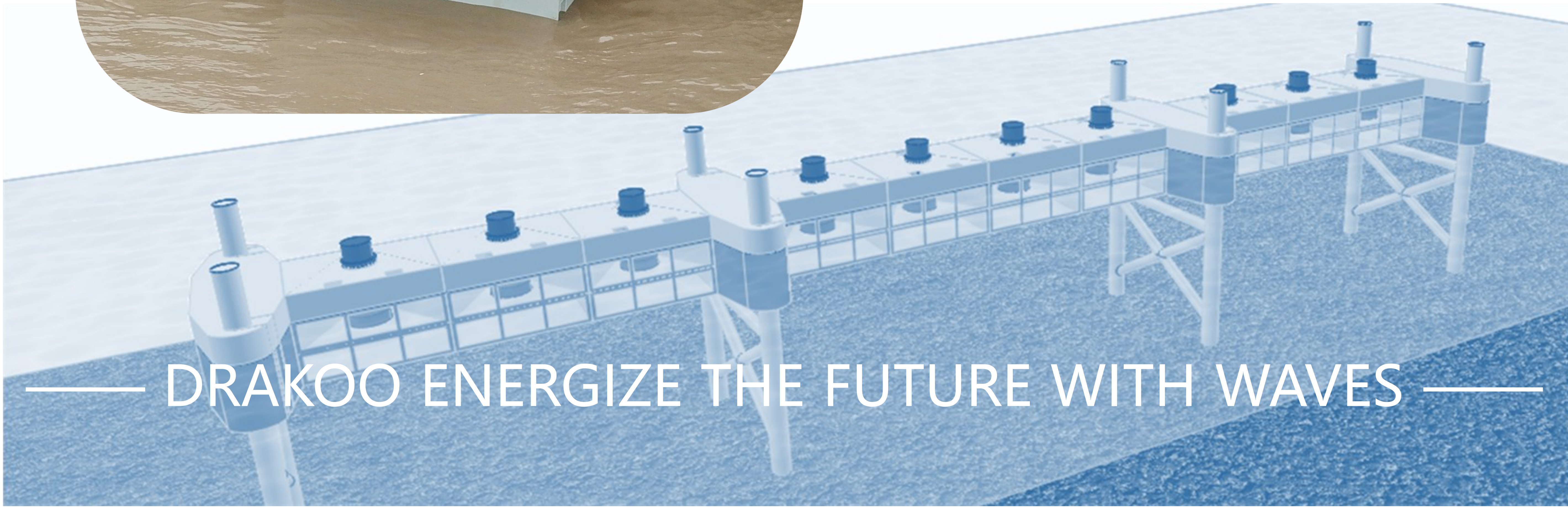




DRAKOO

THE MOST COMMERCIALY VIABLE WAVE
ENERGY TECHNOLOGY TO DATE



— DRAKOO ENERGIZE THE FUTURE WITH WAVES —

Effect Verified

- ✓ Lab Tests and Sea Trials: > 10,000 hours
- ✓ Expected Annual Full-Capacity Output: > 3000 hours
- ✓ Concept, Output & Applications Verified by
NAREC, DNV & ATKINS

Cost-Effective & Efficient

- ✓ Drakoo Wave power costs as low as **\$0.063/kWh***
- ✓ Integrated power generation (offshore wind +
Drakoo wave energy): **\$0.057/kWh***
- ✓ Breakeven Period: 3-7 years from diesel
power cost savings

Broad Application Market

- ✓ Ideal for Offshore Facilities & Remote Islands
- ✓ Excellent replacement for diesel power

Proprietary Technology

- ✓ Internationally patented in over 20 countries

Commercialization Progress

- ✓ Projects in Pipeline: > 100MW

STRATEGIC PARTNERS



NUMEROUS ADVANTAGES & INFINITE POTENTIAL



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Wave energy is one of the most promising sources of energy in the renewable energy sector. Compared to solar/ wind energy, wave energy has the advantages of greater energy density, higher power generation efficiency and longer full power generation time throughout the year. In small and medium-sized waves, Drakoo is an efficient and stable wave energy converter. At the same time, it is an ideal alternative to diesel power generation for off-shore installations and remote island power supplies due to its environmental benefits and low power generation costs. It can also be integrated with existing offshore wind farms to increase overall power generation.

