



Global Centres of Expertise
GCE Subsea

Norwegian Subsea Sector

- Bringing industry and research together

Jon O. Hellevang, Senior Subsea Innovator

**WORLD-CLASS
SUBSEA
SOLUTIONS**

//// FROM NORWAY



The Cluster Map

PARTNERS

Industry								
R&D								
Higher Education Institutions								
Development Contributors								

MEMBERS

Supported by

		
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Cluster Relations

						
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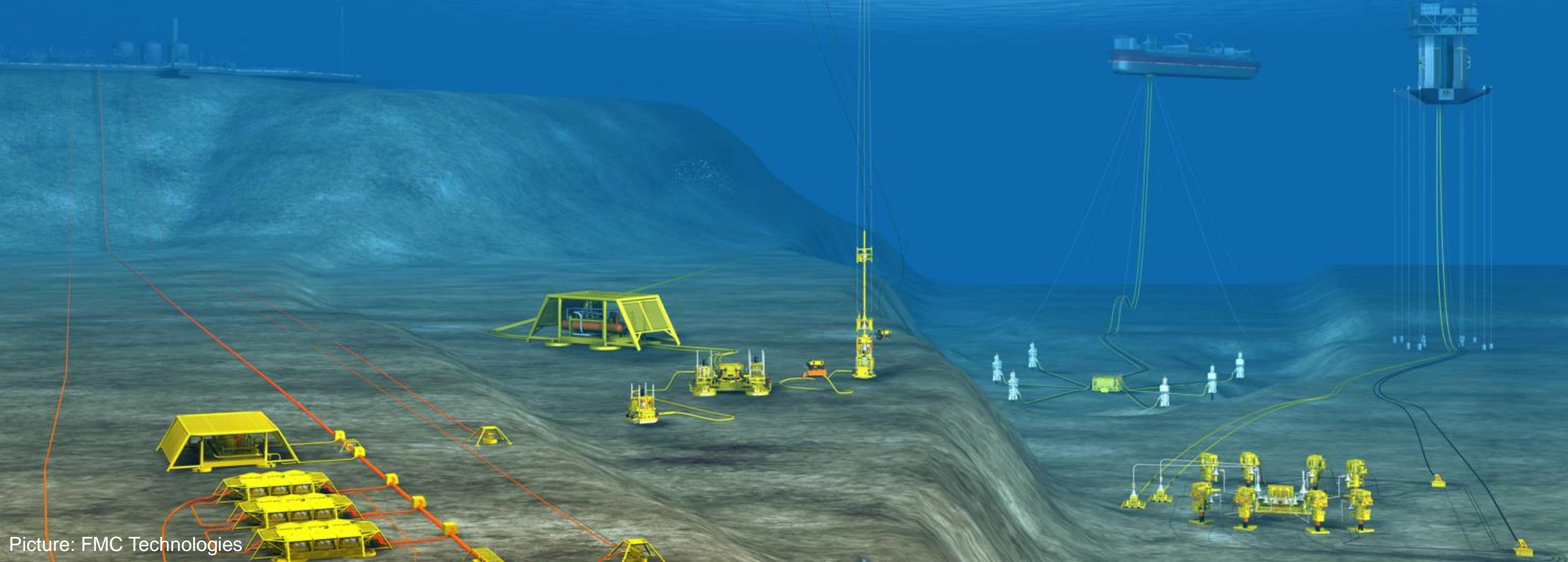
National Relations

															
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International Relations

				
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GCE Subsea strengthens innovation and internationalisation of the Norwegian subsea cluster



