

Industrial Decarbonization and CCS in the Nordics:

Public Perception & Progress

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About Bellona

- Established in 1986 in Norway, in Brussels since 1994
- International, independent non-governmental organisation (NGO) working against climate change and environmental degradation, with a science-based and solutions-oriented approach
- Comprehensive and cross-sectoral approach to assess the economics, climate impacts and technical feasibility of necessary climate actions
- Collaborating with civil society, academia, governments, institutions, and industries
- Offices in Oslo, Brussels, Berlin and Vilnius
- Focus areas across offices include:
industrial decarbonisation, carbon accounting, energy systems, embodied carbon, lead markets for low-carbon products, sustainable economy, bioeconomy, nuclear safety and shipping



CCS & Bellona: a brief history

1986: Bellona is founded in Norway by Frederic Hauge

1992: Bellona starts working on CCS

1994: Brussels office opens and Bellona gradually starts engaging in CCS debates at EU-level

2005: Bellona becomes a founding member of the Zero Emission Platform (ZEP), which advises the EU on industrial carbon management technologies. Since 2007, Bellona holds one of the vice-chair positions of ZEP

2008: Bellona publishes the report “How to Combat Global Warming,” illustrating the potential of CCS and risks linked to non- or delayed deployment of CCS technologies

2010: Bellona organizes its first international workshop on potential of Bio-CCS to mitigate climate change

2011: Frederic Hauge is appointed to expert group advising the EU Commissioner for Energy on reducing EU CO₂ emissions by 85% by 2050

2012: Launch of joint first-of-its kind report on Bio-CCS during the first CCS-focused session at the EU Sustainable Energy Week in Brussels

2013: Bellona report on CCS as essential to reconcile a strong EU industry with the Union’s climate ambitions

2020: Following years of Bellona advocacy, the Norwegian Parliament decides to co-fund Longship, a CO₂ storage site off Norway’s western coast

2021: Bellona Deutschland opens, focusing on industrial decarbonisation in Germany, including CCS

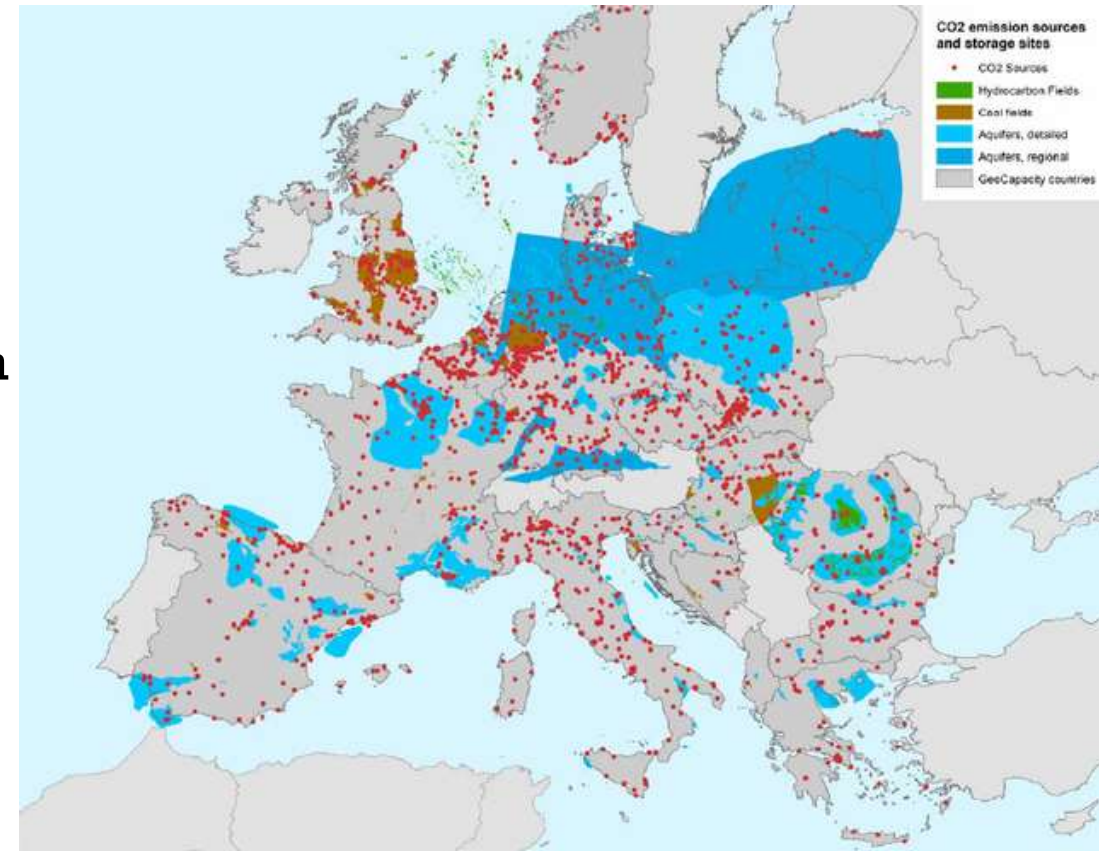
2022: Bellona Europa co-chairs WG CO₂ Infrastructure of the CCUS Forum (now Industrial Carbon Management Forum)

