



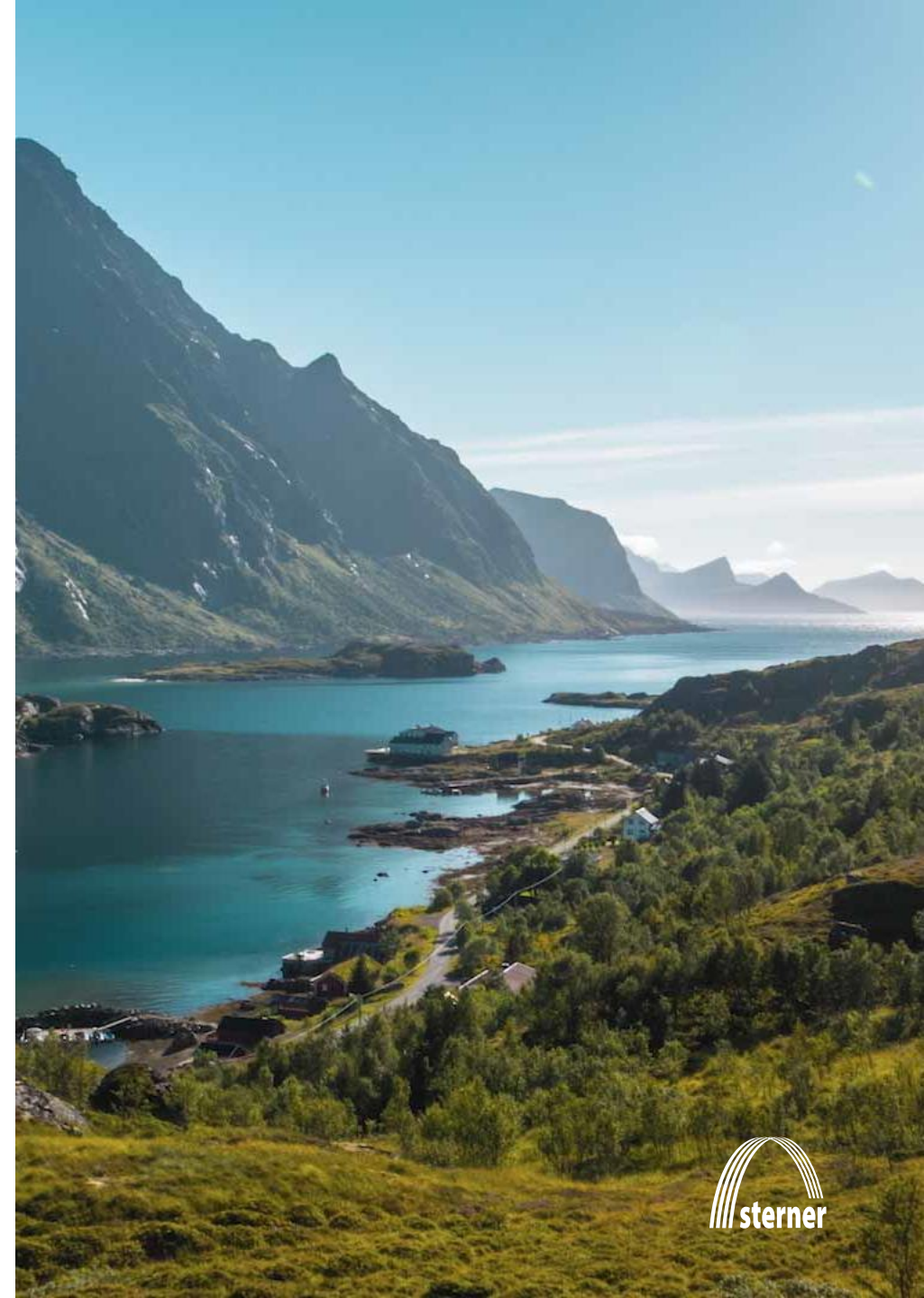
Robert Eliassen, BEAF24, April 19th 2024

Utilization of sludge from fish farming and biogas



Why is nutrient capture and energy production from fish waste important?

