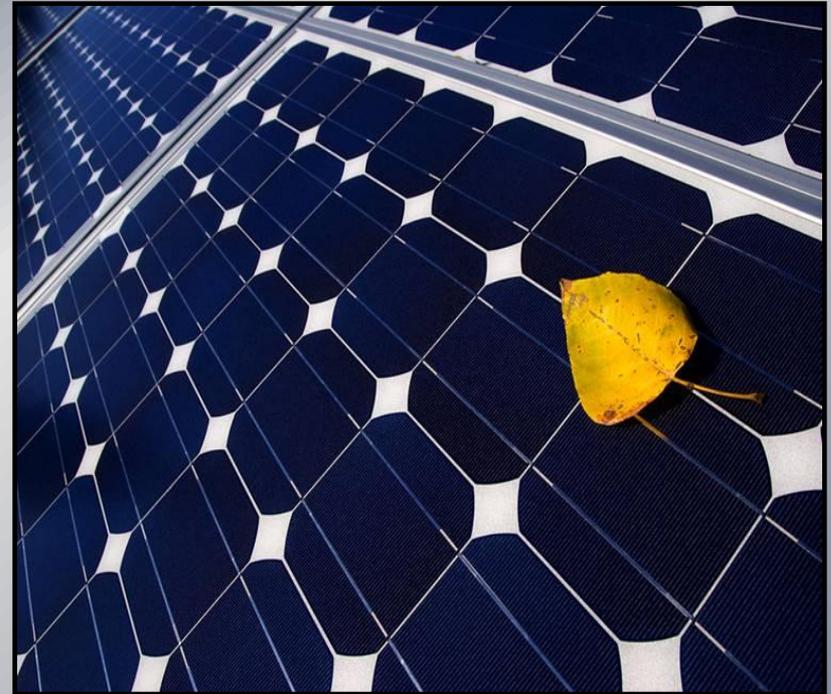


The Oregon Solar Highway

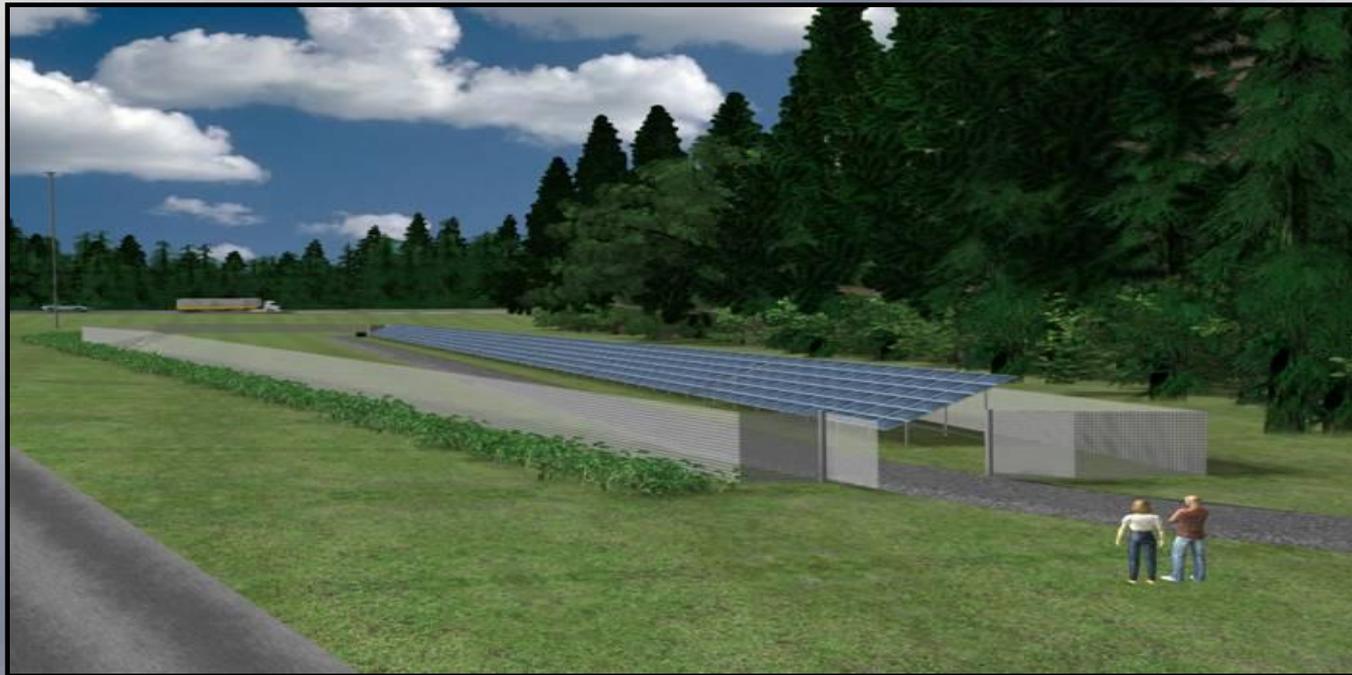
Alternative Uses of
Highway ROW
AASHTO 2011



