LBG and blending
Status for the Samsø Case

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Content

• The Samsø case – From Field to Ferry
  – Why Field to Ferry biogas on Samsø?
  – Biogas liquefaction challenge
  – Present status: Business and politics

• Lessons learnt
  – Steps ahead, refleksions
    • LBG og LNG? No talk about GTL!
    • Single Fuel/ Duel fuel /hybrid?
  – Other coastal communities
Samsø - The island of gathering

- 3700 inhabitants, 7x30 kms
- Independent municipality
- Agriculture, grain, pigs and milk
- Vegetables – intensive cultures
  - potatoes, onions, cabbage
- Tourism, green energy, gastronomy
  - The Samsoe Way
Connections and cooperation

Liquid Natural Gas ferry 2015
Liquid Bio Methane 2020

New harbour in 2014
Biogas from the fields to the ferry

- Renewable energy Island since 2007
- Biogas is impossible without the ferry as customer
- Municipal decision in 2013: We make our own shipping company!
- New ferry since 2015
- Now we need the biogas 😊
600 pax
160 cars
1 hour trip
Dual fuel engines

27 million euro

7,000 euro per islander
EUDP Feasibility
The Samsoe Case

- Field to ferry concept
  - Biogas 2020 value chain permissions
  - GOLNG technical & economic feasibility
Job creation and waste resource handling
Vision, Plan: Free of fossil fuels by 2030
Biogas Liquefaction

• Workshop held at Samsø in 2017
• Challenge of scale and economy
  – Technically possible
    • Wärtsilä, Kosan Crisplant, StirLNG/Pentair, Air Liquide, Cryopur, Nærenergi/Cryobox, Biofrigas
  – Island delimitations

• Liquefaction of biogas report
• Coastal communities business model challenges and opportunities with GO-LNG
Status for Samsø Field to Ferry

- Environmental permissions OK (Biogas 2020)
  - Samsø Municipality is the gas costumer
  - The biogas plant should be private

- The business plan is the challenge
  - World market LNG price is very low
  - Tax exemption for ships, lower subsidies, more restrictions
  - Renewable Energy Directive negotiations
    - Will determine the potential Bioticket value of Biogas on EU market
  - Municipal Board should procure Biogas for the ferry
    - 10 years to be delivered at Samsø
Lessons learnt – way ahead

• LBG or LNG?
  – LBG is not the complete answer.
  – Challenges described, how much can we cover?
  – GTL- synthetic diesel from LNG?

• Blending is intermediate, realistic in some cases
  – This very ship could be the first!

• Single Fuel/ Dual fuel/battery/hybrid/fuel cells?
  – Hybrid solutions upcoming
    • Not economically feasible with the Samsø Ferry
    • Future ferry energy needs
  – Pure single fuel engines have less CH₄ emissions
Emission Reduction Measures: up to 75% by existing technologies

Source: Boumann et al. 2017
Future in Baltic Sea Region

• Other coastal communities
  – Dialogue between biogas and maritime sector is challenging
    • Planning for biogas
    • Planning for new ferry
  – Matching scale for business
  – LBG can be realistic for medium sized ferries, where biogas production/gas grid is available
  – Bumble bees do fly, but against odds!
Questions, comments, discussion