

strategy workstream

MER UK task forces and operator technology manager meetings

July 10th and 12th 2018



TLB strategy - work in progress

November, December 2017

- Initial working group discussions
- Initial engagement with sector deal team
- Report out to TLB

January, February 2018

- Engaged MER UK – Exploration, Asset Stewardship, Efficiency, Decommissioning, Supply Chain
- Second engagement with sector deal team
- Report out to TLB

March, April

- Engaged UKRI, BEIS, NERC, EPSRC, DIT, RSC
- Engaged OGIC, ITF, NSRI, Strathclyde
- Working group workshops
- OGA Technology Insights report published
- Report out to MER UK board
- Input to Industrial Strategy Challenge Fund 3.0

May

- MER UK task force workshop 1
- May 23rd TLB

June, July

- **MER UK task force workshop 2 – this week**
- **UK operator technology manager community of practice meeting – this week**
- **Report back to MER UK steering team – 17th July**



TLB technology leadership role

TLB role

- provides well documented guidance on oil and gas innovation priorities
- maintains relationships with and provides relevant information to industry
- strengthens the relationship with relevant technology cluster organizations
- plays an "expert role" on petroleum technology in the public domain

monitoring implementation – ensuring that the strategy:

- continues to be the basis for public investments in petroleum R&D
- is well known by decision makers in operators, suppliers, research institutes and academia
- influences technology & business investments of operators, suppliers, research institutes and academia
- has impact at scale on the UK Continental Shelf

analogous to Norway's OG21, with more tracking and visible influence



Attributes of an effective challenge statement

- inspirational
- bold
- open to innovation and collaboration from other sectors
- specific
- measurable impact (e.g. safety, cost, production, investment, reserves)
- time bound (e.g. fix today, maximise recovery, transform the future)
- linked to broader strategies (e.g. MER UK, Industrial Strategy)
- potential to link with other industries (e.g. renewables)
- opportunity for cross-border partnership (e.g. Norway, Netherlands)
- grasped, remembered and restated by diverse stakeholders including those outside our industry
- provides framework for existing UK strengths and activities

need to communicate clearly across the industry – and also to those beyond the industry



UK technology strategy – MER 2018 priorities

Exploration

1. Attracting investment
2. Delivering future Activity
3. Licensing rounds
4. Geophysical technologies

Asset Stewardship

1. Production efficiency
2. Resource-reserves progression
3. Integrity and asset stewardship

Efficiency

1. Business process simplification
2. Standardisation and simplification
3. Co-operation, culture and behaviours ([Efficiency Hub](#))