Joseph A. Gray
Oregon Solar Highway Program
Oregon Department of
Transportation

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In 2008, the Oregon Department of Transportation embarked on an historic initiative... ..to build the first Solar Highway project in Oregon and the nation.

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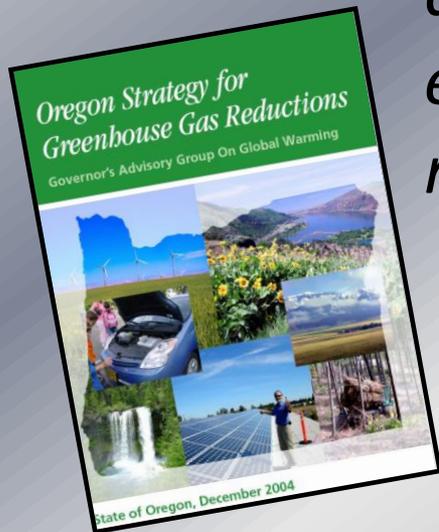
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The Time is NOW...

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.*

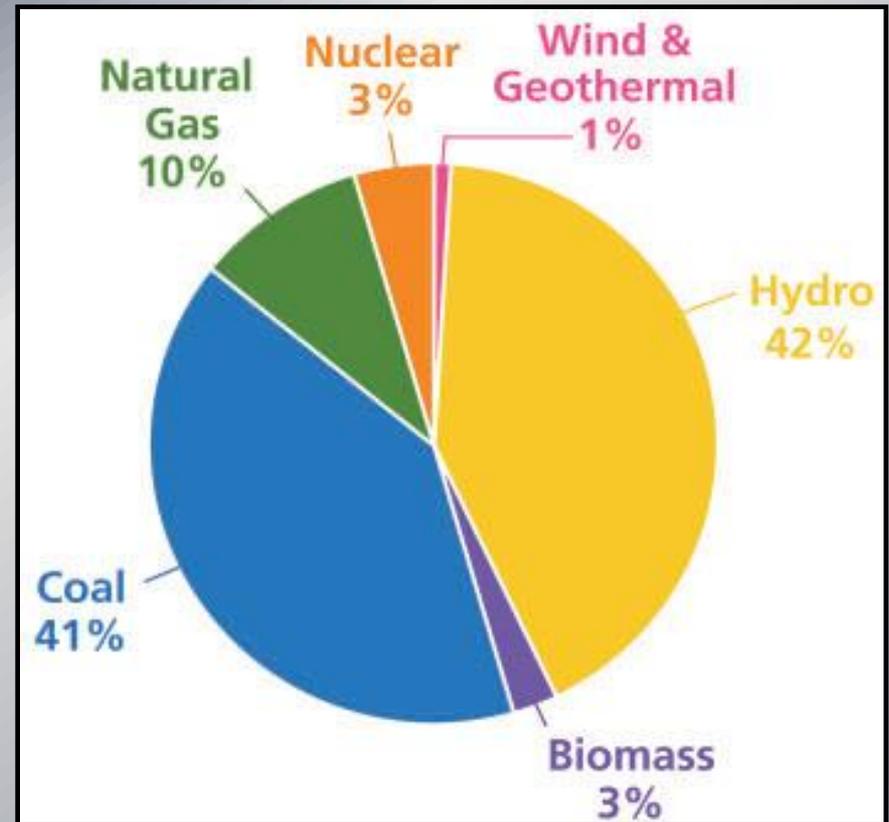


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ODOT Needs Electricity...

