



Oregon Department of Transportation



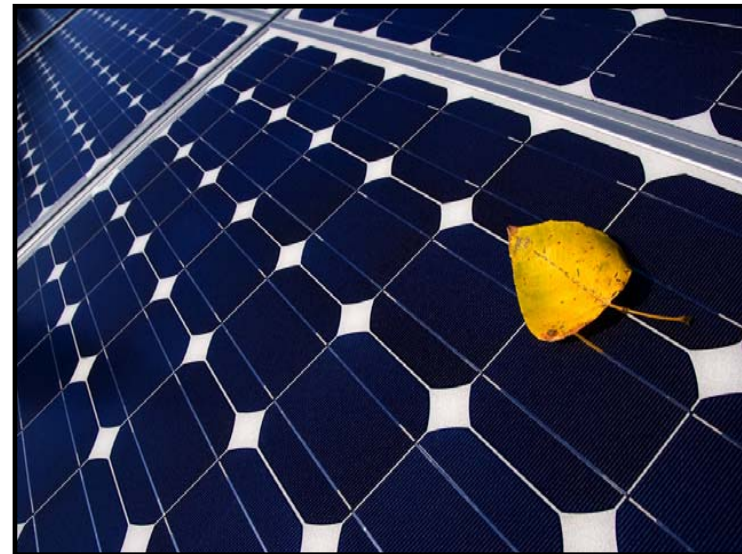
The Oregon Solar Highway

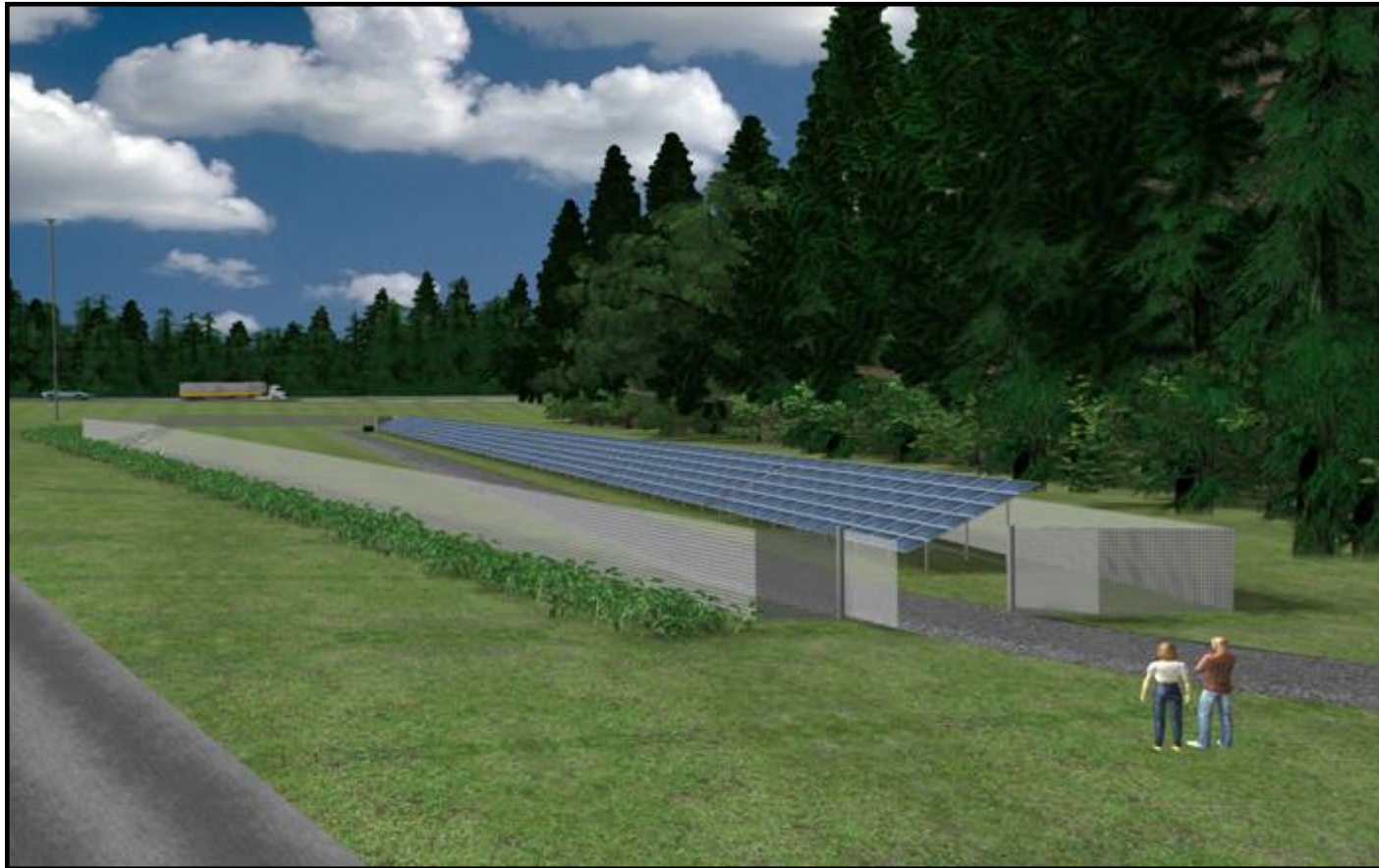
Presented to the

ODOT Surveyors Conference

March 17, 2009

Allison Hamilton, Project Director
Oregon Department of Transportation





The Oregon Department of Transportation embarked on an historic initiative... *...to build the first Solar Highway in Oregon and the nation.*