Advantages of Wave Energy



Solar And Wind Energy Equipment occupies a large space



	Solar/Wind Energy	DRAKOO
Energy Density	Low	High
Generation Efficiency	Low	High
24/7 Electricity Generation	No	Yes
Predictability	Low	High
Space Occupied by Equipment	Large	Small
Full Power Generation Time (Annual)	Short	Long

Wednesday Oct 23, 2019				
Time	Wind	Weather	Air	Waves
12am	12kts max 13kts		29°C 1009hPa	1.3m 11s
3am	11kts max 13kts		29°C 1007hPa	1.2m 12s
6am	12kts max 13kts		29°C 1009hPa	1.2m 10s
9am	12kts max 14kts		29°C 1010hPa	1.2m 11s
12pm	13kts		30°C 1009hPa	1.2m 11s
3pm	10kts max 11kts		30°C 1007hPa	1.1m 11s
6pm	9kts max 10kts		30°C 1007hPa	1.1m 9s
9pm	10kts max 11kts		29°C 1009hPa	1.1m 9s

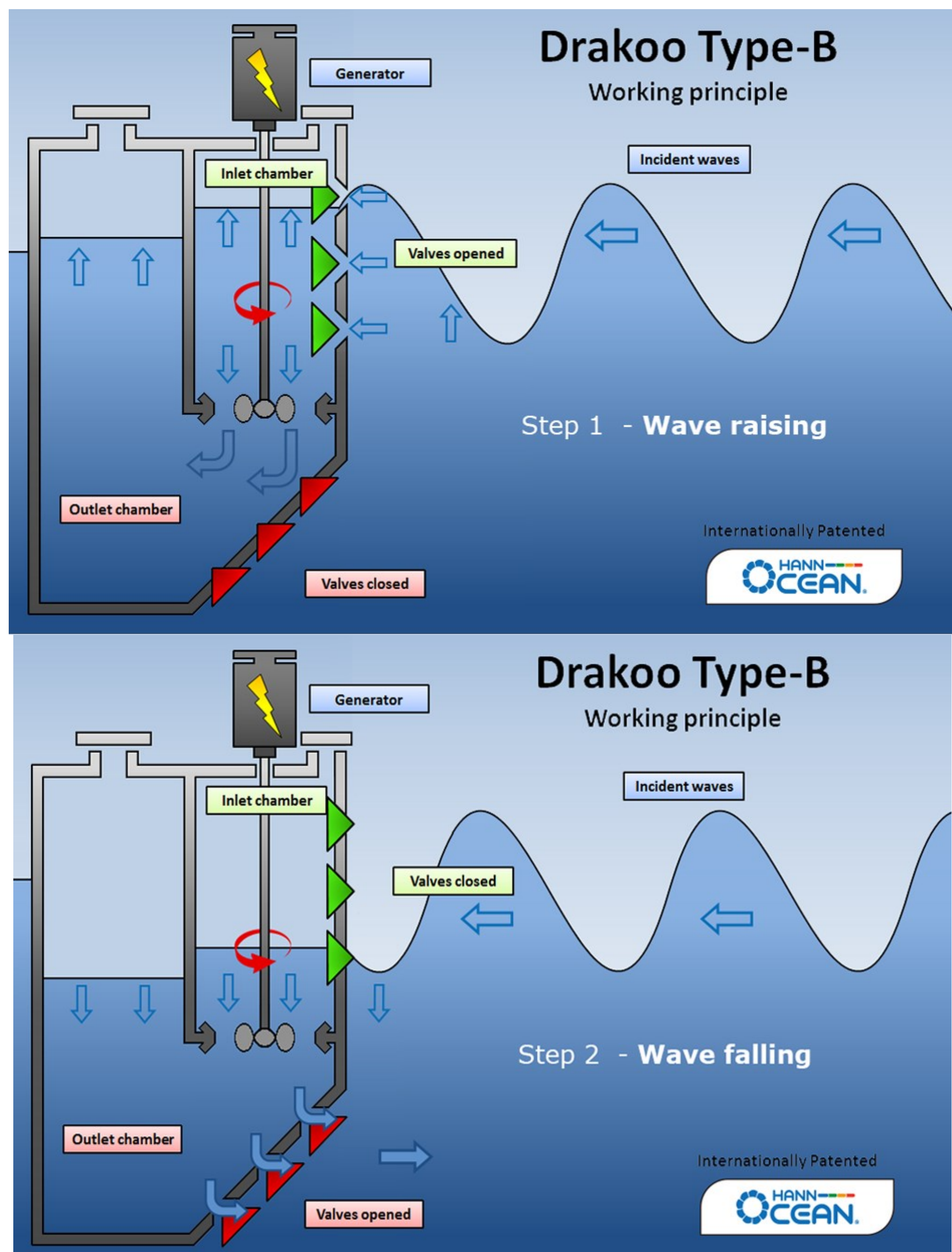
EXTREMELY STABLE WAVE RESOURCES



WORKING PRINCIPLE OF DRAKOO



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Hann-Ocean's internationally patented wave energy converter Drakoo works by transforming ocean waves into a stream of continuous water flow which drives a hydro-turbine generator.