- Reduce greenhouse gas emissions by reduced dependence on fossil fuels
- Reduce the risk of negative environmental impact
- Reduce the amount of mineral fertilizers used
- Valuable proteins can be recycled
- Leading to more efficient production systems



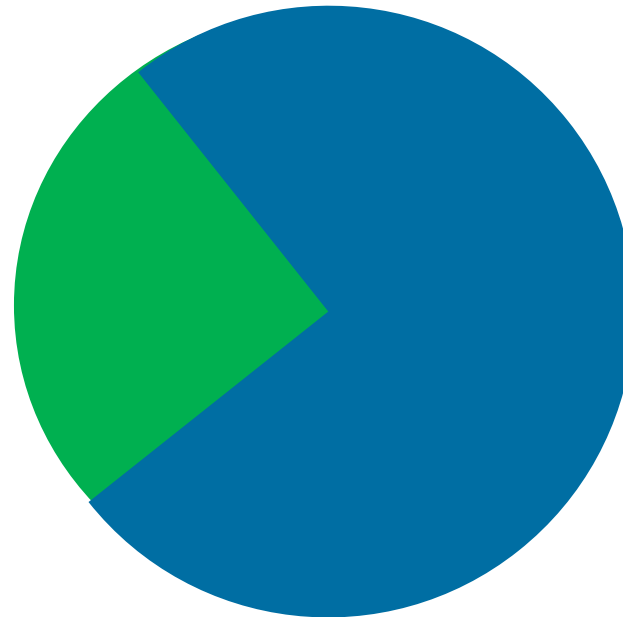
What is waste from a Fish plant?