Picture: FMC Technologies

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



GCE Subsea - Employees



OWE HAGESÆTHER
CEO



JON O. HELLEVANG
Senior Subsea Innovator



GISLE NONDAL
R&D Manager



GUNNAR BUVIK
Business Development Manager



ANNE-GRETHER SOLBAKK
Head of Finance and Communication



KJERSTI BOGE CHRISTENSEN
Event and Office Manager



Florø:
TROND STRØMGREN
Subsea Innovator

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



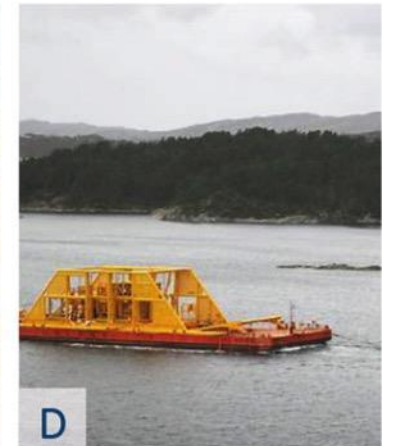
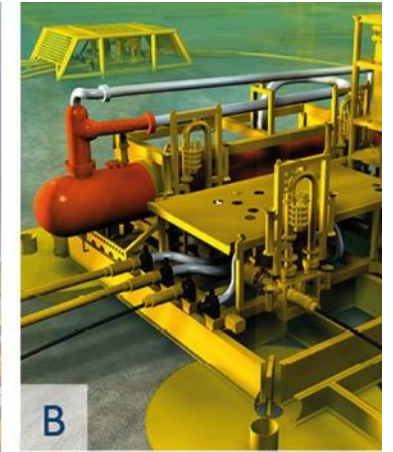
GCE Subsea - A Unique Position

// Norway has:

- the world's most complete cluster for subsea life-of-field solutions
- more than 50 per cent of the global subsea market share
- a strong complementary marine and maritime industry and competence

// The cluster boasts:

- the longest subsea track-record
- the highest hydrocarbon recovery rate
- the best HSE performance



- A. Flow metering and pumping
- B. Separation, injection and boosting
- C. Integrated environmental monitoring
- D. Wet gas compression

Results

Competence:

- // 3 BEng and 2 MEng programmes
- // Subsea Awareness Course
- // Global Subsea University Alliance

Technology:

- // Supported over 60 pre-projects
- // LoVe Ocean Observatory
- // 2 OTC Spotlight on New Technology awards

Business Development:

- // Subsea First/Next Step
- // Subsea Entrepreneur

Market:

- // International stands and study tours
- // Brazil Entry programme
- // Broad international collaboration

www.gcesubsea.no/page/6700/Success_Stories



From NCE to GCE Subsea

// New focus areas:

- **Ocean Innovation:** Subsea solutions and knowledge beyond oil and gas
- **Work Processes:** Strong focus on global competitiveness



// Increased focus on:

- R&D test facilities and infrastructure
- International education, mobility and R&D programmes
- Supporting members in international markets



