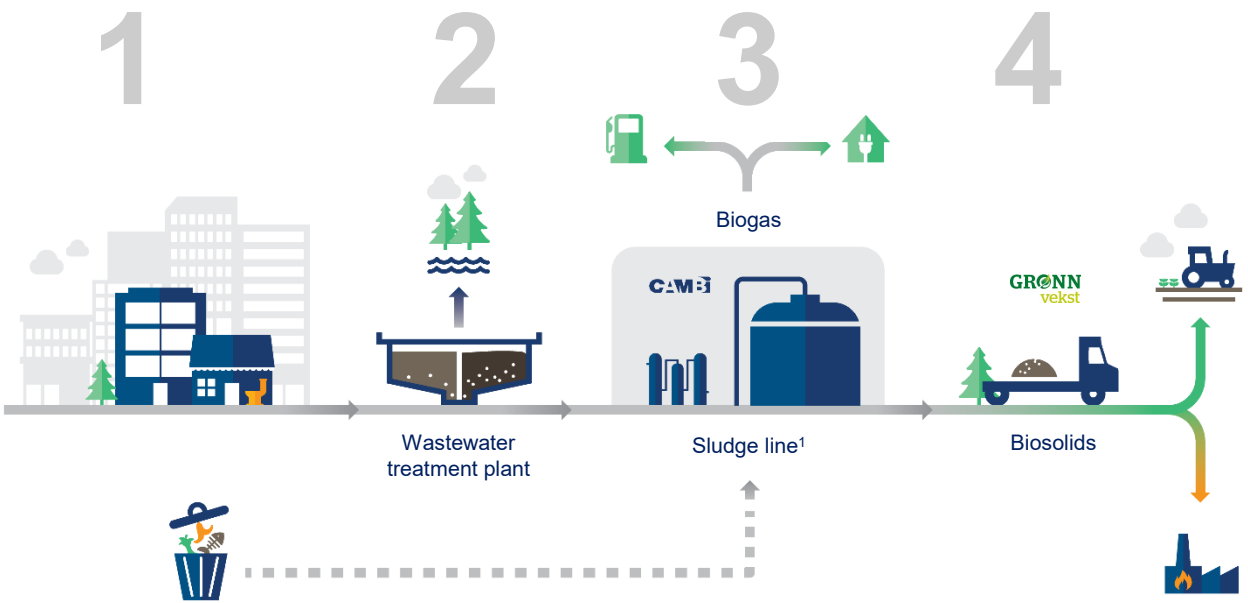
Cambi ASA
SME Conference

23 March 2021

Responsible sludge management solutions

The thermal hydrolysis process (THP) is integrated in wastewater treatment plants



[1] Cambi THP technology

1 **Municipal sewage** from urban areas into a wastewater treatment plant (critical infrastructure)

2 During the **wastewater treatment process**, organic solids are getting separated. **Cambi offers the thermal hydrolysis process** (THP) as part of any sludge line

3 **The THP process** boosts biogas production, a **sustainable fuel for road transport or convertible to green electricity**

4 **Sludge is dewatered** before final disposal or utilisation. **Treatment by Cambi THP halves the sludge volume, while producing an organic fertilizer**

Cambi is a world leader in wastewater sludge treatment

Strong underlying demand on the back of several macro trends

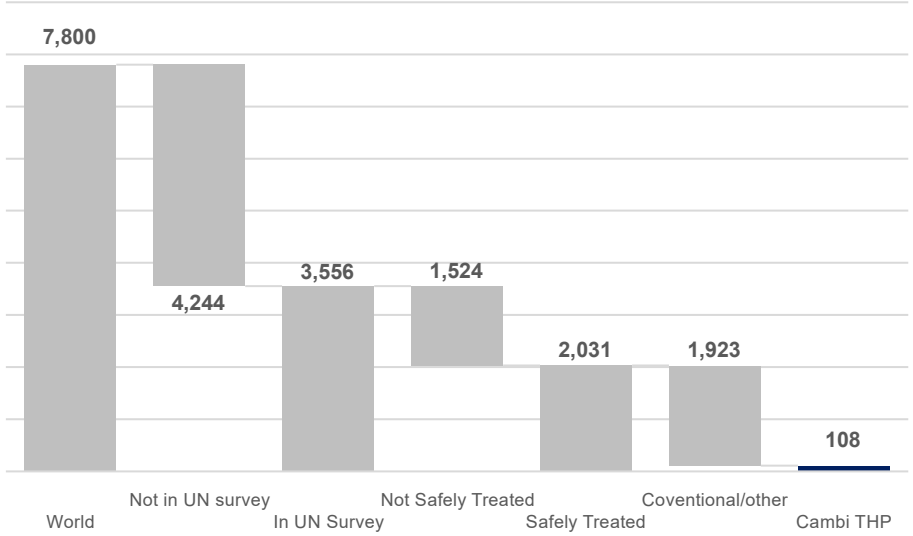
Undisputed proven leader in advanced sludge treatment