Fertilizer

The sludge will be dewatered and dried at low temperature

20-40% Inorganic material

- Phosphorus 1.4%
- Nitrogen 7%
- Potassium 0.7%



Energy

Biogas process that produces heat and electricity power

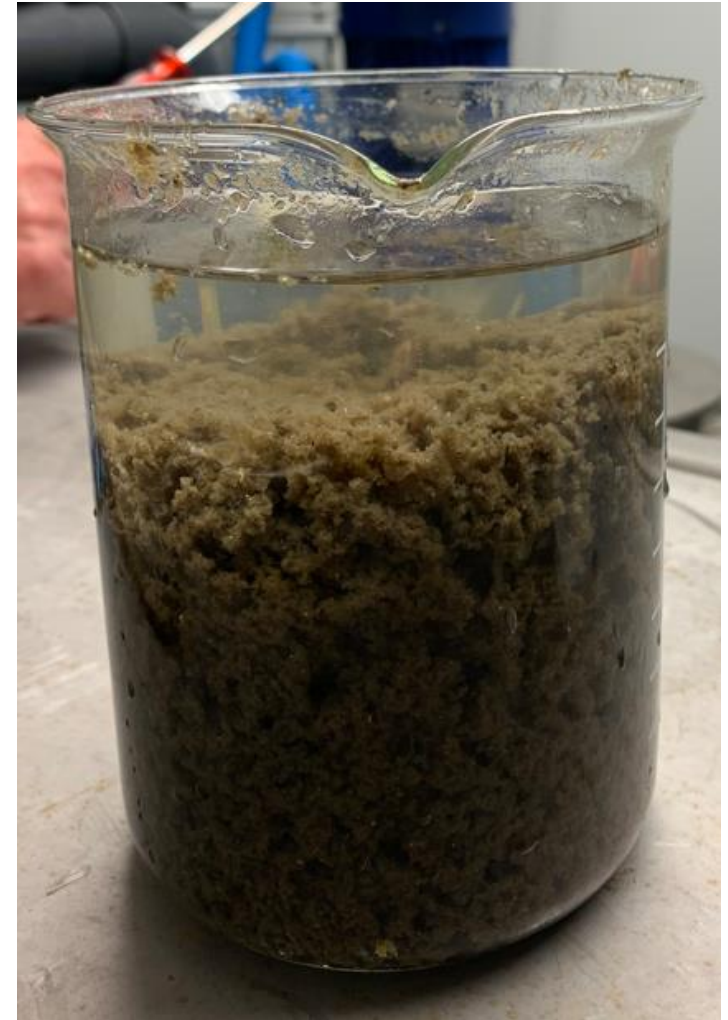
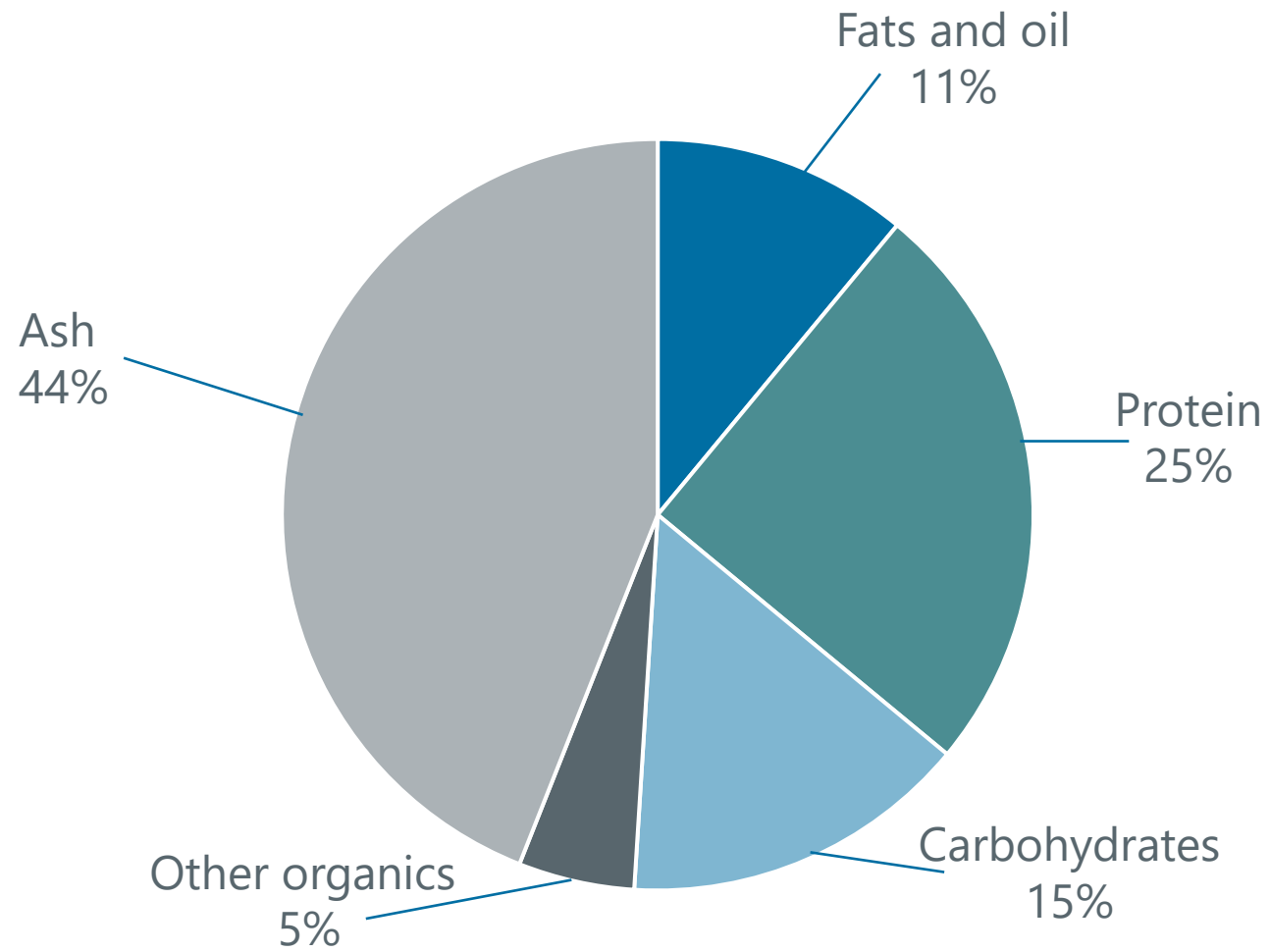
60-80% Organic material

(VS: Volatile Solids)

