



Waste to Wealth

Creating Value from Organic Waste

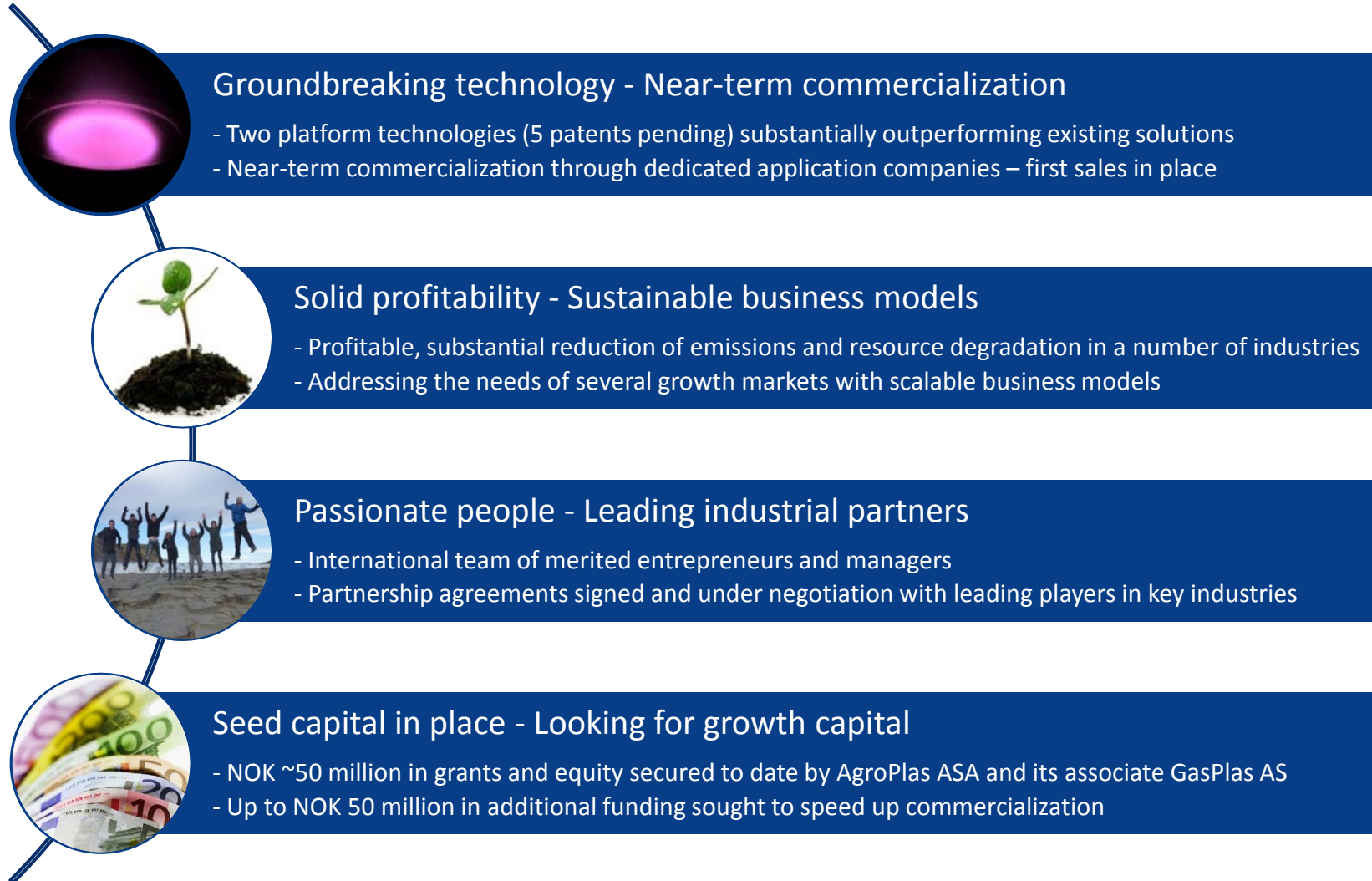
Groundbreaking Technologies for Organic Waste, Agriculture and
Bioenergy

Rushlight/FIN Organic Waste Investor Briefing

22 February 2011

www.agroplas.no

Introduction



Scalable groundbreaking technologies



Vortair Processor



[Video](#) Pictures

- 1 Advanced process enables grinding, drying and separation in a single step with no moving parts
- 2 Low CapEx equipment
Low OpEx – High energy efficiency
- 3 Numerous profitable applications demonstrated – ready for market with first sale made

