

***Waiving Profitability:
The Oregon Wave Energy
Trust's Failure to Achieve a
Return on Public Investment***

by Joel Grey
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Waiving Profitability:

The Oregon Wave Energy Trust's Failure to Achieve a Return on Public Investment

The Oregon Wave Energy Trust (OWET) is a nonprofit, public-private partnership established by the Oregon State Legislature that works to “responsibly develop ocean energy by connecting stakeholders, supporting research and development, and engaging in public outreach and policy work.”¹ Since its inception in 2007, OWET has received nearly \$12 million dollars in public funding² from the Oregon Innovation Council (Oregon InC), another government-sponsored entity. Oregon InC claims its initiatives must earn a profit,³ but that is clearly not the case with OWET. None of the money spent to date by OWET has led to any profitability.

OCEAN POWERS TECHNOLOGIES

Between 2008 and 2013, OWET spent \$6.3 million on various projects and grants.⁴ The highest-profile project with which OWET was associated was Ocean Powers Technologies (OPT), a group that promised to bring viable wave energy to Oregon.⁵ The company and its Oregon project were written up in *The New York Times*, but the project ultimately failed in April 2014 when the company abandoned the project in favor of pursuing another project (with substantial government funding) in Australia.⁶ It abandoned the project entirely before the first buoy even hit the water, after scaling back the project multiple times.⁷ OPT received \$436,000 in funding from OWET,⁸ but taxpayers received nothing in return.

The head of OWET, Jason Busch, claims that the state got a return on its investment through OPT's spending in the community.⁹ OWET claims to have created or maintained 60 family-wage jobs through this and other spending.¹⁰ However, this is a simplistic assessment of spending, as it overlooks the opportunity cost associated with the \$6.3 million that OWET has spent. If the legislature had never created OWET, \$6.3 million in public funds could have been spent in many other ways that could have been more socially beneficial.

It is not clear why OWET chose to fund OPT, since even the most basic level of due diligence would have revealed a high level of risk for taxpayers. OPT was founded in 1994 and has focused on testing its PowerBuoy® technology. It reported a nine-month loss of \$7.88 million,¹¹ as well as approximately \$15 million losses for the two years before that.¹² Its annual reports show losses of \$10 million or more every year since 2007.¹³ In fact, by its own admission, the company has never made a profit and does not know when or if it ever will.¹⁴ OPT has accumulated an overall deficit of \$148 million.¹⁵

OPT FUNDING SOURCES

The vast majority of OPT's revenue comes from government entities, including the U.S. Navy and the U.S. Department of Energy (DOE).¹⁶ OPT has received varying funds from these agencies; but the U.S. Navy made up more than 50% of funding each year from 2007-2011,¹⁷ peaking in 2010 at 80% of their recorded revenue.¹⁸ In 2012, no single entity provided the majority of the revenue, but the DOE and the U.S. Navy each provided around 30% of OPT's revenue, for a total of 60%.¹⁹ Beginning in 2013, the DOE became the majority funder, providing 51% of OPT's revenue for that year.²⁰ If wave energy were as promising as proponents believe, private investors would take on the risk and invest in wave energy. The fact that private investors are not involved signals that they realize there is little potential for wave energy to be profitable—and that is with government subsidies involved. It would be even less attractive without public money.

Despite all of this funding, OPT still did not earn a profit, nor did it create a functioning long-term buoy that contributed electricity to a power grid on a permanent basis.²¹ The company is now pursuing a project in Australia, reportedly with AU \$66 million (US \$62 million) in grants from the Australian government to pursue wave energy there.²² This means that the investments by the DOE and OWET are, at least in the short term, not going to produce any results.

OTHER OWET EXPENDITURES

Other OWET expenditures have been similarly unimpressive. A grant of \$239,272²³ was approved for the Pacific Marine Energy Center (PMEC), which will consist of testing facilities on the Oregon State University and University of Washington campuses and open water testing facilities in Puget Sound, Lake Washington, and off the coast of Oregon.²⁴ The PMEC is expected to be completed in 2016.²⁵

In addition, \$1.8 million was spent on environmental and applied research.²⁶ This includes \$110,123 for a Green Sturgeon Study, \$20,000 for a Dungeness Crab Genetic Study, and \$236,506 on a Sediment Transport Study.²⁷ Also, \$344,760²⁸ was spent on education and outreach, \$1,250,512²⁹ on regulatory work, \$1,682,292³⁰ on commercialization of wave energy technologies, and \$977,866³¹ on market development.

