Snøhvit – Wider impacts from the LNG process plant at Hammerfest

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The 5th Concept Symposium on Project Governance
Valuing the Future - Public Investments and Social Return
20. – 21. September 2012

Symposium web-site: http://www.conceptsymposium.no/
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Snøhvit - Wider impacts from the LNG-process plant in Hammerfest

Resource peripheries and global production networks

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This presentation leans on primary data

- Trail research project for the Snøhvit Construction Phase (2003-2008)
- Trail research project for the Goliat Construction Phase and Early Operation Phase – started (2010-2015)
- Study of ripple effects in five regions, for Ministry of Petroleum and Energy (august 2012)

These research projects are performed by Norut -Northern Research Institute, Alta.

The TRP for Snøhvit was led by a steering committee with representatives for the operator Statoil, Hammerfest municipality and Finnmark county municipality.

The TRP for Goliat is led by a steering committee with representatives for the operator Eni, Hammerfest municipality, Finnmark county municipality, The county Governor of Finnmark.

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The Snøhvit project

- Development of the Snøhvit and two other **gas** fields in the Barents Sea at 250-350 m water depth, 140 km north-west of Hammerfest
- Remote controlled **Subsea production system** on the seabed
- Pipeline to shore, feeding a **land based LNG plant at Melkøya Island** at the shipping channel entrance into Hammerfest City
- Capture and **reinjection of Carbon dioxide** from the wellstream
- Shipping by **LNG vessels** (Asia, Spain, France etc.).

Operator: Statoil AS
Construction Phase 2002-07

Came on stream late 2007. The plant was fraught with equipment failures, during the first year of operation, but is now, after several planned stoppages for overhaul and repairs, producing at full capacity, about 4.3 million tonnes of LNG a year, corresponding to one cargo every five or six days, and smaller quantities of LPG and condensate

The Snøhvit partners hope to add a **second liquefaction train** at Melkøya, provided new discoveries bring forth enough new reserves to justify the investment. A decision has to be balanced with plans about developing pipeline solutions.

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The Goliat development project

Offshore production and offloading of **oil** from the Goliat field in the Barents Sea 80 km northwest of Hammerfest on a Floating Production Storage and Offloading (**FPSO**) unit. **Electric power supply** by submarine cable **from shore** (partly from 2013, fully when the power grid network to Finnmark is upgraded). Export on shuttle tankers every 7.-14. day.

Compared to other oil fields at the Norwegian shelf, Goliat is a relatively small field, but in terms of expenditures it is Northern Norway's second largest investment project.

Operation phase (Goliat) **2013-28**
OpEx :1 Billion NOK/Year **(~130 mill Euro**)
Supply- and Standby-ships, logistic services, oil-spill preparedness, M&M etc

Operator: Eni Norge AS
Construction Phase 2010-13
CapEx: 28 Billion NOK **(~3,5 B Euro**)
-FPSO, Hull and Topside
- Seabed templates, subsea
- Pipelines, marine risers
- Onshore electric installations
- Submarine cable, electricity
- Drilling
- Engineering

Several main contracts awarded

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Regional distribution of supply effects in Norway reflects that

- The Norwegian oil and gas supply industry has its stronghold in the South West parts of Norway
- The ”E18-corridor” westwards from Oslo has a strong R&D/expert knowledge services cluster
- Arendal/Kristiansand strong cluster in drilling and services
- Large construction companies also have their headquarters in the south-east

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Ripple effects Snøhvit

- First and foremost, major economic impact on the development site. The local effects of the development phase was significantly higher than the regional, but it can also be identified clear regional effects.

- Snøhvit development has also meant a lot for the Norwegian supplier industry and the labor market for Norwegian yard workers.

- Such field development is primarily a possibility for the established oil - and gas industry with its suppliers arriving at the scene in the north. Therefore, the key to the effects of development projects in the north is both the spin-offs from the established supply industry and the opportunities existing local industry has to connect on the arrival.

