# IMPACT ASSESSMENT OF THE IMPLEMENTATION OF THE 90% CO2 EMISSION REDUCTION TARGET IN THE EU ECONOMY BY 2040 AND THE REGULATIONS OF THE "FIT FOR 55" PACKAGE ON POLISH INDUSTRY

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## Introduction

U.S. President Dwight Eisenhower used to say: "In preparing for battle I have always found that plans are useless but planning is indispensable". In line with Eisenhower's maxim, in early February 2024 the European Commission set a flagship target of a 90% reduction in net emissions in the EU economy by 2040 relative to 1990.

What the target set by Brussels means for European industries - after analysing the detailed impact assessment accompanying the Commission's main communication - is described in point. 1 of this analysis below.

At the outset, it is worth emphasizing that the proposal for a new 2040 target does not dramatically change the legal status vis-à-vis the obligations of industrial installations that are already covered by the EU ETS and would have to expect a continuation of the decline in the pool of allowances after 2030 anyway. The rate of decrease in the supply of permits has already been set by the EU ETS Directive, as amended in 2023.

Nevertheless, the Commission's analysis of how to achieve the 2040 target in industry is of great importance, because it offers a strategic list of technologies that Brussels will bet on and allocate funds for their development. On the other hand, there will remain the loser technologies, which are to be gradually terminated.

The "Fit for 55" legislative package implements the commitment of EU countries to achieve a binding target of at least a 55% reduction in net greenhouse gas emissions in the European Union by 2030 compared to their level in 1990. This commitment is already legally defined in European Climate Law, and it is intended to help bring the European Union to the goal of climate neutrality by 2050.

In connection with the commitment to achieve the aforementioned greenhouse gas emission reduction targets, in July 2021, the European Commission presented the first part of the "Fit for 55" legislation package with its extension in December 2021. The package consisted mostly of revisions to existing directives and regulations - such as those on CO2 emissions trading and renewable energy sources - but also included newly proposed acts in areas previously unregulated in the Union – such as methane emissions and the introduction of the CBAM mechanism.

At the EU level, the "Fit for 55" package's commitments mean accelerated decarbonisation first of all of the energy sector, which is expected to be fully decarbonized in terms of net emissions as early as 2040.

At a later stage, decarbonisation of energy-intensive industries will take place; these sectors will be gradually electrified, and in industries where this is not possible new technologies for carbon capture and storage or utilisation will be applied. What the "Fit for 55" package's commitments specifically mean for industries is discussed in point 2 of the analysis below.

## EC impact assessment for implementation of 90% CO2 reduction target for EU by 2040 - current policy environment

Once the regulations of the "Fit for 55" package have been adopted by the EU institutions, the discussion of their implementation and setting of the 2040 target will be a leading topic in the next term of the European Commission and the European Parliament.

Presented by the European Commission in February 2024, the impact assessment accompanied a political recommendation in the EC's flagship Communication "Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society."[1]. This was a proposal by the outgoing College of Commissioners on the rightfulness of the Union's adoption of a 90% reduction target for CO2 emissions by 2040, relative to their 1990 level. Of the scenarios analysed, **option S3** was selected (which is the focus of further analysis of the EC's impact assessment) and the outgoing EC ultimately recommended precisely the 90% reduction target for 2040 vs. their 1990 levels.

The impact assessment consists of five parts and totals about 600 pages of analysis.

At the next stage, the new European Commission will resume work on the proposal to amend the European Climate Law and the procedure for negotiating EP and Council amendments to the Commission's proposal will begin, followed by trilogues. **It is likely that the new 90% target will be approved as early as the end of 2025**, so that the EU can communicate it at the COP-30 in Brazil. Much will depend on the pace of the new EC's work on the proposal, and then the subsequent Council presidencies, starting with the Polish one in the first half of 2025.

It seems that **the 90% target has a good chance of being adopted by the EU institutions**, as a strong group of Member States has already supported setting an ambitious target - in line with the recommendations of the The European Scientific Advisory Board on Climate Change set up by the Commission (i.e., in the 90-95% range). There should also be no problem in maintaining the required majority on the side of the climate-ambitious MEPs elected for the new term in the European Parliament.

Currently, it is not yet clear whether the February 2024 impact assessment will be updated with the expected presentation by the new College of Commissioners in February/March 2025 **of a legislative proposal introducing the 90% target**. This will happen through the revision of the EU Regulation on the European Climate Law. It is possible that the analyses will be updated, as by the time the draft revision of the Regulation is published, it will have been about a year since the EC presented the impact assessment in question.

It is very likely that in parallel to the proposal to revise the European Climate Law, Brussels will put forward legislative proposals to facilitate the decarbonisation of energy-intensive industries, which will become increasingly difficult to sustain in the Union - given the rising cost of energy and industrial production. This is to be the so-called **Clean Industrial Deal**. The combination of these proposals is being sought, among others, by the government of Denmark, which will take over the presidency of the EU Council immediately after Poland, i.e. in the second half of 2025. The Danes make no secret of the fact that they want to adopt the new 90% target as soon as possible, and this would be the success of their presidency. **Proposals for energy-intensive industries are expected to make it easier to reach an agreement and win the support of countries more sceptical of the 90% target**.

For this, the Danes need the Polish presidency preceding the Danish one to take up the topic and advance negotiations on the new goal. But the Polish administration would have its hands tied at that time - as a neutral president of the EU Council - when it comes to promoting its

[1] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Securing our future Europe's 2040 climate target and path to climate neutrality by 2050 building a sustainable, just and prosperous society.

demands and forming key coalitions, so it is unlikely to pursue the issue as a priority during its presidency.

The question is whether the new Clean Industrial Deal will include specific **additional funding for capital expenditures or to cover rising operating costs**, arising from the establishment of new EU instruments - such as the **European Competitiveness Fund** announced by Ursula von der Leyen - or whether it will end with a series of "soft" administrative initiatives, such as speeding up permitting procedures.

If additional funds are found in the EU budget for the European Competitiveness Fund, these could be dangerous proposals for Poland in the first place, because **Brussels will find it easiest to tap into domestic revenues from the auctioning of EU ETS emission allowances**. Poland has a much higher share of the Union's CO2 emissions - as the leading emitter - than it does in the EU budget, so such a proposal would be counterproductive for Warsaw, because it could lose more funding than it gets. Another alternative is the option of incurring additional EU debt, analogous to the National Recovery Plans, which, however, is mainly opposed by Germany.

The EC's Climate Directorate General suggests the need to include new funds for the development of clean technologies in industry as part of the revision of the multiannual financial framework for 2028-2034. The Commission also mentions the important role of the Innovation Fund, the potential increase of which will be discussed in the new term of the EU institutions. This fund is to be supported by auctioning free CO2 emission allowances for industry, which are to be phased out. Thus, on the one hand, industry is to lose operating allowances, while on the other it is to receive investment support for new technologies.

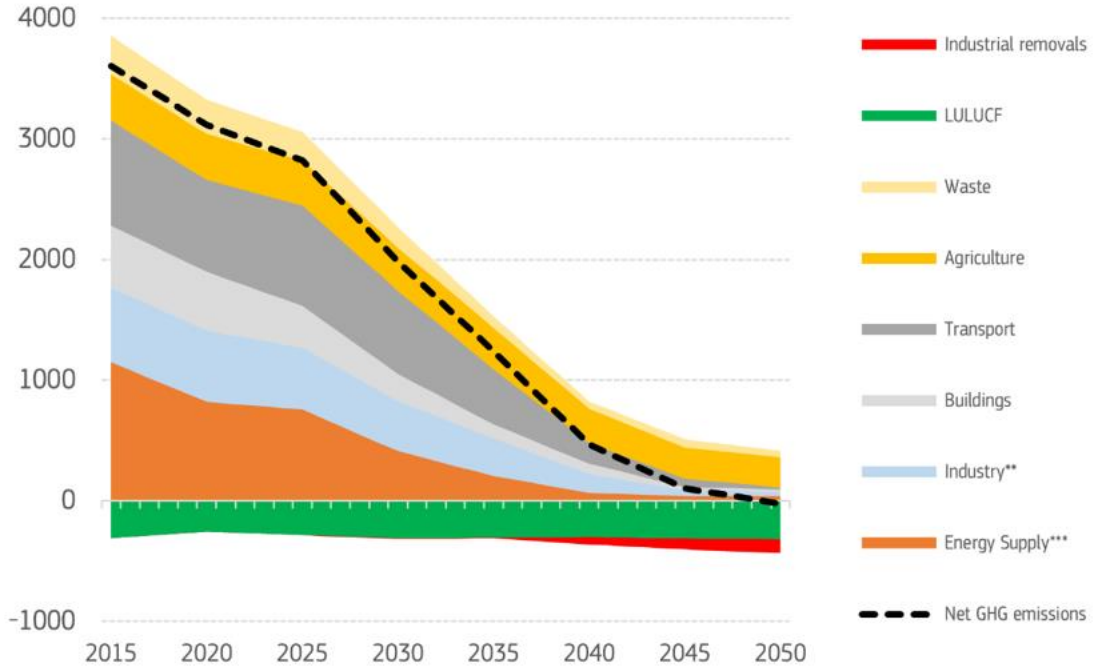
It is also unclear how the new Commission will approach state aid rules for countries wishing to finance their own industries from their budgets, and whether it will allow the richer ones further flexible options of state aid for domestic industries exposed to global competition. For the moment, **the option of harmonizing support at the EU level, rather than a subsidy race between countries, seems to be prevailing in the European Commission.**

It is worth noting that the 2040 target does not dramatically change the legal status vis-à-vis the obligations of installations that are already covered by the ETS and would have to expect **a continued decline in the pool of allowances in the EU ETS after 2030 anyway.** And the rate of decrease in the supply of permits was already set by the EU ETS Directive, as amended in 2023.

## 1. Main conclusions of the EC's impact assessment of the 90% CO2 reduction target by 2040 for Poland's energy-intensive industry.

The EC's impact assessment is done at the EU-wide level and **does not include specific analysis at the Member State level**. Although the EC's models include such national data, it is customary not to publish it in the impact analyses of EU climate policy, and countries must realize it themselves for negotiation purposes.

**Figure 1** Historical and projected greenhouse gas emissions for the period 2015-2050 by sector of the EU economy (in million tons of CO2 eq.).




**Source**: European Commission PRIMES model analysis .[2]

The above projections of CO2 emission reductions by sector of the EU economy show that the electricity sector is expected to be virtually decarbonized by 2040, and the remaining sectors, including industry (marked in blue), with the exception of agriculture, are expected to join by 2050. Emissions remaining in the EU economy in 2050 are neutralized by afforestation (LULUCF), CO2 capture and storage or utilization, and CO2 capture from the air.

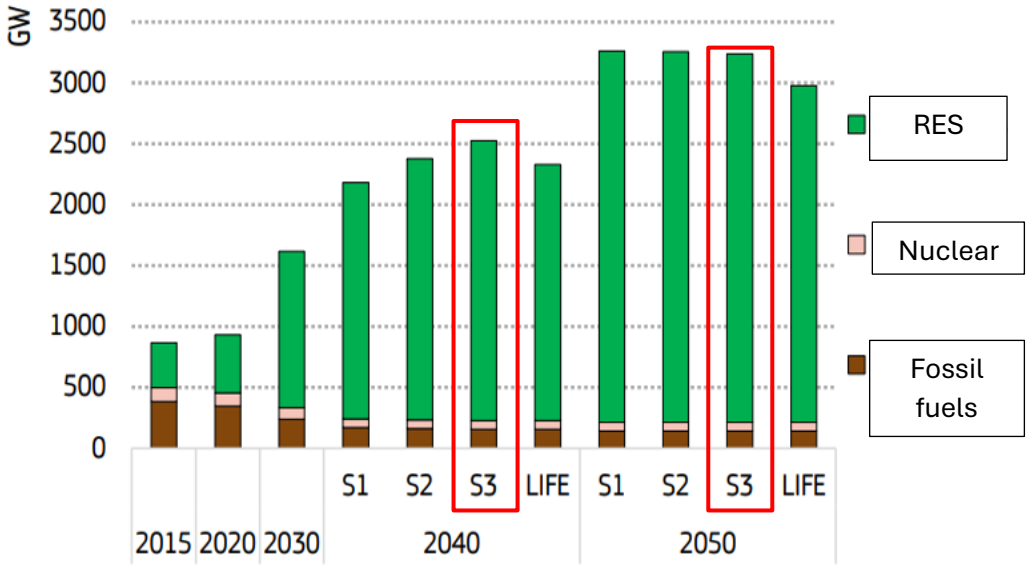
## 1.1 Main assumptions of the EC's impact assessment for the power industry

The main assumption of the impact analysis is that **the power sector will be completely decarbonized in terms of net emissions already in the 2040 timeframe**. In the scenario of a 90% reduction in CO2 emissions by 2040, Brussels even shows the sector's negative emissions in net terms (-10 million tons of CO2). This does not mean that the sector will then be completely free of emissions - those that will still occur are, however, neutralized by new installations of net negative emissions like biomass-based CO2 capture and storage (*BECCS - Bioenergy with Carbon Capture and Storage*) and *Direct Air Carbon Capture* and *Storage* (DACCS) technologies. These are currently newcomer technologies - the first BECCS project in Europe is just taking off at the Drax power plant in the UK, and is already causing a lot of environmental controversy. Indeed, biomass (especially wood) is currently being pushed out

[2] https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2040-climate-target_en.

of power generation in Europe due to sustainability issues, or competition for feedstock with the timber industry.

**Chart 2**. Installed capacity of electricity generation installations in the EU by technology in each scenario (S3 scenario recommended by the EC is shown in red).




