The Oregon Solar Highway

Presentation to the
CONNECTICUT WTS
2011 TRANSPORTATION MINI-SERIES
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Allison Hamilton
Oregon Solar Highway Program Manager
Office of Innovative Partnerships
Oregon Department of Transportation
In 2008, the Oregon Department of Transportation embarked on an historic initiative... ...to build the first Solar Highway in Oregon and the nation.
The Time is NOW...

Oregon Energy Legislation: Far-reaching and broad, addressing energy and climate change

Governor’s Directive: The Governor directs state agencies to meet their electricity needs with 100% renewable resources

Leadership: ODOT’s Director & the Oregon Transportation Commission tell ODOT to develop real solutions to climate change
ODOT Needs Electricity...

Oregon’s transportation system uses almost 50 million kilowatt hours annually at a cost of more than $4 million.
ODOT has the Opportunity…

ODOT has more than 19,000 lane miles of right-of-way. Solar arrays on less than 1% of that could supply all 50 million kilowatt hours ODOT uses annually.
World energy use
15 TW-yr
per year

(15 billion kilowatt-hours x 24 x 365 PER YEAR)
RENEWABLES – per year

World energy use 15 TW-yr per year

FINITE ENERGY RESERVES – one and done

© Richard Perez
World energy use 15 TW-yr per year

SOLAR 40,000

Wind 23

Natural Gas 70

Petroleum 170

Uranium 220

Total reserve 900

Coal

SOLAR

Wind

OTEC

Biomass 11

Hydro 6

Geothermal 4

Waves 2

Tides 0.3

SOLAR

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All World electrical energy from solar: 0.07% World Land Area
Solar Arrays are on European Highways

Germany

Switzerland

England

Netherlands
Oregon’s Solar Resource Offers No Less Promise
We Secured Leadership Support...

- ODOT Director
- Governor’s Office
- Other State and Federal Agencies
- OSEIA – Oregon Solar Energy Industries Association

Artist’s rendering of ODOT’s second solar highway project – under construction now
We Secured Strategic Government Allies...

Your solar highway initiative is an exciting project that again demonstrates the innovation and creativity that ODOT brings to our Nation’s transportation community. The Federal Highway Administration is excited for this project and we look forward to actively supporting you and your staff in seeing this project through development and into construction.

~ Phillip A. Ditzler, Division Administrator, Federal Highway Administration

We would definitely like to help ODOT on this as much as we can. I think it's a great idea.

~ Michael W. Grainey, then-Director
We Secured Strategic Utility Industry Allies...

I am writing to confirm PGE’s commitment to work with you ... it appears that there is real potential to utilize some of ODOT’s right-of-ways, buildings and/or other structures to host a range of renewable resources.
~ Joe Barra, Director, Customer Energy Resources/Distributed Generation

It is clear that the Energy Trust is keenly interested and ready to work with ODOT... (the ETO) has technical resources and funding available for solar, wind, and biopower electric generation projects.
~ Steve Lacy, Director
Solar Highway Demonstration Project

- 104 kW dc ground mounted solar array
- 594 175-watt dc solar panels
- Produces about 130,000 kWhs annually
- About 1/3 of interchange lighting needs
Placed in Service December 19, 2008
Called one of the nation’s highest transportation priorities by the American Solar Energy Society Congress

“One of the highest priority transportation activities … should be the creation of a full-scale federal transportation program aimed at making alternative solar-based transportation (the “solar highway”) a realistic option in the near future. Planners can build this effort on the solar highway demonstration projects already underway, such as the current solar highway project in Oregon.”
Recognized as 2008 WTS Transportation Project of the Year

“Seldom do we see projects as transformative as this year’s selection, the Oregon Department of Transportation’s Solar Highway Project…it has propelled Oregon as a national leader for innovative sustainable technology, garnering international recognition as well.”
Awarded 2009 Environmental Excellence Award

“The Oregon Solar Highway Initiative reflects the innovation and spirit of partnership that have helped to develop entrepreneurial and sustainable ways of addressing the nation’s transportation and energy needs.”
Received the 2009 Oregon Solar Pioneer Award

“Given in recognition for pioneering the use of solar energy in Oregon for the nation’s first solar highway installation. The installation of a 104 kW solar array at the intersection of I-5 and I-205 opens the door to future public-private partnerships for solar nationwide.”
Solar Highway Demonstration Project

🌞 Winner 2009 National Solar Electric Power Association Partnering for Success Award

🌞 Second round finalist for national “Innovations in American Government Award” - Harvard School of Government

🌞 Finalist for Oregon Sustainability Award
Many states have expressed interest...
...as have countries from around the world.
Public-private partnerships can use tax benefits to deliver solar power at costs no greater than paid for electricity from the grid.
Current Project – Baldock

Baldock Rest Area
- ~7 acres east side of rest area
- ~7,000 SolarWorld panels
- 1.75 MW producing 1,900,000 kWh
- National Research Project
- Go to www.oregonsolarhighway.com and click on Baldock Project link
Ballock Solar Highway Project

- Project Completion
- Project Agreements
- Energy Trust Grant
- Priority BETC Allocation
- Preliminary BETC Approval
- Oregon Way Signature Project
- Oregon Way Presentation
- Oregon Way Launched
- I-5/I-205 Completion
- I-5/I-205 Groundbreaking
- Site Selection
- Jan-12
- Dec-11
- Oct-11
- Sep-11
- Jul-11
- May-11
- Apr-11
- Feb-11
- Dec-10
- Nov-10
- Sep-10
- Jul-10
- Jun-10
- Apr-10
- Mar-10
- Jan-10
- Nov-09
- Oct-09
- Aug-09
- Jun-09
- May-09
- Mar-09
- Jan-09
- Dec-08
- Oct-08
- Aug-08
- Jul-08
- May-08
- Apr-08
- Feb-08
Statewide Solar Site Search

Solar Resource Sites

- Computerized cartographic modeling (GIS)
- Determined if ODOT has the potential to meet its electricity needs with solar resources
- Answer: YES – many times over
ODOT’s Solar Highway Goals

☀ Complement and not Compromise the transportation system

☀ Supply clean, renewable electricity to operate the transportation system

☀ Fulfill mandates to develop sustainable energy resources

☀ Add value to right-of-way assets

☀ Build a foundation for solar highways throughout Oregon and the nation
The Oregon Solar Highway

*Powering the Transportation System of the Future...Today*

Office of Innovative Partnerships & Alternative Funding
Oregon Department of Transportation

www.oregonsolarhighway.com