- We also saw that an efficient transport of personnel is essential to realize the developments in the North, but also a challenge for local ripple effects

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Development Phase Snøhvit

- Total deliveries from Northern Norway 2,7 billion
- Snøhvit development (2002-2008) turned a negative growth in the Hammerfest area (immigration, development of industry)
- Local deliveries for 1.5 billion, or 5% of domestic shipments. Particularly interesting is supplying 320 million to commercial services and 80 million to the local shipbuilding industry
- Significant income from property tax (150 million each year) to the municipality created major investments in upgrading schools, building new kindergarten, cultural center and so on
- "Local" suppliers are of three types:
  (i) National established suppliers establish in Hammerfest;
  (ii) National Suppliers who buy up established local businesses, and
  (iii) Locally owned businesses

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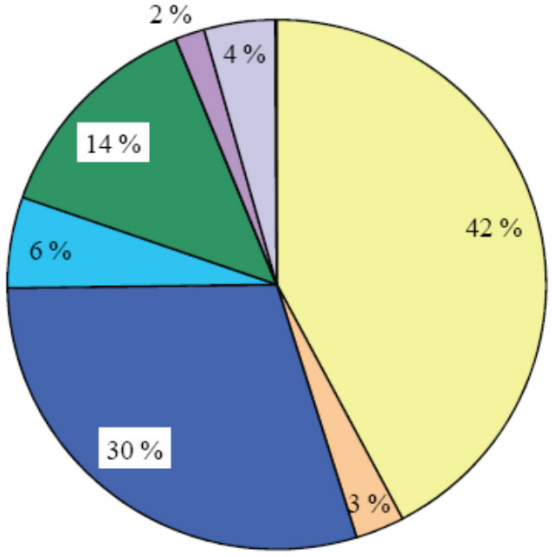
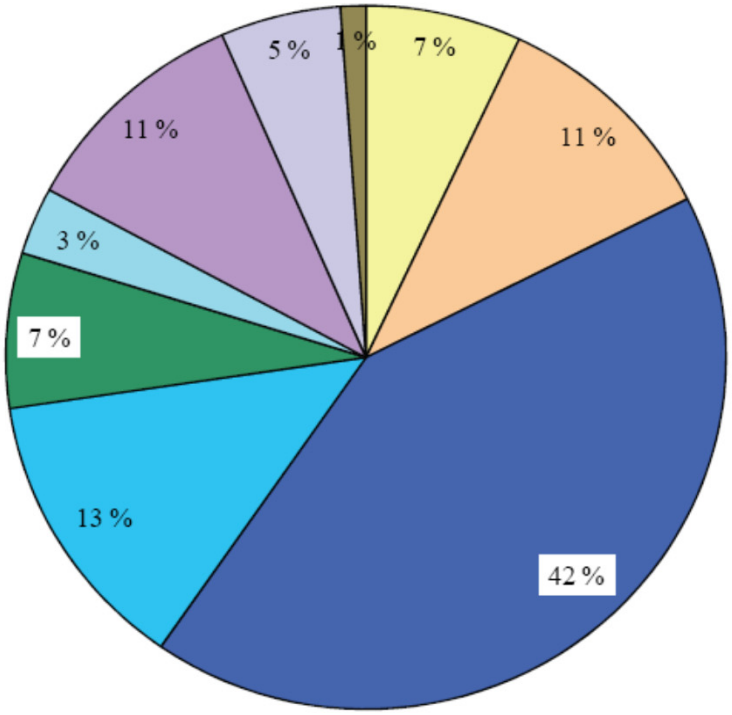
Deliveries to Snøhvit - Foreign / Norwegian / Northern-Nor

Fordeling av inngåtte kontrakter pr mars 2008 etter geografi og næring, utbyggingsfasen

