Oregon Renewable Energy Center

As a public purpose, applied research center created by the Oregon State Legislature, the Oregon Renewable Energy Center (OREC) speeds the integration and optimization of renewable energy resources with current power generation systems, and accelerates clean energy technologies in collaboration with industry partners.

Given the increasingly urgent global focus on reducing carbon and increasing energy efficiency, OREC will become even more important to Oregon in the next decade, by helping to preserve our environment as well as sustain industry competitiveness, growth and development.

Based on Oregon Tech's trusted history of advancing renewable energy solutions in Oregon for over 30 years, the Legislature authorized the Center in Oregon Statute in 2001. Since then, OREC has a 15 year history of successful execution, producing a 10-year ROI for state funds invested of 4.3 to 1.

OREC leverages globally distinguished capabilities at Oregon Tech.

- First university in North America to reach the goal of generating most of the electrical power for its campus.
    - Two geothermal power plants and testing sites, including the 280kW Geothermal power plant and the 1750kW geothermal plant.
    - 7,800 ground-mounted solar electric panels on 9 acres of hillside at the Klamath Falls campus, with a total capacity of just under 2 megawatts.
- First ABET-accredited BS in Renewable Energy Engineering in the world; also offers a Master's degree in Renewable Energy Engineering.
- Home of the Geo-Heat Center, an internationally renowned repository of information and technical advice on geothermal energy development.

OREC is designed to meet a critical gap in technology development.

- **Focus on prototyping, validating, testing, and manufacturability.** Many technologies fail to transition through the "valley of death" between basic discovery and deployment. OREC is designed to bridge that gap in collaboration with companies who are evaluating the feasibility and manufacturing of more competitive or lower cost solutions. Collaborations with Oregon Tech include the use of unique labs and facilities, distinguished industry-aware faculty, and a focus on applied research.
    - **Meeting the needs of small and mid-sized companies**. OREC enables Oregon's smaller players to invent and produce solutions to the nation's larger energy and manufacturing challenges, by providing access to expertise and equipment that is beyond reach otherwise.

OREC is a good financial investment.

- Since its inception in 2001, OREC has received approximately $52,132 in state dollars for energy-related contracts, and $2,355,624 through the Engineering Technology Industry Council (ETIC) to enable OREC to support engineering education in the form of renewable energy labs, funding for student projects, and small faculty-led applied research projects.
- These state dollars have been matched with $9,578,357 in other public funds (federal and local), and $750,468 in private investments (sponsored projects, stipends) for a total of $10,328,825 in other funds. **OREC produced a 10-year ROI for Oregon of 4.3-to-1.**

OREC for the next decade.

- **Approach-specific strategy.** Oregon Tech is proposing to combine OREC's capabilities with Oregon Tech's additional capabilities in manufacturing, software, embedded systems, and business to capture a market niche that is not technology-specific, nor industry-specific, but approach-specific.
- **Leveraging Oregon's unique breadth of renewable energy sources.** Oregon is a unique place in the world with its access to wind, wave, hydro, geothermal coal, gas and solar energy. These natural resource advantages position OREC to be a unique center for collaboration with companies, other universities, and communities seeking expertise and lower-cost solutions as they experiment, disrupt and innovate.
- **OREC will focus in five program areas**, utilizing faculty expertise and shared equipment laboratories at its applied research centers or within industry partner locations:
    - Energy system integration, power and controls, and grid security
    - Clean Tech testing, prototyping, embedded systems designs, validation
    - Manufacturability: materials, processes, robotics
    - Entrepreneurship: multi-disciplinary projects and invention
    - Policy analysis and support

What OREC can do.

- Developing prototypes for solar, wave and other energy devices
- Testing the manufacturability of new products
- Battery characterization and testing; expanding storage capabilities
- Optimization of hybrid vehicle control systems
- Building and testing customized components to reduce production costs
- Selecting materials, assessing strength of materials, especially composites and metals
- Manufacturing product or process improvements; manufacturing controls and robotics
- Product development and remote monitoring of solar energy systems
- Utilizing geothermal energy to accelerate food and agricultural products
- Geothermal combined with solar for boosting solar output in hybridized systems
- Training on the use of Oregon Tech's unique geothermal resource

Accountability: measuring OREC's success.

- Value of contracts, grants or revenue from sponsored applied research
- BS and MS-level degrees awarded by Oregon Tech in energy and related fields
- % Employment of Oregon Tech graduates in Oregon
- # internships and industry-supported undergraduate/ graduate projects, related fields
- # jobs created through new or improved product development or manufacturing production
- # start-up companies (student inventors/ spin offs)

Making it happen.

- **Stable funding sources to achieve public purposes.** Oregon Tech lacks a stable funding source to direct the applied research center, and the faculty with dedicated time to conduct this research in collaboration with industry partners because its faculty are appointed to full-time teaching positions.
- **Match investment approaches to other legislatively-authorized university centers:** OREC needs state support, like Oregon's other university-led research centers, to build the infrastructure to fulfill OREC's mission in applied research, technical assistance, and workforce development and lift it to a level of national prominence.

Summary

OREC's future rests on developing into a preeminent applied research center of multi-disciplinary expertise that takes an applied research approach to accelerating and optimizing products, services and systems to assist companies and communities to solve the nation's technical challenges. OREC has proven over the past 10 years that it can achieve significant ROI for the state. OREC anticipates that the $985,000 biennial state investment will generate matching substantial public and private matching investment within five years.

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