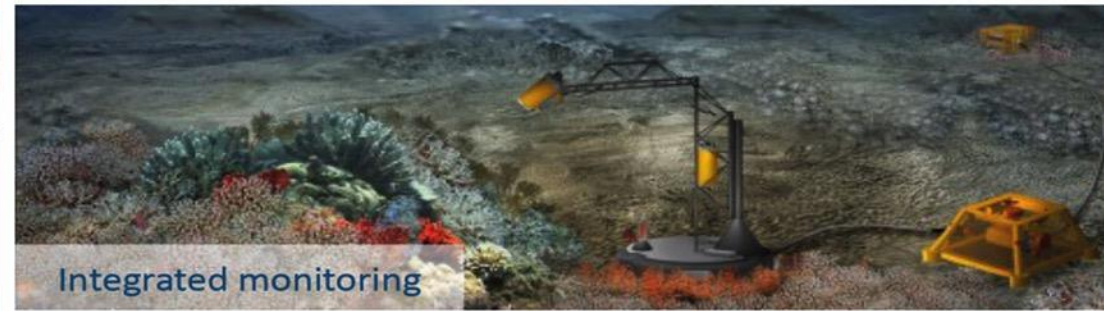
GCE Subsea - Overview



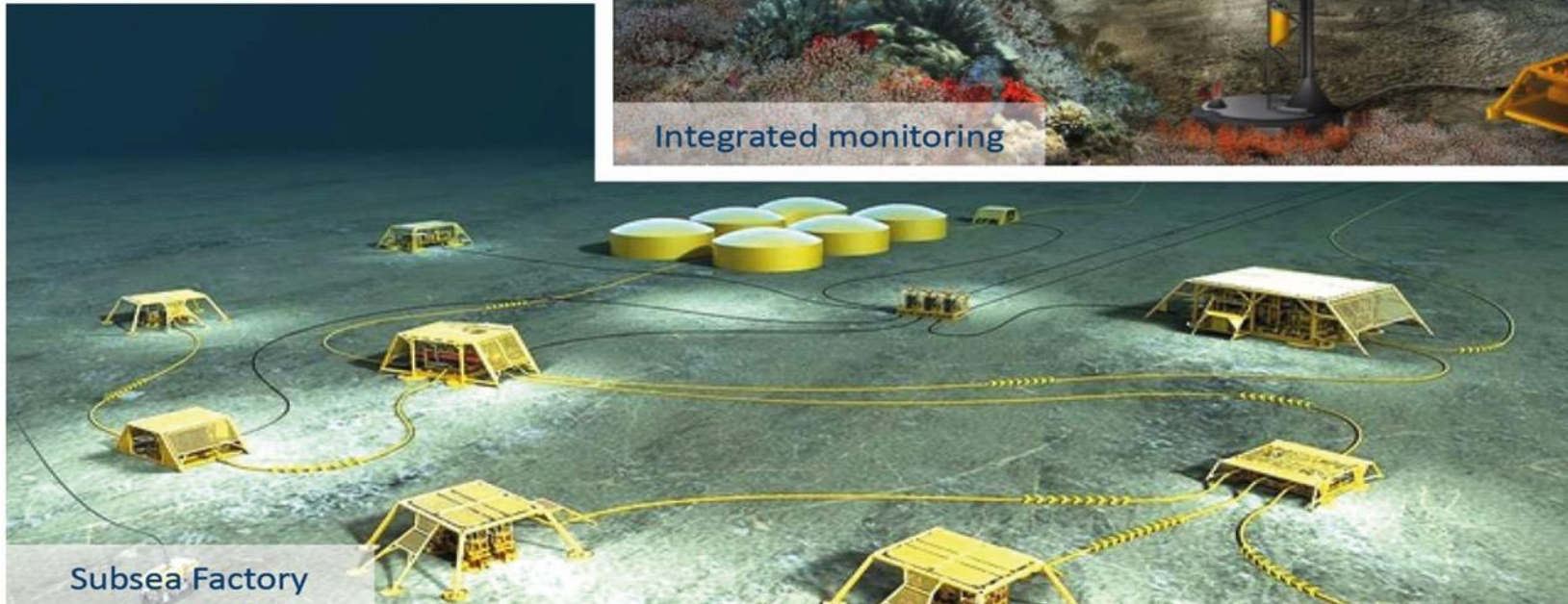
Deep-sea mining



Marine food production



Integrated monitoring



Subsea Factory



Offshore renewable energy

GCE Subsea - Services

- // Increased knowledge and expertise
- // Support for innovation projects
- // Business development programmes
- // Meeting places:
 - exclusive events
 - priority and discount on events
- // International market programme
- // Large international network
- // Promoting and marketing

