Design and Noise Innovation for Offshore Wind Installation

13th March 2024

MAKE POSSIBLE

Subsea7 & Seaway7 - At a Glance

Perth Office
45 years
Experience

3
Vessels in the Region

3
Live Projects

50+
Projects Successfully Completed

48
Offshore Wind Projects Delivered

11+
GW Installed

12
Projects In-Hands

Powering
14M+

38 Vessels in our fleet

Opportunities & Challenges for Australia

Fundamentals

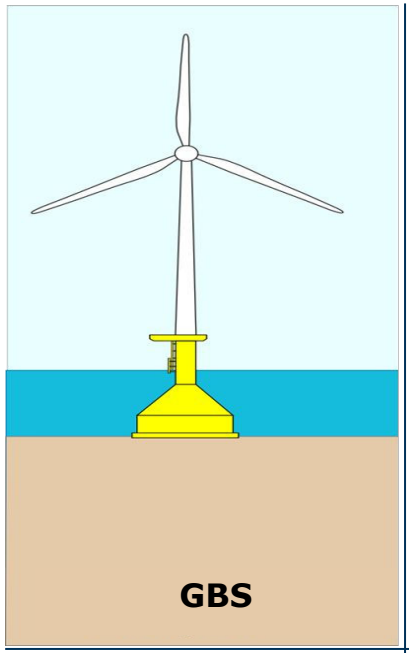
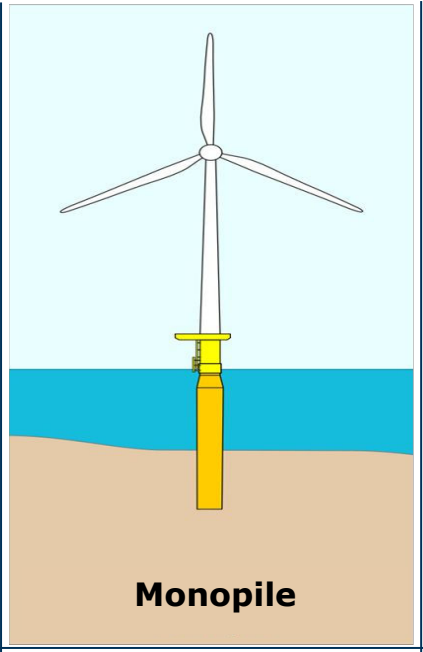
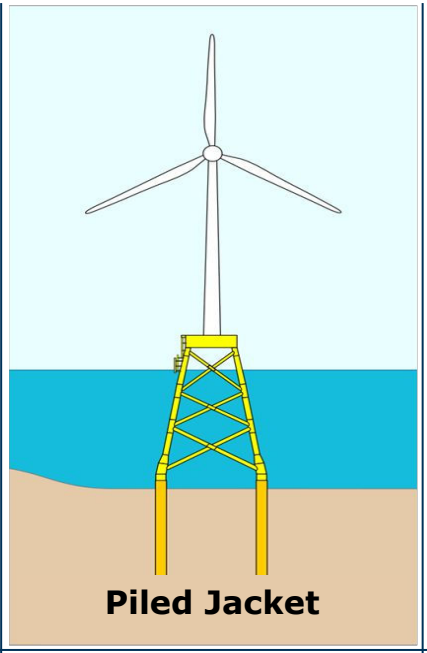
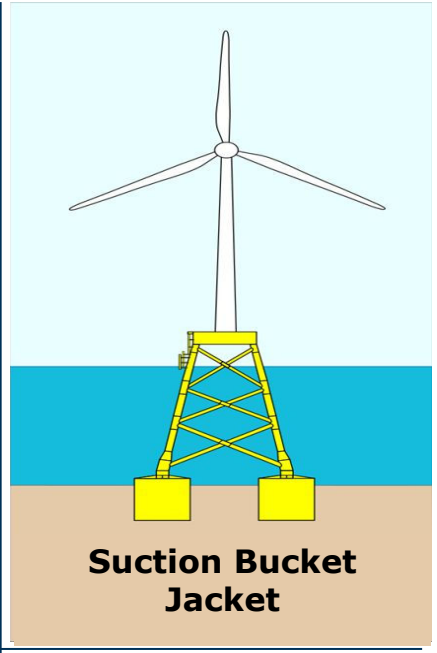
- Significant wind resource
- Energy demand

