Capturing Public Trust: Social Acceptance of CCS in Poland

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Executive Summary

Carbon capture and storage (CCS) is a crucial tool for Poland's efforts to both achieve climate neutrality and maintain the competitiveness of its heavy industry. Although Poland possesses significant geological storage capacity and faces an urgent need to decarbonise its hard-to-abate sectors, actions taken by the government to promote public awareness of CCS have remained limited, and social acceptance is uncertain. Without coordinated, long-term initiatives to build trust in local communities and deliver measurable local economic and social benefits, CCS deployment may encounter opposition and delays similar to those experienced by other energy projects in Poland and internationally.

Key findings:

→ CCS is critical for Poland's net-zero emissions goals

It can reduce CO_2 emissions in hard-to-abate sectors such as steel, cement, and chemicals, while preserving jobs and industrial competitiveness and leveraging CO_2 storage potential that is one of the largest in Europe.

→ Social acceptance is a decisive factor

Evidence from previous CCS deployment attempts in Poland and other countries indicates that projects may fail even when they are technically sound and supported by an appropriate regulatory framework if communities perceive risks, including safety and environmental impacts, as outweighing potential benefits or if they feel excluded from decision-making processes.

→ Proactive engagement and transparency are essential for building trust

Early and continuous dialogue, accessible evidence-based information, and visible safety monitoring have shifted public perceptions in successful CCS projects across the globe.

→ Providing a coherent narrative on CCS benefits is essential for local support

Local communities need to receive information on tangible gains, including job creation, infrastructure investment, and community development programs, to foster a "social licence" for CCS deployment.

To align CCS deployment with European Union climate policy requirements, Poland must integrate social acceptance strategies into all stages of its CCS policy and project deployment. This integration necessitates a shift from top-down communication to bottom-up partnerships, focusing on engagement with local communities to ensure transparency of CCS investments and the just distribution of economic and social benefits from them. In the absence of these measures, CCS will remain technically feasible but risk delay or cancellation due to community opposition, potentially undermining Poland's industrial decarbonisation and climate leadership objectives.

SECTION 1

Setting the stage: Poland's industrial challenge and the case for CCS

Public perception of carbon capture and storage (CCS) refers to the awareness, understanding, and attitudes of individuals and communities about the technology. *Social acceptance* goes a step further, referring to the willingness of local communities, stakeholders, and the broader public to support or tolerate the implementation of CCS projects. In practice, social acceptance influences whether a project gains a "social licence to operate," meaning an informal but crucial form of community approval that extends beyond formal and official permits. Without this social licence, even a permitted CCS project can face public opposition, leading to delays or cancellation. Gaining and maintaining social acceptance are therefore as essential as ensuring engineering safety as they represent ongoing public consent to CCS operations.

What is CCS?

CCS is a set of technologies that **capture** carbon dioxide emissions from sources like power plants, cement kilns, steel mills, and other industries before the CO_2 enters the atmosphere. The CO_2 can then be **transported** and **stored** deep underground in geological formations. In simple terms, CCS acts like a filter for heavy industries: it traps CO_2 that would otherwise contribute to climate change and locks it away safely underground. A typical CCS project might involve capturing CO_2 at an industrial facility, compressing it, transporting it by pipeline or ship, and injecting it a kilometer or more beneath the earth's surface into porous rock layers capped by impermeable rock. This storage method prevents the CO_2 from escaping. The goal is to reduce emissions from sectors that are hard to decarbonise by other means. In the climate policy context, CCS is seen as a vital tool for reducing emissions from heavy industry and even achieving "negative emissions" when combined with bioenergy or direct air capture.

Poland is currently **the fourth-largest CO_2 emitter in the European Union (EU)**, largely due to a heavy reliance on coal for power and a sizable base of energy-intensive industries. About 73% of Poland's electricity production still comes from fossil fuels, making its industry sector one of the most carbon-intensive in Europe. At the same time, Poland has committed (as an EU member) to ambitious climate targets for 2030 and aims to achieve climate neutrality around mid-century. This situation creates a dilemma: how to dramatically cut emissions without undermining industries like **cement**, **steel**, **chemicals**, **and refining**, which form the backbone of Poland's economy. These sectors emit roughly **40.6 million tons of CO_2 per year**, about 15% of Poland's total emissions, and are considered "hard-to-abate" because they involve processes (e.g., calcination in cement, blast furnaces for steel) that currently have no zero-carbon alternative.

CCS is widely viewed as a key solution to this challenge. By capturing CO_2 from industrial plants, Poland can reduce emissions while preserving industrial jobs and competitiveness in those sectors. Indeed, analyses suggest that deploying CCS for Poland's heavy industry (alongside efficiency and electrification) would enable the production of **net-zero or near-zero emissions steel, cement, and chemicals**, allowing these industries to continue operating under stricter climate regulations. Moreover, Poland has a strategic advantage in that it has one of the largest estimated CO_2 storage capacities in Europe (comprising saline aquifers and depleted hydrocarbon fields with on the order of 15 gigatons potential). In theory, these geologic sites could store centuries of Poland's emissions, indicating that with general social acceptance, CCS could be scaled up domestically as a long-term climate solution. Poland's climate policy to date has taken a cautious approach, with **limited deployment of CCS** and few research and development pilot projects. However, meeting EU climate milestones — while protecting industrial regions — will likely require a significant scale-up of CCS in the 2025–2035 period. In this context, understanding public perception and building social acceptance in Poland are timely and key priorities.

Successfully implementing CCS hinges not just on technology readiness or cost-effectiveness, but on public perception: specifically, how individuals balance *perceived* benefits against *perceived* losses. Local acceptance is largely shaped by whether communities believe a project's benefits (e.g., job creation, cleaner air, climate gains) outweigh its potential downsides or risks (e.g., safety concerns, environmental impact, financial cost). For instance, if residents fear that injecting CO_2 underground could contaminate groundwater or trigger earthquakes, those perceived risks are experienced as potential losses to their community, regardless of technical assurances to the contrary. Conversely, if local communities perceive that a CCS project will create jobs, attract investment, or prevent closure of a local factory, those anticipated tangible benefits will help build support for the project.

Extensive research and practical experience show that this perceived risk-benefit balance is key to securing a social licence for CCS. In Europe, particularly in regions where public awareness of CCS is low, isolated projects have sometimes met significant resistance fueled by amplified perception of risk — often stemming from a lack of understanding of economic and other benefits, as well as of the safety measures undertaken and the potential for long-term community input regarding the project. Public concerns often come from unfamiliarity: when CCS is new to a particular community of interest, a lack of communication can create space for misconceptions such as exaggerated fears of CO_2 leaking. At the same time, if the benefits are not visible to the human eye (as with long-term climate mitigation benefits) or are not explained in accessible terms, a community might see little reason to accept even minimal perceived risk.

