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Oregon Built Environment & Sustainable Technologies Center

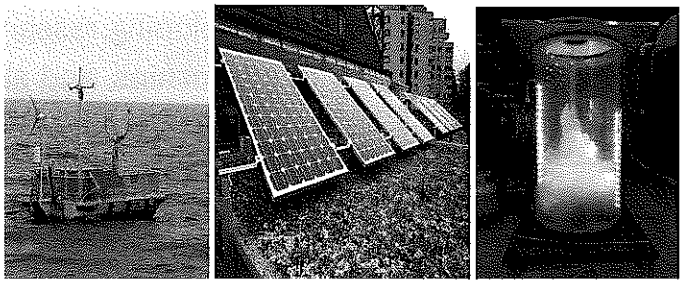
Impact Overview

Commercialization Grants fund technologies developed by small businesses & universities to bring clean-tech innovations closer to market. Oregon BEST is deploying over $2 million to help 23 Oregon start-ups, which has leveraged $2 million in follow-on investments.

"Oregon BEST's ongoing support has been instrumental in helping Indow Windows grow from a startup of 3 people in 2010 to an Oregon manufacturing company of 14 employees with distribution in 20 states (and growing!)."
– Sam Pardue, CEO of Indow Windows

200+ Oregon BEST Member Faculty have attracted over $83 million in research funding for clean technologies since 2008.

The **Proposal Matching Program** has committed matching funds to over 112 research proposals & 35 successfully funded projects by Oregon BEST Member Faculty. These projects have attracted over $14 million in funding from federal, private & foundation sources.

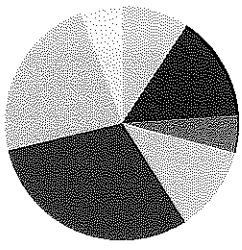


Our success is generating national support

- Awarded the highly competitive **i6 Challenge grant** from the US Economic Development Administration (EDA) with OTRADI & ONAMI.
- Launching a collaborative research partnership with **Bonneville Power Administration** for $250,000 to increase university focus on important energy innovation opportunities.
- Secured $250,000 from the Portland-area's $2 million **Jobs & Innovation Accelerator Challenge grant** from the US EDA.
- Selected to be a part of the National Energy Technology Laboratory's **Commercialization Alliance.** Funding amount TBD.

The **Agenda Development Series** has led over 150 leaders in design & construction industries to create 3 research agendas that communicate industry research needs to federal agencies & policy makers.

Oregon BEST FEST 2012: 260 Attendees



Top 5 Impacts of 2013-15 Budget Request

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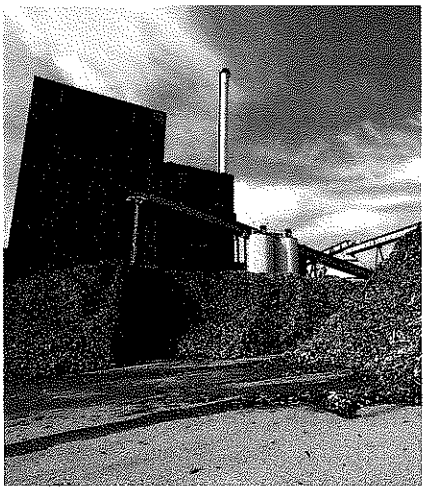
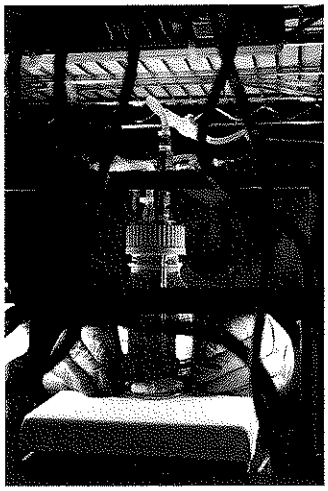
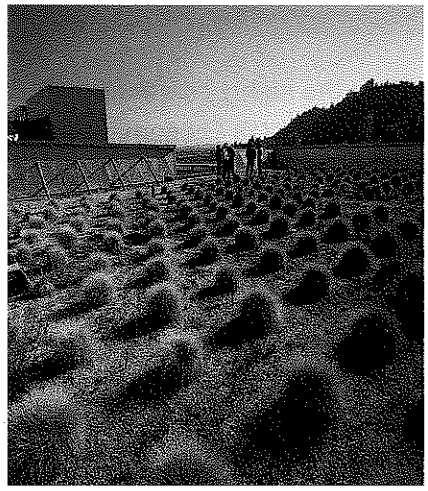
1. Double the number of commercialization grants that accelerate small Oregon companies. Grow Oregon BEST commercialization grant portfolio to 60.
2. Deliver more services to more entrepreneurs including industry specific coaching and resources. Provide entrepreneur support service to over 75 companies.
3. Expand statewide impact by partnering with organizations around the state to increase the number of companies helped in all Oregon communities.
4. Accelerate university growth around 2-3 centers of excellence by growing lab infrastructure, developing research teams for pursuit of federal grants, engaging students with internships, and aligning industry partners.
5. Dramatically increase the number of new clean-tech companies created in Oregon by offering industry and student innovation competitions.







