

Bioenergy with
Carbon Capture and
Storage

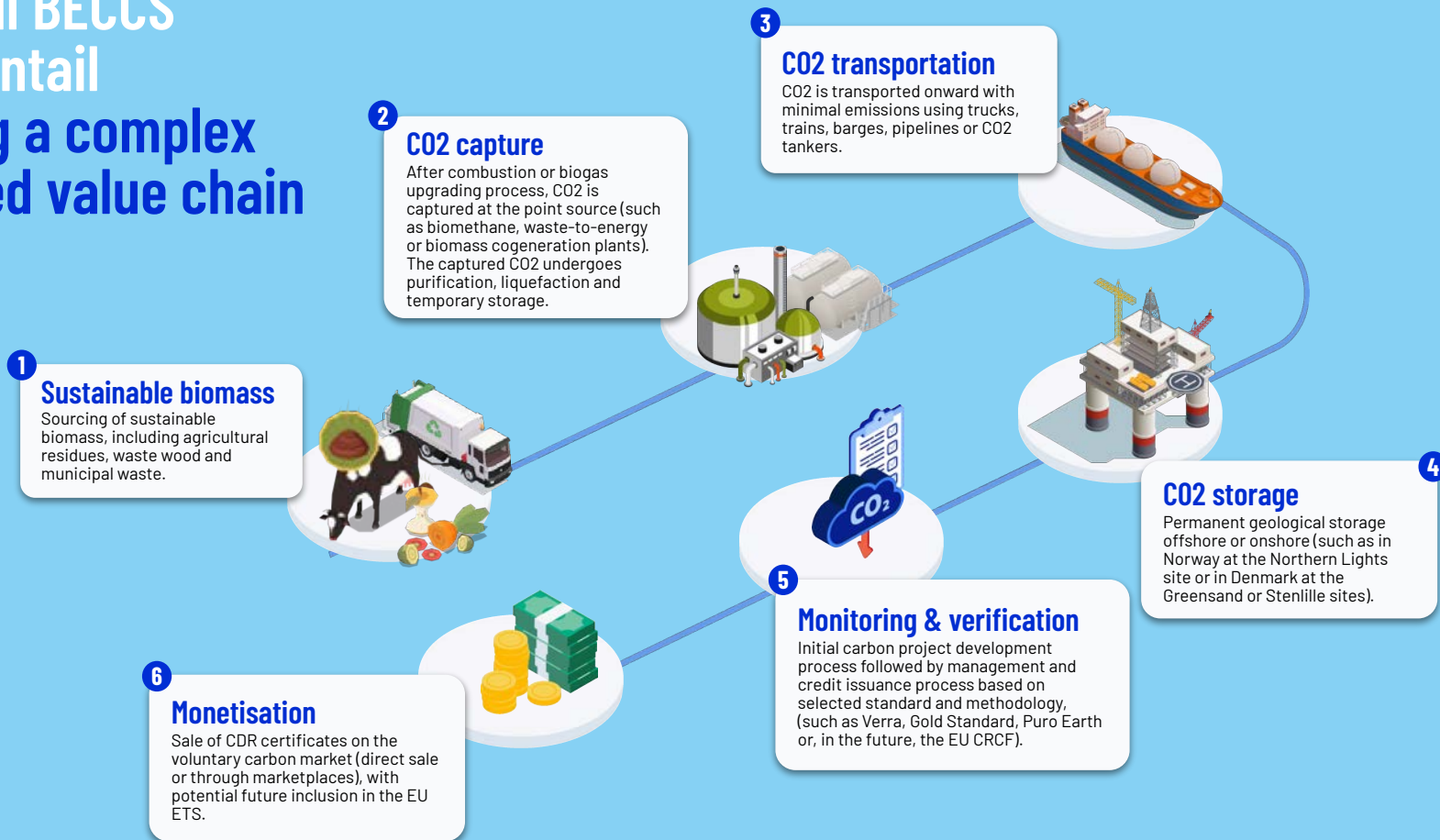
BECCS



A first commercial Swiss BECCS project in 2026: A crucial step towards scaling CCS in Switzerland

CCUS Stakeholder Dialogue – Sion, 15.06.2026

Successful BECCS projects entail navigating a complex & extended value chain



Example BECCS Niederwil (AG)

