

# Study shows mercury scrubbers at Oregon power plant lower other pollution, too

July 8 2015

---



Portland General Electric's coal-fired generating plant near Boardman, Oregon.  
Photo by Rachel Beck

Air pollution controls installed at an Oregon coal-fired power plant to curb mercury emissions are unexpectedly reducing another class of

harmful emissions as well, an Oregon State University study has found.

Portland General Electric added emission control systems at its generating plant in Boardman, Oregon, in 2011 to capture and remove mercury from the exhaust. Before-and-after measurements by a team of OSU scientists found that concentrations of two major groups of [air pollutants](#) went down by 40 and 72 percent, respectively, after the plant was upgraded.

The study was published in the journal *Environmental Science & Technology* this morning.

The Boardman plant, on the Oregon side of the Columbia River about 165 miles east of Portland, has historically been a major regional source of air pollution, said Staci Simonich, environmental chemist in OSU's College of Agricultural Sciences and leader of the study team.

"PGE put control measures in to reduce [mercury emissions](#), and as a side benefit, these other pollutants were also reduced," she said.

The pollutants in question are from a family of chemicals called polycyclic aromatic hydrocarbons (PAHs), which are formed from incomplete combustion of fossil fuels and organic matter. PAHs are a health concern because some are toxic, and some trigger cell mutations that lead to cancer and other ailments.

Simonich and her team tracked concentrations of airborne PAHs during 2010 and 2011 at Cabbage Hill, Oregon (elevation 3,130 feet), about 60 miles east of the Boardman plant, and also at the 9,065-foot summit of Mount Bachelor 200 miles to the southwest.

They sampled approximately weekly from March through October of 2010, and again from March through September of 2011. They analyzed

the samples for three major groups of PAHs: the parent chemicals and two "derivatives"— groups of PAH chemicals resulting from the decomposition of the parent PAHs.

The 2011 measurements at Cabbage Hill showed significantly reduced concentrations of the parent PAHs and also of one of the derivative groups, called oxy-PAHs (OPAHs). The other derivative group, called nitro-PAHs (NPAHs), did not show significant reduction. The NPAHs were more likely to have come from diesel exhaust associated with Interstate Highway 84, Simonich said.

Some of the individual PAH chemicals were reduced so much after the upgrade that the researchers couldn't tell from the data whether the plant was running or not, she added.

"The upgrades reduced the PAH emissions to the point where we could hardly distinguish between air we sampled along the Gorge and at the top of Mount Bachelor."

While Oregon's mountaintops typically have less air pollution than lower-lying areas, Simonich's previous work has shown that they are not pristine.

She and her student Scott Lafontaine stumbled upon the Boardman findings while studying PAHs that originate in Asia and ride high-level air currents across the Pacific Ocean. They were measuring how much of each PAH type was coming from Asia, and how much from within the Northwest or elsewhere.

"We wanted to see if there was the same level of trans-Pacific transport at lower elevations—where people actually live—as we've previously found at Mount Bachelor," Simonich said.

When the researchers analyzed the Cabbage Hill data for 2010, they found high levels of the chemicals they were studying, but the pollutants did not have an Asian signature. Then in 2011, they found that the Cabbage Hill concentrations of the parent PAHs and OPAHs were much lower than they'd been in 2010.

"We looked at the data and said, 'Wow! 2010 is different from 2011, and why should that be?'" Simonich said. "We had trouble understanding it from a trans-Pacific standpoint. So we started thinking about regional sources, and that's what led us to look at emissions from Boardman."

They got in touch with officials at PGE and learned about the April 2011 upgrade. Their review of PGE's emission records revealed correlations with their own measurements. They concluded that the reductions in PAH concentrations at the Cabbage Hill site were caused by the 2011 upgrade.

The upgrade may also aid her research, Simonich said. "When you have a major point source of pollution nearby, it's hard to pick out the signal of the Asian source coming from farther away. Now that these emissions are reduced, we may be able to pick up that signal much better."

More important, she said, the air is cleaner.

"Boardman used to be a major source of PAH pollution in the Columbia River Gorge, and now it's not," she said. "That's a good thing for PGE and a good thing for the people living in the Gorge."

**More information:** "Relative Influence of Trans-Pacific and Regional Atmospheric Transport of PAHS in the Pacific Northwest, USA."

[Article in Press]. *Environmental Science & Technology*.

[ir.library.oregonstate.edu/xmlui/handle/1957/56330](http://ir.library.oregonstate.edu/xmlui/handle/1957/56330)

Provided by Oregon State University

Citation: Study shows mercury scrubbers at Oregon power plant lower other pollution, too (2015, July 8) retrieved 10 April 2024 from <https://phys.org/news/2015-07-mercury-scrubbers-oregon-power-pollution.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.