

Engineering and Technology Industry Council

Campus Investment Proposal

Biennium from July 1, 2009 to June 30, 2011

Campus: Oregon Institute of Technology

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Summary of Proposal: The Oregon Institute of Technology requests a total of \$1.277 million for an integrated plan that will support OIT's Bachelor's and Master's degrees in ETIC mission-critical disciplines and preserve programs in the face of the current budget crisis. Seed funding from ETIC will allow OIT to attract students, increase graduates, and enhance private funding for its important work. The plan will

- Expand unique and relevant programs in Renewable Energy Systems and Health Informatics.
- Increase funded research from \$1.2 Million (2007) to \$6.0 Million (2020).
- Maintain OIT's status as a top 10 western public baccalaureate college

Vision Statement: The Oregon Institute of Technology has the following vision and mission: As an outstanding university, create a pipeline of science and math-savvy pre-college students, prepare world-ready graduates who excel in the workplace, and be a leader in applied research, harnessing renewable energy for the economic development of Oregon.

Aspirational Peers: The aspirational peer for the institution as a whole is Cal Poly San Luis Obispo, which has twice as many students as OIT in the engineering, science and math disciplines, and was ranked 7th in the US News overall list of the West's best universities (with undergraduate and master's-level programs but few doctoral programs). Its students "do intensive and self-directed research," and Cal Poly's College of Engineering ranked as the No. 2 program at a public school in the US. While emphasizing a hands-on, learning-by-doing philosophy like that of OIT, in 2007 they received \$22 million in contracts and grants and had 91 research proposals funded. Aspirational peers for the OIT ETIC-related areas include Florida Solar Energy Research Center for Applied Research and Montana State University for Allied Health.

Long-term Goals

	1998-99 Base ¹	2006-07 Goal ²	2006-07 Actual	2012/13 Goal ⁴	2019/20 Goal ⁵
BS	154	235	198	238	294
MS	1	4 ³	3	8	30 ⁵
PhD	0	0	0	0	0
Total	155	239	201	246	324

1. Source: OIT 1999-2000 Fact Book, all ETM degrees, IT not reported as a separate major.
2. Source: ETIC 2005-2007 Biennium Core Investment Plan, ECS BS degrees.
3. Ibid. 180 graduate credit hours / 45 hours for MS in MFG = 4 degrees completed.
4. Source, extrapolated from OIT Fact Books
5. Based on current and anticipated graduate degree programs.

Other Desired Outcomes in 2013/2020

	1998-99 Actual	2006-07 Goal ¹	2006-07 Actual	2012-13 Goal	2019-20 Goal
Externally funded Research (\$ mil) ²	\$0.77	\$1.3	\$1.2	\$1.2	\$2.0
Patent Disclosures ³				6	10
License Revenue (\$ thousand) ⁴				\$12	\$30
Spin offs (companies) ⁵				1	2

1. From campus plan for 2005-2007 Biennium.
2. Total dollars spent by ETIC-related departments toward research.
3. New patent applications, provisional or otherwise, during year.
4. Revenue from patent and other intellectual property licenses granted to commercial entities.
5. Number of spin-offs as reported to Association of University Technology Managers.

Executive Summary:

I. Plan elements

A. Pre-College Investment

Despite the current financial problems, including reduced funding from ETIC, OIT retains its commitment to working with elementary, middle, and high school students and teachers to bring in more college-ready students to engineering and technology programs at OIT, and particularly to increase opportunities for women and underserved minority populations to become engineering and applied science graduates.

OIT's strong role in Project Lead the Way exemplifies the university's commitment to pre-college programs. New initiatives being considered include advanced gaming courses for girls, augmented summer programs for high school teachers, two programs aimed at engaging the Hispanic population, and a Green technologies emphasis, which will be integrated into as many Pre-college programs as possible.

Collaboration with Oregon organizations: Local schools and school districts – OIT offers dual credit classes in 27 high schools in 12 Oregon counties, and has collaborations with Tribal education offices. In 2007 461 students took Advance Credit Program/High School Transition classes. Dual credit students are predicted to increase from 263 in 2002 to 416 in 2010, and 500+ in 2014. Engineering and other associations – Society of Women Engineers, Software Engineering Association, American Association of University Women, which sponsors activities. Corporations and foundations (that support sponsored programs like math immersion), and ASPIRE (Access to Student Assistance Programs in Reach of Everyone), a state-wide organization that provides mentoring, advising, and resources for applying for college.

