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### Radisson substation

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Radisson substation is by far the largest substation on the Hydro-Québec grid. Its surface is large enough to accommodate 100 football fields, and it has a transfer capacity of 6,600 MW. Located 16 km from the Robert-Bourassa hydroelectric development, Radisson substation has three functions.

First of all, it serves as a switchyard, routing electricity to two of the six 735-kV lines in the James Bay transmission system.

It steps the voltage up from 315 kV to 735 kV so that the electricity generated by La Grande-2-A and La Grande-1 can be brought onto the grid. Conversely, it can step the voltage down for supply to the DC converters.

It converts 315-kV AC current to  $\pm 450$ -kV DC current and can send 2,200 MW south over the Radisson-Nicolet-Des-Cantons line (a multiterminal direct-current system).

Electricity is transmitted at extra high voltage (735 kV) mainly because this is the most cost-effective option. After all, it takes two to three 315-kV lines to do the work of a single 735-kV line. Besides, transmission losses are smaller with high-voltage lines. Between James Bay and Montréal (more than 1,000 km apart), transmission losses vary from 4.5% to 8%, depending on operating conditions and temperature.