Gaining social acceptance requires shifting the balance toward perceived benefits — or, at minimum, mitigating concerns through trust-building and risk reduction. This strategy underscores the importance of **early stakeholder engagement and honest communication**. Project developers and authorities need to openly communicate what the community stands to gain (economic development, industrial retention, climate leadership, etc.) and how risks will be managed (through robust safety regulations, continuous monitoring, or, if needed, compensation measures).

Experience from past projects shows that failing to address local concerns or providing insufficient information can backfire. Over a decade ago, the CCS project at Poland's Bełchatów power plant suffered from both public and political hesitation and was therefore terminated. These dynamics create a vicious cycle: public skepticism prompts political hesitation or withdrawal of support, which then stalls investment and reinforces public concerns.

The lesson is clear: achieving the necessary scale of CCS deployment in Poland will require aligning technical and organizational plans with a deliberate strategy for public acceptance. Communities must be treated as partners in CCS deployment — well-informed, actively heard, and benefit-sharing partners — instead of reduced to the role of passive audiences for pre-determined decisions.

SECTION 2

The social dimension of Poland's CCS challenge

The EU's Industrial Carbon Management Strategy outlines an ambitious approach to scaling up CO_2 capture, utilisation, and storage in order to meet the EU's 2040 climate objectives. It sets a goal of achieving at least 250 million tonnes of annual CO_2 injection capacity across the European Economic Area (EEA) by 2040. This target builds on the EU-wide objective from the Net-Zero Industry Act (NZIA), which calls for 50 million tonnes of CO_2 storage capacity per year by 2030. In May 2025 the European Commission published a long-awaited Decision that operationalises Article 23 of the NZIA, assigning individual CO_2 storage obligations to 44 oil and gas producers across the EU. It is evident that the period leading up to 2040 will require rapid and substantial growth in carbon capture capacity throughout the EU. The NZIA and the rest of the EU regulatory framework envision the expansion of carbon management technologies, with clear timelines for permitting, developing storage capacity, and integrating the value chain in the coming years. Developers must synchronise investment decisions across capture, transport, and storage components with EU policy goals by mid-2026. The NZIA and the rest of the EU regulatory framework envision the expansion of carbon management technologies, with clear timelines for permitting, developing storage capacity, and integrating the value chain in the coming years. Developers must synchronise investment decisions across capture, transport, and storage components with EU policy goals by mid-2026.

Poland has not built its CCS infrastructure yet. Despite its substantial geological potential for carbon storage and pressing industrial needs, the country faces significant regulatory hurdles that, along with other factors, are slowing CCS deployment. The new legal framework should ease the prohibition on onshore CO_2 storage and offer regulatory and financial support mechanisms that incentivise pioneers to invest in CCS infrastructure. The development of CCS projects typically spans five to ten years, from initial planning to operation, with storage projects alone often requiring a minimum of five years. Without early state support, the necessary infrastructure will not be available in time for emitters that need to capture and store their CO_2. At the same time, the success of any legislative initiative or policy measure will depend on gaining broad public acceptance for CCS. Thus, all stakeholders have to participate in these processes.

Key Stakeholders in CCS Social Acceptance

- **Local Communities (Residents):** People living near CO_2 capture facilities, pipeline routes, and storage sites are the most directly affected by CCS projects, and their support is crucial. Residents will understandably ask, “Is it safe for us, and do we benefit?” Early engagement, transparent communication about their concerns (e.g., noise, traffic, safety), and the offering of local benefits are all essential to community acceptance.
- **Industry and Project Developers:** Companies implementing CCS projects (power utilities, cement or steel companies, etc.) play a key role in acceptance of CCS. They must operate transparently, adhere to high safety and environmental standards, and build trust with the public. How industry behaves — whether they listen to community feedback, for example — heavily influences public perception. Developers can also be champions by visibly highlighting the climate and economic benefits of their CCS projects.
- **Government and Regulators:** Public authorities (the dedicated ministry, local governments, and environmental regulators) set the rules for CCS and ensure safety compliance. They are seen as guardians of the public interest. Strong regulatory oversight, fair permitting processes, and enforcement of safety measures all reassure the public that CCS is being done responsibly. Government agencies also have the power to convene meetings, disseminate evidence-based information, and mediate between developers and communities.
- **Environmental NGOs and Civil Society:** Non-governmental organizations, climate activists, and community groups can significantly shape public opinion on CCS. While some environmental groups support CCS as a climate solution for industry, others remain skeptical, seeing it as a potential means of prolonging fossil fuels. These stakeholders often serve as trusted voices or watchdogs. Early outreach to NGOs, inclusion of independent experts, and prompt responses to any critiques can prevent misinformation and build broader societal buy-in.
- **Media and the General Public:** The media (news outlets, social media, local press) and society at large form the backdrop of CCS acceptance. Media coverage will amplify successes or failures, influencing public sentiment beyond the immediate project area. Transparent communication and science-based public engagement through the media can build understanding and trust. National-level acceptance of CCS — especially seeing it as a positive part of Poland’s climate strategy — can create a more favorable environment for individual projects.

Social acceptance of emerging technologies is closely intertwined with broader societal dynamics and is shaped by an interplay of technological, political, educational, social, economic, and cultural factors. The Barendrecht CCS project in the Netherlands serves as a cautionary tale as its development was halted by a lack of local acceptance, despite meeting all technical and regulatory requirements and receiving government support. The project is frequently said to epitomise the critical role that public perception and community engagement play in the successful or failed implementation of CCS. As the depleted gas fields around this Dutch town were particularly attractive for CO_2 storage, the plan was to store CO_2 there from the oil refinery plant in Pernis. The smaller of the two fields could store about 0.8 million tonnes at a depth of 1,700 m, while the larger one could store about 9.5 million tonnes at a depth of 2,700 m. The idea was to move the CO_2 by pipeline, then inject it underground into the two empty gas fields. Shell, the leading developer, started stakeholder engagement by organising bilateral meetings; initially, there was little opposition. However, the first large public meeting raised safety concerns and questions about why Barendrecht was chosen. Shell took a year to respond to some of the council's questions, which raised suspicions. The national government’s support came late and provided little assistance. Negative narratives fuelled local political opposition. Although Shell provided technical answers to local concerns, the company simultaneously dismissed them as “emotional,”which only exacerbated the situation and led to distrust in Shell’s entire project. Furthermore, many Barendrecht residents were already frustrated as they felt that the project was imposed on them without sufficient real engagement from the investors. In May 2009, the local council rejected the CCS project;

however, the national government overruled them a few months later, an action that led again to strong protests. In December 2009, a public "mediatory" meeting concluded with the ministers being booed and accused of ignoring the local community's will, as expressed in the democratic decision-making process. In November 2010, the Dutch Ministry cancelled the project due to rising social opposition and nationwide support for the protesters' arguments.

This case illustrates how failing to address local concerns and build trust can hinder even a technically sound and well-funded project. Public acceptance and real engagement are key for infrastructure projects like CCS. Without them, projects are likely to fail. The Barendrecht case serves as a reminder to both policymakers and investors that local protests, loss of trust, and dissatisfaction with project plans can undermine otherwise technically and policy-compliant climate initiatives.

