

## **BOB DOPPELT: Giant cane an intriguing idea for PGE**

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**BY BOB DOPPELT**

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Climate scientists say carbon dioxide emissions from fossil fuels must be rapidly slashed to prevent catastrophic climate change. Cutting emissions will be difficult, given the number of coal-powered power plants, gas-powered vehicles, inefficient buildings and carbon-intensive products and practices that exist today. Creative solutions are clearly needed.

Biomass has been proposed as an alternative to burning coal to produce electricity. While a battle rages over whether the use of woody biomass such as forest residues and wood chips is ecologically sound, Portland General Electric has proposed an entirely different source of biomass — giant cane — to replace coal at its 585 megawatt Boardman power plant.

I first heard about PGE's proposal from Wayne Lei, the company's director of research, who is also a member of my organization's board of directors. As with most innovative ideas, I learned that it comes with potential benefits as well as risks.

PGE is Oregon's largest utility, serving the Portland area, Salem and other regions. Its Boardman plant is one of the largest sources of pollution in the state. The company is under a mandate to install new pollution control devices in the near term and then shut down the plant in 2020. The utility concluded that earlier closure dates wouldn't allow enough time to find a reliable replacement resource. But another option could be even more beneficial — keep the facility running after 2020 by shifting its fuel supply to giant cane.

Giant cane looks like bamboo, but it is actually a fast-growing grass. It is used to make reeds for woodwind instruments. The grass grows very rapidly, and has a high energy content. That's what makes it attractive to PGE.

Like other grasses, giant cane can be planted once and then harvested periodically without replanting. In one growing season it can reach 20-plus feet tall. According to PGE documents, this productivity can yield 45 to 60 green tons per acre if grown as an irrigated crop in Eastern Oregon. Growing about 60,000 acres within a 50-mile radius of the plant can produce the amount the company needs.

After harvest, the giant cane would be super-heated in a low oxygen environment — a process called torrefication — resulting in charred material that has an energy content of 10,000 British thermal units per pound. This is actually higher than the energy content of the coal now in use. Torrefied giant cane is also low in sulfur and mercury, so it will burn cleaner and more efficiently than coal.

Company staff said the use of giant cane as a fuel would be carbon-neutral, because PGE will grow as much as it burns in a very short cycle. This does not count the fossil fuels used in growing and transporting the crop.

PGE projects that by using giant cane the facility will generate 585 megawatts of electricity for half of the year. This would preserve the 100-plus jobs at Boardman and create up to 60 new ones at three torrefication facilities that would be built in the area.

All this sounds great. But there are risks.

Using agricultural lands to grow fuel for electricity could displace valuable food crops. PGE would pay cane farmers a price comparable to the price of low-value crops such as alfalfa. It would therefore not compete with high value food crops such as potatoes.

Giant cane also needs water. PGE found that the shift from alfalfa and wheat would not significantly increase water use.

The greatest danger, however, is that in some states giant cane is considered an invasive weed. In California it was planted in streamside areas, and rapidly spread and displaced native vegetation.

This risk may not be as high in Oregon. Giant cane is sterile this far north. It can spread only by creeping roots and by nodes on the stems. But if planted in streamside areas or other moist areas, it might rapidly displace native vegetation.

PGE says this risk can be managed by making sure the crop is planted only in dry upland areas. A lack of water, which is a natural condition on the east side of the Cascades, can also control the plant. However, the risk remains. Significant work will be needed to determine if this peril can be controlled.

But the risks should not prevent PGE from exploring this idea. Even as we reduce emissions, we will need electricity. It would be environmentally and economically beneficial if that energy comes from existing facilities using a renewable resource rather than from new plants that require massive amounts of fossil fuels to construct.

PGE is going to test-burn torrefied giant cane in 2013. If it works, and if the risks can be controlled, it seems like a win-win for the region and for the planet.

Bob Doppelt directs The Resource Innovation Group and teaches about global warming at the University of Oregon.