Biogas production



Typical composition of fish sludge



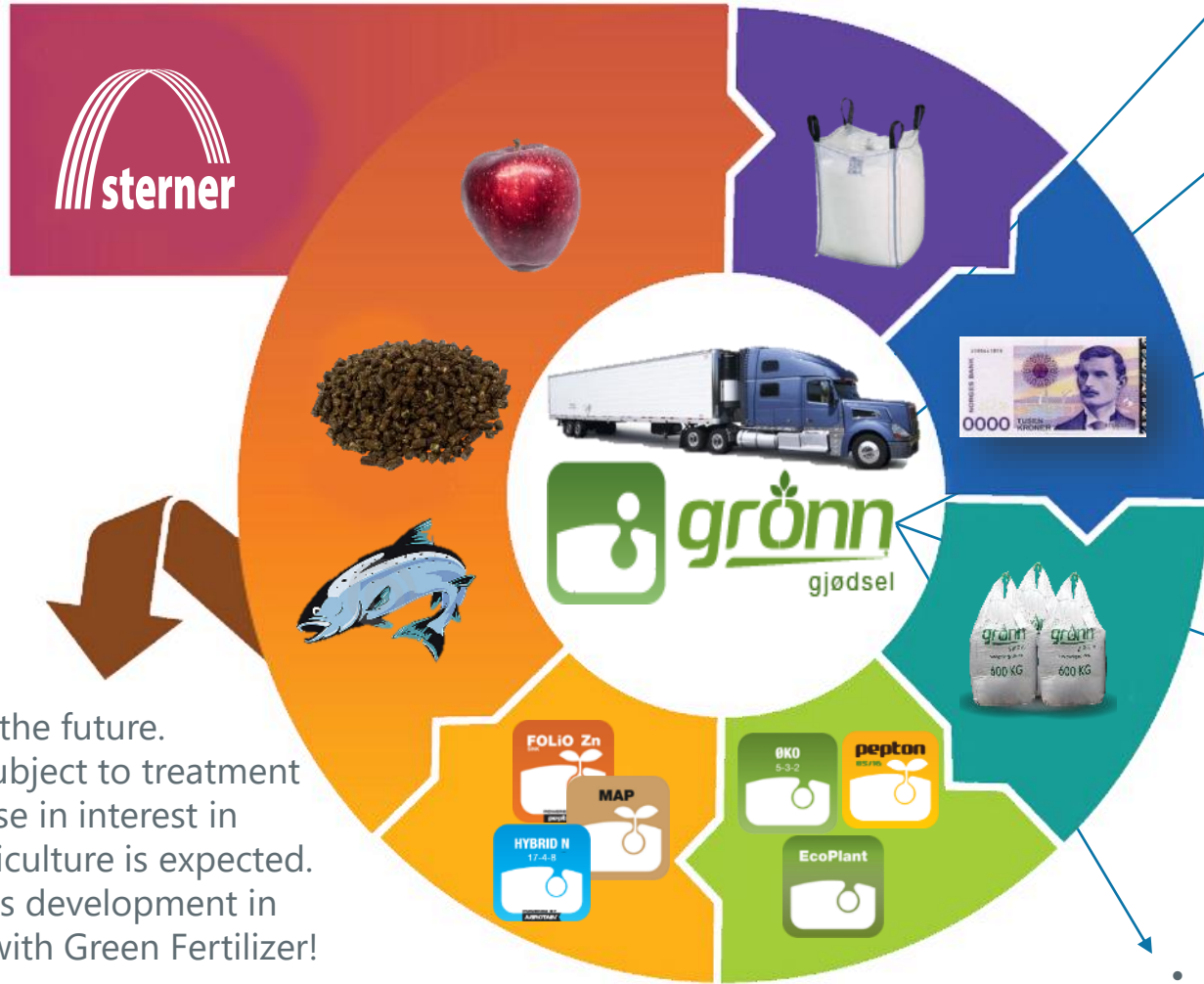
Organic Fertilizer potential

Production of 5000-ton salmon 2500 Seabass and 2500 Yellow Tail Kingfish

- Potential sludge capture as fertilizer is 3000 ton
- Can be used to fertilize 30 000 acres



Cooperation agreement



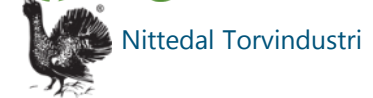
CLIENT GROUP

- Customers across the Norway
- Conventional agriculture - Organic farming

Customers within:

- Greenhouses/vegetables
- Grain farming, grass/meadow
- Fruits and berries, lawn finished
- Courses
- Outlets at garden centers.

Supply agreement



- Some export

Fish sludge is a fertilizer for the future. When more fish farms are subject to treatment requirements, a large increase in interest in supplying fish sludge to agriculture is expected. Sterner AS has facilitated this development in the form of the agreement with Green Fertilizer!