Building trust and understanding in local communities, especially those where CO_2 storage sites or transport infrastructure are to be located, is crucial not only for implementation of a single project but is also essential for executing the long-term CCSU strategy. A 2024 survey by EKObarometr found that Poles have a high level of awareness regarding the adverse effects of carbon dioxide on global warming and overwhelmingly agree with the need to mitigate climate change. Indeed, as many as 78% support measures aimed at reducing greenhouse gas emissions.[1] However, public acceptance of the need for emission reductions does not automatically equal acceptance of specific solutions, such as CCS, despite their potential role in Poland's industrial decarbonisation.

According to public perception polling conducted by Clean Air Task Force in August 2023, 51% of respondents in Poland supported CCS in general, while the country also had the lowest opposition to CCS of countries surveyed. However, surveys in Poland conducted by WiseEuropa on behalf of CCS.pl in 2023 found that less than 46% of the respondents could identify sectors in which CCS could be deployed. The EKObarometr 2024 survey also found that public awareness of CCS remains low. Only about 9% of respondents reported knowing what CCS is, with a further one-third having merely "heard of it" in passing, whereas the majority (57%) had never heard of the technology. This gap in understanding demonstrates the need for public education and awareness-raising initiatives among public administration at the local level that focus on the real-world benefits, risks, and limitations of CCS. The absence of such outreach not only perpetuates knowledge gaps but also heightens the risk that CCS projects will encounter resistance at the local level due to misinformation, especially as deployment moves from concept to practice.

Public acceptance of CCS varies considerably across Poland, reflecting both regional disparities and the unique social, economic, and historical characteristics of the affected communities. The 2023 WiseEuropa study mapped support for underground CO_2 storage at the *voivodeship* (province) level, finding support from as low as 18% in some regions to as high as 40% in others. The highest support was recorded in the southern provinces, where industry is concentrated and coal or other hydrocarbons are mined. In contrast, the lowest support for underground storage was found in the northern provinces, where there is less heavy industry. Understanding these different levels of support is essential as early-stage demonstration projects may be more successful when sited in areas or communities where awareness, trust, and support are already stronger, while parallel investment in outreach and dialogue is carried out in less receptive regions.

A closer look at the social dynamics behind public acceptance for CCS in Poland reveals presence of the classic NIMBY (Not In My Back Yard) phenomenon, reflecting fundamental opposition to locating infrastructure projects near one's residence. Local communities' opposition is typically driven by concerns about perceived health or environmental risks, which they fear could lead to a decline in quality of life or a decrease

[1] Greenhouse gases (GHGs) are those gaseous constituents of the atmosphere, both natural and *anthropogenic*, that absorb and emit radiation at specific wavelengths within the spectrum of terrestrial radiation emitted by the Earth's surface, the atmosphere itself, and clouds. This property causes the greenhouse effect. Water vapour (H2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), and ozone (O_3) are the primary GHGs in the Earth's atmosphere. Moreover, there are a number of entirely human-made GHGs in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances, dealt with under the Montreal Protocol. Beside CO_2, N_2O, and CH_4, the Kyoto Protocol deals with the GHGs sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). See Mathews, J. (Ed.) (2018). Annex I: Glossary. In V. Masson-Delmotte et al. (Eds.), *Global warming of 1.5°C: An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* (pp. 541-562). Cambridge University Press. doi:10.1017/9781009157940.008.

in property values. Another underlying phenomenon is the emerging WIMBY (Why In My Backyard?) attitude, characterised by passive scepticism, indifference, and a tendency to seek short-term benefits in exchange for accepting energy transition projects nearby.

While there is general support for capturing of CO_2 (especially as a means for industrial sectors such as cement to reduce emissions), this support often evaporates when storage projects are proposed near respondents' communities. According to WiseEuropa and CCS.pl findings, nearly 64% of respondents living near large industrial sites or power plants would like to see the facilities equipped with carbon capture installations; however, when asked about the prospect of an underground CO_2 storage site in their immediate vicinity, respondents are divided: 32% oppose such sites, 31% support them, and a substantial 36% are undecided, even after being provided with clear definitions of both the technology and the concept of geological storage. In the latest EKObarometr survey, when asked about concrete support for CCS projects and policies, respondents were also divided. If a CCS installation (such as an underground CO_2 storage site) were proposed in one's locality, about 37% indicated support (11% "definitely" and 26% "rather" in favour) as opposed to 19% against it, while the largest share (44%) was undecided. This mix of attitudes suggests a plurality might accept a local CCS project, but uncertainty is high. Notably, people's cautious outlook is also evident in a NIMBY sentiment: most said they would prefer CO_2 storage sites to be far from where they live, with an average "acceptable" distance on the order of a few hundred kilometres (200–350 km away). Such patterns support the idea that both attitudes toward CCS and NIMBY attitudes are influenced not only by factual knowledge but also by trust in institutions, familiarity with industrial technologies, and a sense of personal stake in the economic and environmental outcomes of such projects.

Polish public opinion on CCS is further complicated by a lack of knowledge on the subject among many members of the general public, which is an often-overlooked factor. Regardless of the opinions on CCS noted above, between 28% and 47% of survey respondents remain undecided. This high level of uncertainty suggests that a considerable proportion of the population neither explicitly supports nor opposes CCS, reflecting either ambivalence or insufficient knowledge about the technology. This finding suggests that public debate on CCS can be easily influenced by incomplete information, unintended or intended misinformation, or controversy as a large share of respondents are unable or unwilling to take a firm stance on the desirability of CCS or the safety of CO_2 storage.

When we dive more deeply into the views of Polish citizens on CCS, safety emerges as the primary concern. As WiseEuropa's research found, while 59% of Poles said they support investing in CCS, and about half (51%) agreed that CCS could help combat climate change, only 41% believed the technology is safe. Opponents of local CO_2 storage most commonly expressed generic concerns about unspecified dangers, followed by more specific worries about CO_2 leaks from storage sites or contamination of local soil and groundwater, which may put local inhabitants at risk. These concerns are often rooted in a lack of proper information, as opponents considered CCS to be unproven and not widely used. Notably, almost a third of the opponents (32%) could not spontaneously provide a specific reason for their stance. Safety was also the leading concern expressed in the EKObarometr study: about one-third of respondents worried about the risk of CO_2 leaking or escaping back into the environment, and one in four feared accidents related to underground storage (such as induced seismic events). Cost was the second major concern expressed in that survey: 31% reported the very high costs of CCS and the possibility of higher energy and product prices as a worry. There were also notable trust and policy concerns. Among respondents, 20% expressed a lack of trust in the companies or institutions implementing and overseeing CCS projects, and a smaller but significant share (14%) feared that investing in CCS could slow the development of renewable energy by diverting resources and prolonging dependence on coal.

It is worth noting that the challenge of social acceptance is not unique to CCS. Across Europe, similar dynamics have played out about other climate and energy technologies, including renewable energy sources.

