Astrimar
Reliability by Design

Technology Qualification Framework for Well P&A Technologies

SPE Well Decommissioning

5 June 2024

Net Zero Technology Centre
Technology Driving Transition

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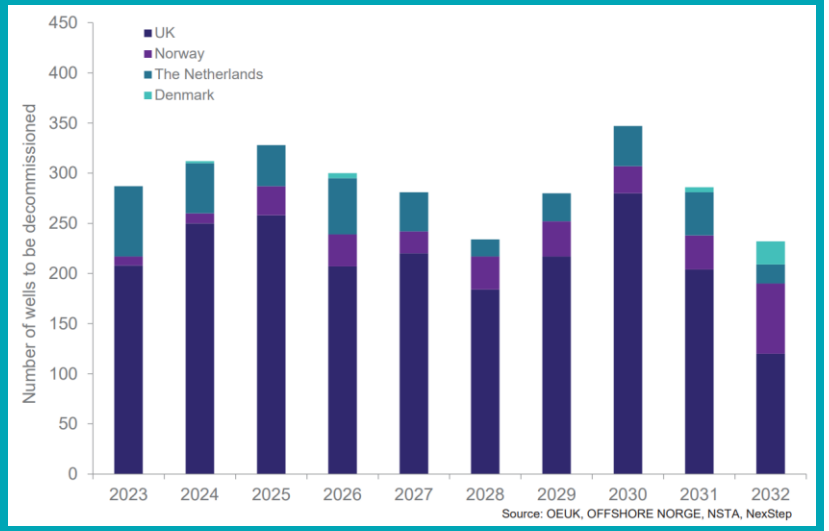
2022

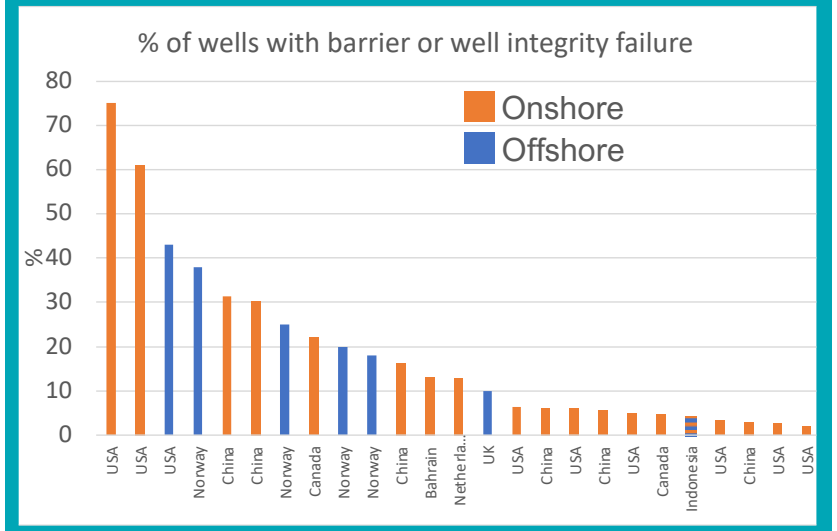
Opportunities



- 1000s of wells requiring decommissioning across NS
- Wells account for 51% of decommissioning expenditure
- Current rising costs per well

Source: OEUK DECOMMISSIONING INSIGHT 2023

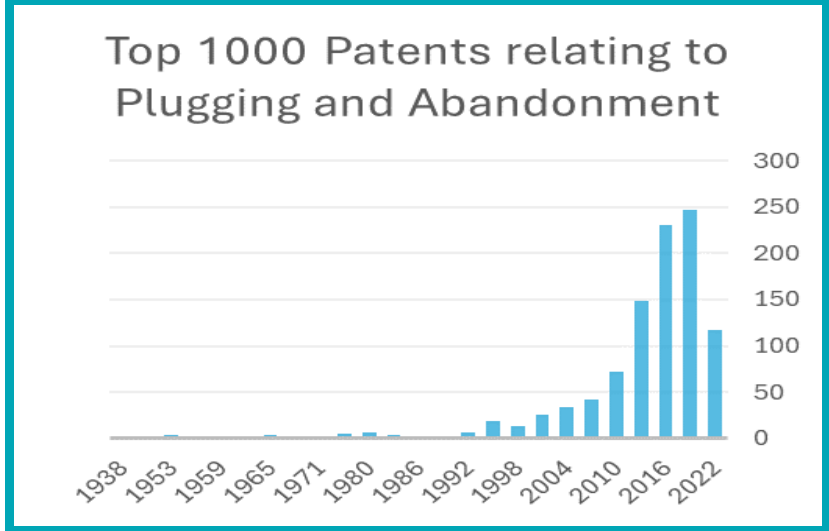
Issues



- Known integrity issues with cement
- Wide variance with age and region
- Increased concern with CCS