**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[3]

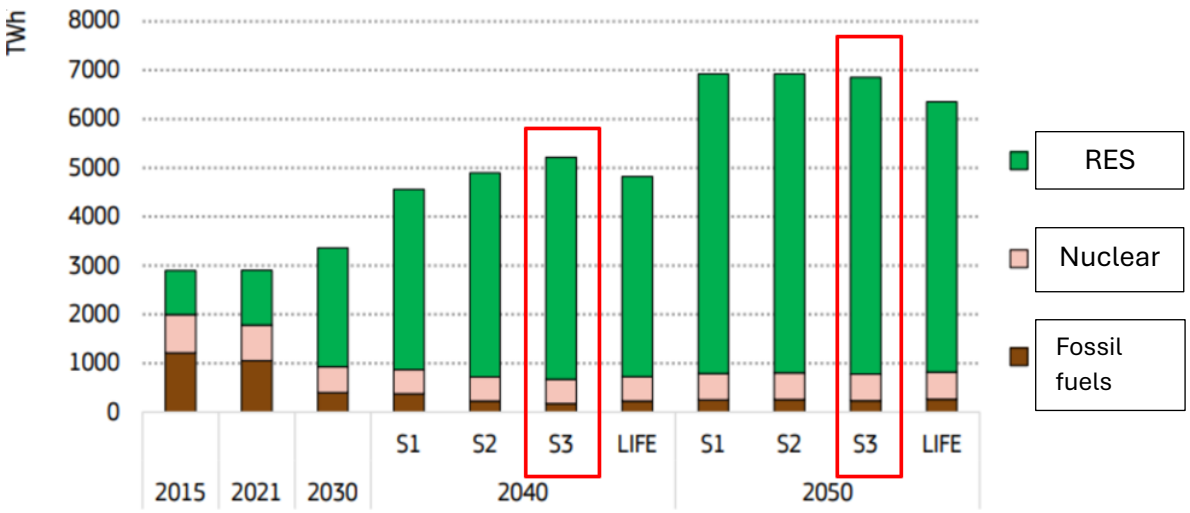
According to the assumptions of the S3 scenario above, installed capacity in the power industry grows by about 2.5 times between 2020 and 2040, and 3.5 times by 2050. After 2040, only natural gas is left from fossil fuels in the EU's energy mix, and coal-fired installations are completely set aside.

Renewable energy sources record a sharp increase in installed capacity to about 2,500 GW in 2040 and about 3,200 GW by 2050, while nuclear power capacity falls by 30% by 2040 - from about 100 to 70 GW. Nuclear power is expected to account for only about 10% of electricity production in 2040. Nuclear power generation is expected to drop to 495 TWh. In 2050, production from nuclear power already drops to about 7%.

Renewable energy sources are to be supported by energy storage (battery storage and pumped storage power plants), whose role in the system is to increase significantly. In 2040, storage facilities are expected to account for as much as 275 GW of installed capacity. In 2022, battery-based energy storage in the EU accounted for less than 3 GW of capacity, so we are talking about the revolution and boom in storage technology assumed by the EC. Looking at the recent power market auctions in Poland and the almost 2 GW of contracted battery storage, it's hard not to agree with this thesis.

[3] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3, p. 34: https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_3&format=PDF.

**Figure 3** EU electricity generation by 2050 by technology.




**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[4]

Renewable energy sources are to be the dominant technology for electricity generation in 2040 - as much as 85% of generation in the Union in 2040. In 2050 it is expected to be as high as 90%.

The drastic increase in electricity demand is linked to the assumed electrification of other sectors such as industry, transportation, and heating. In 2040, production in S3 reaches more than 5,000 TWh, to reach almost 7,000 TWh in 2050. This compares with about 2,800 TWh of electricity production in the EU in 2022.

## 1.2 EC's assumed price scenarios for electricity and CO2 allowances in the 2050 outlook

An interesting issue arising from the EC's impact assessment is the projected electricity price paths given. **Wholesale energy prices for industry are virtually stagnant over the 2030-2050 period - at around €130/MWh (**in EUR'23). This phenomenon is not explained more extensively in the documents, while earlier Commission analyses assumed a significant decline in wholesale prices over time due to the transition to energy price determination by RES installations, which are not bearing variable costs.

[4] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3, p. 32: https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_3&format=PDF.

**Table** 1 Average electricity prices for industry (in EUR23/MWh).

| EUR23/MWh | 2030 | 2040 | 2050 |
|---|---|---|---|
| | S1, S2, S3, LIFE | S1, S2, S3, LIFE | (S2) |
| Industry | 133 | 130-131 | 131 |

**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[5]

The persistence of energy prices in the long term at relatively high levels may be a result of the assumption of significant application of CCS technologies in both gas and biomass facilities, whose total generation costs are at similar levels to the assumed energy prices for industry.

As for expected CO2 allowance prices in the 2050 horizon, the European Commission avoids such a direct estimate in its impact assessment. It does, however, present **projected marginal costs of CO2 reductions in the EU ETS**, which can be used as a reference for the required CO2 prices that will bring to the market the necessary new technologies to achieve the reduction targets.

**Table** 2. CO2 values imposed on energy and industry emissions by scenario.

| EUR/tCO2-eq | 2040 | | | | 2050 |
|---|---|---|---|---|---|
| | S1 | S2 | S3 | LIFE | |
| Energy and industry CO2 (PRIMES model) and non-CO2 covered by the ETS (GAINS model) | 160 | 240 | 290 | 250 | 470 |

**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[6]

The EC notes in the analyses that the "CO2 values" listed above are used only as modeling factors and are not a forecast of the possible future evolution of CO2 allowance prices. The values expressed correspond to marginal abatement costs per ton of CO2 equivalent.

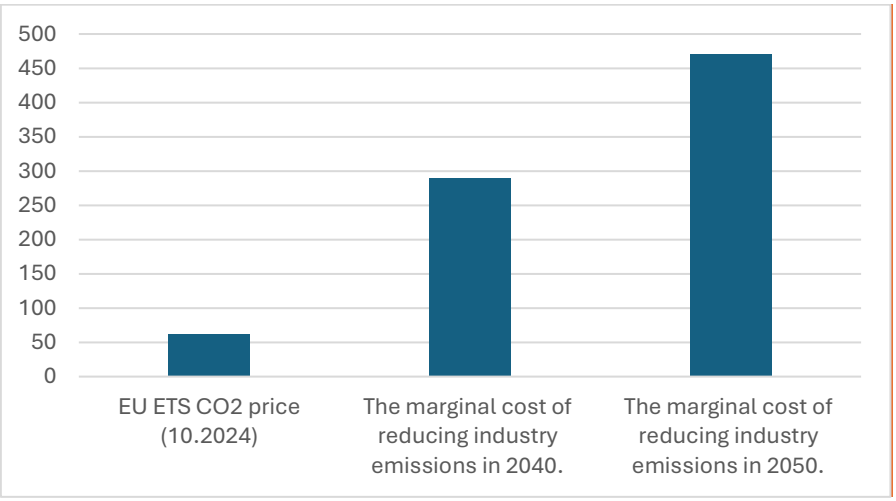
If one translates the CO2 values listed in Table 2 into emission allowance prices, then **in the S3 scenario**, **these prices should be around 290 EUR/tCO2 in 2040, and as high as 470 EUR/tCO2 in 2050**. This would represent an astronomical increase compared to current levels.

[5] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3, p. 188: https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_3&format=PDF.

[6] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 2, p. 43: https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_2&format=PDF.

## 1.3 EC's assumed impact of 90% target on industry costs and emissions

**Figure 4**: Current EU ETS allowance prices compared to the EC's assumed marginal cost of reducing EU ETS CO2 emissions in 2040 and 2050 (in EUR/tCO2).

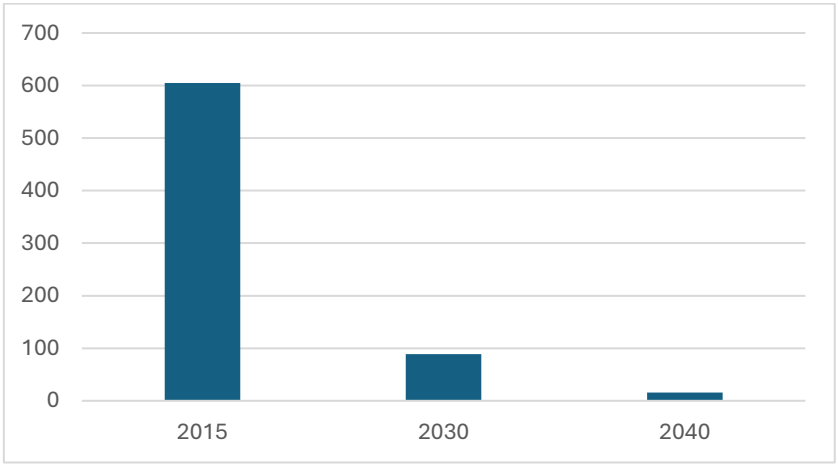



**Source**: Own compilation based on data from the EEX exchange and the European Commission's Impact Assessment of the 2040 CO2 reduction target.

As of October 18, 2024, the spot price of CO2 on the EEX exchange was just under €62/tCO2, **nearly five times lower than the assumed marginal cost of emissions reductions in power generation and industry in 2040**.

In the S3 scenario, the European Commission assumes a drastic decrease in CO2 emissions from industrial sectors by 2040. In 2015, these sectors emitted about 600 million tons of CO2, while in 2030 they are expected to emit only 89 million tons of net CO2, and in 2040 only **16 million tons of net CO2.**

**Figure 5**: Historical and projected emissions of industrial industries in the EU (in million tons of CO2).




**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[7]

[7] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 36.

## 1.4 Balance of EU ETS CO2 allowance availability through 2040.

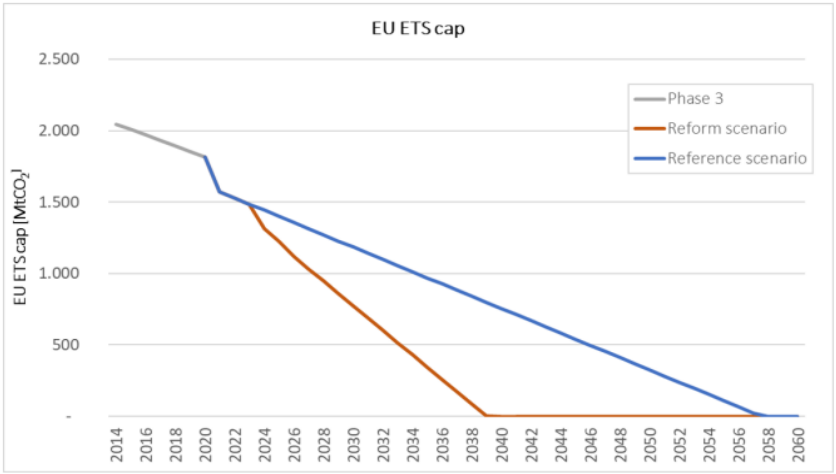
The key question is **whether there will still be physical allowances to buy in the CO2 emissions trading system after 2040**, given the rapid rate of annual decline in the EU pool associated with the adoption of new reduction targets. A paradoxical situation may arise, in which in ca. 15 years there will be no commercially available technologies for industrial emission reductions, and on the other hand there will be no emission permits to buy, or they will be astronomically expensive.

**The European Commission has not indicated in its impact assessment of the 90% target for 2040 a solution to the potential problem of a shortage of emission allowances due to the exhaustion of the EU ETS pool around 2040**. In the impact assessment itself, the EC generally notes that if the current LRF[8] is not changed after 2030, the ETS1 pool will reach almost zero in 2040.[9] , with the caveat that allowances issued under Article 3c (aviation) of the EU ETS Directive will be above zero up to and including 2044, and will only fall to zero from 2045.

This is a problem that is increasingly being highlighted by leading think tanks on the EU ETS. This is because, according to the rate of decline of the CO2 cap adopted in the revised EU ETS Directive in 2023 - there will be an acceleration of the decline of the EU ETS allowance pool from the current 2.2% to 4.3% per year in 2024-2027 and 4.4% in 2028-2030. After 2030, the annual rate of decline of the EU ETS cap is to be maintained at 4.4%.

Extrapolating the continuation of the decline in the EU cap until 2040, the supply of permits should run out as early as 2039 - according to the following analysis by experts from the renowned Potsdam Institute for Climate Policy Impact Research. [10]

**Figure 6**. Assumed decrease in the EU ETS CO2 allowance pool in the reference scenario (blue - according to the EU ETS Directive targets before the latest revision) and after implementation of the latest revision of the EU ETS Directive (orange) - in million tons of CO2.




[8] Linear Reduction Factor - The downward curve of the CO2 emission allowance pool.
[9] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 24.
[10] PIK - Potsdam-Instituts für Klimafolgenforschung.

**Source**: Study, "*The Emerging Endgame: The EU ETS on the Road Towards Climate* Neutrality,"[11] , p. 23.

This raises a key question about the consistency of the assumptions presented in the European Commission's impact assessment, given that **industrial sectors are expected to continue to emit CO2 in 2040, while it is unclear where they will get the necessary allowances to redeem at that time**.

The theses prepared by DG CLIMA[12] officials for a hearing in the European Parliament for the incoming EU Climate Commissioner, Dutchman Wopke Hoestra, which have been leaked to EU media, show that the EC has slightly different calculations in this regard, although detailed data is missing. In the thesis material, the Commissioner is being prepared by his officials for a specific question related precisely to the depletion of the EU's pool of emission allowances in 2039, although it is known that some of the industrial sectors covered by the EU ETS will continue to emit.