Credit photo: Seagreen Wind Energy

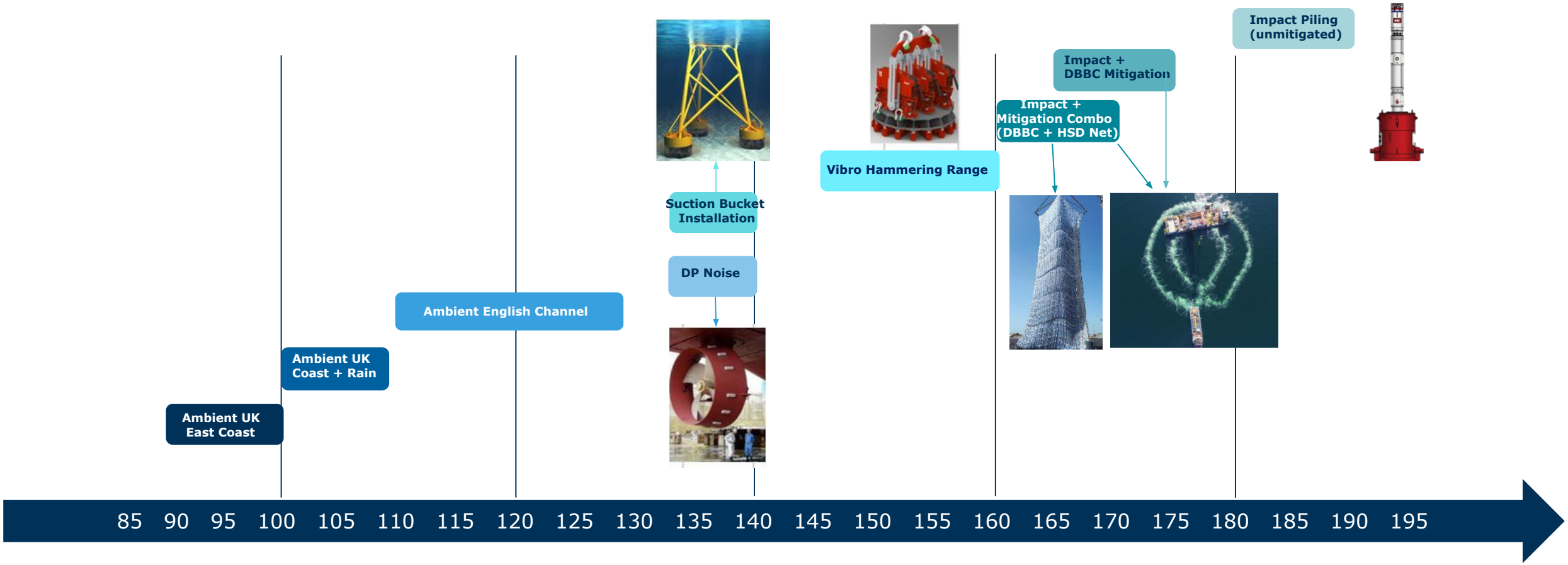
Characteristics

- Leading environmental legislation
- Challenging soil conditions
- Global competition for manufacturing capacity, installation assets and resources
- Lack of support infrastructure
- Lack of installation vessels

Foundations

	 GBS	 Monopile	 Piled Jacket	 Suction Bucket Jacket
Environmental	• Seabed preparation required • No reliance on penetration	• Noise creation via hammering process	• Noise creation via Drilling/Hammering process	• Soft topsoil before bed rock required • "Quiet" installation
Delivery	• Simple Fabrication • Semi-sub or large HLV req. • Draft Requirements	• Simple Fabrication • Large hammer required • Pile run / refusal	• Medium complexity Fabrication • Large transport spreads • Extended offshore operations	• Medium complexity Fabrication • Large transport spreads