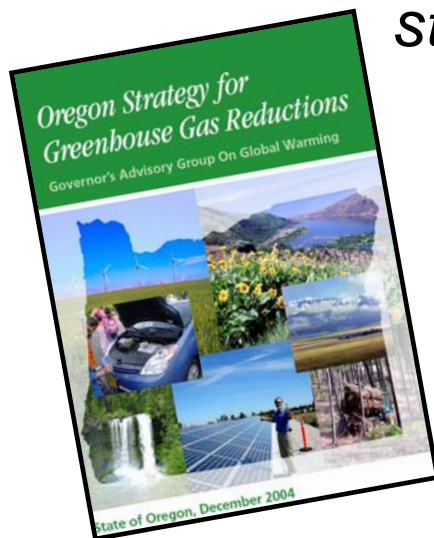


The Time is NOW...

2007 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*

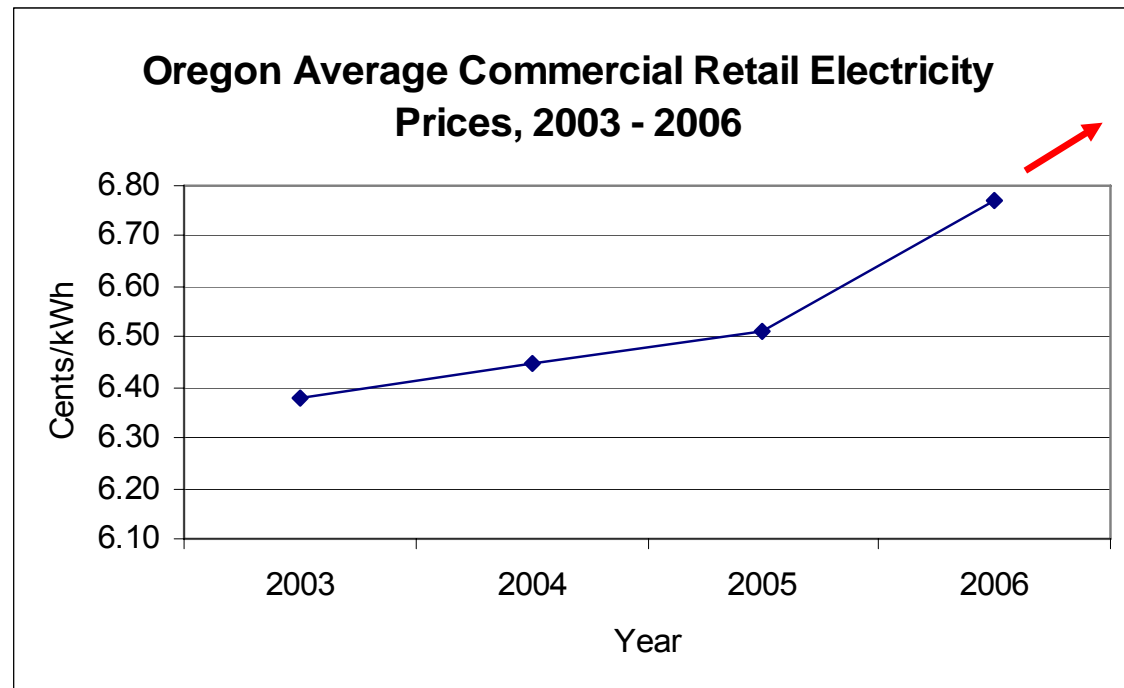
Leadership: *ODOT's Director & the Oregon Transportation Commission tell ODOT to develop real solutions to climate change*





ODOT Needs Electricity...