www.gcesubsea.no/page/5640/Our_Services

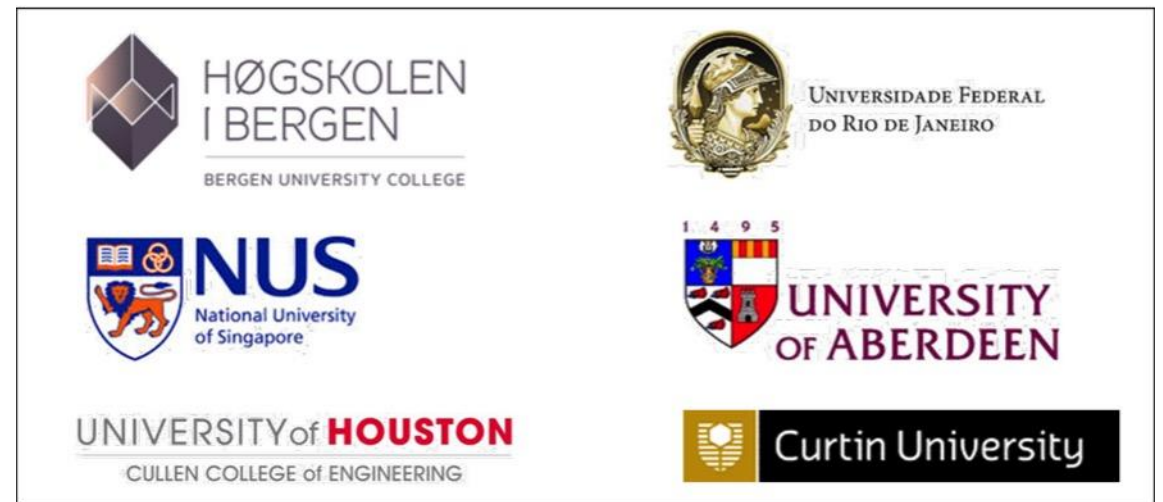


Key Strategic Areas

- I. Competence and Infrastructure
- II. Ocean Innovation
- III. Technology
- IV. Entrepreneurship and Business Development
- V. Market
- VI. Work Processes

Competence and Infrastructure

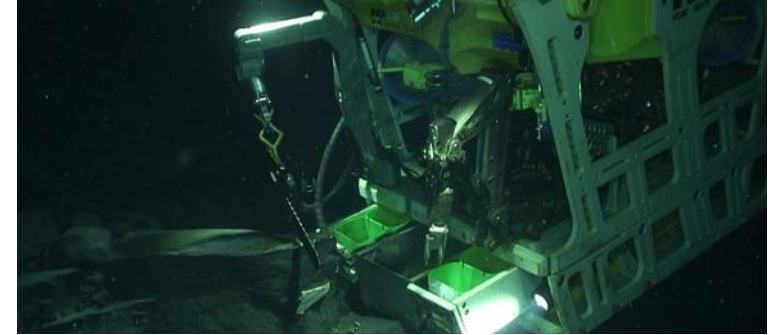
- // Increased focus on joint test facilities and R&D infrastructure
- // Science City Bergen
- // Global Subsea University Alliance: international education programme and RDI projects
www.subsea-alliance.org



Ocean Innovation

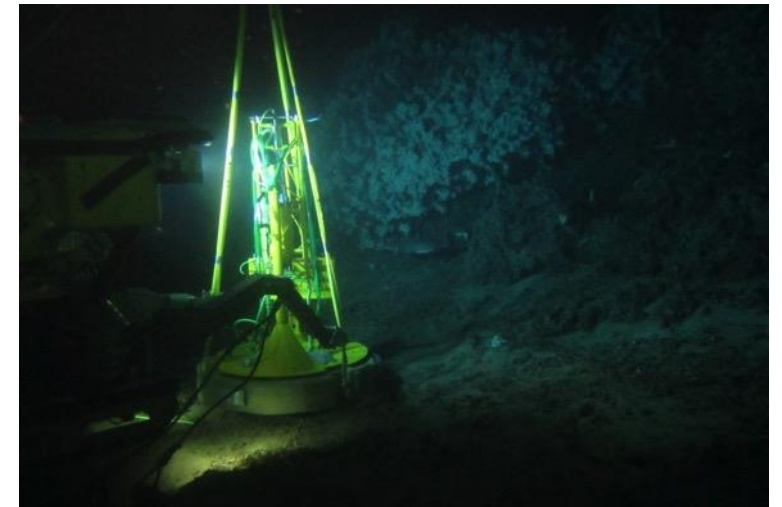
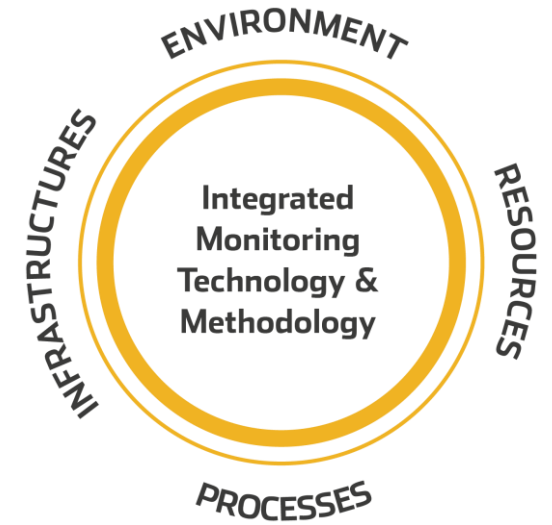
Collaborate with the strong competence in Norwegian marine and maritime clusters to expand into related industries.

