

ICOE-OEE 2022



HARNESSING OCEAN ENERGY

A CASE STUDY OF CHINA AS ONE OF THE
LEADERS



CHINA OCEAN ENERGY RESOURCE

COASTLINE AND ISLANDS



China has [18,000](#) kilometers of coastline and 6,960 islands with a total area of [6,700](#) square kilometers. As most of these islands are far from the mainland, they lack energy supply.

To achieve sustainable development of the coastal and island economies, China is placing significant emphasis on the development of ocean energy.

Ocean Energy Type	Technologically Developable Capacity (MW)
Wave Energy	578,000
Ocean Thermal Energy	366,000
Tidal Energy	21,800
Salinity Energy	11,400
Tidal Current Energy	4,190
Total Resource in China	981,390

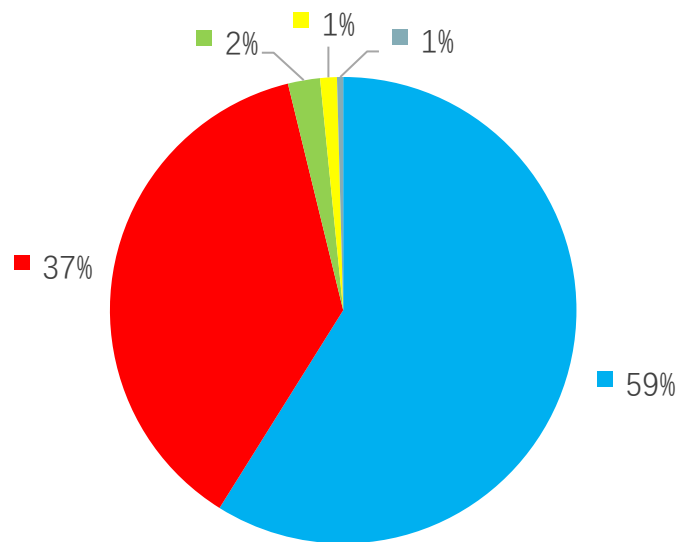


CHINA OCEAN ENERGY DISTRIBUTION

Source: "Coastal Engineering" (2022, Issue 1) in Chinese

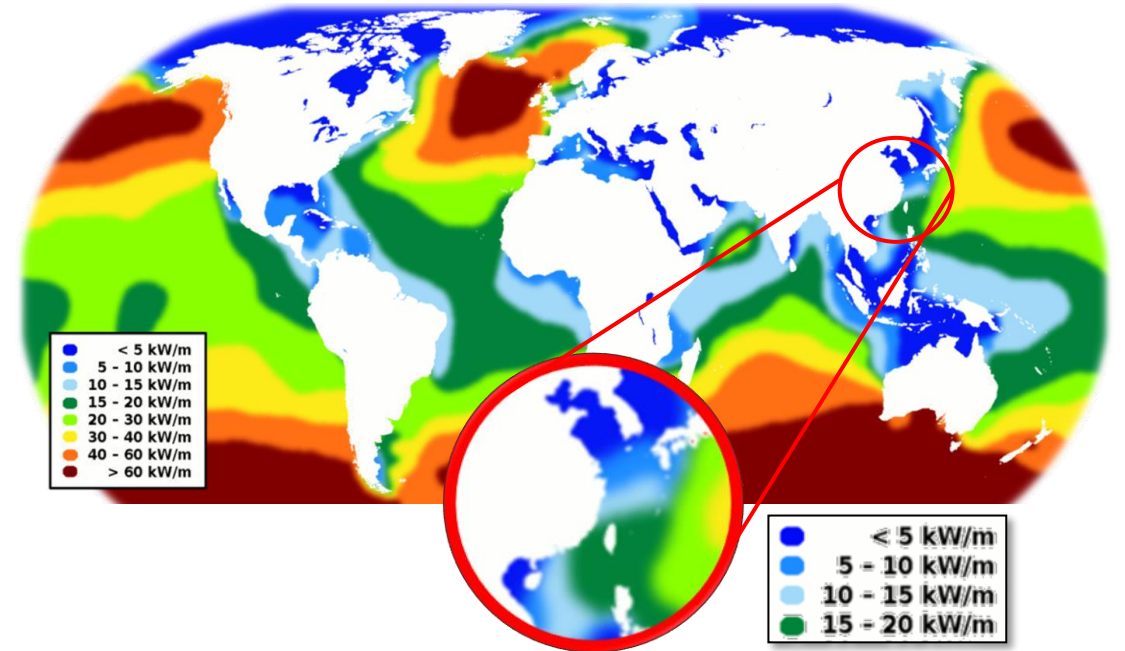
CHINA OCEAN ENERGY RESOURCE

TECHNOLOGICALLY DEVELOPABLE CAPACITY OF OCEAN ENERGY RESOURCE IN CHINA



- Wave Energy
- Ocean Thermal Energy
- Tidal Energy
- Salinity Energy

Source: "Coastal Engineering" (2022, Issue 1) in Chinese



WORLD & CHINA WAVE POWER FLEX

STATUS OF OCEAN ENERGY IN CHINA

TIDAL ENERGY



About 70 tidal power stations built in China in recent years:

- Jiangxia Tidal Power Station (4.1 MW) started producing electricity in 1980
- LHD Modular Tidal Stream Generators (1 MW) was launched and connected to the State Grid in August 2016
- Zhejiang University Tidal Stream Array (650kW) was deployed in 2017 and outputted electricity normally in 2022

Aim to improve its conversion efficiency, reliability and maintainability, cost-reduction and scale-up ability.



Tidal Stream Array of Zhejiang University



TIDAL STREAM ENERGY

STATUS OF OCEAN ENERGY IN CHINA

OCEAN WAVE ENERGY



Chinese research on WEC started in the 1960s. Recent advances in WEC technology has resulted in quantum leaps in their conversion efficiency and survivability.

R&D Institutions in the OE area is growing, including the [Chinese Academy of Sciences](#), the [National Marine Technology Center](#), and universities.

[Hann-Ocean](#) from Singapore is the first foreign WEC developer that launched its WEC in China.



