

Type of Offshore Assets

Offshore Assets



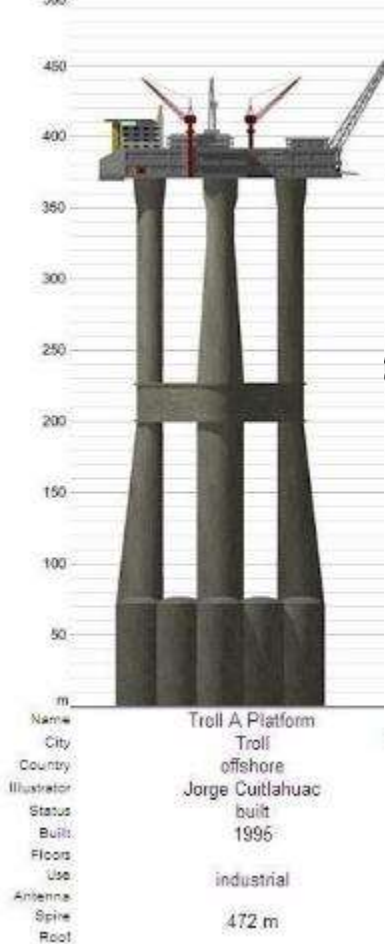
Topsides

Substructure

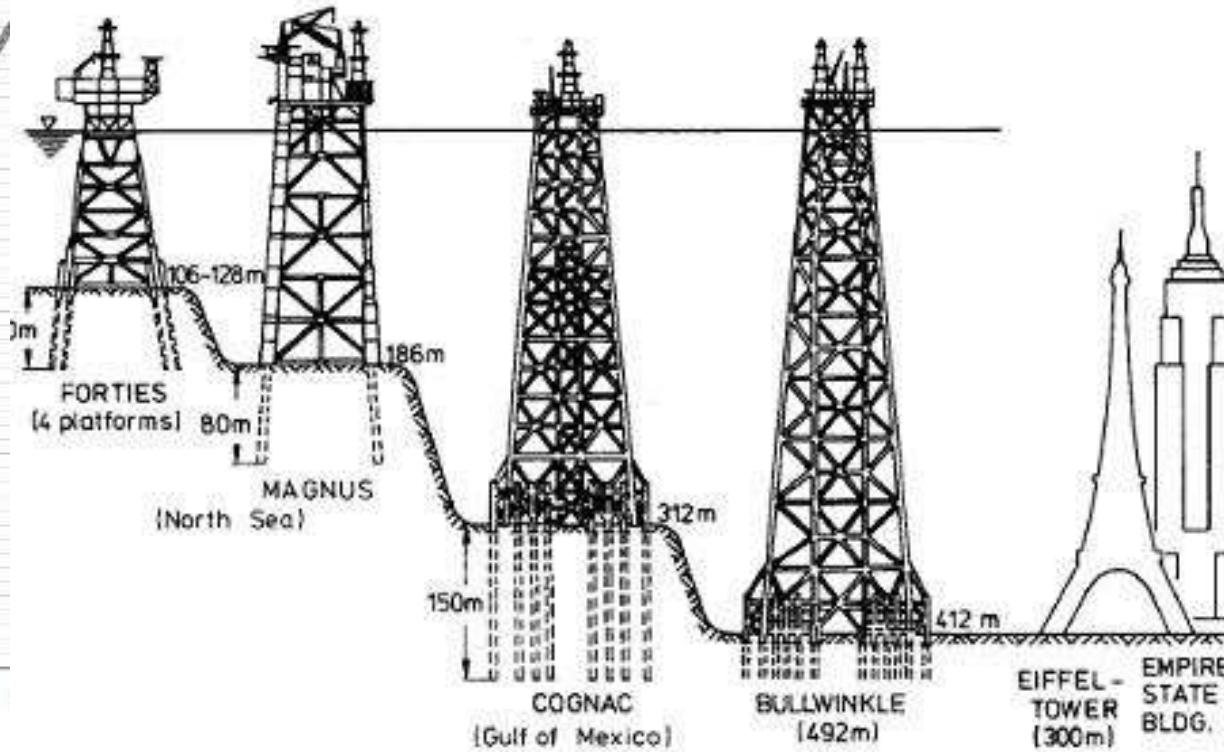
Offshore assets decommissioning- logistically and technically more challenging than onshore

Type of Offshore Assets

42 CGBS globally
(concrete Gravity Based Structures)



Thousands of small to large SPJ
(steel piled jackets)