FIRSTLY: An incoming wave crest increases the inlet chamber's water level. Simultaneously, water is partly directed from the inlet to the outlet through a hydro-turbine set within the hull.

SECONDLY: As the wave crest passes inward and the water level outside falls with the incoming trough, so do the levels in both the chambers of the device, leading to a flow from the inlet chamber to the outlet chamber via the turbine, followed by flow from the outlet chamber to the outside environment.

ADVANTAGES OF HANN-OCEAN & DRAKOO

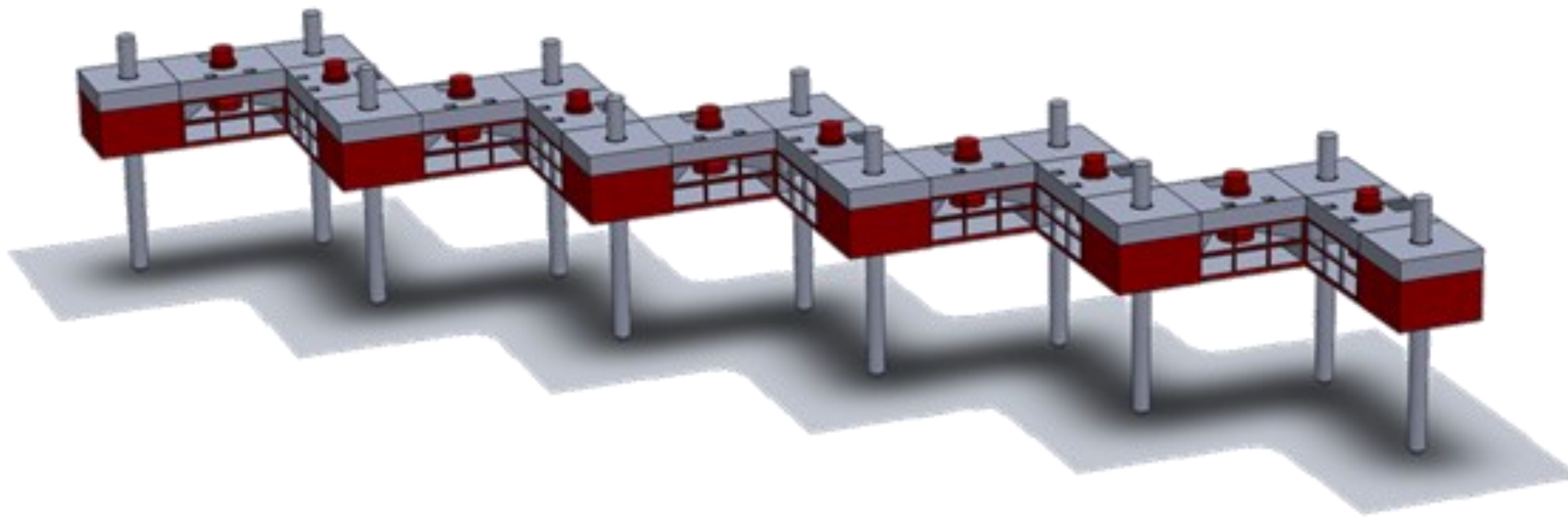
Industry-leading Innovation: Covering coastline, nearshore and offshore areas, Drakoo's power and capacity factor has been proven to be far superior to other existing wave energy converters. Hann-Ocean's self-owned patents for Drakoo Wave Energy Converter have been granted in the USA, UK, China, Canada, Denmark, France, Norway, Australia, Japan, Korea, Germany, Ireland, Netherlands, Portugal, Spain, Malaysia and Indonesia.