2023: Bellona became a founding member of CCS Europe, an advocacy coalition



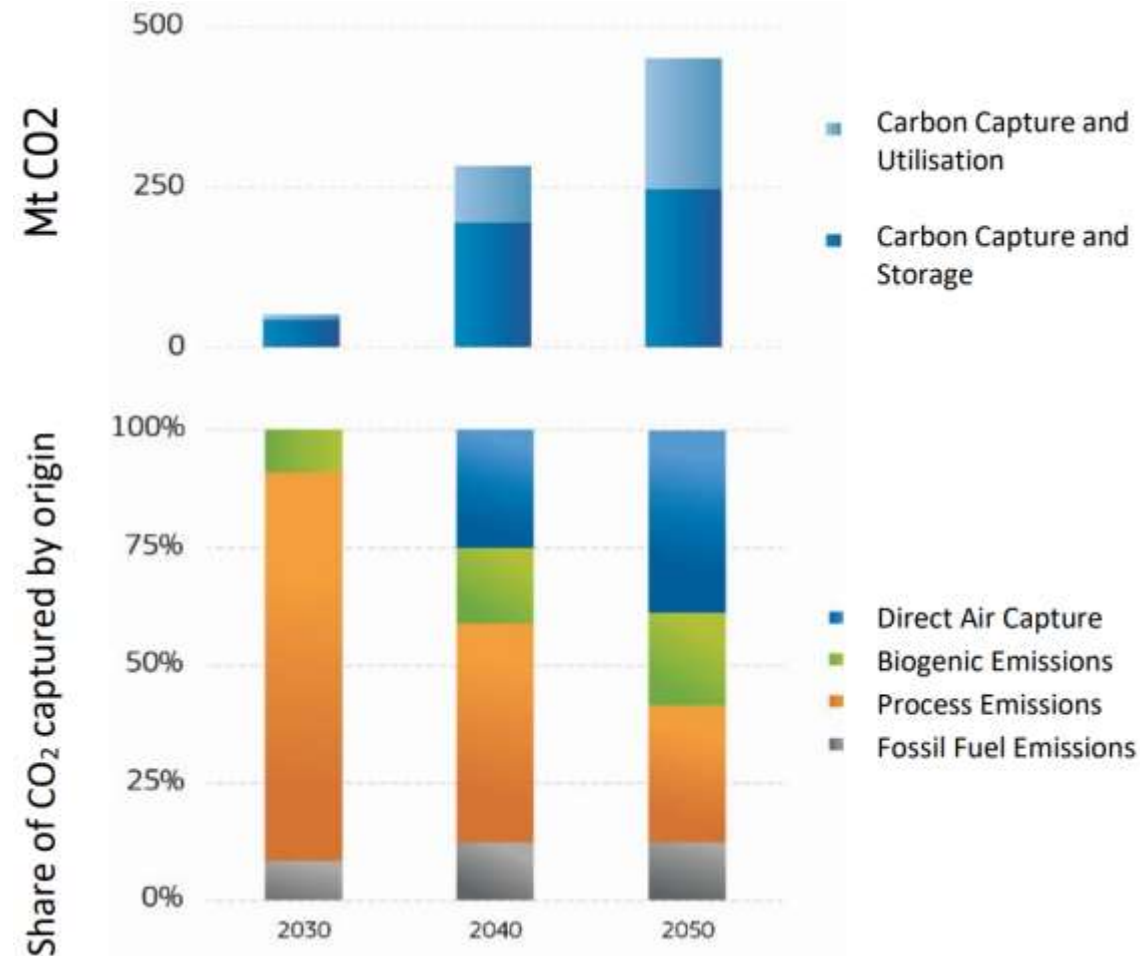
EU Policies: Net-Zero Industry Act

- Binding **target of 50 mln ton** a year for development of commercial injection capacity by 2030
- To be developed by **oil & gas producers**, based on historic extraction levels
- Solves “chicken-or-egg” problem
- Classifies CCS technologies as **strategic net-zero projects**:
 - Priority status in administrative processes
 - simplified and accelerated permitting and dispute resolution procedures
 - one stop shop for regulatory matters