- // **Marine food production:** 35 per cent increase in aquaculture from 2013-2022.
- // **Deep-sea mining:** 10 per cent of minerals will come from the seabed in 2030.
- // **Offshore renewable energy:** The EU has targeted a 20 per cent reduction in greenhouse gas emissions and 20 per cent increase in use of renewable energy by 2020.



Technology

- // Strengthen the link between industry and R&D groups.
- // Provide financial and professional support to realise your projects.
- // Focus on establishing international RDI projects.
- // **Key project:** Integrated Monitoring Technology and Methodology



Entrepreneurship and Business Development

- // Link entrepreneurs to funding, industry and R&D groups.
- // Increase focus on service innovation.

Business development programmes:

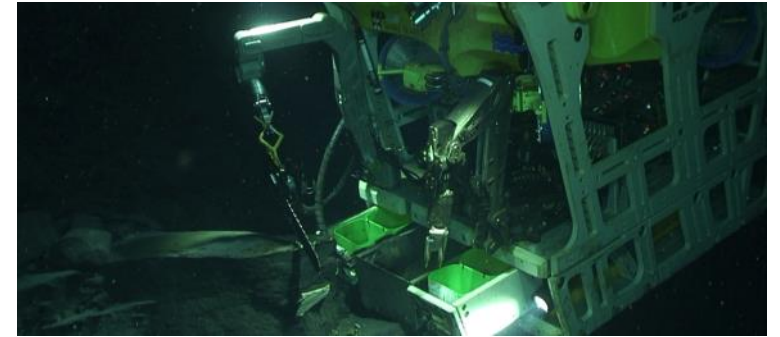
- // [Subsea First Step](#) – supports start-ups and early phase companies.
- // [Subsea Next Step](#) – helps you develop new product and services.



Ocean Innovation

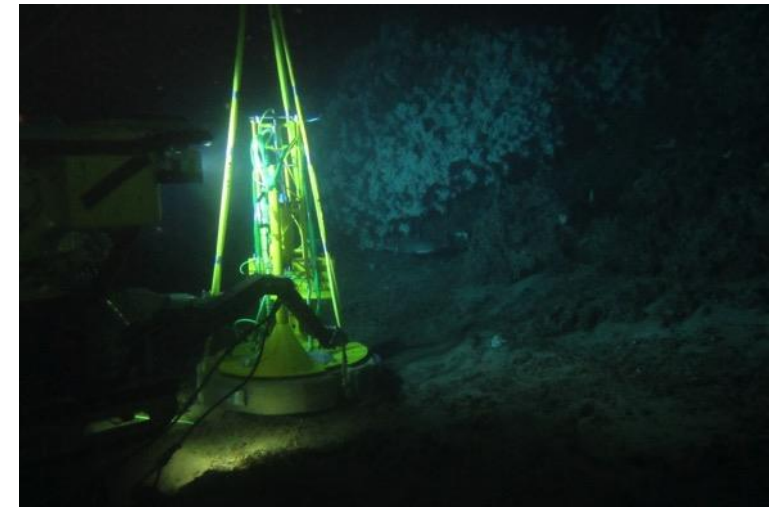
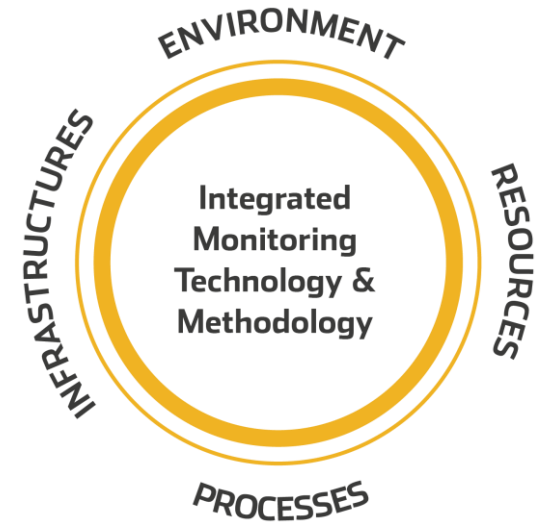
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Market