Mission

We are the nexus for clean technology innovation. We build capability, convene collaborations, and accelerate the solutions to environmental challenges that deliver prosperity in all corners of Oregon.

Oregon BEST transforms research discoveries into clean-tech jobs and economic prosperity.

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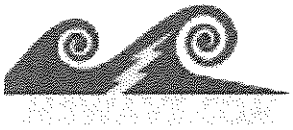
Commercialization Grant Portfolio

Commercialization Partner & Award Amount	The Innovation	How Oregon BEST Helps
indow windows **Portland - $73,481**	**Low-cost thermal window insert for energy efficiency improvement of single pane windows**	Funded performance testing and energy savings validation at the Oregon BEST Green Building Research Lab at PSU. Led to accelerated product sales nationally, helping to secure $1.3 million in private capital.
Stevens **Portland - $150,000**	**SWEETSense™, a wireless water, air and environmental sensing technology**	Funded further development and transfer of PSU-developed technology to an existing Oregon company. Led to startup of new business unit and initial sales.
HM3 ENERGY **Gresham - $86,086**	**Torrefaction system for conversion of woody biomass into coal substitute for coal-fired power plants**	Funded characterization and testing of biomass drying process by OSU researchers to meet environmental compliance targets. Positioned company for further development of commercial scale process.
AE Applied Exergy **Corvallis/Portland - $150,000**	**Grid scale energy storage technology utilizing ice slurry to facilitate integration of renewables into grid**	Funded building of demonstration model and validation of performance and cost assumptions by OSU researchers. Positioned company for pilot trials to complete the spin-out of this OSU developed technology.
Shelter Works Ltd Healthful and Sustainable Building Products **Philomath - $75,000**	**Building system for concrete walls using form blocks made from recycled wood and cement**	Funded seismic testing and the development of engineering guidelines at Oregon BEST Infrastructure Testing and Applied Research Laboratory at PSU. Positioned company to enter commercial market.
CSD Nano **Corvallis - $150,000**	**Nano – coatings for architectural glass to improve energy performance**	Funded joint OSU and UO project to develop window glass prototypes to be tested by JELD-WEN. Positioned company to obtain validation by industry partner.

Commercialization Partner & Award Amount	The Innovation	How Oregon BEST Helps
INSPIRED LIGHT **Corvallis - $150,000**	**Concentrated solar energy systems for rooftop applications on commercial buildings**	Funded product development project at Oregon BEST OPIC Lab at OSU to reach fully operational prototype of this DARPA-funded technology. Led to Department of Energy grant and positioned company for field trials and first customer acquisition.
 **Salem - $74,872**	**Wave energy device that produces electricity while submerged on ocean floor**	Along with Oregon Wave Energy Trust, funded further product development to meet the requirements for scale-up grants from US Department of Energy.
GREEN LITE MOTORS **Portland – $73,284**	**100-mpg hybrid gas-electric vehicle for urban delivery and commuter transportation**	Funded development of next generation prototype with Oregon Tech's researchers and students. Leveraged funding from Oregon Transportation Research and Education Consortium.
NW Northwest Renewable Energy corp **Yamhill – $20,000**	**Suncooler™, a solar powered rooftop ventilator for commercial, agricultural and institutional applications**	Funded installation and data collection by Oregon Tech researchers and students to verify potential energy cost savings. Provides third-party validated performance data necessary for national sales.
Corvallis Tool Company Engineering Fabrication Machining Controls **Philomath – $28,600**	**Densified wood technology that creates higher value green building material**	Funded the development of a manufacturing process with the Oregon BEST Green Building Materials Laboratory at OSU. Technology licensing discussions underway with major manufacturer.
TRILLIUM FIBERFUELS, INC. **Corvallis - $74,343**	**Enzyme technologies for creating fuel-grade ethanol from straw and biomass**	Funded research and development with OSU researchers to advance discovery. Led to follow-on funding including Small Business Innovation Research Grants.