First commercial Swiss BECCS project starting in July 2026

Key points

- **Project type:** "Bioenergy with Carbon Capture and Storage" (BECCS)
- **Biomass point source:** Largest biomethane plant in Switzerland (1000 Nm³/h) – largely food waste from industry and restaurants
- **Partial financing secured:** The Climate Cent Foundation will buy CDR certificates worth CHF 10 million by 2030
- **Transport & storage:** CO₂ is transported by truck, train, and ship to Northern Europe and permanently stored at Greensand geological storage site (North Sea – Denmark)
- **Robust and recognized certification:** According to FOEN requirements. The project was successfully registered in 2025

Key plant data

- **CO₂ source:** Exhaust gas from biogas upgrading plant
- **Raw biogas:** < 1,000 Nm³/h
- **Exhaust gas:** < 400 Nm³/h = Input CO₂
- **CO₂:** < 4,300 tonnes/y
- **Capture technology:** Membrane
- **Avoidance:** CO₂ emissions and methane slip



© CO₂ Energie AG (Visualization of BECCS Niederwil plant)

Project organization

- **RWB / CO₂ Energie AG:** Project developer and operator
- **Alera Energies AG:** Planning office
- **South Pole AG:** Certification according to FOEN guidelines
- **Airfix Carbon AG:** Organization of transport & storage of CO₂

BECCS Niederwil entails complex multimodal CO2 transport



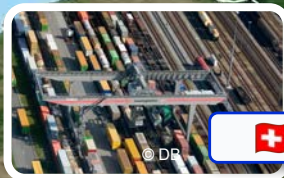
Greensand storage site



Port Esbjerg



Hamburg



Basel

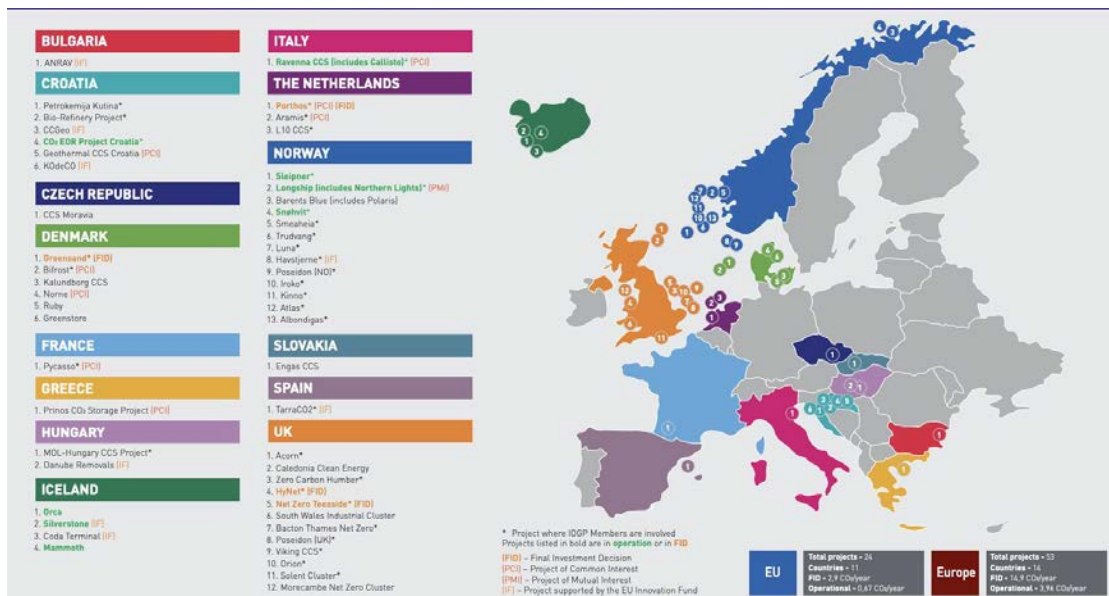


BECCS Niederwil



New CO2 storage sites are emerging

Yet, reaching NZIA target of 50 MtCO₂/a storage capacity remains challenging



Source: [IOGP](#) (2025)

Costs

- Storage prices: typically not publicly disclosed
- Indicative market ranges: ~50–120 CHF/tCO₂

Timeline

- Today, only Greensand and Northern Lights receive 'external' CO₂
- Storage capacity must often be secured 1–2 years before injection.

Location & access

- Access depends on proximity to pipelines, shipping terminals and CO₂ hubs.