According to analysis by DG CLIMA officials, the pool of allowances in the EU ETS will not fall to zero in 2039. Without further changes to the EU ETS directive, according to the EC, this will happen in 2045, and the issuance of allowances will end in 2044 at the latest. Brussels assumes that some allowances resulting from the participation of shipping and aviation in the ETS will remain in the system, but these will be small volumes.

The Commission assumes potential changes in the supply of emission allowances resulting from, for example, the future inclusion of new sectors, or the inclusion of flights leaving the EU. Officials also stress that additional supply of allowances can be created by their generation as a result of implementing CO2 storage technologies, or those generating negative emissions like BECCS and DACCS.

Nevertheless, **it is expected that if there is still a supply of EU ETS CO2 allowances available in 2040, it will be marginal**.

## 1.5 Detailed assumptions of S3 scenario for industrial sectors

Scenario S3 assumes **massive development of carbon capture and storage (CCS), and carbon capture and utilization (CCU) technologies in industry**, which avoids as much as approx. 137 million tons of emissions[13] per year in these industries as early as 2040. As part of the documents presented by the EC in February 2024, in addition to the proposal for a 90% reduction target, there was also a Communication[14] - "Towards an ambitious Industrial Carbon Management for the EU", dedicated to the development of these technologies.

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[11] The Emerging Endgame: The EU ETS on the Road Towards Climate Neutrality, Michael Pahle, Simon Quemin, Sebastian Osorio, Claudia Günther, Robert Pietzcker, April 2024: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4373443.

[12] EC Directorate General for Climate Protection.

[13] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 39.

[14] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Towards an ambitious Industrial Carbon Management for the EU: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX%3A52024DC0062.

Although a number of industrial projects in CCS/CCU technologies have recently emerged, which are also supported by EU funds in the form of the Innovation Fund under the EU ETS - including one Polish project at the Kujawy Cement Plant - **there is no operational project in the block as of today, and there are a number of uncertainties related to their commercialization in the future.** This is primarily related to uncertainties around the development of CO2 transmission infrastructure and offshore storage sites.

According to the EC's impact assessment, storage capacity for CO2 stored underground will in the future be concentrated primarily in the North Sea region (within Denmark and the Netherlands), and if business circumstances permit, also in the Adriatic and Black Seas[15] . Underground storage of CO2 on land remains socially unacceptable in the EU.

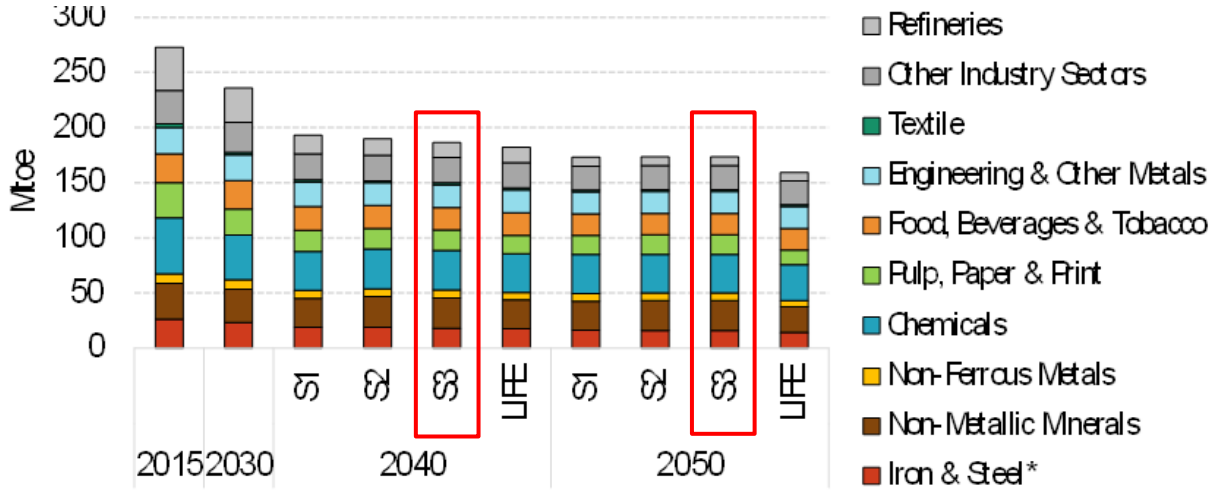
Meanwhile, **S3 assumes a fully developed carbon management industry by 2040**, in which carbon capture will cover all industrial process emissions and provide significant reductions in carbon emissions. Additionally, the EC assumes high production and consumption of e-fuels in this scenario, which will further decarbonise the industrial energy mix.

In addition, S3 assumes **in 2040 75 million tons of CO2[16] negative industrial emissions** due to the assumed development of new BECCS and DACSS technologies (so-called industrial removals). As indicated earlier, these are **technologies that are still practically non-existent, currently in the demonstration stage of several pilots**.

The necessary annual investment in industry associated with the S3 scenario is estimated by the EC as follows: **EUR 48 billion per year over the period 2031-2040 and EUR 22 billion per year over the period 2041-2050 .** [17]

According to the EC's assumptions, final energy consumption in industry will decrease significantly due to increased energy efficiency.

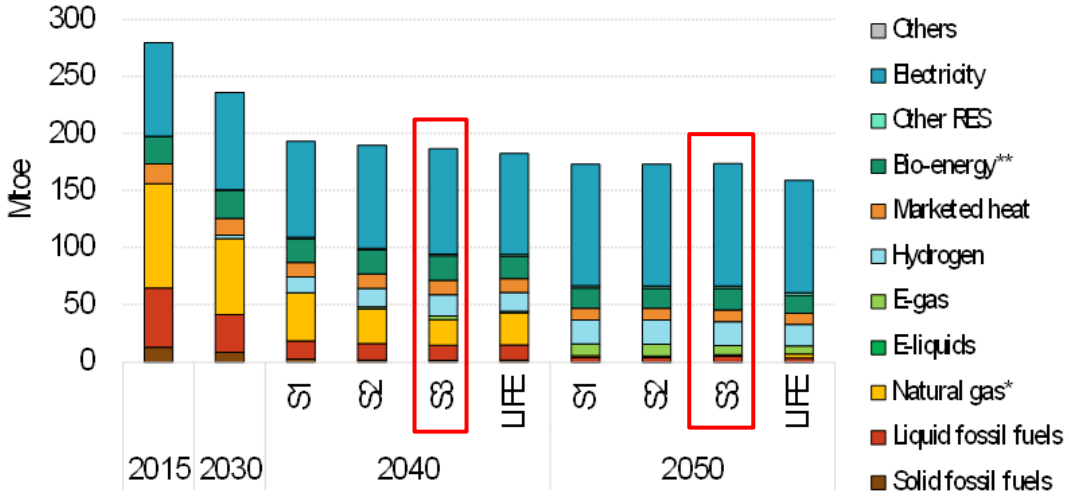
**Figure 7**: Final energy consumption in the period 2015-2050 in industry, by sector (in Mtoe).




**Source:** Impact assessment of the European Commission's 2040 CO2 reduction target .[18]

[15] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 2: page 31.
[16] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 39.
[17] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 57.
[18] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3: page 62.

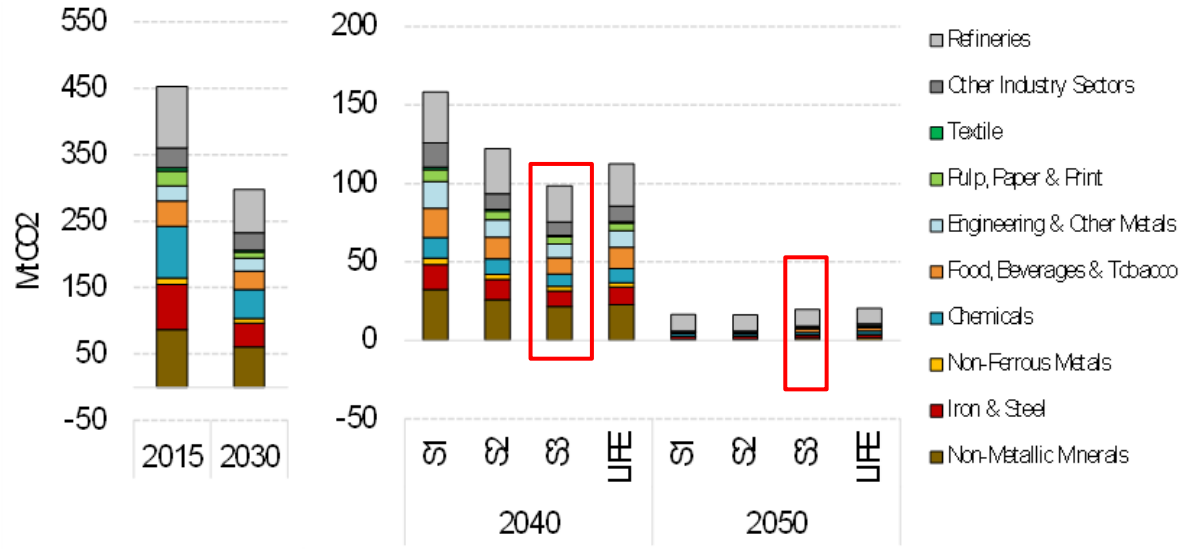
**Figure 8** EU industry energy consumption by fuel.




**Source:** Impact assessment of the European Commission's 2040 CO2 reduction target .[19]

As for the energy consumed in industry, the EC assumes significant electrification of industrial sectors and the elimination of the use of natural gas and liquid fossil fuels as well as coal over time. Their place is to be taken by hydrogen, bioenergy (biomass, biofuels, biogas, biomethane), e-gas and e-fuels.

**Figure 9**: CO2 emissions from energy consumption by industry sectors.

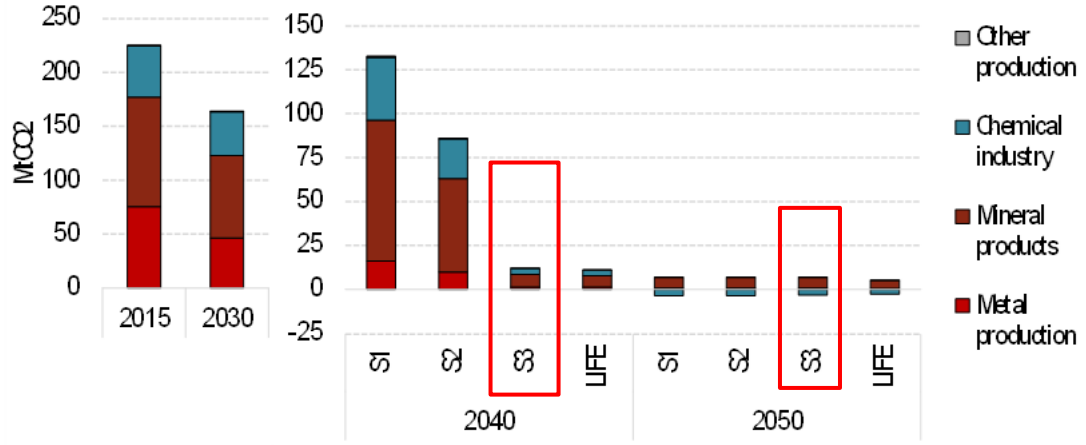



**Source:** Impact assessment of the European Commission's 2040 CO2 reduction target .[20]

In the case of CO2 emissions related to energy consumption, virtually all industries, except refineries, among others, are expected to no longer emit net CO2 in the S3 scenario by 2050.

[19] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3: page 63.
[20] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3: page 65.

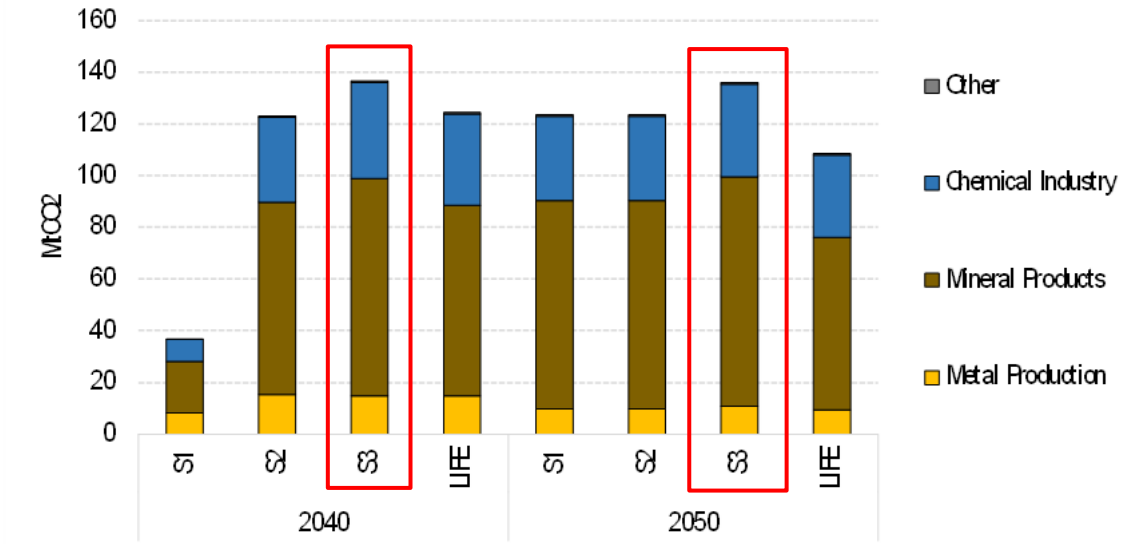
**Figure 10**: CO2 process emissions by industry sectors.




**Source:** Impact assessment of the European Commission's 2040 CO2 reduction target .[21]

Brussels' assumptions for process emissions are similar. By 2050, the chemical industry is expected to generate negative emissions, while positive emissions in net terms are generated by the mineral industry.

