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GCE Subsea

GCE Subsea – strengthening collaboration, innovation and internationalisation of the subsea industry

Dr. Gisle Nondal, R&D Manager

WORLD-CLASS
SUBSEA
SOLUTIONS
///// FROM NORWAY

GOLD
Cluster Management Excellence
PROVEN FOR CLUSTER EXCELLENCE

The Cluster Map

PARTNERS

Industry

R&D

Development Contributors

Higher Education Institutions

MEMBERS

Supported by

Cluster Relations

National Relations

International Relations

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GCE Programme

// **Goal:** Make the cluster more dynamic and attractive, and boost individual companies' innovation and competitiveness.

// Part of the Norwegian Innovation Clusters programme, launched to trigger and enhance collaborative development in central Norwegian business clusters.

GCE Subsea

// NOK 10 million in annual funding
// Annual budget at NOK 25 million
// 6 man-years in the organisation

Innovation Norway

The Research Council of Norway

siva for nyskaping og vekstkraft

GCE Subsea

// **Main goal:**
Increase the cluster's competitiveness and global market share, and take a leading position in sustainable utilisation of ocean resources.

// **Main objectives:**

- Cost-efficiency: strengthen competitiveness
- Research-based innovation: paradigm-shifting technology
- Ocean Innovation: beyond oil and gas

// **Key global drivers:**

- increased demand for energy and marine resources
- climate and environmental challenges
- stronger global competition

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International Collaboration

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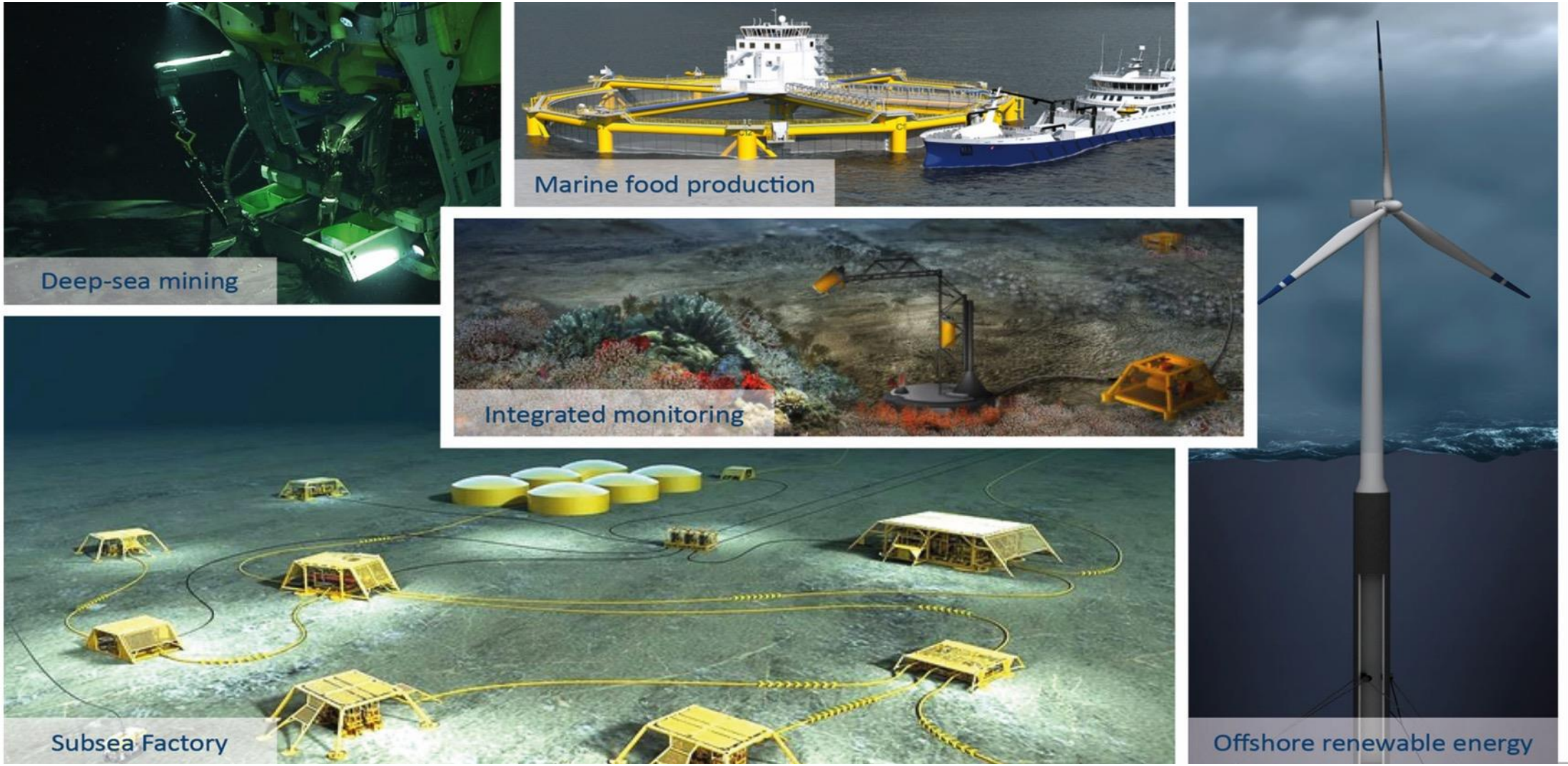
Key strategic areas and projects

