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Tolko uses wood waste for fuel

BY GORDON HAMILTON
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Tolko Industries turns the switch today on a new energy plant that makes gas from wood waste, marking the first application in the North American forest industry of a new green technology that could save millions of dollars in gas costs.

The plant, designed and built by Vancouver-based Nexterra Energy Corp., makes energy from hog fuel, a waste product composed mostly of bark that many mills burn simply to dispose of it. The Nexterra plant converts it into a synthetic gas called syngas that Tolko is using to replace costly natural gas at its Heffley Creek plywood mill north of Kamloops. The plant has successfully completed its startup and Nexterra is turning over the operation to Tolko today.

Nexterra and Tolko are singing the praises of the new technology, saying it marks the beginning of a new era in clean, low-cost energy. The gasification plant saves money, puts wood waste to a higher use and cuts down on greenhouse gases.

The plant will convert 13,000 tonnes of wood waste a year into gas that can replace natural gas in drying veneer and heating water used to condition logs for peeling.

Tolko regional manager Jim Baskerville said plywood production takes a lot of heat and the new plant will knock \$1.5 million off the Heffley plant's current gas bill, cutting gas costs by one third.

"That makes a very compelling business case," Baskerville said.

He said converting hog fuel to gas increases its value to Tolko by 20-fold. Tolko was selling its hog fuel for \$5 a tonne to Weyerhaeuser Co. for straight combustion burning at Weyerhaeuser's Kamloops pulp mill. But using hog fuel to create much more valuable gas has pushed its value to the company up to \$100 a tonne.

Nexterra president and CEO Jonathan Rhone said the plant will replace 235,000 gigajoules of natural gas a year. "That is roughly the equivalent of the amount of natural gas required to heat 1,900 typical B.C. homes," he said.

He also said the clean-burning gas will reduce air emissions; reducing Tolko's greenhouse gas emissions by an estimated 12,000 tonnes a year, the equivalent of taking 3,000 cars off the road.

The gasification plant converts biomass — plant material used as a fuel — into a complex gas consisting mainly of carbon monoxide, hydrogen and methane. It can be easily transported and according to Jim Dangerfield, vice-president of the forest research agency Forintek, the application at Heffley Creek is just the beginning of an entirely new technology.

"We are starting by using the product for heat. But we can transport it by pipeline so we expect this will evolve into a whole new array of opportunities."

With natural gas now eating about 15 per cent of production costs in the forest industry, companies are looking for ways to bring those costs under control. That's opening the door to technologies that only a few years ago were dismissed as too exotic or too costly.

Tolko's plant is the first application of the Nexterra technology. A second project is underway in South Carolina, Rhone said. Also, Weyerhaeuser is conducting research at a pilot plant Nexterra operates at Kamloops to determine if the technology is suitable for heating lime kilns in Weyerhaeuser's

Nexterra's gasification system

How bark takes a bite out of energy costs.

1 Fuel In-Feed System

The metering bin stores wood-waste fuel and delivers it at a steady rate to the gasifier.

