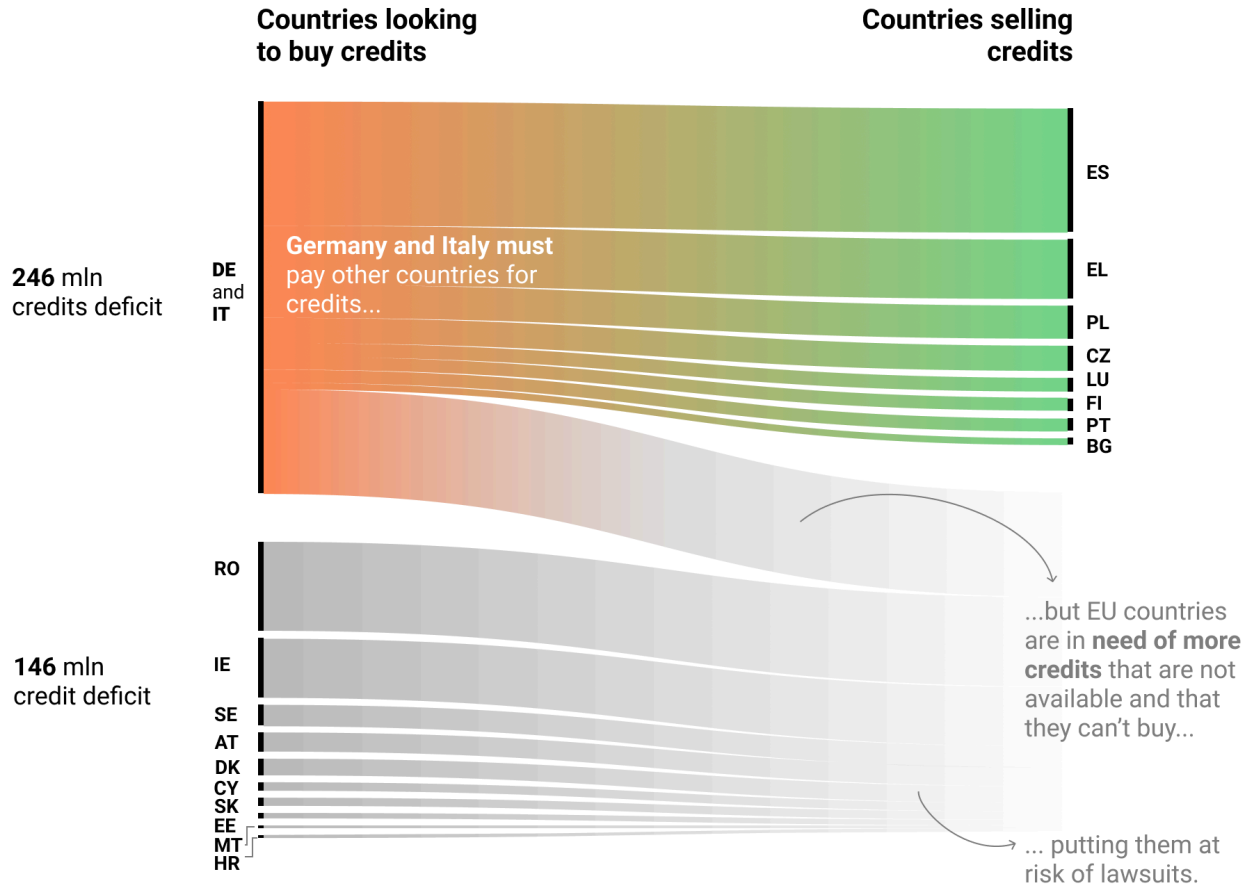
As shown in figure 4 below, Germany and Italy alone are projected to consume a combined total of 246 million allowances, depleting the available surplus that the other 10 "not compliant" countries need to meet their obligations under the ESR. Consequently, these countries, *de facto* rendered unable to purchase allowances, will face EU infringement procedures for non-compliance, with the first compliance check scheduled for 2027 for the years 2021-2025 and a second check in 2032 for the 2026-2030 period.[17]

Germany would need to acquire 126 million allowances, or 70% of the surplus made available by "compliant" countries. Assuming an average price of €129 per allowance, and Germany being willing to pay the highest price for compliance - beating other countries in the race for credits -, the country could spend €16.2 billion, just €0.8 bn less than the €17 bn hole in the 2024 budget that it recently had to close.[18] Considering a price range of €45-260 per allowance, this could translate to an expenditure of at least €5.7bn, potentially reaching up to €32.7 bn if assuming the highest price.