GCE Subsea - Overview



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Subsea meets Aquaculture

// **Phase 1** - First half of 2016

// **Phase 2** - Second half of 2016 and 2017

- Visit relevant companies and customers to connect ideas
- Business development programme - ACCEL Cross-over (from subsea to aquaculture)
- Workshops with both industries; Capacity building, idea generation and identification
- Establish and realise more projects

Norwegian Centres of Expertise
NCE Seafood
Innovation Cluster

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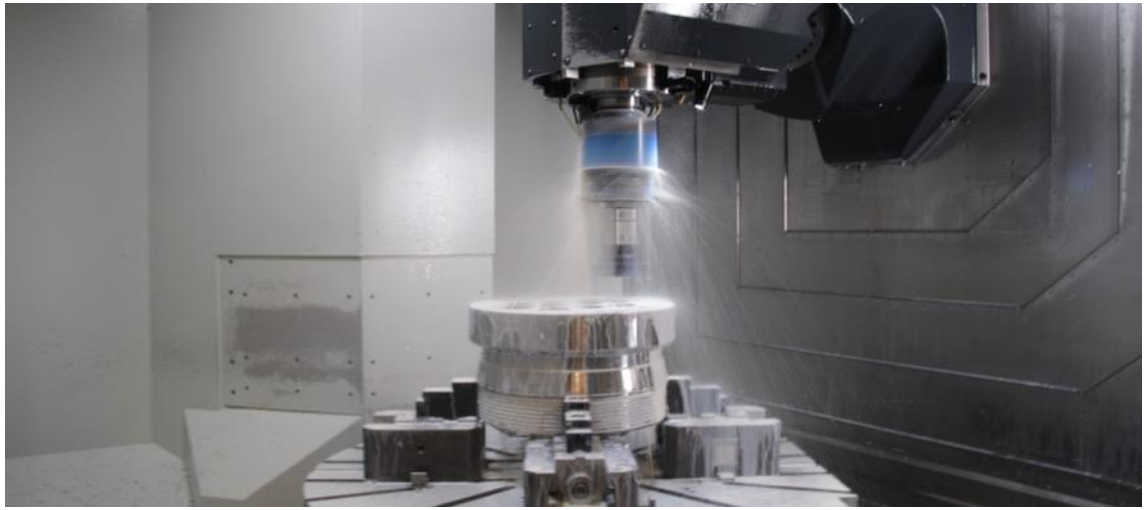
Work Processes

Strong industry focus to improve productivity and competitiveness.

// **Life cycle systems engineering:** strengthen link between engineering and operations.