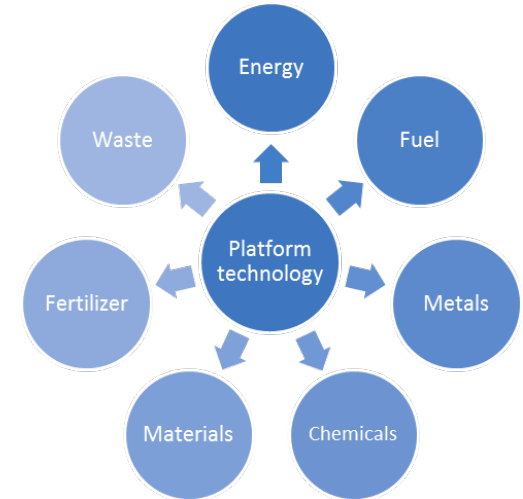
GasPlas Reactor



Pictures BC's

- 1 Scalable, cold-plasma technology enables a wide number of cracking and synthesis applications - with zero emissions
- 2 Low CapEx equipment
Low OpEx – High energy efficiency
- 3 Strong research partnerships
Commercial demo operational Q3/11

Platform technologies



- 1 Both Vortair and GasPlas are platform technologies with numerous profitable applications in diverse industries
- 2 Only small adjustments needed to adapt to new applications
- 3 IP and know-how protection enabling commercialization through licensing to dedicated application companies



AgroPlas Systems main markets

Organic waste



- EU: 130 million tons per year, 1% growth pa.
- Asia: vast volumes and high growth rate
- Legislation against landfilling & incentives to increase recycling
- Driven by gate-fee; low to negative output value
- Need for better recycling and processing solutions

Bioenergy



- EU: 10,000 large biogas plants, 15% growth pa.
- Quickly growing demand for biofuels/biomass
- Renewable energy policies provide financial support
- Better production processes needed to make bioenergy competitive with fossil energy

Fertilizer



- 170 mill tons fertilizer per year, 25% growth to 2020; global food production to double by 2050
- Mineral fertilizer production depends on diminishing supply of natural resources (Phosphorus, Potassium) and causes large emissions
- Need for more sustainable fertilizer production methods