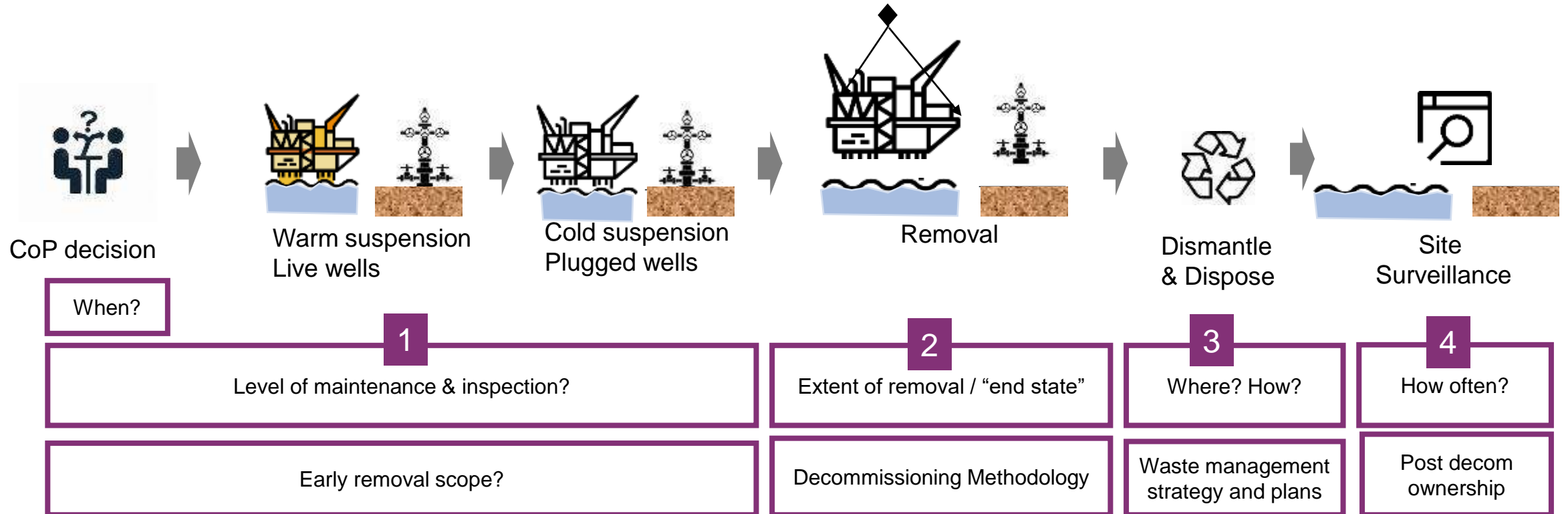


- Massive offshore structures - significant technical, logistical and safety challenge.
- Once cut and lifted, structures need to be brought to a suitable onshore port and demolition yard. For countries new to decommissioning, a new local port and demolition yard often need to be developed.
- Waste management infrastructure needs to be ready to process these waste- including steel recycling facilities, oily liquid processing plants and engineered landfills.

RECAP:

Key decommissioning decisions

Options selected via a multi criteria decision analysis / comparative assessment process considering safety, environment, social economic and stakeholders' views.