Source: http://dx.doi.org/10.1016/j.marpetgeo.2014.03.001

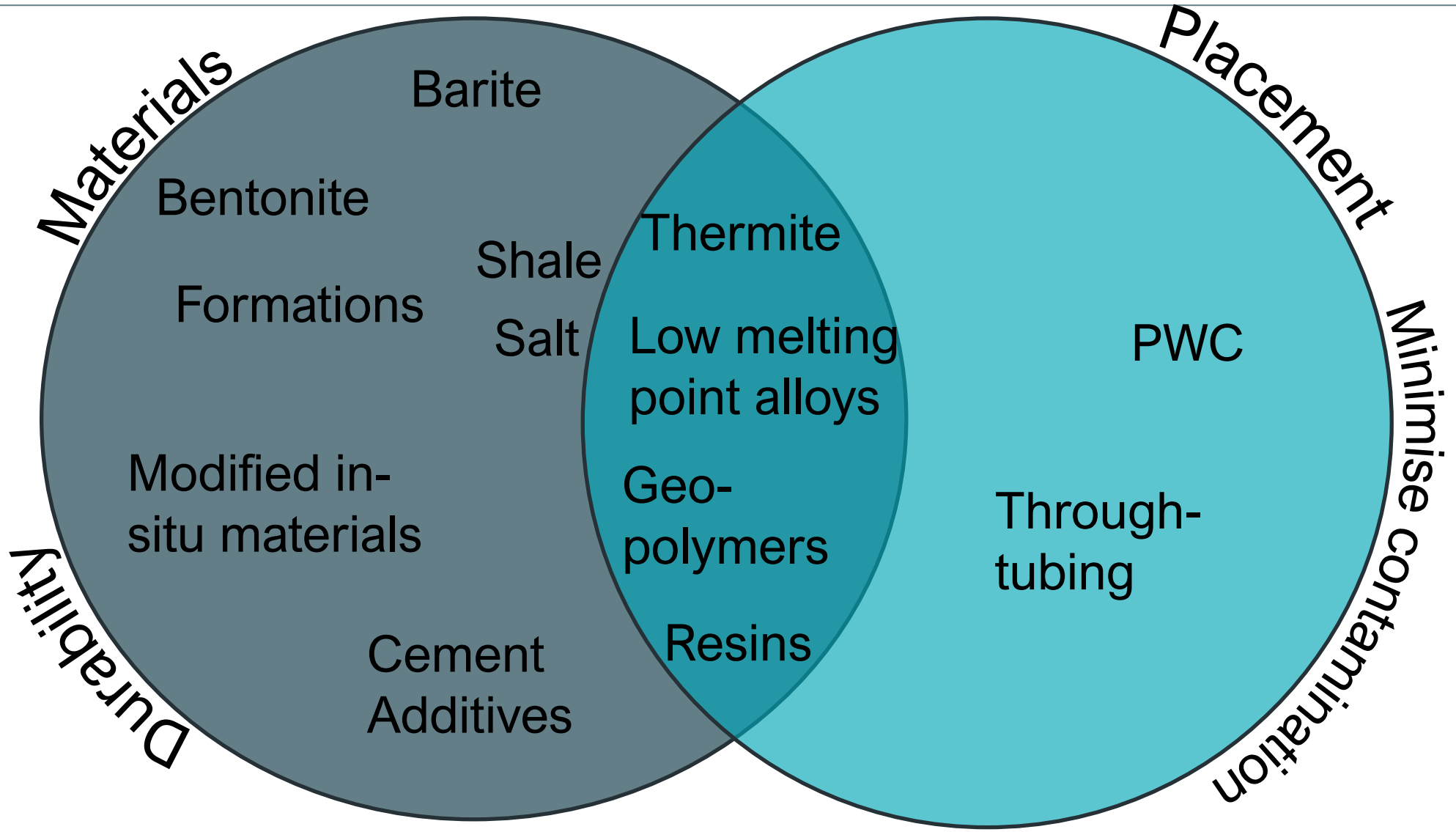
Solutions



- Hundreds of technologies are being developed
- Low uptake and confidence in new solutions
- Qualification process is too slow

Source: Google patent search

Current and Future P&A



Key challenges with Proving P&A Technologies

Understanding what is required to qualify a technology –
Defining requirements, identifying risks and key activities, checklists.