Similarly, Italy is on track to be in a position where it will need to buy 120 million allowances, which could result in an expenditure equal to €15.5 billion with a €129 price per allowance. A potential significant transfer in resources from Italy to other Member States, especially when compared to the approximately €7 bn Italy is allocated under the Social Climate Fund between 2026 and 2032 to combat energy and transport poverty.

[16] From BloombergNEF's European Union Carbon Pricing Model (EUCPM), converted to 2024 real EUR/tonne of CO2e.
[17] If excess emissions remain after the use of available flexibilities, they would be added to the following year's emission figure multiplied by a factor of 1.08. This was not included in the modelling. In addition, if a State fails to meet its obligations, it should submit to the Commission a corrective action plan identifying the reasons and explaining how the funding for climate action was or would be used. This plan needs to be linked to the revision of the NECP and long-term strategy, in cases of non-compliance with the targets for two years in a row.
[18] Politico (2023). German budget crisis: Government reaches spending deal for 2024. Link.

Germany and Italy could eat up the entire surplus, leaving 10 Member States at risk of lawsuits



Source: T&E analysis.
Note: Only compliant and non-compliant countries are represented in the trading flow, excluding the 7 countries "at risk" or "unlikely" to comply.

Figure 4. Overall deficit of allowances in 2030

Spain on the other side stands to be the largest beneficiary due to the measures outlined in its draft NECP. With a significant surplus of allowances, Spain's ambition could be rewarded with a gain of €10 bn (between €3.5 and €20.2 bn if using the wider price range).