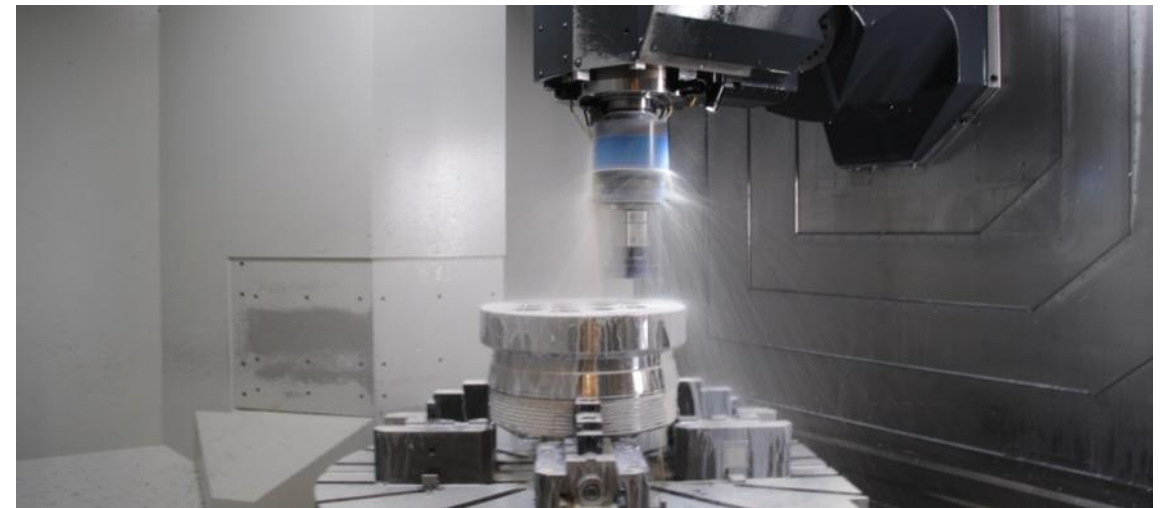
- // A maturing Norwegian sector
- // Growth in the international market
- // Sharing knowledge within the cluster
- // Supporting SMEs collaboration and increase presence in the international market
- // Strengthening the market collaboration with INTSOK, Innovation Norway abroad and Norwegian export oriented clusters



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.



Innovation Example – ClampOn and Partners

Corrosion-Erosion Monitor (CEM)

- // NCE Subsea pre-project funding
- // Technology presented at seminars
- // **Results:**
 - IFU contract with BP and Innovation Norway
 - OTC Spotlight on New Technology Award (2012)
 - Successful commercialisation of product

– NCE Subsea has provided a great arena for contact between ourselves and high-level suppliers of components to the Corrosion-Erosion Monitor (CEM).

Dag Aldal, CEO ClampOn



ClampOn Subsea Corrosion-Erosion Monitor (CEM)



ClampOn with OTC Spotlight on New Technology Award

Innovation Example – METAS and Partners

Integrated Environmental Monitoring

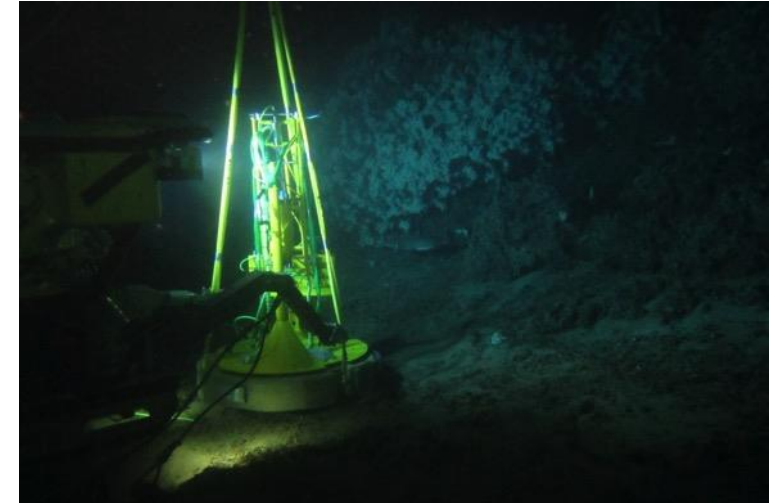
// NCE Subsea business development programmes, gap-analysis report, workshops and seminars.