Agreeing when a technology is qualified –
Communication, evidence and common understanding.

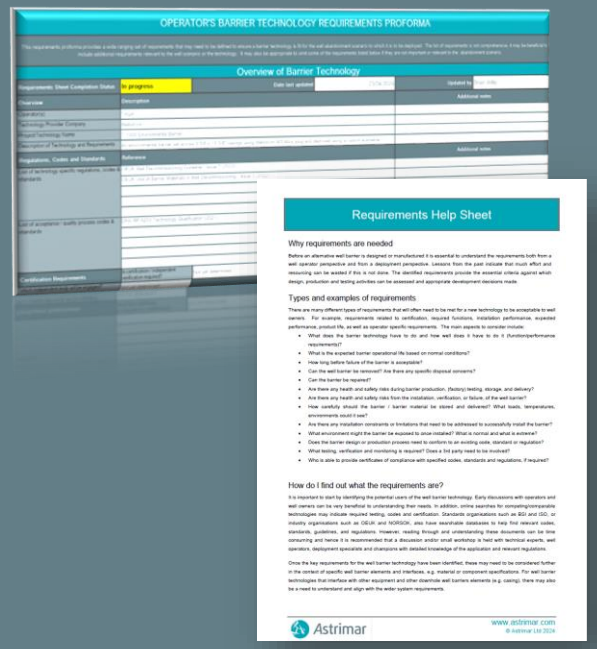
Opportunities to trial and verify well barriers –
Pilots/Field trials, operators' willingness to take risks.

What is required to qualify a P&A technology?

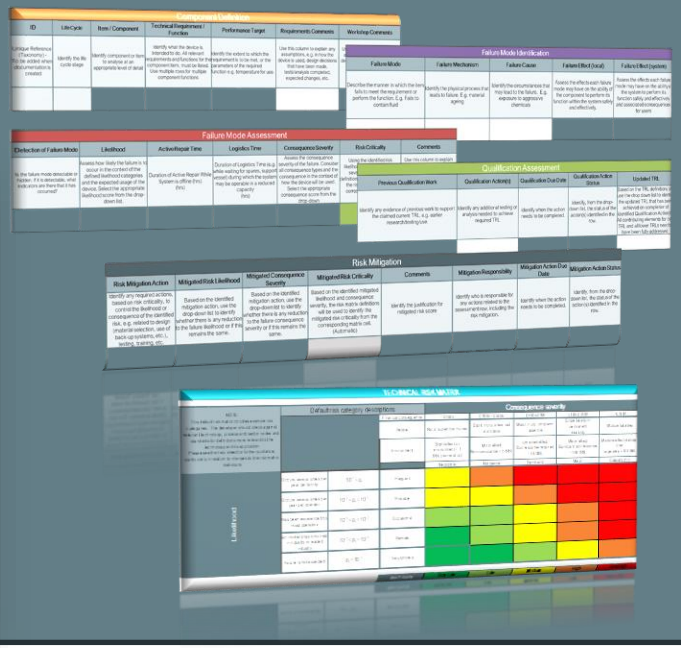
Identification of requirements

Identification of risks and activities

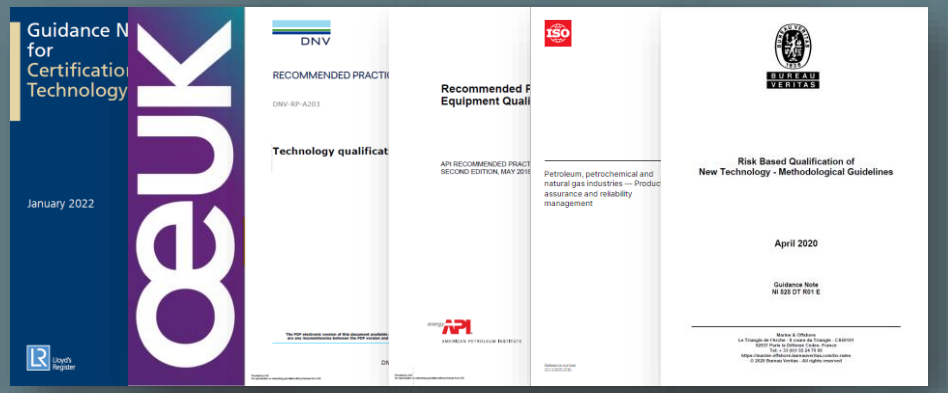
Requirements Proforma



FMECA Template



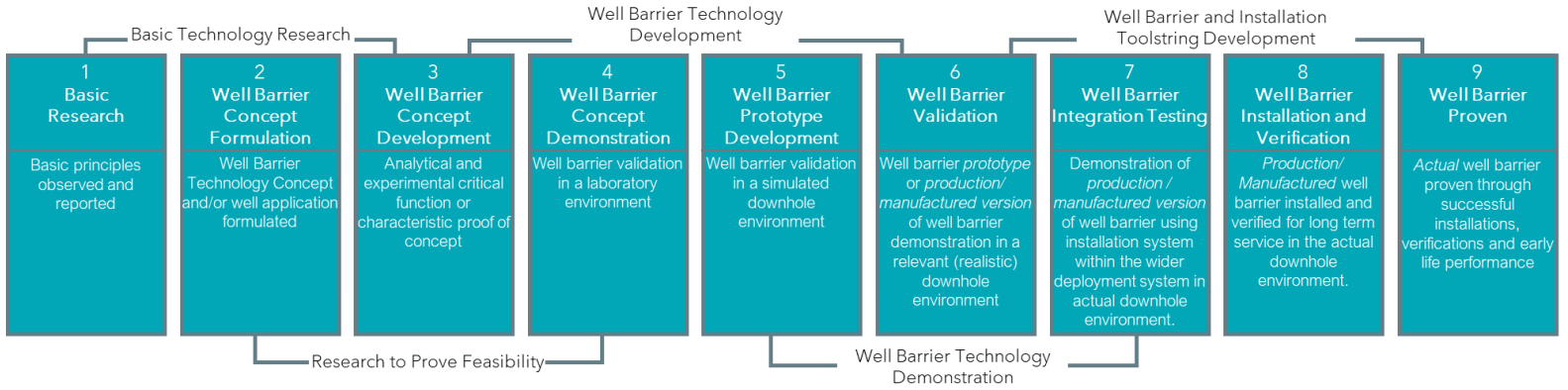
Alignment with qualification guidance



Well decommissioning guideline requirements

When is a technology qualified?

Technology Maturity Assessment - TRL



Technology Maturity Assessment

- ☐ Provides a consistent approach and evidenced against TRL claims
- ☐ 5 high level tasks/activities identified for each TRL
- ☐ Colour coded dashboard to indicate completeness
- ☐ Reviewed and agreed by Operator consortium members

Opportunities – Pilot of Framework

- Well barrier technologies from an array of developers to understand the different approaches needed to qualify and place an alternative barrier material.
- First Pilot of Framework has commenced
  - Requirements Proforma completed – Lessons learnt incorporated.
  - FMECA in progress – Two workshops held with risks and mitigations identified.
- Development of an Installation Checklist for well barrier technology.
- Guidance for Requirements Proforma & Qualification Gap Assessment.
- Extension of Framework for inspection, verification and enabling technologies.

Objectives and Goals

AN EFFICIENT QUALIFICATION PROCESS AND GUIDANCE

DE-RISKED FIELD TRIALS AND PILOTS WITH GREATER SUCCESS

QUALIFIED PERMANENT CAPROCK BARRIERS

REGULATOR ENGAGEMENT AND CONSENT

A PORTFOLIO OF PROVEN ALTERNATIVE BARRIERS READY FOR USE

QUALIFICATION AND DEPLOYMENT CHECKLIST FOR ALTERNATIVE BARRIERS

EXTENSION TO INSPECTION & VERIFICATION TECHNOLOGY; P&A ENABLING TECHNOLOGIES

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The Power of Collaboration

A problem shared is a problem regulated.

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North Sea Transition Authority

OEUK

HSE Health & Safety Executive

Havtil

NORWEGIAN OFFSHORE DIRECTORATE

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ConocoPhillips

equinor

Harbour Energy

PETROBRAS

REPSOL

TotalEnergies

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Thank you

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