Poland Country Report

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300GOSPODARKA is a Polish discussion platform for leaders in the economic and political sphere. It organizes debates, industry roundtables, and economic conferences. It produces independent analyses, reports, and briefings that meet the highest market standards. Above all, it publishes the information service 300gospodarka.pl, which describes the Polish economy in a global context and the global economy in a Polish context.

The weekly climate magazine 300KLIMAT stands out for the quality of its content, its innovative approach, and its reader base. It provides concise information about the green economy in a global context to those actively involved in shaping the economic and political reality in Poland. The publication highlights connections and dependencies between Poland, its region, the continent, and the world.

Abbreviations

CCS	Carbon Capture and Storage – This refers to the technology of capturing carbon dioxide emissions, typically from large sources like power plants, and storing it underground to prevent it from entering the atmosphere.
CCU	Carbon Capture and Utilization – Similar to CCS, but instead of storing the captured CO2, it is utilized in various applications, such as in the production of synthetic fuels, chemicals, or building materials.
KOBiZE	National Centre for Emissions Management and Balancing – A Polish institution responsible for managing and balancing emissions data, playing a key role in climate and environmental policy.
KPEiK	National Plan for Energy and Climate for 2021-2030 – Poland's strategic document outlining the country's energy and climate policy goals for the period 2021-2030.
LULUCF	Land Use, Land-Use Change, and Forestry – This sector in climate policy accounting encompasses land use and its changes (like deforestation and afforestation) and forestry, significant for their impacts on carbon emissions and sequestration.
OZE	Renewable Energy Sources – This encompasses all energy sources that are renewable, such as solar, wind, hydro, and biomass.
PEP 2040	Polish Energy Policy until 2040 – A policy document that outlines the strategic vision and objectives for Poland's energy sector up to the year 2040.
UE	European Union – A political and economic union of 27 European countries that are located primarily in Europe.
UNFCCC	United Nations Framework Convention on Climate Change – An international environmental treaty aimed at combating climate change and its impacts.

Abstract

This report provides an in-depth analysis of Poland's current climate policies and evaluates their alignment with the European Union's proposed 2040 climate target. It examines key sectors, including energy, transportation, agriculture, and industry, and explores decarbonization pathways for each. The report highlights the challenges Poland faces due to its reliance on coal and the lack of sector-specific emission reduction targets. Recommendations include the urgent need to establish 2040 goals in line with EU commitments, accelerate the transition to renewable energy, and develop Carbon Capture and Storage (CCS) technologies for hard-to-abate industries. The report also emphasizes the importance of public engagement and a just transition for coal-dependent regions. In conclusion, it calls for strengthened policy frameworks and continuous adaptation to ensure Poland meets its climate goals.

Introduction

As the European Union prepares to set its climate target for 2040, Poland will have to revise and amend its policies accordingly. So far, Poland has not officially announced emissions reduction goals in most sectors of its economy.

The European Commission's recommendation of a 90% reduction by 2040 was met with some reserve in Poland. As the climate minister stressed at the time, the statement only opens discussion on a binding goal for the EU.

Before the EC"s statement, the European Scientific Advisory Board on Climate Change had recommended a 90-95% reduction goal for 2050 for the EU as a whole. It has also issued a set of policy recommendations recommended for the goal to be viable. Poland will have to take these into account when planning a new climate policy.

The country's situation may be viewed as relatively difficult when it comes to greenhouse gas emissions. Electricity production is still mostly based on coal and many industries are hard to decarbonize. The carbon-intensive energy sector can however be seen as a leader in terms of climate targets. Green energy transition has been speeding up especially as carbon allowances prices have been rising.

Other sectors lack official emission reduction targets and there is no official pathway to carbon neutrality in Poland yet. Challenges in sectors such as transport, buildings and agriculture have made it difficult to set goals. It is up to the recently elected government to create a more ambitious strategy.

Challenges for policymakers include the relatively high position of hard coal miners as a professional group. Miners' labour unions reached a deal with the previous government to stretch out closing coal mines until 2049.

1. Poland's existing climate targets

Poland has not formally defined a climate neutrality target. Therefore, it should be assumed that it is bound by the target set by the European Union, which would mean climate neutrality by 2050. As part of the mechanisms of the United Nations Framework Convention on Climate Change (UNFCCC), Poland is treated as part of the EU. According to the EU Climate Law, the EU should reduce emissions by 55% by 2030 compared to the 1990 level.

Most of Poland's climate targets are currently set for 2030. These are primarily described in the "National Plan for Energy and Climate for 2021-2030", amended in March 2024. This however is not the final version of the NECP, as it only includes the WEM (with existing measures) scenario. A new version, including the WAM (with additional measures) scenario, is due to be made public later in 2024. In early September 2024, the

Ministry of Climate presented a draft outline of the WAM scenario to industry experts and media. The final version, however, will be published later and subject to consultation.

The National Plan WEM scenario includes the following guidance and goals for 2030:

- A 35% reduction in GHG emissions of the whole economy, including 38% in ETS sectors and 14,1% in non-ETS sectors,
- A 29,8% share of renewable energy sources in final gross energy consumption, including 50,1% in electricity, 32,1% in heating and cooling, 17,7% in transportation,
- A 12,8% reduction in final energy consumption compared to PRIMES2020 guidance.

The WAM scenario guidance and goals are currently outlined as:

- A 50.4% reduction in GHG emissions of the whole economy in 2030 and 70% in 2040
- A 32.6% share of renewable energy sources in final gross energy consumption in 2030, including 56,1% in electricity, 35,4% in heating and cooling, 17,7% in transportation,
- A 13% reduction in the cost of electricity generation by 2030, thanks to a 51% reduction in ETS costs and a 31% reduction in fuel costs.

The highest level energy strategy - "Polish Energy Policy until 2040" (PEP 2040) - assumes that by 2030 there will be a reduction of about 30% in total GHG emissions compared to 1990.

Meanwhile, a draft amendment to this document assumes a reduction in CO2 emissions from the energy sector alone by 65% by 2040. Another, amended draft is expected to be published later in 2024.

Poland has not yet formulated emission 2040 reduction targets in other sectors. However, the need to formulate objectives and plan actions will arise from the implementation of subsequent EU regulations that make up the Fit for 55 package and the current discussion on the bloc’s 2040 goal.

In the period before 2024, the Polish government has more often questioned EU agreements on climate policy than accepted obligations arising from them. The new parliamentary majority in the signed coalition agreement declares cooperation to combat climate change and limit its impact on the lives of Polish residents. The government formed by this majority faces several challenges in this area.

Although the energy sector still accounts for the largest part of emissions, the decarbonization of the transport, building, and agriculture sectors should be considered a particular challenge. According to the Emissions Database for Global Atmospheric Research (EDGAR) report, from 1990 to 2022, emissions in the Polish transport sector increased by as much as 240%. This is a sector largely based on internal combustion engine vehicles.