Oregon's transportation system uses 47 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 120 miles could supply all 47 million kilowatt hours ODOT uses annually.



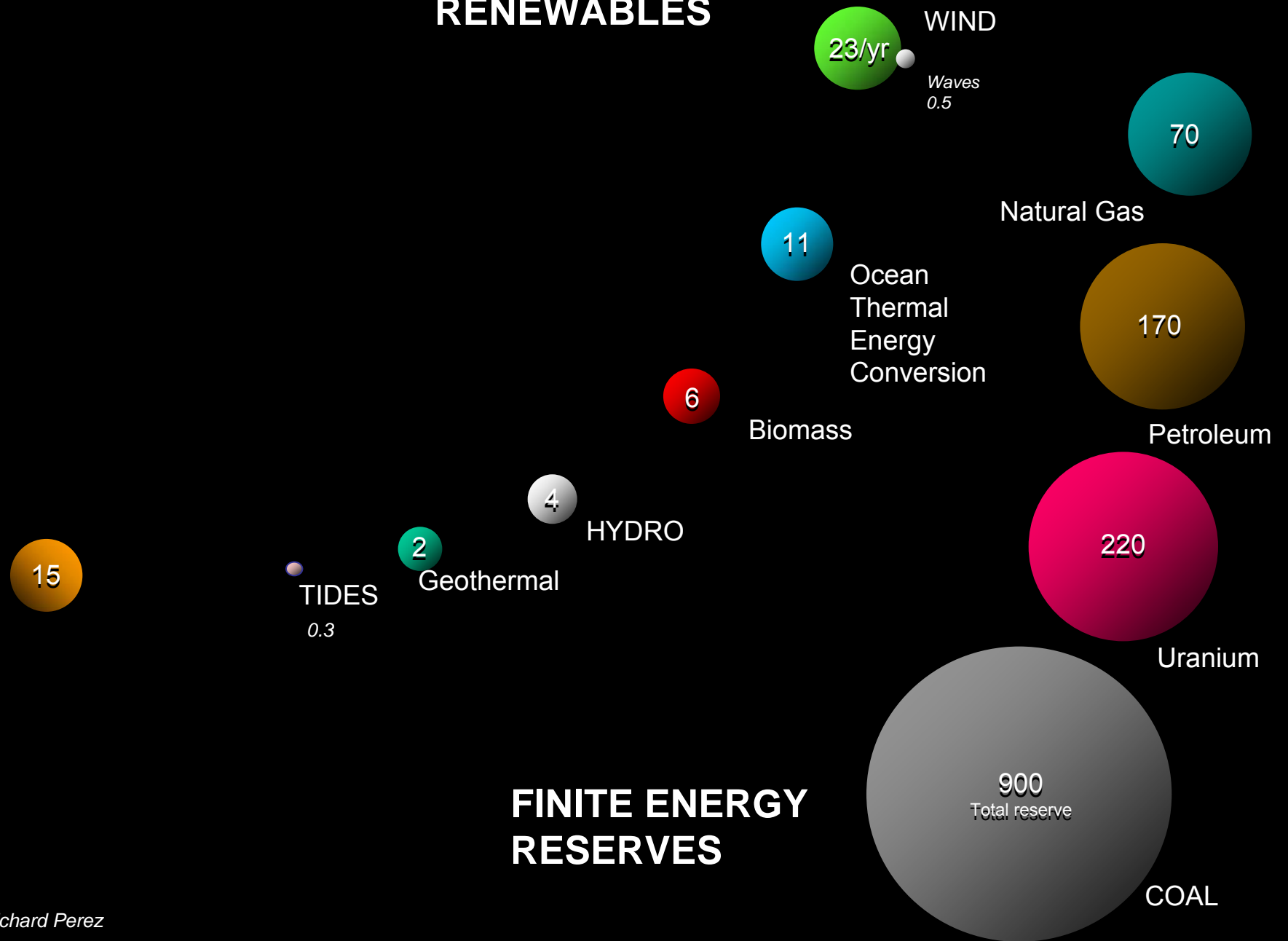
World energy use
15 TW-yr
per year

~ 450 exajoules
~ 440 Quads



15

RENEWABLES



FINITE ENERGY RESERVES

SOLAR
40,000



World energy use
15 TW-yr
per year



TIDES
0.3



2
Geothermal



4
HYDRO



6
Biomass



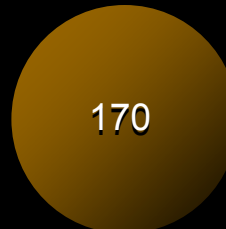
11
OTEC



23
WIND
Waves
0.5



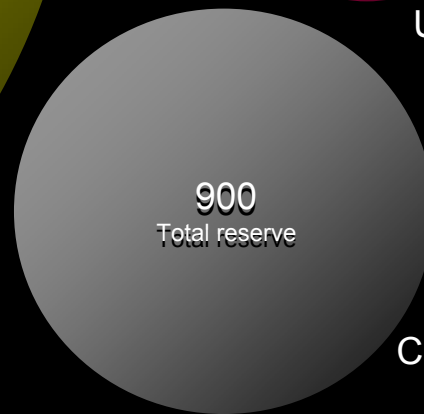