Scalable platform with significant growth potential

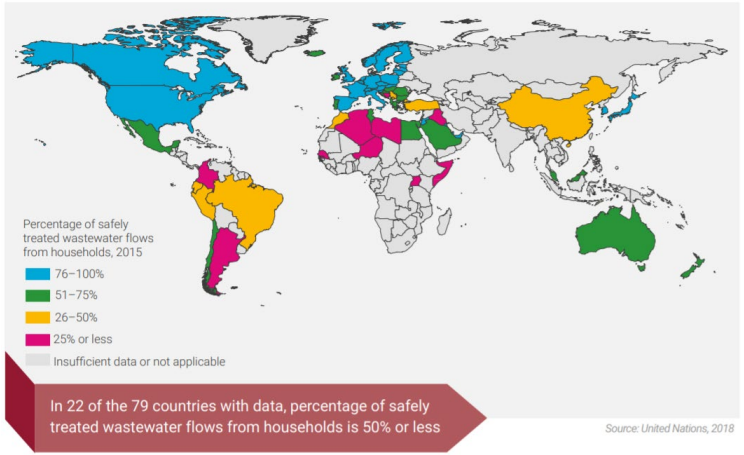
Drivers and macrotrends

Addressing growing need for safe wastewater treatment

Wastewater Handling (million people)



Proportion of wastewater safely treated (%)



UN WATER World Health Organization UN HABITAT

- Of the total wastewater from households in the UN survey (79 countries), an average of 57% is safely treated.
- Cambi THP is treating 5.3% of the safely treated volume, or from 1.4% of the world population
- Significant market share growth potential in the medium term, and market growth in the long term

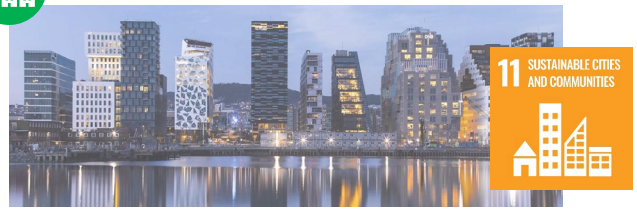
6 CLEAN WATER AND SANITATION

Source: UN World Water Development Report 2018

Ideally positioned to benefit from macrotrends

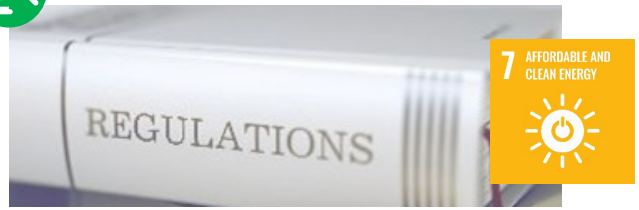
As enabler of a swift global transition to sustainable communities

