Biogas opportunities in Europe

Fundamentals and challenges

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CIP in brief

CIP is specialised in investing in large and complex greenfield renewable energy infrastructure projects

~35 greenfield CIP investments in utility-scale clean energy infrastructure across all key markets and technologies






EUR ~26 billion AUM
from ~160 global investors across 11 funds since the establishment of CIP in 2012.

+120 GW greenfield projects in development and ~14 GW in operation or under construction.

Climate and ESG integrated throughout the investment process and at the project level. Adherence to international ESG standards, industry initiatives, reporting, and climate disclosures.

Innovator & industry pioneer
First movers in offshore wind and Power-to-X and in new markets.

Global organization with local presence in all key markets and 12 offices across Europe, US and APAC. Our team offers a unique mix of industrial, energy, and financial expertise.

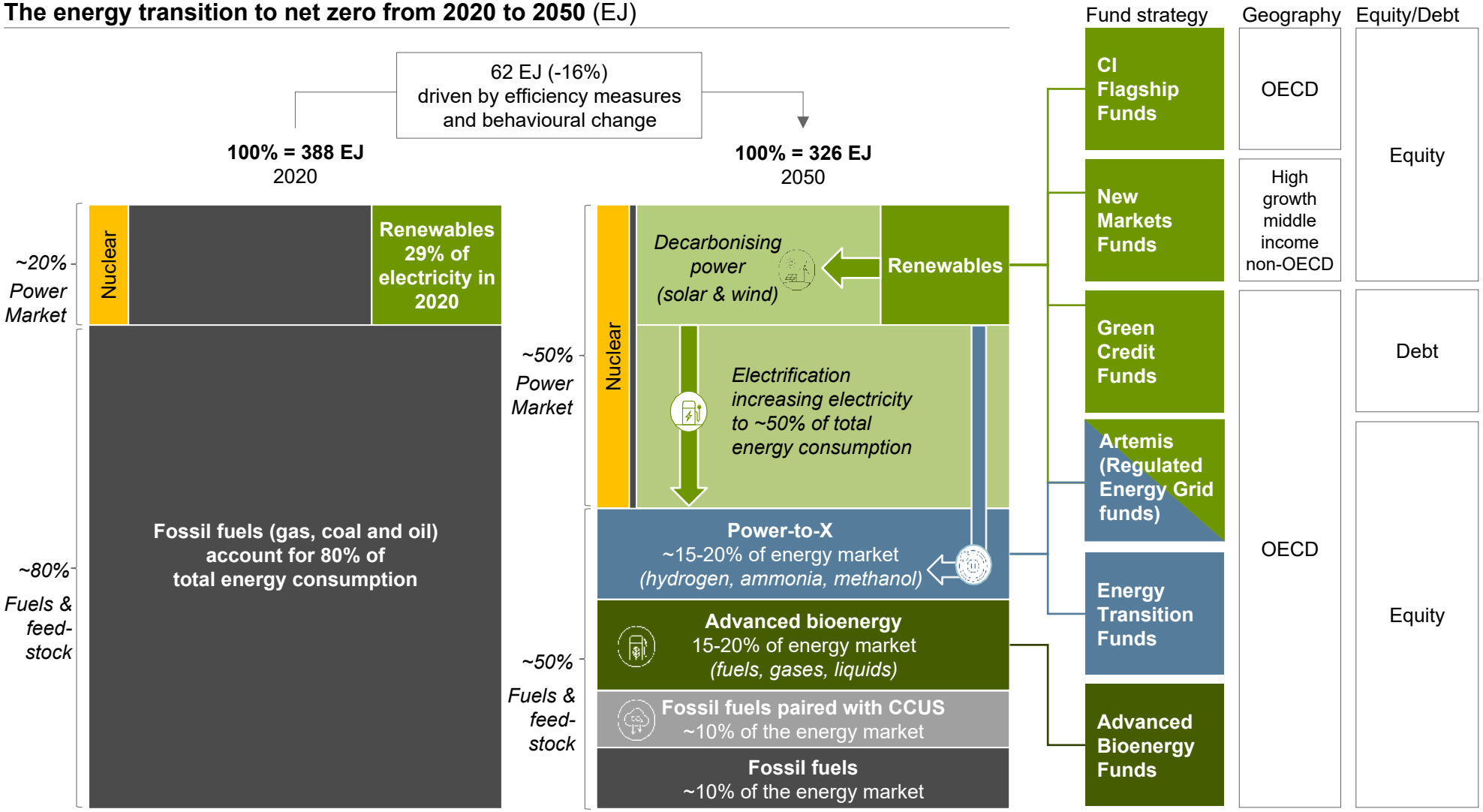
Partnerships based on trust, reliability, and mutual value created through an extensive network of longstanding industry partnerships with the most experienced and best-in-class individual companies.