70
Natural Gas



170
Petroleum



220
Uranium



900
Total reserve

COAL

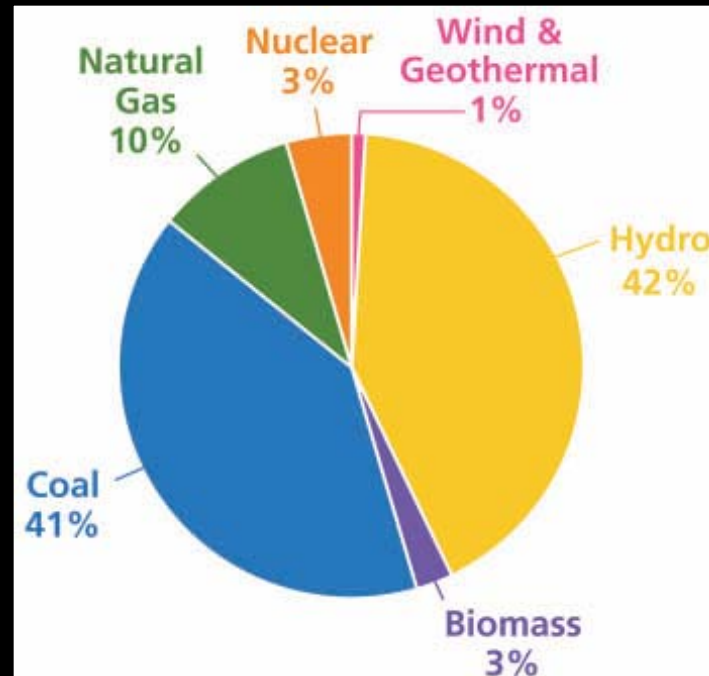
All World electrical energy from solar:
0.07% World Land Area





Where Oregon gets its electricity (2005)

- 41% Coal
- 42% Hydropower
- 10% Natural Gas





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 – the Oregon Solar Energy Industries Association





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. Graine, Director



We Secured Strategic Utility Industry Allies...