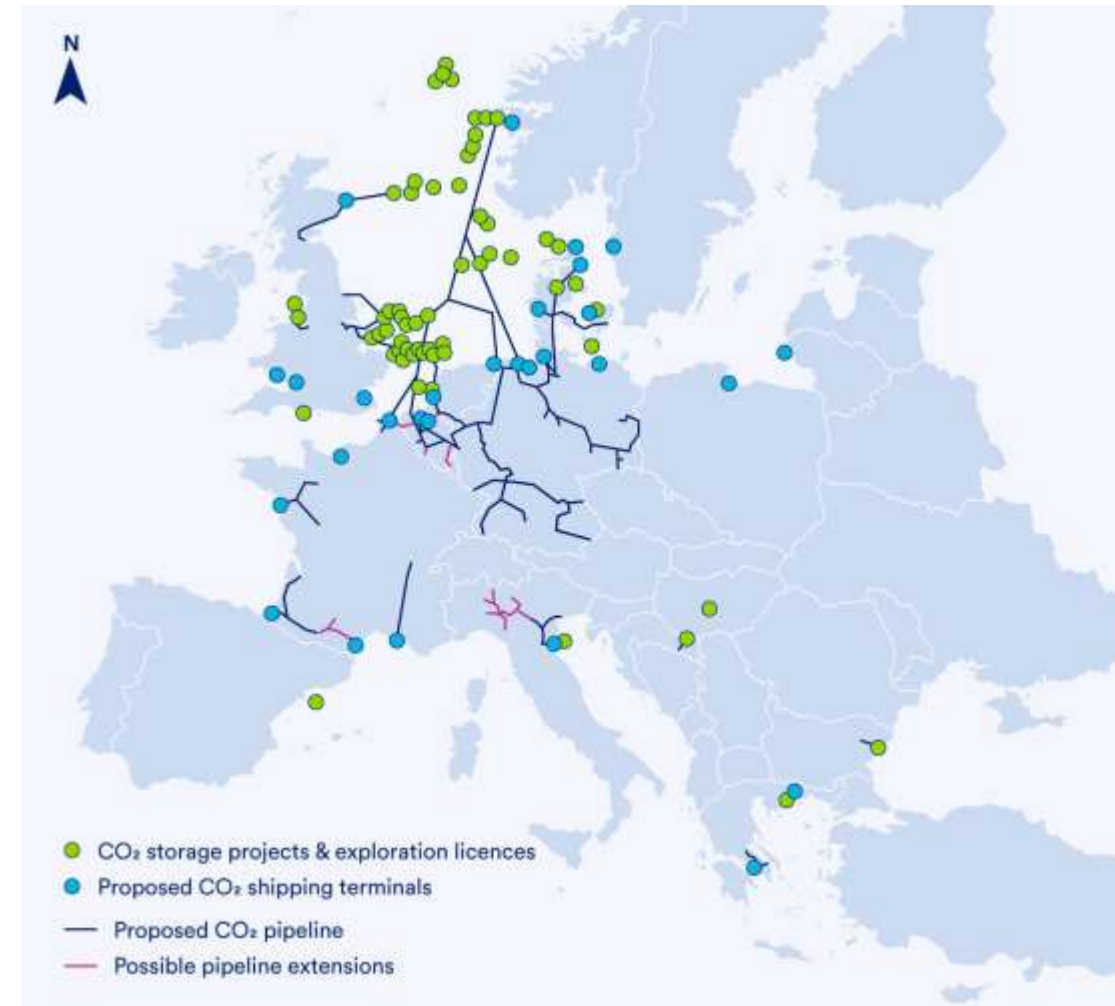
EU Policies: Industrial Carbon Management Strategy

- Capture targets:
 - **280 mln tons by 2040**
 - **450 mln tons by 2050**
- Network targets:
 - 7,300km of pipelines by 2030
 - 19,000km of pipelines by 2040
- Goals:
 - **CO₂ transport and market regulation**, international harmonisation of frameworks
 - **Infrastructure planning mechanism**; assessing potential repurposing of existing gas infrastructure
 - Demand aggregation platform
 - Investment atlas for storage sites
 - Knowledge-sharing platform
 - Guide for permitting procedures



