



Advanced Third Age Renewable Energy Company



# Harnessing the Power of the Ocean's Waves



# Marine trade sector

NO<sub>x</sub>

CARBONE NOIR

CO<sub>2</sub>



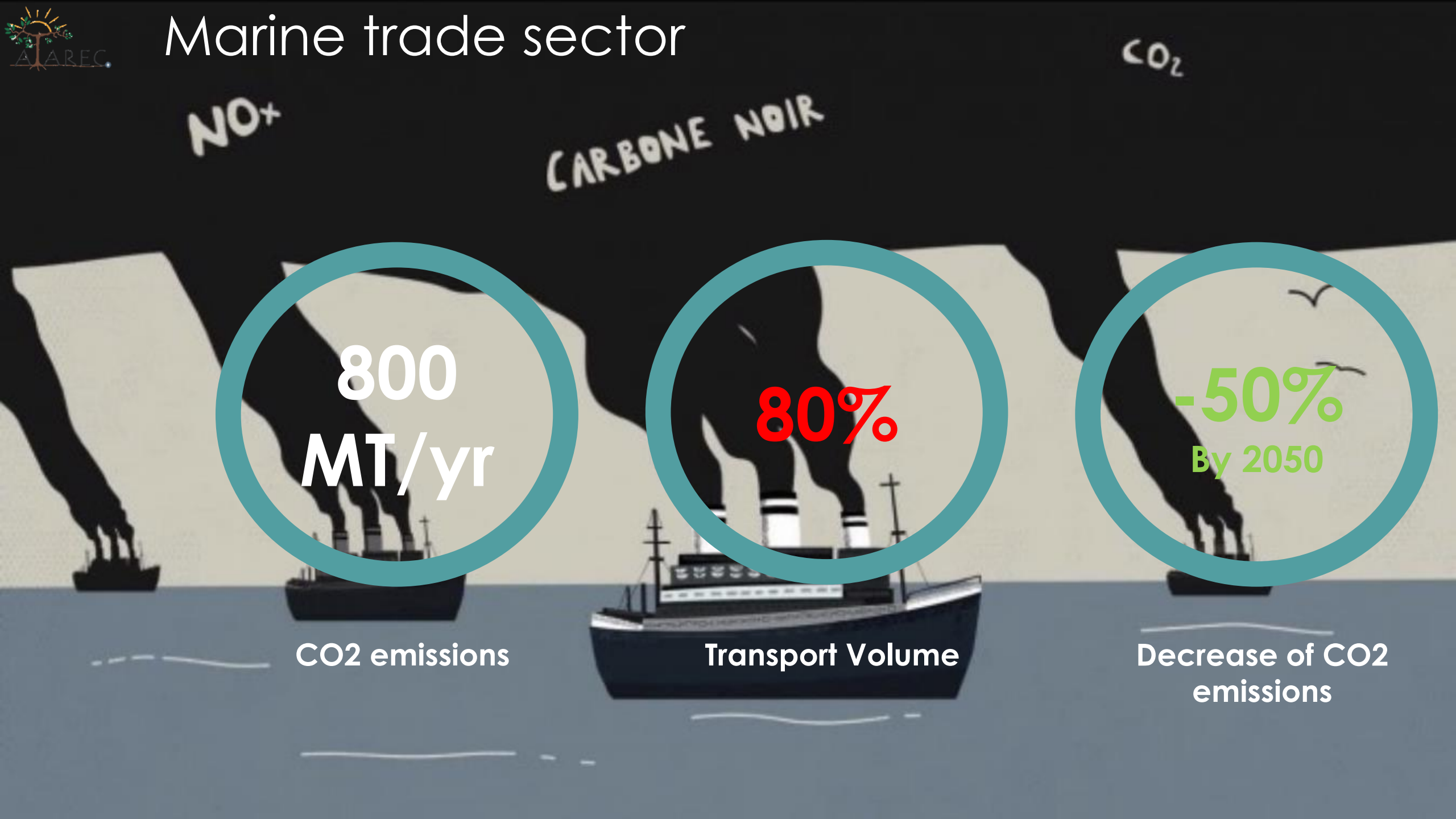