Biogas potential

Production of 5000-ton salmon 2500 Seabass and 2500 Yellow Tail Kingfish

- Biogas production is estimated to 1 mill Nm³/yr. = 6 mill kwh/yr.
- Provide 250 Norwegian households with electrical energy
- Biogas plant is self sufficient with electrical energy
- Surplus energy available
- 1 kg DM gives approximately 0,3 Nm³ CH₄

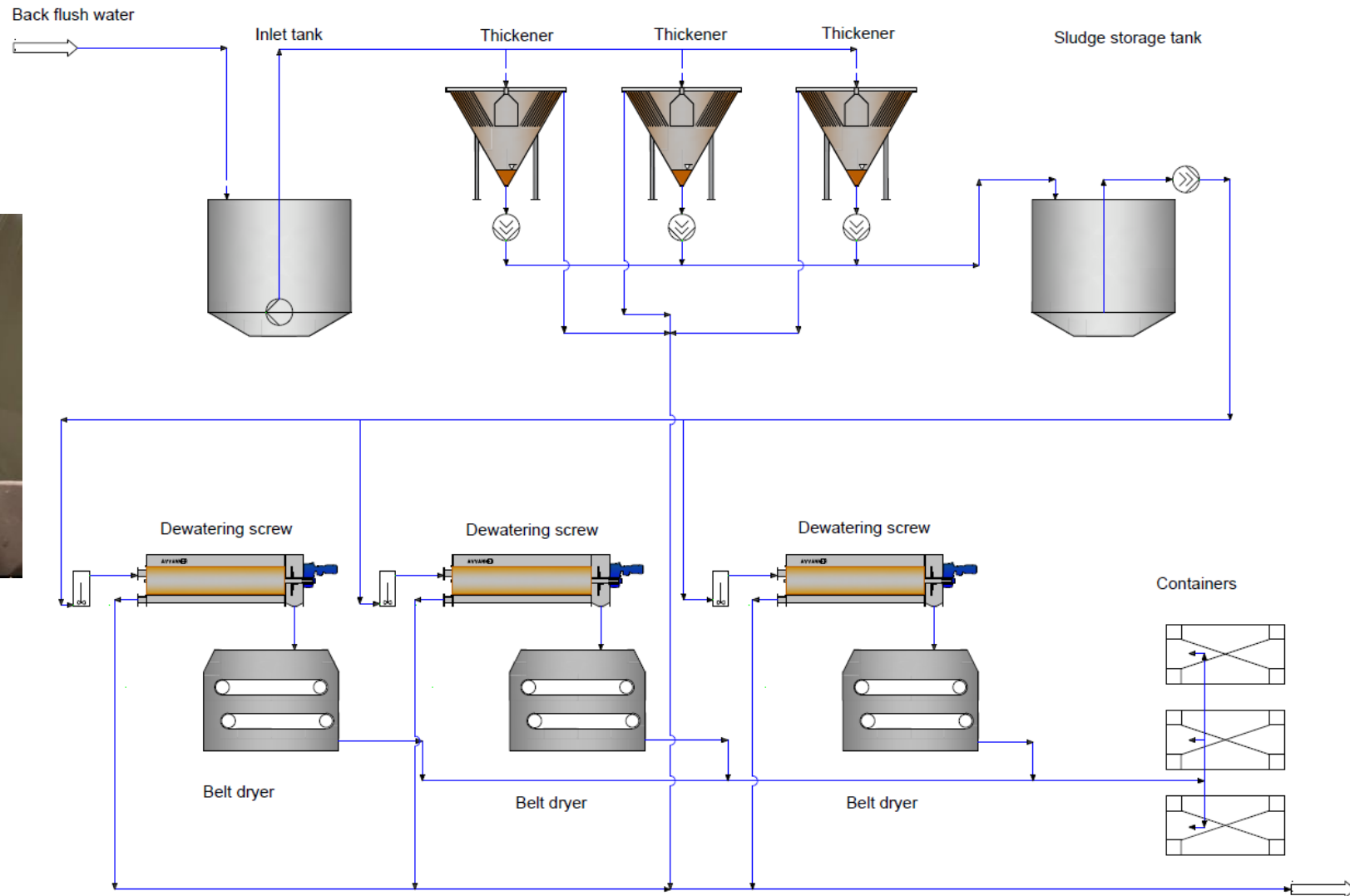
Methane Nm ³ per/h	1
Methane Concentration %	0,6
Conversion factor from Methane to KW	10,4
KW/h	6