WAVE ENERGY TECHNOLOGY

Wave energy is not a new technology. Patents were issued over one hundred years ago, and research was revived in the 1970s.³² However, it never became a popular means of providing electricity. Nonetheless, the Oregon Legislature decided to fund OWET on the assumption that wave energy could be a valuable source of electricity for Oregon. However, subsequent research commissioned by OWET itself suggests otherwise. A study conducted by professors and students at OSU shows that several technologies are superior to wave energy in multiple categories. For example, wave energy is less economically sustainable than geothermal, hydropower, wind, liquid natural gas (LNG), biomass power, and nuclear power.³³ It beats only solar in this category.³⁴ It is less socially sustainable than geothermal and solar energy, but more so than nuclear, biomass, petroleum, LNG, and hydropower.³⁵ Most importantly, given the environmental intent of this project, wave energy is less environmentally sustainable than solar, geothermal, and wind.³⁶ Wave energy has a lower sustainability score overall than hydropower, solar, and geothermal; and it is tied with wind energy.³⁷

Oregon already uses all four of those methods of electricity production. In fact, hydropower is a proven resource that accounts for 70% of power produced in the state.

ENERGY PRODUCTION AND COST

OPT's planned 10-buoy installation at Reedsport would have had a capacity of 1.5 megawatts (MW).³⁸ The state of Oregon had a peak capacity of 15,544 MW in 2013.³⁹ This means the Reedsport facility would have contributed a 0.00965% increase in capacity. Even with the originally planned 100-buoy installation, the state's energy production capacity would change by only 0.0965%.

Bonneville Dam, by comparison, has a capacity of 1,093 MW.⁴⁰ This made it responsible for 7% of the state's energy capacity in 2012. To replace Bonneville Dam, it would take 7,287 buoys. To replace the capacity of the largest coal plant in the state, 3,900 buoys would have to be placed off the Oregon Coast.

Even if the state were to produce significant power using wave energy, it still would be more expensive than current electricity production. The 2009 OSU study estimates that the cost of wave energy in Oregon would range from 20¢ to 30¢ per kilowatt-hour (kWh), while electricity in Oregon was 9.4¢ per kWh in 2011.⁴¹

CONCLUSION

The Oregon Wave Energy Trust has failed to bring viable wave energy to Oregon even after spending millions of dollars. Furthermore, their own research showed that wave energy was not a good option to pursue for renewable energy.

The Oregon legislature has been eager to create so-called "Signature Research Centers" over the past decade in such areas as biotechnology, energy, and food production. OWET is one of those centers. However, legislators have never been clear about why public funds were being put at risk for these ventures. Representative Peter Buckley (D-Ashland), Co-chair of the Joint Legislative Committee on Ways and Means, said that none of the Oregon InC initiatives have fully graduated from the program and stopped receiving government funding, but he cautioned that OWET is relatively new.⁴² State Senator Richard Devlin (D-Tualatin), also Co-chair of the Ways and Means Committee, said that OWET "will again go through the review process in the executive branch and the Governor will make a recommendation in his proposed 2015-2017 budget in the coming session."⁴³ He said he "would anticipate the budget to be reduced further."⁴⁴

According to Representative Buckley, each session the legislature will require demonstrable progress toward the goals initially laid out to continue funding.⁴⁵ He believes that OWET should receive funding for at least 2-4 years more, assuming it continues to hit benchmarks and successfully collaborate with groups.⁴⁶

Further reducing the budget is a good first step, but the legislature should do more. In 2015, the legislature should closely examine all state-sponsored venture capital funds to determine if grant recipients will ever become financially self-sufficient, as originally envisioned. OWET would be an excellent place to start.