Urbanisation

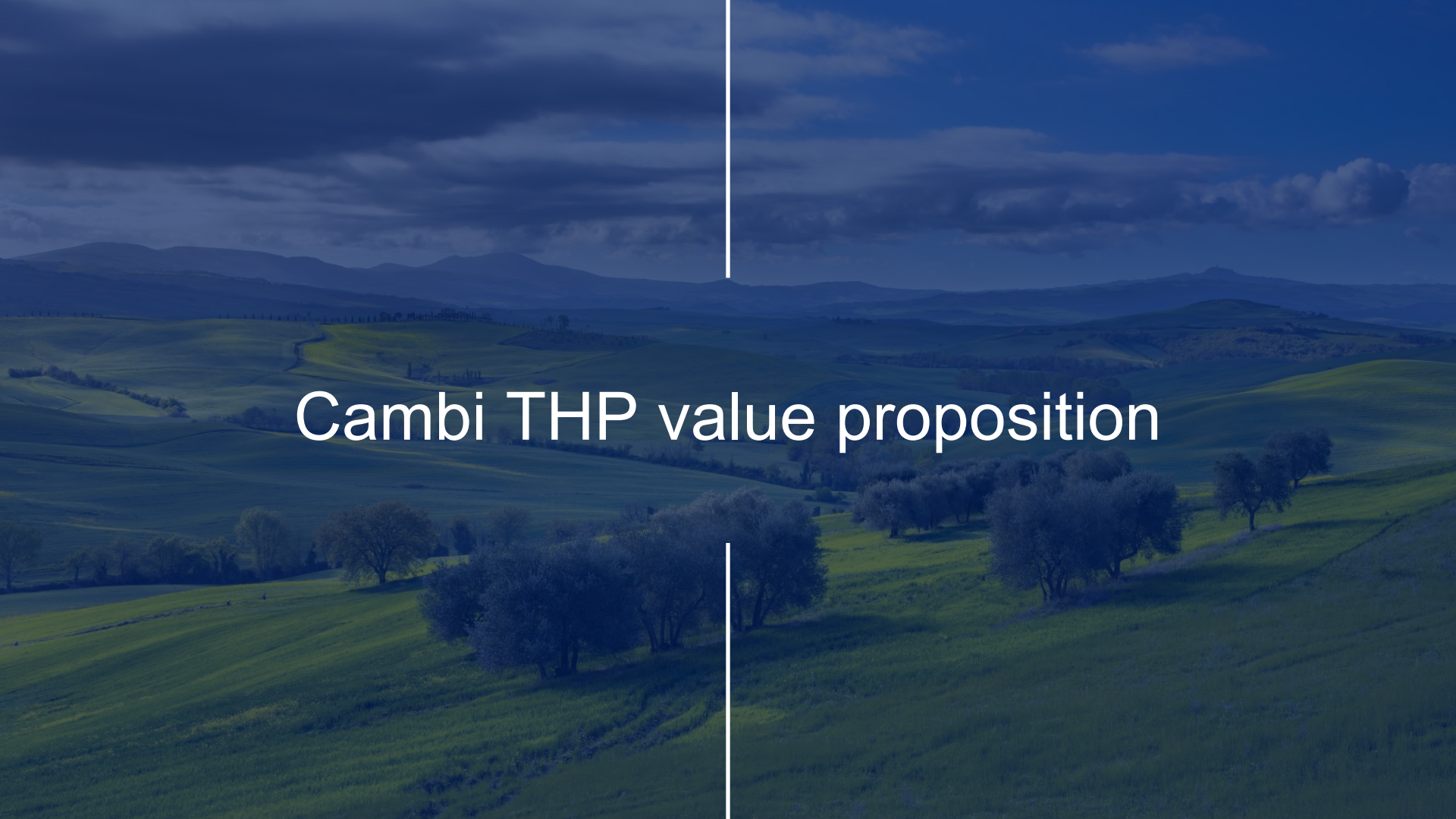


Moving to a circular economy

Tightening regulations



Infrastructure investment


Cambi THP value proposition

Cambi offers the best available technology

From both an economic and an environmental perspective

	Wastewater treatment is characterized by	Cambi solution offers
Investments	Large capital investments, long lifetime	Attractive investment case compared to conventional treatment
Disposal of sludge	Rising disposal unit costs, dependent on local regulations and available outlets	Biosolids volumes down by 50%. Safe, high-quality biosolids can often be land applied locally at lower cost
Environmental and social costs	Significant CO_2 footprint	Lowest CO_2 footprint technology, odour-free biosolids product
Electricity consumption	Often the largest electricity consumer in a municipality	Become (partially) self-sufficient in electricity, due to significantly higher biogas production

