

# **LCC Solar Electric and Vehicle charging Proposal for February 15, 2009 EWEB Greenpower Grant Application**

## **1. Overview of Organization**

### Mission

Lane Community College (LCC) is a learning-centered community college with a mission to provide affordable, quality, lifelong educational opportunities that include professional technical and lower division college transfer programs; employee skill upgrading; business development and career enhancement; foundational academic, language and life skills development; lifelong personal development and enrichment; and cultural and community services. Since its founding in 1964, LCC has helped hundreds of thousands of Lane County students reach their goal of “transforming their lives through learning”—the college’s vision statement).

### Needs Addressed and Populations Served

LCC addresses the essential educational needs of over 12 percent of the county’s 337,000 residents through credit and noncredit courses. With 90 percent of LCC graduates remaining in Lane County upon program completion, LCC provides students with opportunities of upward economic mobility through family-wage jobs and serves as the largest economic catalyst for the county. A 2006 economic impact study notes that Lane County’s economy receives approximately \$826.5 million in regional income as a result of the college’s operations and the collective impact of LCC graduates in the workforce.

LCC strives to be affordable, making access to education for all students a priority. This is particularly important in Lane County where the per capita income and median household income are \$22,461 and \$42,127, respectively—approximately 15–20 percent lower than the statewide and national averages (Source: American Community Survey, 2006). Many students would be unable to enroll at LCC without financial aid. Nearly 38 percent of LCC students’ income is so low that they are eligible for Pell Grants.

The college serves a growing number of students from disadvantaged backgrounds and from underrepresented demographic groups. Forty-seven percent of LCC students fall into at least one of three classifications of traditionally underrepresented students: first-generation college student; disabled student; and/or low socioeconomic status. In terms of gender, 62.7 percent of students are women—a percentage much higher than the 50.8 percent of women in the county. The college is also more ethnically diverse than the county as a whole, with 14 percent of the student population comprised of traditionally underrepresented ethnic and racial groups as opposed to 11 percent for the county.

More specific to the goals of this grant is LCC’s commitment to environmental conservation embedded in its core value of sustainability. The college’s sustainability values may be seen in basic functions such as energy conservation, recycling, and the expansion of sustainability education programs. On a larger scale, LCC has set a goal through the American College and University Presidents’ Climate Commitment to become carbon neutral. In support of this goal, LCC recently prepared a comprehensive greenhouse gas emissions inventory that includes emissions from electricity, natural gas, fleet vehicles, and students and staff commuting to and from campus. LCC currently funds new renewable energy and energy efficiency projects with savings from previously implemented efficiency measures and renewable energy projects. Finally, LCC has adopted a policy that requires all new construction and modernization to comply with, at a minimum, the Silver Standards for Leadership in Energy and Environmental Design (LEED).

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## Programs and Operating Budget

The college offers nearly 40 technical degree programs, plus transfer credits in more than 50 subjects. Fields of study include most disciplines in social sciences, business, computer science, mathematics, science, languages, education, and the visual and performing arts. Career and technical training range from automotive technician and welding/fabrication to the culinary arts and health care professions.

More specific to this grant is LCC's two-year technical degrees of Energy Management, Renewable Energy Technology, and Water Conservation Technology.

The college's 2007-08 annual budget was \$65.3 million and receives 38 percent of its funding from the State of Oregon, 21 percent from property taxes, 35 percent from tuition and mandatory fees, and 6 percent from other fees and income.

## **2. Project Description**

### Purpose

LCC's project will create a learning example of solar-powered electric vehicle charging stations for our community to study. This project will be a platform for 75-80 kW of grid inter-tied solar electric panels and 36 electric vehicle charging stations at the 30<sup>th</sup> Avenue campus parking lots. The solar panels will create a covered parking area. LCC's project will leverage about 1 percent of funds from the recently passed bond (\$700,000) to be used in conjunction with the EWEB grant to create this sustainable transportation infrastructure and solar technology research station. (Renewable energy was included in the November 2008 bond measure.)

