OTEC

Development History

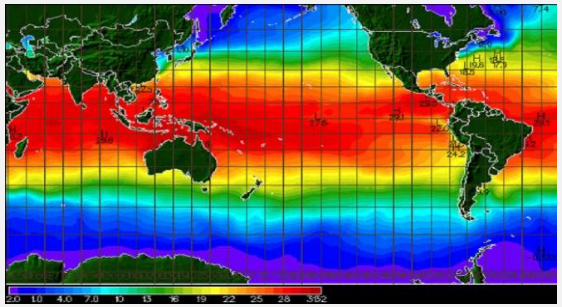
- US OTEC program initiated in 1973 leading to a demonstration of 1 MWe floating OTEC-1 plant.
- Designs of large scale 100 MW to 400 MW OTEC plants.
- Heat exchanger, fouling mitigation and material development at Argonne National Lab.
- On-going OTEC development at Natural Energy Laboratory of Hawaii Authority (NELHA)
- The recent focus on small land-based and floating OTEC plants for the island market.

Argonne Test Facility

OTEC for

the Island Market

- Power and water producing OTEC plants in responses to potential rise of seawater level.
- Deployment of the first commercial OTEC plant in the near future.



Ocean Thermal Gradient Resource

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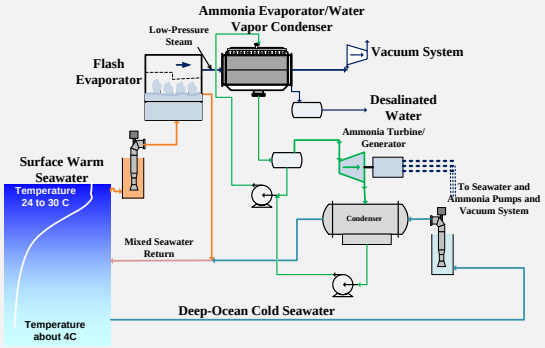
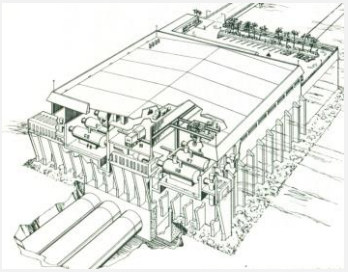
Ocean Thermal Energy Conversion (OTEC) Plantship for Production of Ammonia, Methanol & Desalinated Water

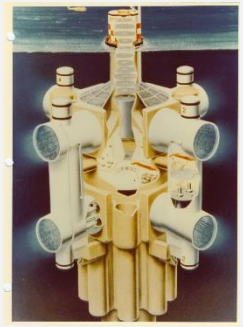


Methanol Production

- **Conversion of captured CO_2 to methanol using OTEC produced hydrogen.**
- **Captured CO_2 transported from coastal utility and industrial plants.**
- **Captured CO_2 from Off-shore Oil and Gas Production.**



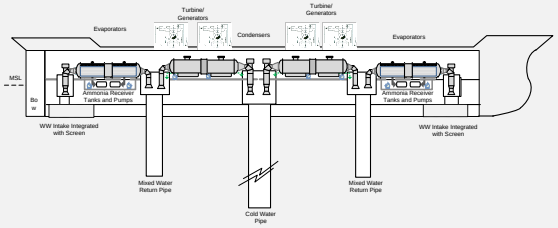
40-MWe Shelf Mounted OTEC Plant



Floating OTEC Plant

Ammonia Production

- **Hydrogen production from electrolyzing of fresh water.**
- **Hydrogen-based Haber-Bosch process for ammonia productions.**
- **Alternate new energy-efficient solid-state process of ammonia synthesis.**

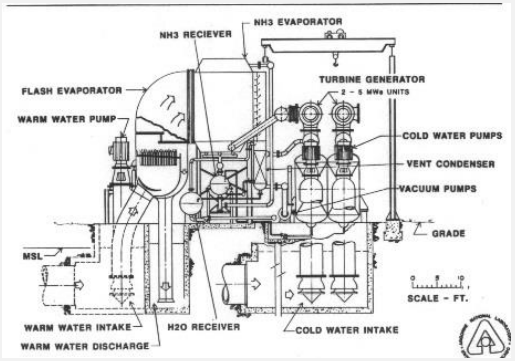


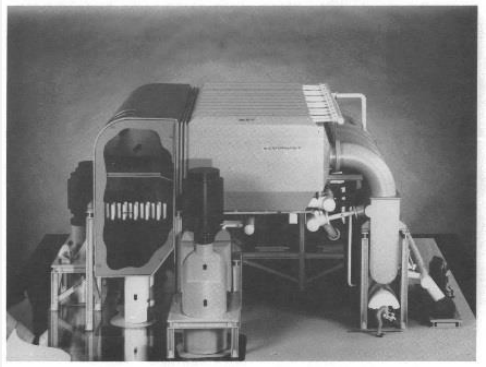
Ship-Shape Floating OTEC Plant

OTEC-1 Pilot Plant off the Coast of Hawaii

Seawater Desalination

- **OTEC Hybrid cycle for co-production of power and desalinated water.**
- **At-sea production of desalinated water using OTEC power and RO membranes.**
- **Competitive global market for water-scarcity regions.**





Hybrid-OTEC Cycle