The share of individual sectors in emissions from 1990 to 2022 according to EDGAR data is shown in the following graph.

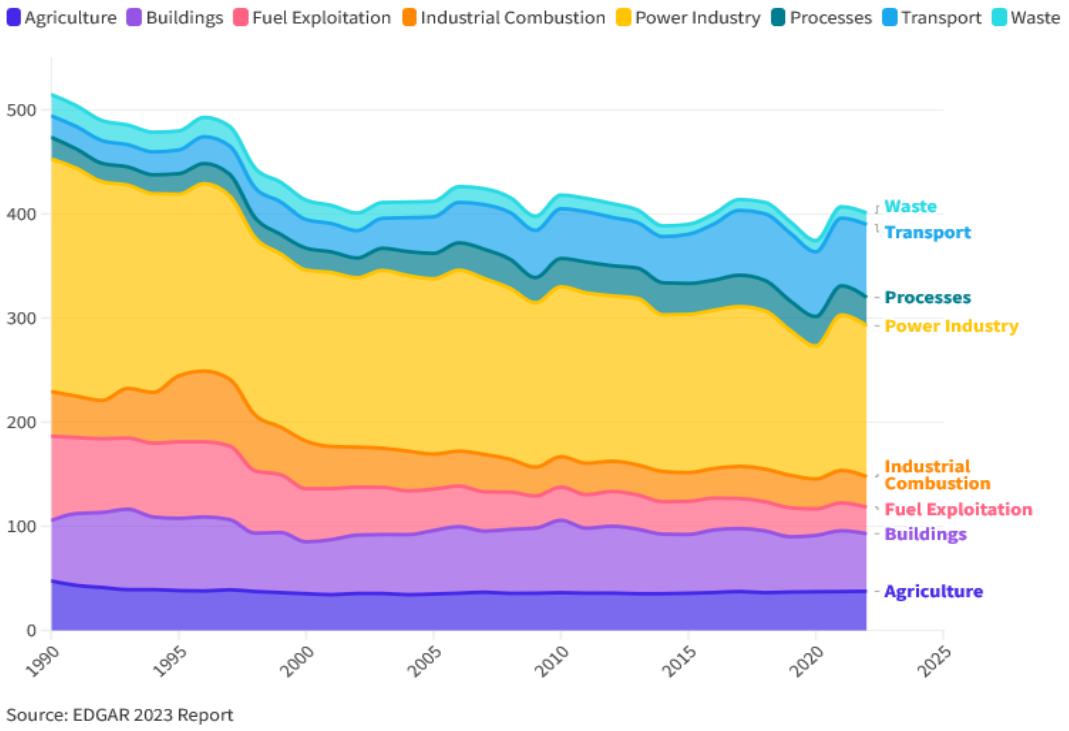


Figure 1.1 Share of individual sectors in emissions from 1990 to 2022

The argument against rapid decarbonization of both the transportation and construction sectors in Poland for many years has been the socio-economic situation of its residents. In the agriculture sector, the challenge is said to be farm fragmentation and the special political significance of farmers as a professional group.

2. The greenhouse gas emission budget

According to estimates by the research group from the Global Carbon Project, the world can emit an additional 380 gigatons of CO2 equivalent if it wants to limit global warming to 1.5 degrees Celsius above pre-industrial levels. Since 1850, 2495 gigatons have already been emitted. As mounting evidence suggests that global warming may pass the 1.5 degree threshold sooner than expected, the carbon budget may have to be revised downwards.

In June 2023, the European Scientific Advisory Board on Climate Change recommended keeping the European Union's greenhouse gas emissions budget for the period 2030 to 2050 within a limit of 11-14 Gt CO2e. According to the Advisory Board, this would mean that the EU should cut down emissions by 90-95% by 2040, compared to 1990 levels.

It's noteworthy that Polish climate policy documents do not make reference to the remaining greenhouse gas emission budget. This budget is an important concept in

climate science and policy, representing the total amount of CO2 or its equivalent that can still be released into the atmosphere while keeping global warming within a certain limit, such as the 1.5 degrees Celsius target set by the Paris Agreement.

The absence of a specific mention of the remaining emission budget in Polish climate policy could indicate a focus on other aspects of climate action, such as setting specific emission reduction targets or developing renewable energy sources, rather than framing policy around the concept of a carbon budget. However, aligning national policies with these global carbon budget estimates is crucial for achieving the collective goal of limiting global warming.

3. The 2040 target and its impact on Poland

The European Union is obliged by the European Climate Law to set a new climate target for 2040. This will be formulated in view of achieving climate neutrality in 2050. In this chapter we discuss what the process would mean for Poland and what the country's own target could look like.

It is worth noting that Poland is currently one of the biggest greenhouse gas emitting countries in the European Union, second only to Germany, as confirmed by data published by Eurostat. This means that its role in fulfilling the EU's climate ambitions is going to be crucial.

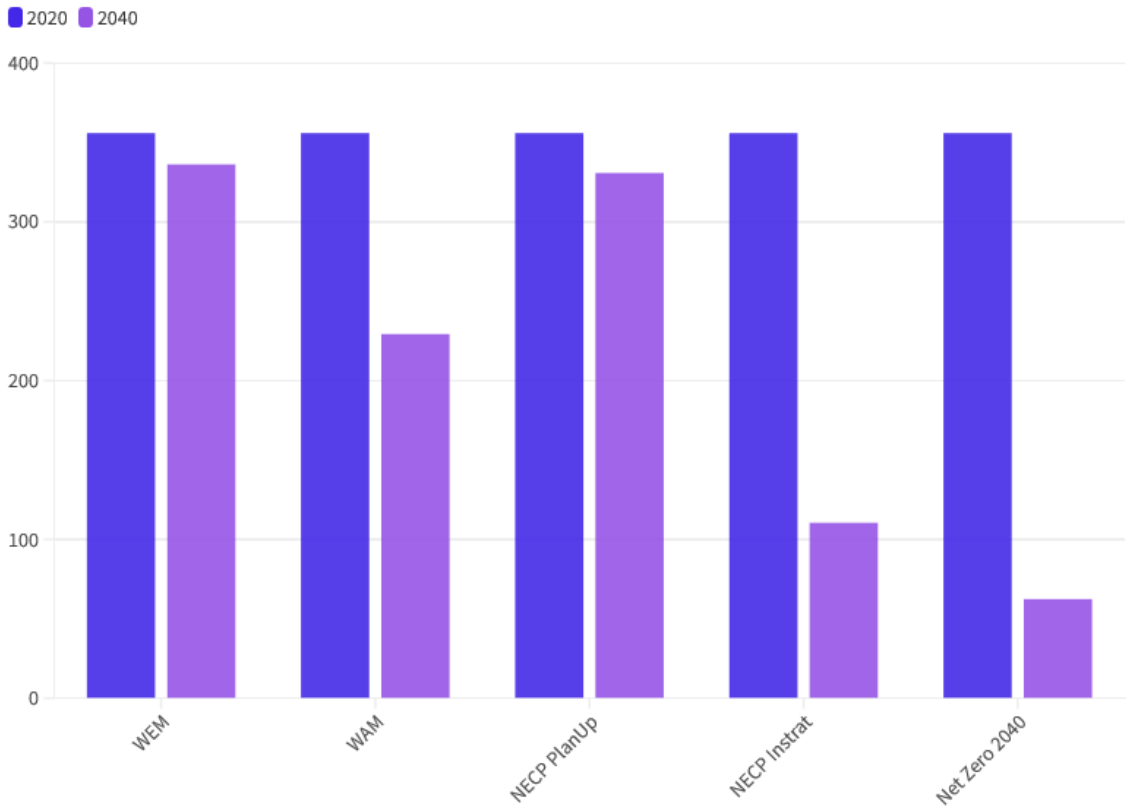
As part of Poland's official climate policy, the National Centre for Emissions Management and Balancing (KOBiZE) published the national report under the UNFCCC framework before COP28. This includes forecasts for the reduction of greenhouse gas emissions.[1]