ENDNOTES

1. "About," Oregon Wave Energy Trust, last modified unknown, retrieved July 3, 2014, <http://oregonwave.org/about/>.
2. Legislative Fiscal Office, *Analysis of the 2013-2015 Legislatively Adopted Budget* (Salem, OR: LFO, 2013), 168 and *Oregon Innovation Council, Oregon Innovation Plan 2.0: Accomplishments, Proposed Investments, Strategic Intent* (Salem, OR: Oregon Innovation Council, 2009), 15.
3. "About Oregon InC," Innovation in Oregon, last modified unknown, retrieved July 3, 2014, <http://www.oregon4biz.com/Innovation-in-Oregon/About-Oregon-InC/>.
4. "Comprehensive OWET Funded Projects," Oregon Wave Energy Trust, last modified unknown, retrieved July 3, 2014, http://oregonwave.org/oceanic/wp-content/uploads/2013/05/Comprehensive-OWET-Funded-Projects_August-2013.pdf.
5. Scott Learn, "Oregon Proposes Approval of Ocean Power Technologies' Wave Energy Project Off Reedsport," *The Oregonian*, October 12, 2011, retrieved July 3, 2014, http://www.oregonlive.com/environment/index.ssf/2011/10/oregon_regulators_propose_appr.html.
6. Mike Francis, "Ocean Power Quits on Oregon Wave Project, Offers Shares to Public," *The Oregonian*, April 14, 2014, retrieved July 3, 2014, http://www.oregonlive.com/business/index.ssf/2014/04/ocean_power_quits_on_oregon_wa.html.
7. Francis, "Ocean Power Quits."
8. "Comprehensive OWET Funded Projects," Oregon Wave Energy Trust, http://oregonwave.org/oceanic/wp-content/uploads/2013/05/Comprehensive-OWET-Funded-Projects_August-2013.pdf.
9. Editor, "Oregon Wave Energy Project Sinks," *Jefferson Public Radio*, April 4, 2014, retrieved July 3, 2014, http://m.ijpr.org/?utm_referrer=#mobile/10303.
10. "How We're Doing," Oregon Wave Energy Trust, last modified unknown, retrieved July 3, 2014, <http://oregonwave.org/about/how-were-doing/>.
11. Ocean Power Technologies, Inc., Form 10-Q (filed March 13, 2014), via EDGAR system, retrieved June 2014.
12. Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
13. Elizabeth Case, "Oregon Wave Energy Stalls off the Coast of Reedsport," *The Oregonian*, August 30, 2013, retrieved July 3, 2014, http://www.oregonlive.com/environment/index.ssf/2013/08/oregon_wave_energy_stalls_off.html
14. Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
15. Francis, "Ocean Power Quits."
16. Ocean Power Technologies, Inc., Form 10-K (filed July 14, 2008), via EDGAR system, retrieved July 3, 2014; Ocean Power Technologies, Inc., Form 10-K (filed July 14, 2011), via EDGAR system, retrieved June 3, 2014; and Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
17. Ocean Power Technologies, Inc., Form 10-K (filed July 14, 2008), via EDGAR system, retrieved July 3, 2014 and Ocean Power Technologies, Inc., Form 10-K (filed July 14, 2011), via EDGAR system, retrieved June 3, 2014.
18. Ocean Power Technologies, Inc., Form 10-K (filed July 14, 2011), via EDGAR system, retrieved June 3, 2014.
19. Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
20. Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
21. Ocean Power Technologies, Inc., Form 10-K (filed July 12, 2013), via EDGAR system, retrieved June 2014.
22. Joshua Hunt and Diane Cardwell, "Experimental Efforts to Harvest the Ocean's Power Face Cost Setbacks," *New York Times*, April 27, 2014, retrieved July 3, 2014, <http://www.nytimes.com/2014/04/28/business/energy-environment/experimental-efforts-to-harvest-the-oceans-power-face-cost-setbacks.html?module=Search&mabReward=relbias%3Ar>.
23. "Comprehensive OWET Funded Projects," Oregon Wave Energy Trust, http://oregonwave.org/oceanic/wp-content/uploads/2013/05/Comprehensive-OWET-Funded-Projects_August-2013.pdf.

ENDNOTES *Continued*

24. “Welcome to the Northwest National Marine Renewable Energy Center,” Northwest National Marine Renewable Energy Center, last modified unknown, retrieved July 7, 2014, <http://nnmrec.oregonstate.edu/>.
25. Ibid.
26. Comprehensive OWET Funded Projects,” Oregon Wave Energy Trust, http://oregonwave.org/oceanic/wp-content/uploads/2013/05/Comprehensive-OWET-Funded-Projects_August-2013.pdf.
27. Ibid.
28. Ibid.
29. Ibid.
30. Ibid.
31. Ibid.
32. David Leary and Miguel Esteban, “How Things Work: Ocean Energy Making Waves,” Science and Technology, last modified October 5, 2009, retrieved July 3, 2014, <http://ourworld.unu.edu/en/ocean-energy-making-waves>.
33. Yao Yin, “Is Wave Energy Relatively Sustainable in Oregon?” in *Socio-Economic Perspectives of Wave Energy Development* ed. Flaxen Conway (Portland, OR: Oregon Wave Energy Trust, 2009), 60.
34. Ibid.
35. Ibid.
36. Ibid.
37. Ibid.
38. Lori Tobias, “Oregon Wave Energy Plan Ready for Vote After Four Years of Work,” *The Oregonian*, January 17, 2013, retrieved July 3, 2014, http://www.oregonlive.com/pacific-northwest-news/index.ssf/2013/01/oregon_wave_energy_plan_ready.html.
39. “Oregon Electricity Profile 2012,” State Electricity Profiles, last modified May 1, 2014, retrieved July 3, 2014, <http://www.eia.gov/electricity/state/Oregon/>.
40. “Oregon Electricity Profile 2012,” Table 2.
41. Jess Jiang, “The Price of Electricity In Your State,” *National Public Radio*, October 28, 2011, retrieved July 3, 2014, <http://www.npr.org/blogs/money/2011/10/27/141766341/the-price-of-electricity-in-your-state>.
42. Peter Buckley, telephone conversation with the author, July 11, 2014.
43. Richard Devlin, email message to the author, July 9, 2014.
44. Ibid.
45. Peter Buckley, telephone conversation with author, July 11, 2014.
46. Ibid.