// **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 (Source: Statoil)

Innovation Example – NLI Odda and Partners

Work Processes and Supply Chain Innovation

// NCE Subsea pre-project funding

// NCE Subsea seminar

// Results:

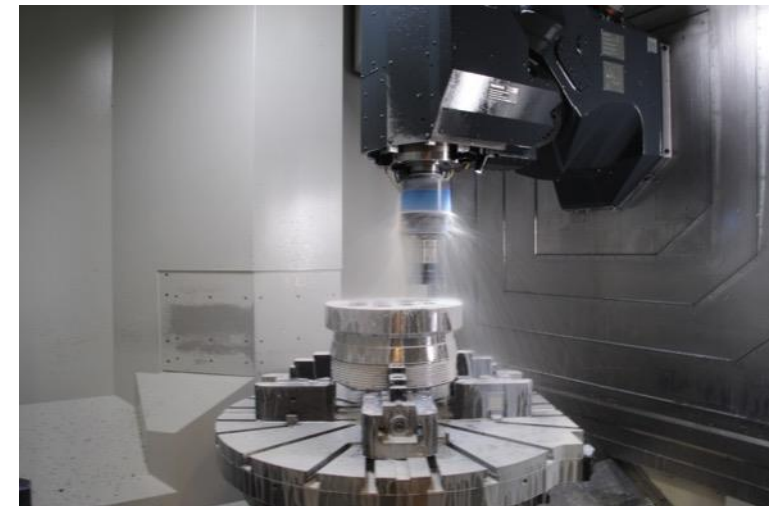
- More efficient work process and supply chain management
- Improved collaboration with suppliers

– NCE Subsea support has helped NLI to develop more efficient collaboration with its partners to enable competitive strength in a global market.

Ingvald Torblå, Managing Director NLI Odda



Assembly at NLI Odda facility



Machining at NLI Odda

Innovation Example – OCTIO and Partners

Permanent Oilfield Monitoring

- // NCE Subsea pre-project funding
- // Industry and R&D partners
- // Workshops and seminar
- // Brazil Entry programme
- // **Results:**
 - Contract with Statoil at Oseberg (2014)
 - DEMO2000
 - Collaboration between complementary companies and R&D institutes

– NCE Subsea has provided valuable support in several of our projects, both with their in-house expertise and by establishing various market and technology focus groups.