In the scenario presented in the report, based on current policies, Poland's GHG emissions are projected to decrease by 43% by 2040 compared to 1988, and by 31% compared to 1990. The greatest reduction is expected after 2030. The "with additional measures" scenario assumes that by 2040, Poland's GHG emissions will decrease by 53% compared to 1988, and by 43% compared to 1990.

A number of think tanks and analytical institutions have attempted to create pathways for the country's decarbonisation process. The range of possible climate goals for 2040 spans from 31% as compared to 1990 to 91% compared to 2020. The following graph shows possible reductions in selected scenarios based on calculations from the Climact Pathways Explorer.[2]

[1] "The Republic of Poland. Eighth National Communication and Fifth Biennial Report under the United Nations Framework Convention on Climate Change"

[2] https://pathwaysexplorer.climact.com



As the Pathways Explorer shows, some scenarios are relatively unambitious. The “with existing measures” (WEM) pathway results in only a 5.5% reduction between 2020 and 2040. NECP PlanUp, based on Poland’s existing National Energy and Climate Plan, results in a modest, 7% reduction.

“With additional measures” or WEM is an approximation of the Polish NECP performed by the Instrat think tank, in line with the European Environment Agency’s 2020 WAM scenario. This would result in a 35.6% reduction between 2020 and 2040. NECP Instrat is a more ambitious version of the NECP, modelled by Instrat, and results in a 69% reduction.

Finally, there is a preliminary scenario for Net zero by 2040 in the EU, with 100% of Renewable Energy. This would require emissions in Poland to go down by 82,5% between 2020 and 2040.

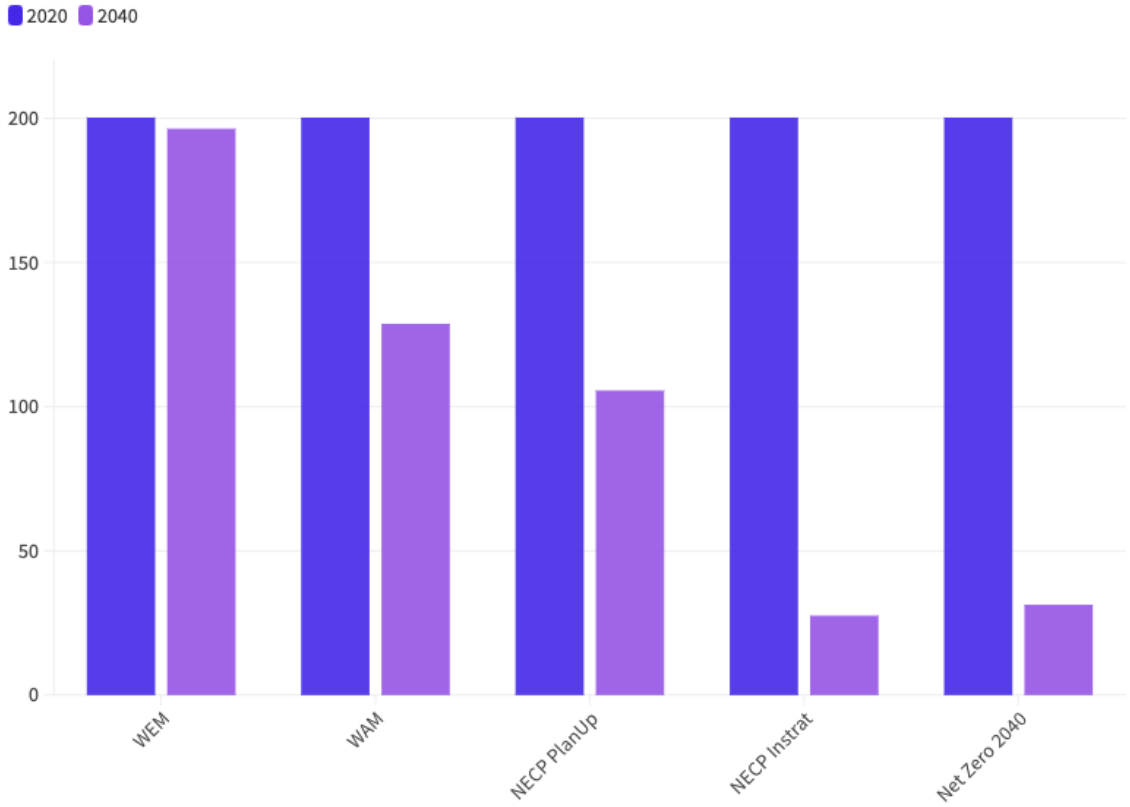
In 2020, international consultancy McKinsey & Company estimated that Poland could become carbon neutral by 2050. This would require emissions to go down by a massive 91% between 2020 and 2050. At the same time the country would have to abate the remaining emissions using carbon sinks. This would however require additional investment of 380 billion euro.[3]

[3] McKinsey & Company, “Carbon-neutral Poland 2050: Turning a challenge into an opportunity”

3.1 Energy sector

The energy sector has been the primary focus in the context of climate goals, as it has the largest share in Poland's total greenhouse gas emissions. In the current version of Poland's NECP, it is expected that the country's energy sector may reduce emissions by about 40% compared to 1990. Possible reduction goals for 2040 range from 30% to around 80% compared to 1990 levels.

When compared to 2020, the Pathways Explorer suggests reduction scenarios of between 2% and 80%.



The reduction target for this sector was set in the "Polish Energy Policy", which is due to be updated. By 2030, emissions are expected to decrease by 30%, and according to proposed changes in the document, by 65% by 2040. This reduction is anticipated to be achieved through the development of both renewable and nuclear energy.

In the report prepared for COP, the National Centre for Emissions Management and Balancing (KOBiZE) estimates that in 2040, emissions from the broadly defined energy sector will amount to 265,017 kilotons of CO2 equivalent under the current policy scenario, and will decrease to 207,300 kt under the additional measures scenario. This would be a respective decrease of 44.34% and 56.46% compared to 476,159 kt recorded in 1990.

