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Nexterra Systems Corp.

a global leader in energy-from-renewable-waste gasification systems

CORPORATE PROFILE

Photo of UBC Gasifier: Don Erhardt

CORPORATE OVERVIEW

Nexterra Systems Corp. is a global leader in advanced biomass gasification energy systems. The company designs and supplies biomass gasification systems for industrial customers and public institutions. These high efficiency systems enable customers to generate clean, renewable energy from biomass.

Our award-winning gasification technology features lower costs, ultra-low emissions, fully automated control, design simplicity, reliability, versatility and fuel flexibility compared to conventional biomass combustion equipment.

These features make our technology ideally suited for thermal and cogeneration applications at industrial and institutional facilities. The typical scale of energy systems range from 2 to 40 MWt (8 to 100 MMBtu/hr) net useable heat for thermal systems or from 2 to 10 MW electricity for cogeneration systems.

Nexterra has completed seven large commercial projects in Canada and the US, and is currently building another project in Michigan. See pages 6 and 7 for project descriptions.

Incorporated in 2003, Nexterra is a private company with an experienced team of employees working in Canada, the United States and Brazil. The well-capitalized company is owned by two Canadian private equity firms, ARC Financial Corporation and Tandem Expansion Fund, and has established relationships with several world class partners including GE Energy and Johnson Controls Inc.

UNBC President George Iwama lights up the Nexterra biomass gasification system

"This (ORNL) project showcases the opportunity for public institutions to partner with the private sector to deploy innovative clean energy technologies that can make us more energy independent. We have a terrific partner in Johnson Controls and a proven gasification technology leader in Nexterra."

– Dr. Thom Mason, Director, Oak Ridge National Laboratory

A GLOBAL OPPORTUNITY

The global market for Nexterra's biomass energy systems is large and expanding, especially in areas where fossil fuel costs are high and biomass is abundant.

Worldwide, thousands of institutional and industrial facilities rely on fuel oil, natural gas and grid-purchased electricity. With higher energy prices, stringent environmental regulations and mandates for renewable energy, many are looking to self-generate heat and power using readily available biomass residues. Nexterra's biomass energy systems are ideally suited for these facilities.

Nexterra's initial focus was on North America where it has a successful track record designing and building large commercial gasification systems on time and on budget. The company is now also targeting opportunities in Brazil, the United Kingdom, Japan and other markets in Europe and Asia.

Nexterra has an extensive R&D program to develop progressively higher value applications for its gasification technology. Product development programs include syngas enhancement to produce bio-methane, ethanol, hydrogen and other synthetic fuels. These new fuels and applications will position Nexterra to target a growing international customer base.

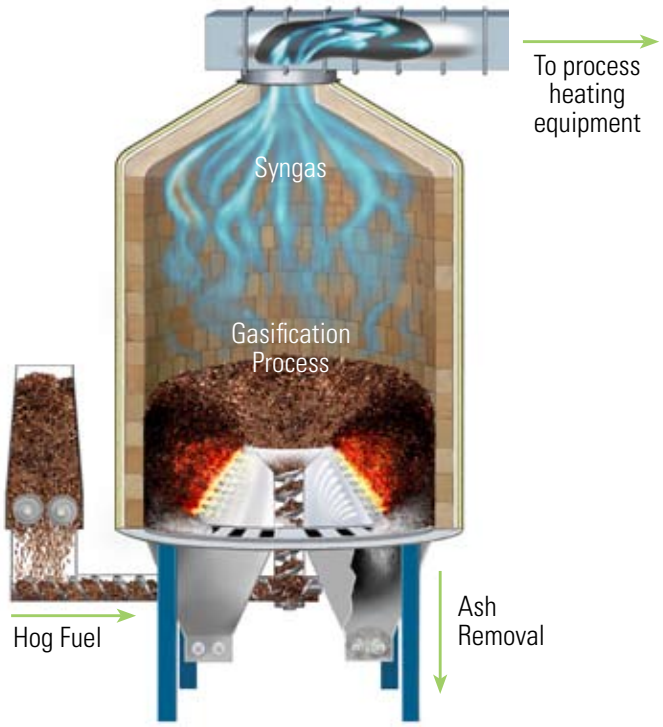
Oak Ridge National Laboratory Campus

WHAT IS GASIFICATION?