Bjarte Fagerås, CEO OCTIO

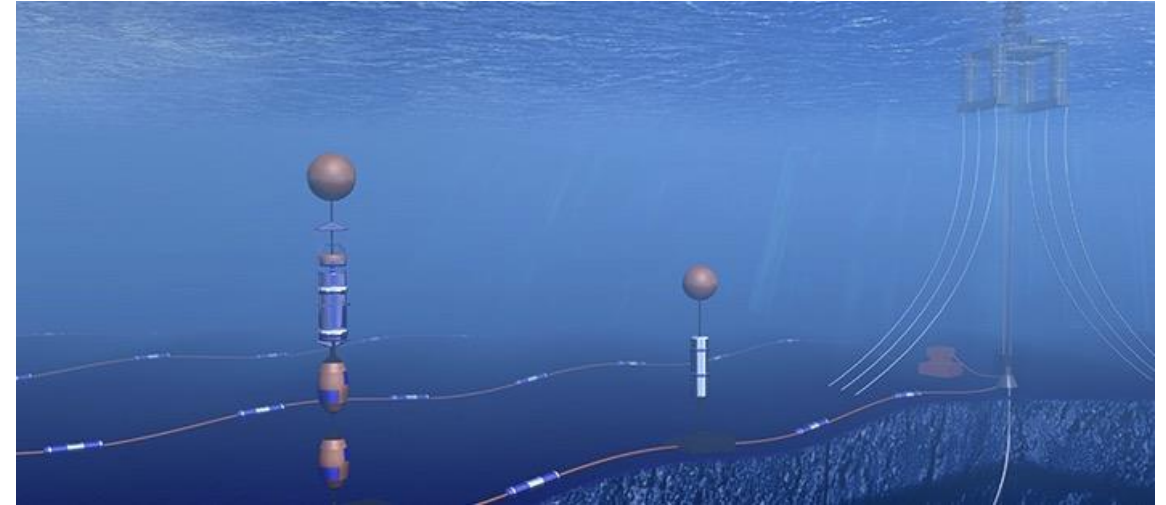


Illustration OCTIO

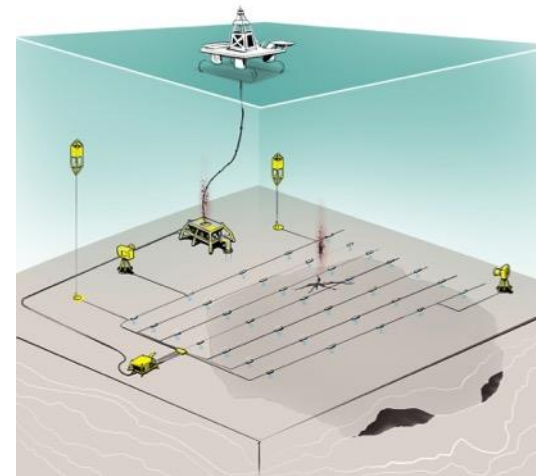
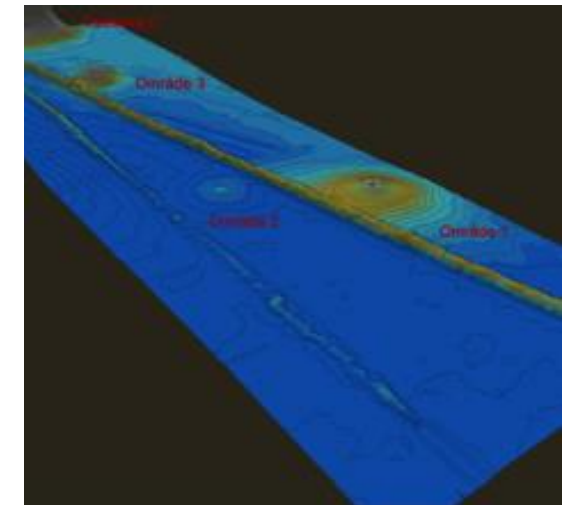


Illustration METAS



Pockmark Oseberg C (Source: Statoil)

Innovation Example – Seaproof Solutions and Partners

Crossover Oil and Gas to Offshore Wind

// Subsea Next Step programme in 2012

// **Results:**

- 90 million Norwegian kroner in revenue within offshore wind in 2015. This is about twice the company's total revenue in 2012.

– Participation in the Subsea Next Step programme was very useful to expand our business of bend-stiffener products towards the offshore wind market.

Henrik Bang-Andreasen, CEO Seaproof Solutions



Offshore wind cable installation



Innovation Example – Wisub and Partners

Pinless Subsea Wet-mate Connector

- // NCE Subsea supported applications
- // Subsea First Step programme

// Results:

- International sales and secured investors
- Collaboration with companies and R&D institutes in Norway and abroad
- OTC Spotlight on New Technology Award (2015)

– NCE Subsea support has helped enable WiSub to court top Norwegian and international partners and secure funding for innovation projects.

Mark Bokenfohr, CEO and co-founder of WiSub



Mark Bokenfohr with pinless subsea wet-mate connector



OTC 2015 Spotlight on New Technology Award

Pre-Project Funding and Support

- // GCE Subsea offers financial and professional support to realise your project idea.
- // We have supported 10-15 technical pre-projects every year since 2008.
- // **Contact us at an early stage** to find out how we can support your project.
- // For more information:
www.gcesubsea.no/page/5662/Project_Funding



WORLD-CLASS SUBSEA SOLUTIONS


//// FROM NORWAY



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 www.subseaoutlook.com