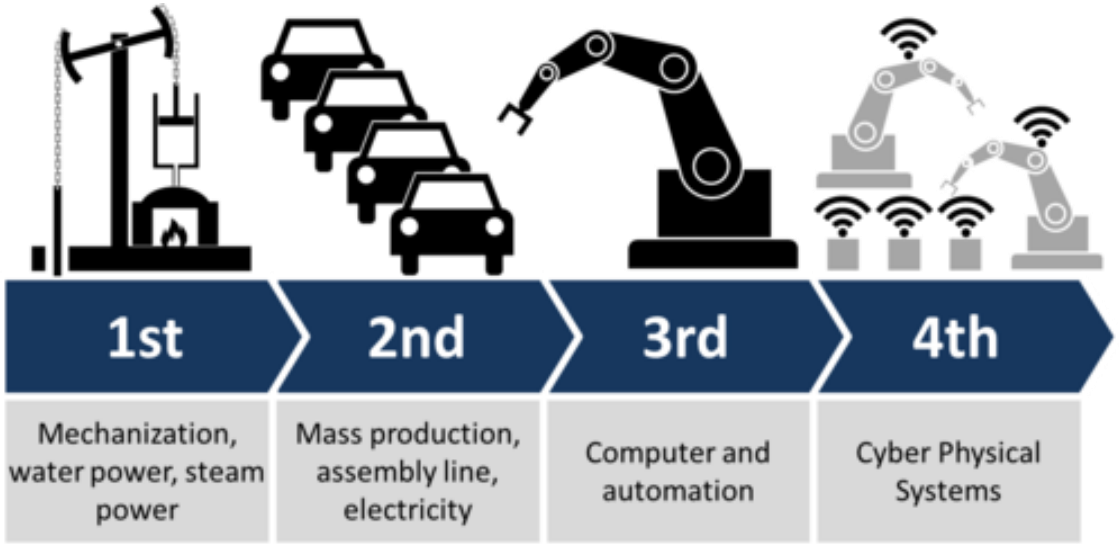
// **Lean management and production:** learn from other industries.

// **Standardisation:** work across the supply chain to standardise documentation, interfaces and requirements.



Industrie 4.0 – digitalisation

- **Main goal:** capitalize on the new trends, technologies and strengths to increase competitiveness
- Collaboration project between the three Norwegian GCE-clusters
- Reduce costs and increase productivity
- Home-source production to Norway
- Robotics and digitalisation



Source: https://en.wikipedia.org/wiki/Industry_4.0

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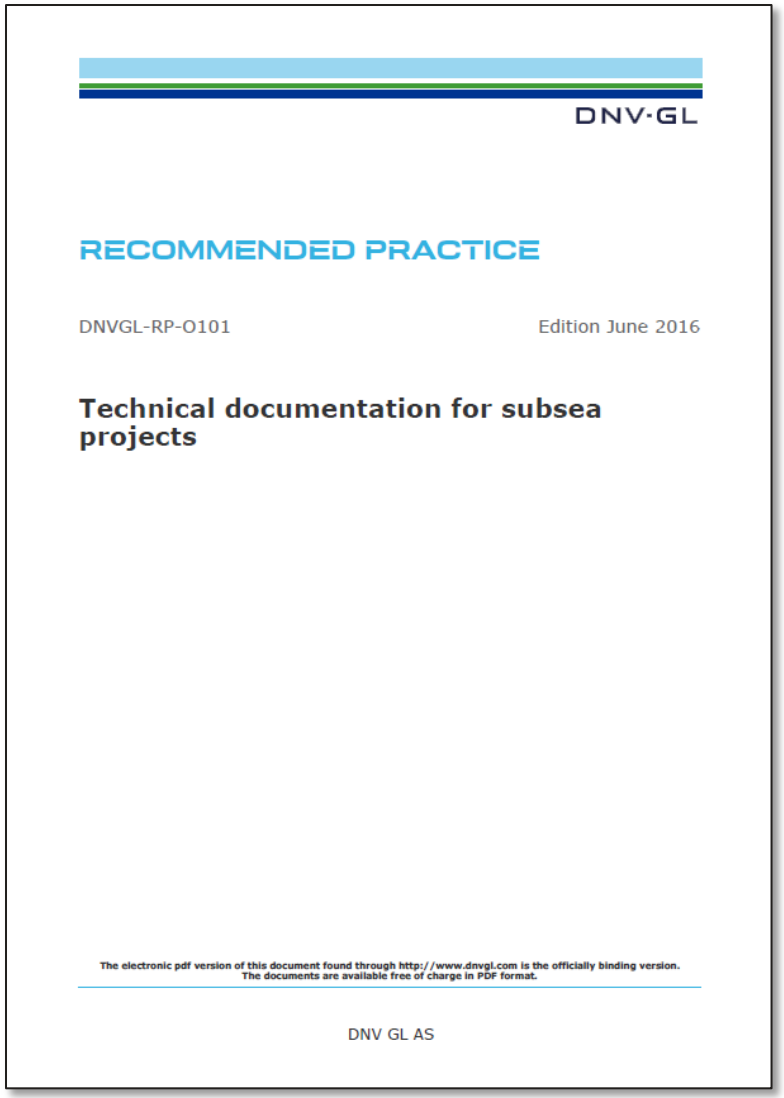
RP - Technical documentation for subsea projects