Cambi THP at Davyhulme WWTP, Manchester, UK

Cambi THP is a highly attractive value proposition

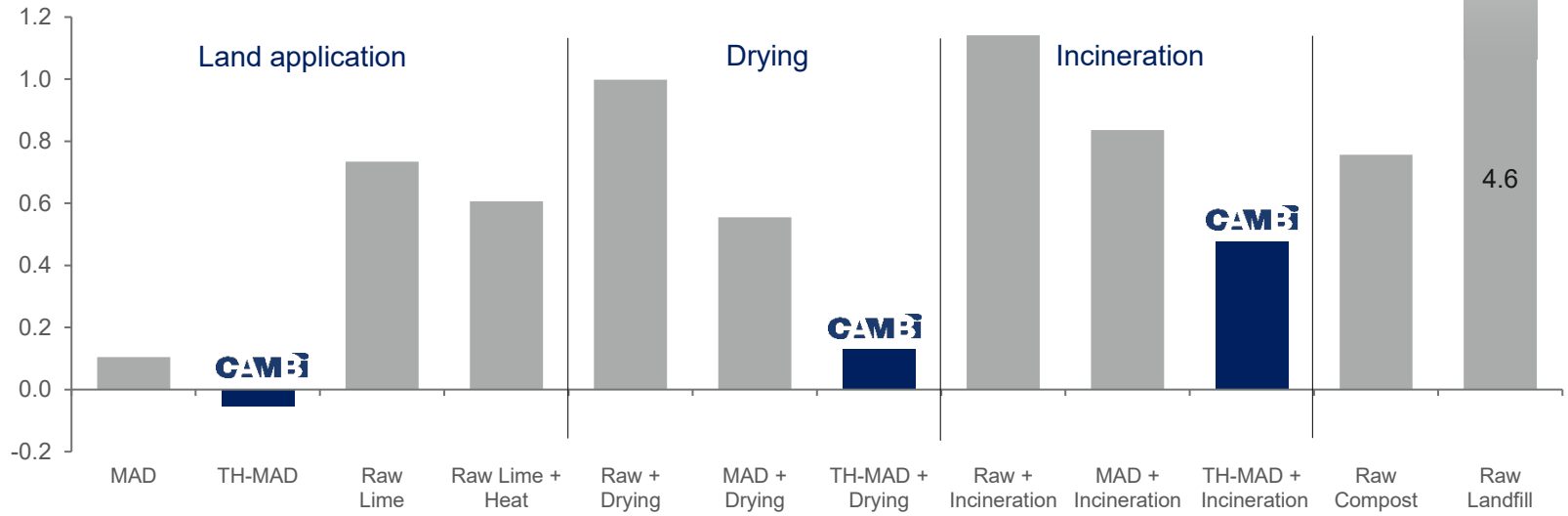
		Conventional	Cambi thermal hydrolysis for sludge treatment
Environmental		**Low carbon footprint**	▪ Independent studies show lowest carbon footprint for all biosolids outlets[1]
		**Energy efficient process**	▪ Energy efficient process: heat is recycled to pre-heat feedstock[2]
		**Increased biogas production**	▪ Typically, 30-40% more biogas[2]
Economic		**Digestion efficiency**	▪ Typically, 3 times higher digester throughput, reducing need for investment in new digesters and subsequently new land[2]
		**Lowest lifetime costs**	▪ Operational benefits offset (occasionally) higher capex[2]
		**Easy to maintain**	▪ Reliable, high uptime and low maintenance costs[2]
Quality		**Low residual volume**	▪ Reducing the final volume by 50%, significantly reducing disposal costs[2]
		**High biosolids quality**	▪ Low odour, with guaranteed pathogen kill (all viruses, bacteria, fungi, protozoa, and worms)[2]

1. Source: Barber, W. (2009). The carbon footprints of various biosolids treatment processes. WEF Biosolids Technical Bulletin, May-June.
2. Source: Cambi

Lowest carbon footprint

Better environment

Carbon footprint of sewage sludge management by biosolids outlet (tonnes CO2 equivalent per tonne dry solids)



The city of **Beijing** used to landfill sludge, emitting incredible amounts of methane.

After installing Cambi THP, the **annual emissions were reduced by 2,200,000 tonnes CO_2 equivalent** – an equal reduction to removing 1,540,000 European cars from the road (or 55% of the Norwegian car stock)[1]

