



REDUCE EMISSIONS – EXPAND POTENTIAL

Teknologikonferanse 2011

*Gass som energibærer i
fiskeflåten*

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Aksel Skjervheim, Gasnor



LNG – A CLEAN, COMPETITIVE FUEL. TODAY AND IN THE FUTURE

- Presently doing regular bunkering of 22 ships
- 1500 bunker operations annually
- 42.000 transfers of LNG in flexible hoses up to now

**REDUCE EMISSIONS
EXPAND POTENTIAL**

THE NATURAL GAS VALUE PROPOSITION

REDUCE

COST

EMISSIONS

MAINTENANCE

EXPAND

SAFETY

BRAND VALUE

PROFITABILITY

AGENDA

- ▶ A little about Gasnor
- ▶ Availability of LNG as bunker
- ▶ Pricing of LNG
- ▶ Bottlenecks for increased use of LNG in fishing vessels
- ▶ Conclusions



**GASNOR –
THE LEADING SCANDINAVIAN
SMALL SCALE NATURAL GAS COMPANY**

**REDUCE EMISSIONS
EXPAND POTENTIAL**

GASNOR KEY FACTS*

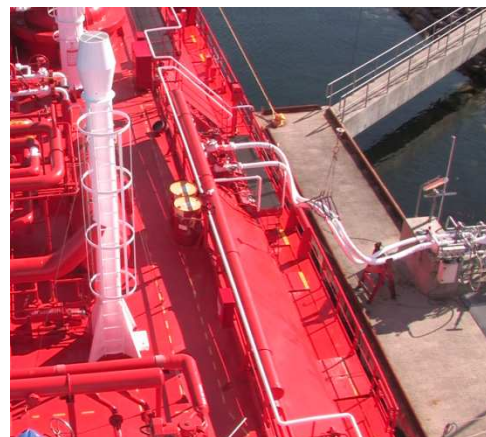
- ▶ Natural gas pioneer – established 1989, first gas delivery 1994
- ▶ 52 employees
- ▶ ISO 9001 and 14001 certified

- ▶ Revenue 2010: 783 mill NOK (98 mill euro)
- ▶ Profit before tax: 68 mill NOK (8,5 mill euro)
- ▶ Total assets: 1.240 mill NOK (155 mill euro)
- ▶ Equity: 331 mill NOK (41,5 mill euro)

* 2010-figures. Euro-figures based on EUR/NOK=8,0



«SMALL SCALE» MEETS «BIG NEED» FOR CLEAN ENERGY



WE SERVE CUSTOMERS IN THREE MAIN SEGMENTS

Industry



Transport



Pipeline customers



- ▶ Industry, commercial, residential and public buildings. District heating and power generation.



