





The quest for green profitability

Building a sustainable European biofuel industry

Håvard Wollan, CEO Biokraft

Gothenburg, 5 November 2019

3 x world records

... and all of them thanks to LBG



Biggest LBG contract in maritime



LBG truck range = 1780 km



World's largest LBG factory

Biokraft – the search for profitable solutions



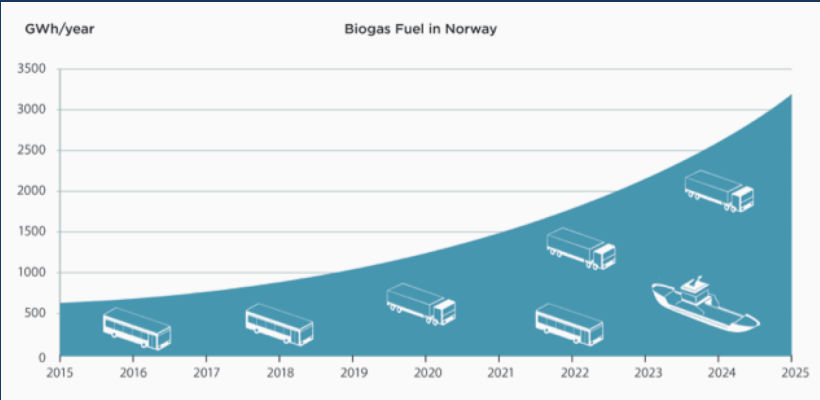
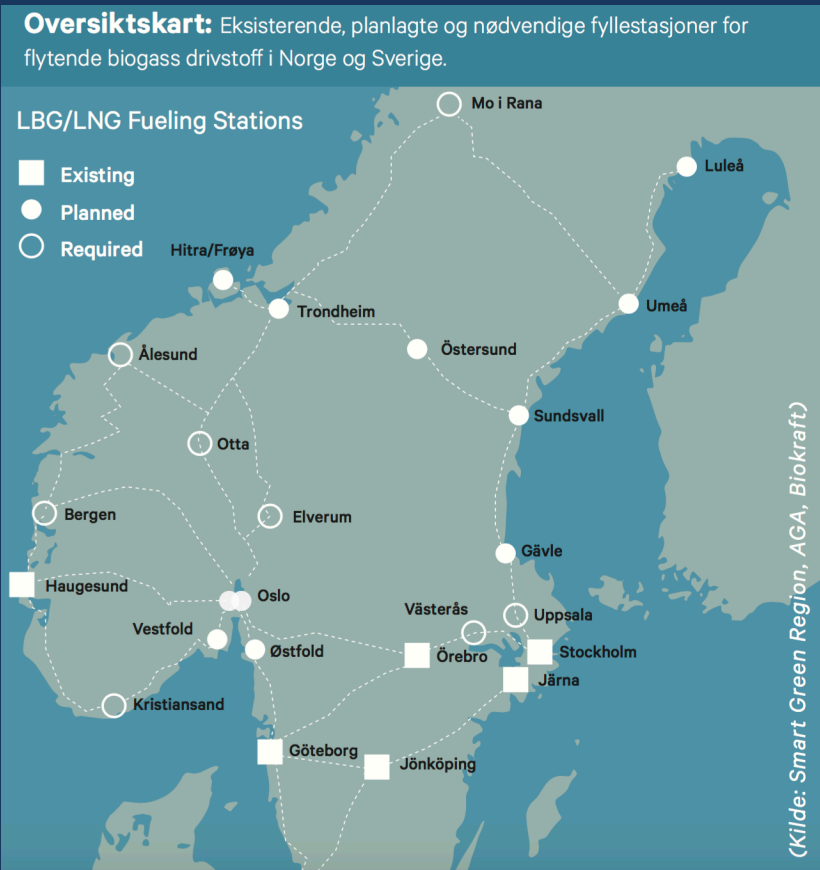
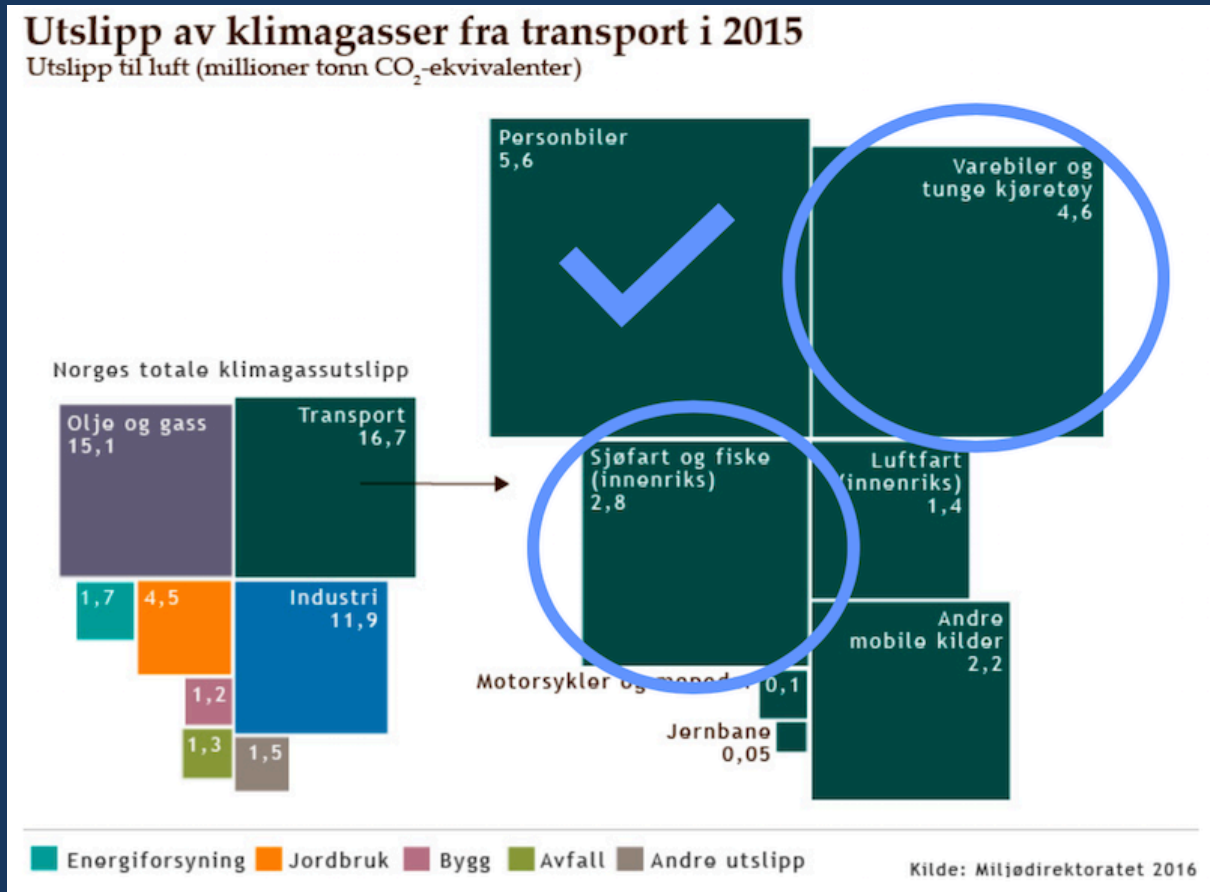
- Large scale industrial biogas plants – BUILD - OWN - OPERATE
- Investing in innovation R&D in order to develop additional revenue opportunities related to biogas (other than sale of LBG) as well as improve operational flexibility and competitiveness
- Involved in the re-design of traditional value chains – ***moving from yesterdays business ecosystems towards tomorrows circular bioeconomy ecosystems (consistent with the 17 SDGs)***