EU Policies: CO₂ Transport Infrastructure and Markets Regulation

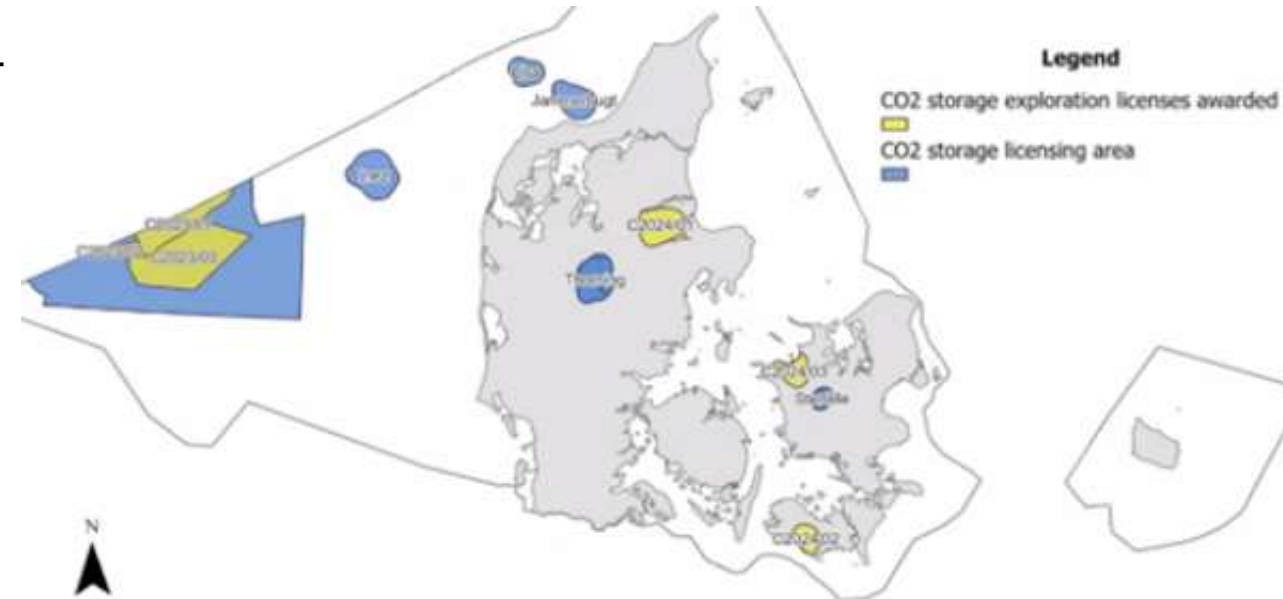
- **Public consultation** now open
- **Bellona survey** with industry
- Important aspects:
 - Cross-border coordination
 - Third-party access
 - Market & ownership structure
 - tariff regulation, capacity allocation and cost recovery
 - Regulatory oversight
 - Stream quality standards
 - Harmonization of measurement, reporting and verification



proposed CO₂ infrastructure in Europe
Source: Clean Air Task Force

National policies: Denmark

- **National Roadmap for Capture, Transport, and Storage** and multiple policy instruments including **pipeline regulation**
- **EU CO2 storage frontrunner**
- **CCS, NECCS and CCUS funds:**
 - Three funding rounds, total value of €5.3 bln
 - CCUS fund specifically for **full-value chain** CCS projects
 - Closes in December 2025
 - **Minimum injection quantity** must be provided, undershooting will be penalised
 - Any potential revenue from negative emission credit sales can be deducted



National policies: Sweden

- Negative emissions procurement scheme: **reverse auction**, companies bid on support per ton of CO₂, lowest bid that meets criteria wins
- € 3.2 bln fund for **negative emissions** between 2026 and 2046
- First round awarded to **Stockholm Exergi**, BECCS Stockholm
- € 1.7 bln allocated in first round
- Next reversed auction round to be launched before the end of 2025
- Public funding also available through “Industriklivet” and EU funds



National policies: Norway

- 1991: introduction of **high carbon tax**
- Economic incentive promoted first European CO₂ storage sites: Snøhvit and Sleipner
- 2020: Launched state-backed Longship project
- **Full-value chain CCS project with open-access storage site**
 - €1.5 bln state support, two thirds of total cost
 - Served the goal of learning and **knowledge sharing**



Public perception and societal acceptance



Importance of societal acceptance

- Gaining public acceptance, a “**social license to operate**”, is critical for CCS success – without community support, projects face delays or cancellation
- **Local opposition** (residents, local governments, or NGOs) has proven **capable of stopping CCS projects**, regardless of technical issues
- CCS projects cannot succeed unless the people living near capture plants, pipelines, and storage sites feel comfortable with projects
- Successful CCS deployment **requires strategies** to inform, consult, involve, and **earn the trust** of society, **at local and national levels**



“Climate protection needs CCS”