*As of 30.06.2023

CIP's distinct fund strategies tap into the main energy transition trends

CIP enables investors to contribute to the energy transition through decarbonisation of both the power and hard-to-abate sectors

The energy transition to net zero from 2020 to 2050 (EJ)

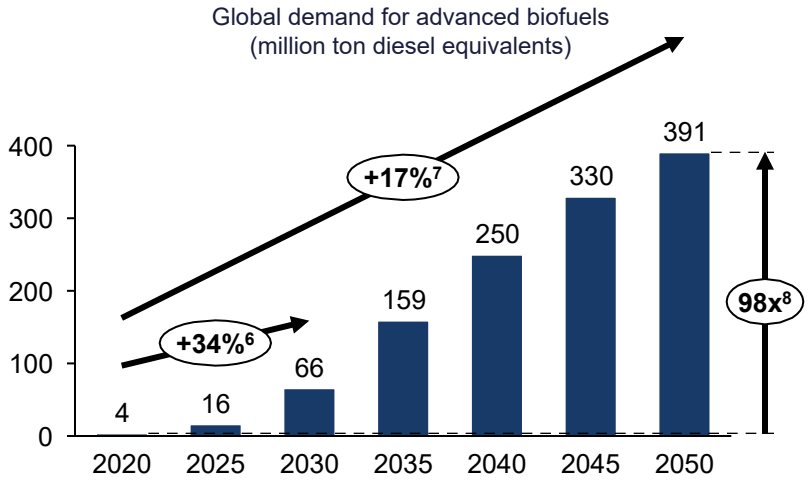


Sources: International Energy Agency (2021), Net Zero by 2050, IEA, Paris

EU & US regulation and waste recycling needs are expected to drive fast growth in biogas & biofuel markets

Expected high growth in demand for advanced biofuels underpinned by regulation in EU and US

Biogas and biofuels markets

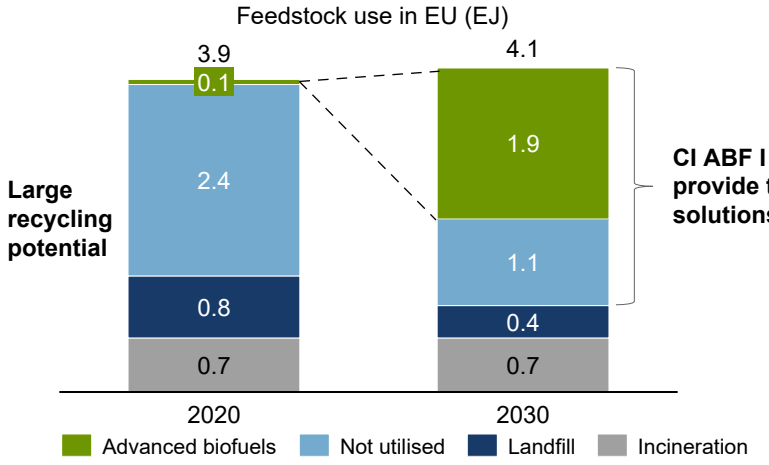


Market drivers

- ✓ McKinsey estimates a total demand for advanced biofuels equivalent to 1,000-1,500 new advanced bioenergy projects by 2030 in EU driven by RED II[1] blend-in targets, EU ETS[2], national legislation and voluntary schemes
- ✓ Federal and state level legislation in the US promote advanced biofuels
  - Federal level: The Renewable Fuel Standard sets blend-in targets equivalent to ~15% advanced biofuels in the energy mix (2021)
  - State level: 2030 target of 20% emission reductions under the LCFS[3]
- ✓ Taps directly into existing infrastructure and offtake markets
- ✓ Immediate use case within industry and road transportation, future use cases within sustainable aviation fuels, shipping and green chemicals

Advanced bioenergy provides circular solutions solving environmental issues from pollution

Waste mgmt. and recycling markets



Market drivers

- ✓ Ban on landfilling organic waste
- ✓ Increasing restrictions in the EU on incineration of biomass[4]
- ✓ Household source sorting of organic waste (EU Waste Directive)
- ✓ Mobilisation and commercialisation of waste resources in agriculture[5], forestry and industry

Source: McKinsey&Co: Advanced biofuel demand, January 2022., EC, US EPA.

