Securing access to CO_2 storage capacity

Learnings from small- and mid-sized European emitters

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Airfix: scaling European Biomass Carbon Capture & Storage (BioCCS)

through three distinct synergetic and complementary activities

Airfix

One-stop-shop for emitters and offtakers

1. BioCCS advisory

Supporting emitters, investors and other stakeholders to:

- Evaluate the feasibility of their projects
- Understand the BioCCS value chain
- Structure their BioCCS projects

building a **pipeline of robust BioCCS projects**

2. CO_2 transport & storage services

Arranging third-party services for emitters, including:

- CO_2 transport & logistics
- CO_2 storage capacity

as well as optimising the value chain through **aggregation of volumes**

3. CDR sale

Selling Carbon Dioxide Removal (CDR) certificates to corporate and philanthropic buyers through:

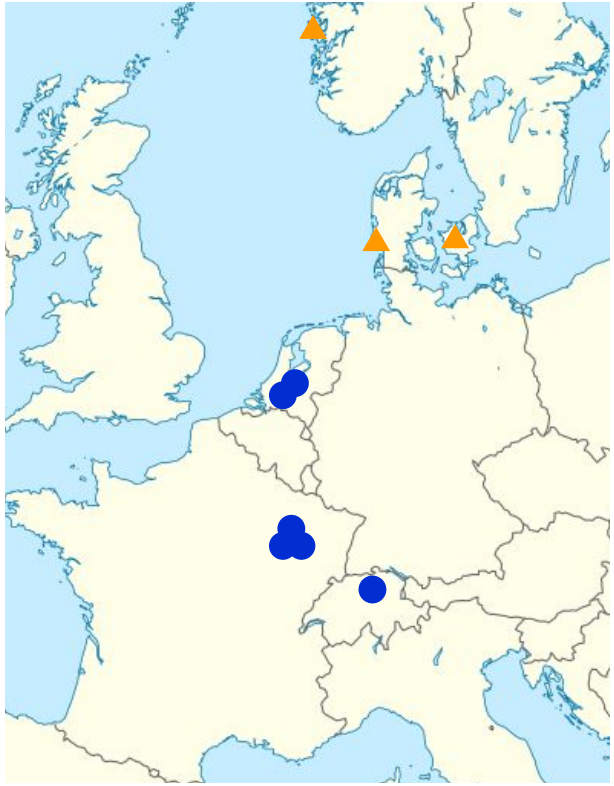
- Pre-purchase agreements
- Long-term offtake contracts

securing a **revenue stream for BioCCS projects** and enabling FID

Airfix offers support to projects along the full CO_2 value chain

Airfix: our first projects will be operational in 2026

with a portfolio of six BioCCS projects spanning across the European continent



Biomethane plants

CO2 storage sites expected to be operational in 2026

Biomethane combined with carbon capture and storage:

- **6 projects** spread across France, Netherlands and Switzerland
- **30'000 - 40'000 tCO_2 per year** removed in total
- **Short lead time**: < 1 year between FID and start of operations
- **Low capture costs** – almost pure stream of CO_2 from biomethane production
- **High transport costs** due to distance to storage sites

Although this does not represent a huge volume to start with, the **potential CO_2 storage needs for small- and mid-sized emitters is huge in Europe**.

Small & medium biogenic CO_2 emitters have an important role to play

in the EU net-zero strategy, as they represent a large source of potential negative emissions

"To reach net-zero economy-wide GHG emissions by 2050, the EU could need carbon removals to balance out around

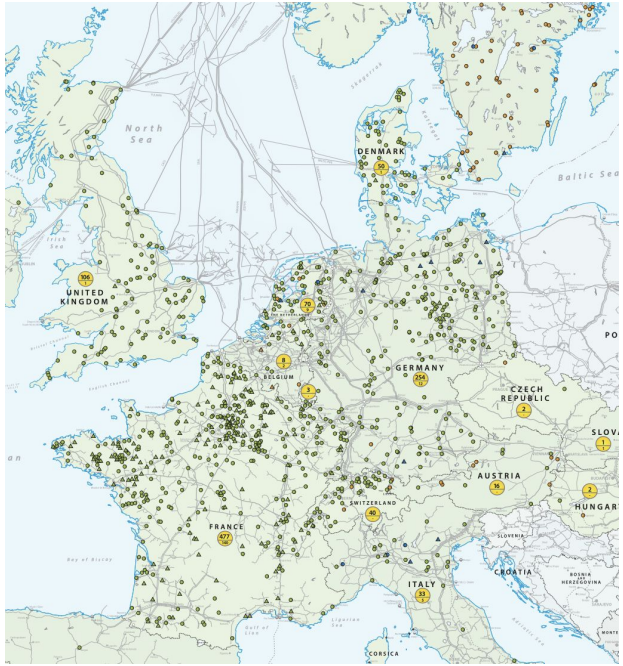
400 million tonnes CO_2

equivalent of residual emissions in hard-to-abate sectors such as agriculture, aviation and some industries."