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.



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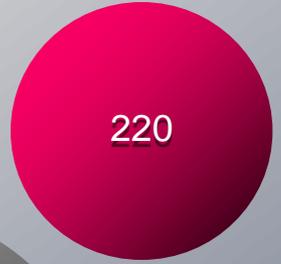
World energy use
15 TW-yr
per year

(15 billion kilowatt-hours x 24 x 365 PER
YEAR)

15

RENEWABLES

World energy use
15 TW-yr
per year



FINITE ENERGY RESERVES

Coal

SOLAR
40,000



World energy use
15 TW-yr
per year



Tides
0.3



2
Geothermal



4
Hydro



6
Biomass



11
OTEC



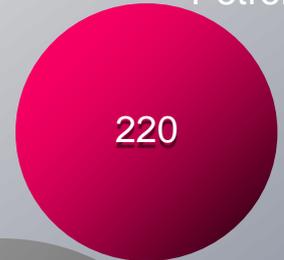
23
Wind
Waves
0.5



70
Natural Gas



170
Petroleum



220
Uranium



900
Total reserve

COAL



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All World electrical energy from solar: 0.07% World Land Area



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Solar Arrays are on European Highways



Germany



Switzerland



England



Netherlands

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Oregon's Solar Resource Offers No Less Promise



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We Secured Leadership Support...

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



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We Secured Strategic Government Allies...



U.S. Department
of Transportation

**Federal Highway
Administration**

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



OREGON
DEPARTMENT OF
ENERGY

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

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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

