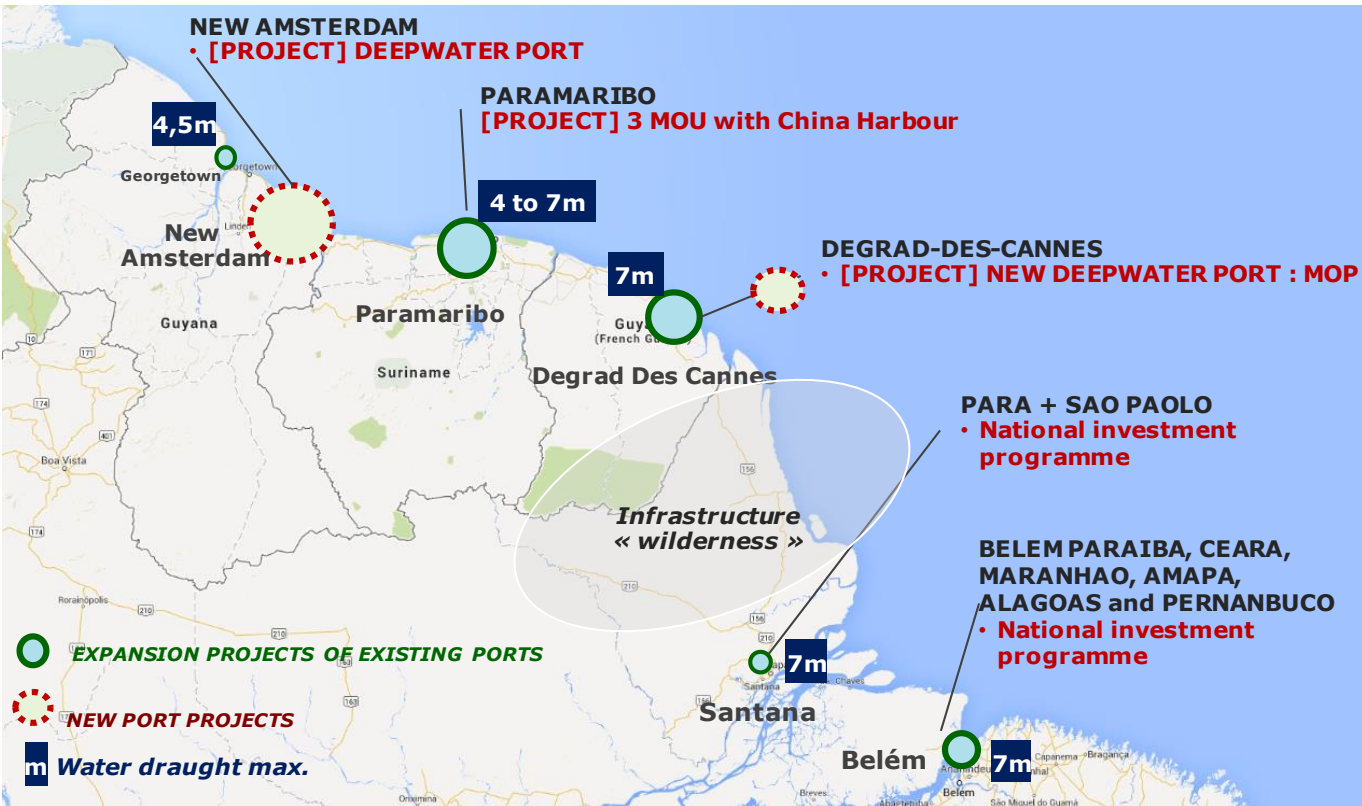


Multi-Use Offshore Platform on the Guiana Shield



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CORICAN: French national council for maritime industry research and innovation orientation