A well-known example of this tension is the conflict between the Polish government's renewable energy development plans and public acceptance, particularly concerning the siting of onshore wind turbines in the 2010s. The reason for this conflict was that municipal authorities approved the locations of wind farms without attention to public concerns, at a time when knowledge about renewable energy sources was relatively low among the general public. The process of establishing wind farms often occurred in conditions of potential conflict of interest in local communities. Despite protests regarding the location of wind farms, municipalities did not engage in dialogue at any stage of the investment

process. Although the municipalities allowed residents to express their opinions and positions at every stage of the proceedings related to the location of wind farms, opponents' concerns were generally not addressed during the decision-making process. This lack of community involvement led to the Polish parliament's adoption in 2016 of the so-called Anti-Wind Turbines Act, which included the 10H rule", a regulation restricting wind turbine construction near residential areas. The rule imposed a minimum distance of over 2000 metres between wind turbines and settlements; as a result, the available sites for new wind farms were significantly limited, as up to 99.7% of the country was no longer available for onshore wind investments. This restriction stalled the sector's growth for years and created a significant obstacle for Poland in fulfilling its obligation under the EU RED Directive of 2009[2]

CCS investors cannot afford to repeat the mistakes of wind turbine developers from the previous decade. In Poland, these risks are magnified by the relative novelty of CCS technology (which was a similar case for wind turbines in the early 2010s) and the failure of previous attempts at demonstration projects. Notably, the inability to kick off a CCS demonstration project at Bełchatów Power Plant in 2013, due to insufficient funding as well as political and social controversy, demonstrated the vulnerability of such initiatives to shifts in public opinion and the importance of sustained engagement at all stages of project development.

More recently, the Polish Ministry of Climate and Environment has recognised the social dimension of CCS by signing a letter of intent with key stakeholders to support its technology and establishing dedicated working groups to facilitate cooperation between interested parties. However, these steps, while important, must be translated into transparent dialogue with local communities on the risks and benefits of CCS, as well as proactive measures to address residents' concerns.

Data from the studies cited above lead to the conclusion that public perception and social acceptance can be one of the most significant bottlenecks to the timely and cost-effective deployment of CCS in Poland. Unlike technical or financial barriers, these challenges are multifaceted and context-specific and thus require tailored, evidence-based interventions. They demand at least as much attention from policymakers, project developers, and regulators as engineering and economics.

Indeed, social acceptance has emerged as the defining challenge for the rollout of CCS and other climate infrastructure in Poland. While there is broad support for climate action and acceptance of specific solutions such as CCS, public support and opposition are closely tied to location, awareness, and trust.

[1] Poland was obligated to achieve at least a 15% share of energy from renewable sources in gross final energy consumption by 2020.

SECTION 3

Supporting Evidence from Case Studies

Australia

Australia provides an example that highlights how public perception can sour if promised outcomes are not delivered. Australia is a global CCS leader in terms of ambition, and the country hosts the **Gorgon CO_2 Injection Project, one of the world's largest CCS installations**. Gorgon, led by Chevron in Western Australia, involves capturing CO_2 from a massive natural gas processing facility (on Barrow Island) and injecting it into a deep reservoir under the island. From the outset, the project had significant public and stakeholder attention. Barrow Island is an environmentally sensitive area (a Class A nature reserve), and although uninhabited by human communities, environmental groups kept a close eye on Gorgon's impacts and performance as a bellwether for CCS viability. When Gorgon's CCS started in 2016, the regulatory requirement was set to capture and store 80% of the CO_2 from the gas stream. This volume amounted to roughly four million tonnes of CO_2 per year, making it a flagship climate project for Australia's liquefied natural gas industry. However, in the first five years, the Gorgon project fell short of its targets, managing only about 5.5 million tonnes in total over the period —– far below the promised volume. In mid-2021, this shortfall attracted greater media attention and sparked criticism. The Conservation Council of Western Australia (an environmental NGO) argued that Chevron's failure to meet the CCS target "will undermine public confidence in carbon capture and storage technology." Media coverage was widespread, with headlines about "CCS failure" casting doubt on the reliability of the technology.

The public perception effects of Gorgon's difficulties were significant. Environmental advocates who oppose CCS seized on the news to paint CCS as "a disaster from the beginning" Essentially, the narrative became that CCS, at least as implemented at Gorgon, was a false promise, and this narrative was delivered to the public through national media and reports. Trust was eroded: if the world's biggest CCS project couldn't meet its goals, skepticism of other projects would naturally increase. The Australian government and regulators responded by pressing Chevron to rectify the issues (the company had to purchase offset credits to make up for the excess emissions and invest in system improvements), but the damage in public opinion was done. Gorgon's early shortfall contributed to more public scrutiny of CCS. Communities in places like South Australia and Victoria, where new projects were being considered, became more vocal in response.[3]

This example shows how important it is to engage early, communicate clearly, and manage expectations. Australia's experience underscores an important lesson: **social acceptance can be undermined if a CCS project overpromises and underdelivers on performance**.

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[3] Government of Western Australia, Department of Mines, Petroleum, and Exploration. (2025, May 30). *South West Hub CCS Research Project*. https://www.wa.gov.au/organisation/department-of-mines-petroleum-and-exploration/geological-survey-of-western-australia/south-west-hub-ccs-research-project

[4] Ashworth, P., Rodriguez, S., & Miller, A. (2010). *Case Study of the CO2CRC Otway Project* (CSIRO Report No. RPT10-2362). CSIRO. https://www.globalccsinstitute.com/archive/hub/publications/8177/co2crc-otway-project-case-study.pdf lyellcollection.org+10pmc.ncbi.nlm.nih.gov+10globalccsinstitute.com+10

The credibility of the technology itself is at stake. While communities may not follow injection volume statistics day-to-day, prominent failures or rule-bending will erode trust countrywide. On the flip side, Australia has seen more positive local engagement on smaller projects, but these get less attention.[4] In the public eye, Gorgon's struggles have been symbolic of the challenges facing CCS. The Gorgon case shows that earning a social licence is not a one-off task; it must be maintained through ensuring operational transparency, meeting commitments, and promptly addressing any issues. Otherwise, as one Australian news outlet put it, CCS can be perceived as "a shocking failure rather than a climate solution" — a perception Poland must avoid.

Japan

Japan's Tomakomai CCS demonstration (2012–2019) is often cited as a success story in public engagement. Tomakomai City, on Hokkaido's coast, was selected for Japan's first large-scale carbon capture and storage project. The plan was to capture CO_2 from a refinery's hydrogen production unit and inject a total of 300,000 tonnes of CO_2 into offshore deep saline reservoirs beneath the seabed. Recognizing that the storing of gas under the ocean floor was a novel concept to the local population, project leaders and government officials undertook extensive efforts to educate and reassure the community. A Tomakomai CCS Promotion Association was established, chaired by the city's mayor and including local industries and even the local fishery cooperative, reflecting all key stakeholder groups. This body met regularly and served as a bridge between the community and project engineers. The project team set up a public information center in downtown Tomakomai with displays explaining CCS. They also held annual open forums (with 300-400 attendees each) where residents could ask questions and hear updates. Importantly, numerous site tours were organized: hundreds of residents, students, and local leaders visited the CO_2 capture facilities and injection sites over the years to see the operations firsthand.

