

U.S. Department of Energy

Wind and Water Power Program




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ENERGY

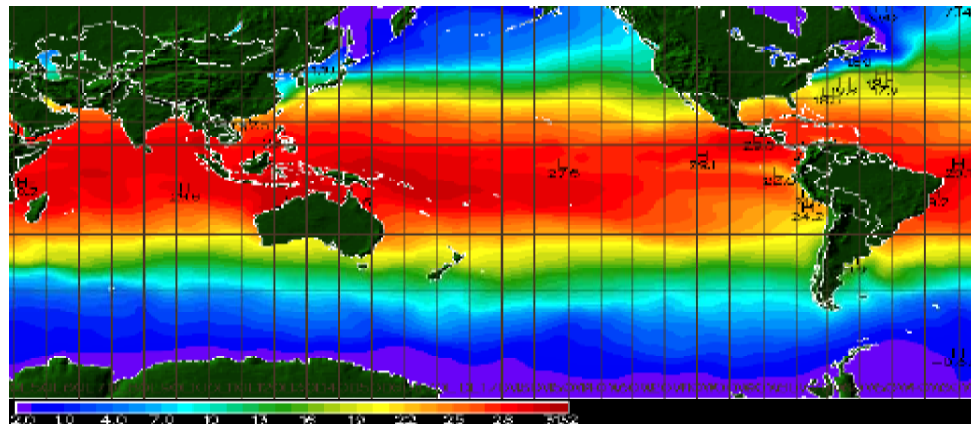
Energy Efficiency &
Renewable Energy



Develop and employ novel technologies, improved operational procedures, and rigorous analysis to assess the potential extractable energy from domestic rivers, estuaries and ocean waters and help industry harness this renewable, emissions-free resource through environmentally sustainable and cost-effective electric generation.

Ocean Thermal Energy

- OTEC represents the most significant global water power resource and one of the largest renewable energy resources available.
 - Very conservative estimates place the practically available resource at 3-5 TW, greater than projected global electric power consumption in 2025 (projected at 2.7 TW)¹.
- Ocean thermal systems provide stable and predictable power output, and are thus ideally suited for base load applications.
 - Near-shore ocean thermal resources are often concentrated in areas where electricity prices are highest and power is generated from the most polluting sources (esp. diesel). In the US, prime OTEC resource locations include Hawaii, Florida, and many military bases.
 - Offshore resources are even more extensive, and will be harnessed and exported by the country that develops the best technologies first.



¹ Nihous, "A Preliminary Assessment of Ocean Thermal Energy Resources," ASME, 2007.

Current DOE OTEC Technology Development Research Efforts

DOE had an active OTEC program through the 1980's.

Current OTEC efforts more limited but include:

- OTEC Resource Assessment
- Potential Impacts of OTEC Intakes on Aquatic Organisms
- Life Cycle Cost Analysis for OTEC Facilities
- OTEC "Mist Lift" Open Cycle Design
- Modular OTEC Heat Exchangers
- OTEC Power Cables

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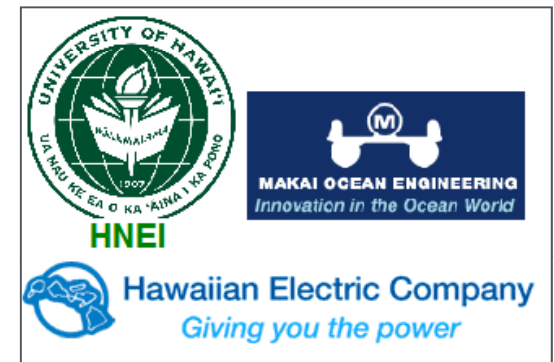
DOE OTEC Research through National Marine Renewable Energy Centers



Energy Efficiency &
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National Marine Renewable Energy Center of Hawaii:

- The University of Hawaii in Honolulu, HI, established a center to facilitate the development and implementation of commercial wave energy systems in their state and to assist the private sector in moving **ocean thermal energy conversion systems beyond proof-of-concept to pre-commercialization, long-term testing.**



DOE Responsibilities under the OTEC Act (1980)

- Gives the Secretary of Energy authority to approve OTEC demonstration projects
- Unique role for DOE – mainly an R&D institution
- DOE is working closely with NOAA to develop an approval process for demonstration projects but has not finalized a process yet
- DOE has yet to receive any OTEC demonstration project applications