Technology

1. Strategy
2. Communication
3. Monitoring

Decommissioning

1. Modelling for cost reduction opportunities
2. Regulation in practice
3. Communication
4. Establish KPIs

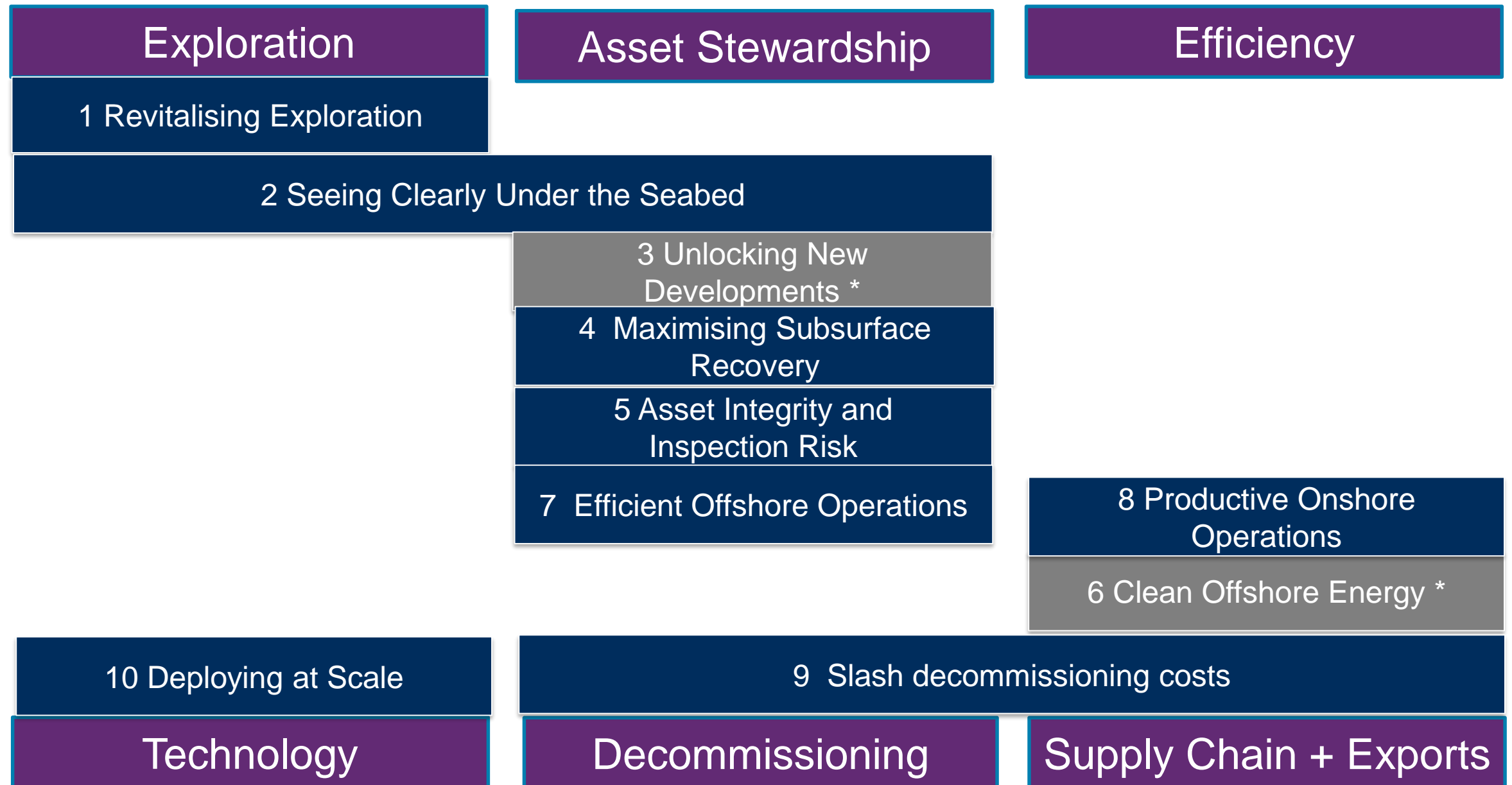
Supply Chain + Exports

1. Sector deal

<https://www.ogauthority.co.uk/news-publications/publications/2018/mer-uk-annual-update-2017>



UK technology strategy grand challenges within MER



* some technology challenges not covered explicitly by MER task forces



MER task force workshop insights, May 9th 2018

- New developments and clean energy do not yet explicitly sit with an MER task force
- Very low reserves replacement is a significant threat to the sustainability of the basin
- Leadership is key – along with domain (functional) expertise and technology (e.g. IT)
- Not all MER task forces yet have clear or validated technology challenges
- MER task force roles and overlaps can be clarified e.g. Efficiency and Supply Chain
- TLB might increase the ‘boldness’ of the challenges to generate commitment to action
- Technology expectations (e.g. for MDs) could be set in Asset Stewardship expectations
- Always the opportunity to learn more from other industries e.g. farming and forestry



MER task force workshop insights, July 10th 2018

- The TLB strategy framework is proving to be resilient and useful
 - Incremental suggestions for improvement emerge at each engagement
 - Planning to communicate TLB strategy at ENGenious event in September
 - TLB also aims to identify best practices for broad implementation
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- MER UK task forces should give credible incremental metrics for impact of technology priorities
 - Exploration Task Force challenges are clearly defined, now need incremental impact metrics
 - Asset Stewardship (Integrity) and Decommissioning have mature, active technology challenges
 - Asset Stewardship (Production Efficiency) is the home for Efficient Offshore Operations challenge
 - Asset Stewardship (Recovery) technology challenges will impact recovery and reserves replacement
 - Efficient Offshore Operations challenge can also impact Decommissioning
 - Supply Chain Task Force can help with how to communicate strategy to those beyond the industry