CO<sub>2</sub> emissions



Transport Volume



Decrease of CO<sub>2</sub> emissions



# 1. The Genesis of Wave Beat

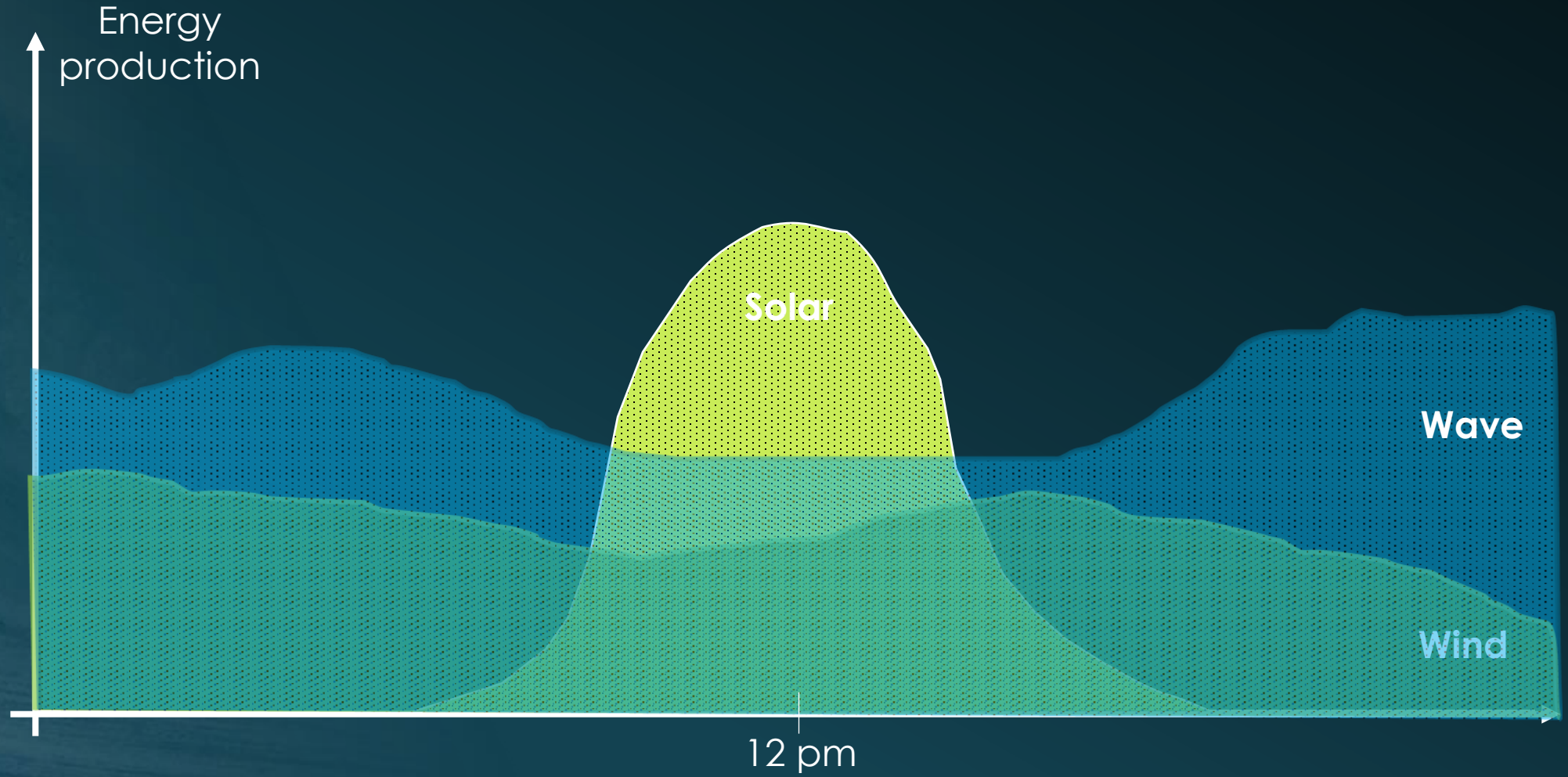
2019, on Tanger Med breakwater ...



