

Wind Power in Alberta

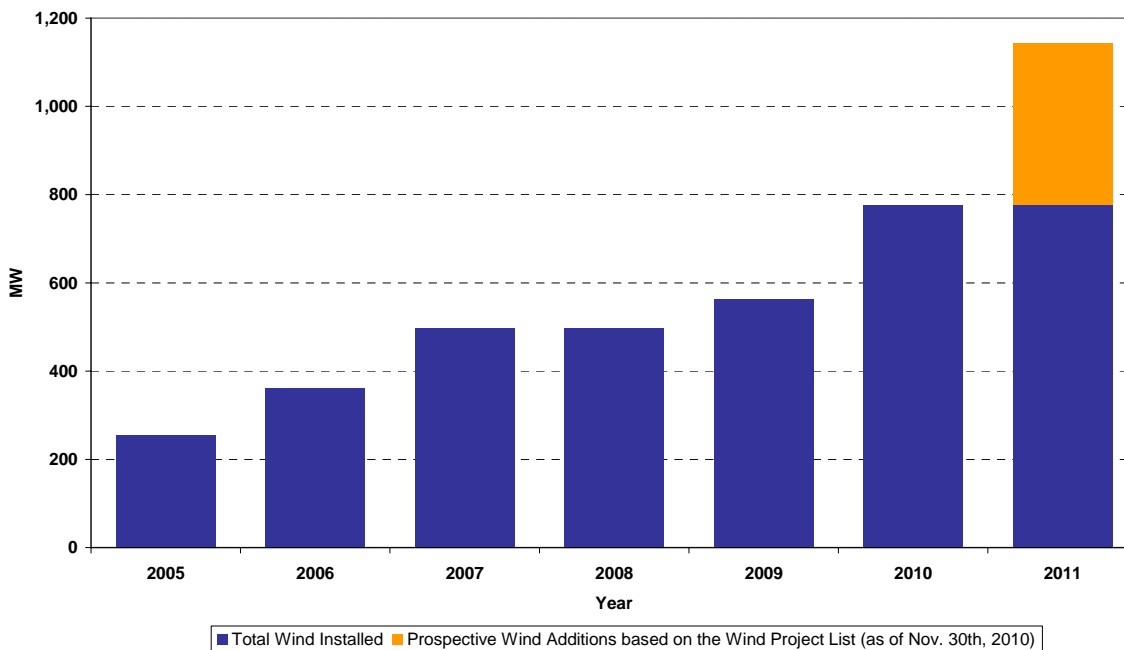
Around the world, interest in wind development as a source of renewable energy continues to grow. In Alberta, wind power is part of the diverse mix of generation sources that supplies the growing electricity demands of Albertans. At the Alberta Electric System Operator (AESO), we are leading the way working with stakeholders on wind power integration in Alberta.

Growth in Alberta's wind power

We were the first jurisdiction in North America to develop a technical standard for connecting wind power facilities to the transmission grid. We were also the first jurisdiction in Canada to launch a sophisticated wind forecasting study using international vendors.

There are currently 777 megawatts (MW) of wind connected to the Alberta grid, with more sites being developed. Wind power represents about six per cent of our total generation capacity of approximately 13,000 MW. However, over the next several years, we expect the amount of wind power connected to the Alberta electric system to increase significantly.

Alberta Installed Wind Capacity and Prospective Additions based on the Wind Project List



Please note this data is based on the April 2011 Connection Queue/Project List. Forecast in-service dates are subject to change.

Wind Power in Alberta

As of April, 2011, the AESO has over 7,500 MW of applications for new wind generation in our customer connected queue, with 5,000 MW of that total concentrated in the south of the province. The AESO anticipates having approximately 1,028 MW of wind power connected to the grid by the end of 2011.

Integrating wind

The basic nature of an electric system is that supply and demand must be in balance at all times to ensure a reliable supply of electricity. Wind can start, stop or change how hard it blows at any moment. Wind can also blow when demand for electricity is low (i.e., in the middle of the night) and stop blowing when demand for electricity is high (i.e., in the morning). Today, there is no way to store large amounts of electricity; therefore, wind power variability must be backed up by another power source.

Managing the variability of wind on the electric system

One way to manage changes in wind generation is through the real time energy market. Currently, units are dispatched to produce more or less energy to absorb the variability associated with wind generation. Fast ramping units such as hydro and gas-fired generation can increase or decrease power quickly in response to changes in wind generation. However, the bulk of Alberta's electricity is supplied by coal-fired generation that can take several hours to start and is much less flexible in its ability to quickly adjust output.

Another means of maintaining the supply/demand balance is to import or export electricity via interties. Interties are power lines that connect Alberta with neighbouring electric systems and provide access to additional sources of supply and demand to balance our system. Alberta currently has interties with B.C. and Saskatchewan, and an intertie with Montana is being developed.

Connecting wind to the transmission system

New or upgraded transmission lines are required to ensure the power produced by wind developers is transferred safely and reliably to customers. Southern Alberta is the province's primary wind power generation area. The South region transmission infrastructure requires substantial improvements including new transmission lines and substations and upgrading of existing facilities to connect the wind power and move it to large load centres like the city of Calgary.

In September 2009, the Alberta Utilities Commission (AUC) approved a project to reinforce transmission in southern Alberta and connect 2,700 MW of wind to the grid. This project will be built in stages over the next 10 years. And in April 2010, the AUC approved a project to reinforce the transmission system in the Hanna/East Central Alberta area to accommodate anticipated growth in demand and connect about 700 MW of wind power.

The AESO is committed to integrating as much wind power as possible on the Alberta electric system without compromising reliability or the fair, efficient and openly competitive operation of the market. We will continue to work with industry stakeholders to develop both short-term and longer-term solutions to the challenge of integrating more wind onto the grid.