Source: EU Carbon Management Strategy (2024)

They also represent significant aggregated volume for CO_2 storage

and an opportunity for CO_2 storage providers to support the development of that market



Sources: European Biogas Association, Mitsui&Co

Biomethane plants offer an almost pure source of CO_2.

- **1'322 biomethane plants** in Europe in 2023 (up 30% from 2021)
- Only a small fraction of the biogas plants upgrade and separate the CO_2
  - e.g. Germany: **only ~2% of biogas plants upgrade to biomethane**
- Each plant emits between **several 100s to several 1'000s tCO_2 per year**
- Although the current market volume is low, these projects are
  - low-hanging fruits – **almost pure CO_2 stream**
  - ideal **complements to larger volumes** for storage companies
  - aggregating around actors such as Airfix

Note: On a case by case basis, the option of CO_2 utilisation should also be explored if local demand exists.

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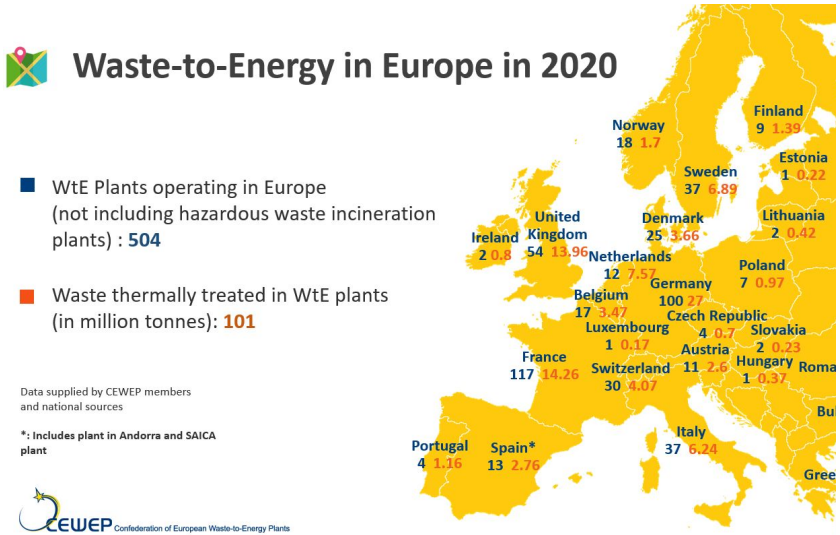

Sources: Confederation of European Waste-to-Energy Plants (2020), CEWEP WtE Climate Roadmap (2022)

Waste-to-Energy plants are typically mid-sized plants and have a strong public value beyond energy generation:

- **504 WtE plants** in Europe
- Emitting roughly **100 million tCO_2 per year**
- On average, **60% of the CO_2 is biogenic**
- Often fully or partially owned by local municipalities
- **High capture costs** – due to the low concentration of CO_2 in the flue gas (typically 10-20%)

Beyond WtE and Biomethane, other small- to mid-sized plants include:

- Biomass incineration plants
- Bioethanol
- Other types of fermentation plants

Challenges for these emitters to secure CO_2 storage capacity

which depend on the storage site and size of the emitter itself

Attractivity	• Not essential or sufficient to support FID process of storage sites because of low volumes
Inclusive infrastructure	• CO_2 offloading infrastructure is typically designed to receive from bulk CO_2 shipping (> 400'000 tCO_2 / year) or pipeline • Limited options for truck, rail or smaller bulk CO_2 ships
Negotiation power	• Key terms and conditions are typically tailored to larger projects and are not suited for smaller projects

Guarantee requirements	• Contract guarantees are required by storage company for part of the contract value
	  ○ They can be hard to secure for local utilities with no credit score
	  ○ Storage companies often do not depend on these projects to take an FID

Opportunities for storage sites to integrate these emitters

into their sourcing strategies by exploring the following ideas

Attractivity	➔ Reserve small portion of capacity for local emitters / small and mid-sized emitters ➔ Use these emitters to fill the gaps and complement the additional capacity not covered by large emitters *Government lever: ensure government support for storage sites requires inclusive access
Inclusive infrastructure	➔ Plan for offloading infrastructure that can accommodate multiple delivery forms ➔ Act as an aggregator of volumes or facilitate volume aggregation at specific nodes
Negotiation power	➔ Offer standard terms and conditions tailored to these emitters ➔ Enable joint negotiation within a group of emitters to facilitate their access
Guarantee requirements	➔ Adjust financial requirements to the FID's dependence on these emitters, the financial risk associated and their financial capacity

Europe needs
non-discriminatory, open-access, transparent, multimodal, cross-border CO_2 transport and storage infrastructure.

Source: EU Carbon Management Strategy (2024)

Thank you for your attention

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