Biokraft – strong position in Norway's biogas landscape



Our market analysis a few years ago



Geographic range and additional functional market segments



CONVENTIONAL CBG MARKET

LBG – A GAMECHANGER



CBG



LBG



Skogn 1 – the world's largest LBG factory



Official opening of Skogn 1 by the Prime Minister of Norway, 2 September 2018

Biokraft – circular bioeconomy innovation power



Innovation R&D focus:

- ***Digitalization***
- ***Feed stock pre-treatment***
- ***Digestate post-treatment***
- ***Utilization of CO2 and byproducts:***
 - ***Bio fertilizer***
 - ***Sustainable feed ingredients***
 - ***Other bio products***
 - ***More sustainable food production***



New markets addressable with LBG

... and our experiences developing them



Green heavy transportation on roads



- In 2018 – 2019, among others IVECO, Volvo and Scania started delivering heavy trucks utilizing LBG/LNG fuel
- This climate risk mitigation strategy for heavy transportation is available NOW ...
- ... and it offers a decent range: IVECO's truck managed 1780 kilometers on a full tank of LBG



TINE

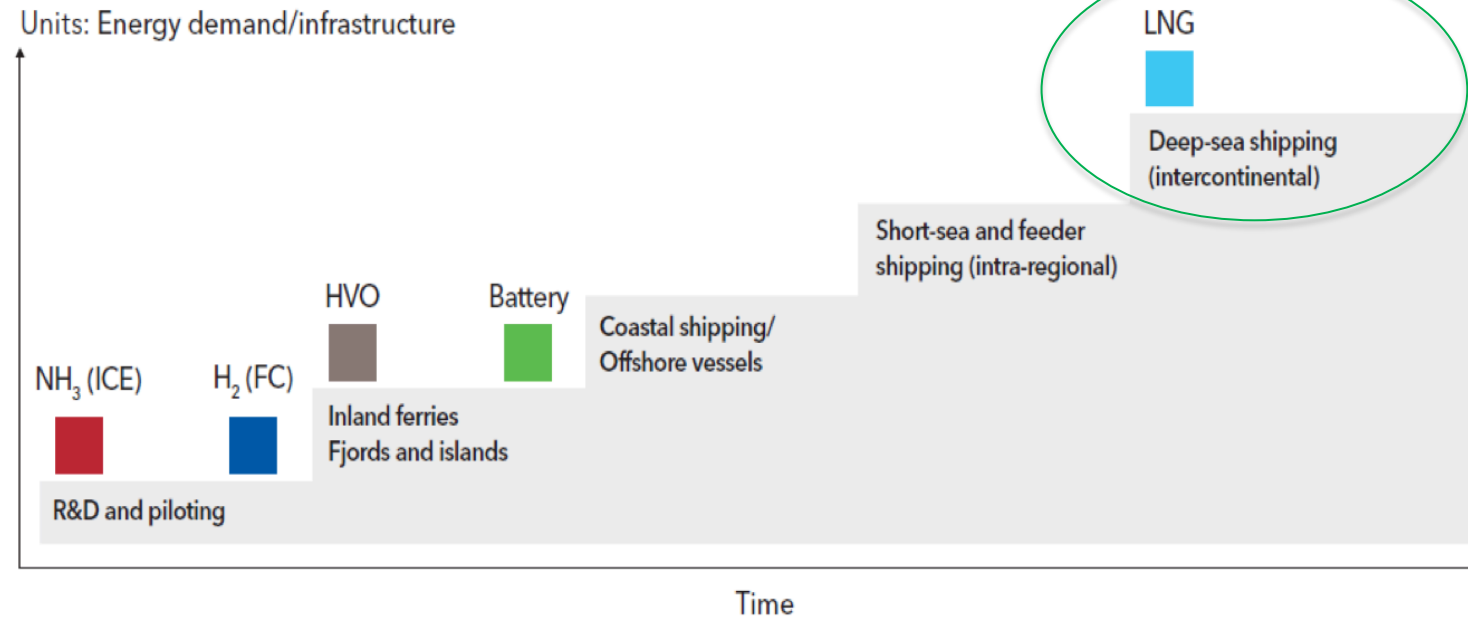


- TINE is Norway's largest producer, distributor and exporter of dairy products with 11 400 members (owners) and 9 000 cooperative farms
- TINE has developed its own biogas strategy, utilizing LBG in its fleet of heavy trucks. They call this #COWPOWER



Green shipping

LBG + LNG = currently the only available solution for deep-sea shipping



Gradual steps allow for:

- **maturing** of technology
- scaling of supply and **infrastructure**

Not all the options have the potential to reach the deep-sea stage, mainly due to limited energy density

It took LNG around 20 years to climb all steps. To reach the IMO targets, carbon-neutral fuels must mature faster!

The Green Shipping Programme takes an ecosystem approach to barrier reduction
Step by step maturation towards deep sea – piloting in short sea.