Meanwhile, economic think-tank Instrat published a report on the decarbonisation of the Polish energy sector[4] that outlines possible scenarios. The report argues for an ambitious

[4] https://instrat.pl/en/poland-2040/

renewables and nuclear power deployment scenario that would result in a 68% reduction in 2040 compared to 2020 and 80% compared to Poland's 1988 Kioto baseline. It is however important to note that Instrat's projections take into account only the electricity production subsector.

Polish energy sector companies are aware of the need to decarbonize their activities. Some major players, such as oil, gas and electricity group Orlen and major electricity supplier Polska Grupa Energetyczna (PGE) have announced climate neutrality goals for 2050. This, however, does not mean that power plants running on fossil fuels will be closed. The previous government's idea was to place them all in a new state-owned entity, the National Energy Security Agency (NABE). It remains to be seen what will come of the idea under the new parliamentary majority.

A separate challenge is decarbonizing the heating sector, both district and individual. It is a vital issue to keep households warm in the winter season. Today, heating is largely dependent on coal and gas burning. Poland does not have a strategy for this sector yet. District heating providers are aware of the challenges. A study published by Polish Association of Professional Combined Heat and Power Plants estimates that the sector's green transition, as required by the Fit for 55 package, will need between PLN 276 billion and PLN 418 billion in investment.[5]

The individual heating sector will in turn be affected by the EU's developing regulations on the energy efficiency of buildings. While Poland has seen a surge in heat pump sales in 2022, they were still installed in a minority of homes in late 2023.

One of the ESABCC's main recommendations for necessary policies is the phase-out of fossil fuel subsidies. This is an issue of key importance in Poland, which is currently granting subsidies to coal and gas-fired power plants (as part of the country's capacity mechanism), combined heat and power plants and coal mining firms.

3.1.1. Renewable energy

The development of renewable energy in Poland has accelerated in recent years, with the most significant growth observed in photovoltaics, largely due to government support for prosumers.

By the end of 2022, Poland had 22,670.2 MW of installed capacity in renewable sources, including 8,255.9 MW in wind farms and 12,189.1 MW in photovoltaics. Other sources include hydroelectric, biogas, and biomass power plants. By the end of September 2023, the total capacity of renewable energy sources (RES) had reached 27,040.9 MW

According to the Central Statistical Office of Poland, the share of energy from renewable sources (RES) in final gross energy consumption was 15.62% at the end of 2021. The data for 2022 should be available in December 2024. The current target for 2030 is to

[5] Assessment of the impact of the EU „Fit for 55" package on the transformation of the district heating sector in Poland. Report by Polish Association of Professional Combined Heat and Power Plants

reach a 23% share of RES in Poland. However, this target is expected to be increased following the enhancements in the Fit for 55 package, which raised the goal for the entire EU. Calculations by the Energy Forum, a Polish think tank, suggest that the new EU target translates to a contribution of 31.5% from RES in Poland's overall economy by 2030

The NECP stipulates a 50% renewables share in 2030 and the implementation of nuclear power after 2030. According to an earlier draft amendment of the “Polish Energy Policy until 2040” Poland could generate 47% of its energy from renewables in 2030 and 50% in 2040. Also in 2040, Poland is supposed to get 23% of its energy from nuclear power plants. The draft was prepared before the last general elections and it may be replaced with a new document by the new government.

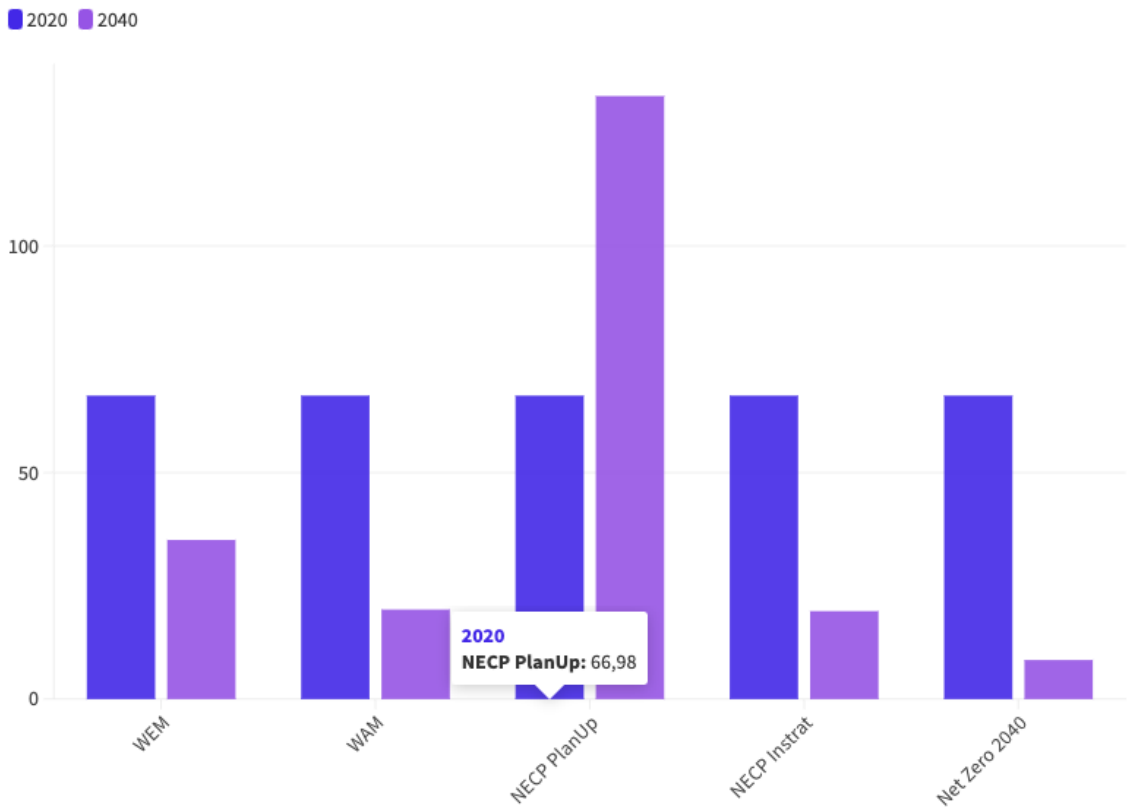
An analysis by the National Centre for Emissions Management and Balancing (KOBiZE) suggests that Poland should increase its renewables share to 50% in 2030 and 70% in 2050. According to the analysis, this would be the best scenario for implementing the Fit for 55 package.

The Instrat report in its turn suggests that Poland could achieve an 84% renewables share in 2040. Nuclear power (14%) and natural gas (5%) would then meet the remaining power demand.