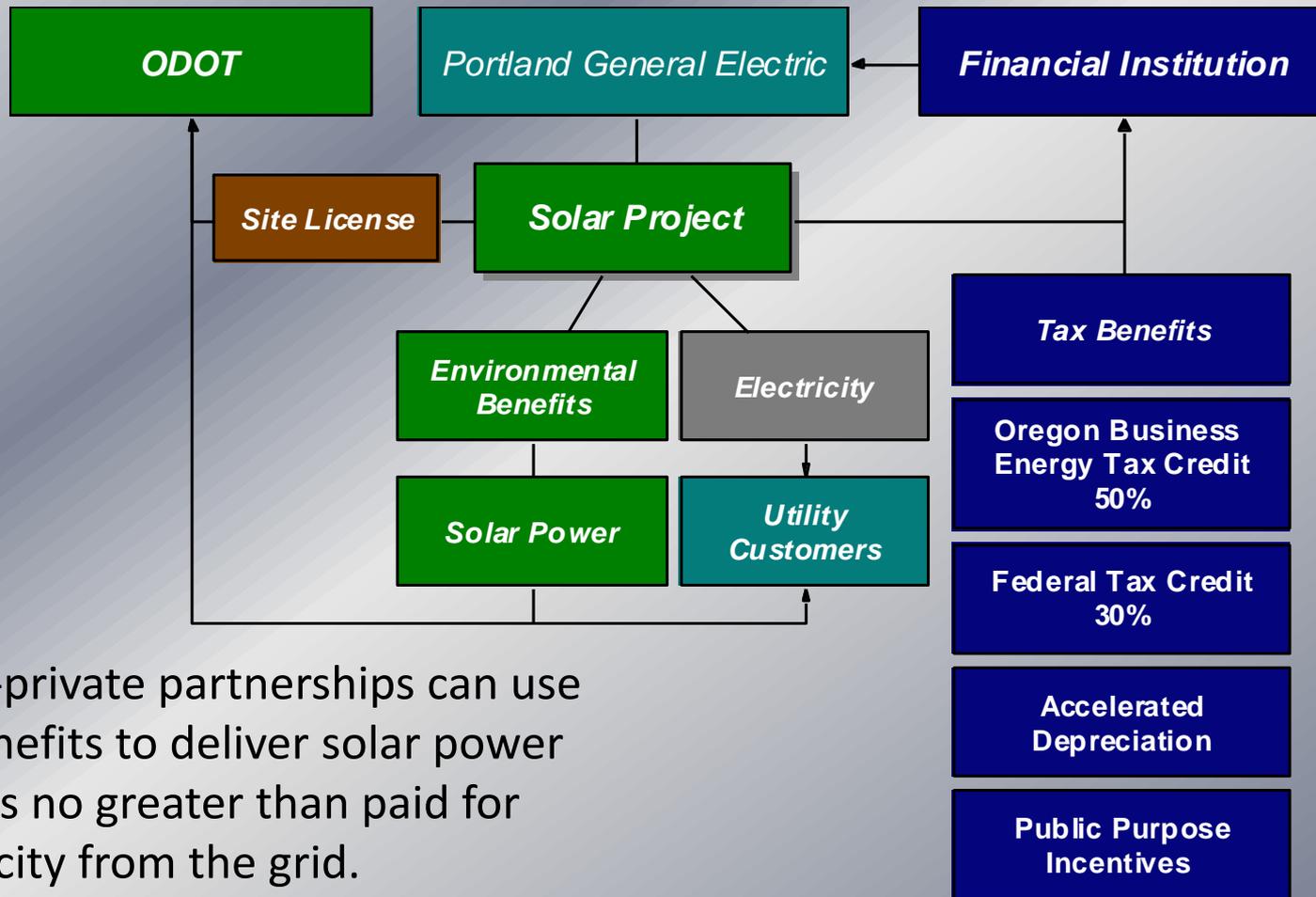


It is clear that the Energy Trust is keenly interested and ready to work with ODOT... (the ETO) has technical resources and funding available for solar, wind, and biopower electric generation projects.