# Intermittence is a big limitation for Green Energy Transition

## Wave energy is 4 times more stable then solar

### 2. Green autonomy



**Green energy capacity : 36%**

### 3. Solution

## WAVE BEAT: giving a new life to exposed to sea infrastructures



Detroit of Gibraltar



Tanger Med Port  
Breakwater

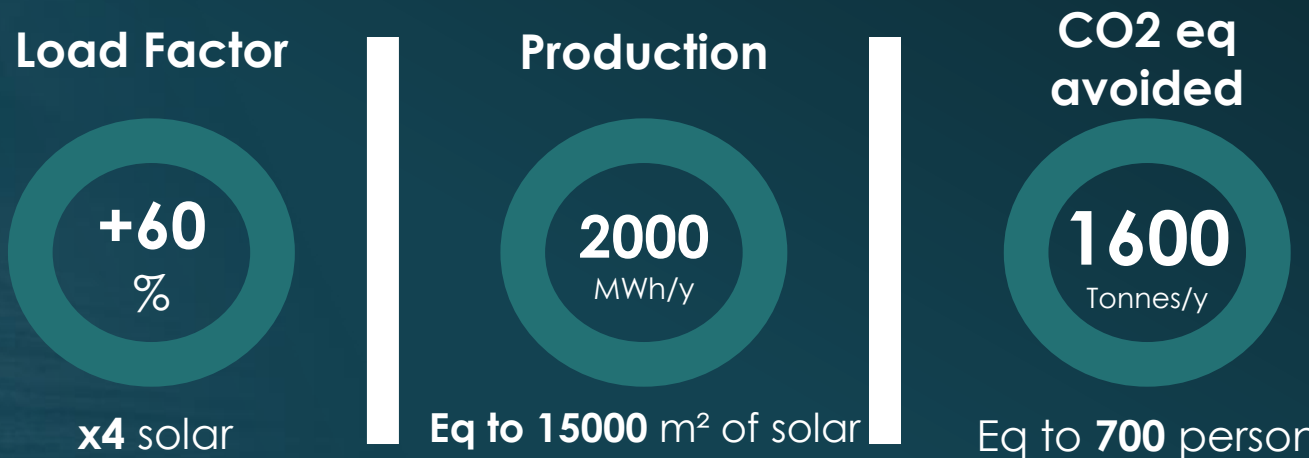
Redefine the role of infrastructures exposed to sea, from breaking waves to mining green energy

### 3. Solution

# WAVE BEAT: a game changer for harnessing Wave Energy

**70%\*** of the investment is already paid  
by the asset owner

Projected **WAVE BEAT** 750 KW performance :