A WELL ESTABLISHED INFRASTRUCTURE

► LNG supply capacity: 300 000 tonnes/year

3 LNG production plants



16 semitrailers LNG



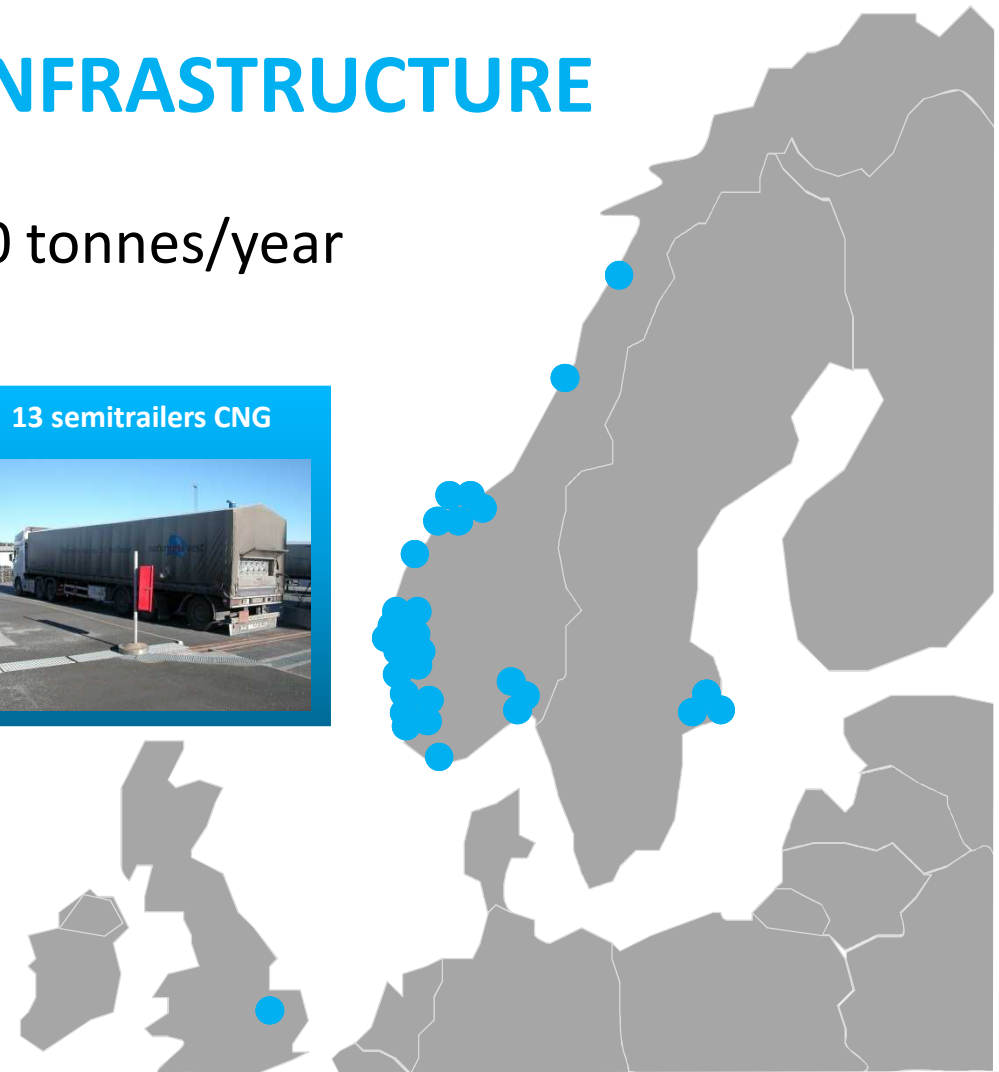
13 semitrailers CNG



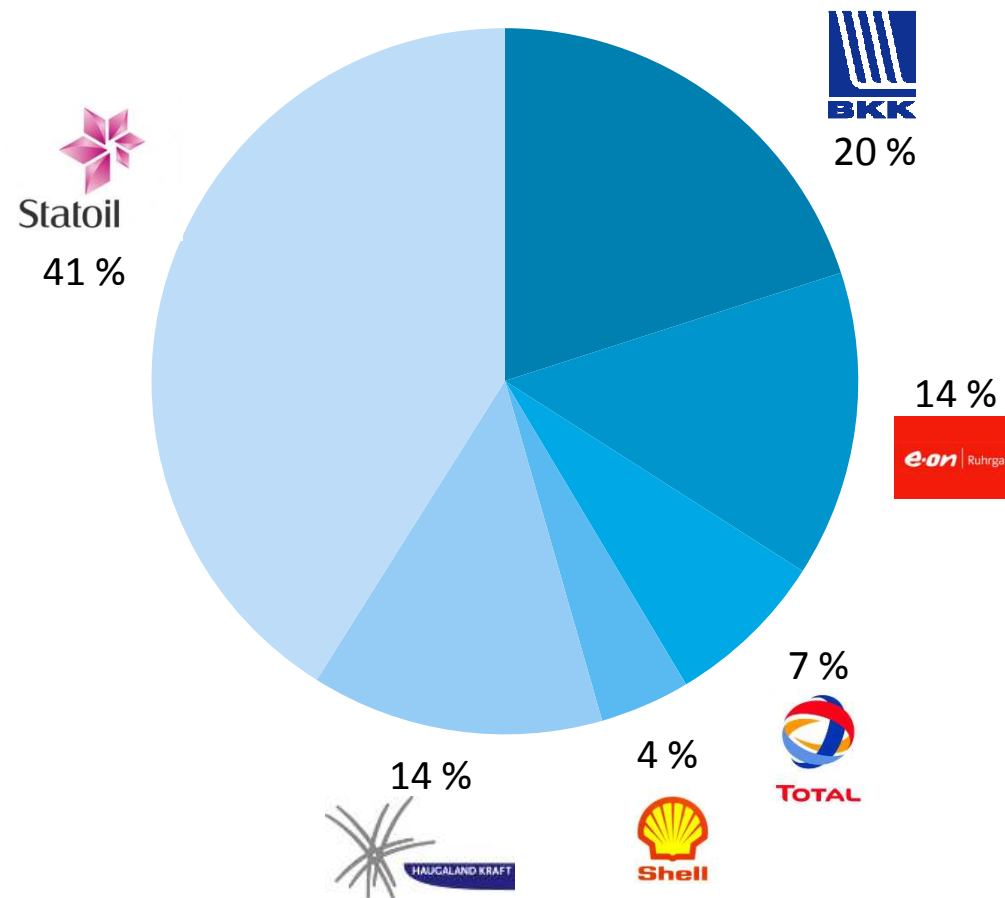
30 terminals



2 tankers



OWNED BY LEADING ENERGY COMPANIES



GASNOR'S PLANT AT KOLLSNES





HYBRID POWERED VIKING LADY, USING LNG IN FUELCELLS AND ENGINES

BUNKERING VIKING LADY ON HER WAY TO COPENHAGEN



BUNKERING OF CORAL METHANE BY PIONEER KNUTSEN AT KOLLSNES



FIRST LNG FROM HUELVA, SPANIA



GASNOR TAKING LNG FROM ZEEBRÜGGE – MAY 2010





GASNOR TAKING OUT LNG FROM HUELVA WITH SMALL SCALE TANKER IN AUGUST 2010





AVAILABILITY OF LNG FOR BUNKER

REDUCE EMISSIONS
EXPAND POTENTIAL

GASNOR KEY BUSINESS AREAS

- ▶ Supply natural gas, incl LNG for industry and bunker in Norway
- ▶ Supply LNG for bunker in North and Western Europe

GAS SUPPLY TO EUROPE

LNG →



LNG ↑

PIPE ↓

PIPE ←

LNG VOLUMES IN EUROPE

- ▶ Annual LNG imports into Europe (2010) 60-70 mill tons
- ▶ Annual bunker volumes in Europe ~ 50 mill tons
- ▶ Annual bunker volumes
in the North- and Baltic Seas ~15-20 mill tons

THERE IS A WELL-ESTABLISHED LNG INFRASTRUCTURE FOR LNG IN EUROPE

- ▶ Tapping contracts from large European LNG-terminals are in place
- ▶ New terminals can be made available in shorter time than normal lead time for a new ship
- ▶ LNG can be supplied to ships in most of Europe

- Bunkering terminal
- Regas terminal
- ◆ Small scale Production



AVAILABLE LOGISTICS

- ▶ A number of small LNG-carriers existing and ordered
- ▶ A relatively large number of LNG semi-trailers are in operation
- ▶ Several European LNG-terminals can fill semi-trailers with LNG
- ▶ Bunker boats are planned
- ▶ Bunker facilities can be made available where needed throughout Europe within the time scope for new LNG-fuelled vessels