15kW Drakoo WEC
by Hann-Ocean



500kW WEC "Zhoushan"
by Guangzhou Institute of Energy Conversion



WAVE ENERGY CONVERTERS IN ACTION IN CHINA

SUPPORTIVE POLICIES IN CHINA

Central Government

- To fulfill the commitments of CCP on carbon reduction

Local Governments

- The Fourteenth Five-Year Plan for Renewable Energy Development

Universities and Research Institutes

- Providing R&D services and academic assistance and technical support

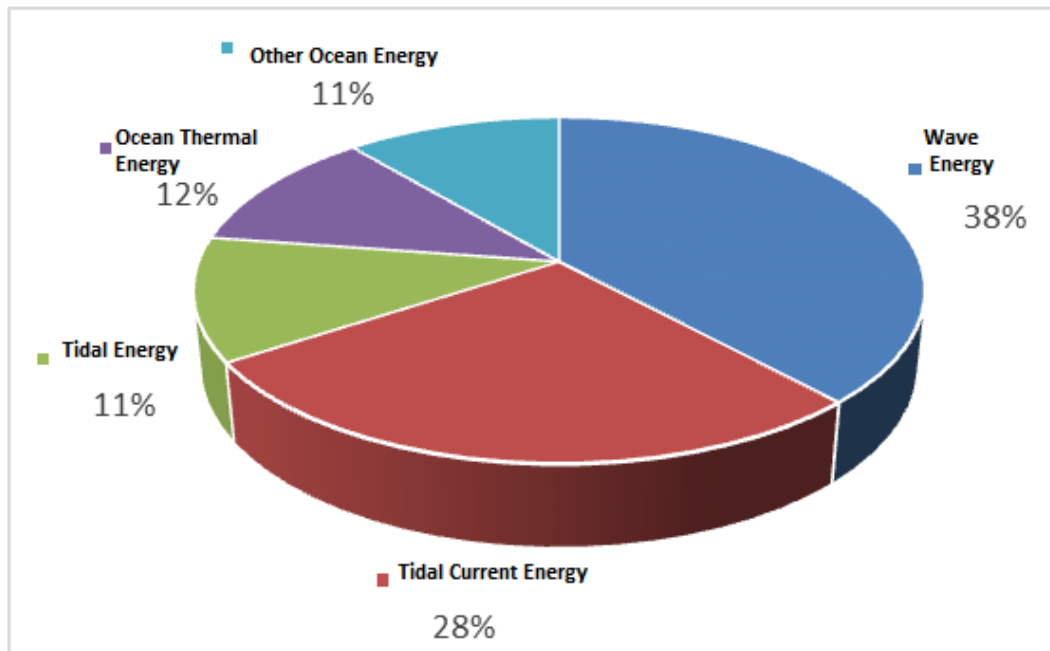




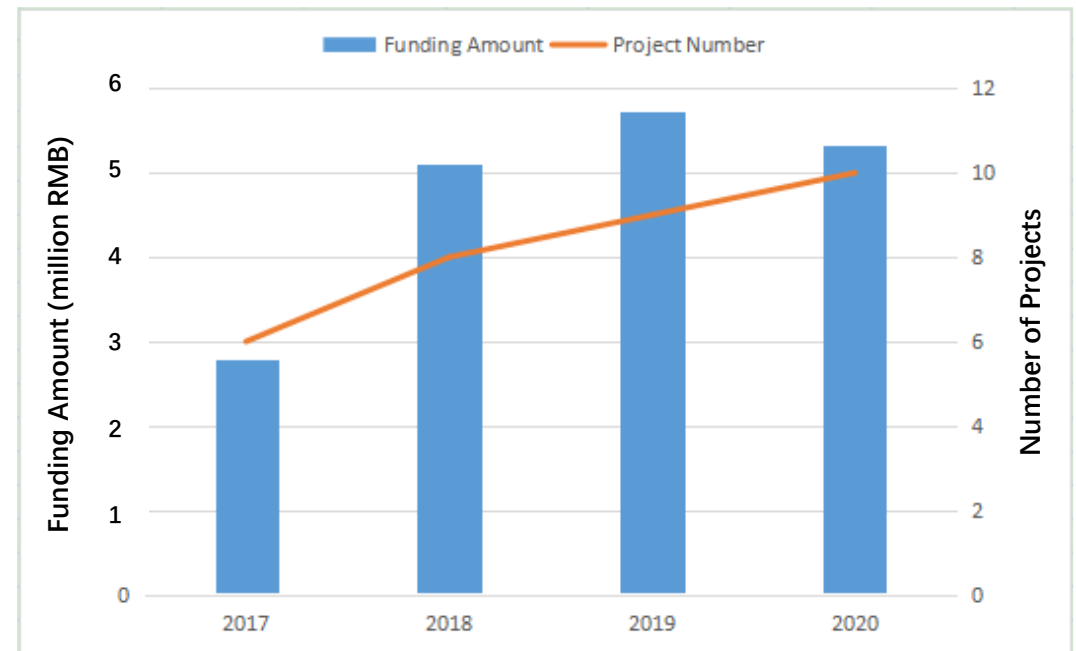
FUNDING

- Government Innovation Fund to motivate Industry-University-Research collaborations
- State grid/utility companies to diversify their renewable energy sources beyond wind and solar power
- Potential end-user funding to save diesel power cost