**Figure 11**: Captured CO2 emissions by industry (in million tons of CO2).




**Source:** Impact assessment of the European Commission's 2040 CO2 reduction target .[22]

The industrial industries' very low net process emissions are due, among other things, to the EC's ambition to commercialise and widely deploy CO2 capture technologies, especially in the mineral products and chemical industries.

[21] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3: page 65.
[22] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 3: page 66.

# 2. Main regulations of the "Fit for 55" package with the greatest impact on the competitiveness of the energy-intensive industry - qualitative assessment with an outlook to 2030.

## 2.1 The impact of the EU ETS Directive on industry.

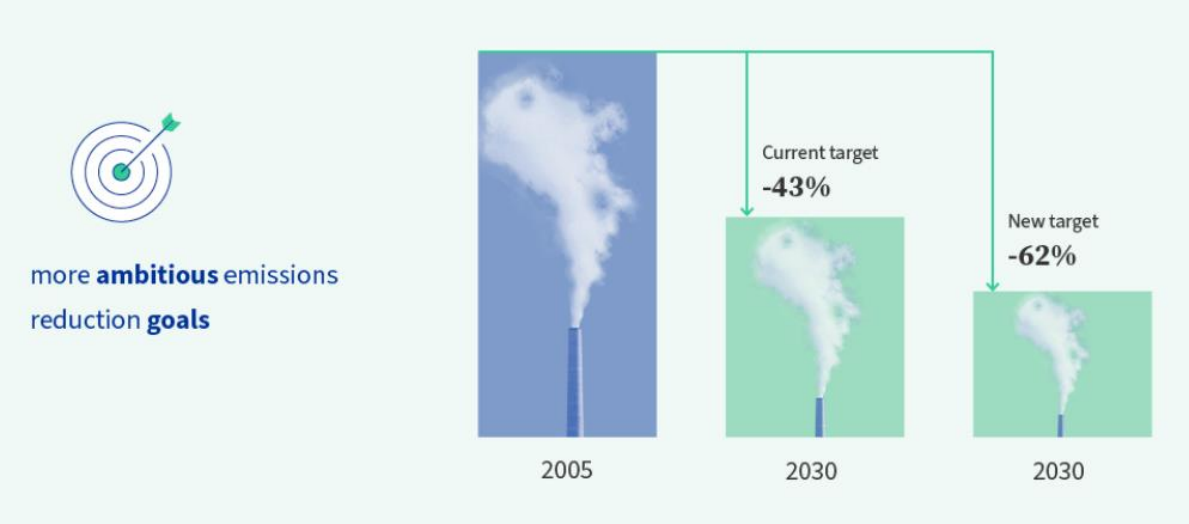
### 2.1.1 New CO2 reduction target for EU ETS sectors - target of 62% reduction in CO2 emissions by 2030 (compared to 2005).

State of play:

As part of the latest revision of the Directive establishing the Union's greenhouse gas emissions trading scheme[23] (hereinafter: ETS Directive) carried out in 2023, **a new CO2 reduction target for the sectors covered by the EU ETS was set at 62% by 2030** (compared to 2005).

This is a significant increase in the reduction ambition for these sectors, including the energy-intensive industries covered by the EU ETS, given that the previous target before the adoption of the amendment to the EU ETS Directive from 2005 to 2030 was 43%.

**Figure 12**: Tightening of the EU ETS emissions reduction target from 43% to 62% by 2030.




**Source:** European Commission infographic.

The tightening of the reduction target in the EU ETS from 43% to 62% will be ensured by **accelerating the rate of annual decline in the EU pool of emission allowances**, as discussed in more detail in Section. 2.1.2 below.

[23] DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (EU) 2023/959 of May 10, 2023. amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading greenhouse gas emissions in the Union and Decision (EU) 2015/1814 on the establishment and operation of the Market stability reserves for the EU emissions trading scheme greenhouse.

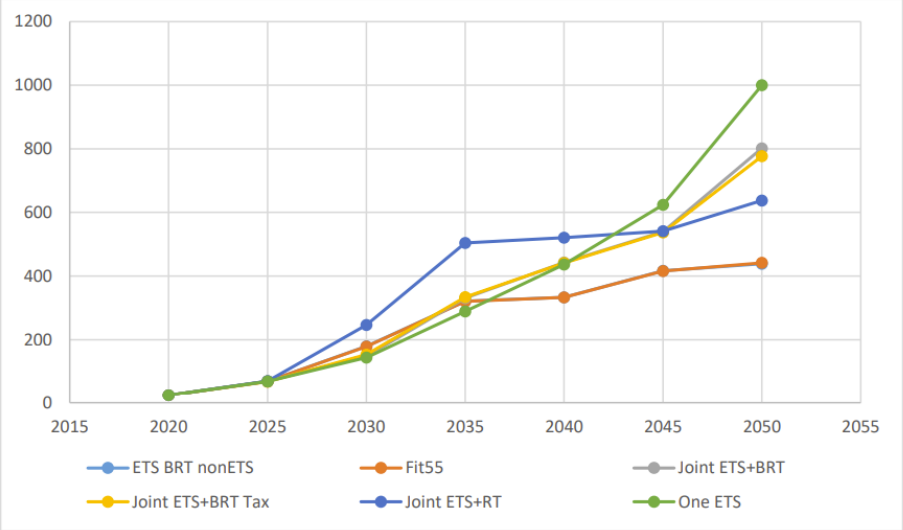
Impact on energy-intensive industries:

The new emission reduction target for EU ETS sectors, tightened from 43% to 62%, will primarily result in a significant reduction in the supply of allowances on the EU ETS market, which, as the linear decline in the EU permit pool continues after 2030, could run out as early as in 2039.

For energy-intensive industries, the main noticeable effect of this change will be **a much higher price for CO2 allowances in the EU ETS market than at present**. Current allowance prices on the spot market on the EEX exchange are around €63/t CO2[24]. Meanwhile, according to the latest analysis by the National Centre for Emissions Management (hereafter: KOBiZE), the projections of the marginal costs of reducing CO2 emissions in the long term, taking into account the new reduction targets of the "Fit for 55" package, are as follows:

**Table 3.** Projected marginal cost of CO2 emission reductions in the EU ETS1 by KOBIZE (in EUR/tCO2) - orange colour in the line graph.

| | EU ETS (Fit55) |
|---|---|
| 2020 | 25 |
| 2025 | 69 |
| 2030 | 179 |
| 2035 | 321 |
| 2040 | 333 |
| 2045 | 416 |
| 2050 | 441 |




Source: https://climatecake.ios.edu.pl/wp-content/uploads/2023/03/CAKE_VIIEW_Changing-the-scope-of-the-EU-Emissions-Trading-System.pdf, p. 45.

To sum up, **current CO2 allowance prices could increase almost threefold - from €63/tCO2 today to €179/tCO2 by 2030**, i.e. in just six years.

The new 2030 reduction targets **could also result in a decrease in free allowances issued to energy-intensive industries** on the basis of product benchmarks, if the number of free allocation under the benchmarks is found to be too high in relation to the total availability of the EU ETS cap.

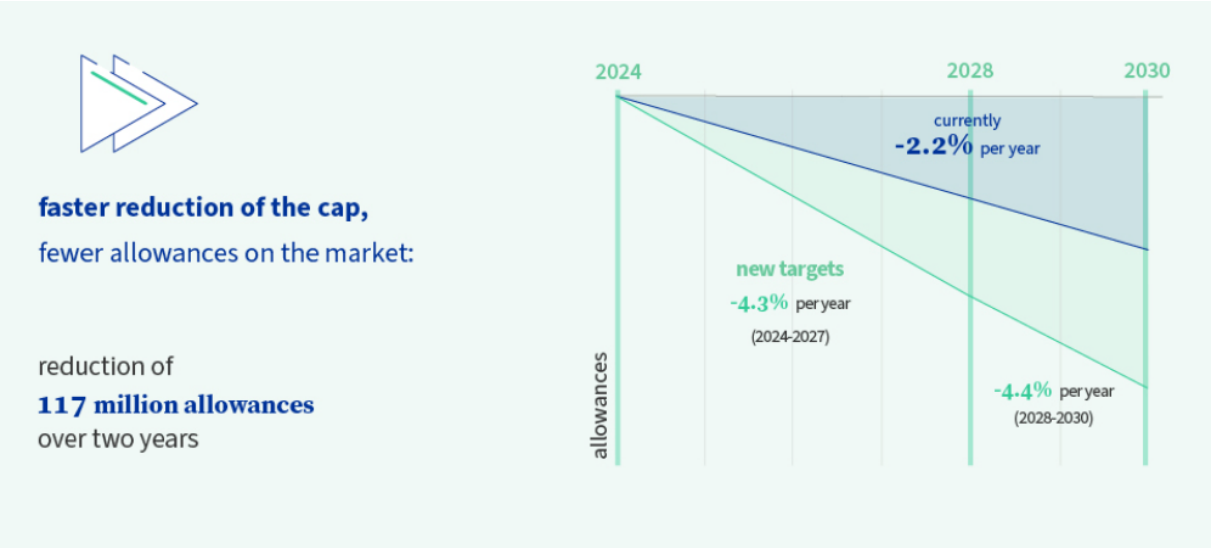
[24] EEX spot quotes as of November 6, 2024.

## 2.1.2 Impact of LRF curve decline on EU ETS allowance supply and possible future reforms to replenish it from 2040 onwards

State of play:

According to the rate of decline of the CO2 allowance pool curve adopted in the revised EU ETS Directive in 2023 - resulting from the tightened reduction target - there will be **an acceleration of the decline of the EU ETS allowance pool from the current 2.2% to 4.3% per year in 2024-2027 and 4.4% in 2028-2030**. After 2030, the annual rate of decline of the allowance pool is to be maintained at 4.4%, according to the infographic below.

**Figure 13:** A faster decline in the supply of CO2 emission allowances after the latest EU ETS reform.




**Source:** European Commission infographic.

Increasing the linear percentage rate of annual reduction in the EU permit pool from 2.2% to 4.4% will, in effect, as indicated above in point. 1 on the analysis of the impact of the 90% emission reduction target by 2040 – lead to **the depletion of the ETS cap already in 2039.** Such a rapid decrease in the supply of permits is the main source of the expected drastic increases in their prices as in the above-mentioned KOBIZE forecast - vide Table 3.

Impact on energy-intensive industries:

As a result of the implementation of the latest revision of the EU ETS Directive, there will be fewer and fewer allowances in the ETS, which will affect their high price in the medium and long term, according to KOBiZE analyses, which are in the mainstream of analyses by leading think tanks in the EU.

The conclusions for energy-intensive industries in terms of the decline in the *Linear Reduction Factor* (LRF) are the same as those made earlier in terms of raising the emission reduction target for EU ETS sectors.

In view of the predictable trend of a steady increase in CO2 emission allowance prices, which is aimed at forcing the implementation of new technological solutions – such as CCS/CCU

technologies, electrification of industrial processes, or bioenergy – industries should include in their long-term strategies **cost analyses related to the economically necessary conversion to new technologies**. The basis for this should be the emission allowance price paths assumed by the European Commission and leading think tanks and the expiration of the EU ETS cap before 2040.

An alternative solution for some industrial plants may be to exit the EU ETS by converting generation sources to biomass. Starting in 2026, there will be a requirement that at least 95% of an installation's emissions come from the use of biomass that meets environmental sustainability criteria in order to leave the EU ETS. **Once the operator demonstrates that the installation's emissions from the use of RED II-compliant biomass exceed the threshold of 95% of total emissions, the installation will be allowed to exit the EU ETS**.

This should take into account the risk of potential further changes to the EU ETS Directive, the next revision of which will begin in 2026, aimed at trying to limit the possibility of installations exiting the system. For example, another revision of the EU ETS exemption regulations for biomass installations is possible, depending on the scale of the exit of installations from the system.

It is also possible that the 20 MW threshold for fuel combustion installations in the EU ETS may be reduced in the future. According to the revised EU ETS Directive (Article 30(5b)[25] ), by July 31, 2026, the European Commission is required to submit a report to the European Parliament and the Council of the European Union (with a legislative proposal and an impact assessment, if appropriate) covering, among other things, **the feasibility of lowering the thresholds of 20 MW of total rated thermal input capacity from 2031** for the activities listed in Annex I of the EU ETS Directive.

### 2.1.3 Rebasing and the impact on CO2 allowance prices.

State of play:

In order to meet the new CO2 reduction target for 2030 in the latest revision of the ETS Directive the EU institutions decided to remove a total of 117 million EUAs (*European Union Allowance*) from the EU ETS market (so-called rebasing) in two tranches - 90 million EUAs in 2024 and 27 million EUAs in 2026.

The main purpose of rebasing is to bring the EU ETS allowance pool into line with the new emissions reduction target set in the "Fit for 55" package - i.e., a 55% reduction in emissions by 2030 vs. 1990 (including a 62% reduction in EU ETS emissions by 2030 vs. 2005).

[25] " By 31 July 2026, the Commission shall report to the European Parliament and to the Council on the following matters, accompanied, where appropriate, by a legislative proposal and impact assessment (...) (b) the feasibility of lowering the 20 MW total rated thermal input thresholds for the activities in Annex I from 2031."

Impact on energy-intensive industries:

The impact of rebasing on CO2 prices in the outlook to 2030 will be "bullish" due to the total withdrawal of a total of 117 million allowances from the system already by the end of 2026 and the associated additional decrease in market supply.

Additional conclusions for the industry resulting from rebasing are the same as those in Section 2.1.2.