### 3. Solution

## WAVE BEAT : How it works



Ocean Waves

Amplification sub-system: it amplifies the incident wave

1. Amplify



**WEC** (Wave Energy Converter): it converts wave into mechanical energy

2. Capture



**PTO** (Power Take-Off): it converts mechanical energy into electricity

3. Convert

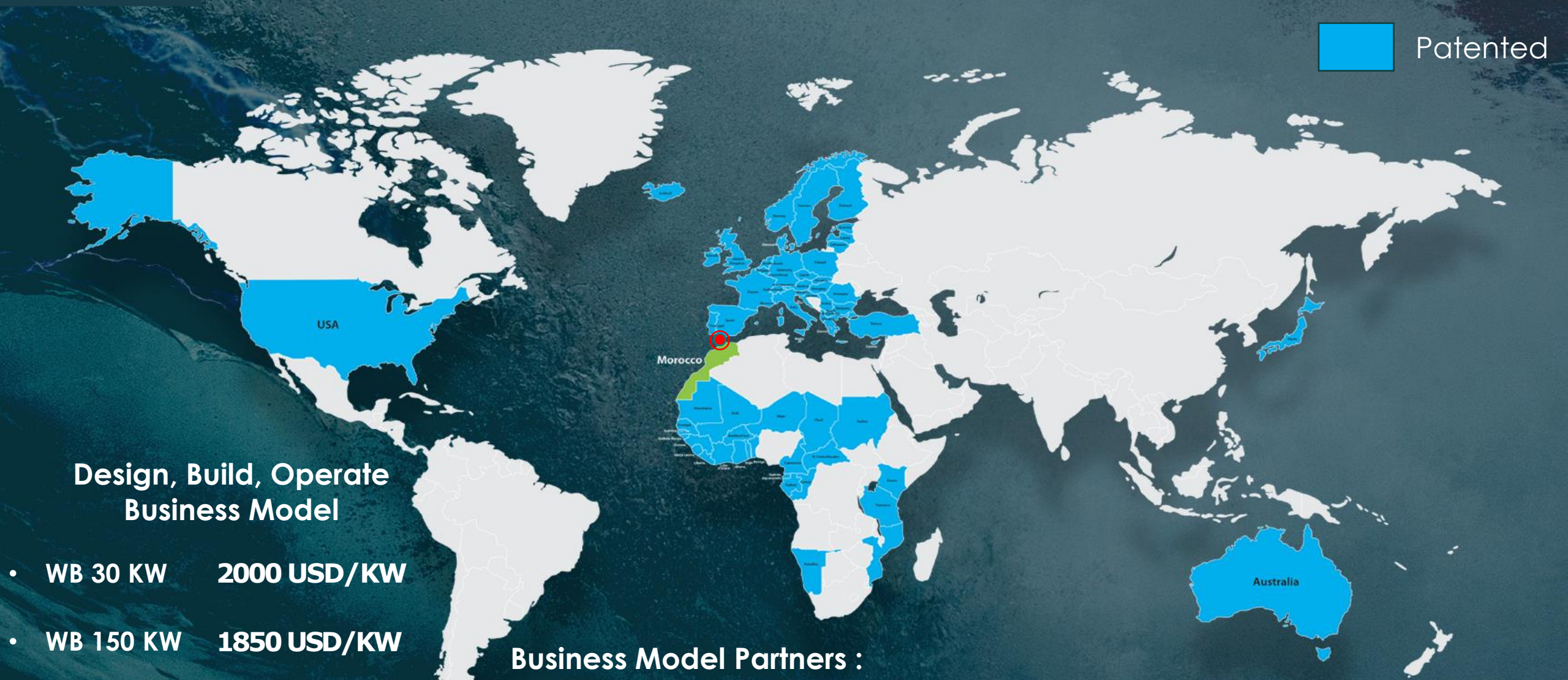


ON-GRID

# Show case validation

## 4. Traction

Patented



**Design, Build, Operate  
Business Model**

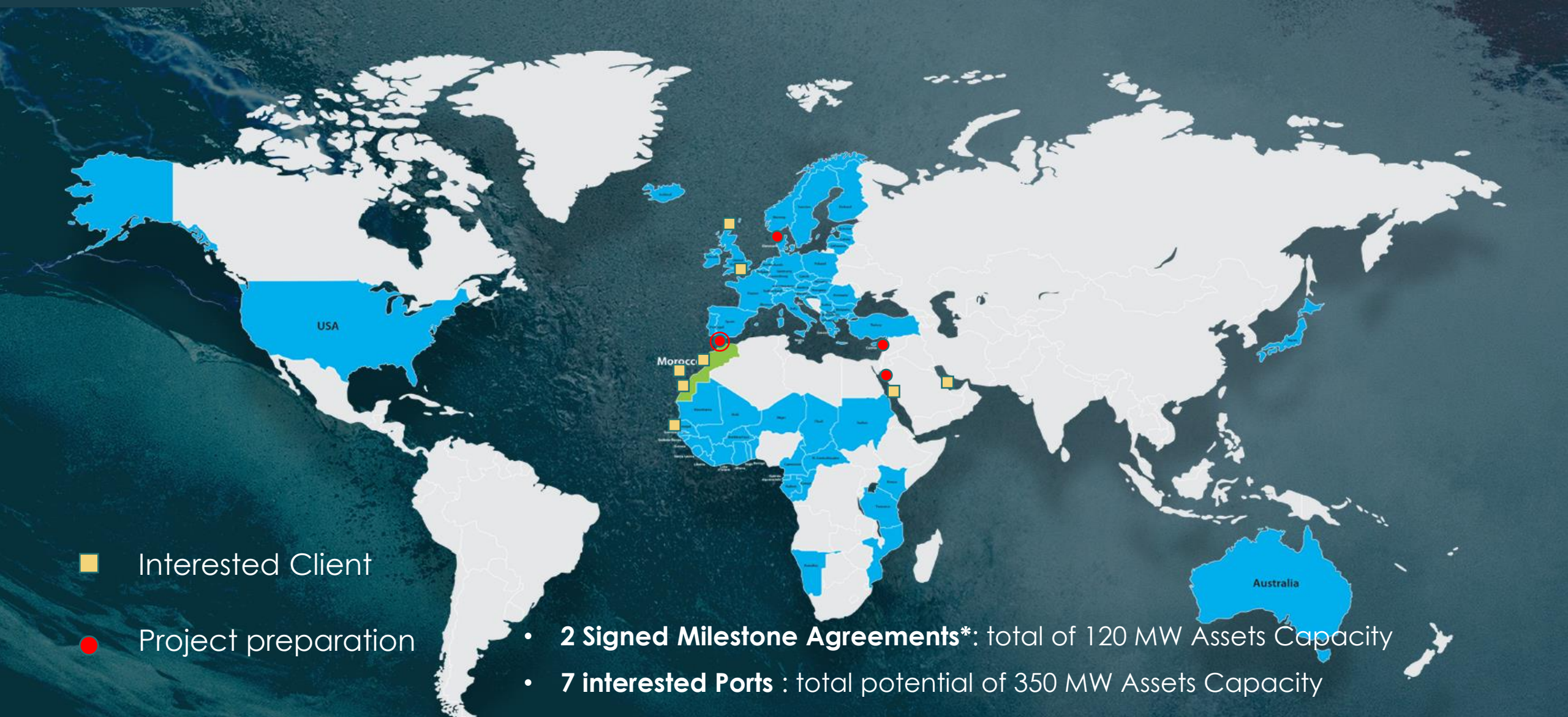
- WB 30 KW     2000 USD/KW
- WB 150 KW   1850 USD/KW
- WB 750 KW   1700 USD/KW

