Wave Energy Converter Market Assessment, By Technology [Oscillating Water Columns, Oscillating Body Converters, Overtopping Devices, Others], By Location [Offshore, Onshore, Nearshore], By Application [Power Generation, Water Desalination, Pumping of Water, Others], By Region, Opportunities and Forecast, 2017-2031F

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Report description:

Wave energy converter market size was valued at USD 23.54 billion in 2023, expected to reach USD 34.41 billion in 2031, with a CAGR of 4.86% for the forecasted period between 2024 and 2031.
Wave Energy Converters offer various benefits including energy diversification, environmental advantages, and resilience. WECs provide a sustainable and clean energy source, contributing to the global transition towards a low-carbon economy. The market is driven by rapid technological advancements, ample availability of wave energy resources, growing power demand from coastal communities, and increasing investments in cleaner energy generation.
Rapid technological advancements are amplifying the growth of the WEC market. Increasing research and development investments drive the market, leading to more effective and cost-efficient processes for wave energy generation. Moreover, the growing adoption of sustainable energy technologies and the rising interest in using ocean waves to generate electricity contribute to the market's growth.
For example, in November 2023, the European wave energy initiative emphasized the value of brand innovation. The USD 21.13 million Wave Energy Demonstration at Utility Scale to Enable Arrays (WEDUSEA) project, co-funded by Horizon Europe and Innovate UK, proved to be a catalyst for the commercialization of wave energy in Europe and throughout the world. Moreover, WEDUSEA features 14 pan-European partners, led by Irish company OceanEnergy.
Oscillating Water Columns Technology is Fostering the Market Growth
The oscillating water columns have fostered market growth extensively throughout the previous timeframe. Factors contributing

to its growth include low maintenance, enhanced material lifetime, and easy access to the shores. Moreover, the technology is less complicated than others and hence is easily adaptable, proliferating the market growth.

For example, in March 2023, IDOM Inc. of Bilbao, Spain, improvised their wave energy converter device, which harnesses wave energy via an oscillating water column. The water drives air through a turbine as it flows in and out of the device's open chamber to generate electrical energy. The IDOM Inc. team will create a more cost-effective version of their invention by inculcating improved controls which will allow operators to operate the device from a distance, as well as new structural and turbine designs that would boost the device's energy production.

Rise in Usage of Water Desalination Process to Accelerate the Market

The increasing adoption of sustainable energy technologies, including the usage of wave energy converters for seawater desalination, is driving the growth of the market. The rising demand for fresh water, coupled with the high energy density of waves, presents an opportunity to harness wave energy for desalination, thereby addressing the global water crisis while promoting sustainable practices. Technological advancements and the growing focus on renewable resources are expected to further accelerate the market's expansion.

For example, in October 2023, Oneka Technologies secured USD 9.19 million in series A funding to complete the development of its floating desalination solutions. Oneka Technologies' sustainable desalination units convert seawater to fresh water using the renewable energy of ocean waves. In a challenging fundraising landscape for start-ups, the company stated that the funding round stands as a testament to the surging investor's interest in unique and credible climate tech solutions.

Investments Towards Offshore Wind Projects Are Leading to Substantial Opportunities

The offshore segment is expected to drive the growth of the Wave Energy Converter (WEC) Market, with offshore wave energy converters harnessing the amount of wave energy. The growth is attributed to factors such as rapid technological advancements, increasing research and development investments, the extensive uptake of wave energy for power generation, and the prevalence of ample wave energy resources.

In November 2023, the UK government has increased the maximum price for offshore wind projects in its flagship renewables scheme, the Contracts for Difference (CfD), to further cement the country as a world leader in clean energy. The maximum strike price for offshore wind projects has been raised by 66% to USD 78.70/MWh, while for floating offshore wind projects, it has been increased by 52% to USD 189.75/MWh. These higher prices aim to attract more investment and boost the UK's offshore wind capacity, which is currently around 14 GW and plans to reach 50 GW by 2030.

Asia-Pacific Emerged as Market Leader

Asia-Pacific has emerged as the fastest-growing region in the wave energy converter market due to significant advancements in technology, government initiatives, and abundant availability of wave energy. The region is expected to dominate the market in the future, with countries such as China, Japan, India, and Australia making significant investments in research and development and cleaner energy generation.

For example, in December 2022, IIT Madras researchers created the "Ocean Wave Energy Converter", which harvests energy from sea waves and successfully completed trials in the second week of November 2022. The device was placed at a depth of 20 meters six kilometers off the coast of Tuticorin, Tamil Nadu. In the next three years, this device hopes to create 1 MW of power from ocean waves.

Government Initiatives

Government initiatives are essential for the growth of the market. Policies such as feed-in tariffs, power purchase agreements, and research and development grants provide financial incentives to investors and accelerate technological advancements in wave energy. Government support in regulatory frameworks and permitting processes creates an enabling environment for WEC projects. Moreover, major nations are making significant investments in research and development and cleaner energy generation, which is expected to boost the WEC market growth.

For example, in January 2022, the United States Department of Energy (DOE) allocated USD 25 million to support wave energy research, development, and demonstration of technologies that harness wave power to create electricity. The funding will support eight projects that will make up the first round of open-water testing at the PacWave South test site off the Oregon coast. Moreover, this funding will help the wave energy technologies to accelerate their commercial viability and deploy them at scale to help decarbonize the grid and reach President Biden's goal of net-zero carbon emissions by 2050.

Impact of COVID-19

The COVID-19 pandemic significantly impacted the wave energy converter market, affecting both pre and post-COVID situations. Pre-COVID, the market experienced growth driven by factors such as the need for clean and renewable energy sources. However, the pandemic led to supply chain disruptions, project delays, and reduced investments, resulting in a slowdown in market growth. In the post-COVID period, the market is expected to recover and grow, as the demand for clean energy and renewable energy sources continue to increase. Moreover, the pandemic has highlighted the importance of diversifying energy sources and reducing the dependence on fossil fuels, thereby making wave energy converters a more attractive option for the future.

Key Players Landscape and Outlook

Major corporations are making significant investments in water desalination, power generation, and other areas, leading to rapid advancements in the wave energy converter market. Moreover, these companies are indulging with various collaborations to develop highly advanced technologies for surge in their respective revenues.

In December 2023, CorPower Ocean created a unique anchored Wave electricity Converter (WEC) that uses ocean waves to generate electricity. A gearbox converts wave motion into rotational motion, which is then transformed into power via generators in the buoy. TotalEnergies, a French multi-energy company, joined CorPower Ocean's Pilot Access Programme to study this technology as one of the possibilities for decarbonization. TotalEnergies will benefit from the Pilot Access Program by gaining in-depth knowledge of CorPower Ocean's wave technology and its operation via the HiWave-5 pilot at the Agucadoura location in northern Portugal.

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