Gasification is a thermo-chemical process that uses heat to convert any carbon-containing biomass fuel into a clean burning gas, commonly referred to as "syngas". The high efficiency process produces much lower particulate and other emissions than conventional combustion technologies.

Gasification differs from combustion because it uses just 20% to 30% of the air or oxygen needed for complete fuel combustion. During gasification, the amount of air supplied to the gasifier is carefully controlled so that only a small portion of the fuel burns completely. This "starved air" process provides sufficient heat to pyrolyze and chemically break down the balance of the fuel into syngas that can be distributed to a variety of energy users.

Unlike "flue gas" from conventional combustion plants, syngas can be transported for remote combustion and used as a substitute for natural gas, fuel oil or propane to produce process heat, steam, hot water and/or electricity using conventional energy recovery equipment. Syngas is composed primarily of carbon monoxide, hydrogen and methane, as well as vapourized pyrolysis liquids and hydrocarbons. Syngas can potentially be synthesized and used as a basic chemical building block for industrial gases and a large number of products in the petrochemical and refining industries.



NEXTERRA'S GASIFICATION TECHNOLOGY – HOW IT WORKS

The system below is a typical Nexterra system configuration for producing thermal energy. Systems can be adapted for a number of heat, hot water and power generation applications, and can vary in size and number of components.

1. Fuel In-Feed
Locally sourced biomass, sized to 3-inch minus, is loaded into the fuel bin, conveyed to a metering bin and then bottom-fed through the fuel feed cone. It is distributed across the top of the fuel pile inside the refractory lined gasification chamber. Nexterra's gasifiers can accommodate biomass fuels up to 60% moisture content without any pre-conditioning

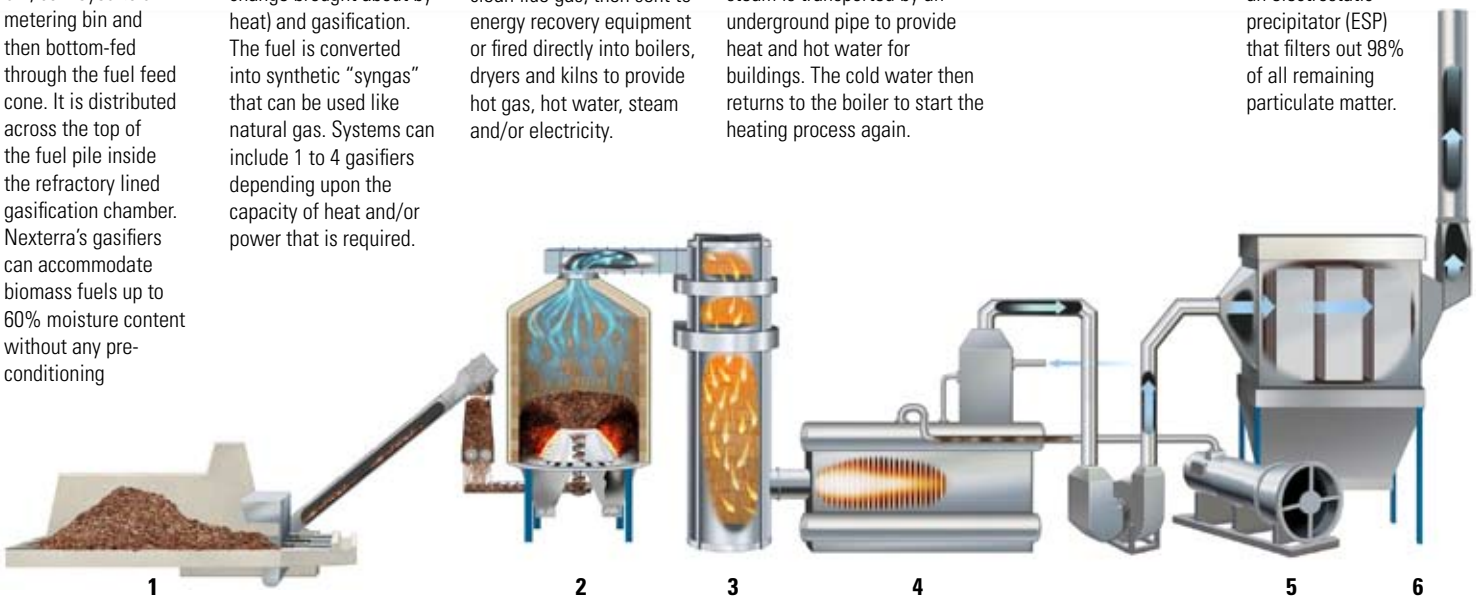
2. Gasifier
Fuel enters the gasifier(s) and goes through several stages including drying, pyrolysis (chemical change brought about by heat) and gasification. The fuel is converted into synthetic "syngas" that can be used like natural gas. Systems can include 1 to 4 gasifiers depending upon the capacity of heat and/or power that is required.