The project's primary goals are as follows:

- Create opportunities for students to learn to install, repair, and service the solar electric and vehicle infrastructure necessary for our community to establish a lower carbon footprint in the coming years.
- Generate renewable energy.
- Help transform the local community to use plug-in electric vehicles.

### Relationship to EWEB Mission

LCC's solar electric vehicle charging station would help EWEB achieve its mission of meeting the present and long-term energy needs of the community and benefit the citizens of Eugene as follows:

- LCC's project will help create the workforce needed as the community's demand for renewable energy technicians increases.
- Creating the infrastructure to encourage the transition from combustion to non-combustion commuter transportation.
- Reducing emissions and directly improving air quality in our area, with an eventual reduction in greenhouse gas emissions of up to five tons per year for charging 36 electric vehicles.
- Helping to meet the present energy need for recharging intercampus electric plug-in vehicles.
- Providing a research area to gauge community need to charge vehicles at work or while taking classes and attending events.

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### Populations Served and Benefited

The project will serve LCC students and the community at large. LCC's students directly benefit from the infrastructure's use as a learning lab. This hands-on learning experience will help them develop skills for a variety of careers aimed at reducing greenhouse gas emissions.

The EWEB community benefits from having a trained workforce that can build systems to recharge vehicles with minimum impact to the electrical system and environment. Furthermore, the community will have the immediate benefit of reduced carbon emissions and better local air quality.

LCC's solar electric vehicle charging station will serve students, staff, and visiting members of the community by doing the following:

- Providing electrical vehicle recharging
- Creating covered parking available for handicapped (alter-abled) students, staff, and visitors.
- Reducing the heat island effect by shading the parking lot surfaces.
- Protecting the public investment in LCC's equipment with the parking structure.
- Generating renewable solar electric power.
- Reducing greenhouse gas emissions in our community.

### Implementation Strategies

The location provides a possibility to create a direct intertie with EWEB's electrical grid not previously available. LCC's staff will plan and integrate the project's location with the college's parking and vehicle infrastructure. College staff will finalize construction details with the assistance of EWEB staff and engineering professionals in preparation to apply to the Lane County Planning Department.

The design delivery system will be a design-bid-build model with an outside firm or LCC's staff performing installation work for the structure and distribution system. Work will start on the project once plans are approved and Lane County has issued construction permits.

Students in the Renewable Energy Technician Program will help install the solar panels through existing class curriculum and students in LCC's Energy Management Programs will help evaluate electrical and parking or transportation system performance. Other opportunities for student participation may exist.

## **3. Project Evaluation**

### Evaluation Criteria

The criteria for a successful project and the results LCC hopes to achieve by the end of the funding period include:

- Installation of 75 to 80 KW of renewable solar electricity to charge electric-powered vehicles and provide energy to the EWEB grid.
- Reduction in greenhouse gas emissions of up to 5 tons per year for charging 36 electric vehicles.
- Reduction in greenhouse gas emissions of up to 4 tons per year for electricity provided to the EWEB grid.
- An opportunity for 15 LCC students to gain experience in solar installations.
- An opportunity for other LCC students to study two or more different types of solar electric collection methods and their efficiency/feasibility in the southern Willamette valley.
- A contribution to Eugene's transition to a more sustainable transportation model by providing 36 electric vehicle charging stations.

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- A contribution to the state's renewable energy portfolio standard.
- A well-publicized, effective example for the community of sustainable future.
- Twenty-five to twenty-eight covered parking spaces that cause a reduced heat island effect of the parking lot.

### Measurements of Effectiveness

LCC will measure the effectiveness of the project by:

- Installing electrical sub metering to measure the amount of energy produced by a solar electric array and the amount of energy used to recharge electric vehicles on the campus.
- Tracking the number of students who work on installation and research.
- Tracking the amount of media coverage generated by this project.
- Tracking the number of community members and students that tour this installation.
- Tracking the number of drivers that utilize the charging stations by conducting weekly checks.