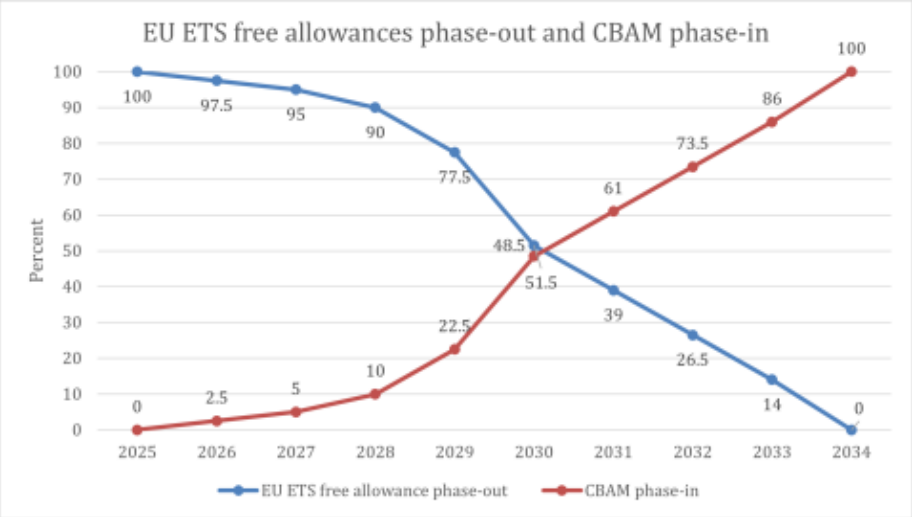
## 2.1.4 Implementation of the CBAM mechanism in conjunction with the phasing out of free CO2 allowances by 2034.

State of play:

The introduction of the *Carbon Border Adjustment Mechanism* (CBAM) - i.e., a system of border fees on CO2 emissions for industrial imports into the EU - is planned in conjunction with the phasing out of free CO2 permit allocations for European industries covered by it.

According to the revised ETS Directive, **free allocation of allowances to industrial sectors covered by the CBAM mechanism will come to an end in 2034**. After the end of the current pilot phase, initially, i.e. from 2026 to 2028 - due, among other things, to political and commercial uncertainties in the acceptance of CBAM by the EU's global economic partners, free allowance allocations will decline relatively slowly, with 90% of permits still allocated for free in 2028. From 2029, the rate of annual decline is expected to accelerate significantly to reach zero in 2034 - as in the chart below.

**Figure 14**: The rate of percentage decrease in the pool of free allowances for energy-intensive industries (blue) with the gradual introduction of CBAM (red).




**Source**: International Carbon Action Partnership, https://icapcarbonaction.com/en/news/eu-adopts-landmark-ets-reforms-and-new-policies-meet-2030-target.

As of October 2023, the CBAM Regulation[26] came into force and the mechanism began operating in a transitional phase (covering 2023-2025), with the first reporting period for importers ending on January 31, 2024. In this phase, CBAM covers imports in industries where production involves high CO2 emissions and the greatest risk of carbon leakage, i.e.: **cement, iron and steel, aluminum, fertilizers, electricity and hydrogen**.

**Figure 15:** A simplified diagram of the CBAM mechanism.


**Source:** European Commission infographic.

The purpose of the transition period is to pilot all stakeholders (importers, manufacturers and administrative bodies) and collect information on embedded emissions in order to refine the methodology for the period of full implementation of CBAM from 2026. During the transition period until the end of 2025, importers of goods covered by the new regulations will only have to report the GHG emissions embedded in their imports (direct and indirect emissions), without having to buy and redeem CBAM certificates. Indirect emissions will be included in the scope after the transition period for certain sectors (cement and fertilizers), based on a specific methodology.

Before the end of the transition period at the end of 2025, the European Commission is to submit a report to the European Parliament and the Council on the application of the CBAM Regulation, taking into account, among other things, the **possibility of extending the mechanism to further industries and indirect emissions**, emissions from freight transport, or progress in international discussions on climate action.

**Starting in 2026, EU importers of CBAM goods will be required to buy CBAM certificates**. The price of certificates will be correlated with the weekly average auction price of EU ETS allowances. EU importers will declare the emissions included in their imports and will be required to redeem the corresponding number of certificates each year.

[26] REGULATION (EU) 2023/956 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 10 May 2023 establishing a carbon border adjustment mechanism.

Impact on energy-intensive industries:

**The gradual move away from free CO2 allowance allocations** carried out in parallel with the introduction of CBAM - combined with the trend of expected significant price increases in the EU ETS, discussed earlier - **will increase the operating costs of energy-intensive industries, especially after 2028, when allocations to CBAM-covered sectors will begin to fall drastically, leading to their eventual elimination in 2034**.

At the same time, it is currently unclear to what extent the CBAM mechanism will prove effective in protecting the competitiveness of these industries, given the **growing opposition of the EU's global partners to its introduction and application to goods imported into the EU, led by the US, China, or India**. The U.S. presidential election, which ended in a victory for Donald Trump, is likely to intensify Washington's reluctance to respect CBAM. China, on the other hand, is one of several countries that have already formally expressed concerns within the World Trade Organization (WTO) about the application of the CBAM mechanism.

In addition, **CBAM does not include export protection for European energy-intensive industries in the form of export rebates**, which EU industries unsuccessfully sought during negotiations**. Without export rebates, the CBAM runs the risk of undermining the EU's climate goals and worsening the competitiveness of EU producers in foreign markets**.

Before January 1, 2028, and every two years thereafter, as part of reports to the European Parliament and the Council, the European Commission will assess the impact of the CBAM on the risk of carbon leakage, including with regard to the exports of European energy-intensive industries**, so it is possible that the mechanism could be expanded in the future to include export credits, but this is currently uncertain**.

Measures to support energy-intensive industries that may be subject to carbon leakage will also be reviewed in light of climate policy measures implemented in other major economies. In this context, **the European Commission will also consider whether measures to compensate EU industries for indirect costs under the EU ETS should be further modified**.

If the EC finds that CBAM is working adequately, **further proposals to reduce and/or ultimately eliminate compensation to EU industries for energy costs can be expected in the future**.

Under the current EU ETS Directive, up to 25% (or more if justified) of all revenues from the auctioning of a national pool of CO2 emission allowances under the EU ETS can be allocated by Member States for this type of compensation, which is used in Poland, among other countries.

There are also doubts about the assessment in terms of an even climate burden on the part of EU partners, given that **the emission trading system operates only in a small part of non-EU countries, and where it works CO2 allowance prices are much lower than in Europe**.

## 2.1.5 The pace of transfer of surplus allowances to the stabilisation reserve (the so-called MSR - Market Stability Reserve).

State of play:

EP and Council Decision 2023/852 of April 19, 2023[27] **maintains the previous high level of annual transfer of surplus allowances to the** *Market Stability Reserve* (MSR) - i.e. **24% of allowances in circulation annually will go to the MSR until 2030**, which is another "bullish" regulatory factor for the EU ETS. Once in the MSR, allowances are permanently deleted from the EU ETS market.

The revision of the Decision additionally shifts the MSR mechanism to the new EU ETS 2 (which will include buildings and transport from 2027).

**Table** 4. Annual allowance contributions from Member States' national EUA pool to MSR.

| EU ETS country | 2021 | 2022 | 2023 |
|---|---|---|---|
| AT | 5 563 187 | 6 345 090 | 5 555 134 |
| BE | 9 228 856 | 10 525 966 | 9 215 496 |
| BG | 6 531 499 | 7 449 497 | 6 522 044 |
| CY | 874 285 | 997 166 | 873 019 |
| CZ | 14 108 876 | 16 091 870 | 14 088 451 |
| DE | 80 029 579 | 91 277 689 | 79 913 725 |
| DK | 5 005 490 | 5 709 009 | 4 998 244 |
| EE | 2 225 742 | 2 538 569 | 2 222 520 |
| EL | 11 888 232 | 13 559 116 | 11 871 023 |
| ES | 30 610 010 | 34 912 228 | 30 565 697 |
| FI | 6 682 443 | 7 621 657 | 6 672 769 |
| FR | 21 881 211 | 24 956 603 | 21 849 536 |
| HR | 1 513 604 | 1 726 341 | 1 511 413 |
| HU | 4 381 023 | 4 996 772 | 4 374 681 |
| IE | 3 740 851 | 4 266 625 | 3 735 436 |
| IS | 156 001 | 177 927 | 155 775 |
| IT | 37 775 362 | 43 084 666 | 37 720 676 |
| LI | 3 492 | 3 982 | 3 486 |
| LT | 1 100 842 | 1 255 564 | 1 099 248 |
| LU | 438 053 | 499 621 | 437 419 |
| LV | 480 330 | 547 840 | 479 635 |
| MT | 332 525 | 379 262 | 332 044 |
| NL | 13 394 277 | 15 276 835 | 13 374 887 |
| NO | 3 106 500 | 3 543 117 | 3 102 003 |
| PL | 34 583 085 | 39 443 717 | 34 533 022 |
| PT | 6 072 075 | 6 925 501 | 6 063 284 |
| RO | 11 604 041 | 13 234 982 | 11 587 243 |
| SE | 3 246 409 | 3 702 690 | 3 241 709 |
| SI | 1 478 674 | 1 686 501 | 1 476 533 |
| SK | 4 206 047 | 4 797 204 | 4 199 958 |

**Source**: European Commission. [28]

[27] Decision (EU) 2023/852 of the European Parliament and of the Council of 19 April 2023 amending Decision (EU) 2015/1814 as regards the number of allowances to be placed in the market stability reserve for the Union greenhouse gas emission trading system until 2030.

[28] COMMISSION STAFF WORKING DOCUMENT Technical information Accompanying the document Report from the Commission to the European Parliament and the Council on the functioning of the European carbon market in 2022 pursuant to Articles 10(5) and 21(2) of Directive 2003/87/EC.

Impact on energy-intensive industries:

The revision of the MSR parameters is another in a series of regulatory solutions - following the tightening of the reduction target in the EU ETS to 62% and increasing the rate of decline of the LRF curve - with a "bullish" effect on CO2 prices, reducing the risk of a possible temporary oversupply of allowances resulting, for example, from the economic crisis, the early closure of fossil-fuel-based power plants, or the relocation of production outside the EU by EU ETS industries. **The main objective of the new MSR parameters is to keep the price of EU ETS allowances high**.

In addition to its impact on the increase in CO2 emission allowance prices, **the increased volume of allowances drawn into the MSR diminishes national pools of emission allowances, including Poland's, which affects, among other things, the amount of funds going to industry for low-carbon investments, or compensation for indirect costs**. This is because the high parameters of the MSR significantly reduce the domestic pool of allowances available in Poland - in 2022 alone it was as much as approx. 34.5 million EUAs.

Additional conclusions for the industry from the MSR revision are the same as those in Section 2.1.2.

### 2.1.6 Compensation for indirect costs associated with energy price increases.

State of play:

According to Article 10a(6) of the EU ETS Directive, Member States may introduce financial compensation for sectors or subsectors exposed to the risk of carbon leakage due to indirect costs resulting from the cost of obtaining energy. These are costs incurred as a result of the transfer of CO2 allowance prices into electricity prices by generators. Such compensation may be introduced provided that it complies with state aid rules and does not cause undue distortions of competition in the internal market.

Compensation for indirect costs should not be more than 25% of a country's revenue generated from the auctioning of allowances. A country may allocate more than 25% of the revenue generated from auctioning allowances, stating the reasons for exceeding this amount in a dedicated report. The report shall also include information on whether due consideration has been given to other measures to sustainably reduce indirect carbon costs in the medium and long term.

**Industry compensation for indirect costs has also benefited the Polish energy-intensive industry for years**, a key instrument for supporting the competitiveness of eligible industries in an era of rising energy prices and emission allowances.

Historically**, the European Commission has sought to limit this type of support for industries, reducing in successive revisions the number of sectors that can benefit from this type of support**. Thus, on the one hand there is pressure on industry to electrify in industries where this is possible, and on the other hand there is a tendency to phase out energy cost compensation. Energy prices in the EU, on the other hand, remain high compared to major world economies.

The list of sectors eligible for compensation for indirect costs is defined by the " Guidelines on Certain State Aid Measures in the Context of the Greenhouse Gas Emission Trading Scheme beyond 2021" - in Annex No. 1. There are currently 14 industrial sectors on the list[29] . Some of them, such as hydrogen and aluminum, are already covered by the CBAM mechanism during the transition period (2023-2025), and **it is possible that they may be excluded first from the list eligible for compensation under the next revision of the EC Guidelines**.

Impact on energy-intensive industries:

The trend of gradual reduction by the European Commission of the list of sectors eligible for indirect cost compensation is evident in successive revisions of the EC Guidelines. At the same time, further reductions in the list can be expected in connection with the implementation of the CBAM mechanism, which is ultimately intended to cover indirect emissions. As a result, **Brussels is likely to argue that sectors covered by CBAM no longer need to be supported through energy cost offsets**.

In the first instance, this may affect sectors already covered by the CBAM mechanism in the transition phase and at the same time on the list of those eligible for compensation for indirect costs - i.e. for the aluminum and hydrogen industries. Nevertheless, **in view of the planned extension of the CBAM measure to new energy-intensive industries in the EU, at a later stage, one can expect EC action aimed at further reducing or even eliminating support for rising energy costs altogether**, analogous to the trend of phasing out free CO2 allowances, which is already in the adopted "Fit for 55" legislative package.

An additional complication is the **imminent expiration of support under the Polish government's "Natural Gas and Electricity Price-Related Assistance to Energy Intensive Industries" program**, which was made possible by the Temporary Crisis Framework (TCF) announced by the EC in the wake of the war in Ukraine. The TCFs allowed for more flexible provision of state aid by EU countries in the wake of the energy crisis and spikes in fuel and and electricity prices.