**Business Model Partners :**



# Project expansion

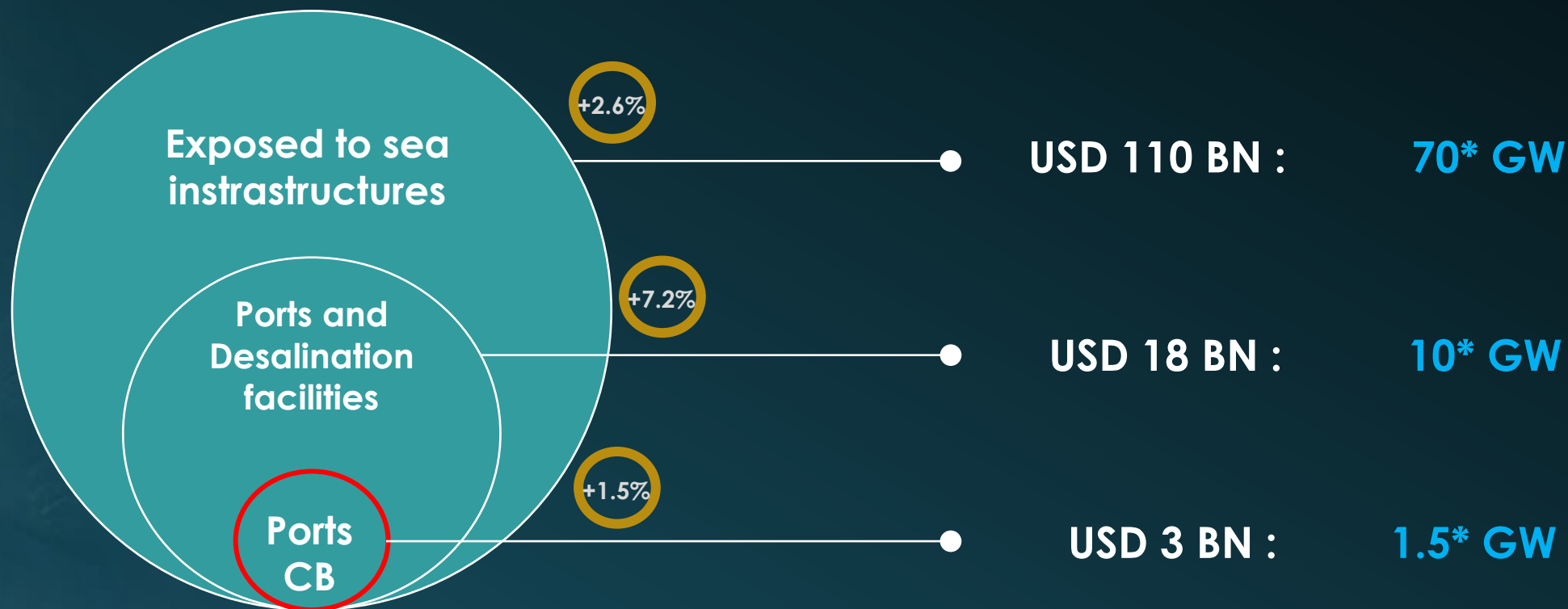
## 4. Traction



- Interested Client
- Project preparation

- **2 Signed Milestone Agreements\***: total of 120 MW Assets Capacity
- **7 interested Ports** : total potential of 350 MW Assets Capacity
- Preparing First Pilot in Middle East with KAUST and MEWA

# Sustainable Energy Generation from Waves Global Market Size\*



Market CAGR

**7000 GW**

Cover more than humanity total needs on electricity

\* : Wave energy potential, based on available asset capacity exposed to waves

## 6. Competition

# WAVE BEAT: the most suitable energy generation Tech for ports

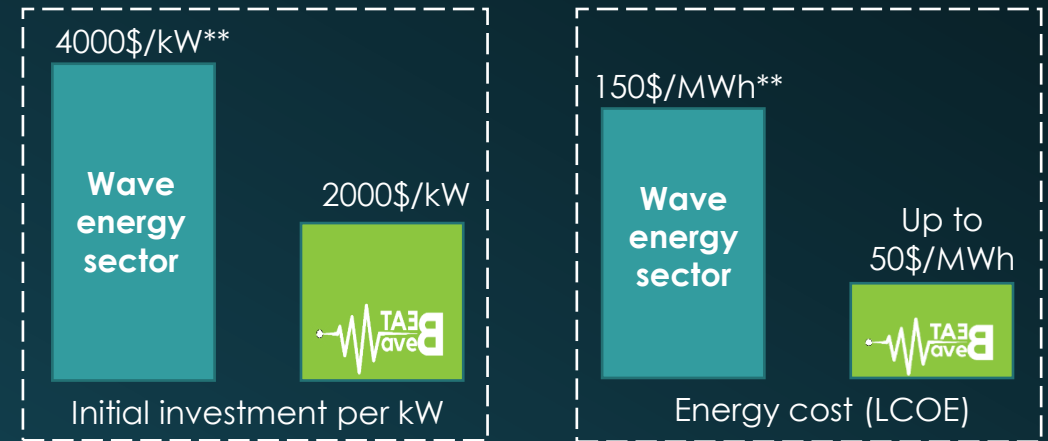
### Beachhead market: Ports with caissons