1. Note: Number displays total annual reduction in emissions (*not* compared to the next best available technology)

Excellent biosolids quality for safe reuse

Improved quality

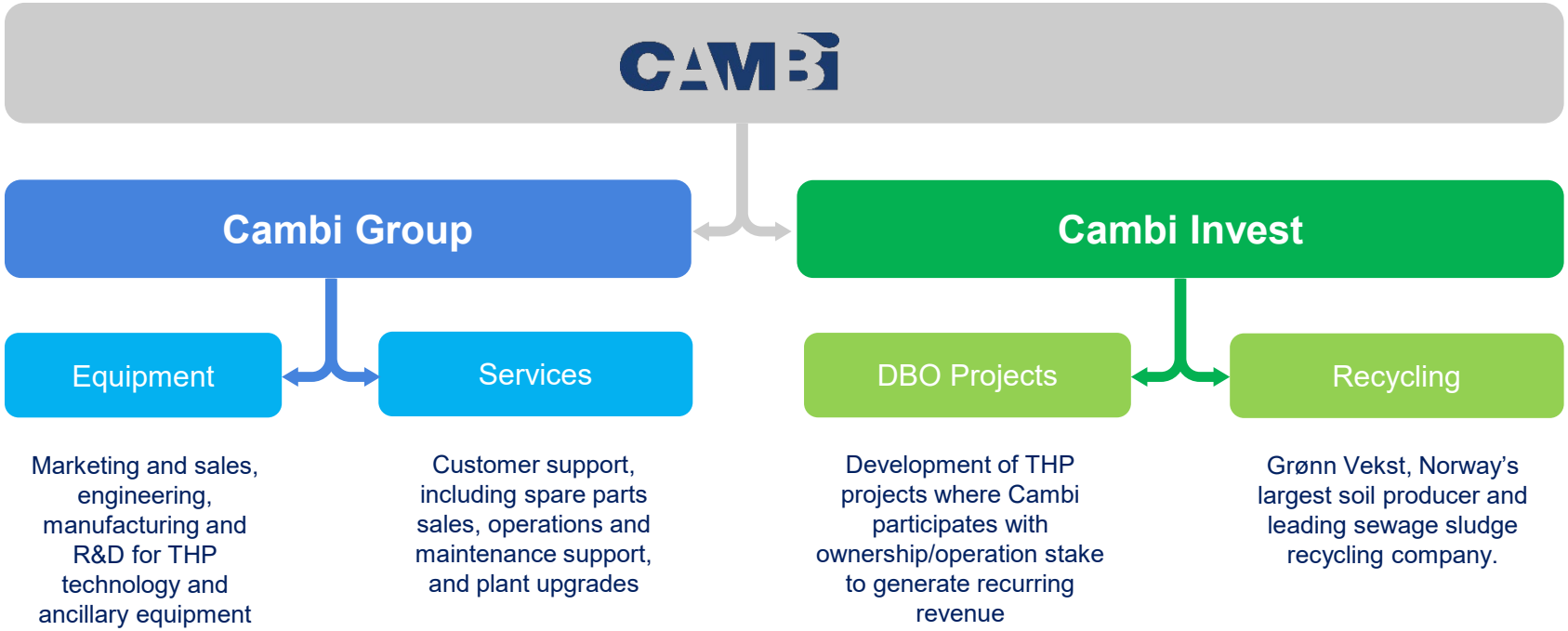
Biosolids **without** thermal hydrolysis pre-treatment

Biosolids **with** thermal hydrolysis pre-treatment

Source: DC Water's resource recycling business enabled by Cambi THP at the Blue Plains WWTP near Washington, DC
The smaller pictures above are from Slupsk and Bydgoszcz, respectively

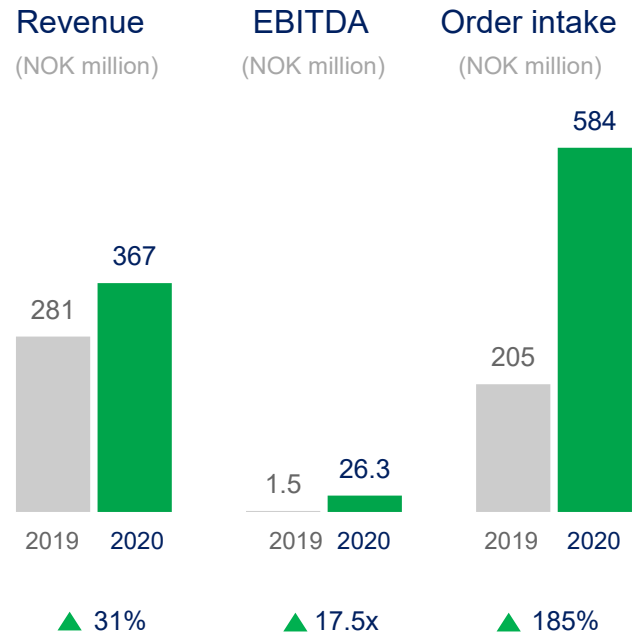
Scalable platform with significant growth potential

