

**Engineering and Technology Industry Council
Campus Investment Proposal
Biennium from July 1, 2011 to June 30, 2013**

Campus: Portland State University

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Summary of Proposal:

PSU requests new funding from ETIC in the 2011-2013 biennium for two initiatives: Portland Innovation Centers (PIC), and a Portland Regional Laboratory for Sustainability (PRLS).

The Portland Innovation Centers form close partnerships with regional industry in these areas: 1) green buildings and sustainable environment, 2) sensing and data network systems, and 3) materials and manufacturing. This is a regional strategy to make each of these PSU strengths a nationally recognized and competitive program in the corresponding fields.

The Portland Regional Laboratory for Sustainability is an R&D laboratory with an emphasis on application. An essential part of the Laboratory is an organized user network that is made of regional governments, businesses, and communities. The Laboratory aims to: 1) speed up the technology transition in all engineered subsystems (e.g. energy, transportation, materials, water, environment) for urban living, and 2) advance the regional sustainability as a system of interactive technology subsystems.

Vision and Goals Statement

Oregon is in an excellent position to become a national leader in sustainability. It has strong academic strengths for advancing sustainability research. More importantly, it has a sustainability culture permeating throughout the State. Every sector in Oregon – political, social, and economic – has long and demonstrable records of its conviction and commitment to sustainability. This is a tremendous advantage, on which a unique position of national leadership can be built.

PSU proposes the following strategy to achieve the leadership position. There are two strategic components: 1) developing a number of innovation centers (PIC) in specific technological fields that complement the research strengths in OSU, UO, OHSU, and OIT, and 2) integrating all the research strengths in the State to establish a Portland Regional Laboratory for Sustainability (PRLS).

In addition to the cultural advantage, the strategy stems from several important rationales. One, sustainability should fundamentally be considered as a system of systems. All subsystems interact. Progress in one area, such as transportation technology for lower GHG emission, may have negative impact on others, for example, water quality. Two, by focusing on a region, the

problem of sustainability becomes tractable. Three, sustainability research becomes transformational if it involves applications by the community users. Transition to a sustainable future involves more than technology. Policies, regulations, investment, education, and social behavior all have to be brought into play. Four, the Portland region has a national reputation for its track record on sustainable development. The regional government bodies, the industry, the business, and the communities form a powerful user group. Enabled by a laboratory for technological innovations, the region can lead the nation toward sustainability.

The concept of PRLS includes a sensory network and a data center. They form the backbone for monitoring and assessing regional sustainability.

Investment Description

From 1999 to 2009, the College's undergraduate student credit hours (SCH) increased by 63%, MS SCH by 55%, and PhD SCH by 166%. Sponsored research expenditures rose from \$1.65M in 1999 to \$7.75M in 2009, a 460% increase. Several of our strongest research programs have attained national stature, notably groups in green building technology, acoustic and terahertz sensing, water and air research, database technology, circuit design and test, biomedical signal processing, and transportation.

The strategy of regional strategy outlined above, namely, PIC and PRLS, is designed to attain goals beyond quantitative increases. It will transform PSU engineering and the research universities in Oregon as a whole, into a national leader.

For the strategy, PSU requests a total of \$31,600,000 in the 2011 – 2013 biennium above its ETIC base of \$7,351,265.

Specific items are:

1. A sensory and data backbone for monitoring and assessing the sustainability in the Portland Region: \$14M
2. Building space for PRLS: \$8M
3. Four new faculty hires: \$600,000
4. Start-up fund for faculty hiring (4 new and 4 replacement): \$3M
5. Student Support: \$1.5M
 - Summer Undergraduate Research Experience (SURE) Program \$350,000
 - Full-time summer opportunities for students working with faculty researchers
 - Undergraduate Research and Mentoring (URM) Program-academic year \$100,000
 - Part-time research opportunities for students while pursuing full-time study

- Student internships at industrial affiliates of PIC \$150,000
 - Develop/manage student internships with PIC industrial affiliates
 - Sustainability scholars working in PRLS and its user organizations \$900,000
 - Graduate student support: tuition/OPE/stipend
6. K-14 Outreach: \$1M
- Undergraduate Scholarships for high achieving students interested in research \$500,000
 - K-14 Pipeline programs in areas related to the PICs and PRLS \$500,000
7. Community Outreach: \$1.5M
- Diversity outreach and support programs \$1M
 - Agricultural communities in the Willamette Valley
 - Tribal communities in the region
 - Underrepresented populations in regional Metropolitan areas
 - Forums and workshops for users \$500,000
8. Post-doctoral researchers: \$2M

Private Support

For the FY11 – FY13 biennium we plan to raise \$2.1M private funds. Half of this amount is expected to come from industry in support of the PIC.