2 Gasifier

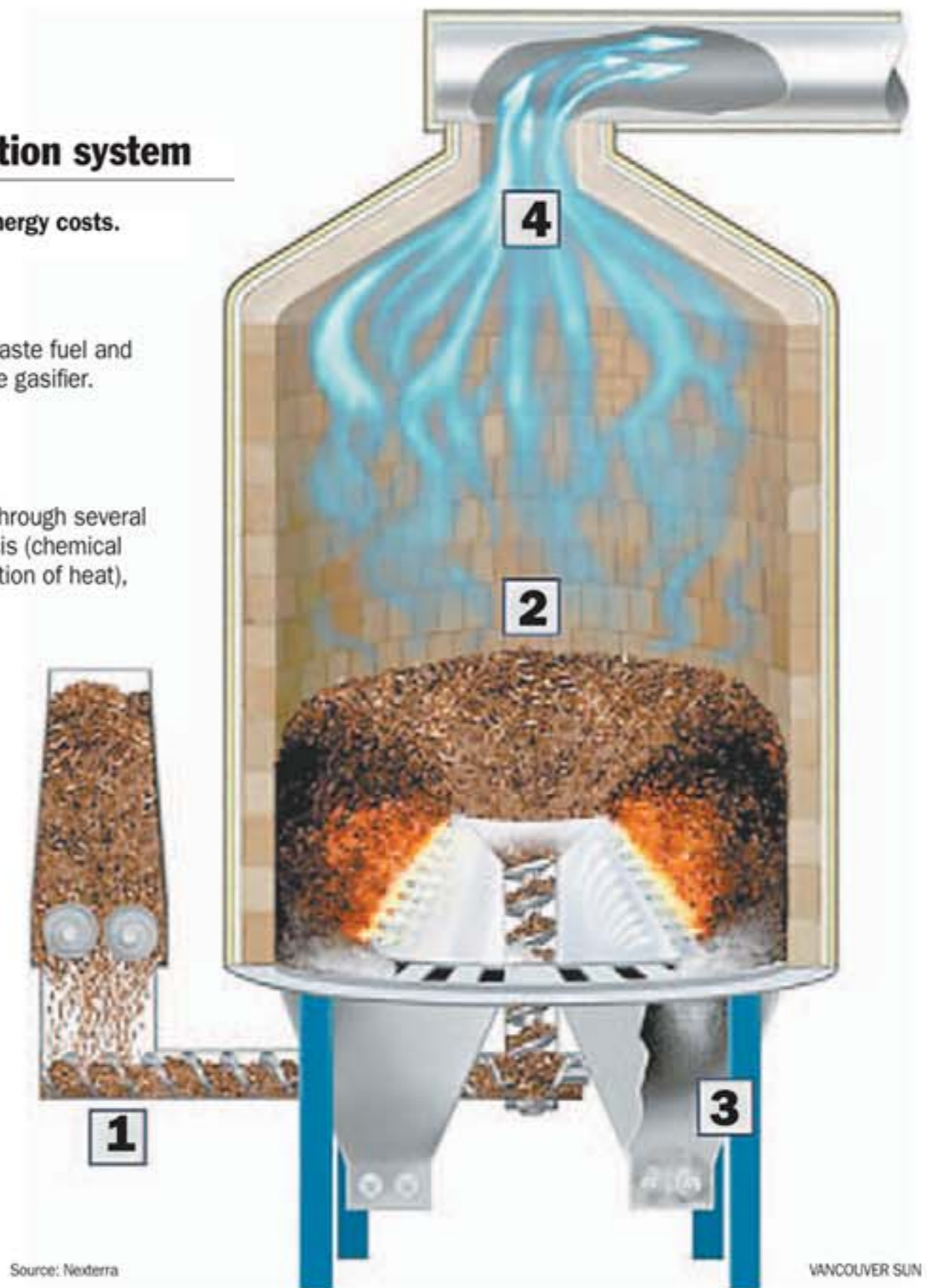
Fuel entering the gasifier goes through several stages, including drying, pyrolysis (chemical change brought about by the action of heat), gasification and reduction to ash.

3 Automatic Ash Removal System

As partially processed fuel passes to the outer cone, it is reduced to non-combustible ash. The ash is removed intermittently through a set of openings.

4 Syngas

Syngas (synthetic gas) exits the gasifier at 500-700 °F. The syngas can be combusted with the resulting flue gas directed to heat recovery equipment such as boilers and turbines.



Source: Nexterra

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"Biomass gasification is really starting to take off right now because of the high prices of fuels," said Rhone. "Our business is all about helping industrial customers switch from expensive fossil fuels to a low-cost alternative fuel. Our business is really driven by high energy prices and until the last few years, the business case for companies to invest in this kind of technology has been less than optimal."

Gasification plants, costing from \$5

million to \$10 million, can be paid back within 1½ to 3½ years.

"That kind of return is attractive," said Rhone.

The high-flying Canadian dollar coupled with high energy costs is forcing forest companies to look for ways to stabilize their fuel costs, said Rhone.

And at the same time, government and public attention are focused on finding alternative uses for the massive die-off of timber caused by the mountain pine beetle infestation. That has

encouraged research and investment into biomass energy, said Dangerfield.

The gasification technology was developed in the mid-90s. Essentially, the plant creates gas by burning hog fuel but starves it of oxygen.

"A small portion of the fuel burns to produce heat that converts the rest of the fuel into gas," Rhone said. "It's a fully self-sustaining process."

Nexterra, a private company formed three years ago, bought the technology and began finding ways to apply it in the forest industry. ARC Financial, a Calgary-based energy financing company, is the majority owner. Company executives and directors own the rest of Nexterra.

The gasification project has received federal and provincial funding as well.

"This project is a great example of the innovative use of biomass for energy production — a concept we are addressing in the development of a new bioenergy strategy," Energy, Mines and Petroleum Resources Minister Richard Neufeld said in a news release. "In the future, bioenergy will help meet our electricity needs, help create jobs and develop economic opportunities, while also helping to protect our health and environment."

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