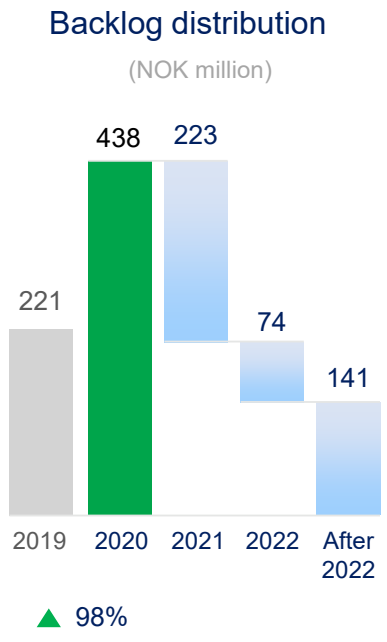
Strategic focus on two operating segments

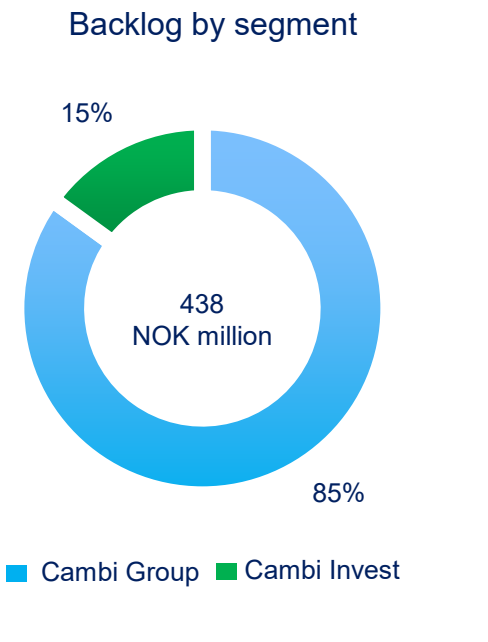


Resilient performance from Services and Recycling

2020 Financial highlights - Cambi ASA





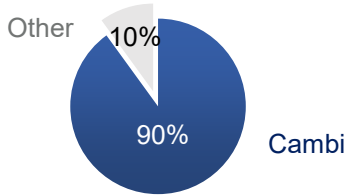


Backlog includes options making up c. NOK 18 million of the Grønn Vekst backlog as of Q4 2020. Over the past years, close to 100% of options have been exercised. Note that until options are exercised, there can be no assurance that the contracts will be realised

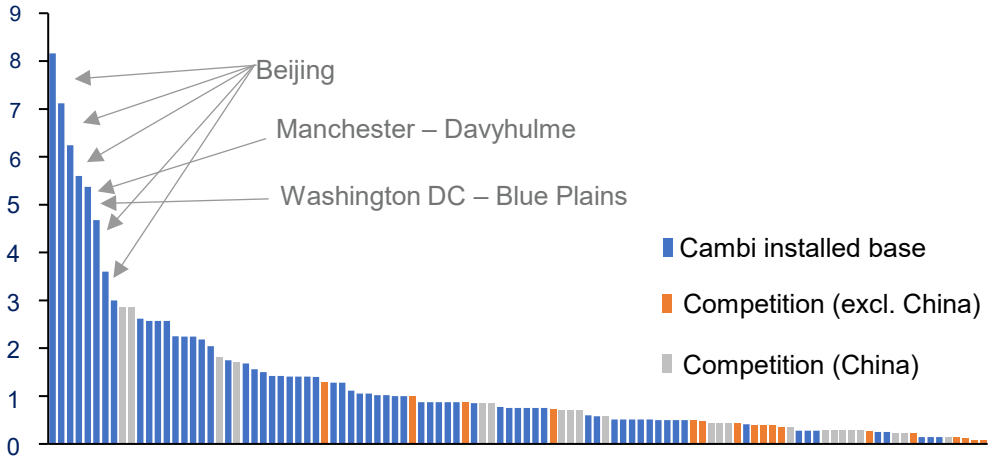
Equipment sales are Cambi's core activity

- Standardised THP plants for both megacities and small municipalities
- In-house manufacturing in the UK, highly scalable production capacity
- Conservative market, but Cambi is increasingly accepted as a "best practice" sludge treatment process

Global THP capacity
(outside China)



