Harnessing green energy from a brownfield site

The Gob Nob is a 60-foot hill east of Farmersville, Montgomery County in the midwestern state of Illinois in the United States. The hill is what is known as a ‘gob pile’, consisting of waste material from an abandoned coal mine site. On top of this heap of coal tailings stands an EWT DW54-900kW wind turbine, measuring 310 feet (102 metres) from the base to the tip of the blade when in a vertical position. It generates zero-carbon electricity where once upon a time, a carbon-rich fossil fuel was dug out of the ground.

The wind turbine is owned by the Rural Energy Convenience Cooperative (RECC), a member-owned not-for-profit business created in 1936 to bring electricity to rural homes and farms. The co-op has 380 members and serves 5,800 customers in Sangamon, Morgan, Macoupin, Christian and Montgomery counties.

RECC President David Stuva said: “The EWT wind turbine is very popular with our members. It is a direct drive unit, it doesn’t have a gearbox which is one less thing you have to worry about down the road. We needed something around 1 megawatt because that was the average load on the nearby substation, so EWT was a good fit for us.”

The wind turbine started operations in 2009. The Department of Energy awarded RECC Wind Cooperative of the Year 2013 for outstanding leadership in advancing wind power in the United States. Asked about RECC’s experience in working with EWT, David commented: “They’ve done everything they said they would do. They went above and beyond on standing behind their product. We benefit from the maintenance contract we have with them. They monitor the wind turbine from The Netherlands, and we don’t have to worry about anything. I give them an A+ on service.”
EWT Rural Energy Co-op Case Study

RECC’s members receive the direct benefit of all renewable electricity generated by the EWT wind turbine at Gob Nob. The turbine is connected to the Farmersville substation about half a mile away. All of the turbine’s electricity is fed into the substation, and then distributed to the co-op members served from that substation in the surrounding area.

Based on its installed capacity and the local wind resource at Gob Nob, the 900kW wind turbine is expected to generate 2,300 megawatthours every year. This equates to about 5 per cent of the total demand on the co-op’s system on a hot day. The turbine has an operational life of up to 25 years.

The wind turbine’s output reduces the amount of power RECC has to purchase from their wholesale power supplier. Electricity generated by the turbine costs less than the average cost of the co-op’s wholesale energy supply, as there is no fuel cost involved. While the cost of power on the wholesale market is expected to rise steadily, the energy price from the wind turbine will increase only very slightly, due to relatively small cost components such as labour prices for turbine maintenance.

The wind turbine project had a total cost of approximately $1.8 million. To enable the co-op to realise this green energy venture, grants totaling $675,000 were received from the United States Department of Agriculture’s Rural Development program, the Illinois Department of Commerce and Economic Opportunity and the Illinois Clean Energy Foundation. The remainder was financed with a zero-interest loan through the Clean Renewable Energy Bonds program, and is to be repaid over 15 years.

Benefits to the Cooperative

- All electricity generated by the EWT wind turbine is used by RECC members in the surrounding area.
- The annual power output of the 900kW wind turbine is expected to be 2,300 megawatthours of electricity. This equates to about 5 per cent of the total demand on the co-op’s system on a hot day.
- The wind turbine reduces RECC’s need to purchase power from their wholesale power supplier.
- Because the wind doesn’t cost anything, there is no fuel cost associated with wind energy generation. That is why the electricity from the wind turbine costs less the average cost of the co-op’s wholesale energy supply.