3.2 Industrial sector

An official and comprehensive 2040 target for the industrial sector in Poland has not yet been formulated. The latest version of the NECP suggests a 9% reduction by 2030 compared to 1990. Various analyses take into account different scopes of the country’s industry, making it difficult to compare possible goals.

Scenarios presented in the Pathways Explorer range from an increase in emissions if the current NECP is carried out to a reduction of 87% in the most ambitious version.



The report by the KOBiZE estimates only a slight decrease in emissions from industrial processes by 2040. However, this estimate does not take into account the total emissions from the industrial sector.

McKinsey & Company estimates that Poland's industrial sector could cut down its greenhouse gas emissions by as much as 97% by 2050. This would be achievable by implementing less carbon-intensive solutions in a number of industries, energy efficiency improvements, the electrification of heat generation, green hydrogen implementation, biomass use and carbon capture technologies.[6]

Within the industrial sector in Poland, four energy-intensive industries are of particular importance: metal production, cement production, the chemical sector, and the oil refining and coke production sector. Together, these industries are responsible for approximately 47 million tons of CO2 emissions annually, which corresponds to 81% of industrial emissions and 15% of the total CO2 emissions in Poland.[7]

One of the biggest industrial companies in Poland – copper and silver producer KGHM – has declared its goal of reaching carbon neutrality by 2050. Meanwhile, coal mining remains a challenge to climate policies. Not just because of thermal coal burning in power plants. Another issue is the emission of methane from a number of hard coal mines in the western part of Poland.

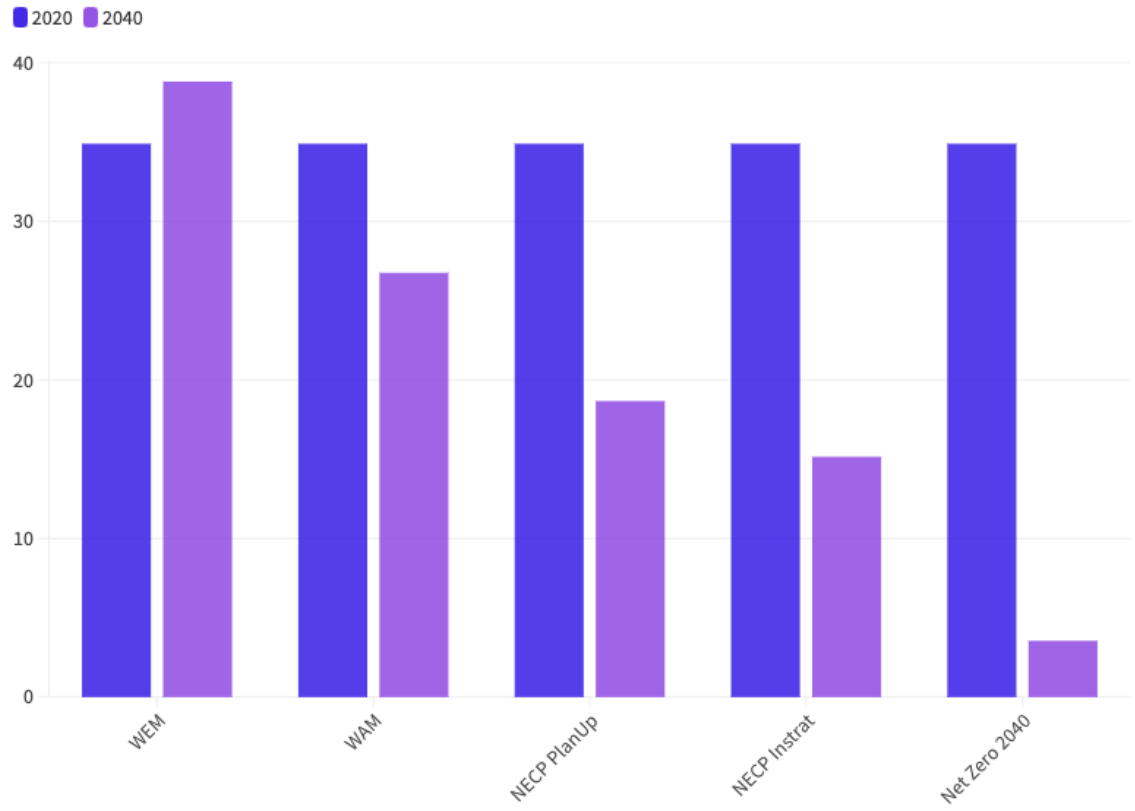
[6] McKinsey & Company, “Carbon-neutral Poland 2050: Turning a challenge into an opportunity”

[7] https://instrat.pl/konteksty-dekarbonizacji-przemyslow-energochlonnych/

3.3 Building sector

The construction sector in Poland is currently not covered by specific regulations or emission targets. It was also not included in a separate forecast in the KOBiZE report prepared for COP. However, with the ongoing discussion in the European Union about including the building sector in the emissions trading system, Poland will need to take action in this direction.

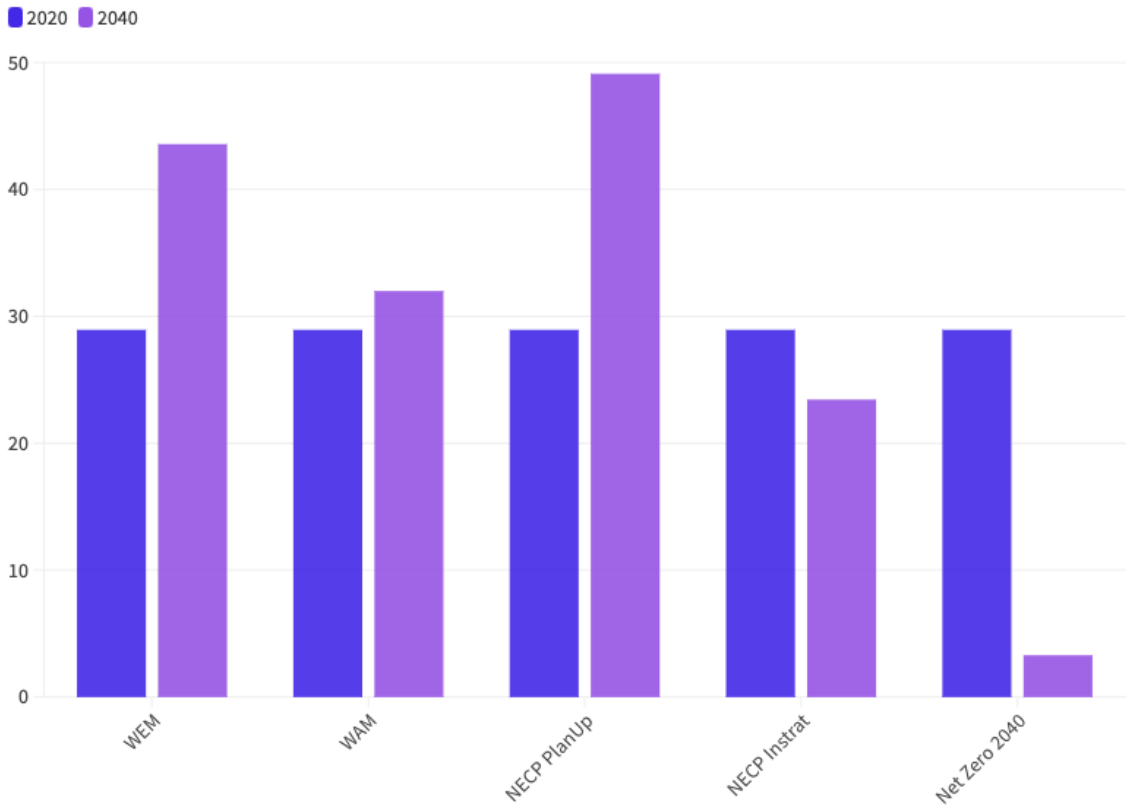
The Climact Pathways Explorer shows that the “with existing measures” scenario would result in an increase in building sector emissions between 2020 and 2040. Meanwhile, in the most ambitious scenario, emissions could decrease by almost 90% in that period.