#### Non Direct Competition – Renewable energy

✓ Cost			
✓ Crowdness			
✓ Flexibility*			

#### Direct Competition – Wave Energy

✓ Developing sector: 55 MW installed around the world



\* : Combined between continuousness and predictability

\*\* : Based on mdpi [report](#): Assessment of Wave Energy



# Combining Engineering and Marine Expertise to drive a Sustainable Future



## 7. Team



Oussama Nour

President and Co-founder  
+11 years energy sector  
Future Energy Leader  
(by the World Energy Council)



Mohamed Taha El Ouaryachi

CEO and Co-founder  
+11 years developing new business  
and dealing with waves



Ossama Abdelkhalik

CTO  
+23 years aerospace and wave engineering  
Coffman Faculty Chair, Professor at Iowa  
University

## Supported by top tier advisors from Africa's Leading Organizations



Mohamed Arjouan

+40 years Projects builder  
Deputy General Manager of Tanger Med Port  
and board member of Tanger Med Engineering



Yassine Laghzioui

+15 years Innovation and startups  
CEO of UM6P Ventures and Director of  
Entrepreneurship and Venturing at UM6P



Hans Henrik Christensen

+30 years in Business development and  
global partnership management

TANGER MED

UM6P  
VENTURES





# Humanity needs wave energy, together we can make it

## 8. Team



The collage features logos from the following organizations:

- TANGER MED**
- UM6P VENTURES**
- TANGER MED ENGINEERING**
- MOHAMMED VI POLYTECHNIC UNIVERSITY**
- Tanger Med Utilities**
- ROYAUME DU MAROC** / **MINISTÈRE DE L'INDUSTRIE ET DU COMMERCE**
- AMDIE** (Agence Marocaine de Développement des Investissements et des Exportations)
- United Nations**
- European Union**
- edf**
- IRESEN** (Institut de Recherche en Énergie Solaire et en Énergies Nouvelles)
- CE3M** (Cluster Electronique, Mécatronique & Mécanique du Maroc)
- GIMAS** (GROUPEMENT DES INDUSTRIES MAROCAINES AERONAUTIQUES ET SPATIALES)
- giz**
- OXFAM**
- ROYAUME DU MAROC** / **ROYAUME DU MAROC**
- EMERGE** (STARTUPS · INNOVATION)
- Royal HaskoningDHV** (Enhancing Society Together)
- OPERA**
- MARIN**
- green energy Park**
- ECOLE MOHAMMADIA D'INGÉNIEURS**
- ECOLE HASSANIA DES TRAVAUX PUBLICS**
- AEB**
- U30**
- Ministry of Environment Water & Agriculture**
- code**
- CENTER OF DIGITAL ENTREPRENEURSHIP**
- Ministry of Communications and Information Technology**
- PLUGANDPLAY**
- ClimateLaunchpad**
- CIP** (Global Cleantech Innovation Programme)
- ORANGE CORNERS**
- Microsoft for Startups**

**Thank you !**

**WAVE BEAT Demonstrator**



**Video of our last report  
on BBC World News**



Click here or visit us  
in Tanger Med Port