The EC has extended **the term of the TCF ultimately until the end of June 2024 -** It is unclear at this point whether such assistance will still be possible after the new College of Commissioners begins its work, and **the current legal framework does not provide for it**.

[29] https://eur-lex.europa.eu/legal-content/PL/TXT/?uri=CELEX%3AE2021X0415%2801%29.

## 2.1.7 The ability of industries to absorb funds from the auction of emission allowances, the Modernisation and Innovation Fund as compensation for the costs of climate policy.

State of play:

The EU ETS Directive provides support for energy transition investments from the Modernization Fund and the Innovation Fund financed by funds raised from EU ETS allowance auctions, which are also available to energy-intensive industries.

The area of investments financed by the Modernization Fund, which can also be made by energy-intensive industries, includes the production and use of electricity from renewable sources, including renewable hydrogen, reduction of industrial energy consumption, and energy storage. Less affluent countries, including Poland, which is its main beneficiary in the EU, are eligible to use the Fund.

Basically, the Modernization Fund (MF) is fed with a pool of 2% of the total number of allowances in the EU ETS over the 2021-2030 period. The latest revision of the EU ETS Directive further increased the size of the MF - intended for energy transition for less wealthy countries. The MF was increased by an additional pool of 2.5% of EU ETS allowances, but new countries were included in this pool at the same time: Greece, Portugal and Slovenia. In total, therefore, it is a pool of 4.5% of the entire amount of allowances in the EU ETS for the period 2021-2030.

The total MF budget for Poland until 2030 is estimated by the government administration at around PLN 60 billion - but it could be significantly lower or higher depending on the development of emission allowance prices.

The increased Modernization Fund, in which Poland has the largest share, will focus on investments related to accelerating the development of RES, both on the generation side, energy storage and grid development - without much support for new gas-fired power plants or the nuclear power program.

At least 80% of the funding in the 2% basic pool and 90% in the additional pool of 2.5% additional FM funds will have to go to investments from the priority list, i.e., development of, among other things: RES, energy efficiency, energy grid, or just transformation in coal regions. Absent from this list are investments in gas or nuclear technologies.

The 2023 revision of the ETS Directive also strengthened the Innovation Fund (IF) by increasing it from the previous 450 million allowances, to 530 million allowances. Total IF funding depends on the carbon price, and according to the EC's assumptions could amount to around €40 billion over the 2020-2030 period, as calculated assuming a carbon price of €75/tCO2.

The Innovation Fund also covers industrial sectors, including innovative energy storage and renewable energy technologies, as well as carbon capture and utilization (CCU), CO2 capture, transport and geological storage (CCS), especially for unavoidable emissions from industrial processes, or direct atmospheric CO2 capture (DACCS).

The financed investments should be placed in EU locations evenly distributed geographically to provide technical assistance to Member States with low participation to date - such as Poland.

Impact on energy-intensive industries:

The additional resources for industries resulting from the establishment and subsequent increase in size in the subsequent revision of the EU ETS Directive of the Modernization and Innovation Fund are a positive element of legislative solutions for the process of industrial energy transition.

Nevertheless, it should be emphasized that **many projects of different scales and a range of industries**, led by the energy sector, **are competing for funds from the Modernization Fund in Poland.** Some of the programs, in turn, are aimed at households or local governments.

In Poland, the National Environmental Protection and Water Management Fund has created about 30 priority programs operationalizing the MF, **of which only a few are available for large energy-intensive industry** - Cogeneration for Energy and Industry, Energy Intensive Industry - RES, Energy Intensive Industry - Energy Efficiency Improvement.

**In the case of the Innovation Fund, the availability of funds for domestic energy-intensive sectors is even more limited due to barriers to technology development and the high cost of new innovative solutions**. Suffice it to mention that to date, only one Polish CCS project has received funding from the IF. [30]

**The scale of the burden** of the rising cost of CO2 allowances and the steady reduction in the volume of free allowances, coupled with the reduction in the list of sectors eligible for compensation, **is disproportionate to the available resources under compensation mechanisms** and the funds discussed above.

## 2.2 RES Directive - impact on energy-intensive industries.

State of play:

The Renewable Energy Sources Directive[31] (hereafter: RES Directive), amended in 2023, introduced **a mandatory EU-wide target of increasing the share of RES in gross final energy consumption to 42.5 percent in 2030**.

The Directive does not contain mandatory targets for individual countries, but in accompanying documents the European Commission includes expected national contributions to the EU target. The EU target collectively consists of the electricity generation, transportation and heating sectors. This is **a significant increase on the previous target in place before the "Fit for 55" package, which was 32 percent at the EU-wide level**.

For energy-intensive industries, in addition to the need to contribute to the increased target for the share of RES in final energy consumption, other obligations under the RES Directive relating specifically to these industries will also be crucial.

Thus, **industries will be required to increase the share of renewable sources by at least 1.6 percentage points as an annual average calculated for the years 2021-2025 and 2026-**

[30] Holcim 's CCS project at Cuyahoga Cement Plant.
[31] Directive of the European Parliament and of the Council (EU) on the promotion of the use of energy from renewable sources.

**2030**. Member States may credit waste heat and waste cooling for an annual average increase of up to 0.4 percentage points under conditions specified in the Directive.

Another quantitative commitment for industries concerns the use of hydrogen. **According to the revised RES Directive, at least 42% of hydrogen consumed in industry should come from non-biological renewable fuels by 2030, and by 2035 it should already be 60%**. A Member State can reduce the share of non-biological renewable fuels by 20% by 2030 after meeting the conditions set forth in the RES Directive.

In addition, the RES Directive provides for an increase in the share of renewable energy and waste heat and cooling in heating and cooling systems.

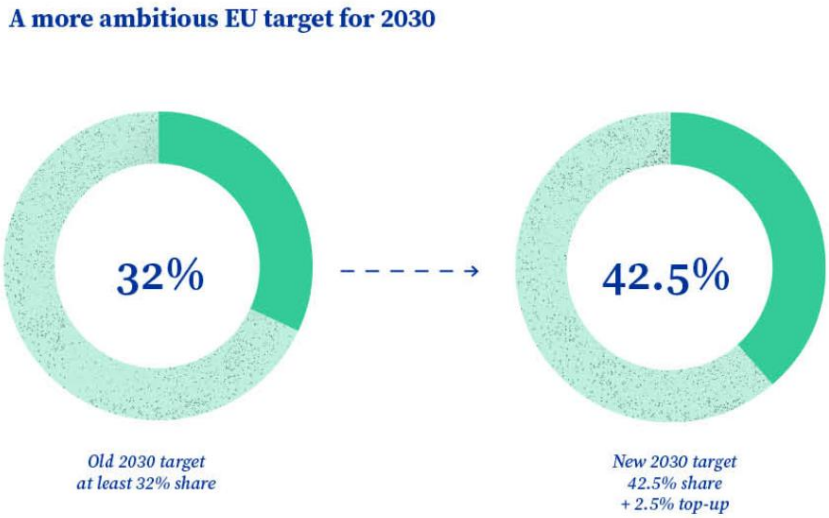
Importantly for industrial CHP plants, the RES Directive refers to the provisions of the Energy Efficiency Directive, revised as part of the "Fit for 55" package[32] , which **provides for a change in the definition of efficient district heating systems** aimed at **phasing out heat produced from fossil fuels in favour of RES**. This is important from the point of view of eligibility for state aid support, since only installations that meet the definition of efficient district heating systems can apply for it.

According to the RES Directive, in 2035 the share of renewable energy sources or waste heat in such an efficient system will already have to be at least 35% and will continue to gradually increase. In addition, **new coal-based CHP installations will not meet this definition, and gas-based installations only until 2030**.

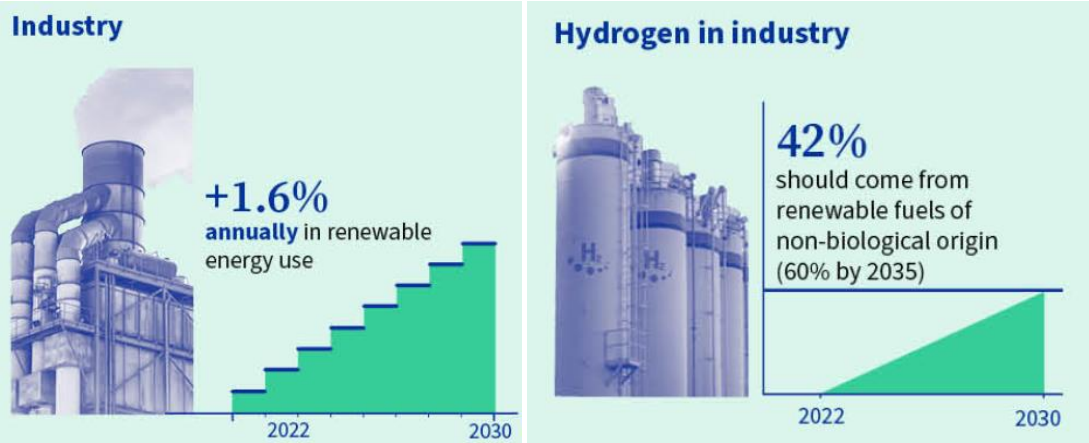
The RES Directive also provides for **restrictions on biomass power and heat generation** - including stricter sustainability criteria for biomass facilities and the principle of using biomass for energy purposes only as a last resort (the so-called cascading principle).

In the context of investment in new renewable electricity generation capacity, the Directive provides for **faster permitting and relaxed environmental obligations for new RES installations** and introduces the treatment of such projects as investments of overriding public interest.

**Figure 16**: Main RES Directive obligations for industries related to tightening the 2030 RES target, increasing the share of RES in industry and renewable hydrogen.




[32] DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL (EU) 2023/1791 of September 13, 2023.
on energy efficiency and amending Regulation (EU) 2023/955 (recast).




**Source:** infographics from the European Commission.

Impact on energy-intensive industries:

Translating the EU target for the share of RES in final energy consumption into Poland's expected contribution - Poland should reach at least 32% by 2030 - as indicated by the EC in its recommendations to Poland's draft National Energy and Climate Plan (hereafter: NECP) - submitted to Brussels in the baseline version (the so-called WEM scenario - *with existing measures*).

It can be assumed that the final Polish NECP will include a RES share in line with the expected contribution from the EC, given that the currently consulted draft NECP in the ambitious scenario (WAM - *with additional measures*) includes a target of 32.5% for Poland by 2030.

Such a contribution will imply **a significant increase in RES consumption in industry as well, both on the side of electricity generation facilities and in the consumption of hydrogen derived from non-biological renewable fuels**.

In addition, as energy consumers, **industries will bear the higher costs of the support system for the development of renewable-based installations under the RES fee paid to generators** when market energy prices are lower than the prices set in bilateral contracts for difference obtained at RES auctions.

The RES Directive will also affect **the acceleration of permitting procedures for RES investments and associated infrastructure carried out by industries in Poland**, including investments in the development of energy storage and grids.

For Polish industrial CHP plants, **the hurdle will be limiting the possibility of using biomass for power generation**, which could be particularly challenging, as cost-effective alternatives to natural gas are limited in this segment. This is because the new RES Directive introduces **restrictions on power and heat generation from biomass through stricter sustainability criteria for this fuel**.

Support systems for biomass energy are to be designed in such a way as to avoid using environmentally unsustainable biomass and undermining the competitiveness of the wood sector. In this context, **lawmakers established the so-called cascading principle with a list of priority uses of woody biomass, according to which bioenergy comes almost at the very end**. Member States may deviate from this principle only in limited cases - if, among other things, they prove that it is necessary to ensure security of energy supply. This could

hypothetically be the case in Polish district heating, where there are limited alternatives to biomass when it comes to moving away from fossil fuels.

In addition, it will not be possible to receive support for new and retrofitted biomass installations for the sole purpose of producing electricity from woody biomass, unless such energy is produced in a just transition region or the installation is equipped with CO2 capture and storage.

The agreement also restricts support for certain types of biomass used for energy purposes. Direct financial support will in principle be prohibited for energy produced from the use of forest biomass in the form of sawlogs, veneer, industrial grade roundwood, and stumps and roots.

At the same time, the **sustainability criteria threshold for biomass facilities was lowered to 7.5 MW.**

Another challenge will be the **growing[33] requirements for the use of RES in CHP plants** due to the change in the definition of an efficient district heating system.

## 2.3 IED Directive - impact on industry.

State of play:

As part of the European Green Deal, the Commission has announced a review of EU measures to reduce pollution from large industrial installations.

The IED[34] covers some 50,000 industrial installations, which account for about 20% of total air emissions, about 20% of water emissions and about 40% of greenhouse gas emissions in the EU.