Verified Performance: Over 10,000 hours of laboratory and offshore testing with a capacity factor of up to 34%, which equates to 3,000 hours of fully loaded power generation annually for a fixed Drakoo wave energy converter. 30% conversion efficiency has been verified by DNV, which is nearly twice the average efficiency of other known wave energy converters.

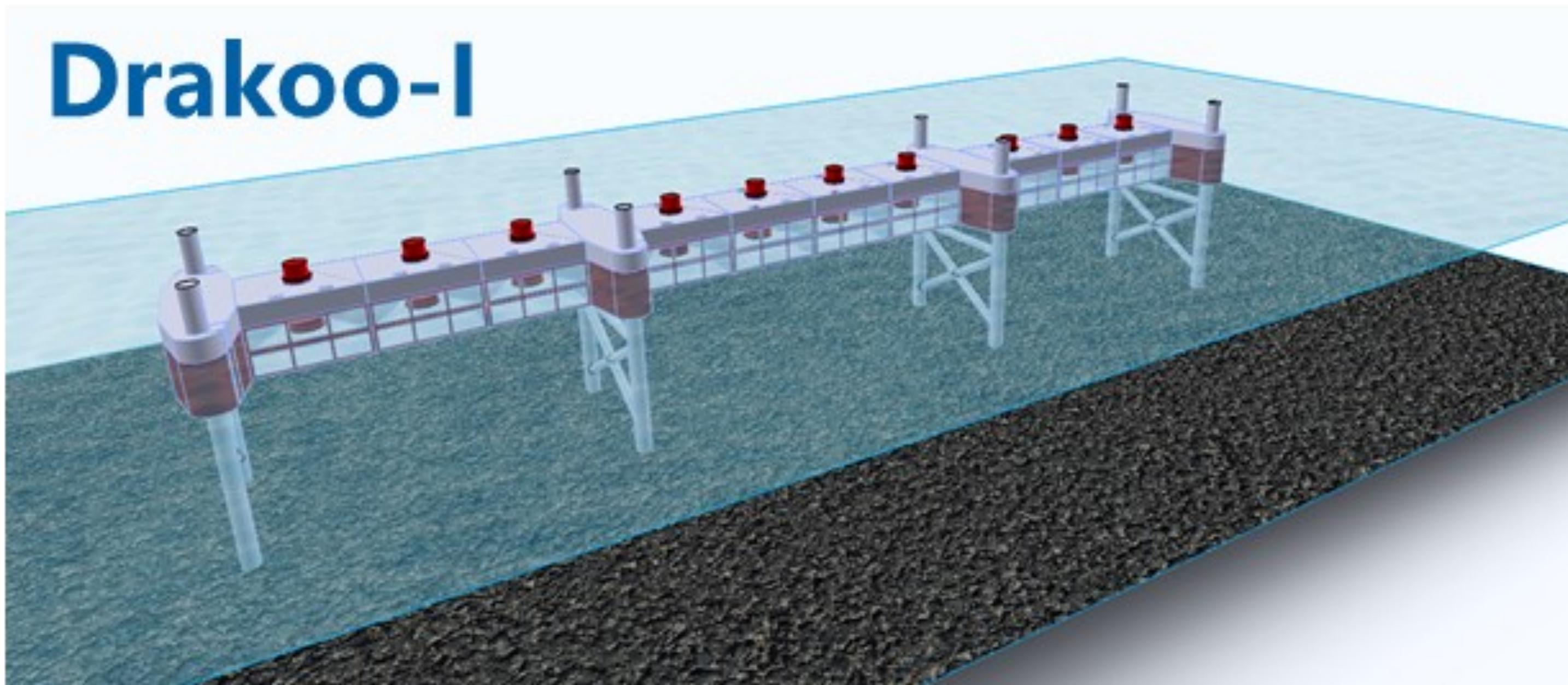
Third-party Recognition: Certified by NAREC and DNV. Stable cooperation has been established with many professional companies and institutions in the industry, including China Shipbuilding Research Centre, High Performance Computing Institute of the Singapore Science and Technology Research Agency, China Electric Power Construction Group East China Survey and Design Institute, CCCC Third Institute of Navigation Engineering Survey and Design, Sembcorp Industries Singapore, Atkins Group, National Marine Technology Centre of the Ministry of Natural Resources of China, etc.