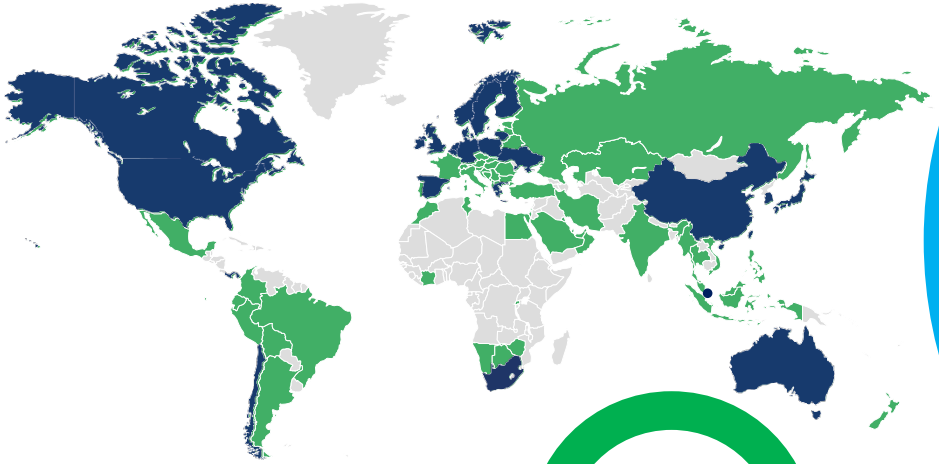
25 years of thermal hydrolysis, a global market created and still dominated by Cambi



Installed capacity in million people equivalent

Tremendous growth potential

Capitalising on good references



73

Reference plants

270+

Sales pipeline

3000+

Identified targets

Services are growing with the installed base

Upgrades of ageing plants to state-of-the-art standard, operations support, and performance optimisation

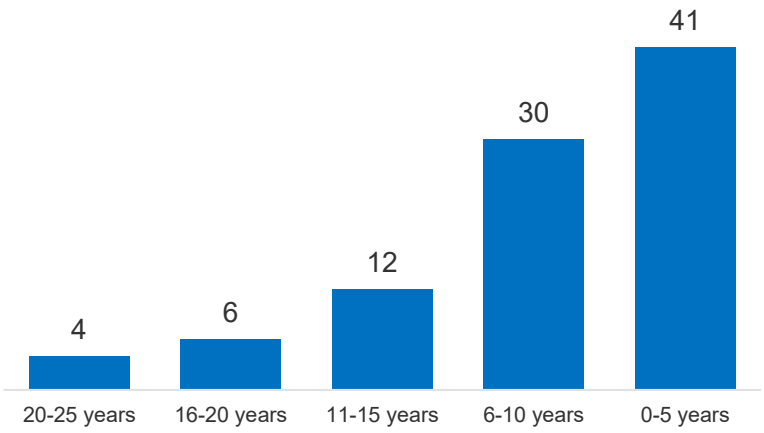
Upgrade portfolio

- Energy efficiency
- Capacity expansion
- Asset life extension
- Ancillaries
- Tailor-made solutions

Parts, operational support & advisory

- Supplying spare and ware parts to 90% of all customers
- Annual maintenance and remote support (PLUS) increasingly in demand

Cambi THP process trains by years in operation



Recycling is a resilient pillar for recurring revenue

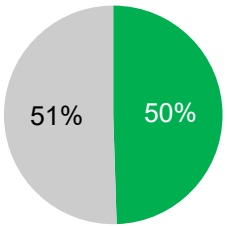
Grønn Vekst is the market leader for soil products in Norway, with solid growth potential

Grønn Vekst (Norway)

- Recycling of organic resources from households and industry
- Produces high-quality soil products based on compost, as substitutes for peat-based products
- Norway's largest soil producer, with more than 250,000 tons sold in 2020