Additional projects in the contract development phase that will support 10 companies in Curry County, Corvallis, Eugene and Portland.

Legislative Testimony, March 13, 2013
David Kenney, President & Executive Director
Oregon BEST

My name is David Kenney and I am the President & Executive Director of Oregon BEST, the state's research and commercialization center focused on clean technologies.

I'll take a few minutes today to explain who we are, what we do, and the impact we are having. I'll also tell you briefly about the opportunity we see to significantly increase our impact with the budget request included in the Oregon Innovation Council's recommendation and the Governor's budget.

First, our scope. We are focused on the technologies that are needed to help our planet sustain life for the coming century. As the world's population grows and, even more importantly, the rate of economic growth around the world increases, the technologies that have fueled past growth can no longer sustain us without causing massive global problems, including climate change, environmental degradation and scarcity of resources like clean water and rare earth materials. Clean technology solutions address these challenges, and include renewable energy, energy efficiency, green buildings, lower-impact water treatment technologies, water efficiency, energy storage, smart grid, sustainable materials, and other technologies which address demands from virtually every industry on the planet.

While the business models and profitability of individual industry sectors periodically face challenges, most notably recently in the solar manufacturing sector, the global demand for new clean technology solutions has not slowed. In fact, more solar and wind energy was deployed globally in 2012 than in any year in history. Demand for new stormwater treatment technologies and approaches has grown in recent years due to regulations and steep fines for cities that have combined sewer overflow events. Long term trends show strong growth in many different water, energy and agriculture technologies and sustainable materials and products. Oregon is well-positioned to capitalize on the business opportunities created by these demands and Oregon BEST is well-suited to help Oregon companies grow and proper by developing and deploying new technologies. As we highlight on the back of our brochure, businesses are the ones who create jobs, and they do that when they are successful in receiving private investment or in selling their products and services.

We have organized our programs at Oregon BEST into three areas: Build. Convene. Accelerate.

Build is about continuing to grow Oregon's research infrastructure, capacity and capabilities. We have a network of over 220 Member Faculty and we have established a network of 7 shared user Signature Research Facilities distributed at our university partners. We also provide a Proposal Matching Program which provides a source of cost share often required by federal and other research funders. We think of this hub of research expertise, equipment and activity as the core "asset" that Oregon BEST is able to offer to our industry and entrepreneur collaborators. As you can see in the handouts I have provided, our Member Faculty have

collectively secured $83 million in research funding from non-state sources in the past few years and our Proposal Matching Program has played a direct role in landing $14 million of that. We have recently submitted documentation to the state showing how that $14 million created or retained more than 40 university jobs.

Convene is about bringing our diverse audiences together to collaborate. Our signature event, Oregon BEST FEST, attracts hundreds of attendees each year and showcases university research, startup companies' products and industry partners' needs in a format that encourages lots of networking and cross-disciplinary and cross-industry interaction. The pie chart on one of the handouts shows you just how well-distributed the audience is in terms of interests.

We launched an Agenda Development Series last year, in which we gather industry leaders and a small number of researchers for a forum in which we identify industry research priorities in a variety of topic areas and then publish a research agenda. Our first three forums, all held in the past 6 months, attracted over 150 industry and research leaders and we have published a research agenda developed at each forum. We then promote these research agendas to federal funding agencies to encourage alignment between federal research funding and industry needs and we organize research teams to pursue funding and execution of the identified research projects. During a trip to Washington DC two weeks ago, we learned about a US Department of Energy research grant solicitation that was about to be released and we had discussions with the US General Services Administration about a research project concept from one of our published research agendas. The solicitation was released last week (with a two week response time) and we are now organizing a team made up university researchers, two companies and a federal agency partner to submit a proposal we believe will be compelling and which we hope will lead to the development of a new tool for the green building industry which can be commercialized.

We also make hundreds of one on one connections every year between our various stakeholders, introducing faculty to each other, startups to researchers, and other partners to whatever resources help to build a stronger innovation and business ecosystem.

Finally, Accelerate is the category of our programs focused on supporting Oregon-based clean technology startup companies to develop new products and get to market. We provide Commercialization Grants, in which an entrepreneur and a university researcher partner on a project which either advances a university technology toward the marketplace or uses university expertise or equipment to help the startup develop, prototype, or validate their product. We have committed $2 million of these grants since 2011, benefitting 22 startup companies. One of the two handouts I provided lists the first 12 of these projects – there are 10 more that have been selected and will be underway soon.