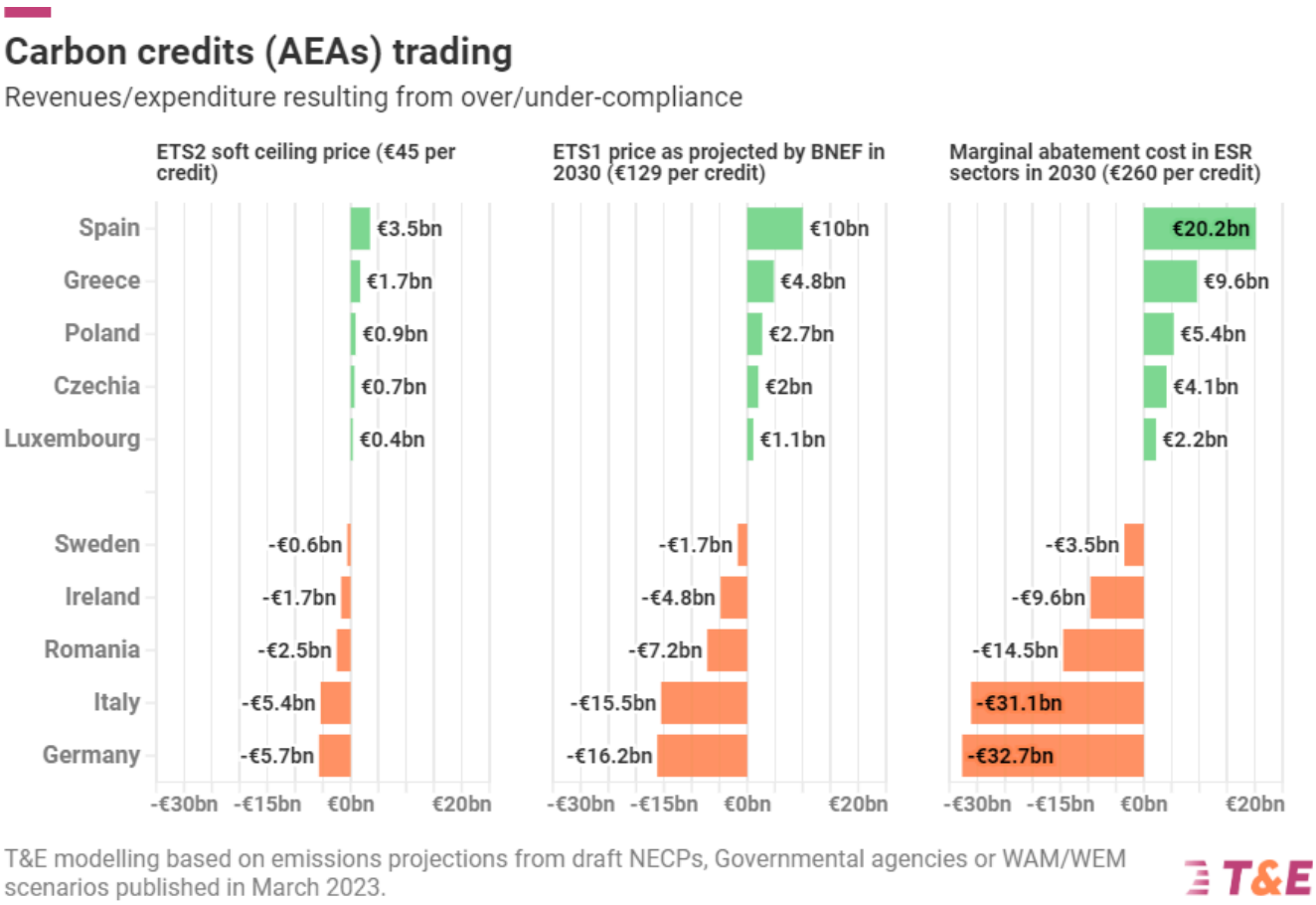


Figure 5. Winners and losers of ESR non-compliance

5. Policy recommendations

Non-compliance with national ESR targets would have disastrous effects on the climate and should therefore be prevented. As shown, the financial damage would also be significant due to the need to purchase AEAs from compliant countries.

Luckily, there are still six years left to rectify government policies in order to meet the 2030 targets.

5.1. Member States must improve final NECPs

In the final NECPs, which need to be submitted by June 2024, EU Member States have an opportunity to avert this outcome. By including additional measures and policies, they can still move from non-compliant to compliant, thereby contributing to the overall -40% ESR target for 2030. If Member States need more time to design impactful measures, the EU should allow them a six month extension to the deadline to submit their final NECP. This should however only

be granted if the Member States hands in a status update to the Commission and accepts Commission guidance to improve its plan.

5.2. Commission should launch gap-closing action group

As soon as possible, the new Commission should gather an action group to course correct ESR compliance. Within the realms of this action group, the Commission should propose new EU-level action with a pre-2030 impact in the ESR sectors. In the road transport sector, this should include tabling a Corporate Fleets Regulation which sets binding zero-emission targets for large corporate car, van and truck fleets. As shown in previous T&E analysis, setting ambitious targets for large corporate fleets from 2026 could save Europe 71.2 Mt CO_2e by 2030, compared to a scenario relying only on the CO_2 standards.[19] One single EU measure could thereby close the needed emissions savings gap to the 2030 target by 36.5%. In practice, a few Member States' NECP could already include some measures with overlapping impacts, but a Corporate Fleets Regulation will remain a significant gap closing policy.

In addition to proposing new EU policy action for each ESR sector, the Commission should provide guidance to laggard Member States, presenting them with best practices from other Member States in terms of additional national policies for the ESR sectors, and helping them with technical support or implementation.

5.3. Set up EU lending facility with frontloaded ETS2 revenues

More emissions reductions than currently budgeted by Member States could potentially also be achieved through the new Emissions Trading System for road transport and buildings (ETS2). Even though this overarching carbon pricing mechanism will already kick in in 2027, the Commission's 2023 assessment of draft NECPs found that only 7 Member States have so far considered the ETS2 in their plans and projection scenarios (Cyprus, Czechia, Estonia, France, Hungary, Lithuania, Romania). Member States should apply the carbon price and price elasticities to their fuel sales projections.

The Social Climate Fund accompanying the ETS2 also presents an opportunity to implement new measures from 2026. The EU should however create a new EU lending facility stocked with frontloaded ETS2 revenues, which can be used by Member States to borrow against their future ETS2 revenues. This will allow more early action in terms of social transport and housing policies.