Transparency and safety assurance were central to winning trust. The project implemented an intensive monitoring program (seismic sensors, CO_2 detectors, etc.) and made the data publicly available. Locals could go online and see daily readings of injection pressure, cumulative CO_2 stored, micro-seismic activity (none above natural background levels), and even CO_2 levels measured in seawater and ground water. This level of openness was unprecedented and gave the community a sense of security: if anything were amiss, they would know immediately. In fact, no irregularities occurred during the project's operation. Public surveys and media reports in Tomakomai showed that initial caution or skepticism gradually shifted to broad acceptance as people became familiar with the project. By the time injection began (2016), the majority of local residents supported the CCS project, seeing it as both safe and an investment in Tomakomai's future. The project was completed in 2019 after safely storing ~300 kilotons of CO_2 with no environmental incidents. Local officials even touted Tomakomai CCS as a model of how to do industrial projects in harmony with the community and environment.

Norway

Longship is Norway's first fully integrated carbon capture and storage value chain. It comprises CO_2 capture at Heidelberg Materials' cement plant in Brevik and the planned capture facility at Hafslund Celsio's waste-to-energy plant in Oslo. Captured CO_2 is transported by ship to Øygarden, near Bergen, where it is piped offshore for permanent storage 2,600 meters beneath the seabed. The transport and storage of CO_2 is provided by Northern Lights, a joint venture of Equinor, Shell, and TotalEnergies, which aims to store up to 1.5 million tonnes of CO_2 annually in its first phase of operation. The first CO_2 shipment from the Brevik cement plant to the Northern Lights facility in Øygarden took place in early June 2025. Starting in 2028, the second phase will expand capacity to five million tonnes per year.

The Northern Lights Visitor Centre in Øygarden has intentionally become a leading international hub for knowledge-sharing and public engagement on CCS since construction began. Officially inaugurated in 2022, the centre is located near Bergen and serves as a gateway for both professional and public audiences interested in CCS technologies. A formal visitor policy was also established to ensure consistency in how visits are managed by introducing a full-time liaison role and launching a digital booking system. Since opening its doors in 2021, the facility has welcomed over 12,000 visitors from more than 70 countries. In 2024 alone, it attracted 5,025 guests eager to learn about the pioneering cross-border CO_2 transport and storage solution developed by Northern Lights. The centre features guided tours through interactive exhibitions designed to foster an understanding of the role of CCS in industrial decarbonisation and Norway's leadership in this field. As one of the project's foundational elements,

the visitor centre plays a crucial ongoing role not only in educating stakeholders and the general public, but also in supporting international collaboration and dialogue as Northern Lights enters the operational phase of its CO_2 storage activities.

Implications for Poland: Key takeaways from the case studies

Insights from these international case studies, complemented by lessons from the unsuccessful Barendrecht project, provide important lessons for advancing Poland's CCS journey.

Japan's Tomakomai project illustrates how **proactive engagement and transparency can win community acceptance** even for a first-of-a-kind project. This project's key strategies — involving local authorities, sharing data openly, and investing in education — are directly applicable to Polish communities proposed to host CCS projects (ranging from a steel mill with CO_2 capture in Silesia to a storage site in the Baltic Sea region). In contrast, Australia's Gorgon experience is a cautionary tale: **public trust is fragile**. Grand promises about CCS will need to be backed by performance, and any setbacks should be communicated honestly and mitigated quickly to retain credibility. For Poland, this lesson means setting realistic expectations (do not overhype CCS as a silver bullet, for example), ensuring robust project management, and having contingency plans so that communities see that problems will be solved, not swept under the rug. Polish stakeholders should also be aware of the broader narrative: if CCS is seen as merely prolonging the use of coal or causing delays to "real" solutions, it will face public resistance. Thus, Poland should frame CCS as part of a comprehensive climate effort, *alongside* renewables and efficiency, focused on industrial emissions that otherwise would be unabated. The public should hear, early and often, why CCS is needed for jobs and climate in Poland specifically — and then should see transparent evidence of it working. The Northern Lights Visitor Centre in Norway exemplifies a dedicated public engagement strategy, which shows that accessible education policies and active dialogue are key to building trust and support for CCS. Poland's leaders should keep these lessons in mind when proposing new activities within public campaigns for climate and energy policies.

Overall, Poland can cultivate social acceptance by combining the community-centric approach of Tomakomai (trust-building from day one) with a commitment to technical excellence and honesty, so it never faces a Gorgon-like crisis of confidence. By doing so, communities in Poland's heavy industry regions may come to view CCS not with fear or skepticism, but with a sense of opportunity in the clean transition ahead.

SECTION 4

Key takeaways on social acceptance and engagement

- **Social acceptance is one of the main factors influencing the success of CCS in Poland.** Without the cooperation, trust, and understanding of the community, even the best-funded and most technically feasible projects will fail to scale or deliver benefits, such as mitigating climate change or fostering a competitive industry.
- **Proactive, transparent communication and early community engagement** at pilot and demonstration sites are critical to building credibility and support for CCS, (especially carbon storage).
- **Policymakers and developers must actively counter misinformation** by providing clear, evidence-based information on the safety and benefits of CCS, leveraging trusted messengers to maintain public confidence. At the same time, they should set realistic expectations and avoid making commitments regarding project performance that cannot be reliably achieved.
- **Investing in education and communication at national and local levels** will create a robust foundation for effective stakeholder engagement and will support long-term deployment.
- **Framing CCS as part of Poland's industrial transformation** in times of geopolitical uncertainties and economic challenges, while highlighting opportunities for climate leadership, job retention in key regions, and a just transition, will broaden support and stimulate a fact-based debate.

SECTION 5

Key Challenges...

Challenges are primarily linked to the discrepancy between declared and actual engagement, weak social capital and trust, opposition from interest groups with ties to legacy industries, economic anxieties about the energy transition, and persistent negative stereotypes. There is also increasing reluctance caused by regulatory gaps and lack of a coordinated, long-term strategy for CCS development.