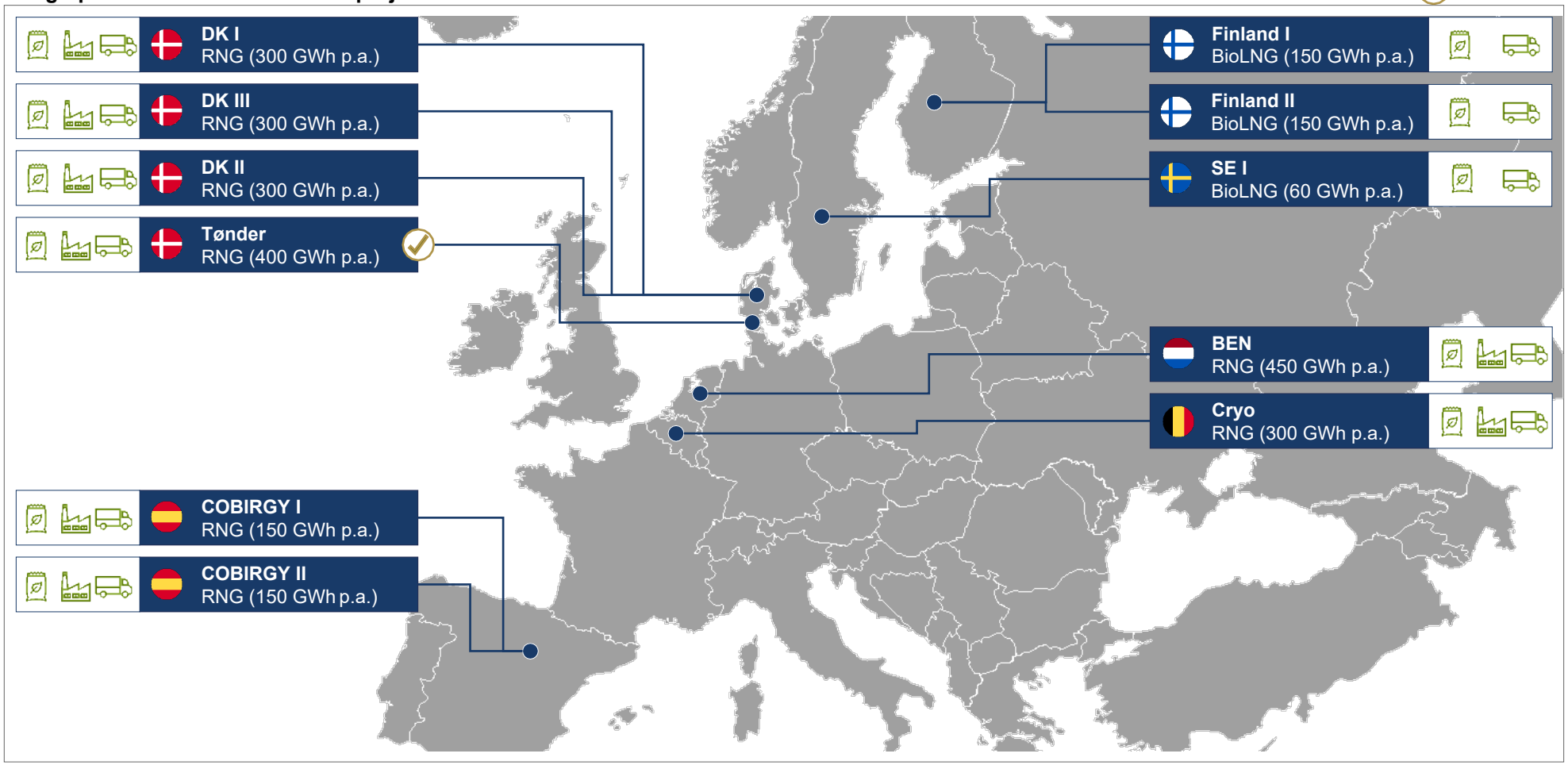
Notes: 1) Renewable Energy Directive II; 2) Emissions Trading System; 3) Low Carbon Fuel Standard; 4) McKinsey&Co: Feedstock markets, February 2022; 5) E.g., manure and straw; 6) Compound annual growth rate in demand 2025-2030;7) Compound annual growth rate in demand 2020-2050; 8) Increase in demand from 2020 to 2050.