Clusters: Green Industries, High Tech and Display Technology, Software and Silicon.

Private Funding: The Pre-College program has an active grant-seeking program and anticipates making a 1:1 match for ETIC funds received. Corporations like Microsoft, International Gaming Technology, PacifiCorp, and TransCanada have been regular donors.

B. Education Support from ETIC will allow OIT to broaden its offerings into areas important to the Oregon economy and that have potential for attracting students to engineering and information technology:

- **Renewable Energy Engineering** – a successful program with promise for expansion and near-term self-sufficiency. The REE program is the first undergraduate engineering program in the nation in renewable energy, and the only one working toward accreditation. OIT is requesting ETIC support to continue the growth of the RES program with funds for critical laboratory work in Portland and for one new faculty there. Funding is critical at this time to support the program until it reaches the optimum enrollment to cover costs.
- **Health Informatics:** The investment will support one additional faculty member, and develop a Simulation lab for virtual Community Hospital Clinical Systems.

OIT believes that in developing and carrying out these educational programs there are important opportunities for collaboration with other Oregon institutions of higher learning. OIT has articulation agreements with community colleges throughout Oregon, and OIT administrators have been exploring strategies with other OUS schools, in particular Eastern Oregon University.

Education Investment:

1. Renewable Energy Engineering – expand REE Degree with 1 new faculty (1.0 FTE in second year of biennium)	\$ 80,000
2. IT and Engineering – 3 existing positions	\$700,000
Total Education Investment	\$780,000

Clusters: The OIT education programs target Manufacturing, Environmental Technology & Services, Green Development, High Tech, Healthcare, Bioscience, Renewable Energy, Agriculture, Software, Energy Efficiency Clusters.

Private Funding: The programs that will be strengthened by ETIC support are engaged in aggressive grant seeking, as well as continuing to seek industry donations and funding for undergraduate laboratory supplies and equipment. In the past year, the Health Informatics

program in particular has been successful in reducing costs by negotiating sizeable in-kind contributions from industry.

Education Investment Results and Benefits:

- ETIC funding for Renewable Energy Systems will consolidate gains that this relatively new program has made. Enrollment gains will support the program by the end of the biennium.
- The Health Informatics program is now on both the Klamath Falls and the Portland campuses.

C. Applied Research is the driving force for OIT's mission of producing skilled engineers and technologists. The proposed ETIC investment for the next biennium will expand the role of applied research to increase private support and leverage state funds. ETIC funding of \$497,000 will be used to build on OIT's reputation in renewable energy, by drawing additional students to the university, engaging those students and faculty in relevant projects, and producing world-ready engineering graduates.

The OIT leadership believes renewable energy – and the larger idea, sustainability – to be of paramount importance to the nation and is positioning the university to be a leader in the state. OIT's presence in renewable energy has three facets, the first two of which are supported by ETIC funds – (1) applied research through Oregon Renewable Energy Center (OREC), (2) the only undergraduate program in Renewable Energy Engineering in the Northwest, and (3) a plan to make the OIT campus in Klamath Falls the first campus in the world to generate all of the electricity it uses from renewable sources, while turning the campus itself into a demonstration and renewable energy technologies research park.

ETIC funds for Applied Research will be used to support

- **Salaries and support** for OREC management, research, and development staff (OREC director, technical support, as well as travel/supplies). This investment brings in revenue to OIT through grants and research contracts.
- **Faculty productivity grants** will be used for proposal development and mini-research projects in renewable energy, to encourage faculty development and encourage the solicitation of external funding to leverage ETIC's funding.
- **Stipends to support student research** will be used to encourage OIT students to pursue undergraduate research in the areas of renewable energy.
- **Support of student projects** by providing funds for materials, supplies, tools, etc. to supplement the major laboratory equipment with items necessary for specific projects.

Clusters: Green Energy and High Tech are the primary industry clusters for Applied Research, but OREC is cross-disciplinary in nature and its opportunities for interactions are broad.