Experienced Core Team: Hann-Ocean Energy specializes in the development, design and supply of floating platform products and marine renewable energy equipment, utilizing its internationally patented technology. Its core team, with long-term positions in large research institutes or companies in the fields of ocean engineering and shipbuilding, possesses rich experience in the research and development, operation, and management of marine equipment. Hann-Ocean has gained widespread recognition and commercial orders in the field of marine and offshore system integration.

Drakoo-W



Drakoo-I

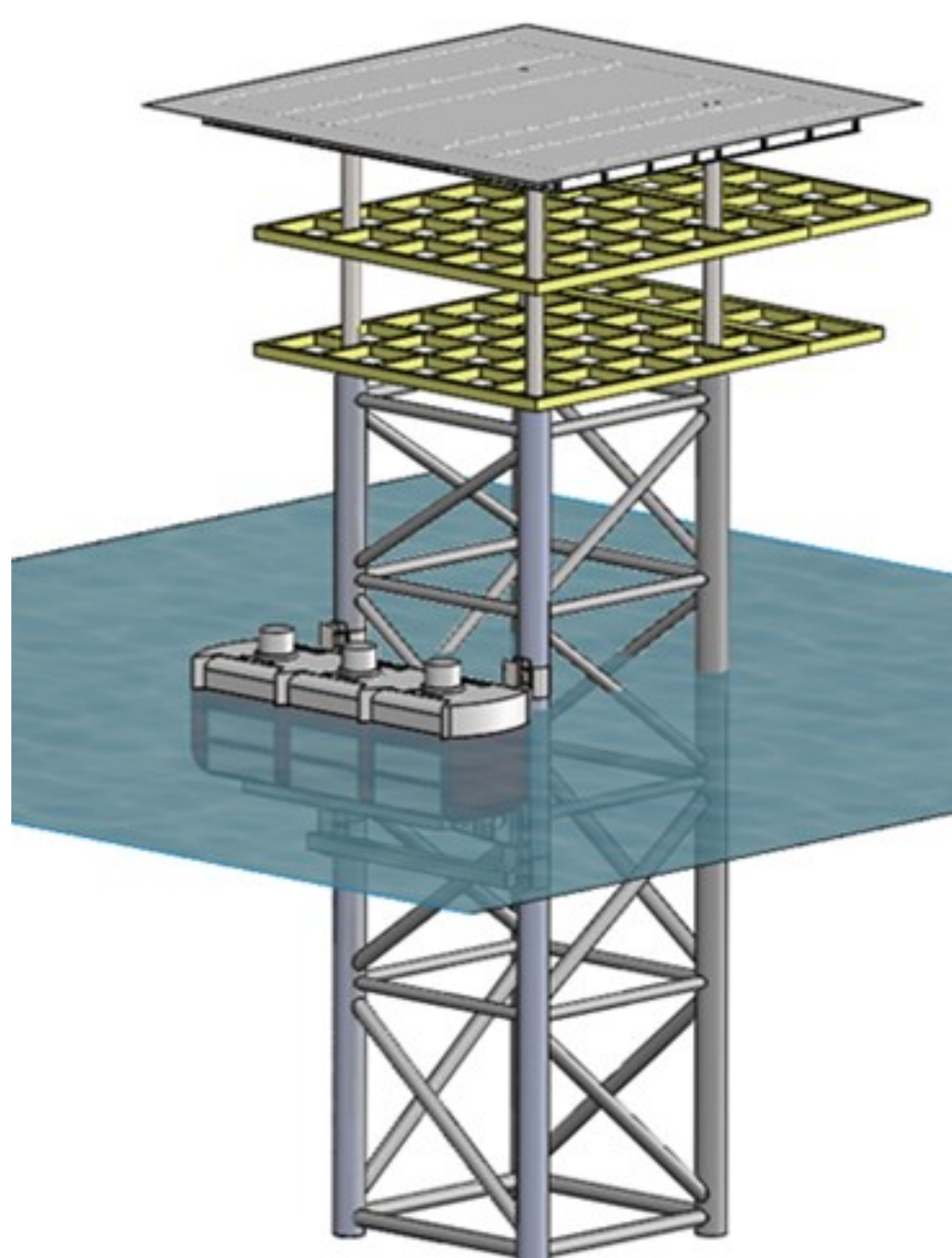
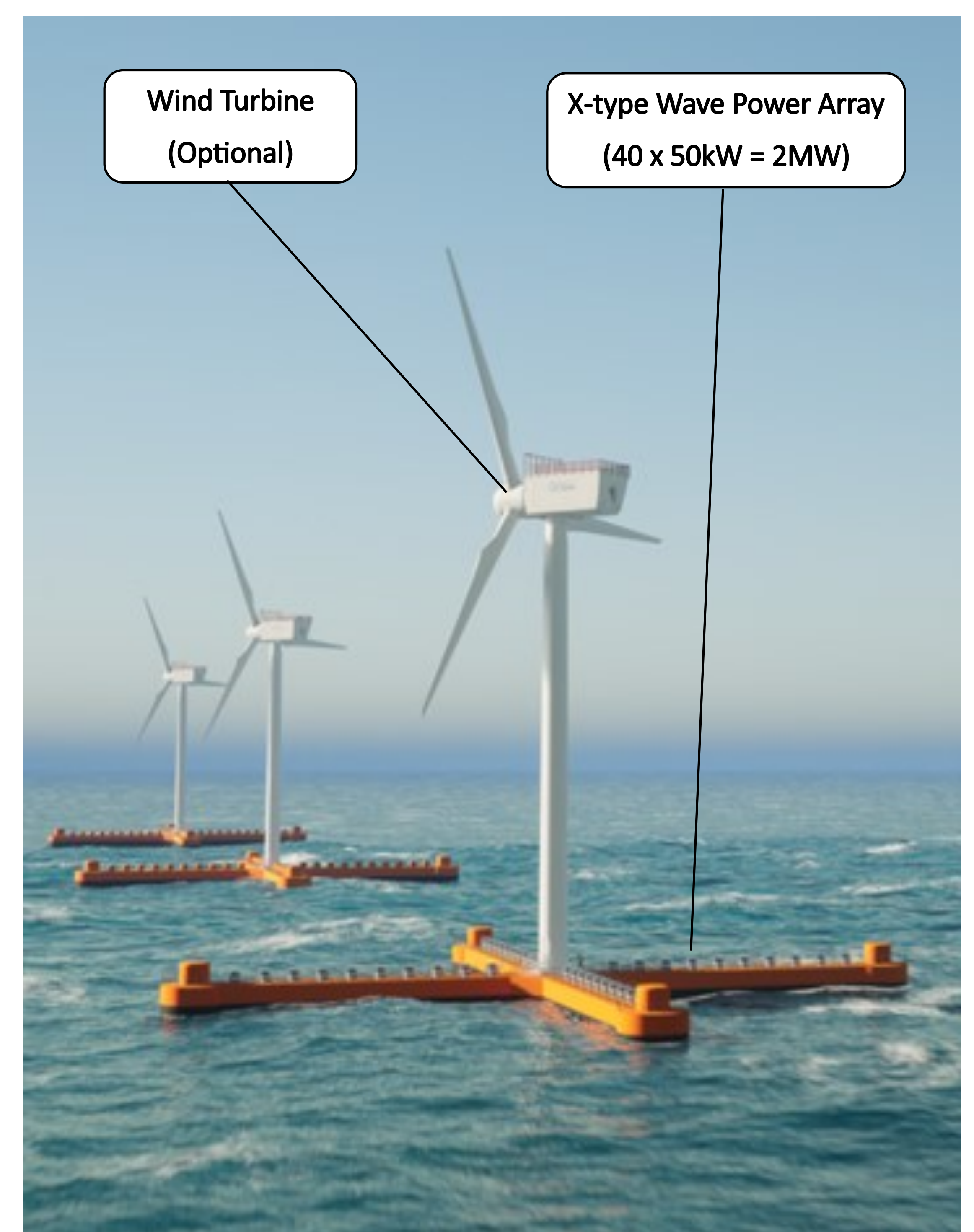