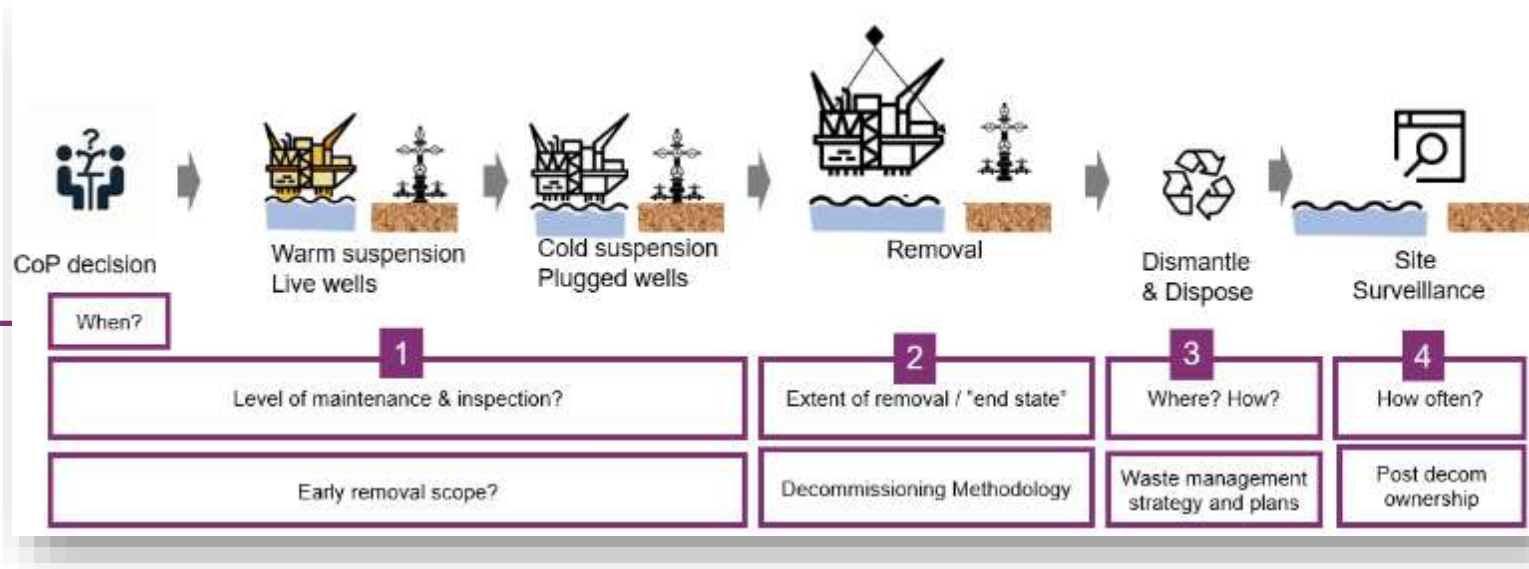


Let's understand the challenges & opportunities through case studies

[Options for decommissioning – YouTube](#) 2:17mins video- Decommissioning options for Brent

Case study 1

- In a country with
 - limited landfill capacity, no engineered landfills
 - no recycling capacity
 - no steel smelting plant
 - No purposed-built onshore decommissioning yard exists
 - Expecting to decommission 50+ structures in the next 10 years
- Shallow water field
 - 21 numbers of 30-50MT platforms
 - 10-20m water depth
 - Stop producing in 2019, wells still live but shut in
 - Pipelines and topsides shut in but still contain hydrocarbon
 - Close to shoreline



Discuss:

- What are the risks to people and the environment?
- What needs to be maintained and inspected?
- How should the asset be decommissioned?
- What are the opportunities for the country?
- What are the challenges?

Case study 1



Case study 1

Discussion

1. What are the risks to people and the environment?

- Wells are still live, risk of loss of containment from wells, pipelines and topsides piping/ equipment
- Platforms need to be visited for well annulus pressure checks. If structure integrity is poor, there is a risk of harm to people from fallen objects, poor integrity of boatlanding. If it becomes unsafe to visit, then wells cannot be inspected.

2. What need to be maintained and inspected?

- Wells
- Access – boatlanding- padeyes, swing ropes; helideck- safety system, structures
- Integrity of the structure (underwater, depending on corrosion rate- once every 5-10 years)

Discuss- examples of answers to discussion

3. How should the asset be decommissioned?

Subject to Multi-decision analysis,

- but as this is shallow waters, the likely best solution is for the structures is to be cut and removed to shore for onshore dismantling
- Pipelines-?

4. What are the opportunities for the country?

- Development of supply chain for decommissioning, local business development and creation of job

5. What are the challenges?

- Availability of waste management processing system in country
- Readiness of supply chains, availability of skills and resources
- Impact of decommissioning activities (removal- disturbance to seabed etc.) on the near shore sensitive environment- must be managed

