



## FAST PYROLYSIS IN ROSEBURG

On a hot day in late August, Kate Brown, Secretary of State and Chair of the Oregon Sustainability Board, and staff members attended a demonstration of fast pyrolysis. The Umpqua National Forest hosted the demonstration at the Lemelo Sand Shed, about 90 minutes up the Umpqua River highway from Roseburg.



*Kate Brown stands in front of the fast pyrolysis machine at the demonstration near Roseburg*

Fast pyrolysis is the rapid thermal decomposition of organic compounds in the absence of oxygen. It creates three products – a liquid bio-oil, a solid bio-char, and a collection of gases known as syngas. The organic feedstock must be dry before utilization in the pyrolyzer's reactor that heats it to over 1000°F. The bio-oil may directly power space heaters, furnaces, boilers, and some turbines. Due to the excessive water and acidity, it needs refining before use in combustion engines, like a car or heavy machinery as bio-diesel. The bio-char is a finely ground, carbon-rich, charcoal ash for possible use in the agricultural industry as a soil amendment. It helps plants grow up to seven times faster. The syngas is a collection of combustible gases that can be recycled back into the machine to keep it running and to perpetuate the cycle.

But, what does this have to do with sustainability? Here's the answer. The area around Roseburg suffered greatly when the lumber mills closed due to economic drivers. The organic matter that feeds the fast pyrolysis machine comes from woody debris, or woody biomass, sustainably harvested out of the forests. By sustainably harvesting the woody debris, it eliminates possible fuel for catastrophic forest fires and at the same time can be used for this new process.



*The machine produces bio-oil, which smells like hickory.*

*Continued on page 4.*

## SUSTAINABILITY PROGRAM NEWS

- **New DAS communication tools:** DAS launched a new, aggressive resource conservation management policy in July. The policy requests help from our tenants and staff to save energy and water in our buildings – to save money and jobs. We are amazed at the teamwork we see in the buildings, and would like to share that information with you. Here are a couple of new tools you can use to track your building's use.
  - **Electricity scorecards:** we plan to complete and post one per DAS building in October, January, April and July. The scorecards will show electricity reductions, compliance with the 20 percent reduction target, recent night audit results, and tips for conservation.
  - **Buildings' web pages:** DAS plans to compile a "one-stop shop" of sustainability information for each building. This will include: building history, Green Team, most recent scorecards, night audit information, renewable potential, and more. DAS will begin adding building information throughout October and November at the following link:  
[http://sustainability.oregon.gov/DAS/FAC/building\\_info.shtml](http://sustainability.oregon.gov/DAS/FAC/building_info.shtml)
- **Suggestion box:** the box is up and running. Please submit your ideas, observations or critiques of sustainability efforts in DAS and state government.  
[das.ssb@state.or.us](mailto:das.ssb@state.or.us)
- **Field trips:** the DAS Sustainability Program coordinates field trips to local sustainability hot spots. The October tour features the garbage burner in Brooks, the ash mono-fill in Woodburn, and Agri-Plas, a local company that recycles nearly all kinds of plastics. Follow the link below for the schedule.  
[http://sustainability.oregon.gov/DAS/FAC/SUST/docs/Field\\_trip\\_schedule.pdf](http://sustainability.oregon.gov/DAS/FAC/SUST/docs/Field_trip_schedule.pdf)
- **Restroom lights:** While we should all look for ways to save electricity in buildings, please think about your coworkers before you turn out the lights in restrooms. Some restrooms do not have windows or emergency lights and can be very dark. Double check no one is present before you turn them off.

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# BUILDING SAVINGS UPDATE



DAS compares all bills to the calendar year 2000 as a baseline. The goal and OAR require a 20% reduction in electricity and natural gas usage by 2015. DAS does not adjust the buildings without baseline adjustments for weather or any other factors. The Billed Electricity column reports in kilowatt-hours (kWh) and Billed Gas in therms. The % change column represents the combined electric and gas savings in Btu's compared to the year 2000 usage. The Billed Cost column includes the totals for electric and gas – not all utilities. The individual buildings listed do not include all DAS-owned buildings, but the TOTAL DAS line does represent the total DAS spend for electricity and natural gas.