Norway is a great place to pioneer green shipping



Biokraft is a partner in Norway's Green Shipping Programme – where Norway establishes the world's most efficient and environmentally friendly shipping



Hurtigruten

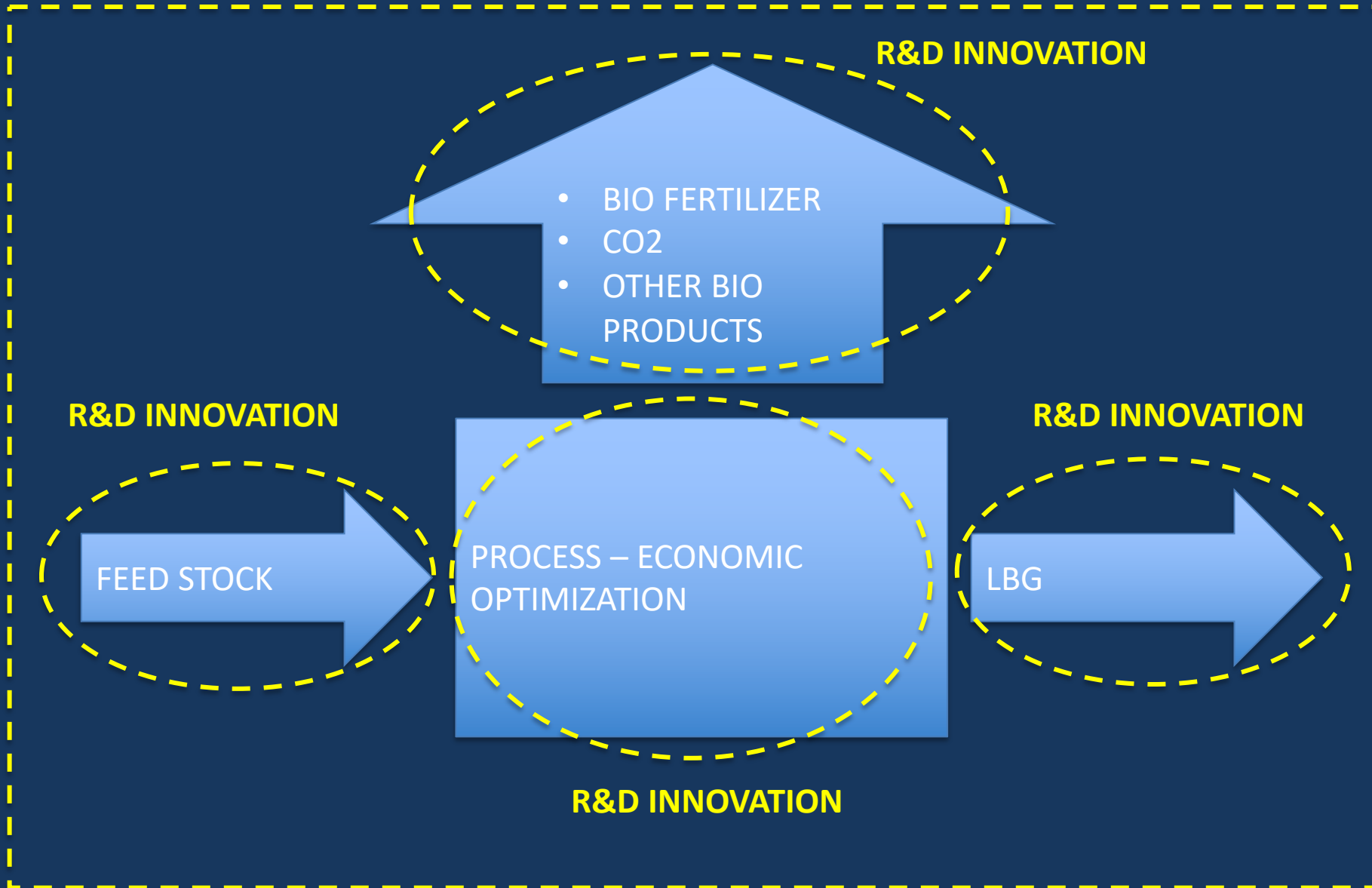
- Hurtigruten is perhaps most known for its operation along Norway's western and northern coast between Bergen and Kirkenes
- 
- As world leader in exploration travel, they also offer expedition cruises in Antarctica, Greenland, Iceland, Spitsbergen, Alaska, Northwest Passage and more
 - Hurtigruten will start utilizing LBG in six of their ships from 2021 – LBG delivered by Biokraft



The eternal quest for green profitability



**NATIONAL AND
REGULATORY
CONTEXT
(EU RED II,
etc.)**



The present and future of LBG



At Biokraft, we believe that LBG is the best solution currently available for mitigating climate risk by reducing CO₂-emissions in heavy transportation (trucks) and larger maritime vessels