1. NIMBY and WIMBY

Many communities in Poland have limited familiarity with the entire value chain of CCS, which may fuel public concerns about safety and the environmental impacts of CCS infrastructure in local areas. NIMBY attitudes in the Polish population pose a risk for the success of CCS projects: while many acknowledge the national necessity of CCS, resistance emerges when projects (especially those associated with CO_2 storage) are proposed close to local communities. The challenge becomes more complex when WIMBY attitudes are considered. In the AgaStor study conducted in Poland, 18.9% of respondents were identified as displaying a NIMBY attitude, while 45.5% were classified as exhibiting WIMBY tendencies. Conversely, 30.9% of participants were categorised as rejecting the NIMBY stance, and 13.6% as rejecting the WIMBY approach. These findings illustrate the need for nuanced and tailored communication strategies: while providing more information about CCS may reduce instinctive opposition to CCS projects nearby (NIMBY), increased social awareness can also lead to milder forms of opposition when project details are made apparent (WIMBY). Such skepticism and reluctance to support big industrial investments are exacerbated when local stakeholders feel excluded from the decision-making process, making trust both challenging to build and easily lost. Therefore, carefully crafted communication practices and trust-building mechanisms should be considered essential for disseminating information about CCS and reducing negative responses to the technology.[5]

2. Informational and Educational Challenges

The public's ability to correctly associate CCS with the decarbonisation of the economy remains limited in Poland, despite general awareness of this technology. As data provided by Wise Europa showed, there is a widespread lack of understanding regarding CO_2 storage and its impact on the environment, as most citizens are unfamiliar with engineering practices and the practical benefits of CCS, contributing to the proliferation of unfavourable stereotypes and unjustified concerns. The absence of clear, accessible information creates fertile ground for misinformation, especially in the context of broader societal polarisation and the rapid evolution of EU climate policy in the industry sector. As other CATF researchers have noted, this point is "particularly salient for Poland and other Central and Eastern European (CEE) countries, where industries provide a considerably higher share of employment and gross value added (GVA) than the EU average"

[5] Wojakowski, D., Langhelle, O., Stopa, M., Nagy, S., Gąciarz, B., & Sattich, T.M. (2025). *Carbon Capture Technology and Storage in Poland: Social acceptance and the energy transition*. Routledge. doi:10.4324/9781003607151.

3. Spread of Misinformation and Common Misconceptions

Misinformation and misconceptions about CCS technologies are common and can quickly undermine public confidence. Typical misunderstandings such as equating CO_2 storage with fracking or questioning the effectiveness and safety of the technology are strengthened in the absence of accessible, evidence-based information provided by respected parties such as academic experts or local leaders. Conspiracy theories and misinformation about technology failures, high costs, or the notion that CCS prolongs fossil fuel dependence are widespread and may dominate public discourse if not addressed early and transparently.

It is worth emphasising that media coverage amplified public opposition to planned legislative changes concerning CCS in Poland in the summer of 2023. Media outlets indicated that the introduction of new regulations was raising concerns in municipalities where the potential CCS investment was to take place in coming years. The major concern was that areas designated for underground CO_2 storage could be determined without adequately considering the voices of local communities in the decision-making process.

Most coverage focused on issues raised by local communities, including lack of transparency, consultation, and potential environmental and health effects. Expert opinions were not always included to add context, factual information, or clarification. While some outlets shared views from independent experts and regulatory bodies, many primarily highlighted community concerns without providing much expert input. In the absence of active communication on CCS by policymakers, media reporting often emphasised public skepticism. Proactive, clear, timely, and fact-based communication from stakeholders can facilitate balanced reporting in the media.

4. Institutional Challenges

Institutional barriers include limited local organisational capacity and a shortage of CCS specialists. Transparent and dedicated social dialogue mechanisms and effective channels of communication are underdeveloped in many areas, leaving local authorities and communities without the necessary tools to manage complex projects or address community and local government concerns. There is also an insufficient level of institutional support such as capacity-building for local officials or technical expertise for municipalities, as well as a perceived lack of legal and regulatory clarity, particularly following the failure of the Bełchatów CCS project (2009–2013), which has left lingering doubts about the long-term stability and strategic direction of CCS development in Poland.

The lack of a consistent and proactive communication strategy can hinder CCS development; without it, local communities may receive conflicting or incomplete information from unreliable or biased sources. Furthermore, the manner of communication and the communication channels used have a significant influence on how messages are perceived, especially in local communities where CCS investments are planned. In addition, a lack of coordinated information measures can lead to misunderstandings or mistrust. Open and transparent communication should extend beyond the benefits and losses narrative; it must include genuine dialogue with active listening to stakeholders' needs and concerns, as well as adaptation to local circumstances.

5. Gaining and Maintaining Trust for CCS in Local Communities

One of the key challenges for deploying CCS technologies is achieving social acceptance at the local level. Gaining public trust for an infrastructure project about which the local community is likely to have neither prior knowledge nor experience is a lengthy and challenging process that is highly dependent on the expertise and knowledge of local stakeholders. Civil clerks and local politicians in municipalities often act as intermediaries and facilitators of dialogue between industrial project developers and community members. Any active engagement from municipal authorities can significantly influence the success or rejection of a CCS project, especially for CO_2 storage, which remains the most controversial part of the CCS value chain in the eyes of the Polish public. However, building trust is a sensitive and lengthy process. Once lost, trust is difficult to restore, and prior negative experiences between local inhabitants and investors or government officials can influence attitudes toward other technologies and future investments. Distrust may arise regarding the competence or motives of local politicians advocating for CCS infrastructure. To minimise the risk of losing credibility, a transparent decision-making process must be implemented — for instance, by inviting members of the community to participate in sessions of the municipality's governing bodies on the location and development of CCS infrastructure in local areas, or by establishing and regularly updating a dedicated public-facing website. Without a comprehensive and transparent community engagement strategy, securing sustained social support for CCS projects through all their development phases will be a significant challenge.

CCS Common Misconceptions vs. Facts

Common Misconception: "CO_2 stored underground will eventually leak out and endanger communities."

- **Fact:** Decades of experience show that well-selected and managed geological storage sites can securely contain CO_2 **for the long term**. For example, Norway's Sleipner project has safely stored over 20 million tonnes of CO_2 beneath the North Sea since 1996 with no leaks, and in the United States over 850 million metric tonnes have been injected safely since the 1970s for a process known as enhanced oil recovery.[6] CO_2 leakage from properly assessed and characterised storage sites is considered extremely unlikely - similar geological structures have kept oil and gas, and even many natural stores of CO_2, trapped in place for millions of years

Common Misconception: "CCS is an unproven, experimental idea; we should wait for something else."

- **Fact:** While CCS is not yet widespread in Poland, its **components are proven**. CO_2 capture technologies have been used in industry since the 1970s, and multiple large-scale projects around the world have successfully operated (e.g., in Canada, Norway, the United States). The *scale* needs to grow, but CCS is recognized by the IPCC and International Energy Agency as a crucial climate tool for sectors like cement and steel where alternatives are limited. In short, CCS is ready to deploy, and delaying its adoption in hard-to-abate sectors could make Poland's climate goals harder and costlier to reach.

Common Misconception: "CCS just props up the fossil fuel industry and distracts from renewables."

- **Fact:** CCS is not **a competitor to renewable energy**, but a complement. Its primary role is to cut emissions from industrial processes and sectors that cannot be easily electrified or immediately switched to 100% renewables. For instance, making steel or cement inherently produces CO_2; CCS can capture those emissions. It can also abate emissions from natural gas plants that provide grid stability. Far from prolonging *unabated* coal or gas use, CCS provides a pathway to deeply reduce emissions in tandem with expanding renewables. Climate models show that, **without CCS, achieving net-zero emissions is significantly more expensive or even unachievable** in certain sectors. Poland's focus will remain on efficiency and renewables, but CCS is a necessary piece of the decarbonization puzzle for the toughest emissions.