PSU will also submit proposals for large federal grants, including IGERT and ERC of National Science Foundation.

Results and Benefits

Short-term

1. The establishment of Portland Innovation Centers (PIC)
2. A plan for the Portland Regional Laboratory for Sustainability (PRLS)
3. Proposal submissions for federal programs: GAANN, IGERT, and DOE
4. Proposal submission for an NSF ERC in 2012
5. Growth in quantity and quality of MCECS students
6. Growth in MCECS research expenditures and the number of research students

Intermediate-term

1. The expansion of PIC
2. The establishment of PRLS
3. Expansion of MCECS research and impact

Future Plans & Resources

We expect that the sponsored research expenditure of MCECS will reach \$12M in 2015 from \$7.8M today. The student body will be largely transformed by the strategy outlined above. More than the numerical gain, we expect that MCECS will be able to compete with peer institutions of much greater name recognition in attracting both undergraduate and graduate students.

On average we anticipate one to two faculty positions made available due to retirement. Such resources will finance the four new faculty members hired with this funding request on a continuing basis.

Metrics

The table at the end of this proposal contains estimated metrics. They are based on the current ETIC baseline and the addition of the four hires we are proposing. Since these new hires will occur more likely in the middle or end of the biennium, they have only a small impact on the FY2013 metrics.

The 2020 goals are from earlier ETIC reports. The projected numbers assume the hiring investment proposed here with 6 more hires in the period 2013 to 2020.

These outcomes meet ETIC's goals of 2x enrollment at 2013 from 1999, and 5x research revenue at 2020 from 1999. Since the ETIC program was established, MCECS has consistently met the SCH, graduates and research funding goals.

Proposed Investment and Private Support Forecast (\$M)

		2011-2013 Biennium
1	Sources of funds	
2	Base budget for ETIC-related programs -- all sources except ETIC allocation & private support	\$ 27,211,900
3	Proposed allocation from ETIC budget (\$M) (3) PSU A	\$ 38,951,256
4	Expected private support (\$M) (4) PSUB	\$ 2,100,000
5	Total (\$M)	\$ 68,263,156
6	Personnel supported (FTE) (5)	
7	Existing faculty (1)	16.4
8	New faculty(2)	0.0
9	Existing staff (1)	5.1
10	New staff(2)	0.0
11	Total	21.5
12	New positions created (6)	
13	Faculty (2)	0.0
14	Staff (2)	0.0
15	Total	0.0
16	Uses of ETIC funds in line 3	
17	New facilities	\$ -
18	Improvements to facilities (7)	\$ 8,000,000
19	Laboratory equipment (7)	\$ 11,000,000
20	Other equipment (7)	\$ 600,000
21	Other one-time expenses PSU C	\$ 12,000,000
22	Existing faculty salaries & benefits (1) PSU D	\$ 5,197,230
23	New faculty salaries & benefits (2)	\$ -
24	Existing staff salaries & benefits (1) PSUD	\$ 860,500
25	New staff salaries & benefits (2)	\$ -
26	Services & supplies	\$ 842,761
27	Other PSU E	\$ 450,765
28	Total (8)	\$ 38,951,256
Instructions. (Replace with your own notes in the document you submit.)		
(1) Hired through June 2011 that will be supported by ETIC funds during 2011-13		
(2) To be hired with ETIC funds during 2011-2013 biennium.		
(3) Include any Certificates of Participation to be issued during 2009-2011 biennium.		
(4) Consistent with ETIC Private Support Policy dated 1-23-02.		
(5) FTE expressed as percent of full time over 2 years of biennium. For instance, a new full-time faculty member hired on 7/1/12 would be counted as 0.5 because he/she joined half way through the biennium.		
(6) FTE on an ongoing basis. For instance, if a new half-time position is created but not expected to be filled until the last month of the biennium, it would still be counted as 0.5.		
(7) Include improvements and equipment to be purchased with ETIC funds and any Certificates of Participation to be issued during the biennium.		
(8) Totals on line 3 and line 28 should match.		