Multi-use Offshore Platform challenges

- **TRADE requirements**

Water draught < 7m



Trend



Water draught > 15m

DEPTH AND SPACE LIMITS

+ Opportunities related to the **Panama Canal**

With favourable met-ocean conditions

- **RESOURCES opportunities**



O&G resources



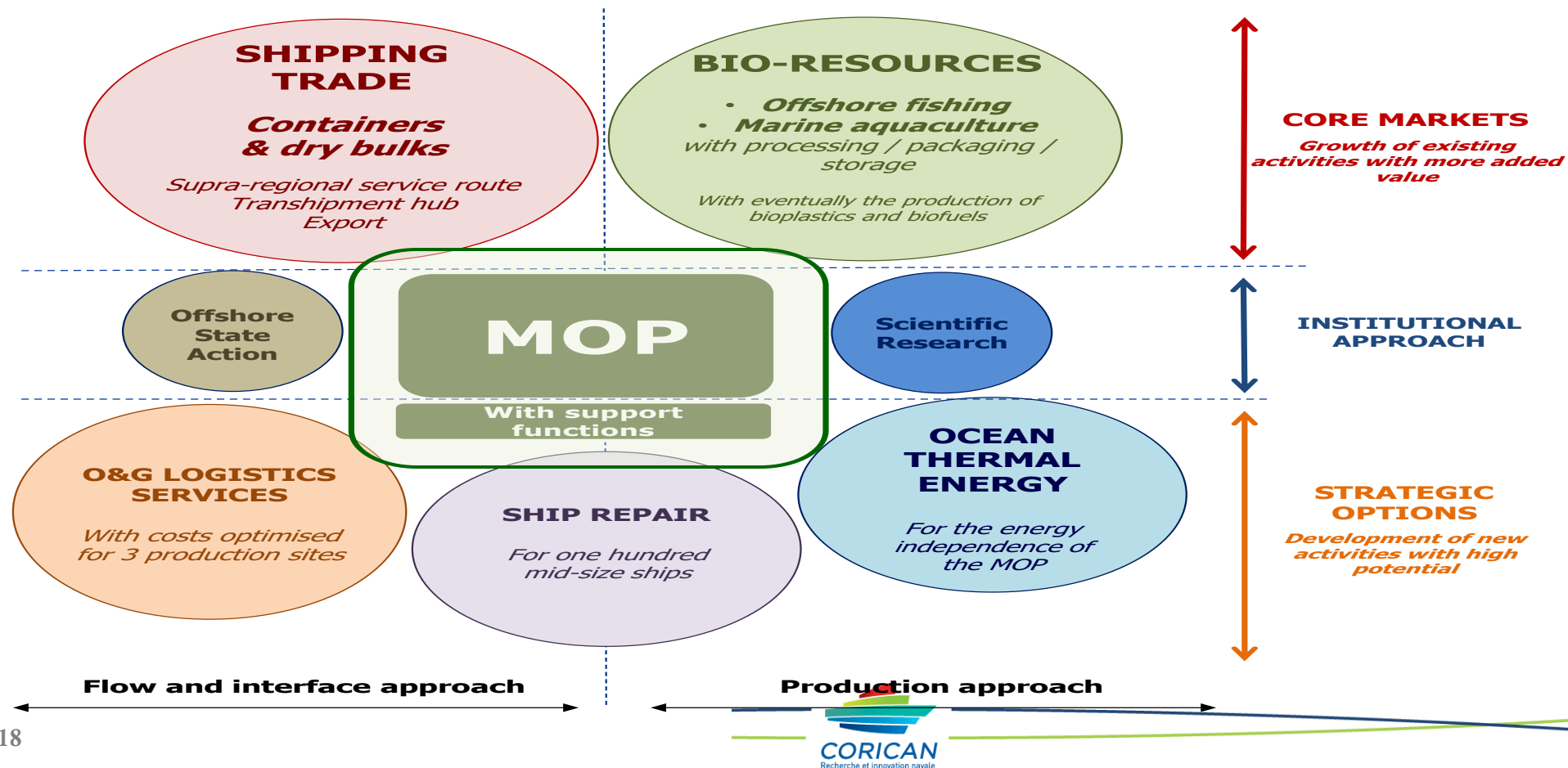
- Fishing
- Aquaculture



Ocean Energies
Especially tidal & OTEC

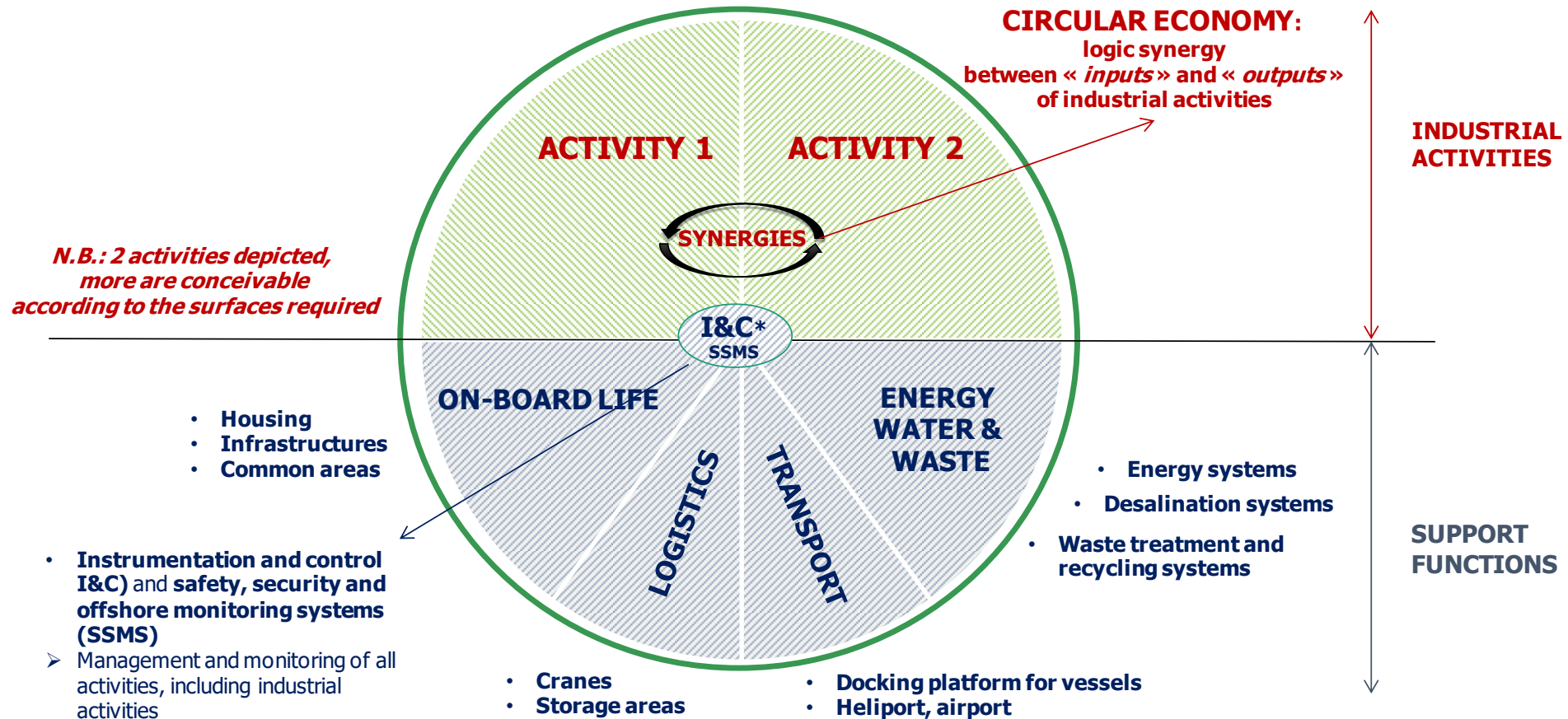
SUSTAINABLE VALORISATION OF BIO-RESOURCES

Multi-use Offshore Platform Markets



Multi-use Offshore Platform Concept

Towards a « maritimisation » of the global economy



Multi-use Offshore Platform Value proposition

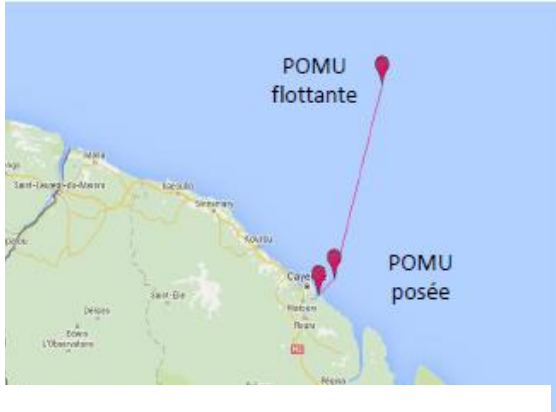
Logistic

- facilitate Panamax 2016 container ships stop & act as a **distribution hub** for the area
- provide a **barge system** for container feeding & semi-**automated container transfer** system
- **reduce dispatch times** and **transportation costs** for shipping and oil & gas companies