Potential European bioenergy projects – Advanced Bioenergy Fund I

CI ABF I has positioned itself favourably to take advantage of the increasing demand for decarbonization and security of energy supply

Geographical overview of CI ABF I projects

FID taken



Potential offtake markets

Fertilizer | Industry | Transport

Tønder Biogas – first investment made

- Industrial-scale biogas plant with in-take of up to 930.000 tons of organic waste annually

Tønder Biogas site overview, December 2023

CIP considers different levels when assessing an opportunity

Level	Key factors	Description	Status
Regional	• RED II • EU ETS • EU waste directive • EU Fuel maritime	• Regions with high ambitions and targets for bioenergy are more attractive to CIP • Targets need to be supported by regulation • E.g. EU regulation, such as RED II and EU ETS drives demand for CI ABF I products	✓
Country	• National implementation of EU regulation • National requirements	• Countries with ambitious regulation and targets can increase demand and the green premium on advanced bioenergy • E.g. prices on advanced bioenergy for the transportation sector in Germany are higher compared to other EU countries due to more ambitious targets and higher penalties for non-compliance	✓
Area	• Feedstock availability • National regulation on feedstock	• Plenty availability of agricultural feedstock within approximately 30 km • Availability of industrial feedstock within reasonable distance	✓
Site and project	• Available infrastructure • Utilities • Technology	• Several fundamentals must be in place when assessing a site or project including: - Site location (neighbours) - Optimal transport infrastructure such as access to roads (or harbors) - Distance to gas grids (otherwise bioLNG) - Power grid availability and other utilities - Commercially ready technology	✓

Development of biogas plants in Europe is not without obstacles

Local opposition groups

- Local opposition groups can delay the development of biogas projects significantly by e.g. delaying permit process
- Issues often raised include:
  - Odours
  - Noise
  - Increase in traffic
  - But also, more radical criticism

Permitting process

- Long and complicated permitting processes extends the timeline for constructing biogas plants and causes higher DEVEX
  - Long response time from authorities
  - Unclear processes
  - Processes that need to be re-done due to even tiny changes

Local political support

- Support from local politicians can help prioritize the development of biogas plants when e.g. applying for permits
  - An example is CIP's La Sentiu project that has been declared strategically important for the Catalan region with positive implications on the permit approval process.
- On the contrary if local politicians do not support the development of biogas plants, the permit process can be challenged, and it may also have negative consequences on commercial agreements

All challenges can lead to bioenergy projects being abandoned or delayed

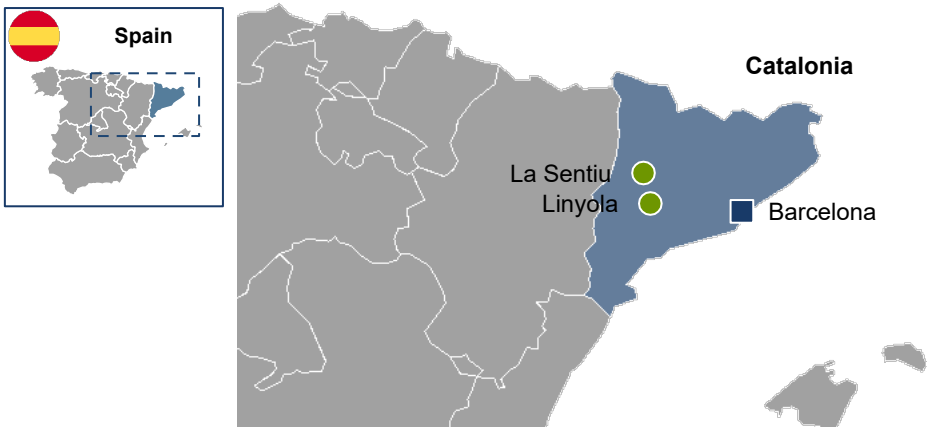
Introduction to Project COBIRGY

Solving an environmental challenge while producing green energy for the grid

Overview of challenges and project locations

Solving an environmental challenge: Catalonia is currently experiencing nitrate pollution of its drinking water, due to a mismanagement of agricultural waste

Strategic important: The La Sentiu project is classified as strategically important for the region by the Catalan government with positive impact on the permitting approval process



