METHANOL CONVERSION OF VESSELS – HANDS ON EXAMPLES
METHANOL AS MARINE FUEL

Why?
VISION:
COMPETITIVE SHIPPING WITH MINIMUM ENVIRONMENTAL IMPACT
METHANOL IS LIQUEFIED NATURAL GAS

Methane $\text{CH}_4$  
Methanol $\text{CH}_3\text{OH}$

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METHANOL CAN BE PRODUCED FROM A LARGE VARIETY OF FEEDSTOCK

**Fossil Feedstock**
- Oil
- Natural Gas (methane)
- Coal

**Renewables**
- Gasification of biomass / waste
  - Municipal Solid Waste (Enerkem in Canada)
  - Farmed wood (SRF)
  - Forest Residues (Värmlands Methanol)
  - Black Liquor (Chemrec)

- CO₂ plus renewable energy
  - CO₂, energy from geothermal (CRI Iceland)
  - CO₂ from steel mill FreSMe
  - CO₂ from waste plant Liquid Wind

**Synthesis Gas**

**Synthesis with H₂ from water electrolysis**

**Methanol**

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METHANOL PROJECTS

EffShip

SPIRETH

Stena Germanica

Waterfront shipping

SECA

Methaship

SUMMETH

GreenPilot

Dubai December 11th 2018
RULES AND REGULATIONS

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STENA GERMANICA       GOTHENBURG – KIEL

50 000 Cars
43 000 Trucks/trailers
220 000 passengers

Lifted from the road onboard the worlds first methanol conversion

SOX - 90% REDUCTION
NOX - 60% REDUCTION
PM - 90% REDUCTION

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Engines converted Q1 2015 for methanol

Double walled fuel pipes

Ballast tank converted to methanol fuel tank

Pump room

STENA GERMANICA – WORLDS FIRST METHANOL SHIP

STENA Line

ScandiNAOS AB
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Methanol as marine fuel - Dubai December 11th 2018

Shipping fuel is highly regulated and methanol is not on the approved list (yet). Development of the IGF code ready in Sept.-16.

Major effort to establish new standard

Fueling procedures, storage, fire and other safety measures have been challenges to overcome

Engine is working fine but there has been issues with pipes and pumps.

Approval from Lloyds register to run on Methanol!
Methanol bunkering in Gothenburg

December 11th 2018
SIZE MATTERS

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METHANOL AS FUEL

- Low flashpoint
  - 11°C (Diesel >43°C, Gasoline <-60°C)
- Low flame visibility
- No smoke from combustion
- Material compatibility
- Toxicity
PILOT 729SE

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<th>Name</th>
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GENERAL ARRANGEMENT

- Aluminium hull
- Composite superstructure
- CO₂
- Water jet
- Engines aft below deck
- Methanol as marine fuel - Dubai December 11th 2018
GENERAL ARRANGEMENT

New tank room
2x 440L methanol

Fuel pumps and filters in steel chest

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METHANOL

A cost efficient, clean burning, universal, future proof fuel

with potential to be sustainably produced in large quantities
AVAILABLE ENGINES

- Large 4 stroke engines – Wärtsilä
- Large 2 stroke engines – MAN B&W
- Smaller engines 100 – 450 kW
  Converted Scania engines from ScandiNAOS
Thank you