~ Steve Lacy, Director



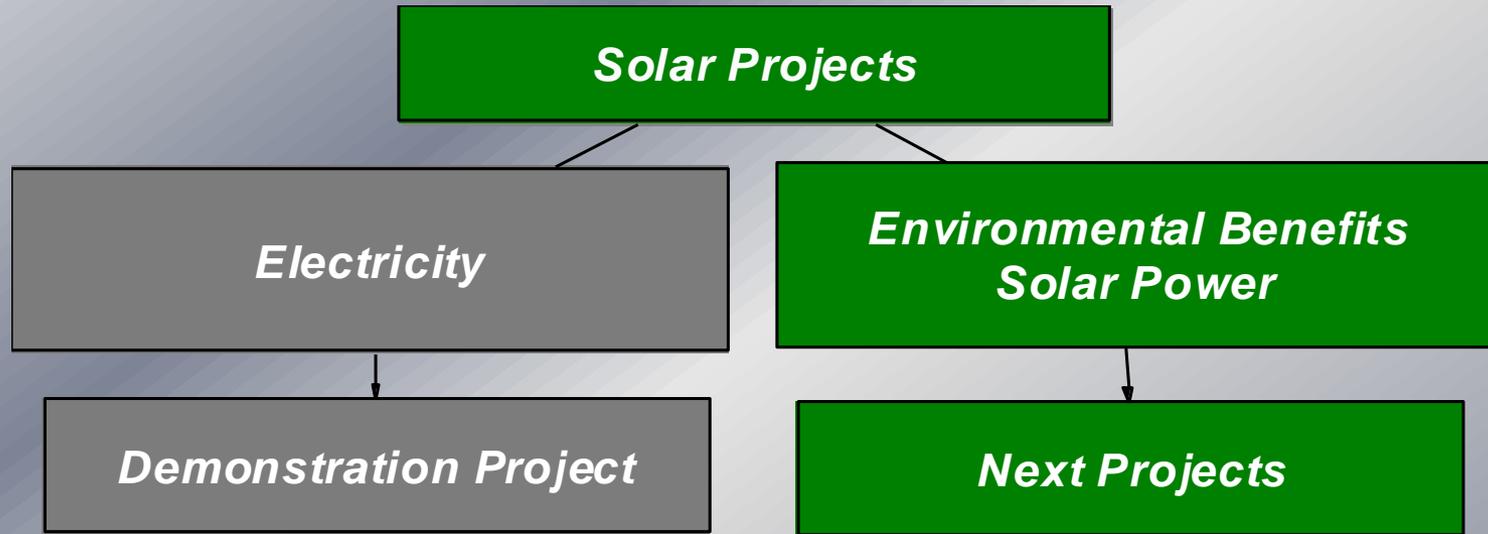
Public Private Partnerships



Public-private partnerships can use tax benefits to deliver solar power at costs no greater than paid for electricity from the grid.

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Key Differences: Public Benefit



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



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Placed in Service December 19, 2008



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Called one of the nation's highest transportation priorities by the American Solar Energy Society Congress

“One of the highest priority transportation activities initiated in 2009 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.”

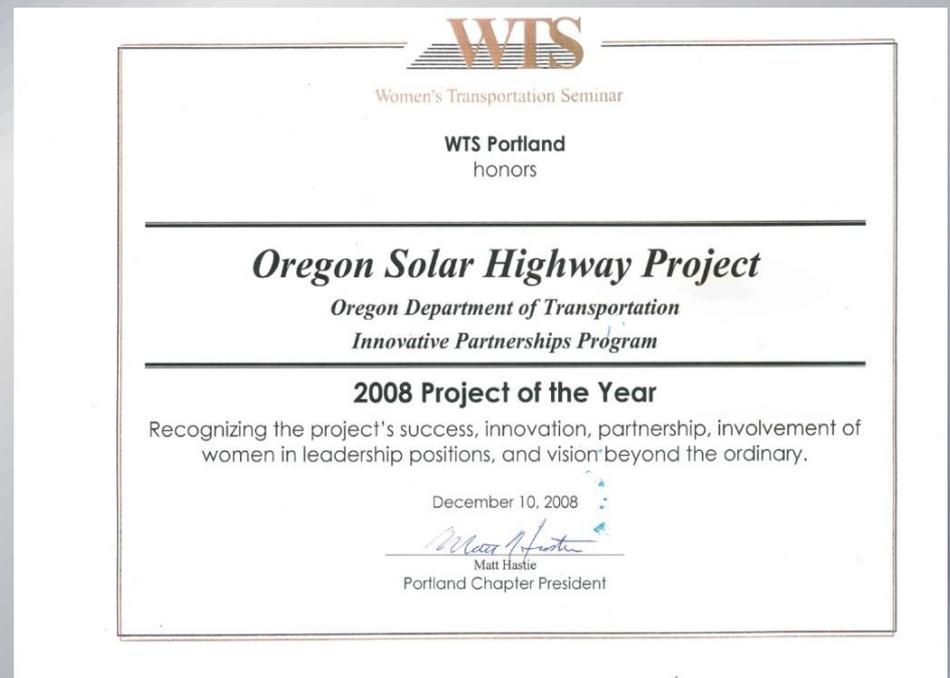


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Recognized as 2008 WTS Transportation Project of the Year

“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.”



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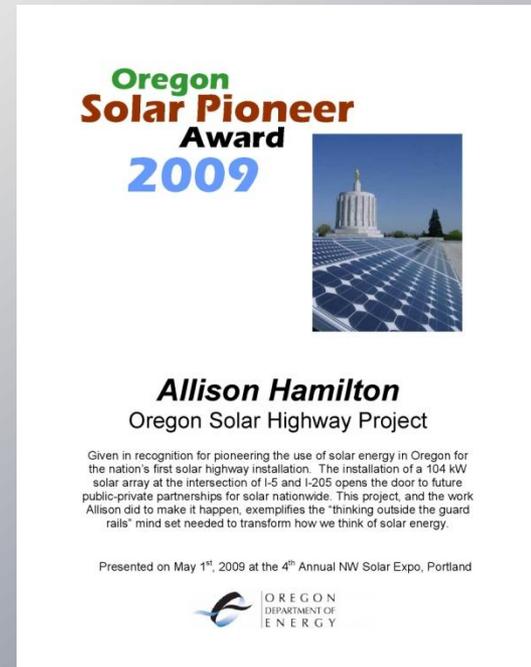
Awarded 2009 Environmental Excellence Award

