



An example of a small-scale Nexterra gasifier system

Nexterra Systems has its eyes on conquering the small-scale global renewable energy sector and James Barrett talks to CEO Mike Scott about current and future manoeuvres

Hoping for world domination

Canada-based renewable energy company Nexterra Systems is one that thinks on a global scale. As a provider of energy-from-renewable waste systems, it does not view being established in a country that uses hydro and natural gas in abundance as a hindrance to its own progress.

And, despite the Canadian market for smaller scale renewable bioenergy systems being still quite small, Nexterra has been working with partners and companies across the world and developing new technology to positively advance biopower production and consumption.

‘Our focus is places like

western Europe, Brazil, Japan and other countries in Asia that have high fossil fuels prices, abundant biomass waste fuels or a regulatory context that supports the growth of renewable fuels,’ says Nexterra’s CEO Mike Scott.

And along with the recent opening of a new combined heat and power (CHP) system on the campus of the University of British Columbia (UBC) in Vancouver, Nexterra’s global footprint is continually growing.

Back to school

The system at UBC is North America’s first commercial demonstration of a transformative application

that combines Nexterra’s gasification and syngas conditioning technologies with one of General Electric’s Jenbacher internal combustion engines. The project represented the next step in the development of Nexterra’s core gasification technology to produce power and thermal energy from waste feedstocks.

‘We began working on both advanced syngas cleanup and conditioning and syngas thermal cracking technology about four years ago, with an aim to produce an engine grade syngas that could be fired directly into an industrial internal combustion engine to produce electricity,’ explains Scott.

UBC has a peak power

consumption of approximately 40MW and the institution was looking to become more energy self-sufficient. Nexterra’s CHP plant will reduce UBC’s annual carbon footprint by creating 2MW of electricity and 3MW of heat (or 9,600 lbs an hour of steam). The system is also set to reduce CO₂ emissions by 5,000 tonnes per year, equivalent to taking 1,000 cars off the road.

Since UBC’s electricity comes from hydropower it is considered carbon neutral, so the carbon reduction comes from displacing the natural gas used to produce heat.

‘The plant uses renewable woody biomass, including City of Vancouver tree trimmings, clean construction



GE Canada Energy Financial Services MD Mark Tonner and Nexterra's Mike Scott in front of the Jenbacher engine

and demolition debris, and wood waste from local furniture manufacturers,' adds Scott. 'The UBC project requires about 12,500 dry tonnes of locally-sourced urban wood waste per year, which is an average of two to three trucks a day.'

The application went through over 5,000 hours of testing, with 3,000 hours of run time on a GE Jenbacher engine prior to entering UBC.

ROC steady footing

Nexterra is simply targeting markets for CHP, process heating, district energy or power plants that produce in the range of 2 to 10MW, in addition to a range of thermal capacities throughout all its primary customer regions.

'We do not see any significant market growth in Canada or the US until the price of natural gas rebounds. That said, we have had interest from certain industries and institutions in the US that are looking for a renewable, clean energy alternative to fossil fuels,' says Scott, before adding that interest is coming from regions in North America where the low price of natural gas is not the only determining

factor in choosing to switch away from fossil fuels.

Nexterra has also extended its reach into the UK by signing a partnership with engineering design and project management services provider Stopford Projects. The plan is to develop and market waste-to-energy gasification systems for the industrial and district energy markets in the UK, as one of the few commercially proven gasification systems at the 2 to 10MW scale.

Under recently announced revisions to the UK Department of Energy and Climate Change's Renewable Obligation Certificate (ROC) programme, projects deploying Nexterra's gasification systems will qualify for two ROCs, which is the highest level available for any renewable energy project.

Feedstock and the future

All commercial Nexterra gasification systems have used woody waste biomass as the feedstock to produce thermal heat and hot water, plus electricity as demonstrated at UBC.

The variety of wood residuals used to date includes wood waste from forest products mills in Kamloops,

New Westminster and Prince George (all in British Columbia), and bush clearing and tree trimmings from places like the US Department of Energy's Oak Ridge National Lab in Tennessee.

'The UBC system runs on

exceeds the fuel supply that is needed at the UBC project meaning it is a valuable and bountiful source,' says Scott.

Nexterra is also looking to process a variety of other waste feedstocks including agricultural residuals, composted municipal solid waste and bagasse.

'We've also been working with biosolid feedstock like sludge from sewage treatment plants,' Scott adds. 'We have processed this material successfully at our Product Development Centre and look forward to bringing a commercial solution to the wastewater treatment industry.'

That, coupled with the supply of equipment to an \$18 million (€14 million) biomass heat and power project at the US Department of Veterans Affairs Medical Centre in Michigan, means Scott and his team have a busy time ahead of them.

'The Michigan project will open in 2013 and is projected to reduce the centre's annual



Delivery of woody biomass at UBC

wood residuals that include City of Vancouver tree trimmings, clean construction and demolition debris, and waste from various furniture manufacturers in the Metro Vancouver area. In fact, Metro Vancouver produces a volume of wood residuals that greatly

greenhouse gas emissions by 14,000 tonnes as part of the department's objective to significantly reduce greenhouse gas emissions in its buildings by the end of the decade. Should they need us further, we'll be there,' smiles Scott. ●