Comparison of Different Underwater Noise Sources



Sound Pressure Level / Sound Exposure Level for pile installations (dB)

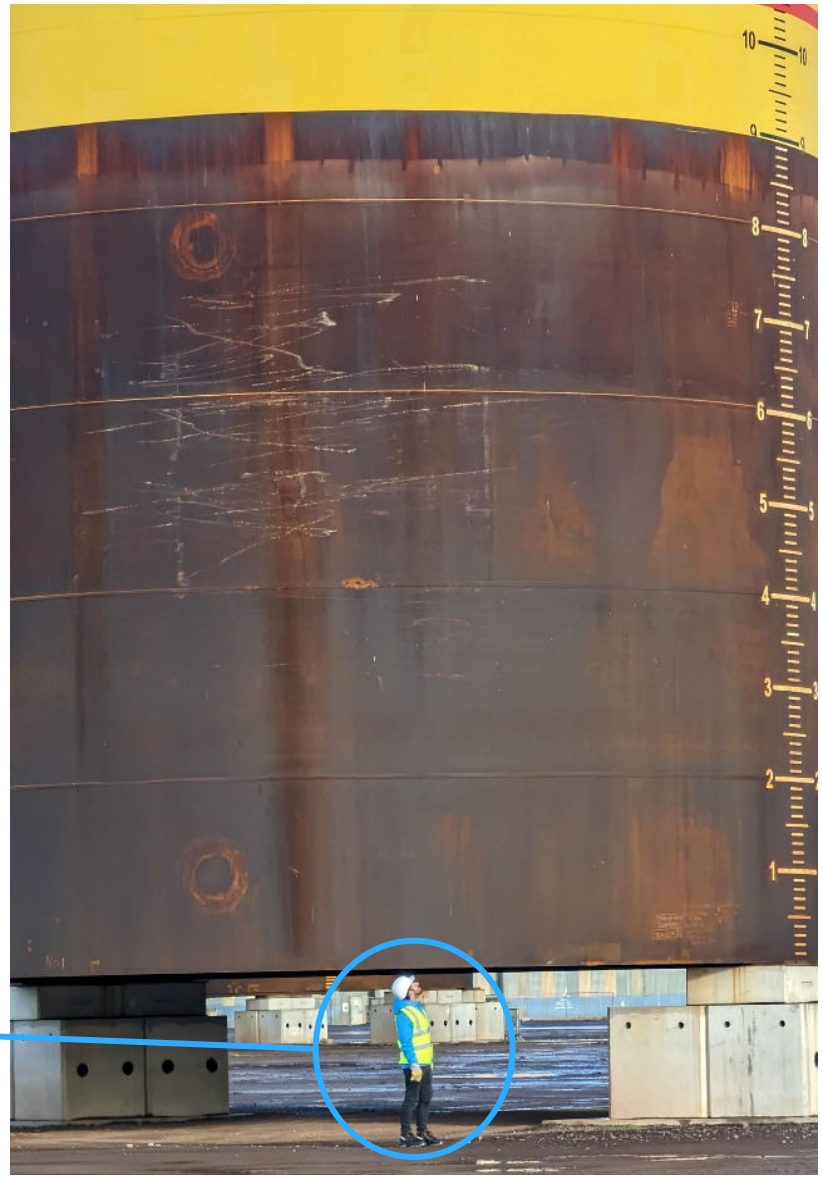
Seagreen Project Overview

1,075 MW
27km offshore
40 to 60m of water
FID : June 2020
Offshore Installation : 2021-22
1st Power : Oct 2022

Scope

- EPCI for balance of plant
- 114 foundation jackets
- 3 x fabrication yards
- Intercontinental transportation
- 116 inner array cables = 330km

