Re-use & Decommissioning in The Netherlands: A Joint Effort

20 September 2017
Content

• Introduction EBN & NOGEPa
• Netherlands re-use & decommissioning landscape
• Netherlands Masterplan for Decommissioning & Re-use
• Joint industry project
• Summary
EBN: Dutch State participant

- Industry partner & co-investor in E&P of natural gas and oil
- Non-operating partner (40-50%) for oil & gas companies
- Shares held by the Dutch State
- 2015 results:
  - 21 bln Nm³ (incl. Groningen)
  - 2.6 mln bbl
  - €2.1 bln State revenues
• Represents the interests of the companies licensed to explore for and produce oil and gas in the Netherlands

• Vision: Contribute to an open and transparent energy transition towards a fully sustainable energy supply in 2050

• Current projects: Code of Conduct, Decommissioning, NOx, NOGEPA Standards, Onsaardgas.nl, North Sea Integration
EBN interest in re-use & decommissioning

The Netherlands Ministry of Economic Affairs have requested EBN to take the lead in organising the Dutch decommissioning challenge:

• EBN is 40% owner of the Dutch oil & gas production infrastructure
  ◦ Wells
  ◦ Facilities
  ◦ Pipelines

• Tax payers pay 73% of the total cost of decommissioning

€ 7 Bn = cost estimate of decommissioning in the Netherlands offshore: € 5 Bn, onshore: € 2 Bn
The Netherlands offshore O&G infrastructure

- Shallow water depths:
  - < 50 meters
- Similar platform types:
  - 151 steel jackets and monopiles
  - 2 steel gravity bases
  - 2 concrete gravity bases
- Well depth:
  - 2000–4000 meters
- Pipelines:
  - buried
Netherlands decommissioning regulations

Described in the Dutch Mining Act, Decree & Regulations

• Mining installations are to be removed after use, including materials near location
  - Timing of removal may be set by Ministry of Economic Affairs
  - Removal of offshore installation parts to 6 m below seabed
  - Onshore disposal (NORM, asbestos)
  - Site restoration

• Pipelines can be left in place - (possibly) in future to be removed after use
  - Cleaning, protecting & regular surveying required

• Wells are to be permanently abandoned
  - Kill fluid (corrosion inhibited)
  - Sealing to be absolute & sustainable (cement or equivalent alternative)
  - Casing to be removed 3 m below ground level or 6 m below seabed
Staying in control of our costs

1. Based on reservation of ~€3 mln per well based on 27 wells decommissioned to date – as at January 2017
Source: Operator and EBN estimates total Netherlands (onshore + offshore)
## North Sea Offshore O&G infrastructure

<table>
<thead>
<tr>
<th></th>
<th>UK</th>
<th>N</th>
<th>NL</th>
<th>DK</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wells</td>
<td>4,000</td>
<td>2,400</td>
<td>700</td>
<td>500</td>
<td>7,600</td>
</tr>
<tr>
<td>Platforms</td>
<td>323</td>
<td>199</td>
<td>156</td>
<td>62</td>
<td>740</td>
</tr>
<tr>
<td>Subsea</td>
<td>370</td>
<td>350</td>
<td>25</td>
<td>5</td>
<td>750</td>
</tr>
<tr>
<td>Pipelines (km)</td>
<td>&gt;20,000</td>
<td>&gt;10,000</td>
<td>1,800</td>
<td>&gt;35,000</td>
<td></td>
</tr>
<tr>
<td>Total future decom costs (€Bn)</td>
<td>1.2</td>
<td>1.3</td>
<td>0.1</td>
<td>0</td>
<td>2.6</td>
</tr>
<tr>
<td>Decom expenditures 2015 (€Bn)</td>
<td>67</td>
<td>25</td>
<td>5</td>
<td>5.5</td>
<td>86</td>
</tr>
</tbody>
</table>

Source: WEC NL 2017
Our energy transition will change the North Sea

- Rotterdam planning for Offshore Center Maasvlakte 2
- Accommodating offshore wind and O&G decommissioning industry
Objective:
• Reduce near future CO2 and other emissions on platforms

What is needed:
• Connectors between windparks and platforms
• Brown field modifications on platforms
• Working ETS
• Regulatory framework
Nature as it once was

Olsen, O.T. (1883), The piscatorial atlas of the North Sea, English and St. George’s Channels
Return to nature

• Should we dismantle the platforms or investigate ways of continue using the lower part i.e. the steel jackets to preserve and restore the North Sea’s marine habitat?

Platforms naturally!