Case Studies: 2009 Spremberg, Germany

- Citizens perceived project as **high risk, no benefit**
- Authorities did not grant necessary injection permit due to local resistance
- Vattenfall abandoned project and withdrew from CCS research in Germany altogether
- CCS became no-go issue for German politicians at that time



Case studies: Scandinavia

- **Norway:**

- CCS framed as part of Norway's **climate leadership**
- Support from NGO Bellona and government

- **Denmark:**

- Initial project in Jutland in 2010 shelved due to local opposition
- **Comprehensive approach** to fostering public acceptance since
- Through environmental assessment, stakeholder consultations, and community input **long before projects are started**
- Generally people are positive, but risk that this changes locally with onshore storage



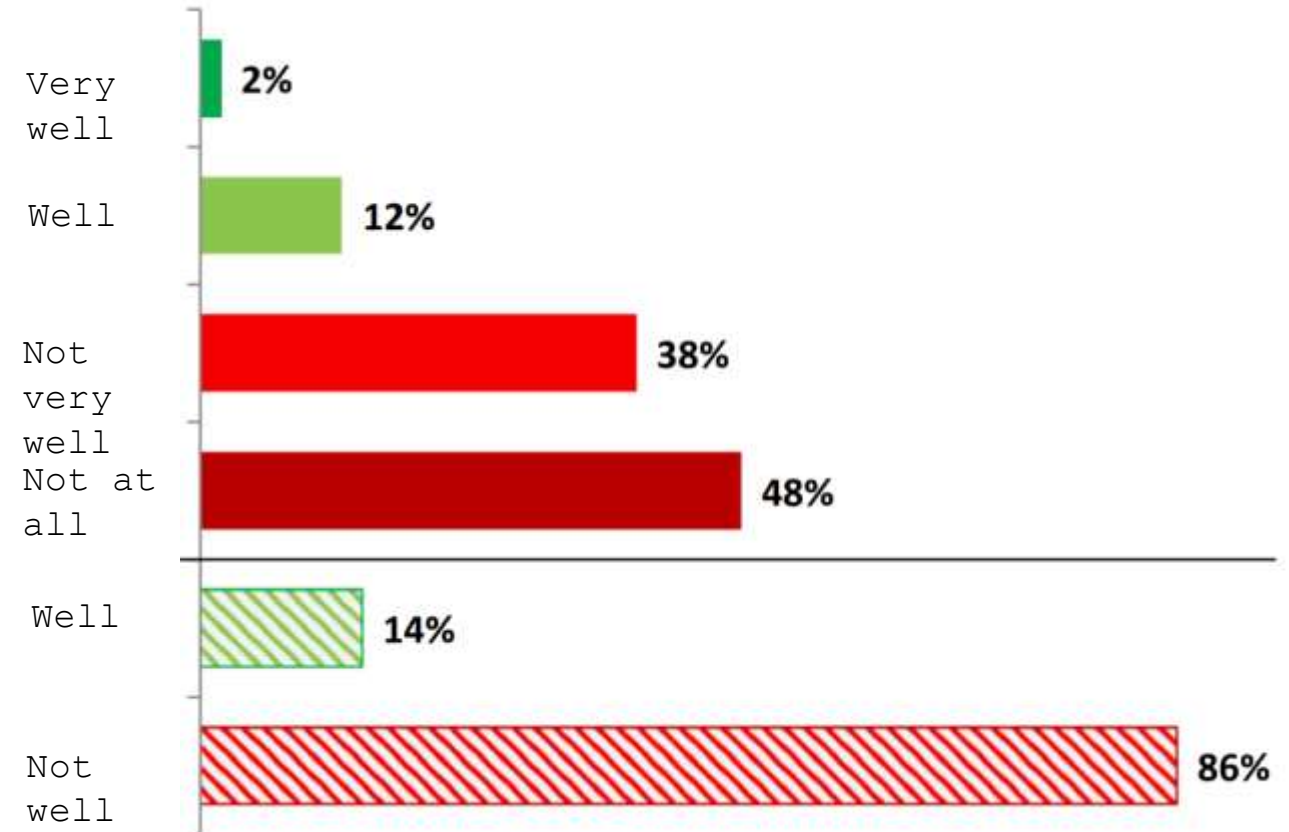
General public understanding of CCS

- **Public awareness of CCS generally low**

Example, 2025 survey in Sweden:

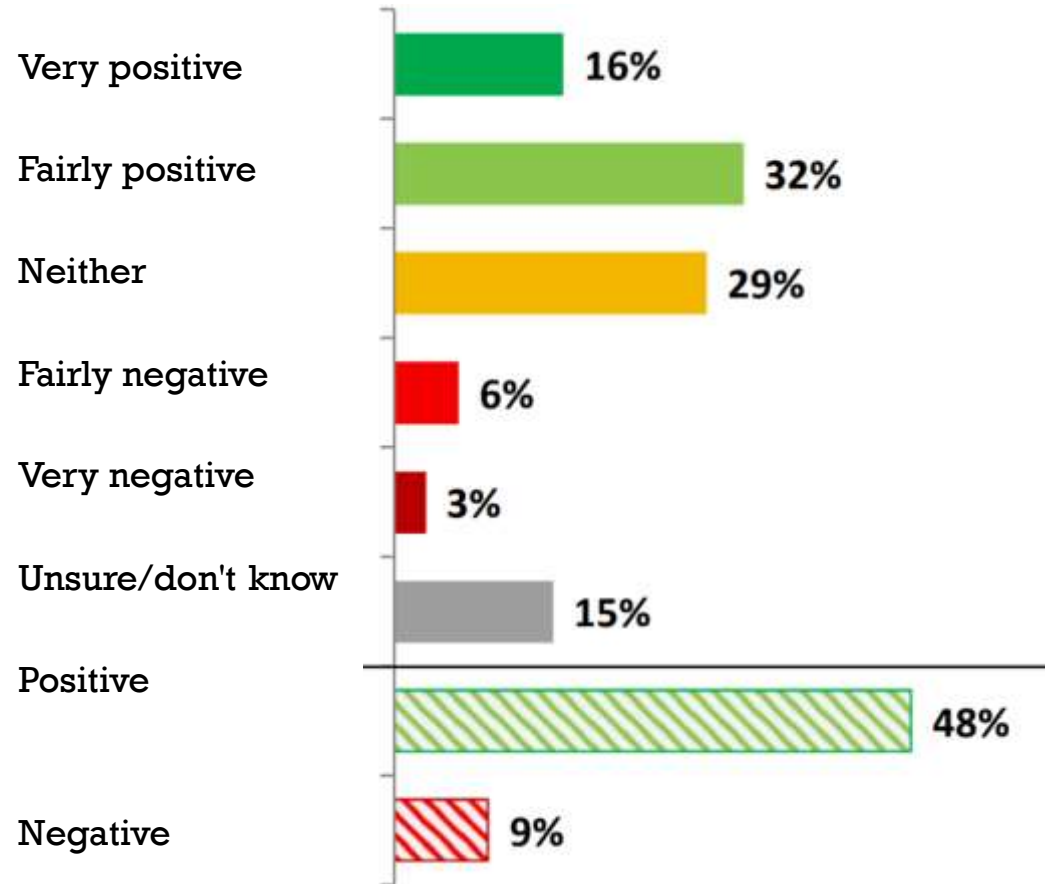
- **45% have heard about CCS**, but only 14% are well aware of what it is - **86% are not**
- In general, **people that know more are more positive**, but slightly bigger share of sceptics among the well informed
- **Only 5% feel that they have enough information** about CCS in Sweden

How well aware are you of what CCS is?



Source: Novus
2025

Based on the provided description, how do you feel about use of CCS in Sweden?