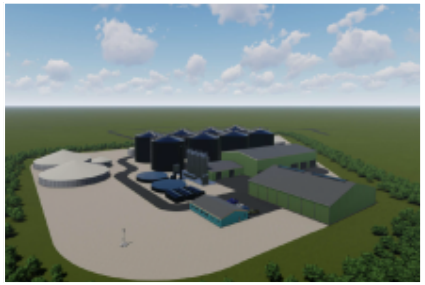
Key project facts

The project	• Two projects in Catalonia, Spain (La Sentiu and Linyola) • Utilise manure and industrial waste to produce Renewable Natural Gas (RNG) for the grid, fertiliser products and biogenic CO_2
Sustainability	• Solving environmental challenge by using manure to produce RNG • The RNG produced will replace fossil natural gas
Production p.a.	• 38m Nm^3 RNG • ~60,000 ton of fertiliser • 48,000 ton of biogenic CO_2
Feedstock sourcing	• Large volume of manure (low calorific waste) to be supplied by an aggregator • Industrial waste (high calorific waste) to be supplied on long term agreements
Regulatory support for the offtake	• RED II drives the demand side
Offtake contracting	• RNG and Green Gas Certificates (GGCs) intended to be sold on a long term offtake contracts • Nutrients/fertiliser intended to be sold on long term contract • Biogenic CO_2 sold to slaughterhouse industry or PtX facilities
Site & permits	• La Sentiu declared strategically important by Catalan government • Access to power and gas grid on both sites

Introduction to Project Cryo

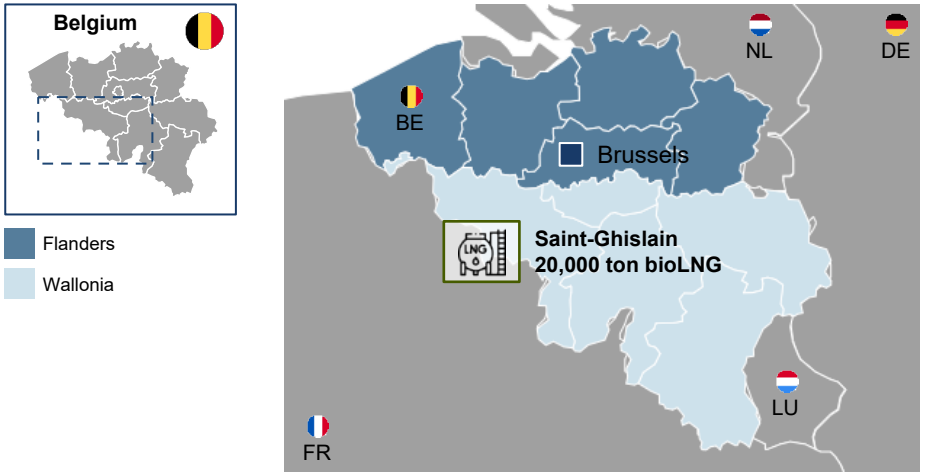
Using manure and industrial waste to produce bioLNG for the transport sector

Overview of project location and timeline



Solving Flanders' soil problem:

- Flanders has had manure management regulation in place for over 30 years and has continuously been tightening its penalties on manure disposal on farmland
- Limited availability of industrial land in Flanders, while Wallonia has available sites with attractive infrastructure
- Project Cryo located in Wallonia targets sourcing manure from Flanders



Key project facts

The project	• Project to use manure and industrial waste to produce bioLNG for transportation and fertiliser products
Sustainability	• Solves environmental challenge by using manure to produce RNG • BioLNG will replace fossil natural gas, saving CO_2
Production p.a.	• ~20,000 ton bioLNG[1] • 50,000 ton of fertiliser • 39,000 ton biogenic CO_2
Feedstock sourcing	• Agricultural and industrial waste • Robust feedstock strategy with focus on direct supply agreements • Secure long term manure supply
Regulatory support for the offtake	• RED II drives the demand side
Offtake contracting	• BioLNG intended to be sold on a long term offtake contract • Nutrients/fertiliser intended to be sold on long term contract
Site & permits	• Industrial site with available infrastructure

Note: 1) Equivalent to ~300,000 MWh p.a.

Key opportunities and challenges

- CIP's biogas projects in Spain and Belgium

COBIRGY (Catalonia, Spain)

Plenty of agricultural and industrial feedstock available

Limited existing biogas capacity

Catalonian government declared the project strategically important for the region

Ideal site location with gas/power grid access, good road access and no nearby neighbors

Local opposition group

Permit process seems to be intransparent and creates uncertainty on timelines and necessary steps

Cryo (Wallonia, Belgium)

Plenty of agricultural feedstock available in Flandern (i.e. long distance)

Limited existing biogas capacity

Site in Wallonia is chosen due to regulatory constraints in Flandern

Ideal site location with gas/power grid access, good access to roads and in-land waterways and in an industrial area

Local mayor is against the project and has impacted negatively

Permit process is somewhat clear, but very political system with needs for having strong connections with the right stakeholders