In practice, the implementation of the revised EU directive on the energy performance of buildings will lead to a reduction in the emissions intensity of the sector. These regulations are already forcing construction firms to rethink the design of new buildings. One budding trend in the installation of photovoltaics not just on individual houses, but also on multi-family buildings.

3.4 Transport sector

There is no comprehensive emission reduction goal for the transport sector. Current policies tend to focus on specific areas. However, the current NECP states that a small reduction in GHG emissions compared to 1990 is possible in 2030.



The "National Plan for Energy and Climate for 2021-2030" includes the objective of reducing the negative impact of transportation on the environment, in line with the directions indicated in the "Strategy for Sustainable Transport Development until 2030."

Two goals have been formulated in this area. The intermediate goal, set to start from 2025, involves reducing the average level of CO2 emissions from new passenger cars and light commercial vehicles by 15% compared to 2021.

The main goal, to be implemented from 2030, is to reduce the average level of CO2 emissions from new passenger cars by 37.5% and from new light commercial vehicles by 31% compared to 2021.

At the same time, the authors of the National Plan for Energy and Climate believe that achieving these goals will be challenging due to the expected further significant increase in transport, especially of goods, as an inevitable result of continued economic development.

Therefore, emission reduction is said to require both optimization of transport needs and the use of the transport system's potential, as well as an increase in the use of alternative fuels. This approach reflects a comprehensive strategy that combines regulatory measures with the promotion of technological innovation and behavioral change in the transport sector.

McKinsey & Company estimates that the transport sector would need to almost fully decarbonize in order for Poland to be carbon neutral in 2050. This would require the use of electric engines, as well as hydrogen as a fuel.[8]

So far Poland's government has implemented few measures aimed at the decarbonization of the transport sector. There has been some focus on electromobility and financial incentives are available for the purchase of electric cars. However, at the end of October 2023, there were only 46 888 battery electric passenger cars in Poland and 44 014 plug-in hybrid passenger cars. The respective number of heavy-duty vehicles was 2 126 and 1 040.[9] Altogether, there are about 20 million cars registered in the country.

The WiseEuropa think tank recommends focusing on more than just the electrification of transportation in a December 2023 report[10]. Its analysts argue that further development and the optimization of public transport is a key component.

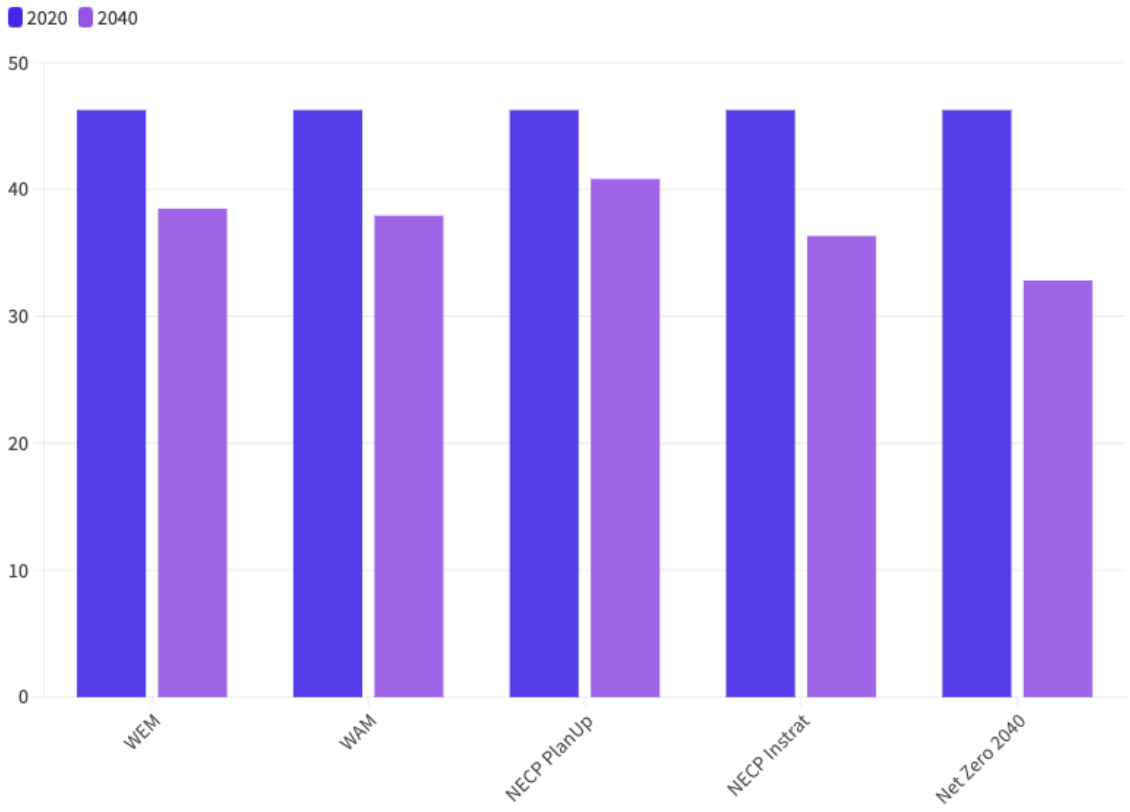
3.5 Agriculture

Agriculture in Poland currently does not have its own emission reduction target. However, the implementation of the EU's Fit for 55 package will necessitate taking action in this area. The latest version of the NECP states that it will be difficult to reduce emissions by 2030 as this “would be synonymous with a reduction in agricultural production and its transfer to other countries.