3. Oxidizer
The syngas exits at 500 - 700° F (260 - 390°C) where it can be directed to an oxidizer for conversion to clean flue gas, then sent to energy recovery equipment or fired directly into boilers, dryers and kilns to provide hot gas, hot water, steam and/or electricity.

4. Boiler
The boiler produces either steam or hot water depending upon the system application. In a central heating system, steam is transported by an underground pipe to provide heat and hot water for buildings. The cold water then returns to the boiler to start the heating process again.

5. Generator
In some applications a steam turbine generator can be added to produce electricity.

6. ESP
In some applications, after exiting the boiler, the flue gas is cleaned in an electrostatic precipitator (ESP) that filters out 98% of all remaining particulate matter.



APPLICATIONS

Nexterra provides turnkey biomass energy systems to produce heat, steam or power. Systems can be easily configured to best satisfy the requirements of the end customer.

1. THERMAL ENERGY SYSTEMS

Figure 1: Configuration of a 20 MWt Heating Plant

- Output: Hot Air, Hot Water, Steam
- System Sizes: 2 to 40 MWt (8 to 120 MMBtu/hr)
- System Efficiency (HHV): 72 – 82% depending on fuel/project specifics
- System Efficiency (LHV): 77 – 87% depending on fuel/project specifics
- Fuel Types: Wood Residuals, Clean Construction Debris, Biosolids (planned)
- Fuel Feed: 25 – 250 tonnes per day (bone dry)
- Fuel Moisture Content: 6 – 60% moisture
- Fuel Size: 7.5 cm (3 inches) or less in all dimensions
- Projects: Oak Ridge National Laboratory, University of Northern British Columbia, Dockside Green, Tolko Industries

2. STEAM POWER & CHP SYSTEMS

Figure 2: Configuration of 20 MWt/1.4 MWe CHP plant

- Output: Power, Combined Heat and Power
- System Sizes: 1.4 to 10 MWe
- System Efficiency (HHV): 21 – 27% depending on fuel/project specifics
- System Efficiency (LHV): 22 – 29% depending on fuel/project specifics
- CHP System Efficiency (HHV): 46 – 50% depending on fuel/project specifics
- CHP System Efficiency (LHV): 49 – 53% depending on fuel/project specifics
- Fuel Types: Wood Residuals, Clean Construction Debris, Biosolids (planned)
- Fuel Feed: 25 – 250 tonnes per day (bone dry)
- Fuel Moisture Content: 6 – 60% moisture
- Fuel Size: 7.5 cm (3 inches) or less in all dimensions
- Projects: Veterans Affairs Medical Center Battle Creek Michigan (under construction) and University of South Carolina

3. DIRECT FIRED THERMAL ENERGY SYSTEMS

Figure 3: Configuration of 12 MWt Direct Fired Boiler System

- Output: Syngas for existing boilers, lime kilns, furnaces
- System Sizes: 2 to 40 MWt (8 to 120 MMBtu/hr)
- System Efficiency (HHV): 72 – 82% depending on fuel/project specifics
- System Efficiency (LHV): 77 – 87% depending on fuel/project specifics
- Fuel Types: Wood Residuals, Clean Construction Debris, Biosolids (planned)
- Fuel Feed: 25 – 250 tonnes per day (bone dry)
- Fuel Moisture Content: 6 – 60% moisture
- Fuel Size: 7.5 cm (3 inches) or less in all dimensions
- Projects: Kruger Products Tissue Mill

4. INTERNAL COMBUSTION ENGINE HIGH EFFICIENCY CHP SYSTEMS

Figure 4: Configuration of 2 MWe IC Engine Based CHP System

- Output: Power, Combined Heat and Power
- Systems Size: 2 to 10 MWe + 3 to 15 MWt (9 to 45 MMBtu/hr)
- System Efficiency (HHV): Combined Cycle electrical 30%; CHP up to 60%
- System Efficiency (LHV): up to 64% depending on fuel/project specifics
- Fuel Types: Wood Residuals, Clean Construction Debris, Biosolids (planned)
- Fuel Feed: 35 – 140 tonnes per day (bone dry)
- Fuel Moisture Content: 6 – 60% moisture
- Fuel Size: 7.5 cm (3 inches) or less in all dimensions
- Projects: University of British Columbia (Demonstration)