• Platforms Naturally is a temporary (15 years) research and demonstration pilot project with which we aim to discover if, and how, jackets can contribute to improving nature.
CCS: Back on the radar

CCS Ambition of the port of Rotterdam
Storage in the North Sea gas fields | Pernis-Maasvlakte Pipeline | Capture on location at companies

What's the plan?
- Spring 2017: Formation of 'Coalition of the Willing'
- Autumn 2017: FID. Pipeline + 1st storage field = 1st source
- 2018: Start of realization
- 2019: Start of storage in 1st field (Q14: 3 megatonnes)
- 2020: Start of storage in 2nd field (Q15: 40 megatonnes)
- > 2020: Roll out in other North Sea fields & Re-use of CO2 (CCUS)

North Sea storage potential: +1,000 megatonnes of CO2

OCAP network ~450 kilotonnes CO2/year

Source: Port of Rotterdam
Many 2030-2050 visions on CCS
Urgency: COP approaching rapidly

Source: Operator data and EBN Infrasim, Netherlands offshore gas installations only
Objective: to provide clarity what needs to be done (by whom) to jointly and successfully re-use and decommission the Dutch E&P infrastructure:

- Safe
- Sustainable
- Cost effective
- Within regulations

Continually striving for zero safety incidents and minimum environmental impact

Developing NL capabilities will have positive impact on the international Decom market
NL Masterplan Roadmaps
developed in Sep-Oct 2016

1. Quantification of work scope
2. Industry collaboration
3. Formation of a National Platform
4. Stakeholder mapping
5. International experiences
6. Shared learnings
7. Regulation
8. Standardisation
9. Innovation
10. Transparent communication
11. Implementation plan

https://www.ebn.nl/publicatie/masterplan-decommissioning-and-re-use/
JIP H1 2017 focussed on developing initial priorities and lay the groundwork for execution levers

**Initial priorities**
- Establish a National Platform
- Establish a National Decommissioning Database
- Promote effective and efficient regulation
- Establish mechanisms to share learnings

**Mid-term objectives**
- Foster effective collaboration
- Support Quality, Cost-effective Standardisation
- Stimulate innovative decommissioning
- Build on International experiences

**Execution levers**
- Identify key stakeholders
- Launch a Tailored Communications Plan
Priority deliverable H1 2017

• The National Platform (and website) design established. The National Platform will drive the agenda of the Masterplan forward:
  - New effective and efficient regulation
  - Cost effective standardization and innovation
  - Execution of pilot projects
  - Re-use and re-purposing
  - Joint decommissioning campaigns

• National Platform:
  - NOGEPA members + EBN + MEA as observer (+ in due time affiliate members)
Our JIP has delivered tangible results

**National Platform**
- Design and governance captured in the National Platform guide
- Platform name selected

**Database**
- 6 objectives defined
- Outline report drafted with 24 specific analysis/charts
- v1.0 data collection ongoing

**Regulatory**
- Identified and developed roadmaps for 4 key topics
- Initial engagements with key stakeholders (e.g. SodM) ongoing

**Shared Learnings**
- Knowledge Management System and Who-is-who register built
- First workshop Wells P&A organized (20/6)

**Stakeholder engagement**
- Initial stakeholder overview and approach in place
- Public website ready for review (incl. logo and housestyle)
### Goals and objectives of the national platform cover outcomes and the platform's role

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Role of platform</th>
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</table>
| • Continue to strive for **zero safety incidents and minimal environmental impact**  
• Reduce the **costs for the general public and the industry** of like-for-like decommissioning projects by 30% |  
1. Act as the **public face of decommissioning**  
2. Create **demand transparency** to support the development of a **competitive service industry**  
3. Collect, compile and analyze info to enable **benchmarking**  
4. Develop a **dedicated innovation agenda**  
5. Propose amendments to existing **regulations** |  
6. Stimulate **collaboration** amongst key stakeholders  
7. Identify and share opportunities to **re-use and/or re-purpose**  
8. Collect, develop and **share lessons learned**  
9. Engage with relevant **(inter)national bodies**  
10. Support and promote efforts to **standardize**  

Annual NL Re-use & Decom Report: provides comprehensive picture of anticipated activity for all stakeholders

• Report will provide comprehensive picture of anticipated activity, thereby:
  ▪ Providing operators with valuable insights to assist in decom planning
  ▪ Pointing the supply chain to where demand for services is likely to lie

• Report will be made public and will contain anonymized data only

• Report will be published on an annual basis

• Main findings and conclusions in report may be presented at conferences and industry events

• Report will show similarities with Decommissioning Insight report that is published by Oil & Gas UK, but will include more:
  - Actuals of Decom activity and expenditure
  - Historically and currently installed base
# National Platform launch