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**4. Project Management**

Budget

The following table represents the basic costs of LCC's project, including both the charging stations and the solar panels. Bond funds of \$700,000 will be leveraged for the solar electric system, with the remaining \$100,000 for other elements of the project coming from the EWEB grant.

**BUDGET PROPOSAL FOR SOLAR ELECTRIC CHARGING STATIONS**

<i>ITEM</i>	<i>AMOUNT</i>	<i>UNITS</i>	<i>COST</i>	<i>TOTAL</i>	<i>NOTES</i>
<b>REVENUE</b>					
Funds from Bond Measure	700,000			\$ 700,000	Passed by voters November 2008
EWEB Greenpower Grant	100,000			\$ 100,000	Voted on By EWEB Greenpower customers
		<b>Revenue Grand Total</b>		\$ 800,000	
<b>EXPENSES</b>					
Steel parking lot structure	3000 square feet			\$ 40,000	Approx 25 to 28 vehicle spaces
Charging stations	36	9	\$3,000.00	\$ 27,000	4 outlets per unit
Electric charging infrastructure				\$ 33,000	Engineering, electrical service, etc.
Solar electric system		70000	\$ 10.00	\$ 700,000	Includes permits, inverters, wiring, etc.
		<b>Expense Grand Total</b>		\$ 800,000	

Timeline

The college anticipates completion in spring 2010 in conjunction with the parking lot improvements scheduled with the bond funds. The following is the initial project's timeline.

- Choose design / delivery method: April – May 2009
- Prepare / finalize project requirement documents: June – October 2009
- County plan / permit review: November – January 2010
- Select A/E or design/build firm: February - March 2010
- Construction phase : April – May 2010
- Post-construction phase: June 2010

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### **5. Attachments**

#### Key Staff Resumes

The project implementation team consists of Roger Ebbage Director, Northwest Energy Education Institute; Jennifer Hayward, Sustainability Coordinator; Anna E. Scott, Energy Analyst; and David Willis, Facilities Director.

Roger Ebbage has been the Energy Management Program Manager at LCC in Eugene, Oregon, since 1992 and has made the program a national model for energy education. After developing and piloting several energy-efficiency workshops in the residential and commercial sectors, Ebbage founded and serves as Director of the Northwest Energy Education Institute. His duties include identifying energy-efficiency market trends, developing/teaching workshops based upon market trends, evaluating training programs, and providing technical expert consulting.

Jennifer Hayward is LCC's Sustainability Coordinator and oversees all aspects of sustainable operations at the college. She plays a key role in developing and implementing the college's sustainability goals coordinating LCC's adoption of sustainability as a college core value in 2007 and the continuing infusion of sustainability into college curriculum. Jennifer has a BS in Chemistry from the University of Oregon, is a LEED Accredited Professional and a Sustainable Building Advisor.

Anna Scott was hired as LCC's Energy Analyst in June 2005. Her professional experience reflects a combination of construction contracting experience, work in the energy management, and renewable energy fields. She has earned degrees in Energy Management (LCC) and Fine Arts (Temple University). Blending her educational experiences for the past fourteen years, Anna has been actively pursuing educational projects involving renewable energy, wise use of resources, and contemporary problems about how energy is used in our culture as a personal passion.

David L. Willis was hired as the Director of Facilities Management and Planning in June of 2007. David has earned a certificate in Facilities Management, a Bachelors degree in Building Construction Management and a Masters degree in Business Administration. David has 25 years experience in manufacturing engineering management and construction management in fields such as the semiconductor, food processing, defense aerospace, and higher education.

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The following two pictures are examples of the type of infrastructure we would build as part of this proposal.



Example of a PV covered parking structure at the Tamarack Wellness Center in Eugene, OR.



Example: Electric charging stations from a PG&E installation in Oregon City, OR.  
Station design: Designed by Steve Smith of Smith Creative Group, Portland  
Station manufacturer: Shorepower Technologies, Portland