PSU Footnotes

A	EBL \$6,929,992 + \$421,264 (adjustment to cover salary and benefit increases) plus \$31.6 million Policy Option = \$38,951,256
B	Due to state of economy, private support projections greatly reduced.
C	See schedule below for details
D	Projects annual salary increase (2%) and benefit increases
E	Ongoing costs such as graduate assistants.

Details Related to Line 21, Other One-Time Expenses

Proposal Narrative Reference	Description	Other One-Time Expenses
1	Sensory & data backbone for sustainability monitoring	\$ 2,400,000
3	New Faculty Hires	\$ 600,000
4	Start-up funds for faculty hiring (new & replacement)	\$ 3,000,000
5	Student Support	
	Summer Undergraduate Research Experience	\$ 350,000
	Undergraduate Research & Mentoring	\$ 100,000
	Student Internships	\$ 150,000
	Sustainability Scholars (Grad)	\$ 900,000
	Student Support Total	\$ 1,500,000
6	K-14 Outreach	\$ 1,000,000
7	Community Outreach	\$ 1,500,000
8	Post-Doctoral Researchers	\$ 2,000,000
	Total One-time Expenses	\$ 12,000,000

Metrics Forecast (for programs/departments receiving ETIC funding):

	Actuals (1)		Projected (2)		
	AY 99	AY09	AY13	AY15	AY20
Undergraduate student credit hours	20785	33321	39050	42955	51976
Graduate student credit hours	8685	13542	15125	16638	20131
Graduation rate, 6-year (5)	24%	28%	31%	34%	37%
Bachelor's degrees granted	157	185	230	278	337
Master's degrees granted	105	180	220	242	293
PhD degrees granted	4	14	17	18	22
Women graduating (6)	55	69	88	97	117
Minorities graduating (7)	76	46	66	73	88
Externally-funded research expenditures (8), thousands	\$1,647	\$7,752	\$10,000	\$12,000	\$14,000
Invention Disclosures (9)	0	3	7	7	10
License/options (10)	0	2	5	5	7
License income received (11), thousands	\$0	\$1	\$3	\$3	\$8
Spin-off Companies (12)	0	1	1	1	1
National ranking of <program or department> (13)	NA	NA	NA	NA	NA
National ranking of <college>	NA	NA	NA	NA	NA
Notes/instructions. (Delete these notes and replace with your own in the document you submit.)					
(1) Actuals for 12-month period ending in June of the year shown.					
(2) Forecast for the 12-month period ending in June of the year shown.					
(3) Percentage of first-time freshmen who remain in an ETIC-supported program the following fall.					
(4) Percentage of transfer students who remain in an ETIC-supported program the following fall.					
(5) Percentage of students who started ETIC-supported program six years earlier as first-time freshmen who have completed bachelor's degrees.					
(6) From engineering, computer science, and other programs directly benefiting from ETIC funding, stated as percent of all those graduating.					
(7) Racial and ethnic minorities who are US citizens or permanent residents, stated percent of US citizens or permanent residents graduating.					
(8) Total external dollars spent by ETIC-related departments towards research during academic year.					
(9) See Association of University Technology Managers (AUTM) survey definitions.					
(10) Number of license or option agreements executed during the year. See AUTM survey definitions.					
(11) License issue fees, payments under options, annual minimums, running royalties, termination payments, the amount of equity received when cashed in, and software end-user license fees equal to \$1000 or more, but not research funding, patent expense reimbursement, valuation of equity not cashed-in, or end-user license fees less than \$1000. See AUTM survey definitions.					
(12) New companies that were dependent on the licensing of your program's technology for their initiation. See AUTM survey definitions.					
(13) Forecasts for multiple programs and departments are encouraged. Each ranking should be footnoted with the ranking body or ranking methodology.					

Introducing PIC and PRLS at ETIC

1. PIC is for regional impact. We build up PICs with our faculty clusters in these areas: Sensing Systems, Metal work and manufacturing, Computing systems, Green building and environmental engineering.

2. PRLS is for national competitiveness. Regional Sustainability as a theme takes advantage of the fact that the Portland region is widely known for its commitment and activities in sustainability. Given all the research and development in green tech, the concept of sustainability is still sufficiently fuzzy, and therefore an opportunity.

To achieve these goals, we need particular faculty strengths in complex system modeling and analysis, life-cycle analysis, sustainable manufacturing, and power/energy.