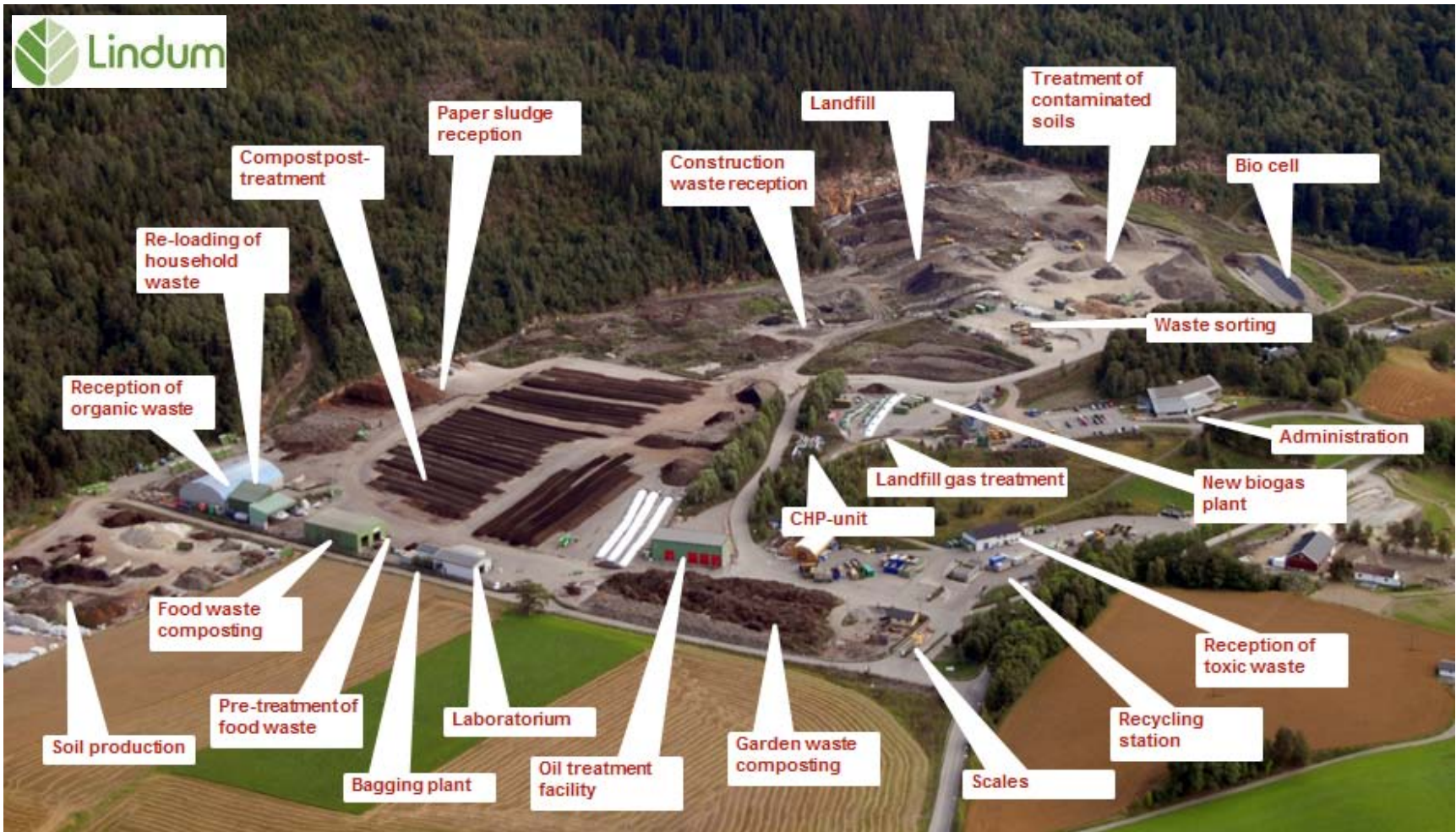
Natural gas energy



- Natural gas is an abundant and increasingly important source of energy (20 % of global supply)
- Increasing costs on emitting CO2 incentivizes emission reductions
- Need for cost-efficient emission reduction measures



Waste and bioenergy development partner Lindum AS



- Joint technology test center operational Q2 2011
- World's first carbon negative energy park operational Q4 2011

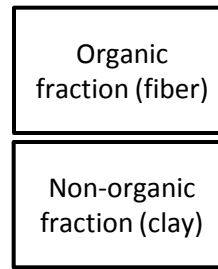


Product example: Paper sludge processing

Residual sludge from paper recycling is an environmental and economic liability

The paper sludge is dried and separated into organic and non-organic fractions

Animal bedding, bioenergy fuel, soil-improvement products, etc



Current problem

- Recycling of paper yields a residual sludge which currently is landfilled at a cost of EUR €50-70 euros per ton
- Legislation against landfilling is being phased in due to excessive organic content
- Better processing solution needed to reduce costs and capture valuable products

Market size

- Norway: 50 000 tons sludge per year
- EU: 5 million tons of sludge per year; market for 2-300 Vortair units
- Strong demand for derived products (bioenergy fuel, animal bedding, etc)

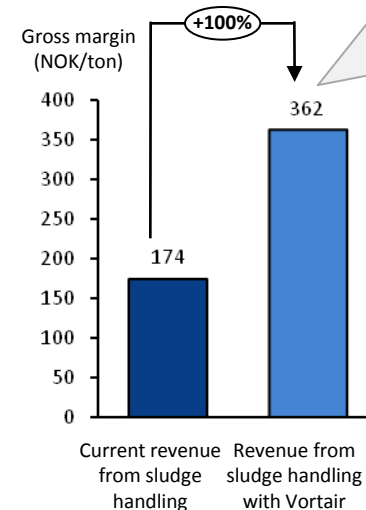
Our solution

- Vortair processor transforms paper sludge into valuable products
- Capacity: 25 000 tons per year
- OpEx per ton: Est. < 6 EUR/ton
- Status: Performance proven, demo plant operational Q2/11

Business model

- Primarily sales of Vortair processing system
- Build-own-operate through separate company and sell sludge management services to waste producers or waste management companies (e.g. Lindum)

Competitive edge



Vortair is the only known technology which enables efficient processing of paper sludge into tradable products



Product example: Eggshell waste recycling



Eggshells waste from food factories and hatcheries

Eggshells are ground, dried and separated into calcium carbonate powder and membranes by the Vortair system