January–June 2009 data are as follows:

	Billed Electricity	Billed Gas	Billed Cost	% change
• Agriculture:	517,402	12,336	\$ 63,036	-22%
• Albina*:	265,901	4,115	24,943	-34%
• Archives:	491,428	17,223	62,456	-35%
• BC/OSHA*:	179,451	8,809	28,493	+36%
• Central Pt:	261,027	9,929	28,751	-2%
• Commerce*:	121,535	4,176	20,096	-49%
• Data Ctr.!:	3,242,516	5,721	263,685	N/A
• Employ*:	1,235,370	---	104,960	-52%
• Executive:	402,191	6,410	46,988	-23%
• Gen Svcs:	311,006	6,929	39,620	-24%
• GS Annex:	20,459	445	2,627	-17%
• Hum Svcs:	1,931,818	25,480	193,491	-19%
• L&I:	1,509,901	23,517	152,705	-13%
• Library*:	246,819	8,444	31,131	+3%
• NMOB!:	646,516	9,290	69,509	N/A
• New Pend:	226,284	7,082	25,449	-25%
• Old Pend:	122,815	713	9,994	-24%
• Port Cr Lab!:	769,353	16,595	83,584	N/A
• Port SOB:	1,646,823	14,253	125,226	-13%
• Print Plant:	844,419	4,110	78,751	-14%
• Prop Dist:	140,127	15,120	29,684	+14%
• Pub Svc*:	1,220,730	2,755	101,731	-10%
• Pub Utility:	716,367	1,126	65,337	-17%
• Real Estate:	89,944	4,683	14,571	-14%
• Revenue*:	2,227,670	21,396	206,042	-51%
• Salem MP:	221,655	7,743	30,538	-16%
<b>TOTAL DAS:</b>	<b>24,667,037</b>	<b>365,936</b>	<b>\$2,496,935</b>	<b>-26%</b>

## DAS buildings saved 16% in 2008.

\* These buildings had major lighting or HVAC projects, changes in operation schedules, or other outside factors that influenced their use since the baseline year. The buildings will no longer have baselines adjustments, due to a new philosophy for tracking usage, but DAS actively investigates to ensure the non-tenant related use is as efficient as possible.



The Revenue Building

! These buildings have been constructed since the baseline year and adjustments are in progress.

Note: DAS investigates all buildings that do not meet the 20% reduction goal.

## OREGON SUSTAINABILITY BOARD MEETS IN ENTERPRISE

The Oregon Sustainability Board (OSB) held their June meeting in Enterprise, Oregon. The OSB learned of the major sustainability initiatives in the region and wanted to support their efforts. The meeting had informative presentations from a county commissioner, a tribal leader, and sustainability organizations. Highlights included:

- Stories about how sustainability has begun to reinvent a community hit hard by mill closures.
- A summary of the project where the community joined together to restore native river flows and watched the salmon return to the river for the first time in several generations.
- Examples of a new trend. In the past, most of the young people in the region would leave for college and never come back to Wallowa County. Now they are interested in the new sustainability direction, and many have returned after college to start families and join the efforts.

In addition, Margie Harris, Executive Director of the Energy Trust of Oregon (ETO), joined the meeting to share general information about the ETO, as well as how they support the region's sustainability programs. The ETO launched a recent solar program that helps residents save money on their energy bills.

After the meeting, the Board enjoyed a tour of the Zumwalt Prairie, an area protected by The Nature Conservancy. It remains as the last prairie of its kind in the Northern Hemisphere, and supports over 400 species of plants and animals, many native to the area. The Prairie's innocence and beauty impressed the OSB members and the tour was a highlight of the trip. However, the members also learned the remote location of the Prairie and the rough terrain wreaks havoc on car tires as they had a flat on the way back to town. After a short time, they repaired the flat and were on their way.



The Chief Joseph monument sits prominently between the towns of Enterprise and Joseph, in the foreground of the beautiful Wallowa Mountains.



Oregon Sustainability Board members tour the Zumwalt Prairie near Enterprise with the regional managers from members the Nature Conservancy

More information and photos from the OSB's meeting in Enterprise (including the flat tire):

[http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb\\_photos\\_enterprise.shtml](http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb_photos_enterprise.shtml)

## PICK UP THE PENNIES

Daniel Russell from Legislative Administration is the chair of the Capitol's Sustainability Committee and a member of the Interagency Sustainability Coordinators Network. Daniel conducted a study of the computer use in his office and wrote the following article about his findings.

A study I completed on behalf of the Capitol Sustainability Program this last May outlines an opportunity to "pick up pennies" that could add up to a project with a payback of less than three years and long-term energy savings. I measured the energy used by my computer under normal conditions, then using the computer's power-save settings, and finally an occupancy-sensing power strip. My study assumed that an effective approach will allow an employee to leave a computer on overnight, as some employees need to have remote access to their PCs. An effective approach will also cause minimal disruption to regular computer operation; otherwise, the employees will likely circumvent the power saving efforts.