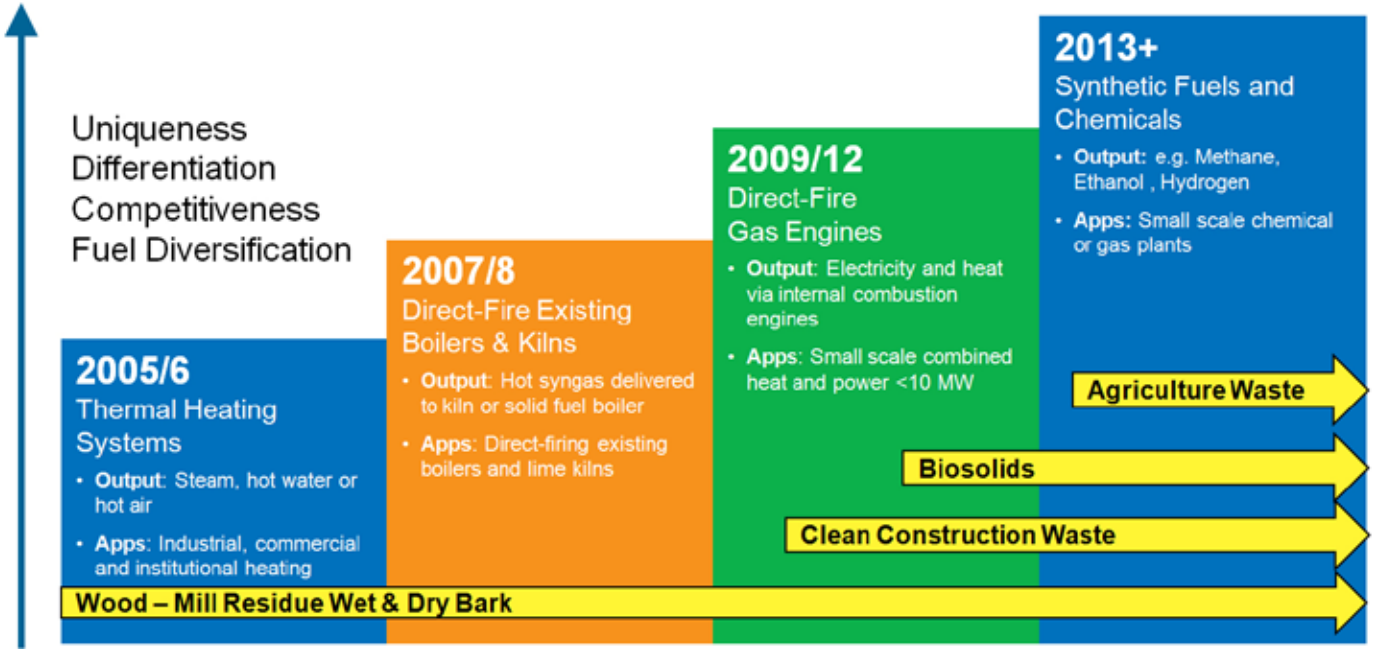
NEXTERRA'S BIOMASS GASIFICATION VS WOOD-FIRED COMBUSTION

Nexterra's gasification technology offers a number of benefits compared to conventional combustion technologies. The table below sets out some of the key advantages of gasification.