MER task force engagement and communication

- MER UK task forces are in the process of defining challenges and reverting to TLB
 - 18th May
 - 23rd May
 - 29th June
 - 30th May
 - 1st June
 - 18th June
 - 17th July
 - 12th September
 - 19th September
 - 19th September
 - 30th October
 - Efficiency
 - TLB
 - Supply Chain
 - Asset Stewardship
 - Decommissioning
 - Exploration
 - MER UK Forum Steering Group
- Starting to plan to communicate the strategy publicly
 - **ENGenious 4th -6th September, Aberdeen**



TLB challenge 1 – revitalising exploration

Use digital technology to unlock 50 years of knowledge and existing data to revitalize exploration activity to deliver new discoveries while infrastructure and knowledge are available

Measures

- Portfolio measures – risk, resources
- Cycle time for evaluation
- Wells drilled, success rate
- Discoveries, volumes

MER task force

- Exploration

Existing UK strengths

- National data repository
- OGTC Digital solution centre

UK Industrial Strategy

- Artificial Intelligence (interpretation)

Cross-border synergies

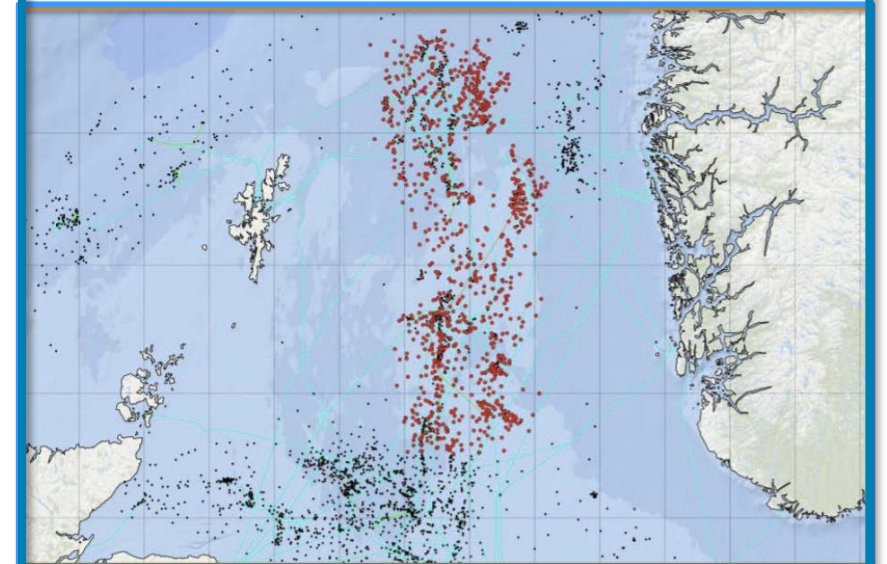
- Norway – UK Northern North Sea missed pay study

MER Exploration priorities

Short term

1 Produce a standard, open-source tool/code to automate the identification of potential DHIs in diverse seismic datasets, using well calibration.

2 Use AI workflows to cleanse all structured and unstructured well data in the National Data Repository to deliver a standardised dataset to industry.





TLB challenge 2 – seeing clearly under the seabed

See with extreme clarity under the seabed at lower cost to identify new resource targets in real time

Measures

- Wells drilled
- Discoveries
- Production
- Cost
- Seismic processing time

MER task force

- Exploration
- Asset Stewardship

Existing UK strengths

- Application of broadband and Ocean Bottom Node technology
- Downhole fibre optic trials

UK Industrial Strategy

- Artificial Intelligence and Robotics (data acquisition and processing)