Offshore aquaculture

- enabler for aquaculture farmers to **exploit 800km² of nutrient rich waters**, around the platform **without conflict of interest**
- ballast tanks on the floating platform will provide a location to **hatch and grow juveniles**
- **shorter distance** between aquaculture farms and seafood workshops
- **increased safety and quality**

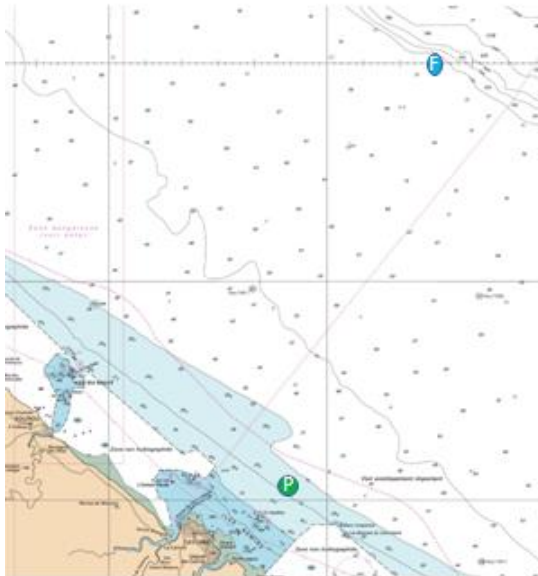
Two identified scenarios, One Floating MOP and One Gravity Based MOP



Gravity based MOP:

➤ In the TTW, at 12 nm North East off Mahury River Mouth, by 22m depth, on sand soil

- 😊 • Enough water depth to host any Container ship (even over Panamax)
- 😊 • In vicinity of Degrad des Cannes
- 😞 • Very limited biomass production and transformation possibilities



Floating MOP:

➤ In the EEZ, Close to continental shelf edge, at 70 n au Nord Nord Est de Cayenne, by 75m depth, on sand soil

- 😊 • Close to offshore O&G platform, to minimize supply permanent ship number
- 😊 • Favourable place for offshore aquaculture and OTEC
- 😞 • 4 Hours sailing from Cayenne

Offshore French Guyana weather

Conditions météo clémentes

			In operation	Extreme conditions
Weather conditions	Swell	Significative Height	Below 1m	3.9 m
		Period	8.5s	12s
		Orientation	SW	SW
	Current	Vitesse	1 m/s	2 m/s
		Orientation	NW	NW
	Vent	speed	9 m/s	19 m/s
		Orientation	ENE (NE /ESE)	ENE (NE /ESE)
Environnment	Water depth	100 m		
	seabed	sand		

MOP reference scenario

3 major activities:

- container hub
- O&G logistical activities
- support services for aquaculture and fisheries

2 step pilot:

- Step one in 2026**, a 14 ha platform to deal with:
 - 150 00 TEU per year
 - logistic support for 2 O&G platforms
 - 5000t/yr of aquaculture fish
- Step 2 in 2030**, a 20 ha platform to deal with:
 - 300 00 TEU per year
 - logistic support for 3 O&G platforms
 - 5000t/yr of aquaculture fish

The floating MOP will be located 75 nm North-East of Cayenne, by 75m depth on sand soil

- for fish farming*
- close to Shelf Break for OTEC*



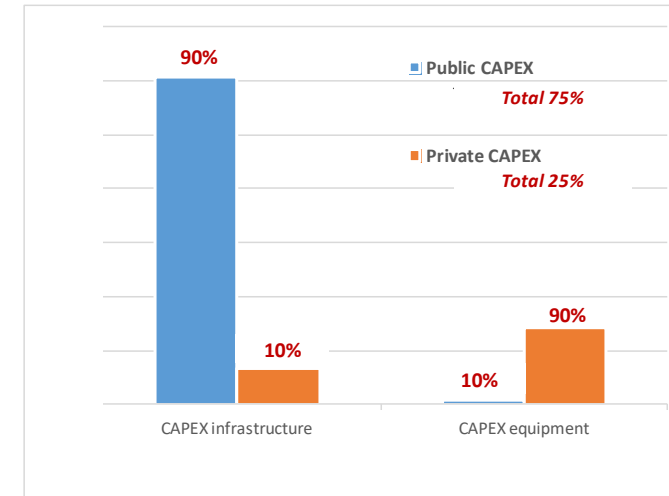
Power source:

- Step1: diesel or already OTEC**
 - Consumption : 25'000MWh/yr
- Step2: OTEC 5 / 10 MW**
 - Consumption : 35'000MWh/yr
 - Diesel as backup

Project Financial attractiveness demonstrated

Item	Value	Unit
CAPEX	1436	€million
OPEX	2030	€million
DECEX	6	€million
Cost of finance	1384	€million
Container hub revenue	60	€million/year
O&G support revenue	86	€million/year
Aquaculture revenue	37	€million/year
Levelised cost, FLW_WAV	110%	-
Simple payback	12.1	Years
<i>Discount rate of WACC</i>	<i>5.0%</i>	-
Operating for	40.0	Years
Payback	20.7	Years
NPV (yr -4)	15.0	€million
NPV (yr 0)	19.0	€million
NPV (yr 0)/CAPEX	1.2%	-
IRR	5.1%	-

• Project funding

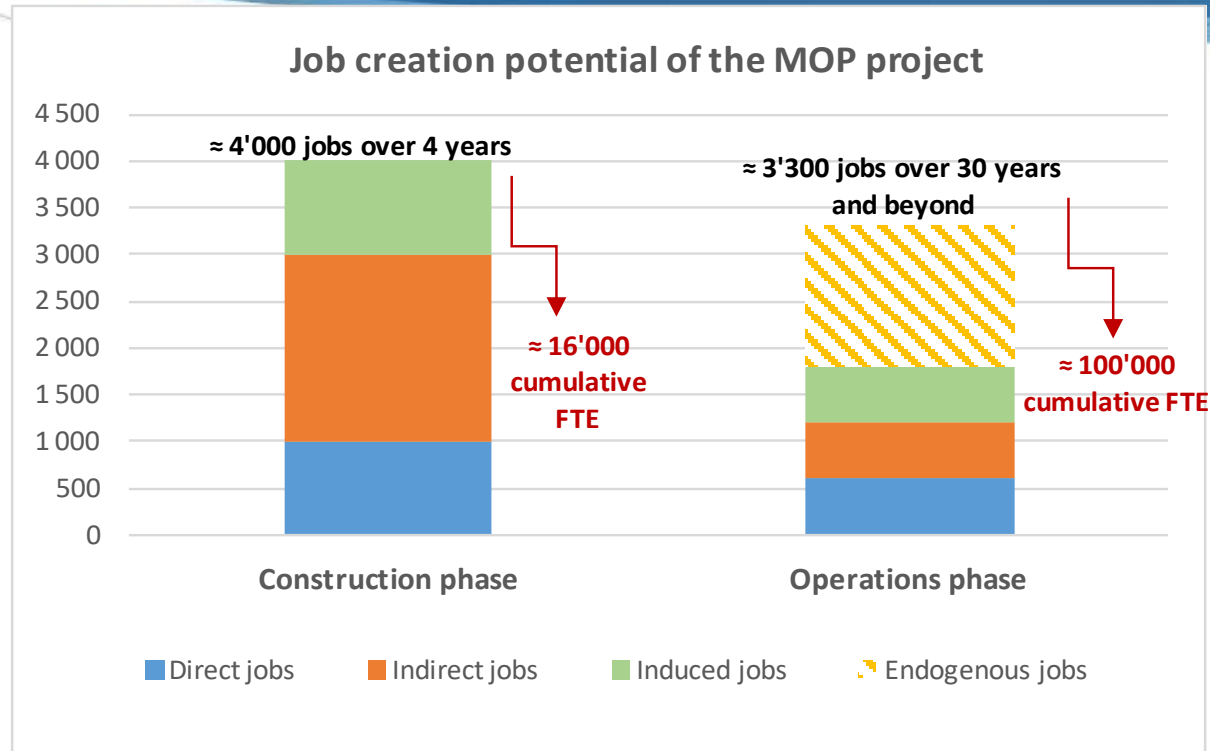


Reference financial plan:

- 75% from public financial vectors
- 25% from private investment

- The share of financing related to infrastructure would be mostly public (90% public vs. 10% private)
- While the one related to equipment would be mainly private (10% private vs. 10% public)

Project Evaluation of socio-economic benefits



A potential impact of around +3% of GDP in French Guiana

- **Construction phase** (estimated duration: 4 years) peak load difficult to capture in French Guiana
 - Limited industrial capacities and time of a significant increase in local demand (concrete and steel production, equipment manufacture and complex subassemblies assembly, offshore integration...)
- **Recommendations :**
 - Focus on **the operations phase, which refers to activities and long-term jobs, over 40 years at least** (MOP lifetime: about 100 years)

STEP 2 GENERAL ARRANGEMENT MOP 8*8

The 8x8 MOP, below, will host the 300 000 EVP container hub and the O&G logistical base.

