

## Why Partner with Wainbee?

Power generation and clean energy is one of Wainbee's most important and emerging markets. Whether it's for geothermal, wind, solar, nuclear, fossil fuel, gas turbine or combined cycle plants, our system solutions reduce costs and advance performance.

Wainbee brings the best practices and leading-edge technologies to help Canadian manufacturers of wind energy equipment stay competitive and efficient in the new digital future.

As a motion & control, industrial filtration and automation solutions partner, our solutions are designed to work in harmony, helping you develop and produce a more efficient and reliable wind turbine system. From components to fully-integrated systems, our vast selection of global manufacturers give you more options, while simplifying your selection of suppliers and products, backed by our comprehensive team of technical and engineering staff coast to coast in Canada.

### Core Technologies of Wainbee's Wind Energy Solutions



#### Filtration

- Desiccant Breathers
- Offline Filtration Units
- Varnish Removal Systems
- Interchangeable Filter Elements
- Air Breathers
- Filters
- Portable Filtration Carts
- Lubricant Storage and Handling



#### Condition Monitoring and Diagnostic

- Oil Quality Sensors
- Contamination Monitoring Sensor and Center
- Particle Counters & Analyzers
- Pressure Switches & Controllers
- Diagnostic Test Points
- Wireless Sensors
- Online sensors



#### Fluid Connectors

*(Kitting & Assembly Services available, with Parker Tracking System (PTS) Asset Management)*

- Hydraulic Hose and Piping
- Thermoplastic Hose, Coolant Hose and Gear Oil Hose
- Tubing & Fittings
- Hose Management System and Programs (PTS)



#### Hydraulics

- Accumulators
- Pumps & Motors
- Electro-Hydraulic Proportional Valves
- Screw-in Cartridge Valves
- Air/Oil Coolers
- Hydraulic Bolting and Tensioning Solutions



#### Automation and EM Drive & Control

- I/O Systems
- Telecontrol Solutions
- DC Drives
- Brushless Servo Motors
- Multi Axis Motion Controllers
- Servo Drives
- Electric Cylinders

#### Renewable Energy Facts

- Renewable energy sources currently provide about **17% of Canada's total primary energy supply**
- Wind and solar energy are the fastest growing sources of electricity in Canada

*(Source: Natural Resources Canada)*

## World Class Brands Powered by Wainbee Expertise



**Des-Case** serves its customers with leading, innovative products and services that enhance equipment reliability and increase profitability. Des-Case Wind Turbine Contamination Control Solutions are trusted by the top wind turbine OEMs in the wind energy business.



**Filtration Group** is a leading provider of high-performance and innovative products for separation, fluid filtration, air purification and process filtration. Efficient filtration systems from Filtration Group ensure the wind power systems to meet the requirements of weather conditions, technology and environmental protection.



**AKG Thermal Systems** is a globally recognized company, which specializes in the manufacturing and production of customer-focused, innovative high-performance heat exchangers, cooler modules and cooling systems for the Industrial, Mobile and Compressed Air markets.



**Parker Hannifin** is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of markets. Parker has been on the forefront of wind power for over two decades with solutions that touch virtually every critical function in the turbine. More than 100,000 operational wind turbines are equipped with Parker products.



**Enerpac** is a global leader in high pressure hydraulic tools, controlled force products and solutions for precise positioning of heavy loads that help customers safely and reliably tackle some of the most challenging jobs around the world. They provide specialized tools for the installation, maintenance or decommissioning of wind turbines with 50+ years of experience and expertise.