Cross-border synergies

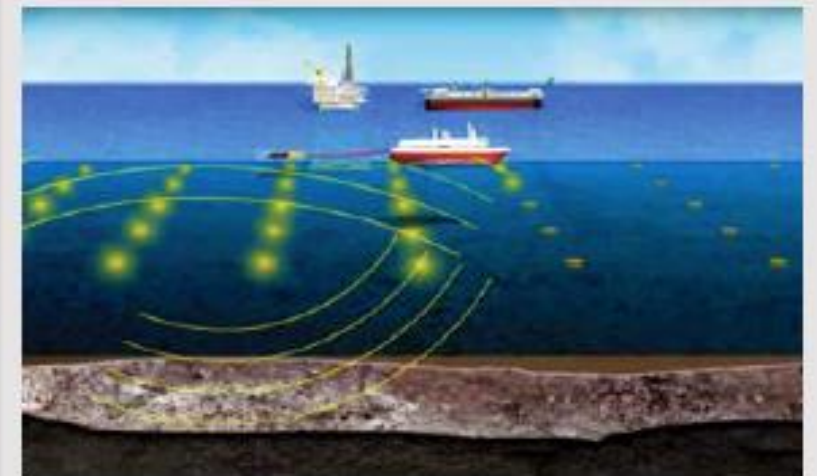
- Global lessons learned from other basins e.g. sub-salt

MER Exploration priorities

Medium term

1 Dramatically reduce seismic processing timelines from months down to days for a 3D survey including FWI production.

2 Drive down cost of Full-Azimuth/High-Density ocean-bottom seismic acquisition to the same or less than an equivalent streamer survey.



Picture courtesy of Chevron Corporation



TLB challenge 3 – unlocking new developments

Attract significant capital investment to develop new reserves in key asset classes through technology transformation of subsurface, facilities and operations design

Measures

- Capital Investment
- Reserves Replacement
- Approved Developments

MER task force

- Not currently a focus of an MER task force

Existing UK strengths

- Existing offshore , unmanned and remote operations
- OGTC Small Pools solution centre

UK Industrial Strategy

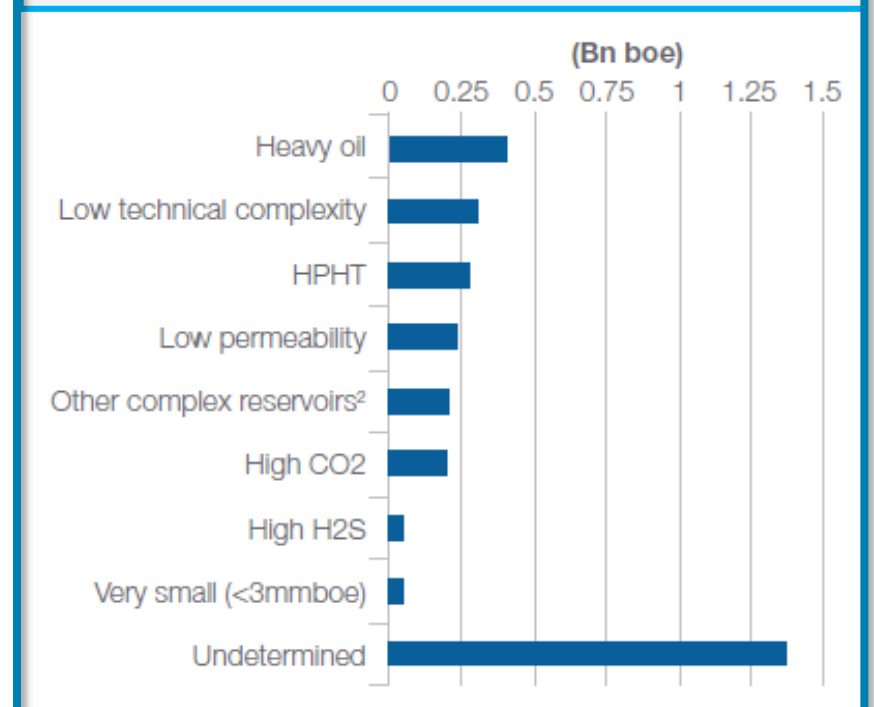
Cross-border synergies

- Norway – subsea power, tie-backs, compression, separation

Resource target priorities

To be developed, addressing:

- Small pools, tight sands
- Heavy oil, HPHT
- Unmanned facilities
- Long-distance tiebacks



'undetermined' means 'unappraised'



TLB challenge 4 – maximising subsurface recovery

Approach the technical limit on reservoir recovery factor through innovation in waterflood surveillance, tight gas stimulation and enhanced oil recovery

Measures

- Reserves Replacement – to 100%
- R/P ratio – from bottom to top quartile
- Recovery Factor – from 42% to >50%
- Capital Investment -
- Approved Developments -

MER task force

- Asset Stewardship

Existing UK strengths

- Broad application of 4D seismic, downhole fibre pilots
- Low salinity, chemical EOR projects

UK Industrial Strategy

- Artificial intelligence for data analysis

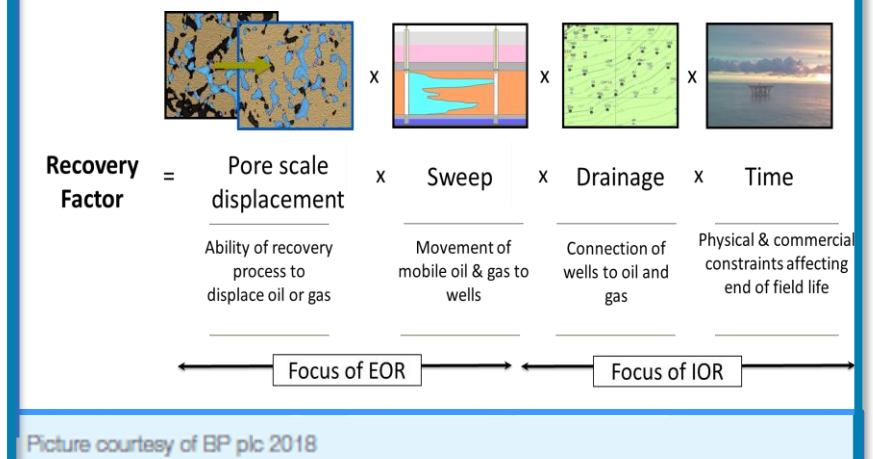
Cross-border synergies

- Netherlands – tight gas

MER Asset Stewardship priorities

To be developed, addressing:

- Displacement – low salinity, surfactant
- Sweep – polymer, stimulation
- Drainage – surveillance





TLB challenge 5 – asset integrity and inspection risk

Transform inspection technology to eliminate loss of containment, and reduce manned inspection by robotic, augmented and autonomous technology

Measures

- No fatalities and serious injuries
- No significant loss of containment
- Cost and speed
- Repeatability and consistency

MER task force

- Asset Stewardship

Existing UK strengths

- OGTC Asset integrity solution centre
- Robotic inspection R&D

UK Industrial Strategy

- AI and robotics

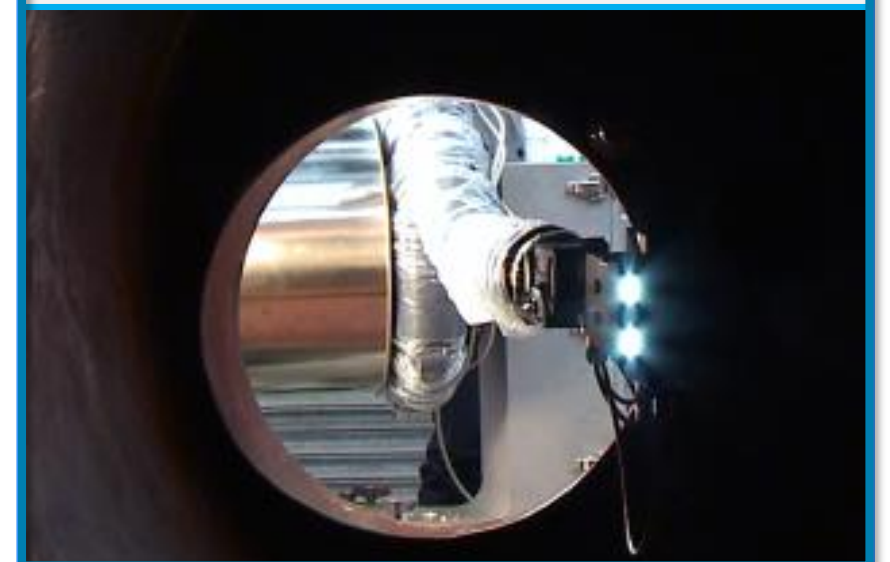
Cross-border synergies

- European Union robotics programmes

MER Asset Stewardship priorities

To be developed, addressing:

- Non-Intrusive Inspection
- Permanent monitoring
- Data integration & visualization
- Deployment of proven technologies





TLB challenge 6 – clean offshore energy

Eliminate atmospheric emissions and increase energy efficiency in existing and new fields by developing and applying transformational technology

Measures

- CO2 and CH4 emissions – to 0
- Energy Efficiency

MER task force

- Efficiency

Existing UK strengths

- Carbon Capture and Sequestration R&D
- UK is the largest offshore wind power generator

UK Industrial Strategy

- Clean Energy

Cross-border synergies

- European Union Acorn project
- Oil and Gas Climate Initiative (OGCI)
- Norway OG21 priority on eliminating offshore emissions

Clean Energy Priorities

To be developed, addressing:

Short to medium-term

- Electrification
- Renewable power
- Downhole power generation



Picture courtesy of EC-OG



TLB challenge 7 – efficient offshore operations

Transform the efficiency and safety of operations, logistics, supply chain and decommissioning, adapting technology and digital to a hazardous offshore environment

Measures

- Safety
- Production Efficiency
- Turnaround Execution
- 'Wrench time' offshore
- Operating Expense resilience

MER task force

- Asset Stewardship

Existing UK strengths

- OGTC Digital solution centre

UK Industrial Strategy

- Artificial Intelligence

Cross-border synergies

- Global lessons learned from other basins

MER Asset Stewardship priorities

To be developed, addressing:

Short term

- Digital worker – tablets
- Asset management digital hubs
- Supply chain optimisation

Medium to long-term

- Smart facilities



Picture courtesy of BP plc 2018



TLB challenge 8 –productive onshore operations

Accelerate adoption of digital technology from other industries to transform the productivity of contracting, financial and warehousing systems

Measures

- Cycle time
- Operating Expense (resilience)
- Inactive inventory

MER task force

- Efficiency

Existing UK strengths

- OGTC digital solution centre
- UK systems and supply chains in other industries

UK Industrial Strategy

- Artificial Intelligence

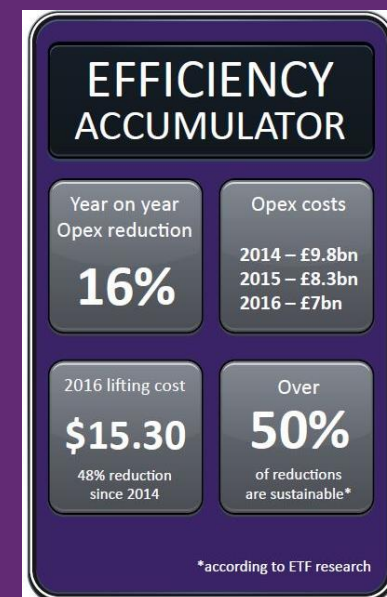
Cross-border synergies

- Global lessons learned from other basins and industries

MER Efficiency priorities

To be developed, addressing:

- Robotic process automation
- Connected supply chain
- National Data Repository
- Blockchain for supply chain





TLB challenge 9 – slash decommissioning costs

Low cost, environmentally friendly decommissioning and re-use of facilities

Measures

- Post-COP (Cessation Of Production) Opex
- Total decommissioning cost
- Earning decom. liability
- Environmental impact

MER task force

- Decommissioning
- Supply chain

Existing UK strengths

- OGTC decommissioning solution centre
- NERC Insite and oil and gas innovation
- Ongoing work on design for decommissioning

UK Industrial Strategy

- Clean Energy

MER Decommissioning priorities

Short term

- Well P&A thermite, geological, bismuth
- Mothballing fluid

Medium to long-term

- Jacket and subsea removal
- Well P&A barriers and verification
- Design new facilities for decom
- GIS-based liability monitoring





TLB challenge 10 – deploying at scale

Enable field trials and basin-wide deployment of key technologies to impact MER UK on a basin scale, linking companies, innovation entities and communities of practice

Measures

- Maximising Economic Recovery
- Number of first field trials
- Commercialization, multiple uses
- MER task force technology milestones

MER task force

- All

Existing UK strengths

- MER UK task force structure for cross-industry alignment
- OGA technology operator survey and Insights Report
- OGA asset stewardship, field and area development plans

UK oil and gas strategy

- Vision 2035

Cross-border synergies

- Norway, Netherlands – ‘one North Sea’

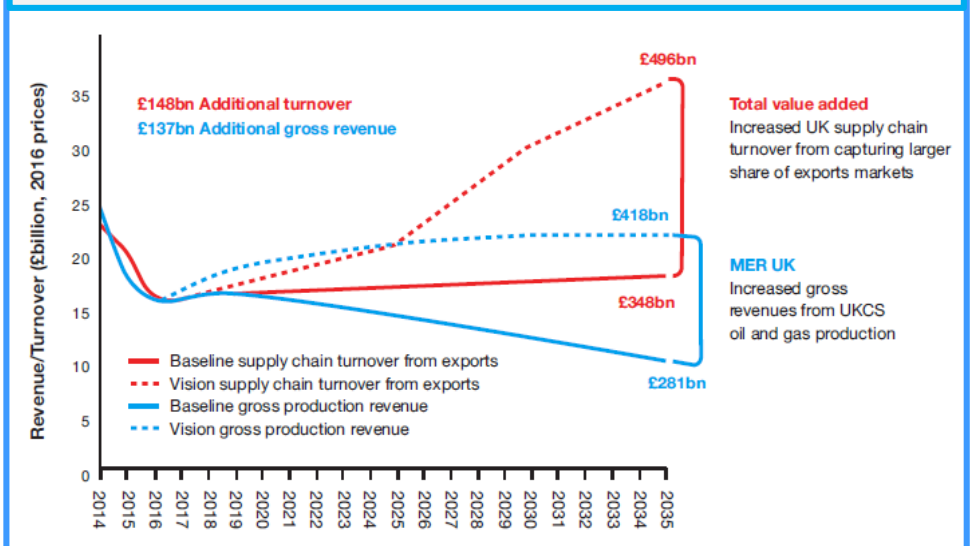
TLB priorities

Short term

- Technology Manager Community of Practice
- IT Manager Community of Practice
- Communicating success stories

Medium to long-term

- Asset Stewardship expectations
- Technology expectations for UK MD's
- Digital skilling and digital data structures





Operator technology manager community 12th July

- Share example job description for technology manager e.g.:
 - develop & mature the business unit technology & data analytics strategic framework
 - establish business unit milestones, and deliver on those commitments
 - champion execution of pilots with timely delivery of results, sharing lessons learned and best practices
 - lead the integration of new and leading technology into the business unit (base business and major capital projects)
 - manage & track the business unit contributions to the corporate / central technology organisation budget for technology development, services and maintenance
 - build and maintain strong relationships key internal and external groups e.g. Oil and Gas Technology Centre
 - work with business unit functional leaders to ensure that business unit technology priorities are effectively represented in corporate / central priorities and projects
 - facilitate the business unit technology advisory board
 - member of a business unit extended leadership team
- Establish community, set expectations, set up standing meetings, track deployment successes
 - Broader deployment of field-proven technologies to impact MER at basin scale
 - Identify best practices for broader use, leveraging OGA Technology Insights report



Delivery organisations map challenges to activity & gaps

- Pre-work to identify current activity (e.g. UKRI, OGTC)
- Workshops to identify gaps and plan closure - once TLB framework and MER priorities agreed

	Fix today		Maximise recovery		Transform tomorrow
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					