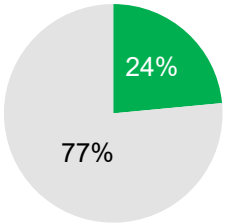
Market potential in Norway

Upstream market
Total: NOK 101 million



Grønn Vekst
Competitors

Bulk soil market
Total: NOK 170 million



Upstream customers

Cities | Industry | Stone quarry | Organic waste | Stone meal

GRØNN vekst

Compost based soil | Soil improvement | Compost

Downstream customers

Entrepreneurs | Agriculture | Private

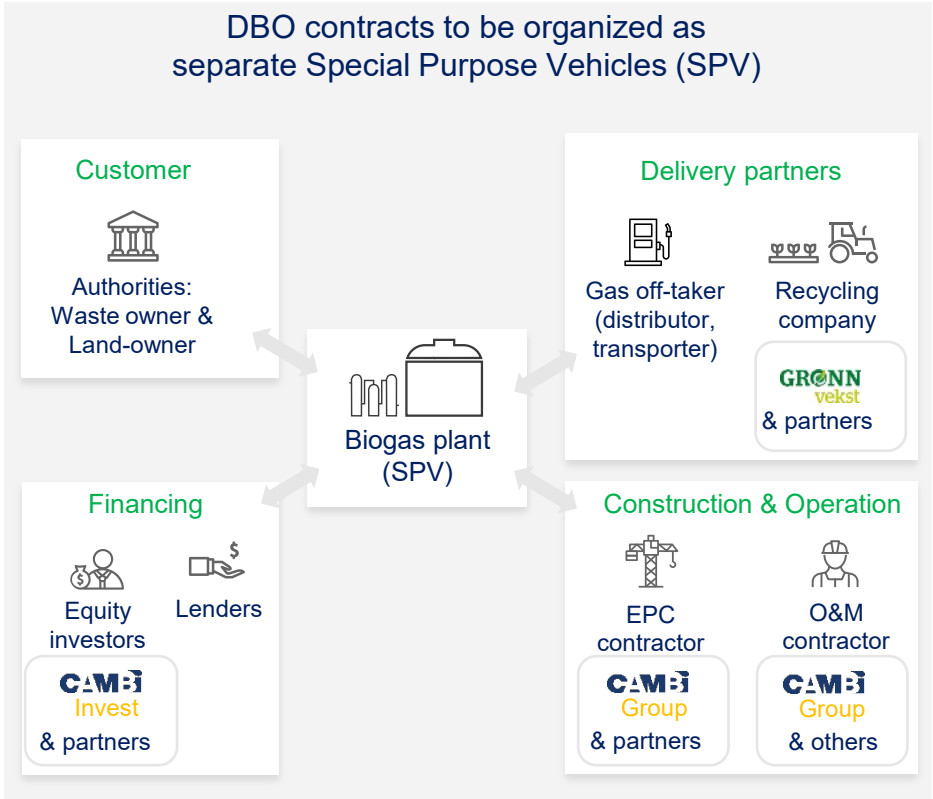
Cambi Invest offers financed sludge solutions…

DBO Projects' – the complete Cambi solution

- Design and Build: optimal THP integration to minimise cost
- Operations: improve plant performance to maximise asset value
- Disposal: reduce sludge handling unit cost by developing markets using Grønn Vekst know-how

Easier for customers to implement THP

- No CAPEX, pay for service at competitive rates
- Access the environmental benefits without the (perceived) risks of complex treatment solutions
- Allows focus on core operations, water and wastewater treatment



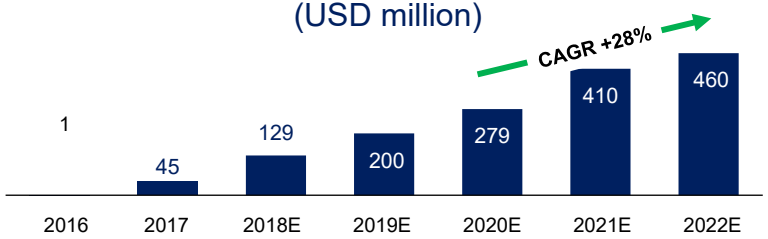
…tapping into global private financing trend

Private finance to increase by 2030 to 8% of total capital expenditure in water, from 1% in 2017

Global trend in municipal wastewater

- Weak public balance sheets imply that governments are limited in their options
- Investor appetite for water infrastructure investment because of its steady long-term yield
- Growth in asset finance rather than politically contentious retail water concessions

Strong growth outlook for privately financed sludge treatment (USD million)



Cambi approach to DBO development

- USA: 'EQ Renewables' – JV with US construction partner
- Emerging markets: Cooperation with Norfund (Norwegian state Investment Fund)
- South Korea: working with several well-known Korean project developers
- Europe: in-house development and project specific partnering

Source: GWI Financing Water to 2030

Well-positioned for long-term sustainable growth

At the doorstep of entering several new markets

Strong and well-distributed backlog

Resilient performance from Services and Recycling

Strong balance sheet supporting growth plan

Q&A

Better environment

Excellent biosolids. No pathogens

Forget about odour complaints

Lowest carbon footprint

Solid business case

Value of smaller digesters

Produce more biogas

Pay less for disposal

Reliable performance

Unmatched uptime

Continuous improvements

Lifelong customer support

Thank you

Contact us