Calcium carbonate and collagen used in pharmaceuticals and personal care products



SKIN CARE

Current problem

- Eggshell waste is produced by hatcheries and food factories and is currently land filled at a cost of ca 400 - 600 NOK per ton
- Eggshells contain valuable substances that currently are not being captured due to lack of cost-efficient processing solution

Market size

- EU: 150 000 tons of eggshell waste per year; estimated market of 30-50 Vortair units
- Growing demand for eggshell-derived products (ex: Nycomed buys 100 tons of calcium carbonate for pharmaceutical products per week)

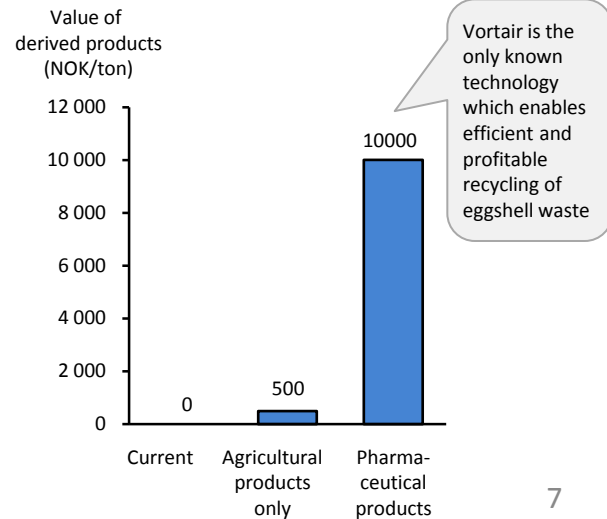
Our solution

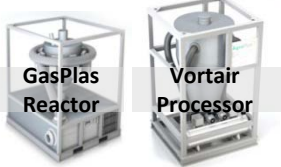
- Vortair processor transforms eggshells into valuable products
- Capacity: > 10 000 tons per year
- OpEx per ton: Est. < 50 NOK/ton
- Status: Verified, ready for market

Business model

- Supply equipment to a separate Build-Own-Operate company which sells eggshell waste management services to hatcheries and food factories
- Royalty on product sales in exchange for exclusivity under consideration

Competitive edge





Integrated biogas value cycle



Problem

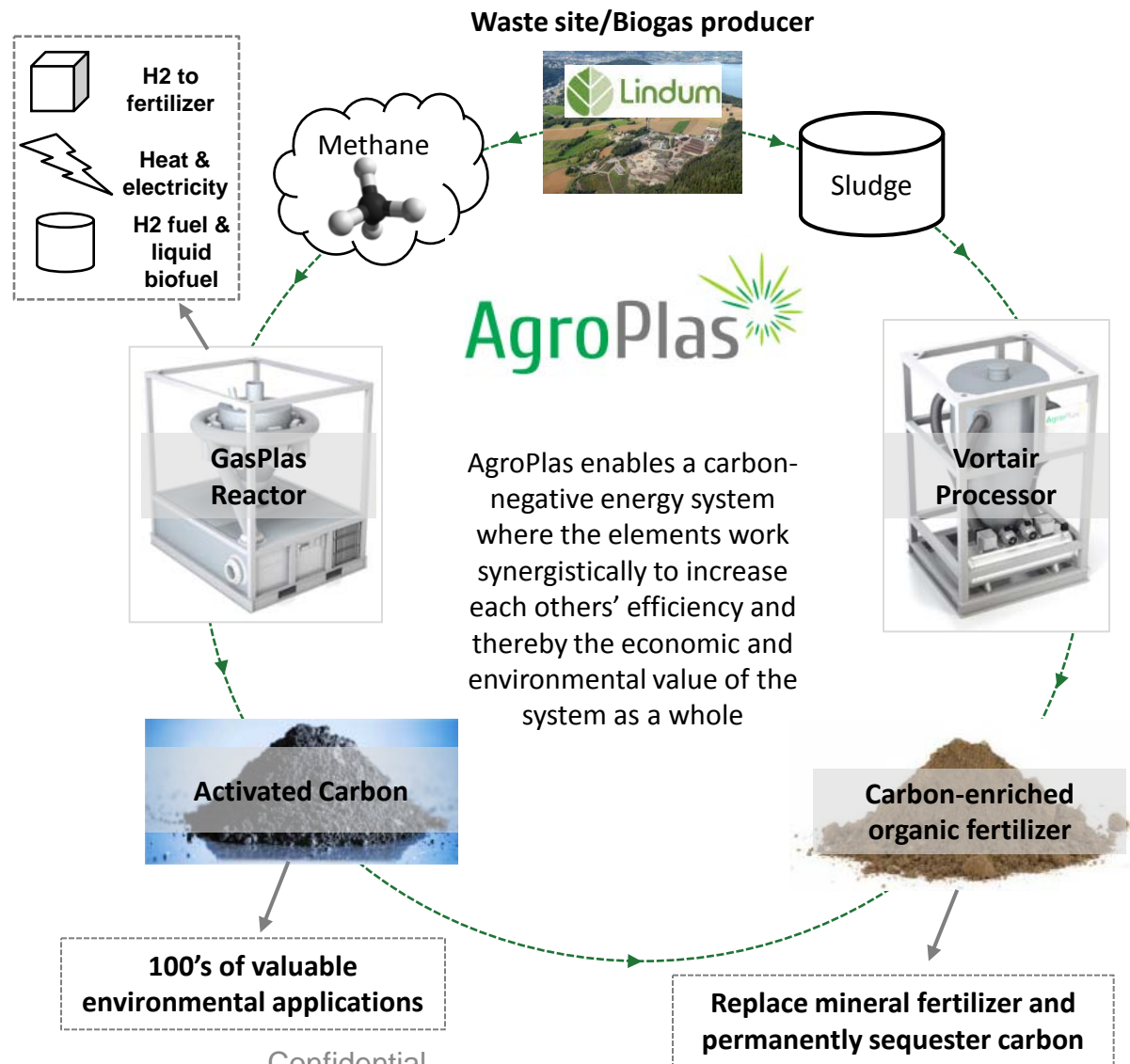
How to increase the profitability of waste management and biogas production, and produce sustainable fertilizer?

