

Portland Water Bureau Renewable Power



Sustainability Plan

- ✓ Purchasing 60,000 gallons of 99.99% biodiesel (B99) annually. The Portland Water Bureau has the largest fleet in the nation running B99.
- ✓ Using 100% recycled content paper for all copy and print orders
- ✓ Reducing use of toxic chemical products by more than 30% since 2005
- ✓ Pump station operation efficiencies have improved our use of Fulton-Carolina pump stations by increasing capacity from 620 gal/kWh to 741 gal/kWh.



Portland Water Bureau Sustainability Action Plan

September 2008 Update



Energy Goals

- Reduce electrical use in bureau-occupied buildings by 10% from FY 06-07 baseline by July 2010.
- Install renewable energy facilities at bureau facilities with minimum capacity of 100 kW by July 2010.
- Purchase 100% of bureau's electrical load from renewable sources.



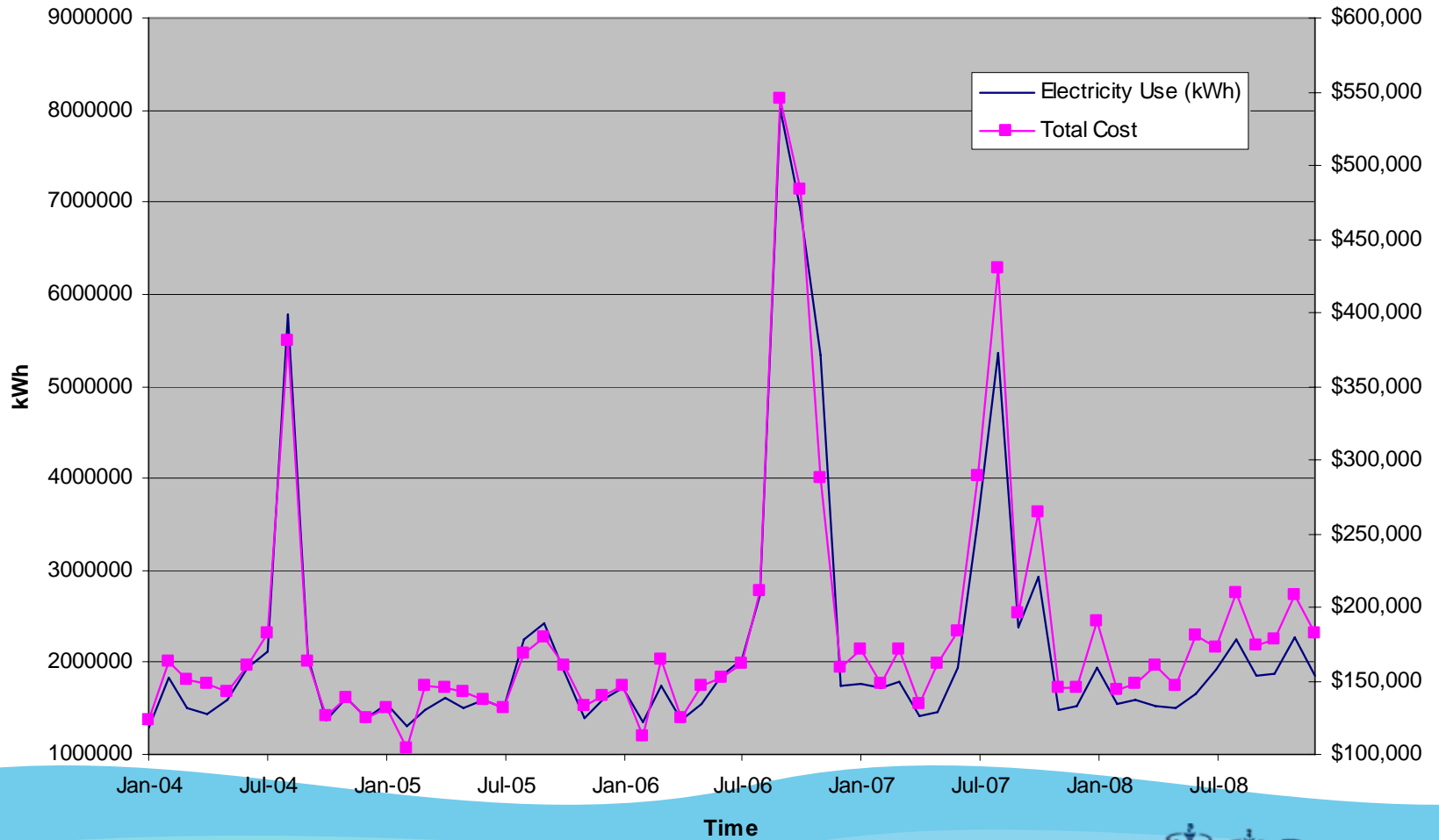
Current PWB Electricity Use

- 27,000 MWh (MegaWatt-Hours) per year
- \$2.2 Million per year
- Pump Station – 61%
- Groundwater – 26%
- Occupied Bldgs – 8%
- Decorative Fountains – 5%