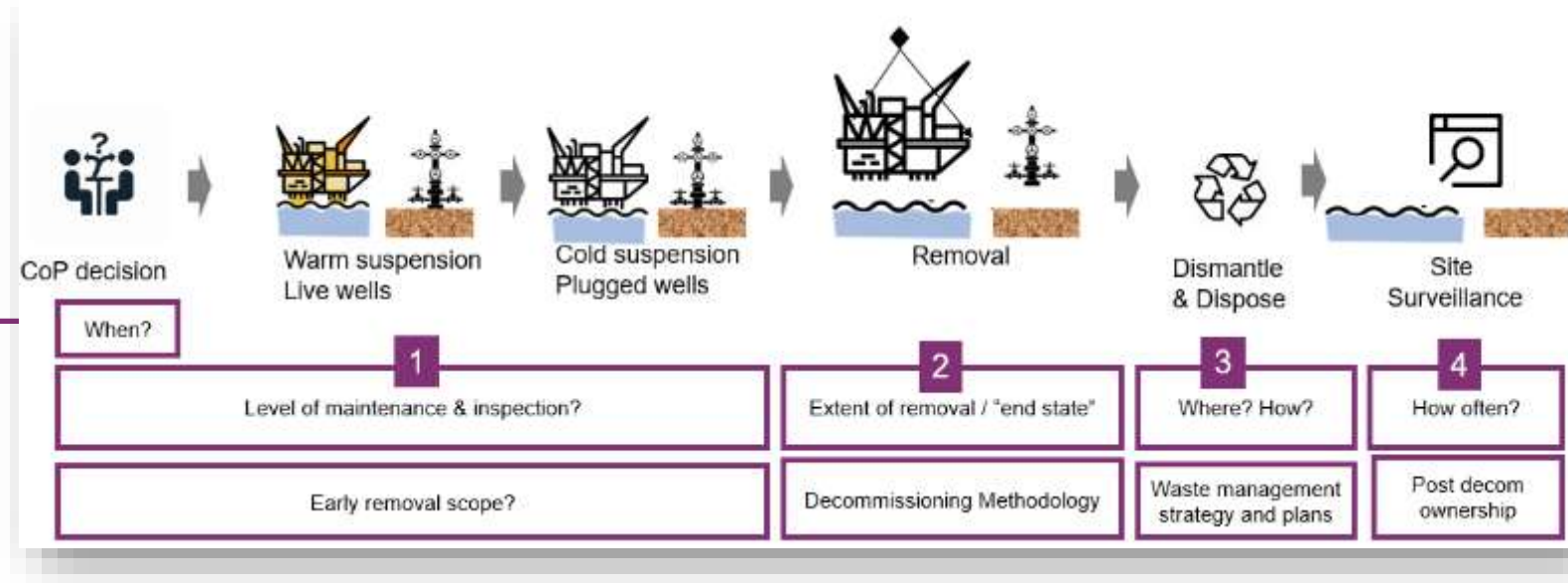
Case study 2:

Steel structure (Jacket > 10,000MT)

- Complex footing configuration
- Harsh Metocean condition
- No local dismantling yards
- One of very few offshore fields in the country

Discuss, in the decision process

- What are the challenges to consider?
- What are the opportunities?
- Who needs to be engaged?
- When should decommissioning planning start?



Another similar case study example:

- Brent Alpha (4mins) Leaving footing in place? Regulations allow flexibility: https://youtu.be/4srmj_BMONM

Case study 2

In the decision process

- What are the challenges to consider?
- What are the opportunities?
- Who needs to be engaged?
- When should decommissioning planning start?



Case study 2

Discuss- examples of answers to discussion

In the decision process

1. What are the challenges to consider?
 - Large structure, complex substructure- Technologically challenging to remove
 - As the field is remote, there will be significant logistical challenges. With very few similar structures requiring the same resource for decommissioning, the ability to share mobilization/ demobilization cost is limited.
2. What are the opportunities?
 - Regional synergies (but need to overcome challenges of cross-border import/ export rules)

