

Ocean Thermal Energy Conversion (OTEC)



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Humanity's Top Ten Problems for next 50 years*

1. ENERGY
2. WATER
3. FOOD
4. ENVIRONMENT
5. POVERTY
6. TERRORISM & WAR
7. DISEASE
8. EDUCATION
9. DEMOCRACY
10. POPULATION

A satellite-style image of the Earth from space, showing the Western Hemisphere with the Americas and the Atlantic Ocean. A semi-transparent blue box is overlaid on the right side of the image.

**OTEC is poised to offer
solutions !
In dramatic ways**

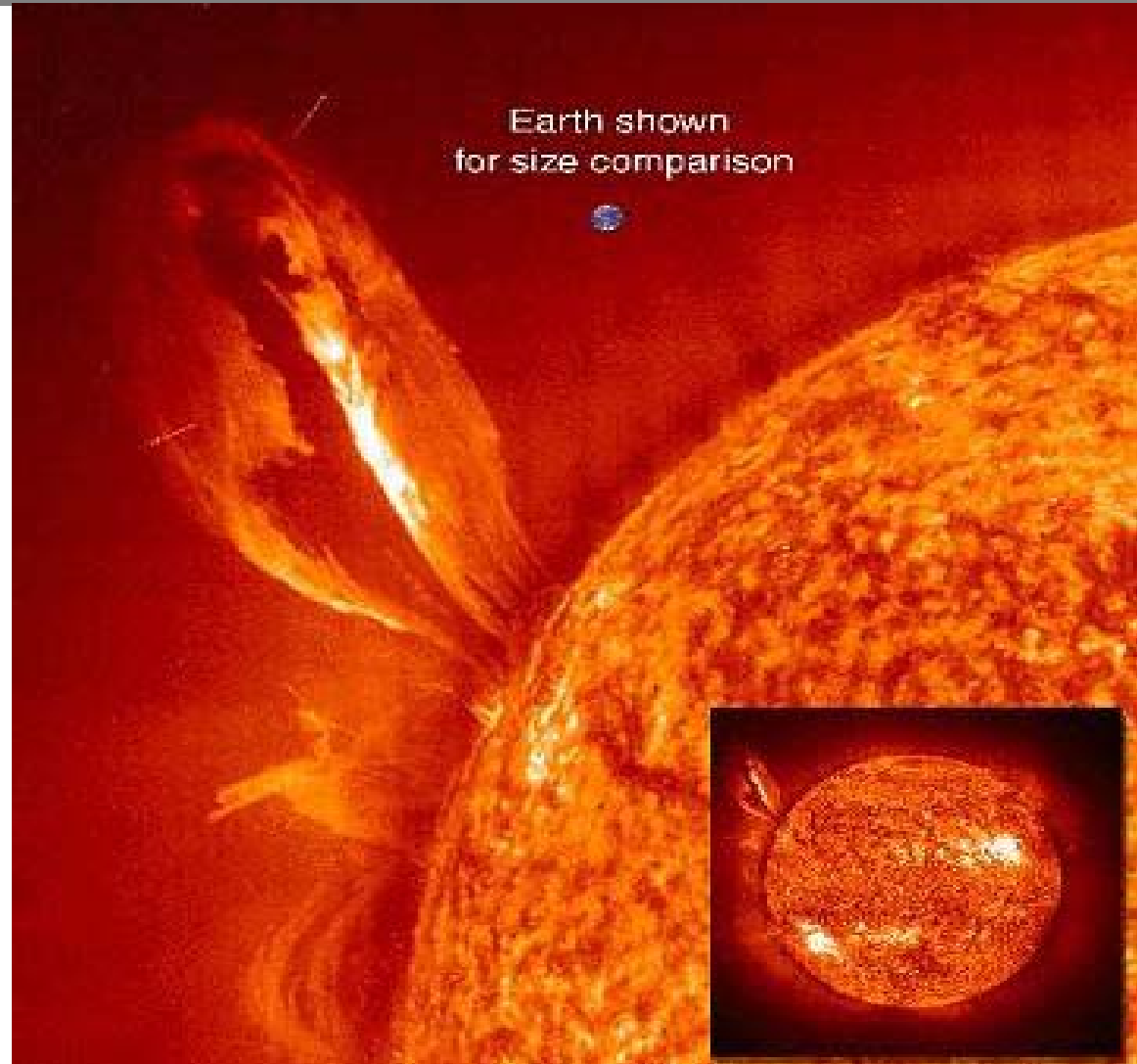
***from R.E.Smalley's presentations**

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**The blue planet
– where the
Ocean is the
largest solar
collector !**