Feature	Comparison	Benefit
Air Emissions • Lower PM, NOx, CO, VOC, TOC emissions • Lower capital costs • Refer to www.nexterra.ca for a copy of the Emissions Report	**Lower**	• Much cleaner air and easier permitting • Greater control of process elements results in lower PM, reducing need for costly emissions abatement equipment
Fuel Costs and Flexibility • Lower cost biomass waste fuels can be used including construction and demolition debris and biosolids. • 5 – 60% moisture content and <75mm particle size vs. combustion systems that operate on either wet or dry fuel	**Better**	• Gasification's precise process control means that problems such as "ash klinkering" can be avoided and NOx formation can be reduced • More fuel supply options, lower fuel cost, and reduced fuel procurement risk
Syngas Versatility: It's A Gas • Syngas can be directly fired into boilers, kilns and gas engines, which cannot be achieved by combustion	**Unique**	• New CHP/power systems developed with GE are significantly higher efficiency
Operating and Maintenance Costs • Lower fuel cost, automated operation, low parasitic load, minimal operator intervention • Less boiler tube fouling, less equipment to maintain, longer refractory life due to clean flue gas	**Lower**	• Lower parasitic power load due to less equipment required for ash removal and soot blowing • Lower maintenance costs, fewer unscheduled maintenance outages and lower lifecycle costs
Green Fuels and Chemicals • Gasification produces a gas, enabling conversion of biomass into high value fuels and chemicals.	**Unique**	• Syngas is primarily a combination of Carbon Monoxide (CO) and Hydrogen (H), the building blocks for high value fuels and chemicals • Combustion cannot achieve this

NEXTERRA APPLICATION ROADMAP

The chart below illustrates the historic and planned progression of Nexterra product applications from simple thermal heating plants to displace natural gas, to direct-firing retrofitted boilers and to direct-firing syngas into high efficiency gas engines.



NEXTERRA PROJECTS

THE UNIVERSITY OF BRITISH COLUMBIA

UNIVERSITY OF BRITISH COLUMBIA, VANCOUVER, BC

- Capacity: 3 MWt (10 MMBtu/hr) and 2 MWe of electricity combined heat and power system
- Nexterra Scope of Work: Turnkey biomass CHP system
- Fuel: Locally sourced urban wood residue
- Combines gasification and syngas conditioning system with GE Jenbacher gas engine
- 1st demonstration of Nexterra's syngas-to-gas engine technology
- GHG Reduction: 4,500 tonnes/yr, equivalent to taking 1,100 cars/yr off the road
- Operation Date: 2012

U.S. DEPARTMENT OF ENERGY

U.S. DEPARTMENT OF ENERGY, OAK RIDGE NATIONAL LABORATORY, OAK RIDGE, TN

- Capacity: 21 MWt (65 MMBtu/hr) system generates steam to heat campus
- Nexterra Scope of Work: Supply only of turnkey gasification system
- Fuel: Locally sourced wood residue (10 – 50% moisture content)
- GHG Reduction: 20,000 tons/yr, equivalent to taking 4,500 cars/yr off the road
- Project Partners: Johnson Controls Inc.
- Operation Date: 2012

UNDER CONSTRUCTION

US DEPARTMENT OF VETERANS AFFAIRS MEDICAL CENTER, BATTLE CREEK, MI

- Capacity: 10 MWt (35 MMBtu/hr) and 2 MWe of electricity system generates heat and power
- Nexterra Scope of Work: Supply only of turnkey gasification system
- Fuel: Locally sourced wood residue (up to 60% moisture content)
- Displaces 85% of current natural gas consumption
- GHG Reduction: 14,000 tons/year, equivalent to taking 3,500 cars/yr off the road
- Operation Date: 2013

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

UNIVERSITY OF NORTHERN BRITISH COLUMBIA, PRINCE GEORGE, BC

- Capacity: 5 MWt (17 MMBtu/hr) system generates steam to heat campus
- Nexterra Scope of Work: Turnkey gasification system
- Fuel: Locally sourced wood residue (up to 60% moisture content)
- Displaces 85% of current natural gas consumption
- GHG Reduction: 3,500 tonnes/year, equivalent to taking 1,000 cars/yr off the road
- Operation Date: 2010

DOCKSIDE GREEN

DOCKSIDE GREEN RESIDENTIAL DEVELOPMENT, VICTORIA, BC

- Capacity: 2 MWt (7 MMBtu/hr) system generates heat and hot water for development
- Nexterra Scope of Work: Turnkey gasification system
- Fuel: Locally sourced, clean urban wood residue (moisture content: 20 – 55%)
- GHG Reduction: 3,500 tons/yr, equivalent to taking 850 cars/yr off the road
- Project Partners: Vancity Capital, Fortis BC Energy Services and Corix
- Operation Date: 2009

NEXTERRA PROJECTS

KRUGER PRODUCTS LP, NEW WESTMINSTER, BC

- Capacity: 14 MWt (45 MMBtu/hr) system generates syngas that is fired directly into a boiler
- Nexterra Scope of Work: Turnkey gasification system
- Fuel: Locally sourced mill waste and/or clean construction debris (up to 60% moisture content)
- System displaces 54% of current natural gas
- GHG Reduction: 22,000 tonnes/yr, equivalent to taking 5,000 cars/yr off the road
- Operation Date: 2009