[8] McKinsey & Company, “Carbon-neutral Poland 2050: Turning a challenge into an opportunity”

[9] https://pspa.com.pl/2023/informacja/licznik-elektromobilnosci-czas-na-elektryfikacje-drogowego-transportu-ciezkiego/

[10] WiseEuropa, “Bez dyrygenta. Instrumentarium dekarbonizacji transportu publicznego”, https://wise-europa.eu/2023/12/28/raport-bez-dyrygenta/



According to the KOBiZE report, emissions in Polish agriculture are expected to continue increasing in the coming years, up to 2040. None of the scenarios presented in the report anticipates a reduction in emissions compared to the 1990 levels.

This situation highlights a significant challenge in the agricultural sector, which is often characterised by its complex relationship with climate change. Agriculture is both a source of greenhouse gas emissions, particularly methane and nitrous oxide, and a sector vulnerable to the impacts of climate change. Addressing emissions in agriculture typically involves a combination of improving efficiency, adopting sustainable farming practices, and potentially restructuring agricultural production.

McKinsey & Company in turn suggests that GHG emissions in agriculture could fall by 5% by 2050 due to a decline in dairy production and in the total area of cultivated land. Further reductions may be achieved by implementing low-emissions land management, replacing fuels and reducing enteric fermentation. Overall, according to the report, Poland should cut down emissions in the sector by 40% by 2050.[11]

In an analysis on the decarbonization of the agricultural sector, KOBiZE notes that this process will require a careful approach and a possible revision of farming methods. It is yet unclear what the EU's approach will be to carbon pricing in the sector. Charging individual farms for emissions would drastically change their financial situation.[12] The authors of this analysis suggest that mitigation measures should include planting forests

[11] McKinsey & Company, "Carbon-neutral Poland 2050: Turning a challenge into an opportunity"

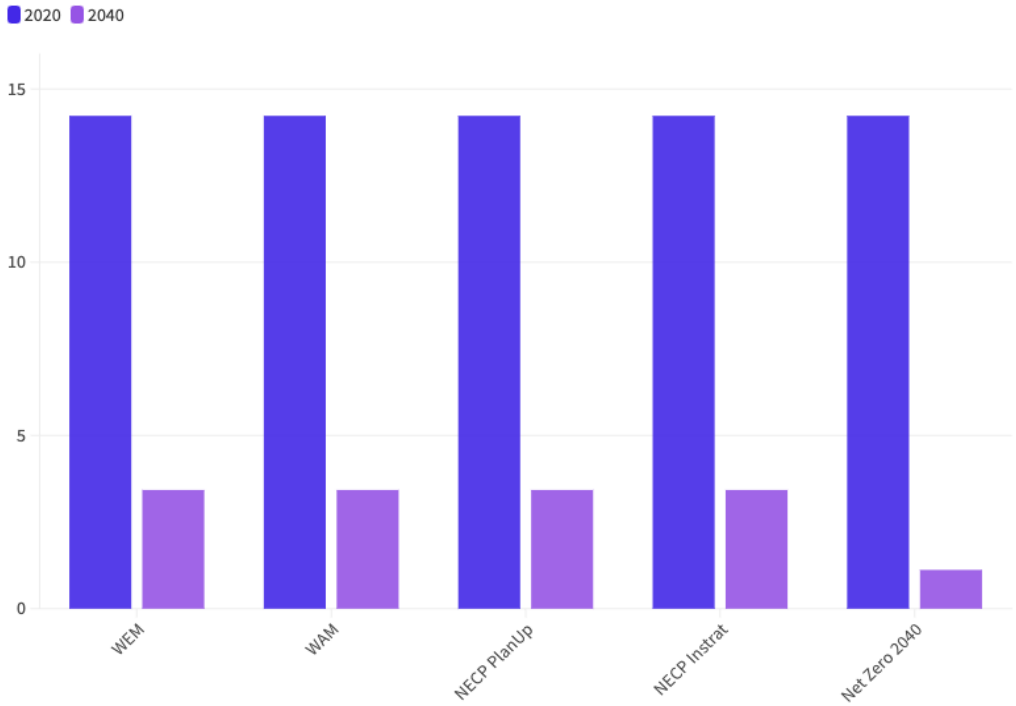
[12] KOBiZE, "Polska net-zero 2050. Wybrane instrumenty wdrażania polityki klimatycznej w sektorze rolnictwa w perspektywie roku 2050"

in agricultural areas and recreating wetlands to absorb emissions, as well as using by-products to produce biogas.

The ESABCC believes that stronger incentives for reductions in agriculture are needed across Europe. An amended agricultural policy should in its view include carbon pricing in the sector and incentives for carbon removal.

3.6 Waste sector

In Poland's waste sector, greenhouse gas emissions have been steadily decreasing since 1990, as environmentally friendly regulations have been introduced.



The projection from the KOBiZE report anticipates that emissions from this sector will decrease by 75% by 2040, regardless of the scenario chosen.

This significant reduction can be attributed to various factors, such as improved waste management practices, increased recycling rates, and the implementation of more efficient technologies for waste processing and disposal. The waste sector's progress in reducing emissions demonstrates the effectiveness of targeted environmental policies and the potential for substantial emission reductions in other sectors with similar concerted efforts.

3.7 LULUCF

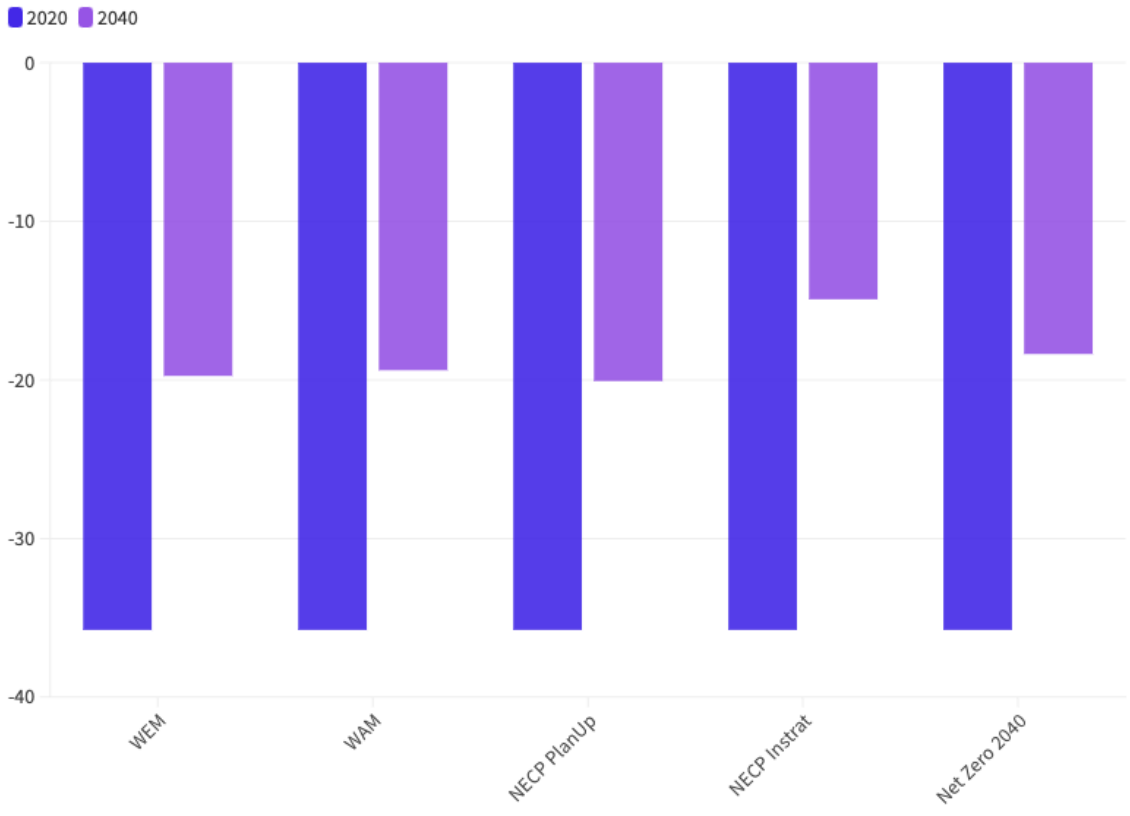
The Land Use, Land-Use Change, and Forestry (LULUCF) sector is unique in that it not only generates GHG emissions but can also absorb carbon dioxide from the atmosphere. EU member states are obligated to balance both types of impacts and maintain accounts of both emissions and absorption.