[19] Transport & Environment (2024). Greening corporate fleets: an industrial and social policy for Europe. Link.

5.4. Member States should choose their trading partners already today

In addition to implementing new policies that reduce emissions, underachieving Member States with too large of a gap to plug should already negotiate deals with other Member States years in advance. Ideally they choose a trading partner where both government resources and the marginal abatement costs are low, to ensure the most cost-effective reductions. For example, based on our analysis Romania is currently unlikely to achieve its target, while marginal abatement costs in the country are relatively low. With additional resources pledged already now, Romania could still implement new policies in time to achieve its 2030 target. This would be more beneficial for the Union and the climate than purchasing from e.g. Spain who is already planning to overachieve on its target. It would also reduce the cost for Member States in need for carbon credits: instead of a bidding war in 2030, they can depreciate the cost annually between now and 2030.

Member States with a surplus who receive money from other countries should also be obliged by Europe to invest these resources in new, additional climate policies, rather than just incorporating in the overall budget.

5.5. Lessons for future design of ESR

Our analysis also clearly shows that some of the flexibilities, particularly banking, are growing out of scale, putting the integrity of the ESR at risk. Currently, Member States can bank up to 75% of AEAs in 2021 and up to 25% for the years 2022-2029. While banking can be a useful tool to encourage early-stage climate measures, loose limits can lead to situations like the one in Bulgaria. Despite Bulgaria having been attributed the lowest emission reduction target of the Union (-10%), Bulgaria is projected to still increase its emissions, both compared to the ESR baseline year 2005 and compared to today (2022[20]). Due to the Covid-19 related slowdown of the economy in 2021 however, Bulgaria could be able to bank such a high surplus in early years that it would manage to remain compliant over the entire period. It would even retain a surplus over the 2021-2030 period, which it can sell to other Member States all while increasing its own emissions.

[20] EEA proxy for ESR sector emissions.