The first four Commercialization Grants we made, totaling $250,000 have helped four companies raise $2 million in private investment and federal grants and accelerate their path from technical concepts to proof of concept, prototype, third party validation or full production.

We also have two part time Entrepreneurs-in-Residence who provide coaching and resources to the many companies in our portfolio and to the pipeline of companies we may be helping more

significantly in the future. We have also recently started connecting entrepreneurs to students for capstone projects in both business and engineering and also piloted the funding of a student internship at a startup company, which was very successful.

Let me share a couple of examples of companies that have directly benefitted from our programs and then I'll turn it over to a third to share a first-hand experience.

First is Indow Windows. Indow Windows is a startup company that was created in 2010 by entrepreneur Sam Pardue. Sam developed a thermal window insert (essentially an interior storm window) that didn't require any hardware and which solved the biggest problem that other interior storm windows had – aesthetics. His product looks good in a home. Indow Windows is addressing a major source of lost energy in tens of millions of homes in America – single pane windows. While developing the product, Sam was introduced to Oregon BEST and he came to Oregon BEST FEST, our annual conference, in 2010, where he met Professor Dave Sailor from PSU, director of the Green Building Research Lab, one of the seven Oregon BEST Signature Research Facilities that I mentioned earlier. Professor Sailor was able to provide the lab testing needed for Indow Windows to make the claim that their product provided 94% of the performance of a replacement double pane window and through an Oregon BEST Commercialization Grant, went on to perform a year-long performance test in four homes that provided valuable data about energy savings that will allow Indow Windows to pursue commercial accounts and strategic partners like utilities. We also funded a short student internship project with a Geographic Information Systems (GIS) student who provided extremely valuable insights to the company about what markets around the US to target. We have also provided valuable industry and fundraising connections to the company and, more recently, have been helping the company find resources to improve their manufacturing processes. The product went to market in 2011 and we are very proud of the role we have played in their success to date. Indow Windows was the Pacific Northwest regional winner and was 2nd place nationally in the 2011 the Clean Tech Open and has been a finalist in a number of angel investor competitions. They raised $1.3 million in equity investment last June from VC and angel investors. They now have 35 dealers in 20 states and they are growing rapidly. From the original 3 employees in 2010, they have grown to 14 employees, mostly in manufacturing, all of which occurs here in Oregon.

A second example is a partnership between PSU and Stevens Water Monitoring Systems. Professor Evan Thomas at PSU invented a wireless water, air and environmental sensing technology that integrates data collection with web-based analysis. Initially, his focus was on applications of interest to relief organizations in developing countries and he was able to use Oregon BEST's proposal matching program to leverage (at a 10:1 ratio) funding from Mercy Corps to test his new technology and he learned a great deal that enabled him to address some of its challenges. Prof. Thomas began collaborating with Scott South, CEO of Stevens Water to explore using the technology in more mature applications, such as monitoring water flow in municipal water systems. Together, they applied for an Oregon BEST Commercialization Grant last year, which has funded the further development and productization of the technology and licensing to Stevens Water. The collaboration has been very successful and has led to the spinout of a new company called SWEETSense Inc., a joint effort between the parties.

Our request in front of the Legislature for the 2013-15 biennium directly builds on our success to date. The funding recommendation in the Governor's budget would enable us to continue and grow our Proposal Matching Program and Commercialization Grant Program. We are targeting to grow our Commercialization Grant portfolio to 60 companies and to have more than 75 companies benefit from a broader range of Commercialization Program services.

We are laying the groundwork now to be able to grow new centers of excellence in Oregon. We have more insights into industry needs, university expertise and labs and what role we can play to leverage these resources into programs and initiatives to grow Oregon's innovation leadership in sustainable technologies. This will manifest itself as new lab equipment, structured convening activities and targeted use of our grant programs to leverage federal and industry support in growing our innovation capacity.

We have plans to partner with the universities to create or expand student innovation and business plan competitions that increases the number of new businesses developed by students coming out of the university system and we are also planning to expand our matchmaking between startup companies and university interns and student projects. I'm happy to answer specific question you have about our program or our future plans.

I'd also like to introduce you to Frank Cloutier, CEO of Inspired Light, one of Oregon BEST's Commercialization Grant portfolio companies. Frank spent 32 years at HP, where he was a Vice President and the CTO of the Printing and Imaging group. He is credited by some as being the father of HP's inkjet printing business. His new venture builds on his HP experience, but in a new industry. I'd like to give him the chance to share his experience with you.

Thank you for your time today.