Private Support: OREC has had success in attracting support from companies that donate equipment, support that can serve as matching funds. Currently OIT is establishing working relationships with private partners such as Idatech, Cascade Solar and, PV Powered in Bend,

King Solar in Portland, Energy Outfitters in Grants Pass, and Eco-Solar in Klamath Falls. Additionally, the campaigns for the Green Technology Center and to make OIT Klamath Falls the first “net-zero energy” campus in the world will attract private support to match ETIC funds. (The Energy bill recently passed by Congress includes \$1 million to establish a deep-well geothermal power plant at OIT that will generate all of the power used on campus.)

In the realm of economic development, there are excellent opportunities for energy extension service work that will help businesses and farmers use renewable energy sources. For example, OREC has recently received USDA funding to facilitate renewable energy assessments for small agricultural producers in the region.

Applied Research Investment Results and Benefits: The OIT administration supported the founding of OREC as a focus for the university’s work in renewable energy and the fulcrum to increase the institution’s general involvement in applied research. OIT intends to expand the role of OREC, adding staff and equipment as opportunities arise.

II. Results and Benefits of OIT ETIC Investment

The OIT strategy is designed to produce significant results during the 2009-11 biennium. The elements of the plan are interrelated and contribute specifically to attracting, engaging, retaining, and graduating engineers. The idea is straightforward:

- place resources in academic areas that combine high potential student interest and societal relevance with OIT’s technical strength
- support the academic effort with applied research, which will attract outside funding and offer practical experience to students

The focus on attractive programs like renewable energy and health informatics will support OIT’s goal of continuing to increase the number of engineering graduates. Although OIT is a small university, its emphasis on relevant attractive programs, seeded by ETIC funding in critical areas, will play a significant role in producing engineers and applied scientists for Oregon.

Long-term Results/Desired Outcomes in 2013/2020:

- **National ranking** at college level vs. 1999 and 2007
- In 2007 No. 10 Baccalaureate College in the West (No. 4 Public College in the West) No national ranking in 1999.
- Desired ranking in 2013/2020: continue to be in top ten.

Other desired long-term outcomes

- **Pre-College: Pre-College:** Maintain and strengthen successful programs in this area, and pursuing innovative partnerships in areas related to OPAS.
- **Education:** Stronger/expanded Information Technology, Health Informatics, and Computer Engineering Technology programs. Double enrollment in Renewable Energy Engineering program and strong growth in other engineering and technology programs. Meet goal of 294 engineering graduates by 2020.

- **Applied Research:** OIT Klamath Falls, the first net zero energy campus in the world, is developing the concept of a Sustainable Technology Park to serve as focus of all of OIT's work in renewable energy and sustainability.

Results of Other Private OIT Support – Advancement Strategy:

The faculty in ETIC-related disciplines continue to be the most active and successful advocates for OIT in finding industry partners and obtaining in-kind support for OIT programs.

Although the OIT Office of Advancement was reduced in size in the past year, it has recently been the focus for increases in personnel and activities to promote fundraising on many levels. The department “sustains OIT over time by developing and stewarding relationships with alumni, friends and other strategic partners.” Last year a new Director of Alumni Relations joined the staff to systematically engage graduates in the life of OIT. Advancement works closely with the Oregon Tech Foundation, and with OIT administration, in particular the President's office and the Office of Public Affairs. The private funding goals in this proposal will be facilitated and assisted by the Advancement staff, particularly the Director of Grants Development, who has been given the particular goal of supporting the renewable energy efforts at OIT. She also works to encourage faculty sponsored research endeavors.

III. Investment Allocation

Proposed Investment and Private Support Forecast (\$M) from OIT

		Level 0 minus 15%
1	Sources of funds	
2	Base budget for ETIC-related programs* – all sources except ETIC allocation & private support	11.26
3	Proposed ETIC allocation (\$M) (3)	1.277
4	Expected private (4)	0.850
5	Total (\$M)	13.387
6	Personnel (FTE) (5)	
7	Existing faculty (1)	3.00
8	New Faculty (2)	0.50
9	Existing Staff (1)	1.50
10	New Staff (2)	--
11	Total	5.00
12	New positions created (6)	
13	Faculty (2)	0.50
14	Staff (2)	--
15	Total	0.50
16	ETIC funds in line 3	
17	New facilities	--
18	Improve facilities (7)	--
19	Laboratory equipment (7)	--
20	Other equipment (7)	--
21	Other one-time expenses	--
22	Existing faculty (1)	0.700
23	New faculty (2)	0.080
24	Existing staff (1)	0.497
25	New staff (2)	--
26	Services & supplies	--
27	Other	--
28	Total	1.277