Monthly Electricity Consumption

Monthly Electricity Use for All Facilities



PWB Renewable Power Generation

- Bull Run Hydro – 86,100 MWh per year
- Mt. Tabor Hydro – 1,000 MWh per year
- Currently Generate 360% of total Electricity Consumed by the PWB
- Future
 - Interstate Meter Shop – 13,000 kWh per year
 - Vernon Micro Hydro Generator - 150,000 kWh per year
 - Groundwater Solar Array – 300,000 kWh per year

**committed to a
renewable future**

FUTURE HOME OF THE PORTLAND WATER BUREAU SOLAR PROJECT

As part of the Portland Water Bureau's long-term commitment to sustainability, more than one acre of the land in front of you will be transformed into a solar facility. Project completion is expected by the fall of 2009.

Last year, the City of Portland saved \$2.8 million by implementing energy-efficient improvements and renewable energy projects at city facilities. Since 1992, energy-efficiency projects like these have saved the city \$24 million in operating costs.



Portland Water Bureau

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Randy Leonard, Commissioner • David G. Shuff, Administrator

www.PortlandOnline.com/water

PORTLAND

SOLAR AMERICA CITY

Committed to a Sustainable Solar Future

A Partnership Program with the U.S. Department of Energy

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renewable future**

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Energy Trust of Oregon, Renewable Inc., PGE, Commercial Solar Ventures, Portland Water Bureau

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**FUTURE HOME OF THE
PORTLAND WATER BUREAU
SOLAR PROJECT**

As part of the Portland Water Bureau's long-term commitment to sustainability, more than one acre of the land in front of you will be transformed into a solar facility. Project completion is expected by the fall of 2009.

Once in operation, solar panels in this field will generate 300,000 kilowatt hours of renewable energy per year — equivalent to the energy consumption of about 50 homes.

The Portland Water Bureau is working with Commercial Solar Ventures, Bonneville Environmental Foundation, Energy Trust of Oregon, Sentry Financial and Portland General Electric to make this project a success.



Groundwater Pump Station Solar Array

- Fenced field at PWB's groundwater treatment facility in NE Portland
- Utilize net metering agreement with PGE
- 270 kW (0.3MW) array
- Will produce 300,000 kWh of electricity per year
- Equivalent power for 50 Oregon homes
- Provide 1.2% of PWB's total electricity consumption
- Provide 5% of GW system electricity consumption



Groundwater Pump Station Site



Groundwater Pump Station Solar

- Ground Mounted
- 7 rows, 1,500 panels
- Start Construction – 05/2009
- Commissioning – 06/30/09
- Cost = \$3.5M
- Bureau Investment = \$350,000



