

# Seaforth Energy Inc.

Dartmouth, NS

## *The technology*

The AOC 15/50 wind turbine has the largest installed fleet and most operating hours of any 50 kW wind turbine in the world. It has evolved and been tested in the field for more than 30 years. Its high availability with regular maintenance has been proven in the harshest weather conditions around the world. One AOC 15/50 is capable of producing enough electricity to power 10–20 average North American homes, depending on the wind resource.

At a standard hub height of 30 m, the turbine starts and stops automatically, according to wind speed. The turbine is based on a simple yet rugged design with no nacelle; it rotates freely to align with wind direction. A rotary transformer results in increased longevity and reliability. The rotor turns at a relatively low constant speed that produces little noise.

The strength and light weight of the blades allow easy starts and stops, enhance air-flow resistance, and promote less wear on the turbine. The braking system is one of the safest and most redundant in the company's 50 kW turbine class.

The AOC 15/50 has undergone the most independent analysis of all turbines in its size class, at the US government National Renewable Energy Laboratory (NREL), the Netherlands Energy Research Foundation (ECN), RISO Laboratory in Denmark, the Atlantic Wind Test Site (AWTS) on Prince Edward Island, and other sites around the world. Machining and assembly of the drivetrain is ISO 9001 certified.

## *Specifications*

- Power output: 3-phase, 480 VAC. Rated electrical power: 50 kW @ 11.3 m/s (41 km/h) wind speed.
- Versions: 60 Hz (for North America); 50 Hz (overseas markets)
- Configuration: downwind passive-yaw
- Cut-in wind speed: 4.6 m/s (16.4 km/h); shut-down wind speed 22.4 m/s (80 km/h); peak survival wind speed 59.5 m/s (214 km/h)
- Rotor: 15 m-diameter, 3-blade, constant 64 rpm speed
- Blades: 7.5 m, high-efficiency epoxy-fibreglass
- Four-part braking system: tip brakes, parking brake, dynamic brake, and stall-regulated blades
- Standard tower: 30 m (100 ft.), self-supporting lattice; towers commonly 30–37 m high; optional tilt-up tower enables installation without a crane
- Calculated annual output (at 100% availability) for different average wind speeds:
  - 5.4 m/s (19 km/h): 87,000 kWh

- 6.7 m/s (24 km/h): 153,000 kWh
- 8.0 m/s (29 km/h): 215,000 kWh
- Sound level: approximately 64 dB at 30 m, 52 dB at 120 m.

### ***Environmental Benefits***

On a site with an average annual wind speed of 6.7 m/s (24 km/h), the AOC 15/50 will displace approximately 150 t of greenhouse gasses annually.

### ***Applications***

The AOC 15/50 produces energy at competitive rates for distributed generation, village electrification, diesel-based utilities, and purchased-power displacement for agriculture, businesses, industry, and municipalities. It is well suited to net metering and off-grid applications.

### ***Advantages***

The AOC 15/50 is primarily exported, but the jobs and growth are mostly in Nova Scotia. Local contractors represent some 12–14 full-time-equivalent Nova Scotia jobs involved in producing, selling, and distributing the AOC. Well over 60 percent of the business takes place in Nova Scotia: roughly 45 percent by hard-goods value plus R&D, engineering, and ongoing support.

David Lombardi and Stan Mason (the two engineer co-founders of Seaforth Energy), got involved in the AOC back in the early 1990s. Over time, they started manufacturing and earned the rights to sell and manufacture the AOC around the world. Were it not for their long-term view and early prescience on renewable energy, it is unlikely that Seaforth Energy (or any wind manufacturer) would be in Nova Scotia.