Discuss- examples of answers to discussion

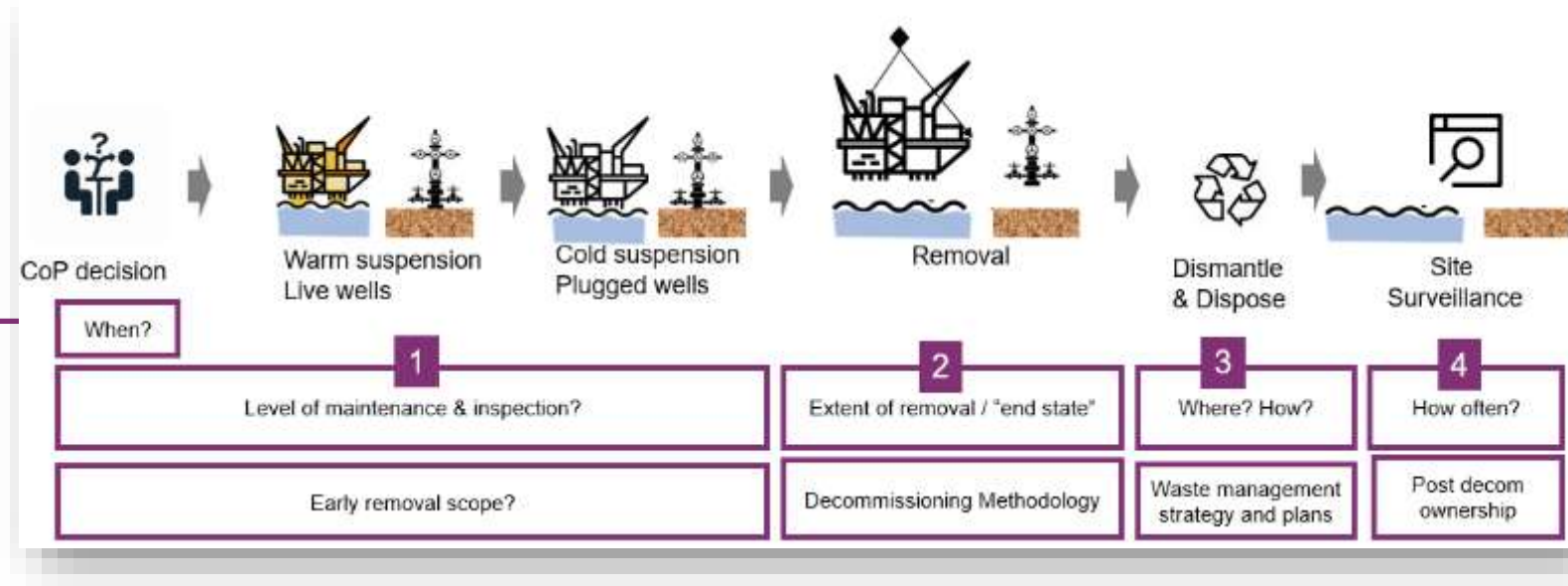
3. Who needs to be engaged?
 - Stakeholders offshore- other sea users
 - Government, Public, NGO
4. When should decommissioning planning start?
 - Understanding of Asset Retirement Obligations (ARO) as early as possible. This means a need to understand the challenges and develop a base case (most likely) scenario
 - As the asset move closer to CoP (Cessation of Production) date, a project team should be formed at least 5 years prior to execution

Case study 3:

A steel piled jacket structure, 4 legs; country has reefing program in place and attempted reefing of purpose-built concrete structure, and other artificial reefs

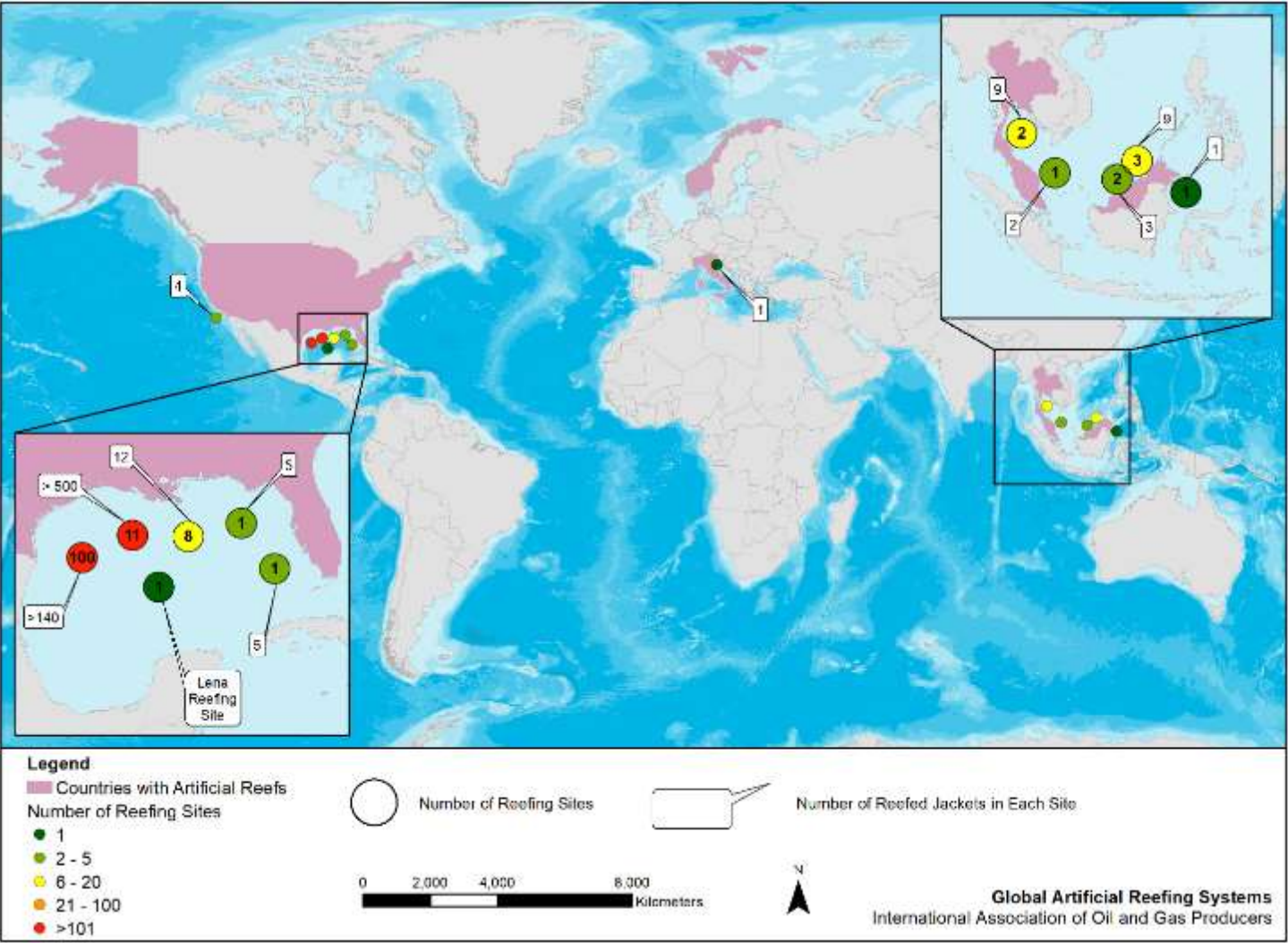
Discuss/ Mentimeter question:

- Who needs to be engaged?
- Does reefing always result in cost savings?
- How can all stakeholders be assured that reefing achieve its purpose?



Refer to later module (Module 6)- IOGP's case studies – reefing as an option & tools used by the industry by Dr. Paul Krause

Map of Artificial reefs (from oil and gas structures)



Summary- challenges in decommissioning

Early planning & understanding decommissioning costs, during asset sales & transfers



BUSINESS Oil Companies Are Ordered to Help Cover \$7.2 Billion Cleanup Bill in Gulf of Mexico

Large oil producers will have to foot some of the costs of capping and abandoning offshore wells they used to own



Tug boats took a semi-submersible drilling platform through Texas' Port Aransas Channel into the Gulf of Mexico in December

PHOTO: TOM PENNINGTON/GETTY IMAGES

By Christopher M. Matthews
July 5, 2021 7:00 am ET

Orphaned assets- bankruptcies & unknown owners – who pays?

DECOMMISSIONING Offshore oil & gas producers to pay for \$1B Northern Endeavour cleanup

For every dollar Woodside saved in 2015 selling the Northern Endeavour, the oil and gas industry may have to pay back threefold after the Federal Government moved to protect ordinary taxpayers from the cost of decommissioning the vessel and oil field.

PETER MELNE
13 SEP 2020 11:48 AM



Summary- opportunities in decommissioning

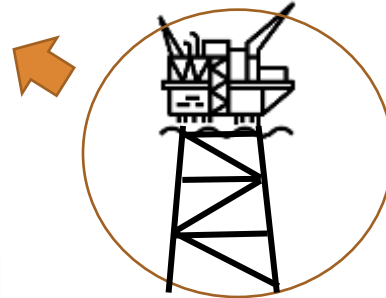
Regulations and national policies can enable these opportunities; support evidence- based science and technologies

Re-use & Decommissioning report 2021

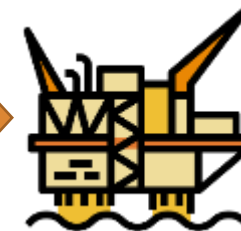
08 July 2021 - News



Recycle steel
for other use



Reuse for other industries



Refurbish, reinstall & reuse
- HC production

Direct reuse? For Carbon
Capture Storage, pipelines for
hydrogen and CO2 transport

Summary

Manage the challenges and realise the opportunities...

- ...through early planning; policies and regulations that are risk-based and allow considerations of developing science and technologies.
- new offshore structures to consider decommissioning in its design including for the wind industry
- maintain overview of decommissioning costs estimates, ensure sufficient funds
- prepare the supply chains needed to execute the work, potential for efficient campaigns
- develop decommissioning science and technologies for site surveys, data collection and execution



Some organisation that are developing decommissioning guidance, and/ or leading the decommissioning Science and Technologies