ODOT Solar Array on I-5

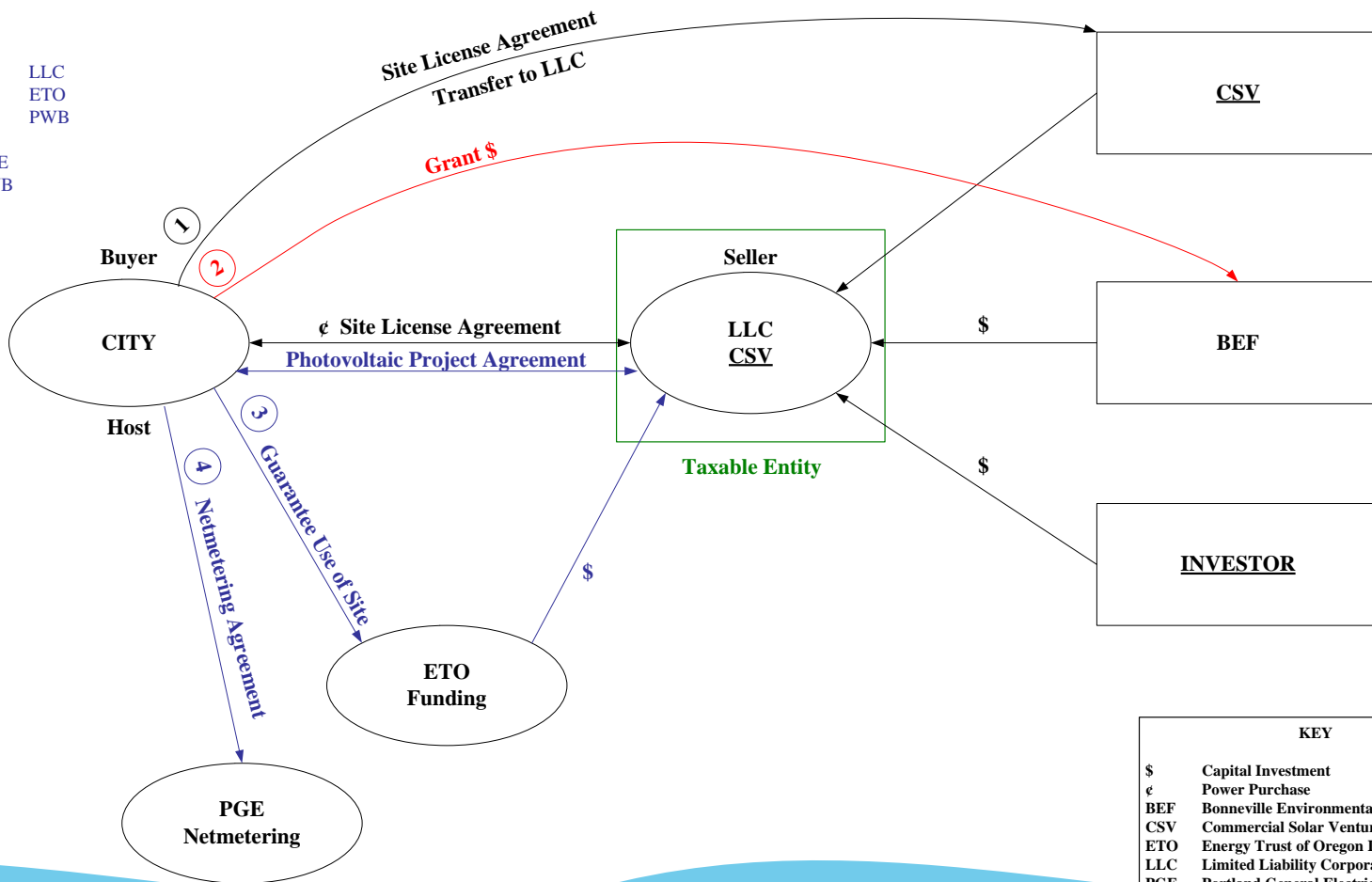
Financing

- Ownership model
- Finance/design/build/own/operate/transfer
- Owner contribution

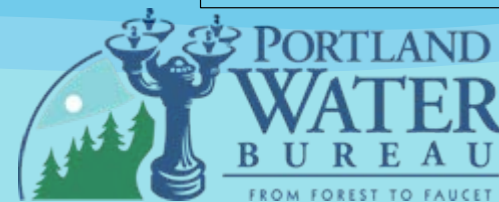


Cooperative Effort

- ① Site License Agreement LLC (CSV)
PWB
- ② Grant to BEF PWB
- ③ Photovoltaic Project Agreement LLC
ETO
PWB
- ④ Netmetering Agreement PGE
PWB



KEY	
\$	Capital Investment
¢	Power Purchase
BEF	Bonneville Environmental Foundation
CSV	Commercial Solar Ventures
ETO	Energy Trust of Oregon Inc.
LLC	Limited Liability Corporation
PGE	Portland General Electric
PWB	Portland Water Bureau



Agreements

- Four Agreements with WB
 - Site License Agreement
 - Net Metering Agreement
 - Grant to BEF (WB contribution)
 - Grant from Energy Trust of Oregon
- Six Parties Involved in Agreements
- Other Agreements
 - Business Energy Tax Credits
 - Federal Tax Credits



Partners

- Portland General Electric (PGE)
- Bonneville Environmental Foundation (BEF)
- BEF Renewable Inc.
- Energy Trust of Oregon
- Commercial Solar Ventures
- Sentry Financial
- City of Portland Bureau of Planning and Sustainability



Public Education Opportunities

- Solar 4R Schools
- Interpretive Displays
- Power Generation statistics and website



Typical Ground Mounted Solar Array



2 MW System in Ft. Collins, CO

Future Efforts

- City wide solar project to add up to 2 MW of solar energy on various city bureau properties
- Future Bull Run treatment will have an alternative energy component.
- Expand efforts to improve energy efficiency



Questions