The Federal Highway Administration awarded the Oregon Solar Highway the *Judges' Award for Special Recognition* in the *2009 Biennial Environmental Excellence Awards*.



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.”



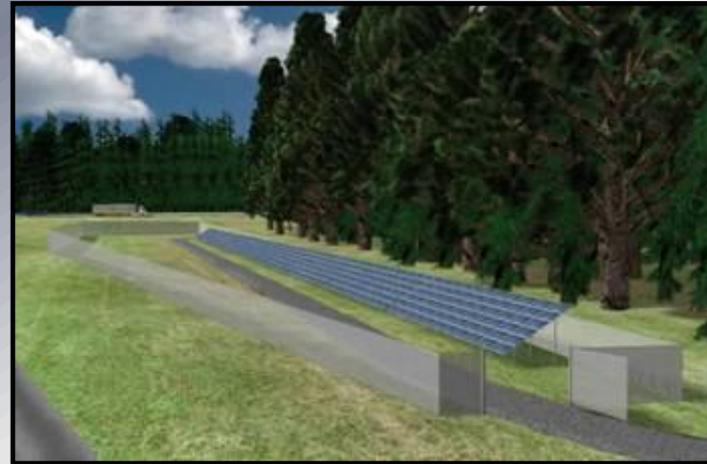
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Solar Highway Demonstration Project

☀️ 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



Artist's rendition, August 2008

The Real Deal, November 2008



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States Interested in Oregon Solar Highway Project

...as have countries from around the world...