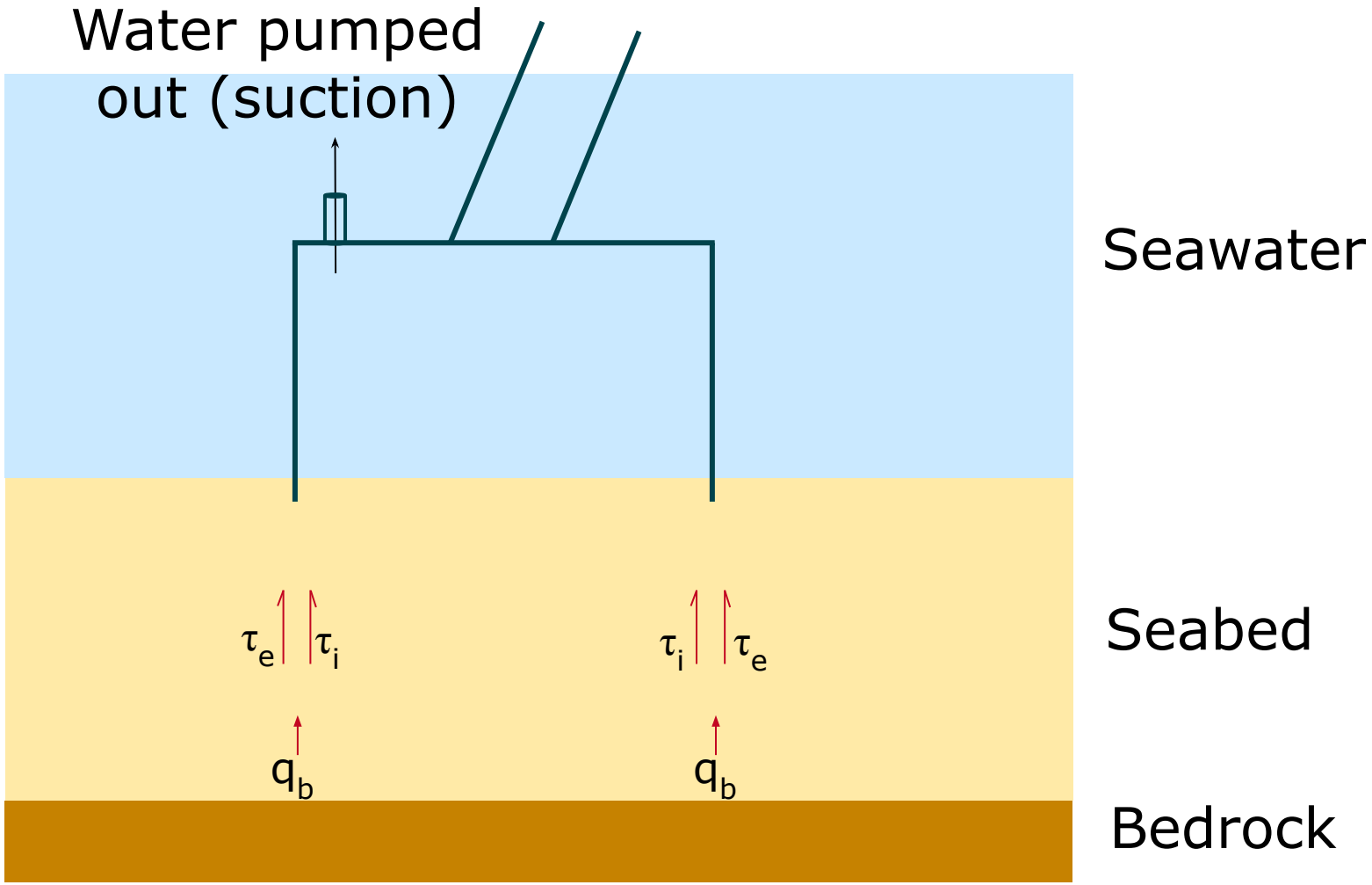

subsea 7
330m
285m
234m
204m
94m



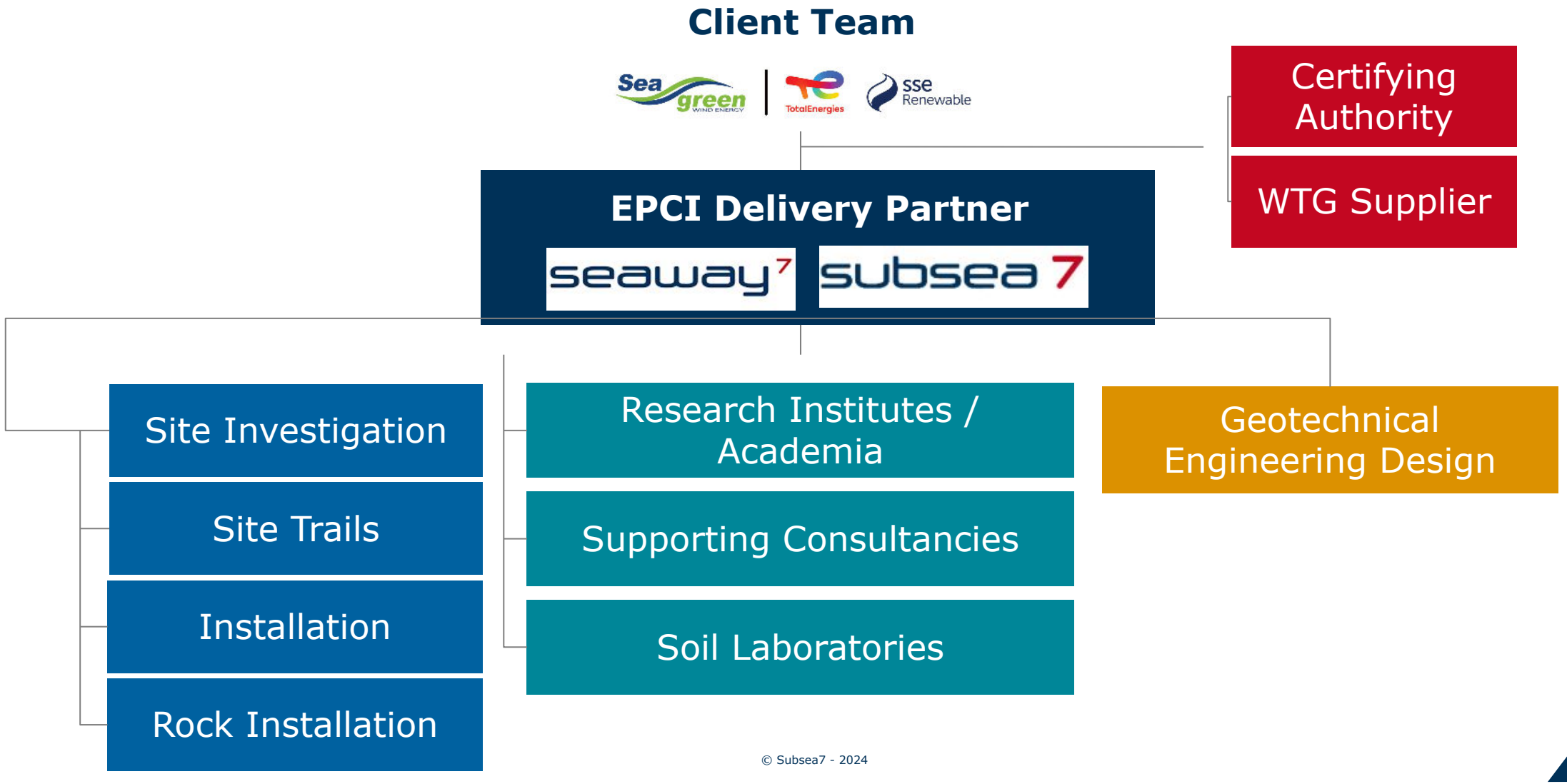
Why select suction caisson foundations?

- Evolution of solution deployed in O&G in the 1990s
- Soil conditions
  - Shallow hard layers
  - Wanted to avoid driving or drilling in to rock
  - Flexibility in planning to allow for finding suitable sites
- Lighter than gravity foundations
  - More installation options
  - No seabed preparation.
- Cost and schedule
  - Speed of installation
- **Noise constraints**
  - **Minimise impact on marine mammals**
- Relatively easy to relocate or decommission

How does it work?



