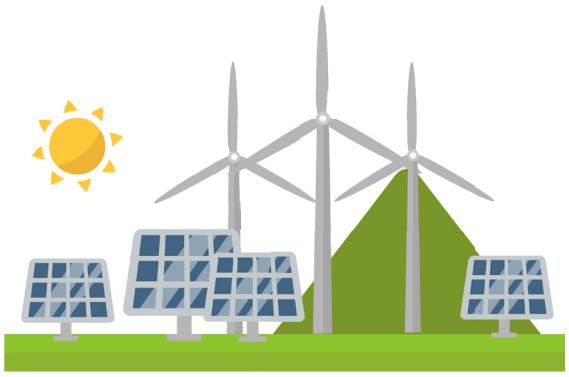
Integrating renewables into the grid

RICH IN RENEWABLE RESOURCES

Alberta is rich in wind and solar resources, with established renewable generation projects in regions where the most potential exists (southwest, southeast and central east). These resource-rich areas are supported by strong existing and planned electricity transmission systems, and are well-positioned to support the development of new renewable generation projects.



30 BY 30

In 2015, the Government of Alberta introduced its Climate Leadership Plan which, among other goals, legislates that by 2030, 30 per cent of the energy produced within Alberta will be from renewable resources and emissions from coal-generated electricity will be phased out.

WHAT'S THE PLAN?

The Renewable Electricity Program (REP) is intended to encourage the development of large-scale renewable electricity generation to support the Government of Alberta's target of 30 by 30. This renewable energy capacity will replace coal-fired electricity generation with cleaner energy sources, such as wind, solar and hydro.

The AESO is responsible for implementing and administering REP, encouraging companies to bid on building renewable energy projects in our province. REP has been designed to ensure new projects won't affect the reliability of our electricity grid, and power is delivered at the lowest possible cost to consumers.

The four REP projects announced during the first competition are located in southwest, southeast and central east Alberta, and it is anticipated that this is where the majority of renewable generation will continue to be developed.

The existing transmission system has an upper-limit capability of approximately 2,600 megawatts (MW). The AESO determined that the optimal and most cost-efficient plan for the integration of new renewable generation into the system, mainly in the renewable-rich areas, includes:

Maximizing the potential of existing collector systems, and using established and planned transmission networks:

- Pincher Creek, Fort Macleod, Lethbridge, southeast Alberta along the Cassils–to–Bowmanton–to–Whitla transmission corridor, the central east area of Alberta stretching between Vegreville in the north and Cypress in the south
- Hanna Region Transmission Development
- Provost–to–Edgerton and Nilrem–to–Vermilion Transmission Development

Moving large surplus renewable energy from where it is produced to where it is needed through previously planned bulk system enhancements:

- Chapel Rock-to-Pincher Creek Transmission Development
- Central East Transfer-out Transmission Development

Completion of the planned transmission developments will bring the total grid integration capability to 4,300 MW. The remaining 700 MW required to meet the 30 by 30 target can be achieved through potential future hydroelectric generation developments and increasing the allocated distributed energy resources (DER) integration capacity.

DISTRIBUTED ENERGY RESOURCES

DER is electrical generation and storage performed by a variety of small, grid-connected devices, generally with capacities of 10 MW or less and located close to the demand centres they serve. While not limited strictly to renewable resource generators, DER can include solar panels, small natural gas-fueled generators, electric vehicles and controllable loads, such as heating, ventilation and air conditioning systems and electric water heaters.