Portland General Electric Company

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

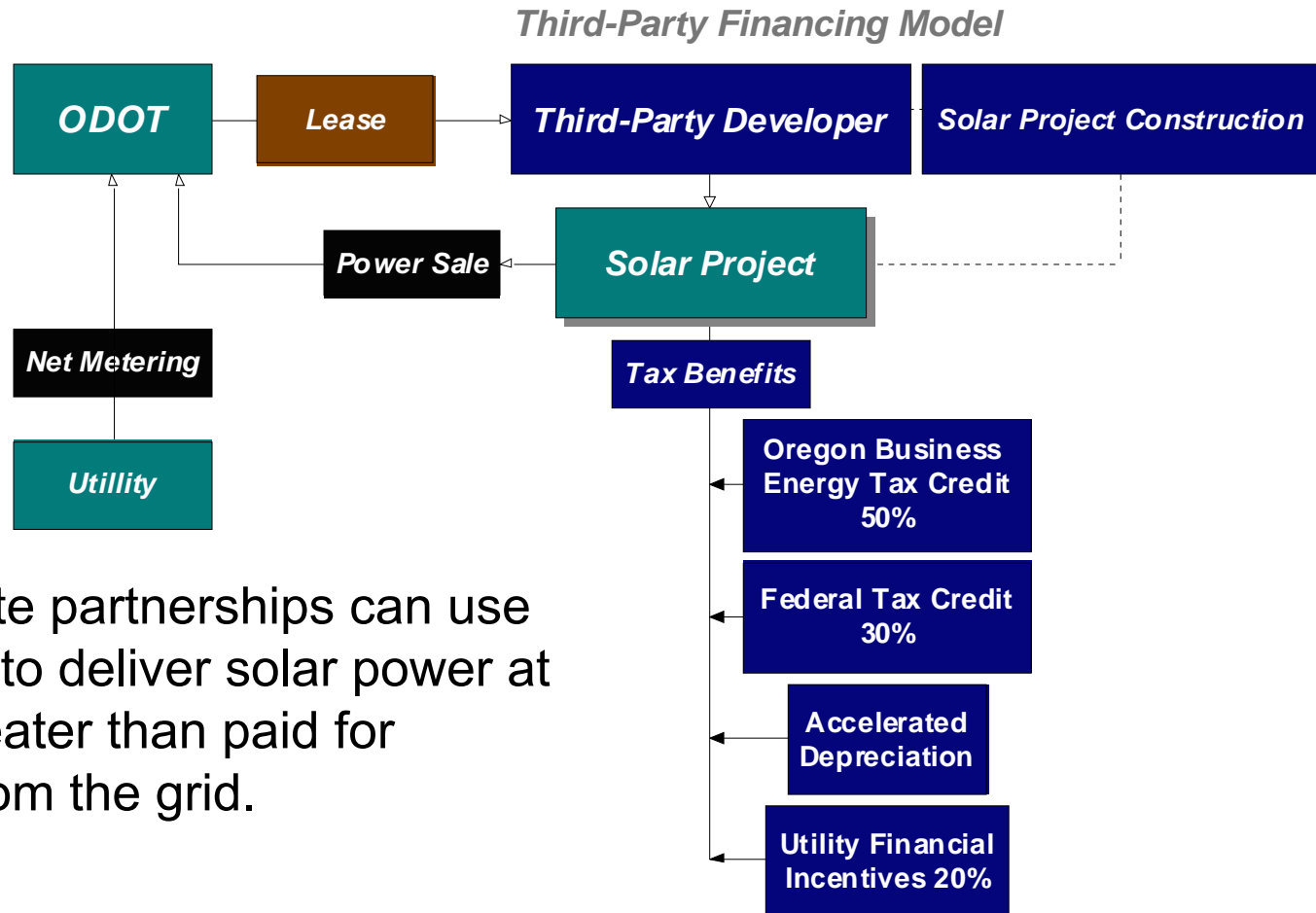


It is clear that the Energy Trust is keenly interested and ready to work with ODOT... (the ETO) has technical resources and funding available for solar, wind, and biopower electric generation projects.

~ Steve Lacy, Director



ODOT has a business model...