The baseline power consumption for my computer is 17.18 kWh over the test period. The same PC operating in Power Save Mode consumed 14.55 kWh during the same amount of time. A third test period was conducted using a "Watt Stopper" occupancy-sensing power strip and my computer used 7.70 kWh. An occupancy-sensing power strip allows the computer CPU to remain powered up, but all peripherals (monitor, speakers, and printers) are powered off when the desk is unoccupied for a period of time (5 – 30 minutes as adjusted on a timer located on the motion sensor). Conversations with a technician that works for the company that manufactures the occupancy-sensing power strip and technical staff that work for Legislative Administration suggest that the lifespan of a LCD monitor will not be impacted negatively when powered up and down at the frequency this system would demand.

### Results Summary

- Baseline: 17.18 kWh/test period
- Power Saving mode: 14.55 kWh/test period
- Watt Stopper: 7.70 kWh/test period



### Conclusion

By installing a power strip with an occupancy sensor that turns the computer off when no one is present, I observed a 56 percent savings over the baseline energy usage and a 47 percent savings over power-down mode alone. Combined with the cost of the device, the simple pay back is less than three years before any available incentives.

## DID YOU KNOW?

It takes three minutes for a refrigerator to regain its temperature after the door opens – even briefly.



## RENEWABLE ENERGY PROJECTS

Governor Kulongoski encourages state agencies to maximize their use of renewable power for state operations. The newsletter will feature stories on different renewable projects. This month, we'll focus on geothermal projects.



Former Secretary of State and Chair of the Oregon Sustainability Board, Bill Bradbury, and his wife Katie, tour the geothermal plant in Lakeview, Oregon in 2007.

In geothermal power plants, steam heat or hot water from geothermal reservoirs provides the force that spins the turbine generators and produces electricity. The used geothermal water is then returned down an injection well into the reservoir to be reheated, to maintain pressure, and to sustain the reservoir.

The majority of geothermal resource for Oregon exists in the south. Some towns and cities, such as Lakeview and Klamath Falls, have tapped this resource. They maintain utility districts to which residents may connect and pay a monthly fee, similar to a natural gas system in other areas. State agencies with offices located in those areas are able to take advantage of geothermal heat. One example is the Warner Creek prison in Lakeview, which uses a geothermal well to supply some of their heat and avoid about \$500,000 in natural gas bills each year. The Oregon Institute of Technology (OIT) in Klamath Falls maintains a geothermal well and hopes to expand its abilities to provide 100 percent of the campus heat load and 100 percent of the campus electrical load. If successful, OIT would be the first carbon-neutral university in the U.S.

While some areas in Oregon successfully harnessed geothermal heat and power, resource uncertainty, high development and exploration costs continue to be substantial barriers to future development of geothermal sources for power production. The location of potential geothermal sources near environmentally-sensitive areas has been a barrier to siting geothermal power facilities in the state. Given these barriers, the Oregon Department of Energy does not anticipate that any generation of electricity from Oregon's geothermal sources will occur in the next five to ten years. However, small-scale direct use of geothermal heat sources and the use of ground-source heat pumps will continue to increase.



The heat exchangers for the plant are surprisingly compact.

Sources: <http://www.geothermal.marlin.org/pwrheat.html#Q1> and <http://egov.oregon.gov/ENERGY/RENEW/Geothermal/geo.shtml>

## FAST PYROLYSIS

*Continued from page 1*

Fast pyrolysis creates new jobs for unemployed forest and wood experts, creates a fossil fuel alternative, and prevents major forest fires. It's a win/win for environmentalists and the forest community. Once they develop the most cost-effective manner to refine the bio-oil into a compatible fuel for combustion engines, this process shows tremendous promise for Douglas County, and other areas that surround Oregon's 4.25 million acres of forest-lands that could produce woody biomass.