AVAILABILITY OF LNG IS PROBABLY NOT A BOTTLENECK FOR INCREASED USE OF LNG IN SHIPPING

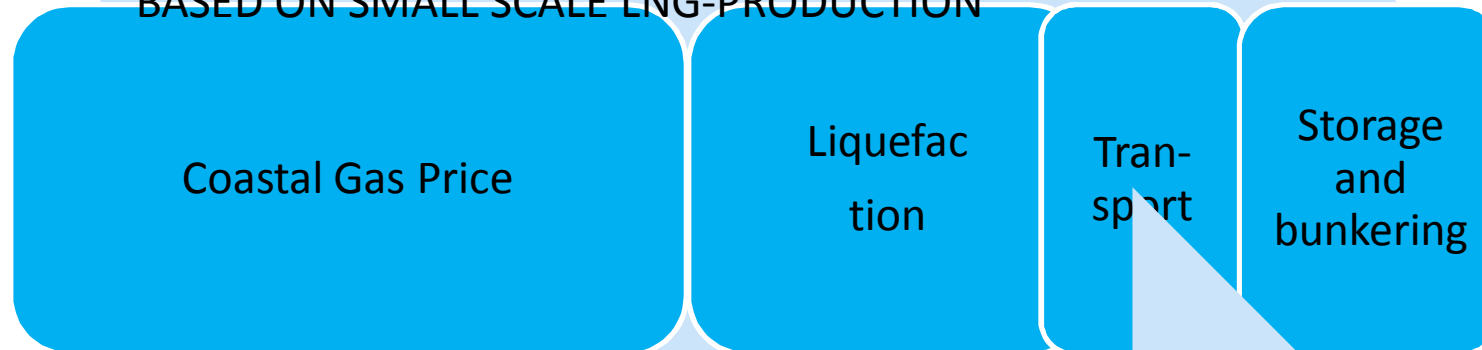


PRICING OF LNG

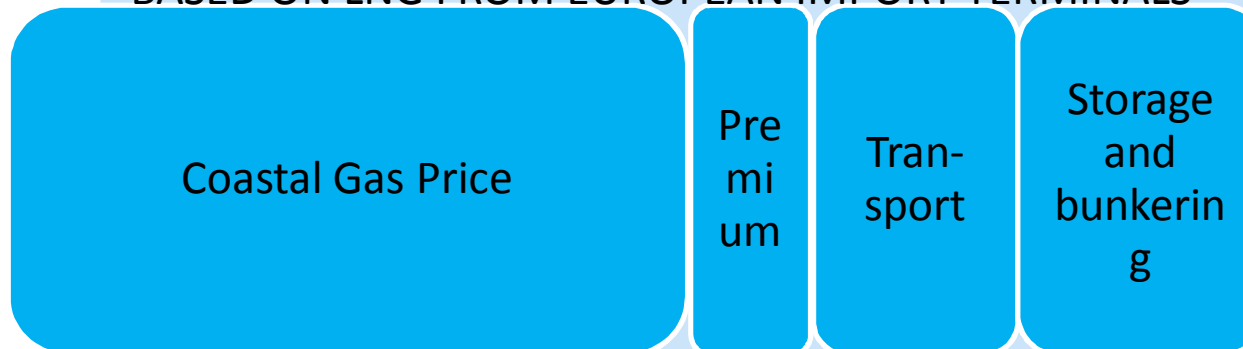
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COST OF THE LNG CHAINS