Starting from 2026, an amendment to the EU regulations concerning LULUCF will come into effect. The EU will aim to achieve a net absorption goal of 310 megatons of CO2 by this sector, broken down into individual targets for member states. Consequently, Poland will need to prepare an action plan in this regard.

This amendment represents a significant step in recognizing and utilising the potential of the LULUCF sector in climate change mitigation. The sector's ability to act as a carbon sink can play a crucial role in achieving overall emission reduction targets. For Poland, this will likely involve measures such as sustainable forestry practices, improved land management, and possibly reforestation or afforestation projects to enhance the sector's capacity to absorb CO2.

According to the latest version of Poland’s NECP, LULUCF will not contribute significantly to reducing GHG emissions by 2030. This is due to the ageing of forests and factors such as wildfires or droughts, Preliminary estimates cited in the document indicate that GHG removals in 2030 may amount to around 6.8 million tonnes of CO2 equivalent.

Possible pathways for LULUCF according to the Pathways Explorer are shown below.



3.8 Carbon Capture and Storage

Carbon Capture and Storage (CCS) and Carbon Capture and Utilization (CCU) technologies are currently a subject of discussion in Poland, and some energy and industrial companies have initiated efforts towards their implementation. However, these technologies have not been included in the National Plan for Energy and Climate.

The absence of CCS and CCU technologies in the National Plan may be due to various factors, such as the nascent stage of these technologies in Poland, cost considerations, or a focus on other mitigation strategies. However, the interest and initial steps taken by energy and industrial companies indicate a growing awareness of the potential of these technologies to reduce greenhouse gas emissions.

CCS involves capturing carbon dioxide emissions from sources like power plants and industrial processes and storing them underground to prevent them from entering the atmosphere. CCU, on the other hand, involves capturing carbon dioxide and repurposing it for use in products or processes, thereby creating a circular carbon economy.

Incorporating these technologies into national plans can significantly contribute to achieving emission reduction targets, especially in sectors where decarbonization is challenging. As the technology develops and becomes more cost-effective, it's likely that CCS and CCU will play an increasingly prominent role in Poland's and the EU's broader climate strategy.

The Polish cement industry has been a keen promoter of investment into CCS technologies. This is due to the fact that carbon dioxide in a by-product in the cement production process. The industry is unable to cut down its GHG emissions just by getting rid of fossil fuels. Some cement producers have already started work on their own CCS technologies.[13]

WiseEuropa, a Polish think tank, estimates that Poland's potential for CO2 storage is high enough to account for 70 years of emissions generated by the energy, district heating and industrial sectors.[14] This potential includes both underground and deep sea storage.

It is worth noting, however, that CCS/CCU technologies have been criticized as being the wrong solution to the world's GHG emissions problem. A report by Oxford University's Smith School of Enterprise and the Environment concludes that heavy dependence on CCS to reach net zero targets around 2050 would be "highly economically damaging". Globally, it could cost at least USD 30 trillion more than a route based primarily on renewable energy, energy efficiency and electrification.[15] The International Energy Agency has also called on fossil fuels companies to focus on emissions reduction instead of carbon capture solutions.[16]

Conclusions and recommendations

Poland must establish clear and comprehensive emission reduction targets for 2040 that align with the European Union's overarching climate goals. The lack of clear long-term targets, particularly in sectors like agriculture and transportation, presents a risk of falling behind EU commitments.

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[13] https://instrat.pl/pas-cementu/

[14] Kamil Laskowski, WiseEuropa, "CCS - konieczny i bezpieczny"

[15] https://www.smithschool.ox.ac.uk/news/heavy-dependence-carbon-capture-and-storage-highly-economically-damaging-says-oxford-report

[16] https://www.iea.org/news/oil-and-gas-industry-faces-moment-of-truth-and-opportunity-to-adapt-as-clean-energy-transitions-advance

Poland needs to urgently develop sector-specific decarbonization pathways. The energy sector, still heavily reliant on coal, should accelerate the adoption of renewable energy sources, aiming for a minimum 50% share of renewables by 2040. The transport and construction sectors should also define clear emission reduction targets and strategies, as their emissions continue to grow without defined policy interventions.

The shift from coal to renewable energy is vital for achieving 2040 goals. The report highlights the necessity for large-scale investments in wind and solar energy, supported by government incentives for prosumers. Additionally, the adoption of nuclear energy post-2030, as outlined in the Polish Energy Policy until 2040 (PEP 2040), remains crucial for Poland's decarbonization efforts.

Considering the challenges in decarbonizing industries like cement and steel, Poland should prioritize CCS technologies. These technologies are seen as critical in the report for capturing and storing emissions that cannot be easily reduced by transitioning to renewable energy alone.

The socio-economic impacts of the energy transition, particularly in coal-dependent regions, must be addressed. The report stresses the importance of involving the public in climate policy discussions and ensuring that affected communities are supported through reskilling programs and economic diversification strategies. A just transition is crucial to maintain public support for Poland’s climate policies.

While the agricultural sector is a significant source of emissions, it lacks defined emission reduction targets. The report recommends adopting more sustainable farming practices and considering policies that encourage carbon sequestration through afforestation and reforestation, as well as reducing methane emissions from livestock.

The Polish government should work towards strengthening its alignment with EU climate packages, including the Fit for 55 initiative. Setting clear regulatory frameworks for sectors not yet covered, like transportation and agriculture, is vital to meeting the 2040 targets.

Given the evolving nature of climate science and technology, the report underscores the need for regular updates to Poland’s climate strategies. Monitoring progress and adjusting policies as needed will be essential to meet both EU and national goals.

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