**165,000 TW
of sunlight
hit the earth**





Prior OTEC R&D efforts - achievements

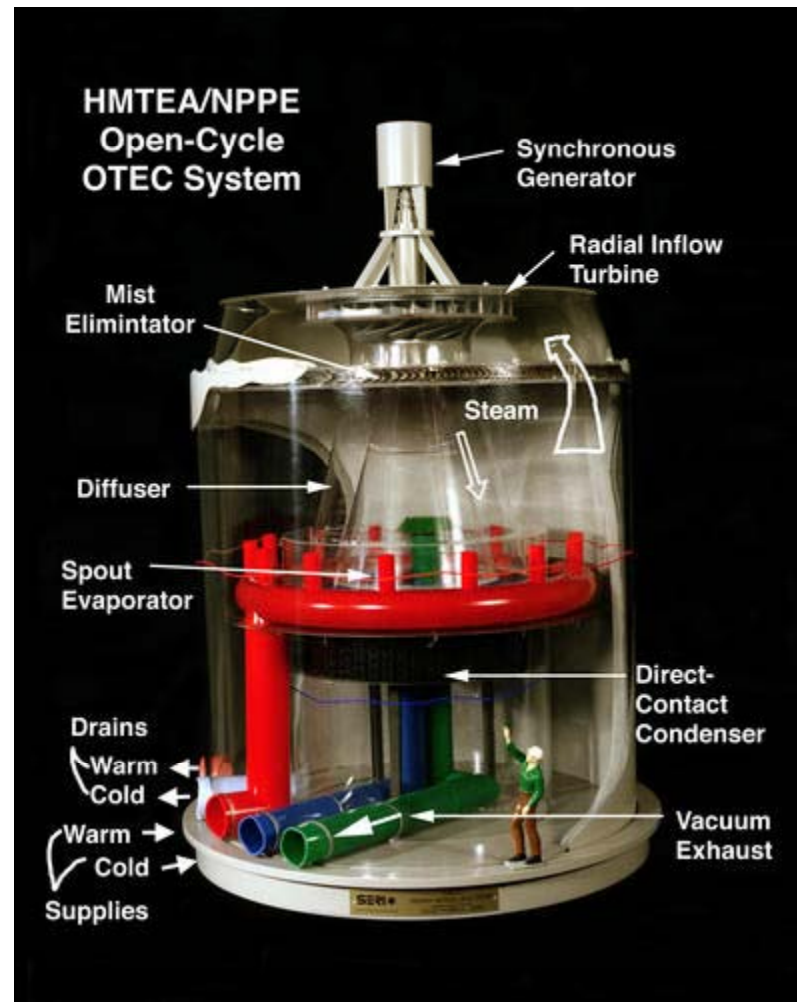
- OTEC

- Operation of resource pipes and pumps have been proven reliable over long periods of time at NELHA.
- Ocean resource has been proven to be “reliable and sustainable.”
- Systems have been proven to produce:
 - » electricity
 - » water;
 - » food;
 - » air-conditioning;
 - » high-value bio-medicals.

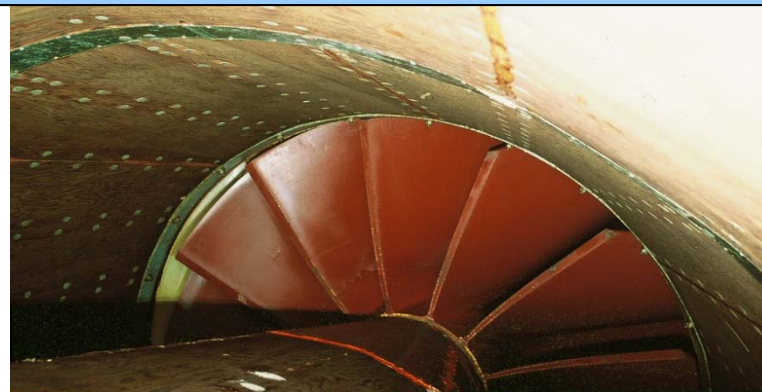


Open-Cycle OTEC System

Cut-away Illustration



Components of the OC-OTEC system





Vacuum system



Cost and Research implications

- Almost **half** the cost is associated with the cold-water pipe and pumping resource.
 - Substantial potential exists to reduce this cost with further R&D.
- Open-cycle turbine stands to be made of alternative materials for cost reduction and longevity in corrosive environment.
 - Material advances in plastics and composites will advance turbine design and fabrication.
- Multiple product production can be established incrementally.