GOVERNMENT FUNDING FROM NATIONAL NATURAL SCIENCE FOUNDATION OF CHINA



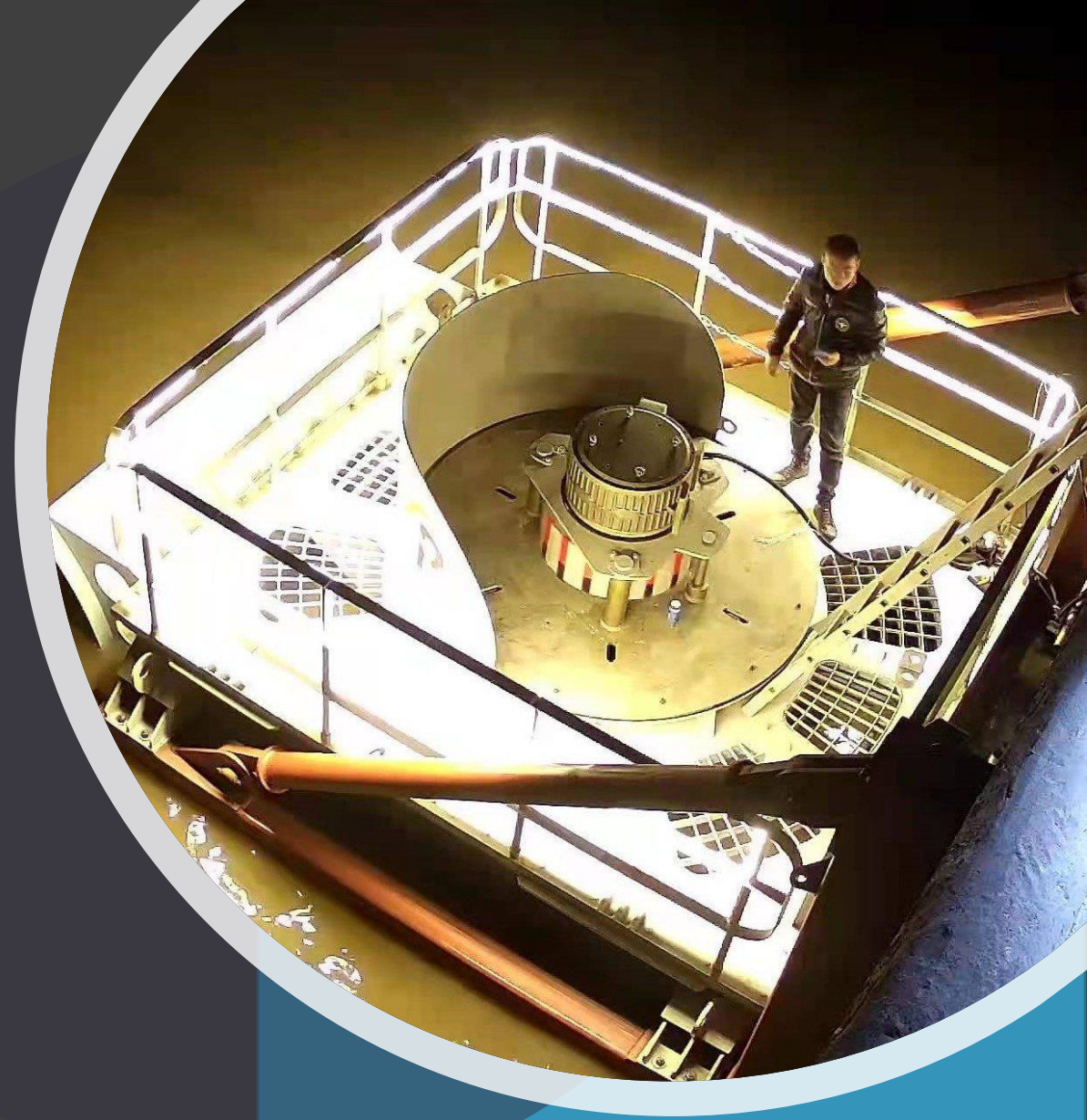
Funding Statistics of NSFC based on Ocean Energy Categories



Funding Statistics of Annual Amount and Number of Projects of NSFC for Ocean Energy Projects in China

HANN-OCEAN'S DRAKOO PILOT PROJECT IN CHINA

- Established its independent R&D base in Nantong, China
- Built its large ocean wave test tank
- Have 3 generations of Drakoo design & performance verified by NAREC, WS Atkins and DNV
- Completed 6 months of its pilot project of Drakoo WEC 15kW at Shengsi island in China



SUPPORT RECEIVED ON DRAKOO PILOT PROJECT IN CHINA

- In November 2021, the Shengsi government gave permission to Hann-Ocean to commence the Drakoo pilot project
- In April 2022, the vice governor of Zhejiang province, Mr Lu Shan visited the Drakoo site
- In June 2022, Zhejiang Daily newspaper published a special report - "Ocean Energy: How we can harness it", that introduces the Drakoo WEC from Hann-Ocean, among the other latest breakthroughs in Ocean Energy in Zhejiang, China.



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CHALLENGES FOR OCEAN ENERGY

- How to reduce CAPEX?
- How to reduce OPEX?
- How to survive in extreme sea conditions?
- How to integrate OE with other RE infrastructures?
- How to encourage investment in Ocean Energy?
- How to attract R&D talents?



FUTURE POTENTIAL

China Carbon Reduction Target

- *Reaching peak carbon emissions by 2030*
- *Reaching carbon neutrality by 2060*

Huge Market Available

- China cut its overall share of energy derived from coal from [72.4 %](#) in 2005 to [56.8 %](#) in 2020. To further cut down the carbon emission, the market demands for more alternative renewable energy technologies and products..

Sunrise Industry

- Following the trend of offshore wind energy development, many enterprises in China are eager to collaborate with OE developers.

A photograph of an audience in a conference room with large windows. Several people have their hands raised, indicating an interactive session or a Q&A period. The scene is brightly lit by natural light from the windows.

Questions & Answers



Let's do OE together!

ICOE-OEE
2022



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