Solution

Produce high value, sustainable products with GasPlas and Vortair technologies

Bonus

Profitable removal of CO₂ from the atmosphere!





Strategy & implementation



Enable transformation of waste streams with negative costs into valuable, sustainable products



Supply standardized, modular and mobile products based on exclusive access to technology



Work closely with existing engineering and manufacturing expertise for efficient operations



Partner with early customers to get access to industrial expertise and facilitate first sales



Achieve strong sales & marketing through distributors with established customer relations



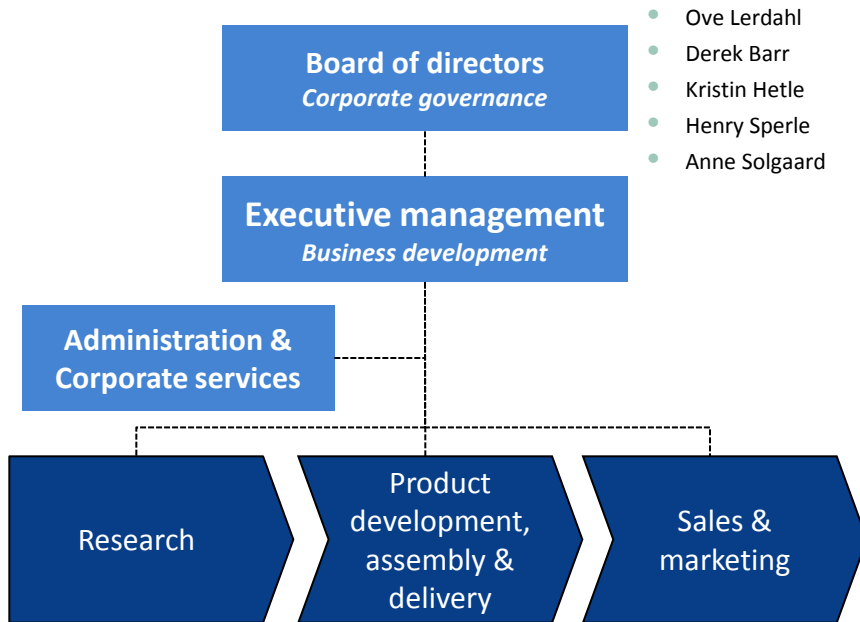
Capture mid-term opportunities through strong focus on product development