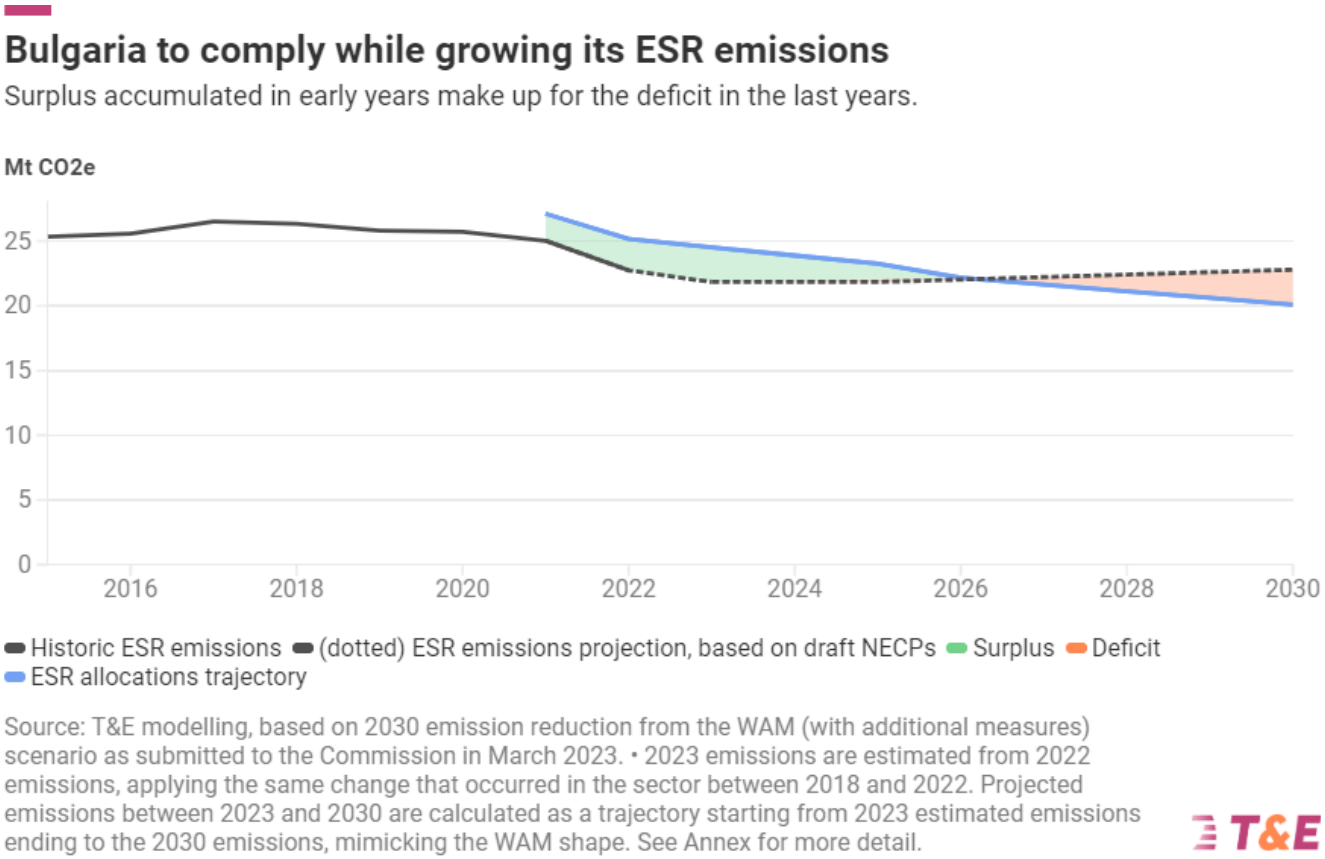


Figure 6: Bulgaria: banking allowing compliance even when emissions grow

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Annex: Methodological note

The estimate of the deficit and surplus in AEAs (Annual Emission Allocations) during the 2021-2030 period consists of subtracting the cumulative emissions under the historical and projected emission curve from the cumulative AEAs under the Effort Sharing Regulation trajectory. We deal with this 10-year period as one pot to take into account the possibility for Member States to bank allocations when overachieving in early years, to eventually be used later if their emissions exceed their AEA. Anything left after considering banking is a net surplus, and can be traded with other MS, that have, by contrast, a net deficit over the 10-year-period.

This Annex gives more information on the data sources and assumptions used in the analysis.

1. ESR trajectory and annual allocations

The annual allocations under the ESR between 2021 and 2025 are defined in the Annex II of the Commission Implementing Decision of 28 June 2023[21] and annual allocations between 2026 and 2030 follow a linear trajectory described in the Regulation.[22] These allocations are still to be exactly defined when the comprehensive review of the most recent national inventory data for the years 2021, 2022 and 2023 submitted by the Member States will be made available. In the analysis, we use historical emissions for 2021 and 2022, and an estimate of 2023 emissions, as explained below.

2. Historical ESR emissions

ESR emissions from 2005 are taken from the Commission Implementing Regulation[23]. Emissions between 2015 and 2021 come from the EEA (European Environmental Agency) inventory of greenhouse gas emissions under the Effort Sharing Legislation review[24]. This includes a proxy from the EEA for the emissions of the year 2022, used in this analysis.

3. Estimate of 2023 emissions

2023 emissions are estimated by extrapolating a line between 2018 and 2022, to capture the change in the sectors in the last 5 years, while excluding the impact of COVID-19. This was deemed to be a better estimate than using the 2023 emissions from the WAM (with additional measures) and WEM (with existing measures) scenarios sent to the Commission in March 2023, as Member States do not seem to necessarily align their early year projections with

[21] Commission Implementing Decision (EU) 2023/1319 of 28 June 2023 amending Implementing Decision (EU) 2020/2126 to revise Member States' annual emission allocations for the period from 2023 to 2030. Link.
[22] European Union (2023). Effort Sharing Regulation. Link. Note that the calculations were made with a trajectory starting in 2024, instead of starting at nine-twelfths of the distance from 2023 to 2024, which increases the overall allocation budget by 0.2% and was deemed negligible.
[23] Commission Implementing Regulation (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council. Link.
[24] Greenhouse gas emissions under the Effort Sharing Legislation.

available verified emissions. Indeed, significant gaps were found between 2021 and 2022 historical emissions and what is projected in the WAM and WEM scenario. For example, for Bulgaria, WAM 2021 emissions from ESR sectors are 6% lower than what was reported in the greenhouse gas inventory. For EU-27 aggregated emissions, using the above methodology results in a 1.6% emissions decrease between 2022 and 2023.