Level 0 minus 15% Policy Option Package		Education*	Applied Research	totald
1	Sources of funds			
2	Base budget for ETIC-related programs* – all sources except ETIC allocation & private support	6.868	4.392	11.260
3	Proposed ETIC allocation (\$M) (3)	0.780	0.497	1.277
4	Expected private (4)	0.519	0.331	0.850
5	Total (\$M)	8.167	5.22	13.387
6	Personnel (FTE) (5)			
7	Existing faculty (1)	3.00 FTE		3.00 FTE
8	New Faculty (2)	0.50 FTE	--	.50 FTE
9	Existing Staff (1)		1.50 FTE	1.50 FTE
10	New Staff (2)		--	--
11	Total	3.50 FTE	1.50 FTE	5.00 FTE
12	New positions created (6)			
13	Faculty (2)	0.50 FTE	--	0.50FTE
14	Staff (2)		--	--
15	Total	4.50 FTE	-	0.50 FTE
16	ETIC funds in line 3			
17	New facilities	--	--	--
18	Improve facilities (7)	--	--	--
19	Laboratory equipment (7)	--	--	--
20	Other equipment (7)	--	--	--
21	Other one-time expenses	--	--	--
22	Existing faculty (1)	0.700	--	0.700
23	New faculty (2)	0.080	--	0.080
24	Existing staff (1)	--	0.497	0.497
25	New staff (2)	--	--	--
26	Services & supplies	--	--	--
27	Other	--	--	--
28	Total	0.780	0.497	1.277

IV. Metrics Forecast

OIT Education and Applied Research Programs – Level 0 minus 15%

	Actual	Forecast (2)	Forecast (2)	Forecast (2)
	AY 06/07	AY 10/11	AY 12/13	AY 19/20
Undergraduate student credit hours (1)	22,089	24,939	26,499	32,768
Graduate student credit hours (1)	276	312	331	409
Graduation rate, 6-year (1, 3) %	37	39	43	47
Bachelor's degrees granted (1)	198	224	238	294
Master's degrees granted (1)	3	5	8	12
PhD degrees granted – not applicable	0	0	0	0
Women graduating as % (1)	9.3	9.8	12	15
Minorities graduating as % (1, 5)	10.7%	11.3	13	16
Externally-funded research expenditures in millions of \$	1.2	1.3	1.6	2.0
Invention disclosures (7)	0	5	6	10
License/options (8)	0	1	2	3
License income received (9)	0	\$0	\$12,000	\$30,000
Spin-off Companies (10)	0	0	1	2
National ranking of program/department (11)	N/A	N/A	N/A	N/A
National ranking of university (12)	4 and 10	top 10	top 10	top 10

- (1) Graduation/participation numbers for students in ETIC-related programs: CE/GEO, MMET, CSET, EERE, IT
- (2) (3) Forecasts prorated from original proposal based on funding level.
- (4) Only in CE/GEO, MMET, CSET, EERE, IT.
- (5) Only in CE/GEO, MMET, CSET, EERE, IT.
- (6) Total external dollars spent by ETIC-related departments toward research during academic year
- (7) According to Assoc. of Univ. Technology Managers (AUTM) survey definitions
- (8) Number of license or option agreements executed during the year (AUTM definitions)
- (9) Fees, payments, royalties, equity cashed in – not research funding (AUTM definitions)
- (10) New companies that were dependent on the licensing of program's technology for their initiation (AUTM survey definitions)
- (11) Engineering technology departments are not ranked nationally.
- (12) US News & World Report #4 Baccalaureate College in West, # 10 Nationally.

Proposed Investment and Private Support Forecast (\$M)

Inputs required during 2009-2011 Biennium

	2005-2007 Plan ¹	2005-2007 Actual	2007-2009 Plan ²	2009-2011 Needed
State investment (\$ million)	\$1.080	\$1.41	\$1.4	\$1.277
Private Support (\$ million)	\$0.540	\$1.694	\$1.4	\$0.850
Other Support (\$ million)		\$0.563	\$0.7	\$1.0

1. From campus plan for 2005-2007 Biennium. 2. From campus plan for 2007-2009 Biennium.