*A machine chips the woody debris (biomass) to specific dimensions for the maximum yield of oil and char.*

More pictures:

[http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb\\_photos\\_roseburg.shtml](http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb_photos_roseburg.shtml)

More information: <http://www.fs.fed.us/r6/umpqua/projects/fast-pyrolysis/index.shtml>

## TIP OF THE MONTH

Add soap to your hands before turning on the water, and then turn it on to wash off. Many people turn the water on first, and waste water while reaching for the soap. It could save up to a pint of water per person each time you wash. That adds up to a lot of water for just one person over weeks, months and years. *Submitted by Sandy Johnson, DAS PEBB*

## EVENT CALENDAR

*The following list contains a summary of low- or no-cost training that touches on subjects relevant for sustainability and resource coordinators in state government.*

- The Natural Step for Sustainability on **September 29** in Salem. This workshop will provide both business and governmental organizations an understanding of the factors that have created our current unsustainable practices, an overview of how to apply Natural Step principles. <http://www.naturalstepusa.org/sustainability-courses>
- GoGreen '09 on **October 7** in Portland. GoGreen '09 features interactive "Oprah-style" panel sessions with speakers who are meant to be an expert on the topic, in different ways, with differing insights. No power points are allowed. <http://www.gogreenpdx.com/>
- Fall Forum for the Oregon Association of Professional Energy Managers on **October 8** in Portland. This forum features expert speakers to describe how smart meters, and the smart grid, will change the future of energy conservation and performance tracking. [www.regonline.com/oregon\\_apem\\_2009\\_fall\\_forum](http://www.regonline.com/oregon_apem_2009_fall_forum)
- Portland General Electric seminars. PGE offers free, high-quality training on a variety of topics, such as new lighting technology, chilled water systems, and even how to establish a green team. [www.PortlandGeneral.com/Classes](http://www.PortlandGeneral.com/Classes)

## RESOURCES

- DAS Sustainability Program website: <http://sustainability.oregon.gov>
- DAS Sustainability Plan: [www.oregon.gov/DAS/FAC/Statewide/docs/DAS\\_Sustainability\\_Plan.pdf](http://www.oregon.gov/DAS/FAC/Statewide/docs/DAS_Sustainability_Plan.pdf)
- DAS Progress Report for 07-09 Biennium: [www.oregon.gov/DAS/FAC/Statewide/docs/DAS\\_Sustainability\\_Report\\_Jul-Dec08.pdf](http://www.oregon.gov/DAS/FAC/Statewide/docs/DAS_Sustainability_Report_Jul-Dec08.pdf)
- DAS Buildings webpage: [http://sustainability.oregon.gov/DAS/FAC/building\\_info.shtml](http://sustainability.oregon.gov/DAS/FAC/building_info.shtml)
- Greenhouse gas emissions inventory for state of Oregon internal operations: [http://governor.oregon.gov/Gov/2007\\_Legislative\\_Session/Correspondence/DAS\\_GHG\\_report.pdf](http://governor.oregon.gov/Gov/2007_Legislative_Session/Correspondence/DAS_GHG_report.pdf)
- Legislative bill tracking: [www.leg.state.or.us/bills\\_laws/](http://www.leg.state.or.us/bills_laws/)
- Oregon Sustainability Board: [http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb\\_main.shtml](http://sustainability.oregon.gov/DAS/FAC/SUSTOR/osb_main.shtml)

In addition, Governor Kulongoski established some of the most aggressive sustainability requirements in the country. Below is a summary of the key drivers in state government.

- 20% energy reduction goal by 2015 and SEED guidelines
- [http://arcweb.sos.state.or.us/rules/OARs\\_300/OAR\\_330/330\\_130.html](http://arcweb.sos.state.or.us/rules/OARs_300/OAR_330/330_130.html)
- DAS policy 125-6-010: Sustainable Facilities Standards (revision planned for late 2009) <http://www.oregon.gov/DAS/FAC/docs/1256010.pdf>
- DAS policy 107-011-010: Resource Conservation <http://www.oregon.gov/DAS/OP/docs/policy/state/107-011-010.pdf>
- DAS policy 107-011-030: Holiday Decorations & Lights <http://www.oregon.gov/DAS/OP/docs/policy/state/107-011-130.pdf>
- DAS policy 107-011-140: Sustainable Procurement and Internal Operations <http://www.oregon.gov/DAS/OP/docs/policy/107-011-140.pdf>
- DAS E-waste policy 107-009-0050
- <http://www.oregon.gov/DAS/OP/docs/policy/state/107-009-0050.pdf>
- ORS 279A governs procurement of goods, the purchase of paper, recycled materials, etc.
- <http://landru.leg.state.or.us/ors/279a.html>
- ORS 459A.480 governs state agency recycling programs. <http://landru.leg.state.or.us/ors/459a.html>
- Solar power in public buildings: 1.5% of construction cost [http://arcweb.sos.state.or.us/rules/OARs\\_300/OAR\\_330/330\\_135.html](http://arcweb.sos.state.or.us/rules/OARs_300/OAR_330/330_135.html)

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