

## Review of Innovative Harbor Breakwaters for Wave-Energy Conversion

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Video title: *Innovative Breakwaters for Energy Production*

### Video Script

Harbor breakwaters protect port areas from heavy wave action. They facilitate smooth cargo handling and the safety of ships during navigation. Traditionally, they dissipate incoming wave energy by reflecting waves back to the sea. However, these structures require continuous improvement via innovative technologies. This is how they can yield better performance amidst rising sea levels. One such approach includes the integration of wave energy converters (WECs) into harbor breakwaters. These breakwaters capture untapped renewable energy from the ocean in the form of wave energy.

Recently, a research team from Italy and Spain reviewed emerging innovative technologies for WEC breakwaters. These included the oscillating water column (OWC) and the overtopping device (OTD) types of WEC. They explored how the OWC could improve the hydraulic performance of breakwaters. They also explained the numerous OWC prototypes being built across the world. The team further found that investors are reluctant to invest in the WEC energy industry. This is due to high repair costs of damaged breakwaters. Thus, to be successful, WEC breakwaters should be economically viable. Moreover, they have to remain resilient under harsh conditions while providing the benefit of energy production and improved hydraulic performance. In this manner, WEC breakwaters can become the first commercially viable and affordable wave-energy technology in the future.