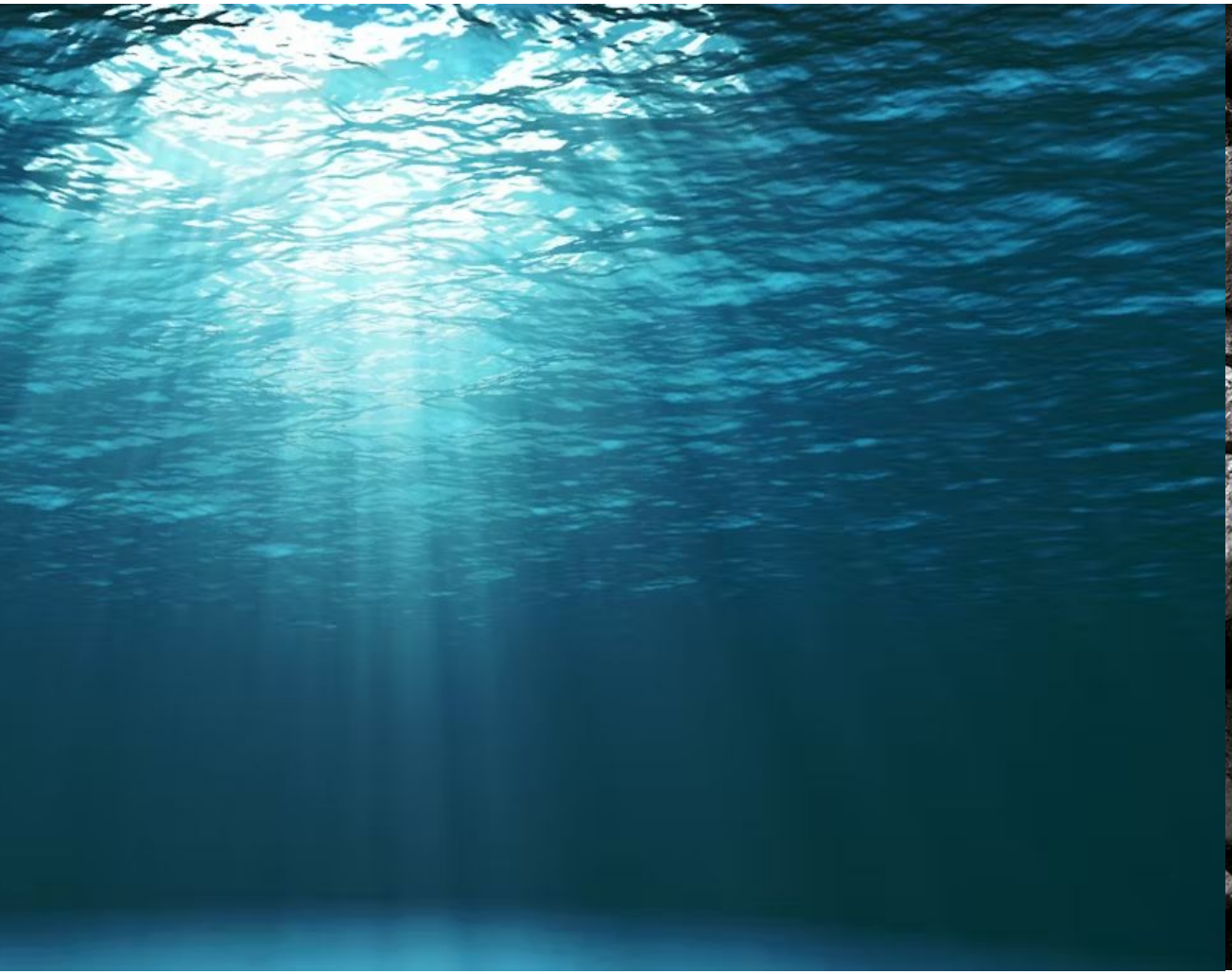
How did we do it?



The Future?

- Increasing environmental constraints
- New WTG foundation designs that reduce cost compared to suction caisson jackets
- New technologies and hybrid designs that minimise ground penetration to de-risk soils risk
- Evolving installation techniques
- New designs that increase manufacturing, logistics and installation options

And for Australia?



THANK YOU