MW-scale Floating Drakoo Array

- A floating mega-watt scale wave energy converter array comprising multiple Drakoo modules (50-100 kW each) is being developed to provide sustainable energy to coastal cities.

Integrated Wind and Wave Power Platform

- A unique integrated marine renewable energy platform is being developed, comprising a wind turbine and wave power array to maximize the use of sea space and enhance the overall energy utilization rate.
- Sharing the subsea cables, transformers, inverters, and the mooring foundation, which reduces the capacity cost and the total lifecycle cost of the installation, while allowing for a stable electrical output from the hybrid system.



Oil & Gas Application

- Completed an engineering feasibility study for the installation of wave generators on oil and gas platforms
- 1. Provided the annual wave power projections of Drakoo Wave Energy Converter array at the chosen site.
- 2. Designed a support structure connecting the wave energy converter to the oil and gas platform.
- 3. Simulated the 6-DOF dynamic loads acting on the jacket.

HANN-OCEAN ENERGY'S 3RD-GEN DRAKOO WAVE ENERGY CONVERTER SUCCESSFULLY COMPLETED SEA TRIAL IN SHENGSI, CHINA

Project Introduction:

Hann-Ocean Energy launched their first third-generation 15-kilowatt wave energy converter (WEC) in Shengsi archipelago, China successfully on the 8th of January 2022. It is entering a one-year sea trial, with the device expected to generate 70,000 kWh of power annually. By July 2022, the first round of sea trial successfully completed. In the following five and a half months, Hann-Ocean's R&D team carried out 21 technical modifications to the equipment, and successfully launched it on February 21, 2023, officially starting its second round of sea trial. The aim was to improve the stability and reliability of its offshore operation. On 8 July 2024, the two-and-a-half-year sea trial came to a perfect conclusion.