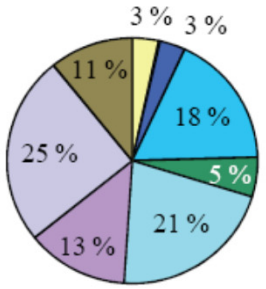
Utenlandske leveranser
NOK 17,1 mia



Innenlandske leveranser
NOK 30,5 mia



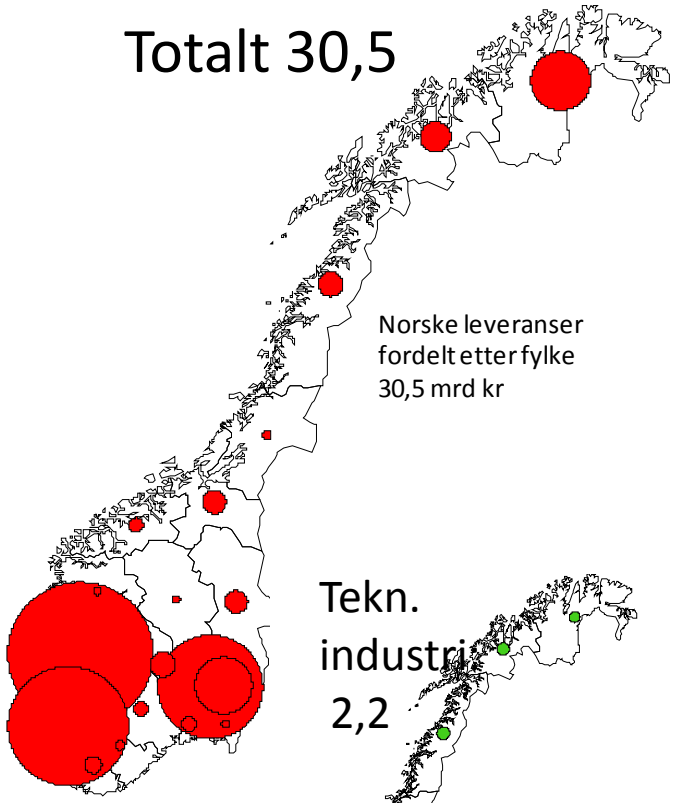
Herav nordnorske leveranser
NOK 2,7 mia



Monitorering:

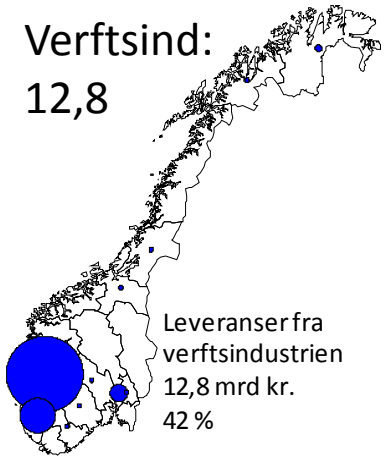
Snøhvit Construction: Contracts by county

Totalt 30,5



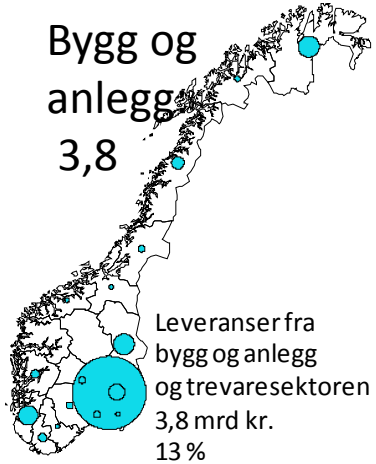
Norske leveranser fordelt etter fylke
30,5 mrd kr

Verftsind: 12,8



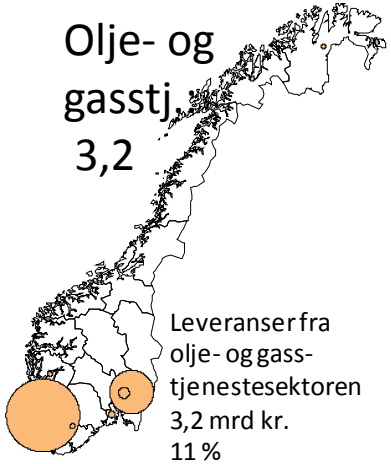
Leveranser fra verftsindustrien
12,8 mrd kr.
42 %

Bygg og anlegg: 3,8



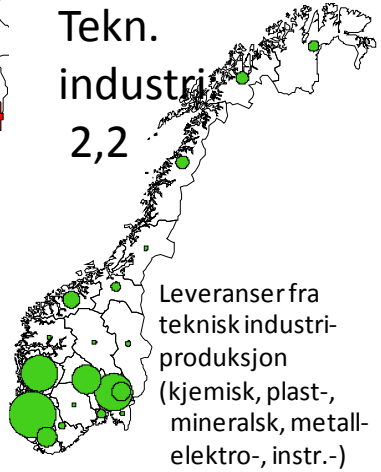
Leveranser fra bygg og anlegg og trevaresektoren
3,8 mrd kr.
13 %