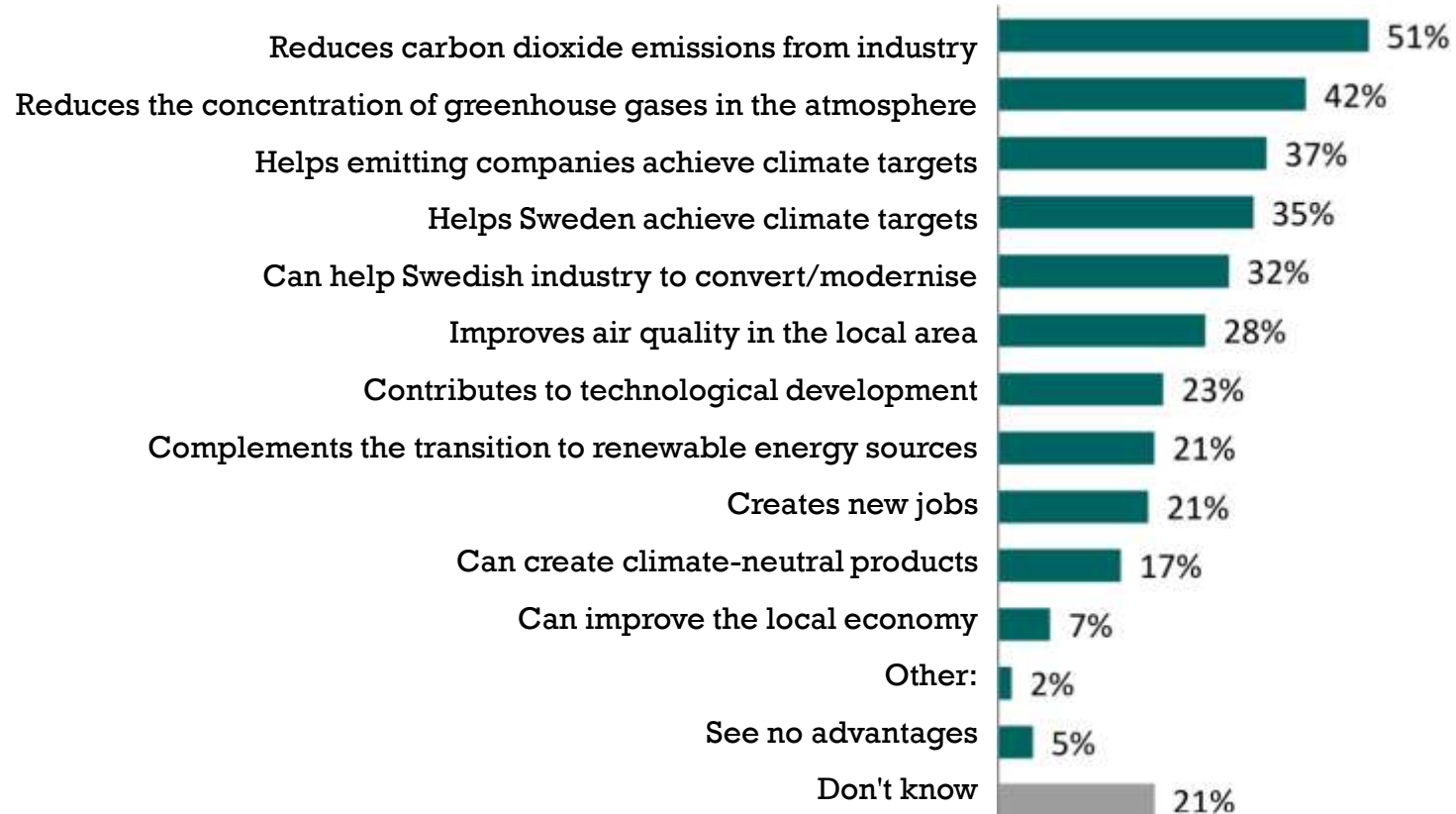


“CCS is a method of separating carbon dioxide from various industrial processes (cement industry) or combustion plants (combined heat and power plants), transporting it and storing it permanently in bedrock.

CCS is a way of reducing carbon dioxide in the atmosphere by binding it in geological formations underground for thousands of years, as long as there are no leaks. CCS may be used at facilities where there are no other alternatives.”