[33] Article 26 of the EED: 1. In order to ensure more efficient consumption of primary energy and to increase the share of renewable energy in heating and cooling supply going into the network, an efficient district heating and cooling system shall meet the following criteria: (a) until 31 December 2027, a system using at least 50 % renewable energy, 50 % waste heat, 75 % cogenerated heat or 50 % of a combination of such energy and heat; (b) from 1 January 2028, a system using at least 50 % renewable energy, 50 % waste heat, 50 % renewable energy and waste heat, 80 % of high-efficiency cogenerated heat or at least a combination of such thermal energy going into the network where the share of renewable energy is at least 5 % and the total share of renewable energy, waste heat or high-efficiency cogenerated heat is at least 50 %; (c) from 1 January 2035, a system using at least 50 % renewable energy, 50 % waste heat or 50 % renewable energy and waste heat, or a system where the total share of renewable energy, waste heat or high-efficiency cogenerated heat is at least 80 % and in addition the total share of renewable energy or waste heat is at least 35 %; (d) from 1 January 2040, a system using at least 75 % renewable energy, 75 % waste heat or 75 % renewable energy and waste heat, or a system using at least 95 % renewable energy, waste heat and high-efficiency cogenerated heat and in addition the total share of renewable energy or waste heat is at least 35 %; (e) from 1 January 2045, a system using at least 75 % renewable energy, 75 % waste heat or 75 % renewable energy and waste heat; (f) from 1 January 2050, a system using only renewable energy, only waste heat, or only a combination of renewable energy and waste heat.
2. Member States may also choose, as an alternative to the criteria set out in paragraph 1 of this Article, sustainability performance criteria based on the amount of GHG emissions from the district heating and cooling system per unit of heat or cold delivered to the customers, taking into consideration measures implemented to fulfil the obligation pursuant to Article 24(4) of Directive (EU) 2018/2001. When choosing those criteria, an efficient district heating and cooling system shall have the following maximum amount of GHG emissions per unit of heat or cold delivered to the customers: (a) until 31 December 2025: 200 grams/kWh; (b) from 1 January 2026: 150 grams/kWh;(c) from 1 January 2035: 100 grams/kWh; (d) from 1 January 2045: 50 grams/kWh; (e) from 1 January 2050: 0 grams/kWh.

The main obligation is the need for each industrial installation to have an integrated permit issued by the competent authorities of the Member States. Permit conditions must meet general principles and obligations, **in particular, consistency of permit conditions with BAT** (Best Available Technologies) **conclusions** and the reference documents defining them (so-called BREFs) **is necessary**.

The concept of available techniques has been defined as techniques with a degree of development that allows their implementation in a given industrial sector, according to existing economic and technical conditions, taking into account the costs and benefits, **regardless of whether such techniques are used or have been developed in the Union, as long as they are available to the operator**.

The IED requires operators of industrial installations to use BAT Conclusions, which define the best available techniques they must implement, to ensure they are consistent with the European Union's climate goals. The goal is also to arrive at a climate-neutral, circular economy.

The revised IED introduces the concept of environmental performance limits to be set by the competent authorities in the permit allowing the operation of the installation.

One of the main changes in the IED, which was amended in 2024, was the reversal of the previous default approach of national integrated permit issuing authorities, which until now have often adjusted the *Emission Limit Values* (*ELVs*) applicable in permits to the upper range, i.e., the least restrictive of possible emission standards.

In the future, the competent authority is to determine, in principle, **the strictest achievable ELVs as a result of the application of BAT**[35]. This will be preceded by an analysis of the feasibility of meeting the strictest BAT emission standard and demonstrating the best overall performance that the installation can achieve.

The technical feasibility assessment will have to be conducted by the operator, who will have the opportunity to argue that the most restrictive emission values are not feasible and economically reasonable. The IED does not introduce any rules regarding the timing of such feasibility assessments or how they will be transparently made available and subject to public scrutiny.

The most important elements of BAT reference documents and emission standards based on the best available techniques in a given industrial sector are adopted through a committee procedure in the so-called Seville process. BAT threshold values are set for specific industries such as the energy industry, metal production and processing, chemical industry, or mineral industry.

**The new emission values in the updated BAT conclusions will take effect at the end of 2028 at the earliest, and around 2030 at the latest** - depending on the timing of the committee procedure.

In order to adapt the provisions of the IED to scientific and technical progress based on the best available techniques, the Commission will adopt delegated acts updating the pollutant

[35] Article 15(3) of the IED: "The competent authority shall set the strictest achievable emission limit values by applying BAT in the installation, considering the entire range of the emission levels associated with the best available techniques ("BAT-AELs") to ensure that, under normal operating conditions, emissions do not exceed the BAT-AELs as laid down in the decisions on BAT conclusions referred to in Article 13(5). The emission limit values shall be based on an assessment by the operator of the entire BAT-AEL range, analysing the feasibility of meeting the strictest end of the BAT-AEL range and demonstrating the best overall performance that the installation can achieve by applying BAT as described in BAT conclusions, having regard to possible cross-media effects" (...).

emission values set for specific industries. Before adopting the delegated acts, the Commission will carry out appropriate stakeholder consultations.

The next revision of the IED is the beginning of the road to tightening emission standards for large industrial installations by updating the BAT conclusions based on the development of best techniques. The industrial activities covered by the IED are contained in Annexes II-VIa.

**The latest revision also covers mining activities** within the scope of the Directive, including in situ processing of industrially produced ores such as **iron, copper, gold, nickel and platinum**. Subject to the Commission's review and legislative proposal, the scope may also be expanded to include industrial minerals.

**The rules for the application of derogations from the application by operators of the emission values included in the BAT conclusions were also clarified**, upon demonstration that the costs of bringing the installation into compliance with the new emission standards outweigh the environmental benefits.

The national competent authority will be required to reconsider the validity of this derogation every four years, and the operator will have to provide a further assessment of the granted derogation based on the concentration of pollutants in the environment. The European Commission will issue an implementing act specifying the methodology for assessing the disproportionality of costs versus potential benefits for BAT derogation procedures.

BAT conclusions after the latest revision of the IED should include **binding environmental performance levels** (including resource efficiency levels) associated with BAT, indicative environmental performance values associated with new techniques, and indicative benchmarks (in other cases) to be included in the environmental management system.

Member States are also to ensure that where harm to human health has occurred as a result of violations of national measures adopted pursuant to the IED, **those affected have the right to seek and obtain compensation for that harm from the relevant natural or legal persons**. Member States may establish limitation periods for bringing actions for damages.

The revised IED further obliges EU countries to require operators of installations **to develop an indicative transformation plan covering their activities by June 30, 2030.** The transformation plan is to include information on how the operator will transform the installation over the 2030-2050 period to contribute to a climate-neutral, circular economy in the Union by 2050.

Impact on energy-intensive industries:

The main potential impact of the implementation of the revised IED in industries will be the **very high costs of bringing emission standards into line with the most stringent ELV standards within the ranges available to national authorities**, if the operators' analysis of their feasibility proves positive, and there is also no justification for taking advantage of the exemptions provided by the Directive.

For example, according to experts, ambitious implementation of the most stringent emission standards in the steel and cement manufacturing sectors, as well as in large combustion plants, could concretely mean that the steel sector will have to install bag filters on all lines to achieve lower <1-15 mg/Nm³ for dust and costly FGD wet desulfurization or regenerative

activated carbon process to reduce SOx emissions below 100 mg/Nm³ and SCR deNOx secondary controls to achieve NOx levels below 120 mg/Nm³[36] .

For coking plants, this could mean requiring wet oxidative desulfurization to achieve residual hydrogen sulfide levels below 10 mg/Nm³, achieving SOx levels below 200 mg/Nm³ (instead of 500), or dust levels of 1 mg/Nm³ (instead of 20 mg/Nm³), and forcing secondary deNOx upgrading to achieve levels below 350 mg/Nm³ [37].

Cement plants, on the other hand, will have to ensure process upgrades and implementation of SNCR/SCR (Selective Non-Catalytic Reduction and Selective Catalytic Reduction, respectively) to achieve <200 mg/Nm³ instead of levels up to 500 mg/Nm³ for NOx. Standards for SO2 will also be greatly reduced (<50 mg/Nm³ instead of up to 400 mg/Nm³), and to a lesser extent for dust (<10 instead of 20 mg/Nm³) [38].

For large fuel combustion plants, existing gas turbines must meet NOx emission requirements of 10-15 mg/Nm³ (from 50 mg/Nm³), while gas boilers must meet emission requirements of 50 mg/Nm³ (from 100 mg/Nm³). In contrast, turbines using diesel as fuel will have to provide 35 mg/Nm³ (from 60 mg/Nm³), while boilers using diesel or heavy fuel oil (HFO) will have to provide 2 mg/Nm³ (from 20 mg/Nm³). Most of these reductions for NOx will involve additional investment in SCR technologies that can achieve lower emission limits.

In turn, dust emissions from coal/solid fuels should aim for 2 mg/Nm³ (from 8-14 mg/Nm³), SO2 emissions should be 20 mg/Nm³ (from 180 mg/Nm³), and NOx emissions to 85 mg/Nm³ (from 175 mg/Nm³).

[36] European Environmental Bureau: "Revised Industrial Emissions Directive and Regulation Establishing the Industrial Emissions Portal: outcomes and opportunities," p. 6, April 2024.
[37] Ibid.
[38] Ibid, p. 7.

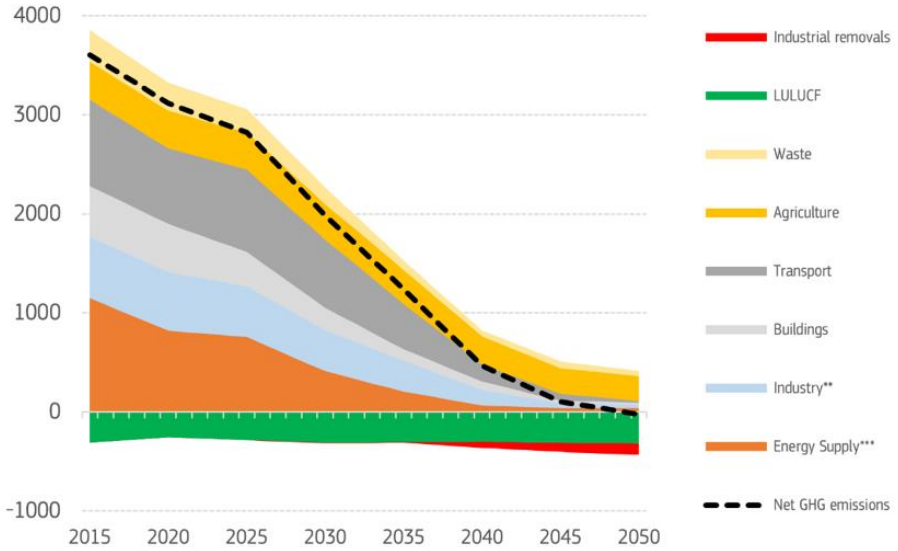
# Summary and conclusions

## 1. Summary of the EC's impact assessment of the 90% reduction target for industry

In the first section of the analysis, the impact of the 90% CO2 reduction target by 2040 on industries is discussed - based on analysis provided by the European Commission.

The impact assessment is done at the EU-wide level and **does not include specific analysis at the Member State level**.

**Figure 1** Historical and projected greenhouse gas emissions for the period 2015-2050 by sector of the EU economy (in million tons of CO2 eq.).




**Source**: European Commission PRIMES model analysis .[39]

The above projections of CO2 emission reductions by sector of the EC economy show that the electricity sector is expected to be virtually decarbonized by 2040, and the remaining sectors, including industry (marked in blue), with the exception of agriculture, are expected to join by 2050. Emissions remaining in the EU economy in 2050 are neutralized by afforestation (LULUCF), CO2 capture and storage or recycling, and CO2 capture from the air.

The main assumption of the impact analysis is **a fully decarbonized electricity sector** in terms of net emissions **already in the 2040 timeframe**. In the scenario of a 90% reduction in CO2 emissions by 2040, Brussels shows even negative emissions of this sector in net terms (-10 million tons of CO2). These emissions, which will still occur, will be neutralized by new installations of net negative emissions like biomass-based CO2 capture and storage technologies (so-called *BECCS - Bioenergy with Carbon Capture and Storage*) and from air (*Direct Air Carbon Capture and Storage* - DACCS).

Renewable energy sources are to be the dominant technology for electricity generation in 2040 - as much as 85% of generation in the Union in 2040. In 2050 it is expected to be as high as 90%.

[39] https://climate.ec.europa.eu/eu-action/climate-strategies-targets/2040-climate-target_en.

The drastic increase in demand for electricity is primarily related to the assumed electrification of other sectors such as industry, transportation, and heating. In 2040, electricity production reaches more than 5,000 TWh, to arrive at almost 7,000 TWh in 2050. This compares with an EU electricity production of about 2,800 TWh in 2022. Nuclear power in 2040 is expected to account for only about 10% of energy production, and in 2050 production from nuclear power already drops to about 7%.

After 2040, only natural gas is left in the EU's energy mix from fossil fuels, with a few percent share, and coal plants are being phased out entirely.

An interesting issue arising from the EC's impact assessment is the projected electricity price paths given. **Wholesale energy prices for industry are virtually stagnant over the 2030-2050 period - at around €130/MWh (**in EUR'23). This phenomenon is not explained more extensively in the documents, and earlier Commission analyses assumed a significant decline in wholesale prices over time due to the transition to energy price determination by RES installations, which are not bearing variable costs.

The persistence of energy prices in the long term at relatively high levels may be a result of the assumption of significant application of CCS technologies in both gas and biomass facilities, whose total generation costs are at similar levels to the assumed energy prices for industry.

As for expected CO2 allowance prices in the 2050 horizon, the European Commission avoids such a direct estimate in its impact assessment. It does, however, present **projected marginal costs of CO2 reductions in the EU ETS**, which can be used as a reference for the required CO2 prices that will bring to the market the necessary new technologies to achieve the reduction targets.

**Table** 1. CO2 values imposed on energy and industry emissions by scenario.

| EUR/tCO2-eq | 2040 | | | | 2050 |
|---|---|---|---|---|---|
| | S1 | S2 | S3 | LIFE | |
| Energy and industry CO2 (PRIMES model) and non-CO2 covered by the ETS (GAINS model) | 160 | 240 | 290 | 250 | 470 |

**Source**: Impact assessment of the European Commission's 2040 CO2 reduction target .[40]

The EC notes in the analyses that the "CO2 values" listed above are used only as modelling factors and are not a forecast of the possible future evolution of CO2 allowance prices. The values expressed correspond to marginal abatement costs per ton of CO2 equivalent.