Common Misconception: "Local communities bear all the risks of CCS but get no benefits."

- **Fact:** A well-designed CCS project can bring **real benefits to local communities**. It can create or retain jobs: employing local workers in construction and operation, for example, and helping keep an existing factory viable by reducing its carbon liability. It can spur investment in local infrastructure (ports, pipelines, innovation hubs) and often comes with community investment programs. Crucially, CCS can help improve air quality and health if it enables industrial facilities to add pollution controls alongside carbon capture. And at a high level, communities benefit from climate change mitigation, thus protecting everyone's future. The key is to ensure benefits are shared locally. Some projects have provided community benefit funds, training programs, or revenue-sharing with municipalities to ensure the host region sees a net positive from hosting CCS facilities. When residents can see the upside — jobs, economic development, pride in climate leadership — they are far more likely to support a project.

[5] Hill B et al. (2013) *Geologic carbon storage through enhanced oil recovery*

SECTION 6

Policy Recommendations

To foster social acceptance of CCS, the Ministry of Climate and Environment and other public authorities should take proactive, concrete steps. Firm action undertaken by the Ministry will raise public awareness and acceptance of CCS, foster trust in local authorities, increase conviction about the need to address climate change, expand the potential for CCS-related job creation, and enhance all stakeholders' willingness to locate CO_2 storage sites. A new approach is needed, one that moves beyond top-down, techno-economic narrative and expert jargon, to build genuine public engagement in CCS development and shared understanding among all involved parties. This approach requires:

- Comprehensive education and outreach tailored to different groups.
- More substantial support for local initiatives, not just financially but also through knowledge-sharing and capacity-building.
- Clear, transparent, and consistent communication from both government and industry, involving communities early and meaningfully in transparent decision-making processes.
- A focus on building trust is necessary, as lost trust is difficult to regain. Careful monitoring and selecting the right site help ensure the carbon dioxide stays safely underground.

The following five actionable recommendations will help secure public trust and a social licence for CCS projects in Poland. Each recommendation is accompanied by an explanation of why it will help, and an illustrative example drawn from international experience or the Polish context.

1. Launch Early Community Engagement Programs.

Recommendation: Require and facilitate early, meaningful engagement with local communities for any planned CCS project — starting from the project conception stage, *well before* permit hearings or construction. This engagement means project developers must hold public meetings, listening sessions, and site visits to explain the project in plain language, hear local concerns, and incorporate feedback. The Ministry should issue guidelines mandating such engagement and even help convene stakeholder panels in key regions.

Why this helps: Early engagement builds trust through transparency and shows respect for local stakeholders. It can surface potential issues (safety concerns, cultural or land use sensitivities) while there is still time to address or mitigate them. When people feel heard and see their input shaping a project, opposition often turns into cooperation. Early dialogue also helps dispel misinformation before it spreads.

Example: In Alberta, Canada, Shell's Quest CCS project engaged landowners and residents from the outset. The project team held numerous town halls and even altered the planned CO_2 pipeline route over 30 times in response to community feedback and property owner concerns. This collaborative approach earned local support: the project proceeded with broad community approval. In Poland, a similar approach could be taken in heavy-industry hubs (like Upper Silesia or Pomerania) where industrial clusters might develop. Community liaison committees and information centers should be established at the planning stage to invite public participation, rather than presenting CCS as a fait accompli.

2. Ensure Transparency and Share Data Publicly.

Recommendation: Implement a policy of maximum transparency for CCS operations. The Ministry should require project developers to publish in an accessible online platform non-confidential data about project impacts and performance — for instance, CO_2 injection volumes, monitoring results (like seismic readings or groundwater measurements), and safety incident reports. Additionally, independent experts or regulators should periodically verify and communicate their findings to the public.

Why this helps: Transparency addresses the fear of the unknown. When people can see for themselves that, say, "one million tons of CO_2 were injected this year with no detectable leaks or tremors," it builds confidence in the safety and effectiveness of CCS. It also signals that there is nothing to hide, greatly reducing suspicion. Publishing data and reports allows third parties (universities, NGOs, etc.) to provide independent analysis, which can further validate a project's integrity.

Example: The Tomakomai CCS demonstration project in Japan set a high standard for transparency. Project operators not only engaged a local community advisory council chaired by the city's mayor; they also disclosed to the public extensive real-time data, including CO_2 injection rates, pressures, micro-seismic monitoring, and offshore CO_2 concentration in seawater. This information was available on a public website and updated regularly. Such openness reassured local residents that any abnormality would be quickly detected and reported. Thanks in part to this transparency, the Tomakomai project gained the understanding and support of the local community throughout its operation. Poland can emulate this by creating a national CCS transparency portal under the Ministry's oversight, where all projects must upload environmental and safety data. Local communities could even be invited to co-monitor (through community observers or joint oversight committees), further building trust that CCS operations are safe and under constant scrutiny.

3. Integrate Social Acceptance into Permitting (Embed a Social Licence Test).

Recommendation: Modify the CCS project approval process to include criteria related to social impact and acceptance. In practice, this requirement means before a CCS project is conceptualised, developers should conduct a Social Impact Assessment or community acceptance report detailing how they have engaged stakeholders, what feedback was received, and what measures will ensure local benefits and address concerns. The Ministry (or relevant authority) would evaluate this report alongside technical and environmental assessments. Projects should be required to have a community engagement plan and grievance mechanism in place as conditions of their licence.

Why this helps: By formalising social acceptance in the permitting process, the government signals that public concerns are not an afterthought but a core consideration. This approach compels project proponents to be proactive about winning trust, effectively making the social licence almost as necessary as the regulatory licence. It also reduces the chance of delays or conflicts down the line, as potential issues are addressed up front, as well as providing an official channel for communities to express their opinions during the planning process.

Example: A precedent comes from **Romania's** approach: the (now stalled) Getica CCS project included a comprehensive study of local community perceptions and a stakeholder communication toolkit during its feasibility phase. This early focus on understanding public sentiment was instrumental in project design and outreach. Likewise, in Japan, regulators required extensive local consultation for the Tomakomai project, resulting in a formal agreement between the city and project operators. For Poland, the Ministry could introduce guidelines such as no injection licence will be granted unless the developer demonstrates community engagement efforts and a plan for ongoing public involvement. Additionally, Poland might draw on the model used in investments in renewable energy sources, where community acceptance has been a criterion for siting, and apply similar rules to the approval of CO_2 storage sites. Integrating social considerations into official decision-making can promote more responsible industry practices and demonstrate to the public that their voices are valued in the deployment of CCS.