Solve existing needs within existing infrastructure



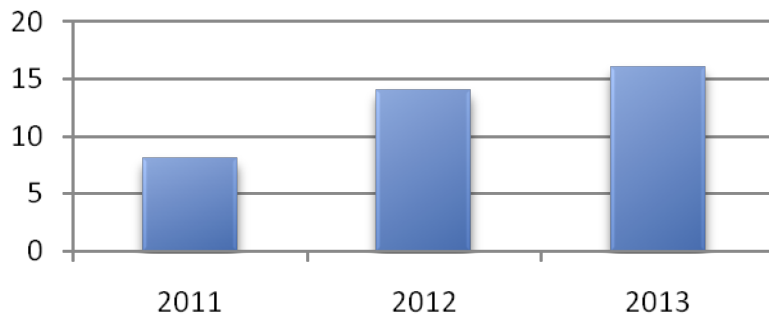
Organization

Organization



- Ove Lerdahl
- Derek Barr
- Kristin Hetle
- Henry Sperle
- Anne Solgaard

Staffing plans, FTE



Executive management

Ove Lerdahl (NO)

Executive Chairman – Co-Founder

- 30 years experience within investment banking and business. Last 15 years focused on clean tech business development within bioenergy and waste.

Bjørn Utgård (NO)

Chief Executive Officer

- MSc in Energy and Environment Engineering
- Broad international experience within energy and industry, focused on development and commercialization of new technology (clean-tech)

Eivind Dugstad (NO/DE)

Chief Financial Officer

- Economist and business manager with 15 years of managing international finance in more than 10 countries, as well as managing a midsize telecom company

Joachim Skoogberg (SE)

Chief Operating Officer

- MSc in Mechanical Engineering, Heat & Power technology
- 12 years of international B2B sales and business development within the energy industry



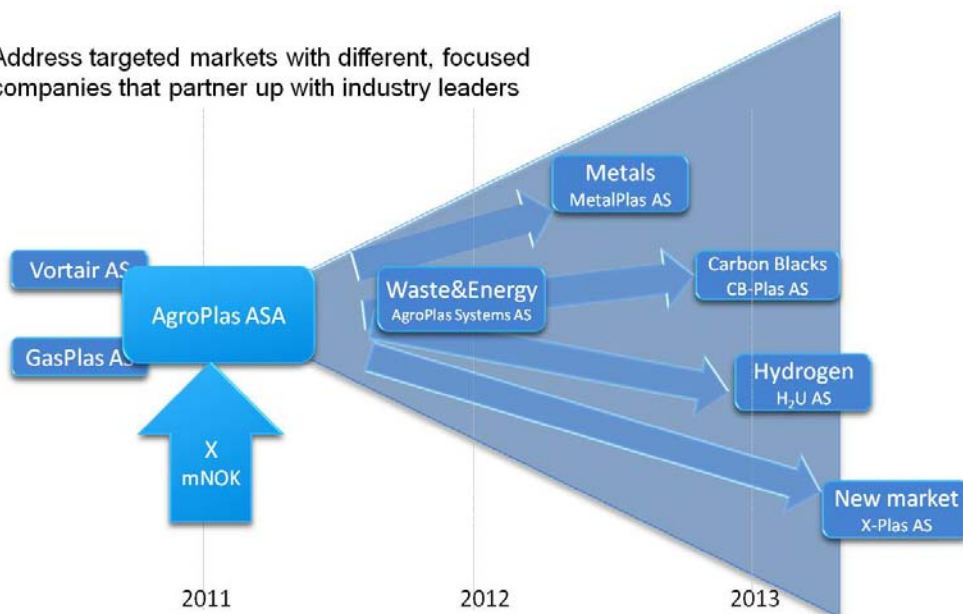
First sales made – defined product roll-out plan (through separate companies)

AgroPlas Systems and GasPlas product sales to date

#	Product	Customer	Status	Price mNOK
1-2.	Two Vortair - general units	Valtor AS, Bø	On order, delivery Q2-11	5.0
3.	Vortair - paper sludge	Lindum AS, Drammen	Project initiated Delivery Q3	3.3
4.	GasPlas - research reactor	Sintef M&C, Oslo	Project init. Delivery Q3	1.5
5.	GasPlas - H2-reactor	Lindum AS & Statoil HyNor Drammen	Project init. Delivery Q4	4.5

AgroPlas and GasPlas roll-out plan for applications

Address targeted markets with different, focused companies that partner up with industry leaders



Significant market interest for applications – Maintaining focus is emphasized