// Cross-industry project led by DNV GL

// Details a required minimum set of documentation transferred between E&P companies, operators and contractors for the construction, procurement and operation of a field

// A benchmarking exercise by one JIP participant showed that adoption of the RP could deliver a **42% potential reduction in engineering hours**

// Another supplier estimates that the potential **cut in documentation can be as high as 75-80%** through increased use of standardized doc


DNV·GL

RECOMMENDED PRACTICE

DNVGL-RP-O101 Edition June 2016

Technical documentation for subsea projects

The electronic pdf version of this document found through http://www.dnvgl.com is the officially binding version.
The documents are available free of charge in PDF format.

DNV GL AS

Entrepreneurship and Business Development

// Link entrepreneurs to funding, industry and R&D groups.

// Increase focus on service innovation.

Business development programmes:

// **Subsea First Step** – supports start-ups and early phase companies.

// **Subsea Next Step** – helps you develop new product and services.

MIT Regional Entrepreneurship Acceleration Program

I-Capacity
Ability to develop new to the world innovations from inception through to the market.

E-Capacity
Ability to start and build new to the world businesses from inception to maturity.

Strong I-Cap:
Universities, Central R&D,
Network of researchers,
Medical Centers

Strong E-Cap:
Entrepreneurs, Mentors,
Founding Teams
Investors at all stages

MIT REAP
REGIONAL ENTREPRENEURSHIP ACCELERATION PROGRAM

Recent GCE Subsea funded technology pre-projects

// **Condition monitoring and automation:**

- Automation of image processing
- Automation of subsea video analysis and annotation
- Corrosion Erosion Monitoring
- Baseline noise and condition monitoring

// **New markets:**

- Mapping of marine mineral resources
- CO_2 storage monitoring
- Subsea geothermal energy production
- Ocean Thermal Energy Conversion
- Tidal water power with hydrogen storage
- Biomass measurement

// **Flow and multiphase:**

- Multiphase flow imaging by gamma-ray tomography
- Fluid characterisation improving multiphase flow meters
- ROV installable non-intrusive subsea water flowmeter

// Subsea Pumping System

// Subsea De-sander System

// Simulation of marine operations

// Lifting and shackle solutions

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Innovation examples

Innovation Example – Fjell Subsea Products

Simplified Hydraulic Distribution

// Provided input to applications for IFU and Skattefunn funding

// Subsea Next Step programme 2012

// Market entry programme for Brazil 2016

// **Results:**

- Secured investors
- Successful commercialisation
- Collaboration with MFX in Brazil
- Shell as sponsor for development project

- GCE Subsea has provided valuable support in acquiring project funding and developed our business plan for our products.