It is composed of 73 modules, 62 similar elementary modules 63m(x43mx15m), plus 10 wave breaker modules.



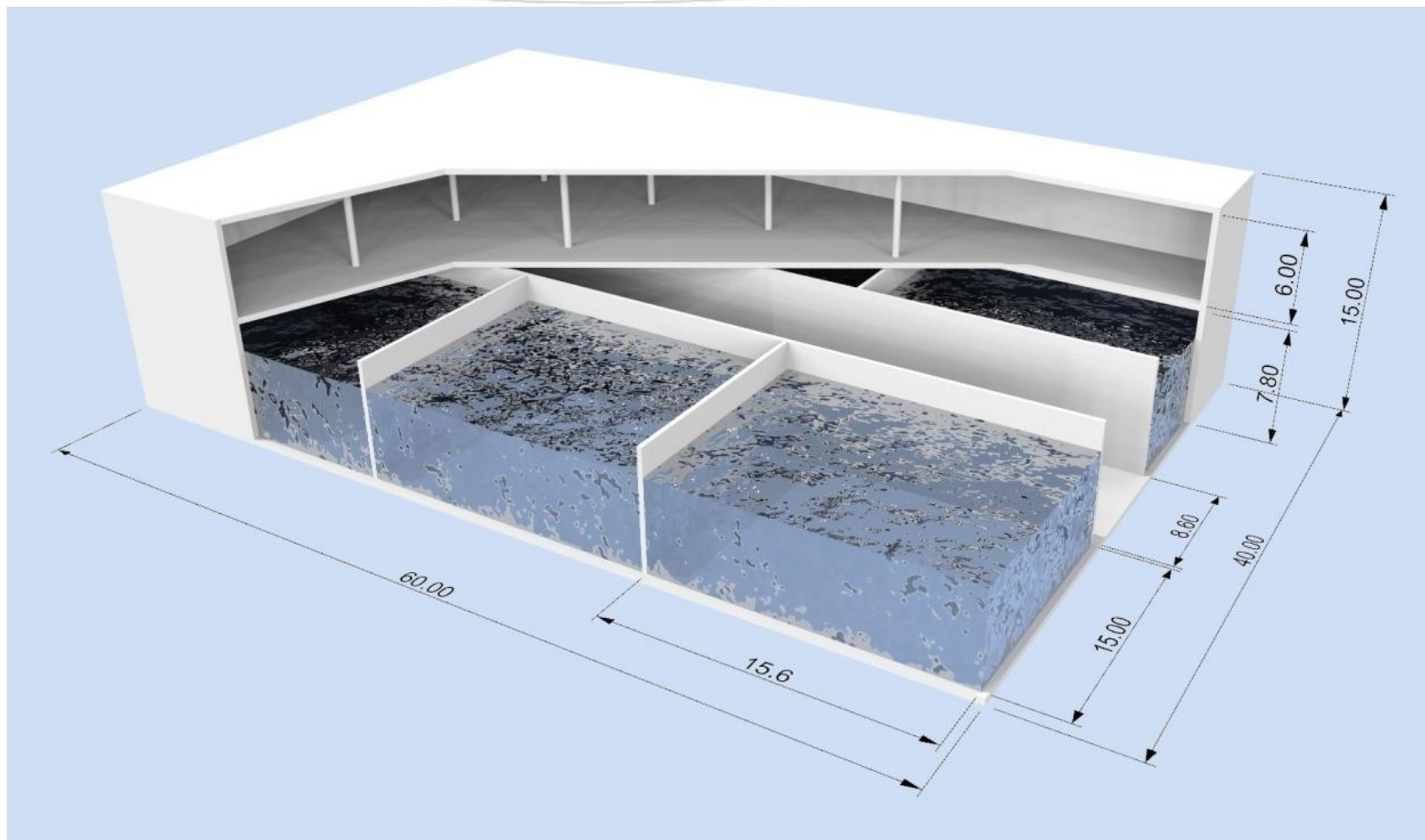
3400 m³ of concrete per module

220 000m³ of concrete for the platform

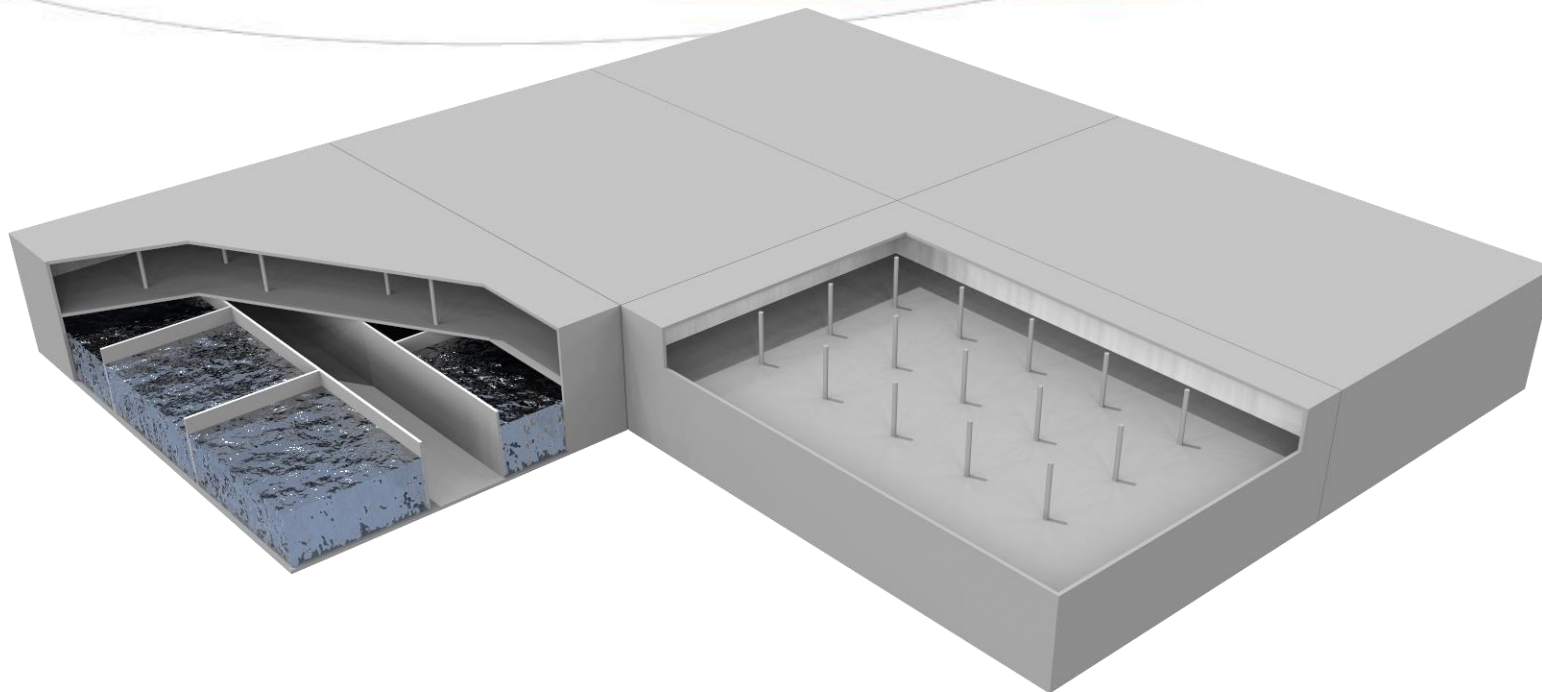
Lessons learnt from Total Nkossa FPSO and EC FP7 TROPOS project

Total outdoor surface totale: 19.1 Ha / Dimensions : 567m /: 430m

ZOOM ON ELEMENTARY MODULE



MODULAR STRUCTURE



Technical studies to be conducted

- ♦ **Modular Platform production, transport, assembly and anchorage methodology**
 - ♦ in cooperation with Oil & Gaz EPCI companies
- ♦ **Inter Modules connection constraint analysis and solution development**
- ♦ **Module anchorage constraint analysis and solution development**
- ♦ **Platform protection against waves and storm surges,**
 - ♦ in connection with costal protection projects

FRENCH GUIANA VISION 2028

**To build with the MOP a sustainable industrial future
looking towards the maritime space, inter-regional integration and marine resources**