4. 2030 ESR emissions projections

The analysis aims at modelling the projections that are most likely to be featured in the final NECPs: where available, 2030 emissions projections of ESR sectors as compiled in the Commission's analysis of submitted draft NECPs were used in the analysis. Where not available, personal communication with sources close to the government or March 2023 WAM and WEM projections were used. It should be noted that most of the time, the reduction featured in the draft NECPs assessed by the Commission remain the same as the ones submitted earlier in March 2023. For Germany, Sweden and Ireland, more recent projections published by national energy and environment agencies were deemed to supersede the projections from the draft NECPs.

Table 1: Projected ESR emissions in 2030 used in the analysis

Country	2030 emissions ($MtCO_2$-eq)	Source for 2030 emissions
Austria	37.0	Personal communication
Belgium	46.8	EC
Bulgaria	22.8	WAM (submitted in March 2023)
Croatia	15.0	EC
Cyprus	3.3	EC
Czechia	43.4	EC
Denmark	24.4	EC
Estonia	5.5	EC
Finland	18.5	WAM (submitted in March 2023)
France	215.0	EC
Germany	290.8	German Environment Agency (UBA)
Greece	40.6	WEM (submitted in March 2023)
Hungary	36.4	EC
Ireland	35.8	Environment Protection Agency
Italy	219.6	EC
Latvia	8.0	EC
Lithuania	10.3	EC
Luxembourg	4.3	EC
Malta	1.5	WEM (submitted in March 2023)
Netherlands	78.5	EC
Poland	165.3	EC
Portugal	31.6	Personal communication
Romania	81.7	WAM (submitted in March 2023)

Slovakia	20.5	WAM (submitted in March 2023)
Slovenia	8.4	WAM (submitted in March 2023)
Spain	133.8	EC
Sweden	25.3	Swedish Energy Agency

5. ESR projected emissions trajectory (2023-2030)

The ESR emissions projections between 2023 and 2030 are modelled as a curve starting from the 2023 estimate and heading to the 2030 emissions shown above in section 4, and mimicking the shape of the WAM projections submitted in March 2023 to the Commission[25]. Figure 7 below illustrates this approach for Spain, where the projection curve (black dotted line) starts from the estimated 2023 ESR emissions and heads towards the 2030 emissions as projected in the Spanish draft NECP assessed by the Commission. In that case, the 2030 emissions are the same as the WAM that was submitted in March 2023. The shape of the dotted line follows the shape of the WAM in the sense that the pace of reduction increases from 2025 onwards.