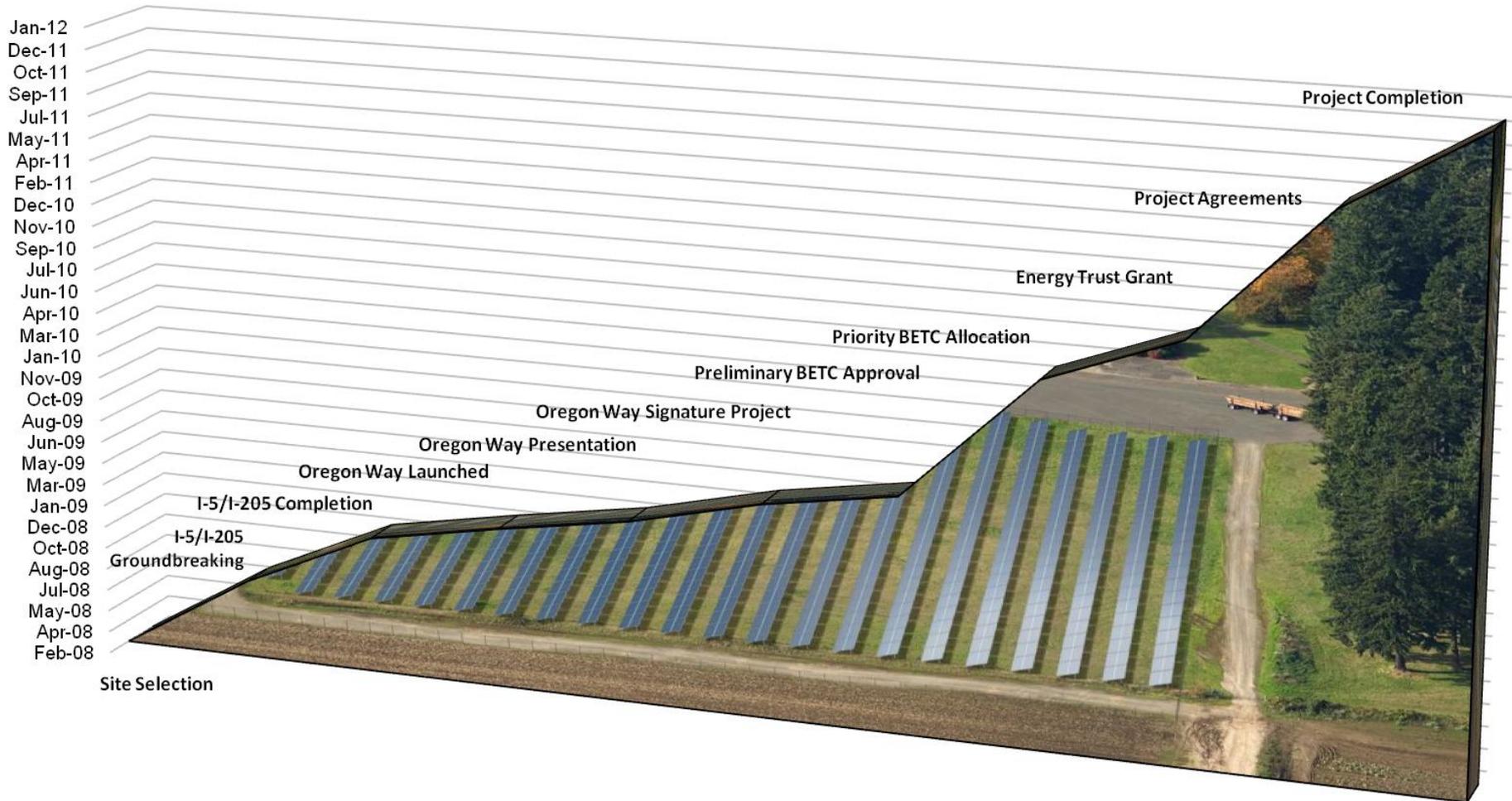
Next Project - Baldock

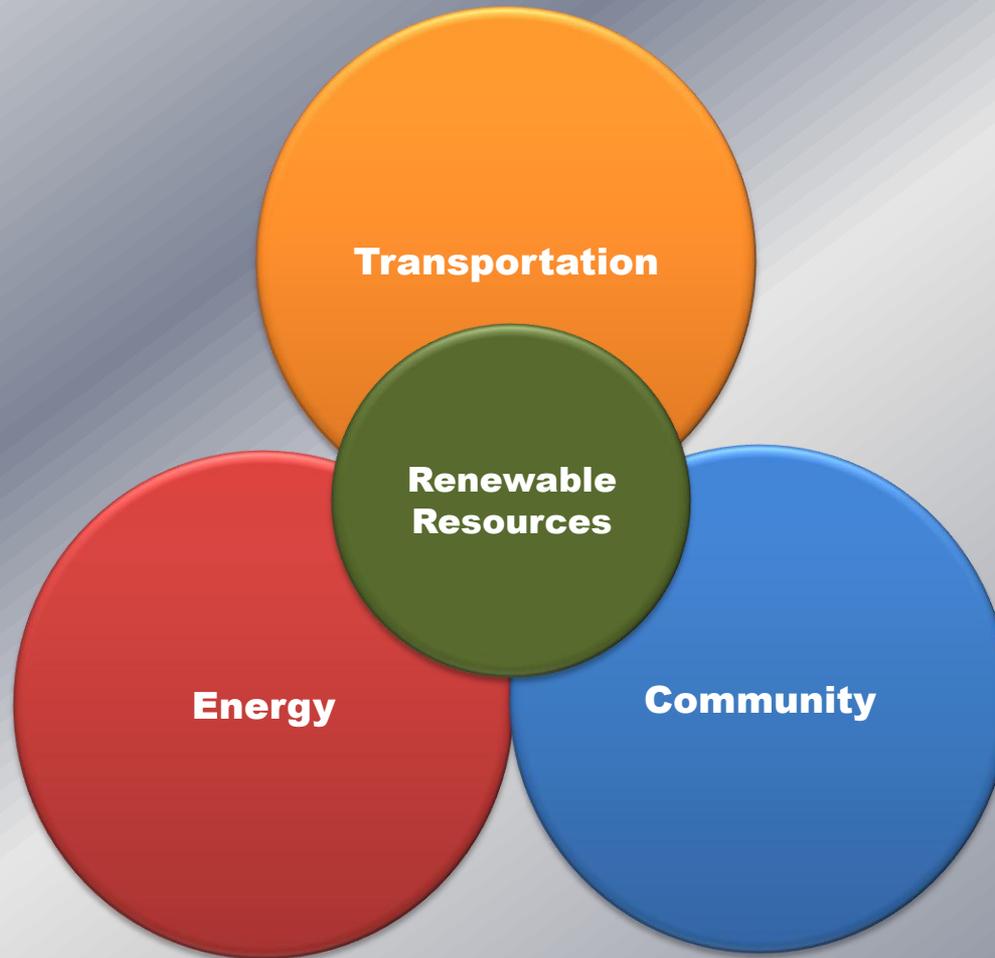
Baldock Rest Area

- 6.4 acres east side of rest area
- ~7,000 SolarWorld panels
- 1.75 MW producing 1,900,000 kWh
- National Research Project



Baldock Solar Highway Project

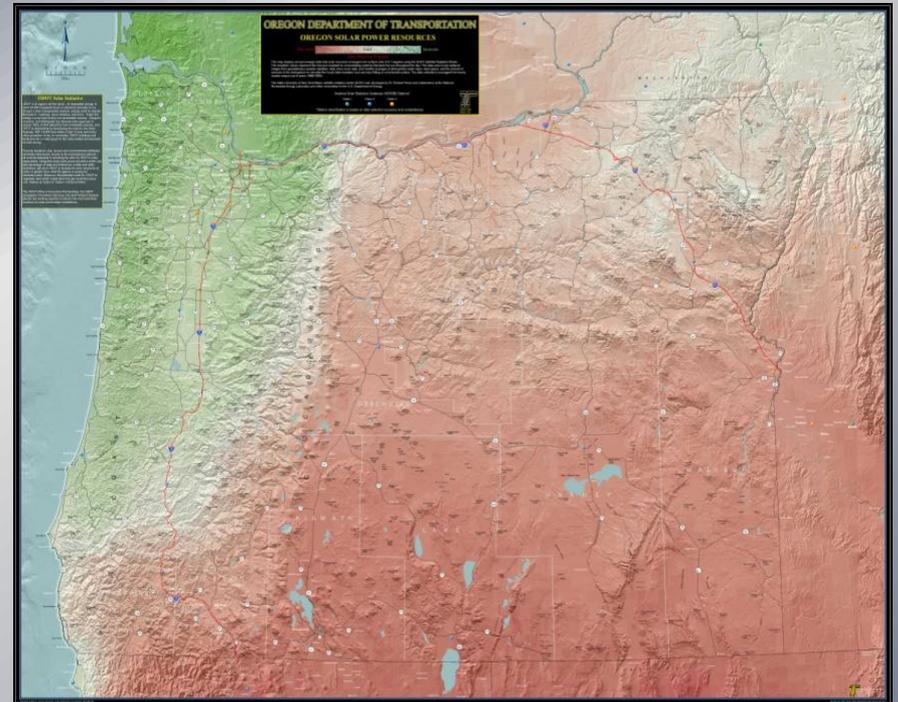




Statewide Solar Site Search

Solar Resource Sites

- Computerized cartographic modeling (GIS)
- Determine if ODOT has the potential to meet its electricity needs with solar resources.
- Targeted completion: January 2011



ODOT's Solar Highway Goals

- ☀️ Complement and not Compromise the transportation system
- ☀️ Supply electricity needed 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

Making the Power of the Future Possible Today

Office of Innovative Partnership & Alternative Funding

Oregon Department of Transportation
3930 Fairview Industrial Dr SE / MS-6
Salem, OR 97302

www.oregonsolarhighway.com



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