

Engineering and Technology Industry Council Excellence Initiative Proposal Biennium from July 1, 2003 to June 30, 2005

Campus: Oregon Institute of Technology
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Summary of Proposal:

ETIC provided “Top Tier” funding during the 2001-2003 biennium contributing to the establishment of the Oregon Renewable Energy Center (OREC) at Oregon Institute of Technology. OREC requests 2003-2005 biennial funding from ETIC under the Excellence Initiative to support its continued development and maturation.

ETIC and additional matching and other funds will support the following key initiatives:

1. Develop a new **Smart Energy Research Laboratory** in Klamath Falls, building particularly on existing experimental capabilities in automation and control;
2. Further development and delivery of a new **bachelor degree program in Renewable Energy Systems (RES)** to be offered in Portland in collaboration with Clackamas Community College (CCC) beginning Fall, 2004;
3. Develop new **renewable energy specializations** to complement existing programs in Klamath Falls;
4. Continue to support undergraduate students involved in applied research projects in renewable energy technologies.

Also, OIT has committed to partner with CCC to establish a world-class **Energy Research Center** at its Wilsonville Training Center. Such a center would support applied research of interest to industry, primarily the electric utilities. While complementing the Smart Energy Research Laboratory, work at the Energy Research Center will focus on specific utility industry-sponsored projects. Although ETIC funding will help support OREC administrative and other staff involved in this strategic initiative, significant additional funding will be required.

Goals

Key goals supported by the requested funding and additional matching funds are as follows. These goals are organized under subheadings that describe strategic directions of OREC.

Smart Energy Research Laboratory at OIT in Klamath Falls

1. Support faculty research opportunities;
2. Provide support to undergraduate students conducting applied research projects;
3. Support early stage commercialization of energy technologies and systems.

Innovative and One-of-a-Kind Academic Programs

4. Develop renewable energy specializations for existing majors;
5. Develop a new bachelor degree program in Renewable Energy Systems.

Currently, no comparable academic programs exist at the baccalaureate level in the nation. OIT, through OREC, will become a national leader in renewable energy education (see Metrics Forecast.)

Wilsonville Energy Research Center

6. Undertake specific applied research projects of interest to business and industry;
7. Modify academic courses to serve as industrial training courses;
8. Help establish the region as the national leader in energy research.

Investment Rationale

A few highlights of OREC accomplishments during the previous (2001-2003) biennium are as follows:

- Six new academic courses in renewable energy were developed, generating a total of 101 student credit hours during the academic year 2002-2003;
- OREC has provided financial support of several student senior projects;
- OREC has funded significant expansion of laboratory capabilities in support of fuel cell, PV, and ground-source heat pump education, training, and applied research.
- OREC sponsored the extension of the Fulbright scholarship of Dr. Igor Tyukhov, a Russian scientist with extensive experience in solar energy applications. Work is continuing on several projects begun with Dr. Tyukhov;
- OREC-affiliated faculty are engaged with the City of Portland Office of Sustainable Development and the Oregon Office of Energy on applied research projects;
- An articulation agreement will soon be completed between the CCC A.A.S. program in Energy and Resource Management and OIT's Operations Management program.
- Dr. Howard Thurston represents OIT on the Leadership Team of the Utility Education and Training Alliance (UETA). The Alliance, with representatives from all utilities in the Pacific Northwest (Washington, Oregon, and Idaho), convenes regularly to discuss education and training opportunities within the industry.

The recent electric power “blackout,” affecting more than 50 million Americans, has focused attention on the need to modernize the nation’s electricity distribution infrastructure. Meanwhile, OREC has been participating on the steering committee of a major research project to identify viable business cluster opportunities in energy and related areas in the Pacific Northwest. Out of that work has come a clear conclusion that the area of “smart energy” holds the most promise for business cluster development in the region. Smart energy may be defined as “the convergence of telecommunications, computing, and energy.” The two broad areas of opportunity appear to be (1) smart grid operations and planning, and (2) smart end-use energy management. In response, we will develop a new Smart Energy Research Laboratory in Klamath Falls, building particularly on existing experimental capabilities in automation and control.

The Wilsonville Training Center of Clackamas Community College was established through an innovative partnership between CCC, PacifiCorp, and Portland General Electric (PGE). The utilities conduct workforce training at the Wilsonville site, and employees are connected with CCC and other educational partners to continue work toward Associate, Bachelor, and Master degrees. Missing from the current educational opportunities is a technical degree. OREC is responding by developing the new program in Renewable Energy Systems. Also, students in technical disciplines in Klamath Falls will benefit from the opportunity to gain additional marketable skills by completing a renewable energy specialization.

ETIC funding will contribute to the support of the Director (1.0 FTE), a research projects administrator (1.0 FTE), a Smart Energy Research Laboratory manager (1.0 FTE), an RES Program Director (0.5 FTE) in Portland, student research assistants (0.5 FTE), a secretary (0.5 FTE), and a Sponsored Programs and Development Manager (0.5 FTE). Funding will also help support further development of academic programs, facility expansion and enhancements, and the development of training materials.

OREC expects to raise additional private sector funds of \$600,000 for the biennium (\$300,000 per year). These funds will support research project personnel and equipment, expansion of academic program capacity, a renewable energy demonstration center in Klamath Falls, faculty professional development, scholarships for undergraduate students conducting research, and necessary travel.

Results

ETIC funding under the Excellence Initiative will indeed promote excellence in several intersecting areas, as follows:

1. OREC is poised to become a world class research and education facility devoted to the burgeoning field of renewable energy, especially through the Smart Energy Research Laboratory in Klamath Falls and the Energy Research Center in Wilsonville.

Metrics: number of faculty, students, and new researchers involved and number of publications, total research expenditures per year

2. Through OREC, OIT will be able to offer highly innovative B.S. degrees and specializations, available in Klamath Falls and Portland, focusing on renewable energy technologies as well as related areas.

Metrics: establish the first-of-their-kind programs in renewable energy

3. OREC will provide facilities in which businesses will be able to test new technologies and begin the process of commercialization.

Metrics: number of royalty-generating intellectual property licenses granted

The metrics represent a significant extension of OIT's traditional strengths into new areas and a larger scope of activities in the important academic pursuits of applied research, scholarship, and appropriate support of emerging technologies and economic development. Also, the metrics are highly marketable given the current interest in these activities of opinion leaders and members of the legislature.

Proposed Investment and Private Support Forecast (\$M)

	7/1/03- 6/30/04	7/1/04- 6/30/05	Total
Proposed OUS Investment (\$M)			
New programs			
Academic personnel/curriculum	0.025	0.025	0.050
Administrative personnel	0.050	0.075	0.125
Research projects personnel	0.025	0.025	0.050
Facility expansion/enhancements	0.050	0.025	0.075
Subtotal	0.150	0.150	0.300
Expected private support (\$M)	0.300	0.300	0.600
Total (\$M)	0.450	0.450	0.900
New Faculty Supported (FTE)	2.0	1.0	3.0

Metrics Forecast:

	Baseline	Projected			
	AY 99	AY04	AY05	AY06	AY09
Total RES Department research expenditures per year	0	0.1	0.25	0.4	0.75
National ranking of RES Department (1)					top 5%
National ranking of OIT	NA				
Licenses sold (2)	0	1	2	3	5
Number of faculty researchers (3)	0	2	3	4	8
Number of student researchers	0	5	8	10	15
Number of scholarly publications	0	1	5	8	12
Notes:					
(1) First-of-their-kind programs in nation					
(2) Patent licenses or other royalty-generating intellectual property licenses granted to commercial entities					
(3) Additional metrics					