Sludge treatment plant

- Mechanical Dewatering and Drying (MDD)
- Unique technology that dries the sludge at low temperature, preserving important nutrients for agriculture
- 22 successful MDD plants delivered



Mechanical Dewatering & Drying (MDD)

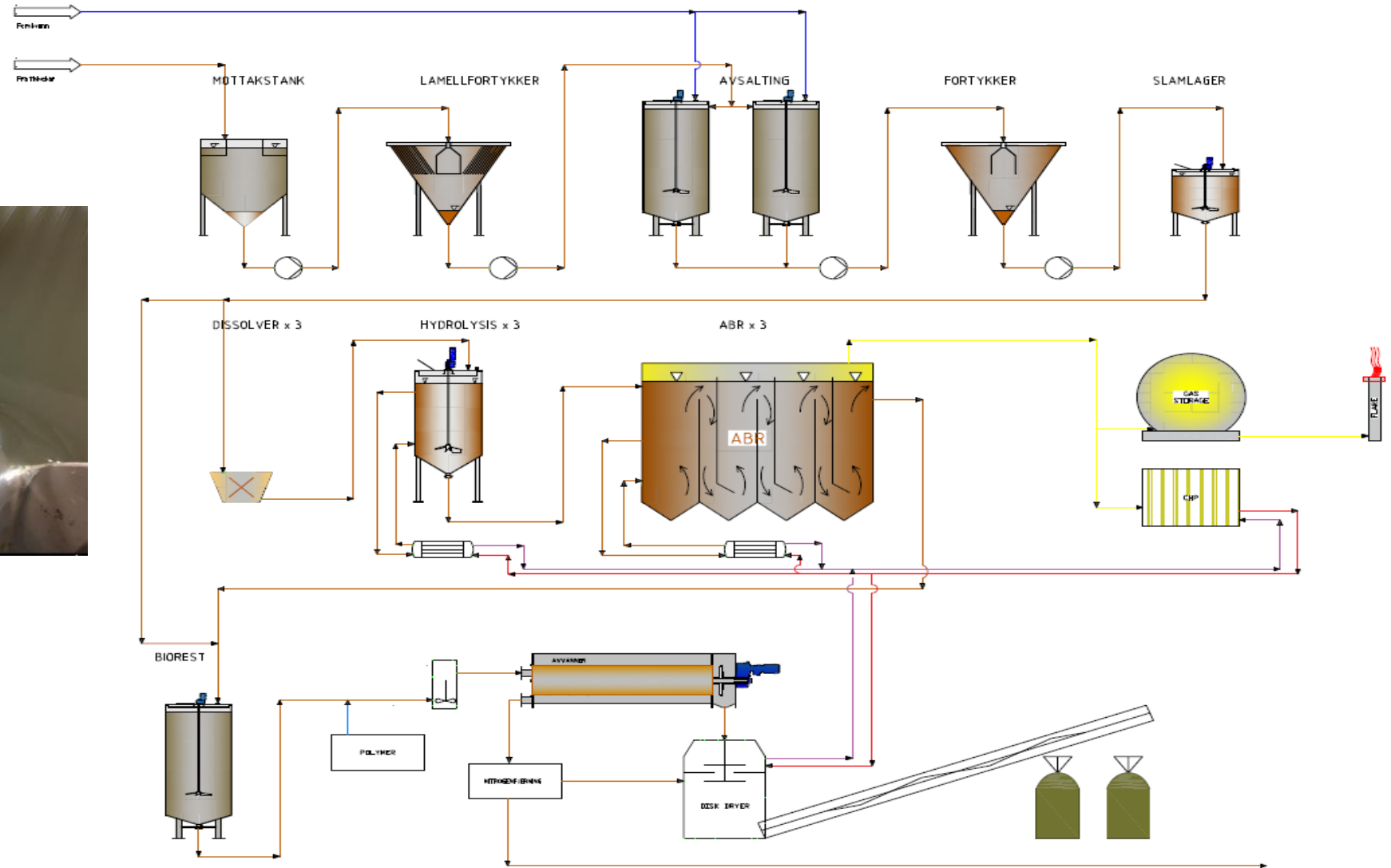


Biogas plant

- Anaerobic Baffle Reactor (ABR)
- Unique technology that produces biogas solely from fish sludge as the only component
- Bacterial culture adapted to handle high level of nitrogen
- Continuous removal of settled material