BASED ON SMALL SCALE LNG-PRODUCTION



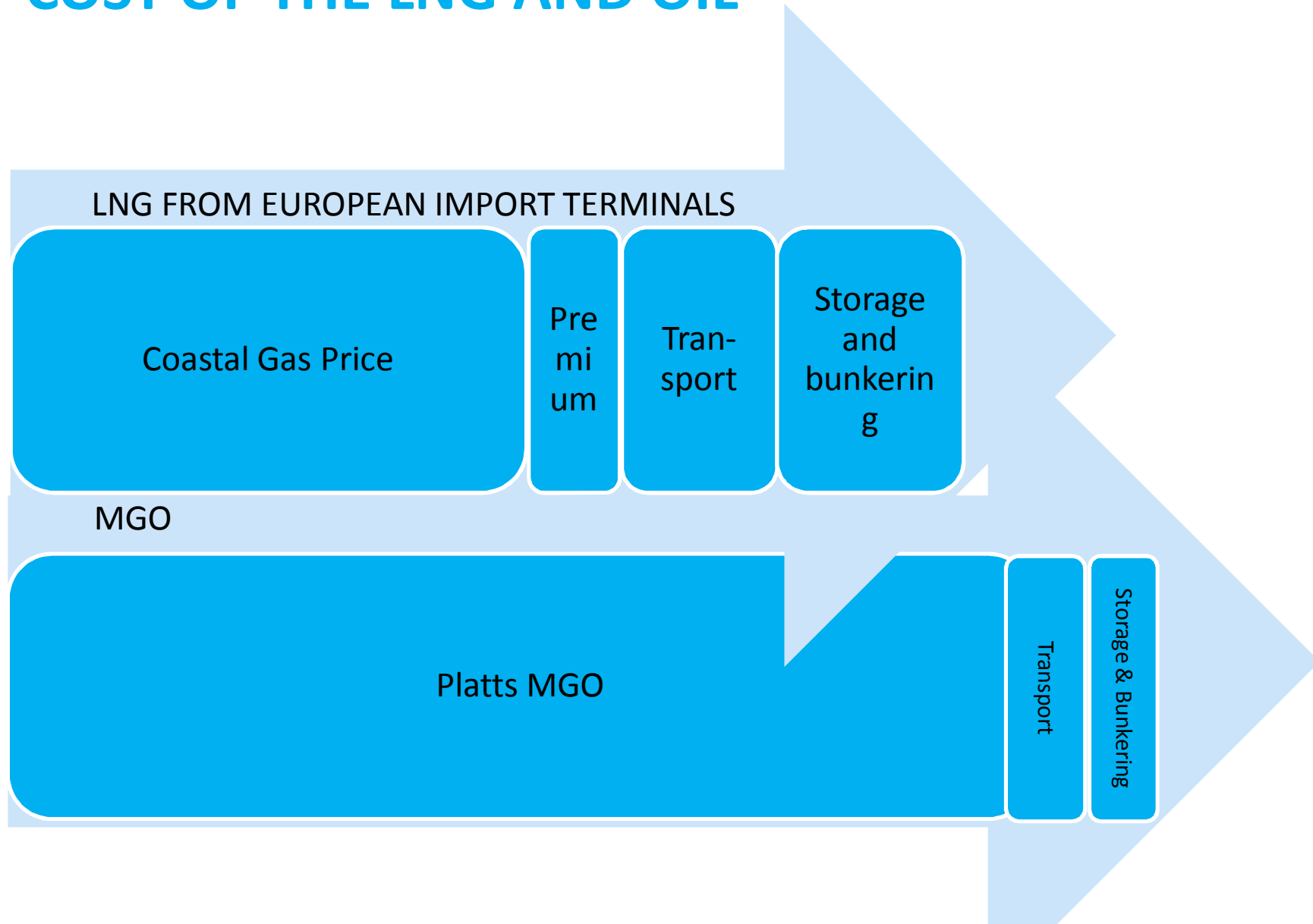
BASED ON LNG FROM EUROPEAN IMPORT TERMINALS



LNG I SKIP/LNG PÅ NORSKEKYSTEN/LNG I FISKEFARTØY

- ▶ Drivstofforbruk i Europa
- ▶ Drivstofforbruk i Norge
- ▶ LNG i skip – et norsk eksportpotensial
- ▶ Hvor er det mest å hente?
 - Container, tank, cruise, ferge
- ▶ Hvordan oppnås lave priser på LNG
- ▶ Er fiskefartøy feil fokus?
 - Varierende fartsmønster
 - Lange tokt – behov for stor tank
 - Lite ubenyttet volum om bord – hver kubikkmeter utnyttet
 - Lavt årsforbruk i forhold til investering i gassutstyr

COST OF THE LNG AND OIL



LAGRINGSTEKNOLOGI FOR OLJE OG LNG



VIRKELIG LAVE LOGISTIKKOSTNADER FOR LNG KREVER

- ▶ Få ledd i forsyningskjeden – LNG forsynes direkte til hvert bunkringssted
- ▶ Store volumer på hvert bunkringssted

INDEXATION OF THE LNG-PRIC

- ▶ By oil (Platts Gasoil, IFO or similar index)
- ▶ By natural gas (TTF or similar index)
- ▶ Today we see a development towards gas pricing more independent from oil

PRICE LEVELS

- ▶ Between MGO and IFO 380, depending on volume and location

**LNG CAN ALREADY BE SUPPLIED
AT COMPETITIVE PRICES**

OPPSUMMERING

- ▶ LNG er godt tilgjengelig på norskekysten i dag, selv om logistikken og kostnadene foreløpig er krevende nord for Bodø.
- ▶ LNG er også tilgjengelig i resten av Europa.
- ▶ Prisen på LNG er allerede konkurransedyktig mot MGO, til og med mot IFO for kontrakter om store volum.