Kristian Karlsen, Founder of Fjell Subsea Products

Innovation Example – METAS and Partners

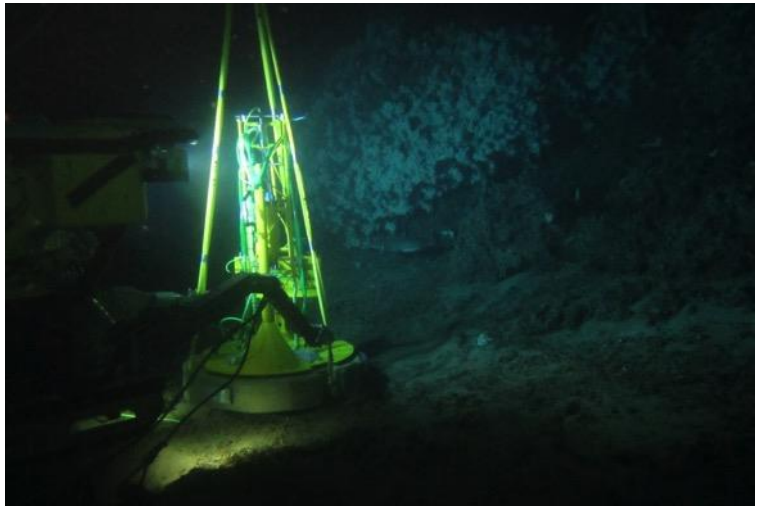
Integrated Environmental Monitoring

// NCE Subsea business development programmes, gap-analysis report, workshops and seminars.

// **Results:**

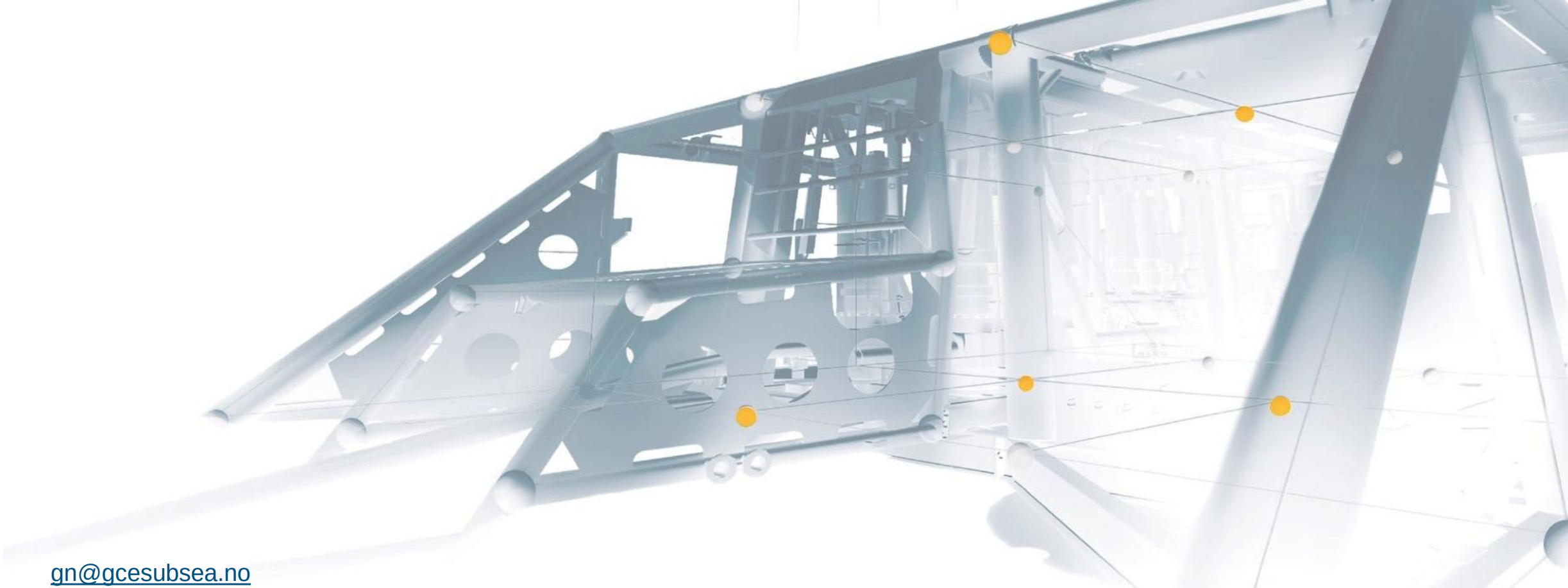
- Morvin drilling licence
- LoVe Ocean Observatory
- DEMO2000

– NCE Subsea has provided valuable business development programmes and important network arenas resulting in international R&D collaboration and business.
Olav Birkeland, CEO METAS



LoVe Node 1 (Source: Statoil / LoVe)

METAS lander installation at the Peregrino field in Brazil



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