Scale-up challenge

- First-wave projects benefit from early access to storage and infrastructure.
- Later projects may face tighter availability and higher costs if storage development lags capture deployment.

For Swiss BECCS projects, CO2 transport remains cost driver

Indicative example only

Small-scale emitter transporting CO2 in ISOtainers from Switzerland to Denmark with the following assumptions:

- Annual volume – **5,000 tCO2 / year**
- The roundtrip cost per container asset – **EUR 4,000 / ISOtainer**
- The emissions along the transport value chain – **1.5 tCO2 emitted per round trip**
- The cost of the container asset (leasing) – **EUR 50 / ISOtainer / day**
- The number of assets – 8 days roundtrip + 1 ISOtainer delivered per day = **10 ISOtainers needed** (incl. buffer 25%)
- Opportunity cost of CDR not issued – **EUR 600 / tCO2**

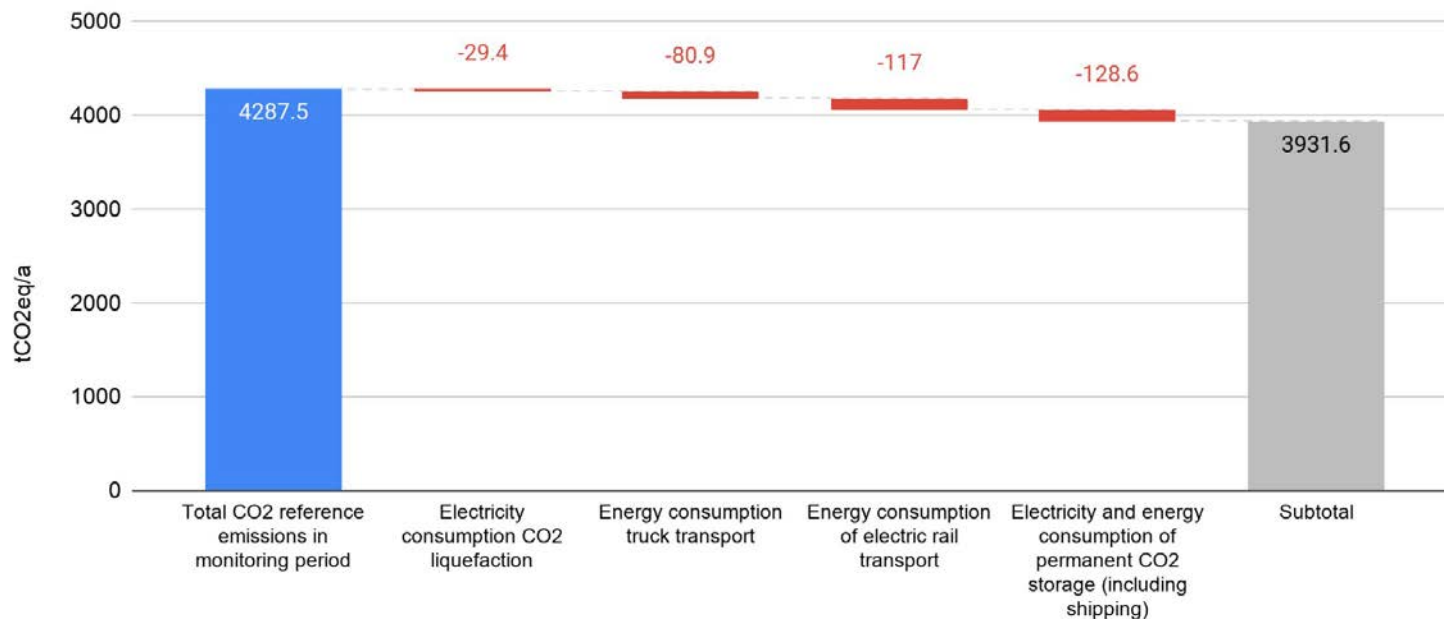
$$\begin{aligned}
 \text{Total costs CO2 transport (EUR/ tCO2)} &= \frac{\text{EUR 4,000 / ISOtainer} + \left[\text{1.5 tCO2 / ISOtainer} \times \text{EUR 600 / tCO2} \right]}{20 \text{ tCO2 / ISOtainer}} + \frac{\text{EUR 50 / ISOtainer / day} \times 365 \times 10 \text{ ISOtainers}}{5'000 \text{ tCO2}}
 \end{aligned}$$

From a initial cost of EUR 200 / tCO2 → the “real cost” of transport becomes **EUR 281.5 / tCO2.**

It is crucial to compare transport concepts / offers based on the real cost and not only the transport quote.