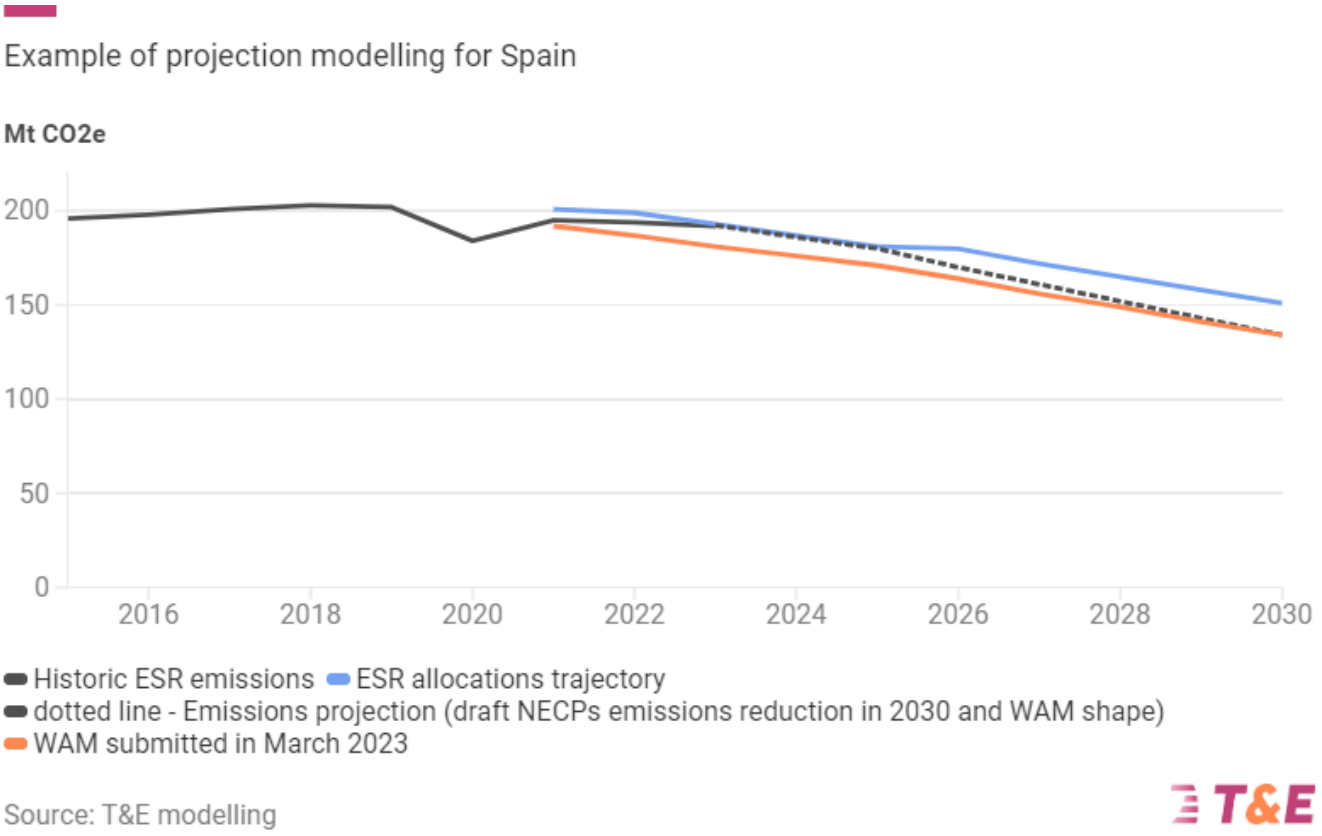

Figure 7. Example of the design of the ESR projection curve

Two exceptions were made in the modelling. The German projections were adjusted to match the ones released by the UBA in order to match the deficit of 126 million allocations; for

[25] When not available, the WEM is used.

Sweden, the 2024 emissions were adjusted upwards, as predicted by the Swedish Energy Agency, as a result of a drastic cut in greenhouse gas reduction mandate.[26]

6. Sensitivity

While the emissions reduction in 2030 are directly drawn from the Commission's assessment of draft NECPs (or more recent projections, see section 4 above), and the ESR emissions from 2021, 2022 are official data (for 2022, we use the EEA proxy), the emissions in between are sensitive to the assumptions used in our modelling. For example, using different assumptions for the estimate of 2023 emissions, namely keeping them constant to 2022, or following the 2021-2022 trend line would lead to 2021-2030 cumulative emissions from the EU-27 to respectively increase by 0.8% or decrease by 0.6% compared to the emissions calculated under our main scenario. Infobox 1 aims at showing how an incremental change (+1% or -1%) in cumulative emissions can shift a country towards a deficit or a surplus. For countries where compliance could change with a 1% change in cumulative emissions, we considered that the margin was too thin to include them in our analysis of allocations trading.

7. ETS flexibilities

As explained in Infobox 1, nine Member States can use a certain amount of ETS allowances for offsetting emissions in the effort sharing sectors. Among them, the Netherlands and Sweden have notified the Commission that they will not resort to their ETS flexibilities. For the seven remaining countries, we assume that the ETS allowances are only used in case of an allocation net deficit, to either reduce their deficit (this is the case for Malta, Denmark, Austria and Ireland) or reach compliance (this is the case for Belgium). Luxembourg and Finland are not modelled to resort to their ETS flexibility since they are projected to comply without. Table 2 below shows the amount of ETS flexibility modelled in the main scenario resulting from the reasoning above.