Olje- og gasstj. 3,2



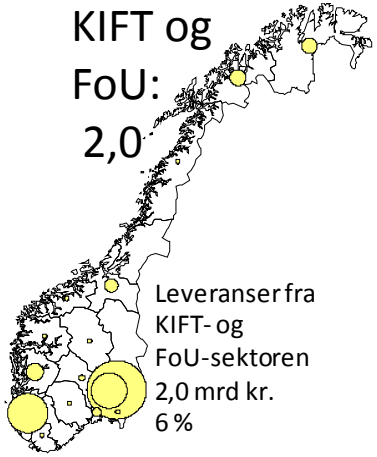
Leveranser fra olje- og gass-tjenestesektoren
3,2 mrd kr.
11 %

Tekn. industri 2,2



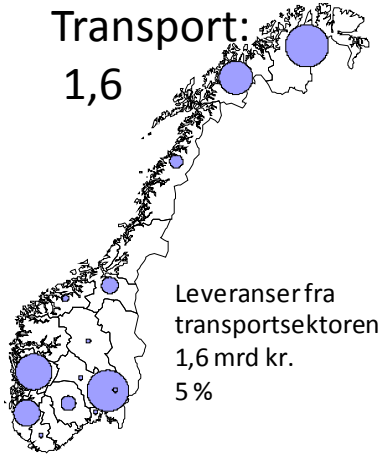
Leveranser fra teknisk industri-produksjon (kjemisk, plast-, mineralsk, metall-elektro-, instr.-)
2,2 mrd kr.
7 %

KIFT og FoU: 2,0



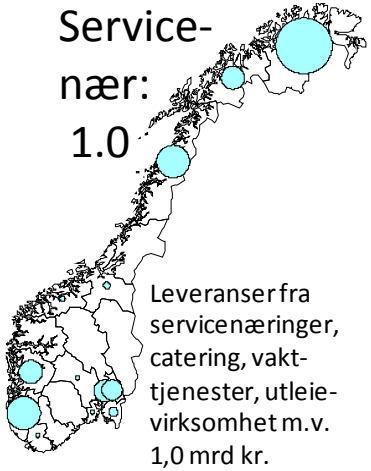
Leveranser fra KIFT- og FoU-sektoren
2,0 mrd kr.
6 %

Transport: 1,6



Leveranser fra transportsektoren
1,6 mrd kr.
5 %

Service-nær: 1.0



Leveranser fra servicenæringer, catering, vakt-tjenester, utleie-virksomhet m.v.
1,0 mrd kr.
3 %

Summary Snøhvit

- That north arrived late is important to explain connections and obstacles for developing systems
- Strategies to handle geographical distance well developend – creates few horizontal connections
- But: Local employees becomes integrated in existing innovation systems
- Local production systems changes and is governed by actors outside north

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Development of Goliat

- Development and operation of the Goliat has few similarities with the development of the Snøhvit field.
- Activity in the project will primarily take place on the Goliat field, not in a factory on land.
- Resource on the Goliat field is primarily oil, not gas. And oil has different demands on systems for emergency response to unplanned events than gas does.
- Expectations of local and regional deliveries are significantly related to the operation phase and not the development phase

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Findings so far

- Ripple effects are concentrated geographically near the plants
- Local ripple effects are more significant compared to regional ripple effects
- Both the 1) regional structure, 2) development projects, 3) technological and 4) organisational framework places strong constrains on what kind of firms and workers who are engaged in the projects
- These factors strongly influence on the local / regional effects we can se in retrospect
- Local firms in the north are upgraded through experience and formal qualifications
- Growing cluster in Hammerfest with both horisontal and vertical connections already serving market possibilities

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- The Northern part of Norwegian Shelf will in 2014 have 5 of 73 of the total amount of projects

- Increased optimism through plans, drilling and findings; Skrugard/Havis, Norvarg: Barentshavet, Aasta Hansteen: Norskehavet

- One effect of this: Firms in oil service streaming to the North (ABB, Aker Solutions, Reinertsen, Xervon, BIS, Aibel mv)

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