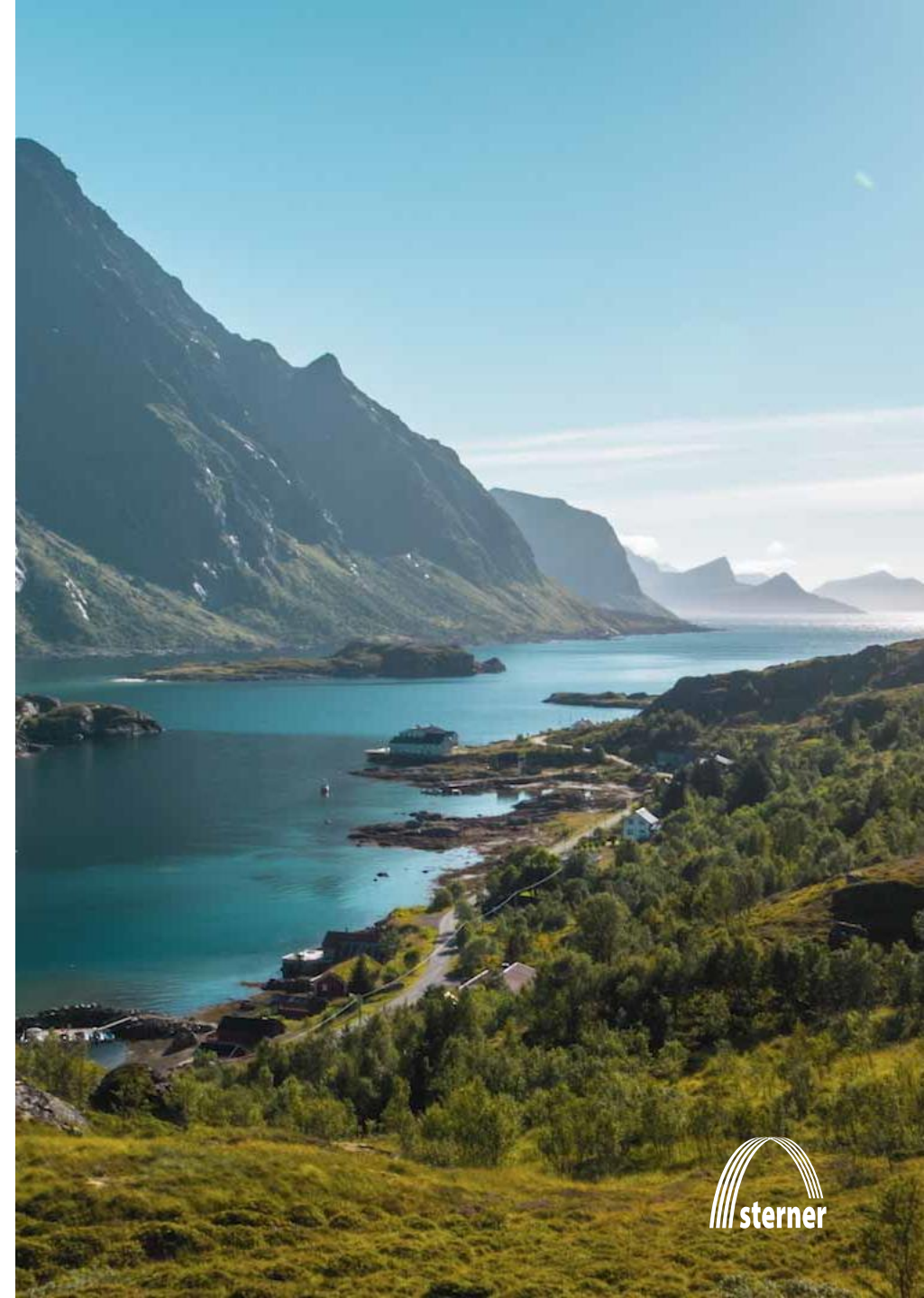


Anaerobic Baffle Reactor (ABR)



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Thank you!

Contact info:

