



Marginal and Mature Field Development and Operation

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Sailing the Seas of Success: Facilities Preparation of the Wells P&A Campaign with SIPROD Mode in Malaysia Water to Propel Carbon Capture Storage (CCS) Initiative through Circular Economy Approach

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Presentation Outline

Objective

Project Brief

Circular Economy Concept

Cost Effective Solutions

Qualitative & Quantitative Benefits

Challenges

Ways to Achieve the Result

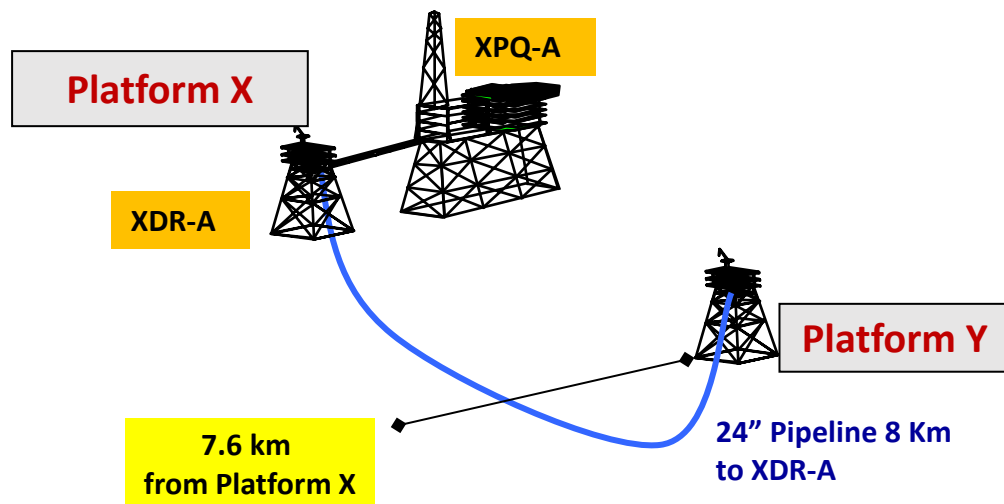
Conclusion & Recommendation



Objective

To share & discuss on case study on **cost-effective solutions** for the facilities preparation for Wells P&A campaign with SIPROD mode in Malaysia water to drive CCS initiatives through a **circular economy approach**.

Project Brief

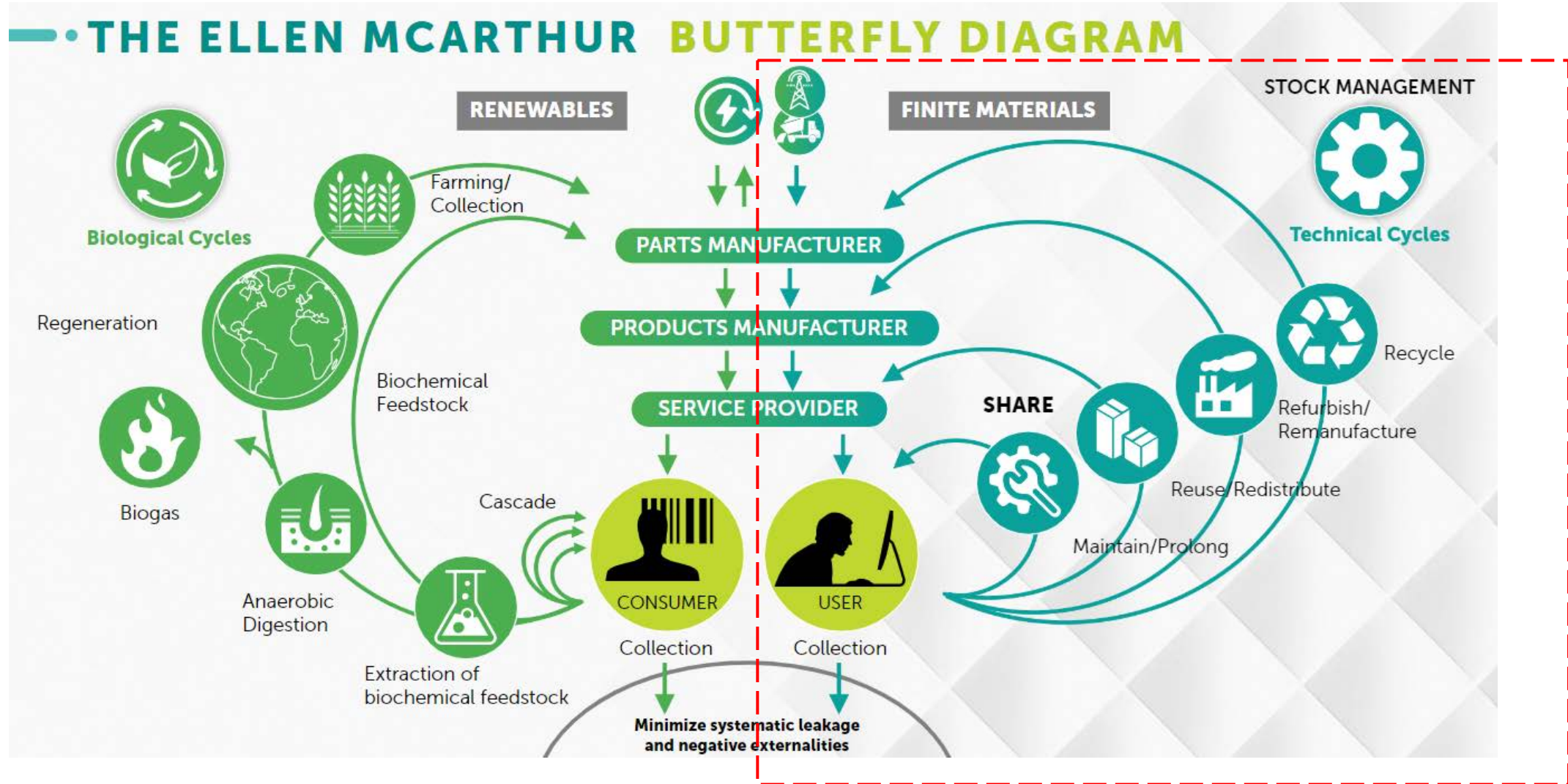


Scope of Work for Surface Preparation Work:-

- SIPROD system preparation & conversion
- Platform modification work for rig entry
- Spool removal up to production header

- Platform X is a gas field in Sarawak with twelve (12) slots which accommodated eight (8) gas producing wells, one (1) water disposal well from Platform Y and three (3) empty slots with conductor driven in each slot.
- Wells Plug and Abandonment (P&A) campaign commenced on July 2023 to **prepare the platform as a CO2 storage area for the CCS project.**
- The P&A campaign involves five (5) wells with full P&A activities, two (2) wells with partial P&A activities and one (1) well with remedial for CCS observation well. It was **executed using a Semi-Tender Assisted Drilling Rig (Semi-TADR).**
- Platform X wells are currently producing with **Platform Y gas evacuating via XDR-A.** Hence, it needs to be **converted to Simultaneous Production (SIPROD) mode prior to the P&A commencement .**

Concept of Circular Economy Approach



Decommissioning & Abandonment is not revenue-generating centric; hence, a cost-effective solution is pivotal

Extending the life cycle of firewater system

CE approach: Maintain/Prolong

Fit-for-purpose SIPROD implementation

CE approach: Reuse

Exploring surplus materials from marketplace

CE approach: Reuse

Removed equipment/valves return back to the market as spare

CE approach: Reuse

Generate revenue through scrap disposal

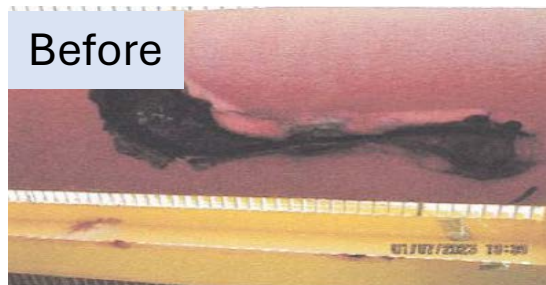
CE approach: Recycle

Refurbishment of Firewater line



Close visual inspection

UT wall thickness measurement

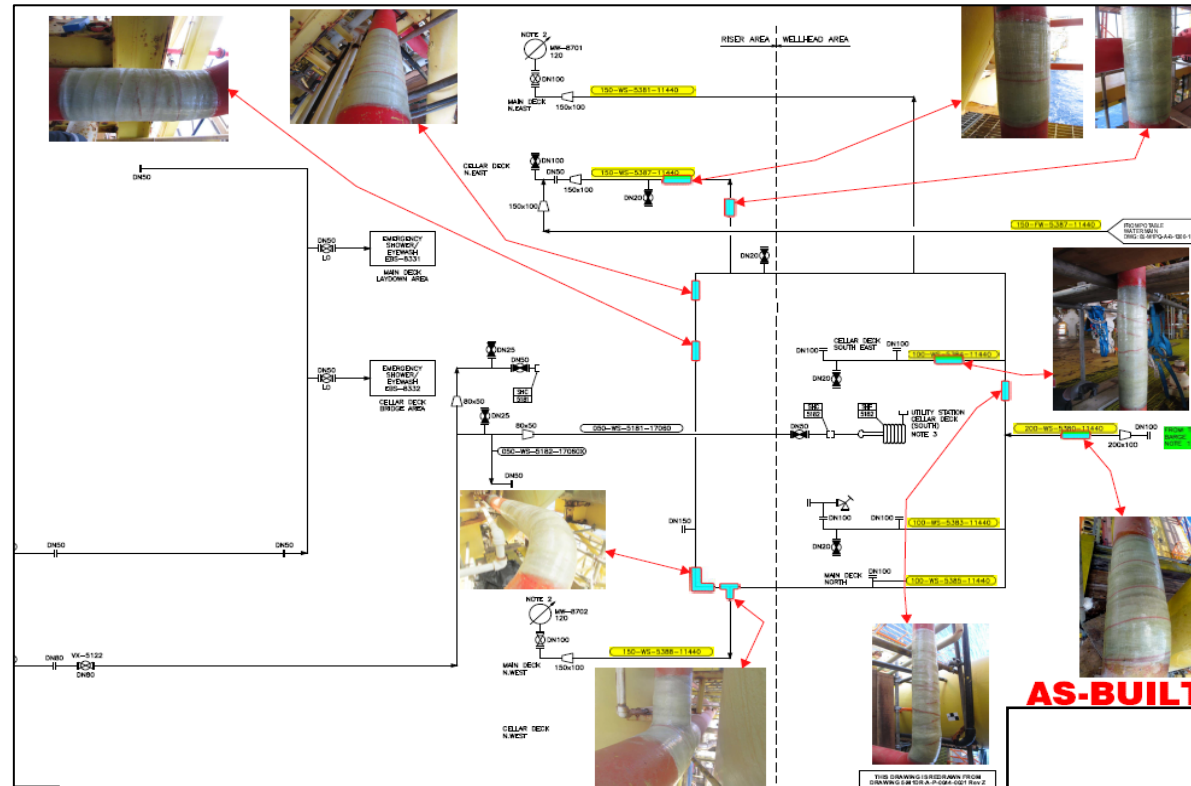


Before

Composite Overwrap Repair System



After



3_{MT}

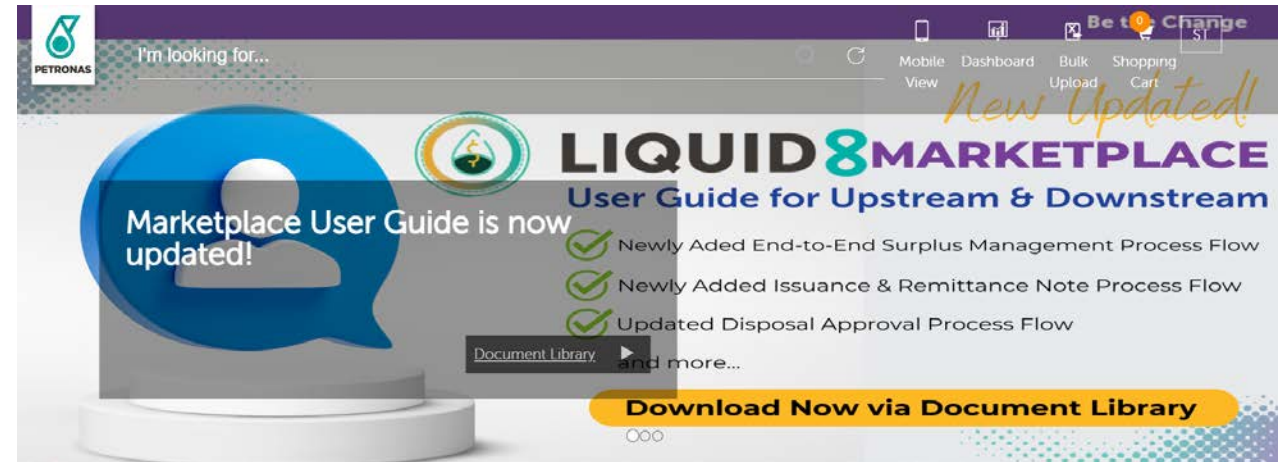
Avoidance of carbon footprint through elimination of new material manufacturing

*from estimated of 2000kg carbon steel

NOTE: FW line is a dry system which is designed for drilling/P&A related activities only

Fit-for-purpose SIPROD system & SIPROD equipment using surplus from internal marketplace

- Eliminate the requirement of new SIPROD panel
- Reuse of pre-identified spare indicator panel, electrical and instrumentation cables and instrumentation device
- Rollover of SIPROD equipment to CCS team



Deluge Valve

Firewater monitor

Kill knob

Sounder

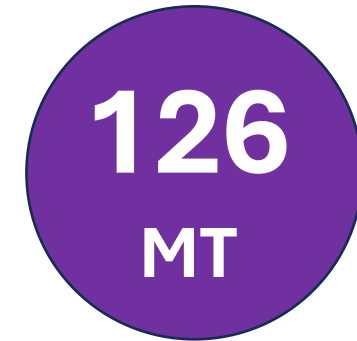


Recovery & monetisation through scrap disposal

Through spool disposal, a total of 86MT waste was successfully monetised with 126 MT of CO₂ emission avoided

Waste Category	Quantity (MT)
Carbon Steel	0.9
Stainless Steel	84.5
Copper	0.6

Note: Every tonne of steel recycled saves 1.5 tonnes CO₂



CO₂ emissions avoided



Circular Economy mindset brings quantitative & qualitative benefit to both P&A and CCS project

22%

Cost saving through the FW line refurbishment

Schedule Intact for P&A rig-up & CCS campaign

Minimise GHG emission & carbon footprint by eliminating manufacturing of new materials

90%

Cost savings through the utilisation of surplus materials

Successful verification of refurbished FW line functionality for CCS usage

Challenges

- 1 Realignment of engineering to suit surplus equipment specification
- 2 Unavailability of surplus in Liquid8. Hence, surplus is explored from other projects
- 3 Schedule constraint between consecutive campaigns
Surface Prep team, Wells P&A and CCS campaign
- 4 Management of TENORM spool disposal require special handling & services

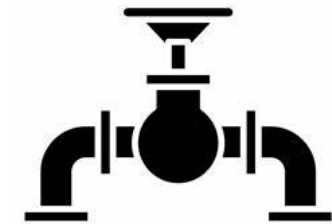
How to achieve it?



Seamless interface
between PMT & CCS
team



Utilisation of surplus
marketplace



Maximising
asset/equipment
lifetime

Conclusion & Recommendation

Cost compression and having a circular economy mindset is crucial when managing aging assets.

The circular economy approach may contribute to ~50% project cost savings.

Minimise cost exposure with dual focus on **supporting sustainability agenda** and ensuring that the **scope of work is tailored to the intended use** of the asset.

Find the **balance between cost savings** and maintaining the **functionality and safety** of the asset.



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Thank you