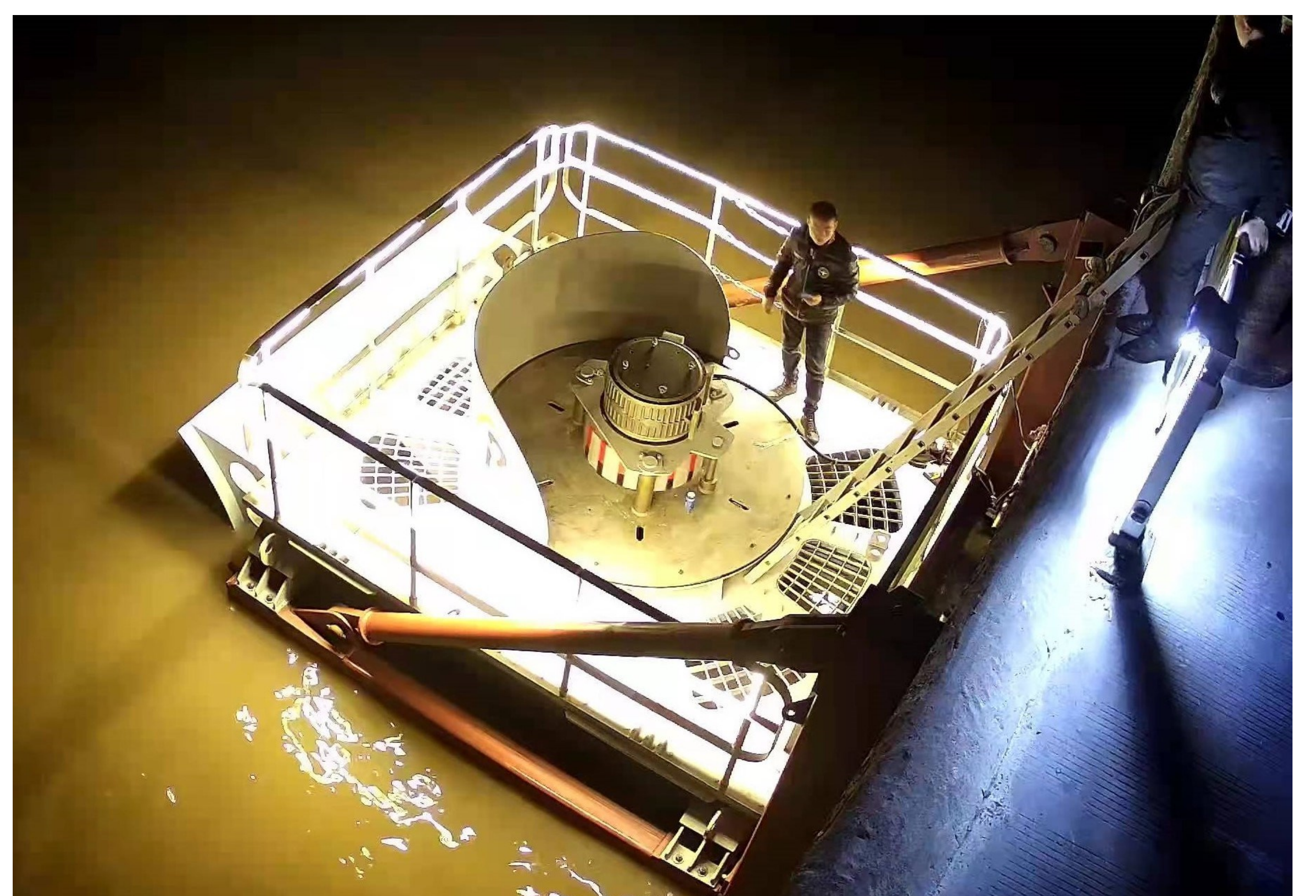
Main Research Contents:

Hann-Ocean accumulated and analyzed the data during the six-month sea trial in 2022, focusing on the stability, reliability, corrosion resistance, pollution resistance and sediment resistance of wave power generation, and optimized design solutions. The results of the sea trial will provide technical support for the future application and innovative promotion of wind, light, wave and other energy micro-grid clusters on the island, as well as providing statistics on the local wave energy resources available.

Drakoo Introduction:

The generator is of a cubic modular design, with dimensions of 3 x 3.5x 5.1 meters and weighs 15 tons. It was independently researched and developed by Hann-Ocean Energy. Drakoo is able to transform random sea waves into a unidirectional stream of water, through the use of multiple passive one-way valves, such that the hydro turbine continuously turns and creates power. One of the key strengths of this device is the ability to generate electricity even with a miniscule wave height of 0.1 meters. This ability makes the WEC extremely versatile, being capable of generating power even when deployed in areas with relatively calm waters.

Drakoo has the advantages of high energy conversion efficiency, compact and modular design, cost-effectiveness, and integration with other offshore structures seamlessly.



Project Significance:

With the Pacific Ocean to the east, Shengsi is particularly rich in wave energy resources and suitable for all-round deep development. This sea trial in Shengsi is to collect data and test its corrosion resistance, sediment resistance and durability to provide data support for future large-scale commercial applications.

As of 8 July 2024, Drakoo has successfully completed two and a half years of sea trials in



Shengsi. It set a new record of generating 600 watts at a minimum wave height of 10cm, with a maximum output of 8.7kW, and has withstood the severe test of 2.4m waves. Its structural performance has also passed the test of Super Typhoon No. 6 "Kanu" in 2023.

Building on this success, Hann-Ocean Energy has formulated plans for commercial application. These plans include product design iterations, further in-depth sea trials, and exploration of new application scenarios. The company also intends to collaborate with offshore wind power projects to achieve energy complementarity, maximizing the potential of renewable resources.

Hann-Ocean Website

Zhejiang News



For more details, please scan the provided QR codes.

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www.hann-ocean.com