Net Carbon Removal (per year- calculated)

Excl. emission reduction from reduced methane slip



⇒ Total calculated process emissions (of reference emissions): ca. 8.3% (7.7% if reduction methane slip included)

Learnings and achievements since start of project in 2023

Technology, processes, complying with regulations

Technology

- Stable and **continuous operation of carbon capture plant** (CO2 Energie AG)

Regulatory / compliance

- Switzerland signed **Amendment to Art. 6 of London Protocol (Nov. 2023)** + concluded **bilateral MoU with Denmark** (Sep. 2025)
- First Swiss BECCS project registered under Swiss BAFU standard
- Securing **CO2-Export permit** (ongoing), **customs** (ongoing)

CO2 transport and storage

- Building up **multimodal, cross-border CO2 transport logistics** including RFP for CO2 transport, risk management & contingency planning, operations concept aligning multiple actors and ensuring interoperability of systems (e.g. couplings)
- Negotiation of CO2 storage contract with large oil & gas company (INEOS) - **only non Danish project which delivers CO2 to Greensand** in first phase

Outlook: BECCUS Otelfingen

Applying our learnings to the next BECC(U)S project

Type

- CO2 capture at biomass power plant (27kt CO2/a)

Start operations

- From 2030

Climate impact

- Substitution of geological CO2 in the food industry (10kt CO2/a)
- Permanent geological storage (negative emissions, 17kt CO2/a)

Financing

- Climate and Innovation law funding (up to approx. CHF 41.7 million), sale of CDR certificates, sale of CO2 to industry (incl. avoidance certificates)

Partners

- RWB/CO2 Energie AG, BAC/BKW, Linde Gas, Alera (engineering), South Pole (certification), Airfix (CO2 transport & storage)



© Google Earth

... but we also see critical challenges for the operation/scaling of BECCS projects in Switzerland

Regulatory framework

- Lack of **CO2 legislation after 2030** (incl. KLiK) ⇒ *Investment risk*
- **Permissibility of amine-based capture methods**
- **Funding under the Climate and Innovation Act:** Difficult to meet all conditions, especially regarding the sale of certificates
- **Lack of binding interim targets for negative emissions** (not just buying certificates in 2050)
- **CO2 considered as 'waste'** under Swiss legislation

CO2 transport and storage

- **No clear roadmaps for CCS for mid-to-large CO2 emitters** (waste incineration plants, cement) ⇒ *Delays the development of efficient CO2 transport infrastructure*
- Fluctuating/rising **transport costs**
- Storage operators **pass on risks to project developers**
- **Closer storage options and optimised transport options** are crucial to market expansion

Financing

- Voluntary CO2 market too small to reliably purchase larger quantities of CDR certificates long-term.
- Swiss certificates are expensive (*CO2 transport is the cost driver*)
- Mandatory market: ETS prices are too low for CCS
- Mechanisms for de-risking (BE)CCS projects: Currently most project risks are with project developer

The world needs to remove 10 billion tonnes of CO₂ every year*

by 2050 in order to maintain global warming below 1.5°C.

Let's start now!

Contact



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***The IPCC states between 5–16 Gt per year. Priority should reductions over removals.**

Source: IPCC 6th assessment report on mitigation; [McKinsey Sustainability Blog](#)



Airfix Carbon AG

Founded in Zurich in 2023, Airfix Carbon AG combines private and public climate finance with extensive experience in CO₂ project development, bringing a new vision for a scalable market for bioenergy with CO₂ capture and storage (BECCS) in Europe.

Our goal is to remove 1 million tons of carbon dioxide from the atmosphere by 2030.

Some of our customers ...



Airfix offers tailor-made solutions ...



CONSULTATION for BECCS projects

We support you in the early phase of your BECCS project – whether for individual aspects or comprehensive 360° feasibility studies.

We can also act as your sparring partner, providing ad-hoc support for specific questions through a Service Level Agreement.

PROJECT for BECCS projects

We support project development for biogenic CO₂ emitters across CO₂ capture, transport, storage, and business model development.

SALE OF CDRs of BECCS projects

Long-term sale of CO₂ certificates to companies on the voluntary carbon market.

More information can be found here: <https://www.airfixcarbon.com/>