UNIVERSITY OF SOUTH CAROLINA, COLUMBIA, SC

- 21 MWt (70 MMBtu/hr) and 1.4 MWe of electricity system to generate heat and power
- Benefits: designed to displace fossil fuel and reduce energy costs
- Project Partner: Johnson Controls Inc.
- Operation Date: 2008

TOLKO INDUSTRIES, LTD., HEFFLEY CREEK DIVISION, KAMLOOPS, BC

- Capacity: 11 MWt (38 MMBtu/hr) system
- Application: Process heat for veneer dryer and log conditioning vats
- Nexterra Scope of Work: Turnkey gasification system
- Fuel: Wood residues (hog fuel) from Tolko mill (25 – 55% moisture content)
- GHG Reduction: 12,000 tonnes/yr, equivalent to taking 3,000 cars/yr off the road
- Operation Date: 2006

NEXTERRA PRODUCT DEVELOPMENT CENTRE

Nexterra is continuously improving and expanding the capabilities of its proprietary technology. These activities are undertaken at our Product Development Centre (PDC) located in Kamloops, BC, Canada.

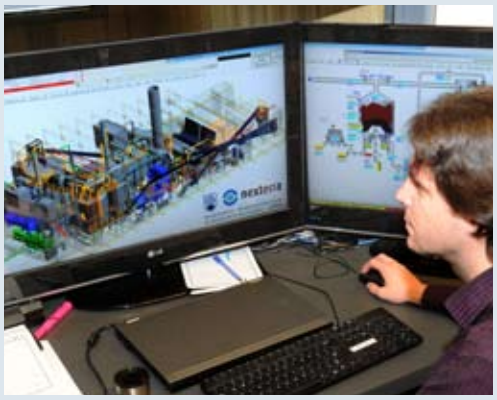
In 2003, Nexterra constructed a 2.5 MWt/hr (8 MMBtu/hr) product development facility. Expanded significantly in 2007 and again in 2010, this commercial scale gasification plant facilitates Nexterra's research and development, product development, and project specific fuels and applications testing. The facility is staffed by a full-time contingent of engineers and operators, and is capable of 24/7 operations. The plant is available for customer site visits and project-related testing activities.

The PDC provides Nexterra with unique R&D capabilities. The product development team is comprised of experienced engineers, academics and technicians. In-house capabilities include fuel testing, process simulation modeling, direct firing syngas into boilers and lime kilns, testing new fuels such as biosolids, and syngas upgrading and tar removal for use in internal combustion engines. Future programs include syngas enhancement to produce bio-methane and other synthetic fuels.

THE NEXTERRA ADVANTAGE

Looking for a renewable energy solution to reduce your reliance on fossil fuels? Nexterra's award-winning biomass gasification energy systems offer significant advantages over conventional combustion or other bioenergy technologies.

- A global leader in advanced biomass gasification systems
- Proven, industrial grade technology with unique attributes
- Project track record and strong customer references
- Ultra-low emissions – much lower than conventional combustion
- Design simplicity, automated operation and fuel flexibility
- Experienced management team
- Blue chip alliance partners and investors
- Expanding international markets
- Strong product pipeline for higher value applications and fuels



CUSTOMER RECOMMENDATIONS

"Nexterra has established itself as an international leader in biomass gasification. Their new CHP System has tremendous potential to help UBC… achieve (our) green energy goals while reducing greenhouse gas emissions."
– John Hepburn, UBC Vice President of Research

"Our New Westminster mill is situated in an urban area, so we needed the cleanest technology available, and in a challenging economic climate, we also needed the most cost-competitive. Nexterra's biomass gasification system addresses both challenges, significantly reducing both greenhouse gas emissions and energy costs."
– Frank van Biesen, VP Technology, Kruger Products

"Nexterra's gasification system is perfect for an urban environment. It is a proven, simple, ultra-clean technology that sets a new standard for converting biomass into useful heat energy."
– Joe Van Belleghem, formerly with Windmill Developments, co-developer of Dockside Green along with Vancity Capital

NEXTERRA PARTNERS

GE · Johnson Controls · FORTIS BC · Stopford

NEXTERRA OWNERSHIP

ARC financialcorp energy capital partners · TANDEM · BDC

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