4. Launch a Public Education and Information Campaign.

Recommendation: Coordinate a national information campaign about CCS to raise public understanding and correct misconceptions. This action could involve the Ministry of Climate and Environment partnering with academic institutions, NGOs, and perhaps European initiatives, to produce easy-to-understand materials about CCS targeted to the general public. The campaign should actively address common misconceptions (as in the box above) by developing and disseminating high-quality educational materials such as infographics, short explanatory videos, and frequently asked questions, adapted to different target groups. These materials should showcase both domestic and international examples of successful CCS implementation and feature respected Polish scientists and industry practitioners who can present the subject matter in a clear and authoritative manner. At the same time, the campaign should encourage public conversations by holding community meetings and workshops, as well as incorporating CCS topics into the national education curriculum at the lower secondary level. It is especially important to involve schools and young people in areas where the economy is undergoing change due to the energy and industry transition. Doing so will help build early awareness and understanding of CCS as part of Poland's climate plans. An effective public education campaign, particularly in the context of introducing complex and often unfamiliar technologies such as CCS, must be rooted in principles of inclusivity, openness, and mutual respect. Education in this sphere should not be conceived as a process of correcting public opinion or rectifying presumed misunderstandings, but rather as an invitation for society to participate actively in a shared learning experience.

Why this helps: A well-informed public is less susceptible to fear-based narratives and false information. By portraying CCS as a practical climate tool, not a science fiction story, the campaign can build general acceptance at the societal level. This broad acceptance creates a more favorable context for specific projects. It can also generate pride in innovation: Poles may come to see CCS as part of a high-tech, climate-smart future for their heavy industry, rather than as a burden.

Example: Other countries have found creative ways to engage the public on CCS. In Japan, the Tomakomai project team hosted annual CCS Forums for citizens (drawing hundreds of attendees each year) and set up public information centers with displays and models to explain the technology. They even ran education programs in local schools and invited residents on site tours, which significantly improved understanding and dispelled anxieties. Similarly, in the United Kingdom, the government-funded CO_2Stored database and public interfaces allow anyone to explore where CO_2 is stored offshore, fostering transparency and interest. Poland could establish a CCS Knowledge Centre (both online and as a physical visitor center in an industrial region) to serve as the hub for such educational efforts. Given the success of programs like "MythBusters" in other domains, a Polish-language "CCS myths vs. facts" series via social media and TV could go a long way to inform and normalize the conversation around carbon capture.

5. Ensure Local Communities Benefit to Share the Gains of CCS.

Recommendation: If communities are expected to host CCS projects, they should also share in the economic and social gains. Doing so means designing CCS policy so that people living near CO_2 capture or storage sites experience real, tangible improvements, such as new jobs, better infrastructure, or local investments. Designing CCS policies so that host communities see direct and tangible benefits could include financial mechanisms (for instance, dedicating a share of emissions trading revenues or a carbon tax to community development funds in areas that host CO_2 storage or capture projects), local content rules (requiring that a portion of jobs and contracts go to local people and firms), and co-investments in community infrastructure (such as improving roads, funding local environmental restoration, or building training centers in conjunction with CCS projects). The Ministry could work with local governments to set up formal benefit-sharing agreements for each major project.

Why this helps: People are far more receptive to new infrastructure when they feel it *improves* their community. If a CCS project is seen as not only mitigating climate change but also bringing in new jobs, better amenities, or long-term economic diversification to a region, residents are likely to view it positively (or at least neutrally) rather than as an imposed risk. Equitable benefit-sharing also addresses justice concerns as such an approach shows that communities bearing the inconvenience of construction or any perceived risk are being compensated and invested in.

Example: In Norway, the municipality of Porsgrunn supported plans for industrial CCS in part because it was framed as a way to sustain local industry and jobs for the long term. By keeping industries viable under climate constraints, CCS was seen as protecting the community's economic base. On a different note, some U.S. states (like Texas and Illinois) have created tax incentives for communities or encouraged revenue from CO_2 storage to flow to local counties, effectively giving communities a stake in the project's success. For Poland, one idea is to create "Just Transition Bonds" for CCS hubs: money saved by industries through using CCS (for example, avoiding EU carbon permit costs) could partially be redirected to local development projects (new schools, parks, hospitals) in the same region. Additionally, workforce development programs can be launched so that coal miners or power plant workers in transitioning regions can be retrained to work on CCS projects (as technicians, drillers, and maintenance operators). By visibly linking CCS to positive local outcomes — new jobs, preserved industries, improved infrastructure — public acceptance will significantly increase. Communities should feel that *CCS is for us*, not just for the environment or distant climate goals.

SECTION 7

Conclusion and Call to Action

The experience of failed CCS projects in the past indicates that even the best-designed regulatory and financial frameworks cannot overcome persistent social resistance or a lack of political support. Building public trust in CCS is urgent. Without it, projects will not progress from paper to practice. Social acceptance is a critical factor in every phase of CCS development, from planning through permitting to construction and operation. Governments, industry partners, and local authorities share responsibility for engaging not only with citizens living in areas identified for CO_2 storage, transportation, or utilisation, but also for ensuring that those living outside these regions, who nonetheless wish to have a say, are included in the process. Shared responsibility entails providing an enabling regulatory framework for open public consultations on national policies, allowing all interested stakeholders to contribute to the public debate on CCS development pathways.

Effective stakeholder engagement in CCS development is possible and essential. It requires initiating genuine conversations with local communities, academia, and industry stakeholders, listening to their priorities and concerns. Engagement must go beyond highlighting potential benefits; it should include being up front about risks, as community members need to understand what will change in their neighbourhoods, how projects will be monitored, and who will be held responsible in case of any accidents or infrastructure failures, among other needs.

Public debate and engagement should begin well before a project appears on a map or a permit is requested from the relevant public authority. By then, opposition and distrust may be too stiff to overcome, as experiences of CCS projects have shown worldwide.

We urge the Ministry to:

- Be transparent about the benefits, risks, and uncertainties associated with CCS.
- Cooperate with trusted entities, such as NGOs, academia, and local leaders.
- Make engagement an ongoing process, not a one-off event, and be present in places where people feel comfortable, not just in official buildings.
- Respect local issues and concerns, which may vary by region.

It is essential to move beyond "ticking the box" in fulfilling EU regulatory requirements and the top-down approach in policymaking. Public hearings are necessary, but they are not enough. Governments and investors should initiate consultations with stakeholders early and proactively seek out views, even before the law requires them to do so. They should provide people with genuine opportunities to influence plans and decisions and utilise practical tools, such as surveys, open meetings, small-group discussions, and citizen juries, to gather community feedback, ensuring procedural justice. Such measures will not slow CCS development, as projects that have gained public acceptance have a lower risk of delays. By approaching local communities with a clear communication strategy, governments and investors can turn CCS into a positive example of a just energy and industry transition, especially in coal regions.

We urge the Ministry of Climate and Environment and all relevant stakeholders to take immediate action. Poland has the opportunity to lead by example in the CEE region, and the development of CCS can demonstrate how to develop innovative solutions for climate and energy while respecting local voices and fostering genuine partnerships. The window for leadership in the CEE region is open; the Polish government should take action and set ambitious goals for CCS development until 2050. There is no time to waste for national decarbonisation efforts.