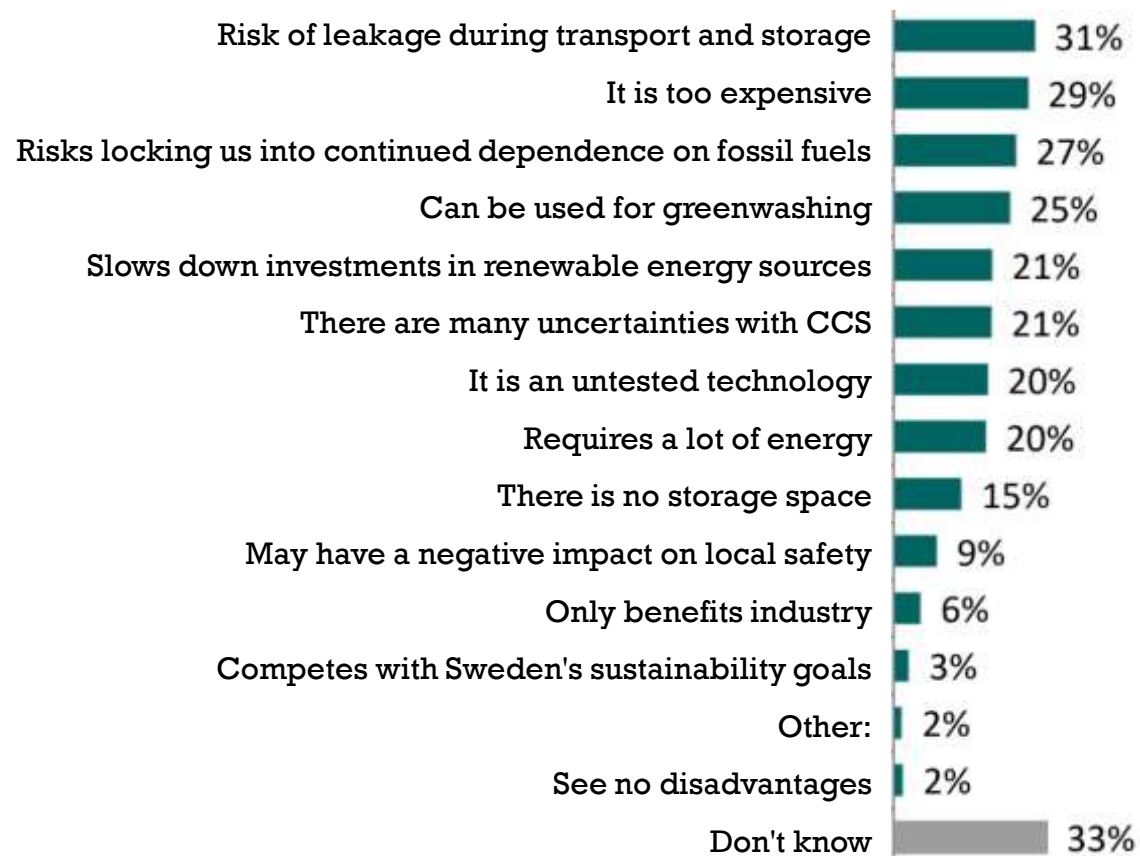
Source: Novus
2025

What advantages do you think CCS could have in addressing climate change?



Source: Novus
2025

What disadvantages or risks do you see with CCS?



Source: Novus
2025

Public Concerns

- **Leakage:**
 - Fear that CO₂ may escape the underground reservoir
- **Environmental damage:**
 - CO₂ **leaching** chemicals and heavy metals out of rock formations into drinking water
 - CO₂ contaminating groundwater or acidifying soil
 - **Induced seismicity**; CO₂ injection associated with fracking or geothermal projects; fear of earthquakes damaging properties
 - carbon capture: may not contribute sufficiently to pollution control in contrast to other alternatives
- **Health & Safety**
 - Concern due to unfamiliarity – in contrast to industry or oil & gas infrastructure that communities learned to live with
 - Concern over insufficient emergency plans and safety measures
- **Economic concerns**
 - Locals may fear they bear all the risks while others reap the benefits; perceived unfairness
 - Property devaluation
 - Frame: “*don’t send us your waste gases*”
 - High costs – public money better spent elsewhere
- **Fossil lock-in**
 - CCS could prolong reliance on fossil fuels; undermine push for renewables
 - “lets polluters off the hook”

Sources matter: reliable information wanted

- Who communicates about CCS matters: **trust in information sources** is a determining factor in how people form opinions on CCS
- In Sweden, the **big majority prefers information from expert agencies, academia, media, and the government. 24% wants more info from environmental NGOs, 16% from industry**
- **If the public perceives the proponents of CCS as biased (e.g. fossil fuel companies), they may remain skeptical**
- **Need for public education to raise awareness and correct false impressions**
- **Transparency and trust-building to foster acceptance**

Media representation

- CCS does **not feature frequently** in mainstream media
- **Coverage spikes around major events**, e.g. often when a new project is proposed, or when there is conflict or controversy, like in community protests
- Studies show **media treatment of CCS has often been skeptical or negative**, especially in context of power generation
- **Media** reports frequently **highlight fears** (safety, environmental risks) and **local opposition** while often **overlooking** potential **benefits** or climate context
- Positive developments (e.g. successful injection trial) get comparatively little attention
- But **not all negative**, recent articles on storage availability have been more balanced

Case studies: lessons learned

- Factors influencing support / opposition:
 - Perceived **risk** vs **benefit**
 - Level of **trust** in parties involved
 - Level of trust in **government**
 - **Climate consciousness**
 - Local **experience** with industry, energy, subsurface activities
 - Advocacy of **local voices**
 - **Timing and quality** of engagement & communication

Policy and governance tools for public perception and acceptance

- Strong regulation (site selection, liability provisions, long-term stewardship) and government oversight can **provide reassurance**
- Government support can **normalize CCS in public discourse**
- Mandating compensation schemes for local residents can foster support
 - **Benefit-sharing** through direct payments
 - **Community funds** (e.g. for infrastructure or culture)
 - **Job training programs** for local residents to get involved
- Message: *not bribing people to stay quiet, but rather granting them their fair share of benefits*
- **Public involvement** (e.g. public hearings, seat in advisory councils) can help build trust
- Responsive and flexible governance (instead of forcing projects through local resistance) can prevent damaging trust
- **Implementing CCS in a general context of high ambition on climate action**



Thank you!

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