However, if we translate the CO2 values listed in Table 1 into emission allowance prices, **they should be around 290 EUR/tCO2 in 2040 and as high as 470 EUR/tCO2 in 2050**. This would represent an astronomical increase compared to current levels.

**The European Commission did not indicate in the impact assessment of the 90% target for 2040 a solution to the potential problem of a shortage of emission allowances due to the exhaustion of the EU ETS cap around 2040**. In the impact assessment itself, the EC

[40] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 2, p. 43: https://eur-lex.europa.eu/resource.html?uri=cellar:6c154426-c5a6-11ee-95d9-01aa75ed71a1.0001.02/DOC_2&format=PDF.

generally notes that if the current LRF[41] is not changed after 2030, the ETS pool1 will reach almost zero in 2040.

This raises a key question about the consistency of the assumptions presented in the European Commission's impact assessment, given that **industrial sectors are expected to continue to emit CO2 in 2040, while it is unclear where they will get the necessary allowances to redeem at that time**.

The Commission assumes potential changes in the supply of emission allowances resulting from, for example, the future inclusion of new sectors, or the inclusion of flights leaving the EU. Officials also stress that additional supply of allowances can be created by their generation as a result of CO2 storage technologies, or those generating negative emissions like BECCS and DACCS.

Nevertheless, **it is expected that if there is still a supply of CO2 allowances available in the primary market in the EU ETS in 2040, it will be marginal**.

Scenario S3 (recommended in the EC's analyses) assumes **massive development of carbon capture and storage (CCS), and carbon capture and utilization (CCU) technologies in industry**, which avoids as much as approx. 137 million tons of emissions[42] per year in these industries as early as 2040. As part of the documents presented by the EC in February 2024, in addition to the proposal for a 90% reduction target, there was also a Communication[43] - "Towards an ambitious Industrial Carbon Management for the EU" dedicated to the development of these technologies.

Although a number of industrial projects in CCS/CCU technologies have recently emerged, which are also supported by EU funds in the form of the Innovation Fund under the EU ETS - including one Polish project at the Kujawy Cement Plant - there **is no operational project in the block as of today, and there are a number of uncertainties related to their commercialization in the future.** This is primarily related to uncertainties around the development of CO2 transmission infrastructure and offshore storage sites.

In addition, S3 assumes **in 2040. 75 million tons of CO2[44] negative industrial emissions** due to the assumed development of new BECCS and DACSS technologies (so-called industrial removals). As indicated earlier, these are **technologies that are still practically non-existent, currently in the demonstration stage of several pilots**.

The necessary annual investment in industry associated with the S3 scenario is estimated by the EC as follows: **EUR 48 billion per year in the period 2031-2040 and EUR 22 billion per year in the period 2041-2050 .** [45]

As for the energy consumed in industry, the EC assumes significant electrification of industrial sectors and the disappearance of the use of natural gas and liquid fossil fuels and coal over

[41] Linear Reduction Factor - the downward curve of the CO2 emission allowance pool.
[42] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 39.
[43] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS - Towards ambitious industrial carbon management in the EU, https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:52024DC0062.

[44] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 39.
[45] COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT - Part 1: page 57.

time. Their place is to be taken by hydrogen, bioenergy (biomass, biofuels, biogas, biomethane), e-gas and e-fuels.

In the case of CO2 emissions related to energy consumption, virtually all industries, except refineries, among others, are expected to no longer emit net CO2 in the S3 scenario by 2050.

Brussels' assumptions for process emissions are similar. By 2050, the chemical industry is expected to generate negative emissions, while positive emissions in net terms are generated by the mineral industry.

The very low net process emissions are due, among other things, to the EC's ambition to commercialize and widely deploy CO2 capture and storage or utilisation technologies, especially in the mineral products and chemical industries.

## 2. Summary of the impact of the "Fit for 55" package on the industry

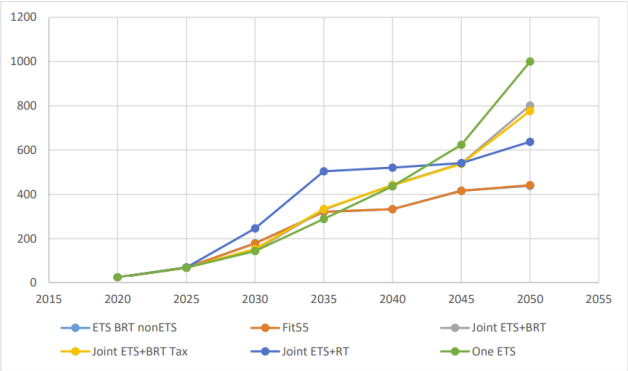
### 2.1 EU ETS Directive

The new emission reduction target for EU ETS sectors tightened from 43% to 62% will primarily affect the supply of allowances on the EU ETS market, which, as the linear decline in the EU permit pool continues after 2030, could run out as early as 2039.

For energy-intensive industries, the main noticeable effect of this change will be **a much higher price for CO2 allowances in the EU ETS market than at present**. Current allowance prices on the spot market on the EEX exchange are around €63/t CO2[46]. Meanwhile, according to the latest analysis by the National Centre for Emissions Management (hereafter: KOBiZE), the projections of the marginal costs of reducing CO2 emissions in the long term, taking into account the new reduction targets of the "Fit for 55" package, are as follows:

**Table 2.** Projected marginal cost of CO2 emission reductions in the EU ETS1 by KOBIZE (in EUR/tCO2) - orange color in the line graph.

| | EU ETS (Fit55) |
|---|---|
| 2020 | 25 |
| 2025 | 69 |
| 2030 | 179 |
| 2035 | 321 |
| 2040 | 333 |
| 2045 | 416 |
| 2050 | 441 |




Source: https://climatecake.ios.edu.pl/wp-content/uploads/2023/03/CAKE_VIIEW_Changing-the-scope-of-the-EU-Emissions-Trading-System.pdf, p. 45.

To sum up, **current CO2 allowance prices could increase almost threefold - from €63/tCO2 today to €179/tCO2 by 2030**, i.e. in just six years.

[46] EEX spot quotes as of November6 this year.

The new 2030 reduction targets **could also result in a decrease in free allowances issued to energy-intensive industries** on the basis of product benchmarks, if the number of free allocation under the benchmarks is found to be too high in relation to the total availability of the EU ETS cap.

### 2.2 CBAM Regulation

**The gradual move away from free allocation of CO2 allowances** carried out in parallel with the introduction of the CBAM mechanism - coupled with the previously discussed trend of expected significant increases in their prices in the EU ETS - **will increase the operating costs of energy-intensive industries, especially after 2028, when allocations to CBAM-covered sectors will begin to fall drastically leading to their eventual elimination in 2034**.

At the same time, it is currently unclear to what extent the CBAM mechanism will prove effective in protecting the competitiveness of these industries, given the **growing opposition of the EU's global partners to its introduction and application to goods imported into the EU, led by the US, China, or India**. The U.S. presidential election, which ended in a victory for Donald Trump, is likely to intensify Washington's reluctance to respect CBAM. China, on the other hand, is one of several countries that have already formally expressed concerns within the World Trade Organization (WTO) about the application of the CBAM mechanism.

In addition, **CBAM does not include export protection for European energy-intensive industries in the form of export rebates**, which EU industries unsuccessfully sought during negotiations**. Without export rebates, the CBAM risks undermining the EU's climate goals and worsening the competitiveness of EU producers in foreign markets**.

Measures to support energy-intensive industries that may be subject to carbon leakage will also be reviewed in light of climate policy measures implemented in other major economies. In this context, **the European Commission will also consider whether measures to compensate EU industries for indirect costs under the EU ETS should be further modified**.

If the EC deems that the CBAM is working adequately, **further proposals can be expected in the future to reduce and/or ultimately eliminate compensation to EU industries for the cost of energy procurement**. Under the current EU ETS directive, up to 25% (or more if justified) of all revenues from the auctioning of a national pool of CO2 emission allowances under the EU ETS can be allocated by Member States for such compensation, which is used in Poland, among other countries.

There are also doubts about the assessment in terms of an even climate burden on the part of EU partners, given that **the emissions trading system operates only in a small part of non-EU countries, and where it works CO2 allowance prices are much lower than in Europe**.

### 2.3 Compensation mechanisms under the EU ETS

The additional funds for industries resulting from the establishment and subsequent increase in size in the next revision of the EU ETS Directive of the Modernization and Innovation Funds are a positive element of the legislative solutions for the process of industrial energy transition. Nevertheless, it should be emphasized that **many projects of**

**different scales and a number of industries**, led by the energy sector, **are competing for funds from the Modernization Fund in Poland**. Some of the programs, in turn, are aimed at households or local governments.

In Poland, the National Environmental Protection and Water Management Fund has created about 30 priority programs operationalizing the MF, **of which only a few are available for large energy-intensive industry** - Cogeneration for Energy and Industry, Energy Intensive Industry - RES, Energy Intensive Industry - Energy Efficiency Improvement.

**In the case of the Innovation Fund, the availability of funds for domestic energy-intensive sectors is even more limited due to barriers to technology development and the high cost of new innovative solutions**.

**The scale of the burden** of the rising cost of CO2 allowances and the steady reduction in the volume of free allocation, coupled with the ongoing reduction in the list of sectors eligible for compensation, is **disproportionate to the available resources under compensation mechanisms** and the funds discussed above.

### 2.4 RES Directive

Translating the EU target for the share of RES in final energy consumption into Poland's expected contribution - Poland should reach at least 32% by 2030. - as indicated by the EC in its recommendations to the Polish draft of the National Energy and Climate Plan (hereinafter: NECP) - submitted to Brussels in the baseline version (the so-called WEM scenario - *with existing measures*). It can be assumed that the final Polish NECP will include a RES share consistent with the expected contribution from the EC, given that the currently consulted draft NECP in the ambitious scenario (WAM - *with additional measures*) includes a target of 32.5% for Poland by 2030.

Such a contribution will imply **a significant increase in RES consumption in industry as well, both on the side of electricity generation installations and in the consumption of hydrogen derived from non-biological renewable fuels**.

In addition, as energy consumers, **industries will bear the higher costs of the support system for the development of renewable-based installations under the RES fee paid to generators** when market energy prices are lower than those set in bilateral contracts for difference obtained at RES auctions.

The RES Directive will also affect **the acceleration of permitting procedures for RES investments and associated infrastructure carried out by industries in Poland**, including investments in the development of energy storage and grids.

For Polish industrial CHP plants, **the hurdle will be limiting the possibility of using biomass for power generation**, which could be particularly challenging, as cost-effective alternatives to natural gas are limited in this segment. This is because the new RES Directive introduces **restrictions on power and heat generation from biomass through stricter sustainability criteria for this fuel**.

Support systems for biomass energy are to be designed in such a way as to avoid using environmentally unsustainable uses of biomass and undermining the competitiveness of the wood sector. In this context, **lawmakers established the so-called cascading principle with a list of priority uses of woody biomass, according to which bioenergy comes almost at**

**the very end**. Member states can deviate from this principle only in limited cases - if, among other things, they prove that it is necessary to ensure security of energy supply.

Another challenge will be the **increasing requirements for the use of RES in CHP plants** due to the change in the definition of an efficient district heating system.

### 2.5 IED Directive

The main potential impact of the implementation of the revised IED in industrial industries will be the **very high costs of bringing emission standards into line with the most stringent ELV standards within the ranges available to national authorities** - if the operators' analysis of their feasibility proves positive and there is also no justification for taking advantage of the directive's exemptions.

For example, according to experts, ambitious implementation of the most stringent emission standards in the steel and cement manufacturing sectors, as well as in large combustion plants, could concretely mean that the steel sector will have to install bag filters on all lines to achieve lower <1-15 mg/Nm³ for dust and costly FGD wet desulfurization or regenerative activated carbon process to reduce SOx emissions below 100 mg/Nm³ and SCR deNOx secondary controls to achieve NOx levels below 120 mg/Nm³[47] .

For coking plants, this could mean requiring wet oxidative desulfurization to achieve residual hydrogen sulfide levels below 10 mg/Nm³, achieving SOx levels below 200 mg/Nm³ (instead of 500), or dust levels of 1 mg/Nm³ (instead of 20 mg/Nm³), and forcing secondary deNOx upgrading to achieve levels below 350 mg/Nm³ . [48]

Cement plants, on the other hand, will have to ensure process upgrades and implementation of SNCR/SCR (Selective Non-Catalytic Reduction and Selective Catalytic Reduction, respectively) to achieve <200 mg/Nm³ instead of levels up to 500 mg/Nm³ for NOx. Reductions in SO2 standards will also be needed (<50 mg/Nm³ instead of up to 400 mg/Nm³), and to a lesser extent for dust (<10 instead of 20 mg/Nm³) . [49]

For large fuel combustion plants, when burning gas, existing gas turbines must meet NOx emission requirements of 10-15 mg/Nm³ (from 50 mg/Nm³), while gas boilers must meet emission requirements of 50 mg/Nm³ (from 100 mg/Nm³). In contrast, turbines using diesel as fuel will have to provide 35 mg/Nm³ (from 60 mg/Nm³), while boilers using diesel or heavy fuel oil (HFO) will have to provide 2 mg/Nm³ (from 20 mg/Nm³). Most of these reductions for NOx will involve additional investment in SCR technologies that can achieve lower emission limits.

[47] European Environmental Bureau: "Revised Industrial Emissions Directive and Regulation Establishing the Industrial Emissions Portal: outcomes and opportunities," p. 6, April 2024.
[48] Ibid.
[49] Ibid, p. 7.