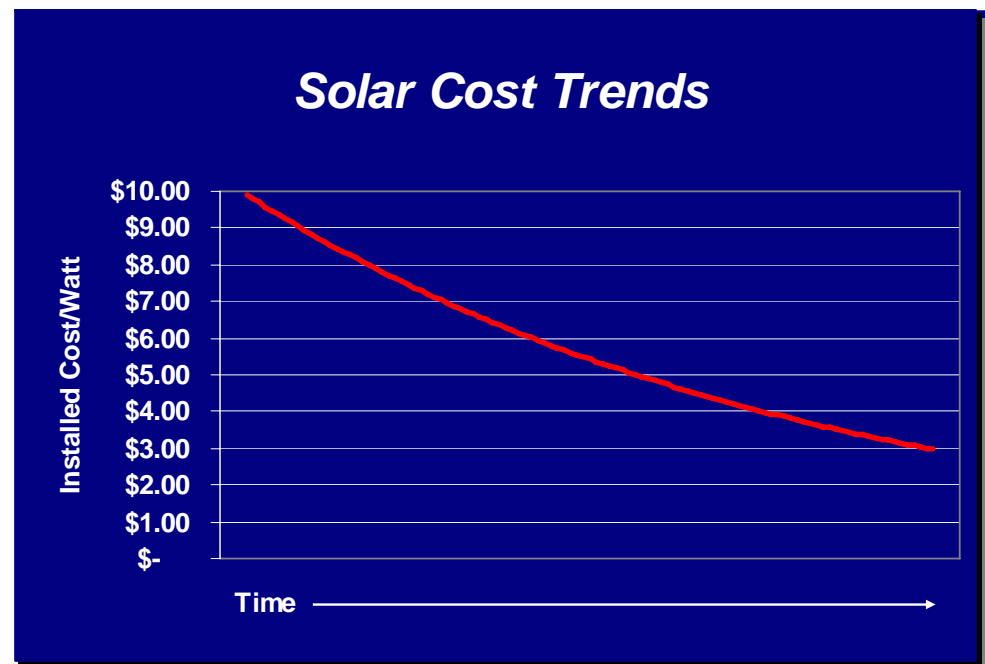


Public-private partnerships can use tax benefits to deliver solar power at costs no greater than paid for electricity from the grid.



...Over Time Costs will Drop

Technology improvements and manufacturing economies of scale will lower costs so tax benefits may no longer be needed.





Solar Highway Demonstration Project

- ☀ 104 kW ground mounted solar array
- ☀ 594 175-watt DC solar panels
- ☀ Will produce 112,000 kWhs annually
- ☀ About 1/3 of interchange lighting needs





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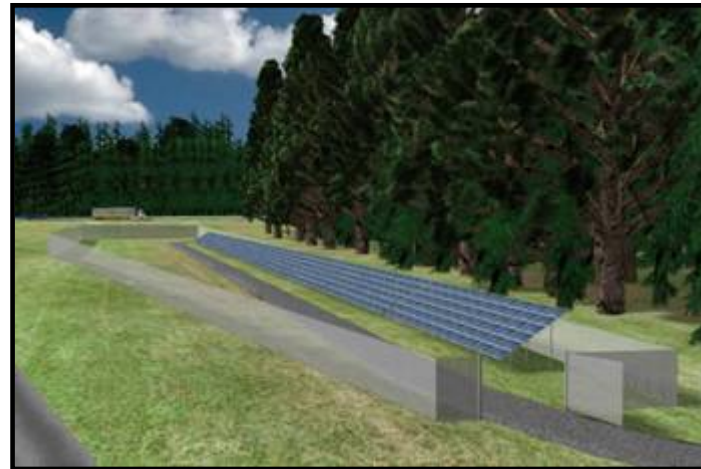
Placed in Service December 19, 2008





Oregon Solar Highway Demonstration Project

- Winner of WTS Project of the Year
- Finalist for the Oregon Sustainability Award
- Nominated for “Innovations in American Government Award” - John F. Kennedy School of Government
- Nominated for AASHTO Environmental Excellence Award



Artist's
rendition,
last year

The Real
Deal,
November





Lessons learned...

- Safety
 - Clear zone
 - Reflectivity
 - Traffic control
- Grid Interconnection
- Shading
- Security





A Solar Project needs...

- An internal champion
- leadership and management support
- commitment over time





What's Next?

- Utilities are interested in partnering on larger solar projects
- Developing RFP for 2 MW in PGE territory
- Exploring possibilities with PacifiCorp
- Potential other utility scale projects



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 – at no greater cost than electricity from the grid
- Add value to right-of-way assets
- Build a foundation for solar highways throughout Oregon and the nation.



Oregon Department of Transportation



The Solar Highway can be achieved...





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The Oregon Solar Highway

*Making the Power of the Future Possible
Today*

Office of Innovative Partnerships & Alternative Funding
Oregon Department of Transportation
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Salem, OR 97301-3871

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www.oregon.gov/ODOT/HWY/OIPP/inn_solarhighway.shtml