**10 October 2017**

## Committees based on an objective

<table>
<thead>
<tr>
<th>Roadmaps</th>
<th>Committees</th>
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<tbody>
<tr>
<td>Regulation</td>
<td>1) Regulatory committee</td>
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<tr>
<td>Re-use/-purpose</td>
<td>2) Re-use and re-purpose committee</td>
</tr>
<tr>
<td>Database/Benchmark</td>
<td>Quarterly meeting of operator community in charge of providing data</td>
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## Committees based on expertise

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<thead>
<tr>
<th></th>
<th>3) Wells committee</th>
<th>4) Facilities committee</th>
<th>5) Pipelines committee</th>
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<tbody>
<tr>
<td>Innovation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Collaboration</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Shared learning</td>
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<td></td>
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<tr>
<td>Standardization</td>
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</table>

## Platform staff only

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<tbody>
<tr>
<td>Public face</td>
<td></td>
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<tr>
<td>International bodies</td>
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<tr>
<td>General/ Admin</td>
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Dear Madam, Sir,

In the coming decades many of the oil and gas fields will reach the end of their economic life. This offers opportunities for the energy transition, as infrastructure may be re-used for renewable energy. Where this is not possible, the industry will dismantle the facilities. In order to assess this challenge and to investigate the opportunities for re-use, EBN and NOGEP A, together with the Ministry of Economic Affairs, have joined forces in setting-up the National Platform for Re-use & Decommissioning.

The Offshore Energy Exhibition & Conference 2017 offers the perfect opportunity to officially launch this platform.

**YOU ARE INVITED** to take part in the launching event and to join us as we take the next steps to grasp the opportunities.

**REGISTRATION [https://registration.offshore-energy.biz/](https://registration.offshore-energy.biz/)**

*To register for this launching ceremony, follow the OSEO registration procedure using invitation code wks.*

At 3 (conference tickets), please select the above-mentioned.

**DATE:** Tuesday 10 October 2017

**Time:** 16:30 – 17:30 hrs followed by drinks & snacks

**Location:** Amstelum, Rai Amsterdam, Europaplein 2-22, 1078 EZ Amsterdam

We look forward to welcoming you there!

Cordially,

Jo Peters Secretary General

Jan-Willem van Hoogstraten CEO
Collaboration is key
Summary

• Oct 2016:
  NL Masterplan for Decommissioning & Re-use developed
• H1 2017:
  Operators and EBN executed the Masterplan (JIP)
    ◦ priority topics + execution levers
    ◦ Design National Platform (and website) as main deliverable
• H2 2017:
  ◦ Lay-out & launch of the National Platform (JIP)
  ◦ add 4 mid term topics + re-use/re-purpose
• 2018:
  ◦ Execution of Masterplan through National Platform
  ◦ International alignment on re-use & decommissioning
Thank you!

https://www.ebn.nl/publicatie/masterplan-decommissioning-and-re-use/
EBN estimate of current NL Decom planning

Source: Focus on Energy 2017, EBN
The National Platform will deliver added value in 6 areas by directly addressing pain points

<table>
<thead>
<tr>
<th>Six areas...</th>
<th>...where the platform will add value...</th>
<th>... by addressing specific pain points</th>
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<tbody>
<tr>
<td><strong>Demand Transparency</strong></td>
<td>• Maintains a database complimented with publications on decommissioning progress, forecasts and timing which will improve our ability to plan and invest</td>
<td>• Re-use and decom demand is not transparent, limiting the supply chain's ability to invest in assets and capabilities</td>
</tr>
<tr>
<td><strong>Regulation</strong></td>
<td>• Creates a forum for informed dialogue to shape effective, efficient regulation • Helps to clarify existing legislation and helps to draft guidelines</td>
<td>• Dutch regulation can be open to interpretation, inconsistently applied, or doesn't always appropriately balance cost with risk</td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>• Accelerates operational and cost improvements through performance benchmarking, standardization and sharing learnings</td>
<td>• Historic projects have had large cost overruns on top of an already undesirably high cost level, especially Well P&amp;A</td>
</tr>
<tr>
<td><strong>Innovation</strong></td>
<td>• Coordinates and drives an innovation agenda dedicated to distinctive Dutch issues</td>
<td>• There are few innovation programmes specifically targeting the Netherlands' distinctive re-use and decom challenges</td>
</tr>
<tr>
<td><strong>Public Support</strong></td>
<td>• Acts as the public face of decom, proactively engaging stakeholders • Engage with relevant international bodies to further cooperation</td>
<td>• The sensitivity of the public and some NGOs towards re-use and decom threatens our license to operate efficiently</td>
</tr>
<tr>
<td><strong>Collaboration</strong></td>
<td>• A single forum will stimulate collaboration and enable campaign planning • Identify and optimize opportunities to re-use or re-purpose infrastructure • Explore the potential benefits of a dedicated decommissioning company</td>
<td>• Project approach (vs. campaign based) creates expensive, inflexible schedules and limits learning</td>
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