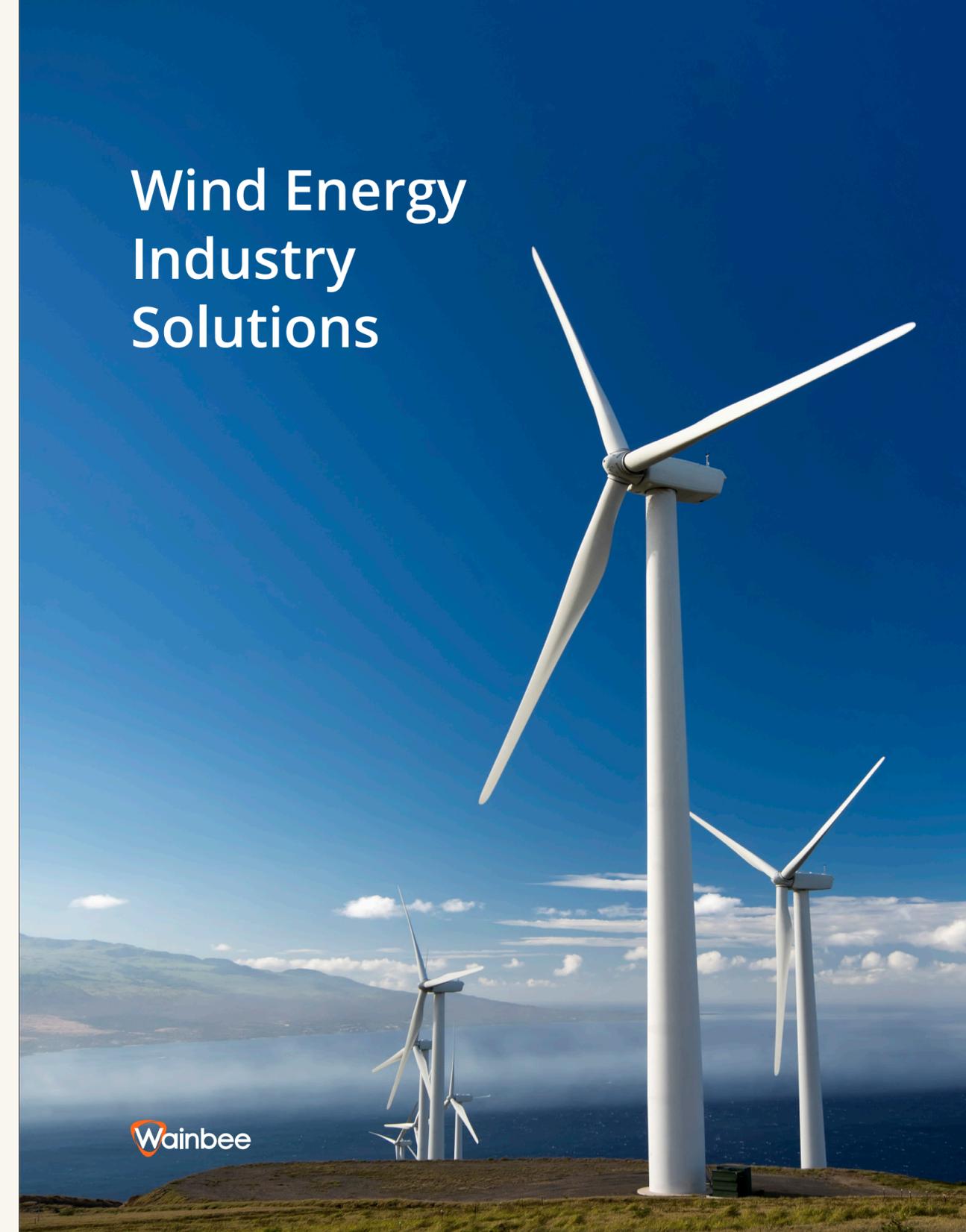


**WAGO** is a global leader in electrical interconnection, interface electronic and automation technology. WAGO supports wind farm management and ensures smooth communication and digitization with WAGO's power engineering solutions.



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# Wind Energy Industry Solutions



## Improve Reliability and Efficiency of Wind Turbines

Wainbee provides Canadian manufacturers in the wind energy industry with solutions that touch almost every critical function in the turbine, from contamination control, fluid condition monitoring to cooling and bolting equipment, as well as kitting and assembly services related to fluid connectors. Our services and quality solutions ensure that our customers generate wind energy more efficiently and safely while improving productivity and reliability.

### Contamination Control

#### Situation

Wind Turbine Gearboxes & Hydraulics are often not meeting their 20-year designed life. 60-80% of all mechanical issues can be directly or indirectly attributed to lubricant contamination.

#### Solution

Flexible and efficient filtration systems remove dirt particles from the air, operating fluids or surface water that can impair the efficient functioning of the system, to meet the requirements of weather conditions, technology and environmental protection.

#### Benefits

Increase scheduled time between maintenance, reduce cost of lubrication replacement, and protect the system from failure. Ensure smooth operation of the wind power system.

### Condition Monitoring

#### Situation

Remote locations and a challenging service environment make it difficult for wind technicians to diagnose the turbine's primary hydraulic and lube systems using minimum equipment to transport up to the nacelle.

#### Solution

A set of standardized diagnostic tools and sensors measure pressures, temperatures, oil levels, and cleanliness using existing sampling ports on the equipment.

#### Benefits

Monitoring condition in real time to remotely identify system problems, eliminating costly up-tower services work. View all statuses and trend data on the web platform from anywhere, anytime.

### Cooling

#### Situation

Overheating is an expensive problem - poor lubrication, internal leakage, higher risk of cavitation, damaged components, etc.

#### Solution

A wide range of innovative coolers and cooling systems keep the ideal working temperature of the wind turbine for cost-efficient operation.

#### Benefits

Improve system efficiency, extend oil service life, and reduce maintenance and repair costs.

### Fluid Connectors

#### Situation

Fluid system leaks in a wind turbine can be expensive to manage and repair. They can cause irreparable damage to the hydraulic, gearbox, and electrical systems, creating a dangerous situation for turbine technicians, as well as environmental damage.

#### Solution

Parker has the industry's largest selection of wind industry approved and tested hoses, fittings, and couplings. With standard sizes up to 152 mm (6 inches) and pressure ratings of up to 4,000 bar (52 kpsi), we offer the fluid connector solution for every system on a wind turbine.

#### Benefits

Leak-free connections ensure lowest assembly, maintenance, and repair costs and a safe working environment.

### Bolting & Tensioning

#### Situation

With the rapid deployment of both onshore and offshore wind farms, operators seek out the right tools to ensure optimum and safe performance.

#### Solution

The range of tools in the Enerpac portfolio uniquely support both wind turbine manufacturers and wind farm operators alike with a broad set of proven tool technology and services.

#### Benefits

The right tools make all the difference. They are put to work under the most intense and demanding conditions, giving you the safest and most efficient path to increase productivity.

## Engineered Systems, Products and Services

### Fluid Condition Monitoring



### Air/ Oil Cooling Systems



### Fluid Connectors



### Bolting & Tensioning Solutions



## Dedicated Solutions and Best Practices

### Hydraulic and Lube Filtration



### Hydraulic Power Units

Wainbee specializes in the sizing, design, manufacture and infield maintenance of Hydraulic Power Units (HPU). Custom solutions can be developed to provide reliable and efficient power for hydraulic systems and the controls communications required.

