

# GAS COGENERATION POWER



## ABOUT CARDINAL POWER

Cardinal Power (Cardinal), a combined cycle gas cogeneration plant, is one of Ontario's largest cogeneration facilities. Cardinal simultaneously produces electricity and thermal energy from natural gas, which results in a highly efficient use of energy. Cardinal has been the 501D5 turbine's world fleet leader in availability every year since the start of commercial operations. This is approximately 2.0% higher than the availability attained by the other 501D5 turbines that report this data. There are about 100 of these turbines operating today. The Cardinal facility is located in the Township of Edwardsburgh/Cardinal, Ontario, which is east of Brockville along the St. Lawrence River.

### OPERATING DATA

**156 NET MEGAWATTS (MW)**  
INSTALLED CAPACITY

**129,000**  
EQUIVALENT NUMBER  
OF HOUSEHOLDS

**911.0 (GWh)**  
ELECTRICITY PRODUCTION\*

**18**  
EMPLOYEES

### GAS COMBUSTION TURBINE

**501D5**  
TURBINE

**3,600 (RPM)**  
SPEED

MANUFACTURED BY  
**WESTINGHOUSE**

WEIGHT OF ENGINE  
**150 TONNES**

### KEY AGREEMENTS

NON-UTILITY  
GENERATOR CONTRACT  
**UNTIL 2034**

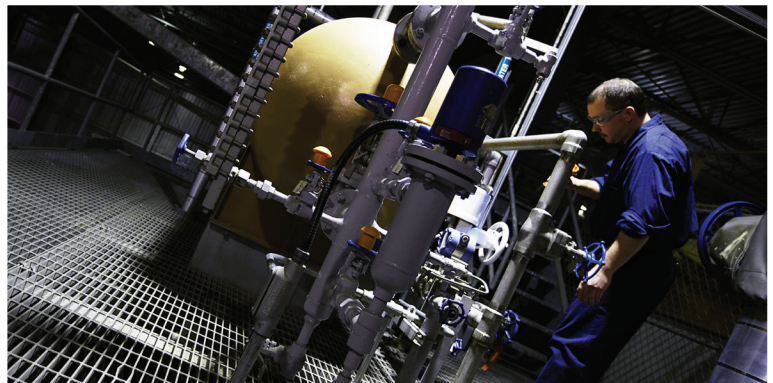
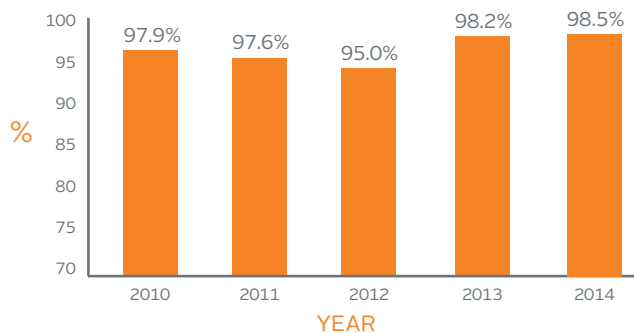
ENERGY SAVINGS AGREEMENT  
(ESA) WITH INGREDION.  
**UNTIL DECEMBER 2034**

### COMMERCIAL OPERATIONS

**NOVEMBER 1994**  
START OF COMMERCIAL OPERATIONS

\*In the year ended December 2014.

## 5-YEAR AVAILABILITY



## KEY CONTRACTS

### NON-UTILITY GENERATOR AGREEMENT

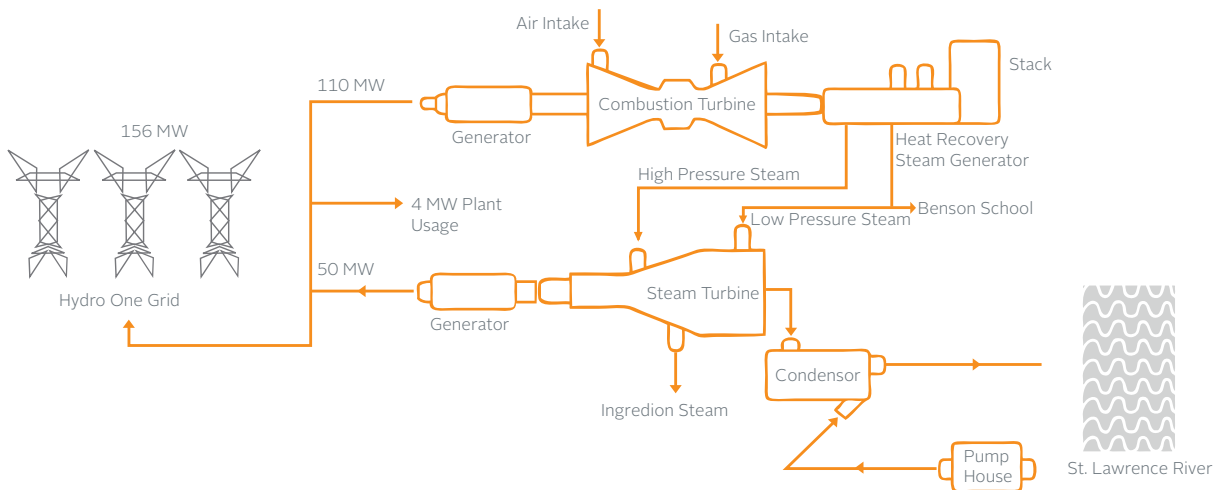
Cardinal operates under a Non-Utility Generator Agreement (NUG) with the Independent Electricity System Operator (IESO). At the start of the contract on January 1, 2015, Cardinal became a dispatchable facility, only supplying energy to the Ontario grid when needed. The IESO provides Cardinal with a fixed monthly payment, which escalates annually to cover Cardinal's fixed operating cost and return on capital.

## HOW CARDINAL GENERATES POWER

As is typical with cogeneration plants, Cardinal has a low heat to electricity ratio and produces more electricity than steam for sale. A combustion turbine burning natural gas powers a generator that produces electricity. The hot gas exhaust from the combustion turbine is diverted into a heat recovery steam generator that produces high pressure steam. This steam is piped to a steam turbine that powers a second generator, which produces more electricity. Some of the steam is extracted from the steam turbine to Ingredion's plant and is used in its manufacturing process. Cardinal also provides free steam to heat an elementary school that is located beside the facility.

## DID YOU KNOW?

- Cogeneration is an environmentally preferred form of power generation because it uses natural gas, a fuel source that emits less than half the greenhouse gas (GHG) per unit of energy produced than the cleanest available thermal power station.
- Natural gas combustion results in virtually no atmospheric emissions of sulphur dioxide and far lower emissions of carbon monoxide and nitrous oxide than the combustion of other fossil fuels



## ABOUT CAPSTONE INFRASTRUCTURE CORPORATION

Capstone's mission is to provide investors with an attractive total return from responsibly managed long-term investments in core infrastructure in Canada and internationally. The company's strategy is to develop, acquire and manage a portfolio of high quality utilities, power and transportation businesses, and public-private partnerships that operate in a regulated or contractually-defined environment and generate stable cash flow. Capstone currently has investments in utilities businesses in Europe and owns, operates and develops thermal and renewable power generation facilities in Canada with a total installed capacity of net 461 megawatts. Please visit [www.capstoneinfrastructure.com](http://www.capstoneinfrastructure.com) for more information.

## CONTACT US

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