Table 2: ETS flexibilities and modelling assumptions

As % of 2005 AEAs	Theoretical amount	Notified to the Commission	Main scenario
Austria	2.0%	2.0%	2.0%
Belgium	2.0%	1.9%	0.7%
Denmark	2.0%	2.0%	2.0%
Finland	2.0%	2.0%	0.0%
Ireland	4.0%	4.0%	4.0%
Luxembourg	4.0%	4.0%	0.0%
Malta	7.0%	7.0%	7.0%
Netherlands	2.0%	0.0%	0.0%
Sweden	2.0%	0.0%	0.0%

[26] Previously it was 30,5 % for diesel and 7,8 % for gasoline. Since January 1st 2024 it is 6% for both fuels (link to the legislative process).

8. Allowances trading price and revenues/expenditure per Member State

As explained in chapter 4, in order to depict the uncertainty of the price at which allowances will be traded, we use a range of €45-€260 (as well as a central figure of €129) per allocation traded. The higher bound corresponds with the marginal abatement cost (MAC) of one tonne of CO2e in the ESR sector, as calculated in a report of Statistics Norway.[27] In the context of Norway's intention to join the Effort Sharing Regulation, Statistics Norway published a report in 2019 that estimates the projected 2030 marginal abatement costs for reducing CO2 emissions in ESR sectors, by means of a global Computable General Equilibrium model called SNOW. A range of MACs are calculated based on the old ESR emission reduction levels in 2030 compared to the EU 2016 Reference Scenario under different assumptions on the use of flexibilities (ETS and LULUCF) and the relative reduction of CO_2 compared to other GHGs to reach that target. The analysis results in 12 pairs of target and corresponding MAC, from which a MAC-curve is estimated. The estimated equation is $y = 0.2211x^2 + 4.9131x$, with y the Marginal Abatement Cost in euro per tonne of CO_2, and x the emissions reduction (measured in percent from the reference). Without considering adjustment for ETS and LULUCF flexibilities, and assuming that CO_2 reduces as much as other GHGs, the old ESR target (-30% compared to 2005) is said to correspond to a 9% reduction compared to the 2016 Reference Scenario. We deduce the new ESR target (-40% compared to 2005) to be a 22% reduction compared to the EU 2016 Reference scenario, leading to a price of 215 in euros of 2019, adjusted for inflation to about 260 in euros of 2024.

These three prices were then multiplied by the surplus/deficit in allocations to calculate the resulting revenues/expenditure.

Table 3 is an extension to Figure 5 and shows the results in terms of revenues and expenditure in our main scenario for three different price assumptions.

Table 3: potential revenues (+) /expenditure (-) per Member State under the main scenario, for each of the three price scenarios

Member State	ETS2 price (€45 per credit)	ETS1 price (€129 per credit)	MAC (€260 per credit)
Spain	3.5	10.0	20.2
Greece	1.7	4.8	9.6
Poland	0.9	2.7	5.4
Czechia	0.7	2.0	4.1
Luxembourg	0.4	1.1	2.2
Finland	0.4	1.0	2.1
Portugal	0.4	1.0	2.1
Bulgaria	0.2	0.5	1.1
Netherlands	0.3	0.9	1.9
France	0.3	0.9	1.8

[27] Statistic Norway (2019), Marginal abatement costs under EU's effort sharing regulation.

Hungary	0.1	0.4	0.9
Latvia	0.0	0.1	0.2
Belgium	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0
Lithuania	0.0	0.0	-0.1
Croatia	-0.1	-0.2	-0.5
Malta	-0.1	-0.2	-0.4
Estonia	-0.2	-0.4	-0.9
Slovakia	-0.2	-0.7	-1.3
Cyprus	-0.2	-0.7	-1.4
Denmark	-0.5	-1.3	-2.7
Austria	-0.5	-1.6	-3.1
Sweden	-0.6	-1.7	-3.5
Ireland	-1.7	-4.8	-9.6
Romania	-2.5	-7.2	-14.5
Italy	-5.4	-15.5	-31.1
Germany	-5.7	-16.2	-32.7

9. Data requests

T&E's modelling can be adapted to other scenarios (emission projections, use of ETS flexibilities etc). Please contact us for any additional data requests.

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