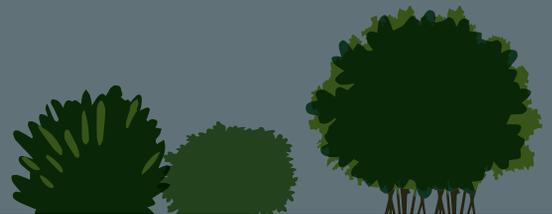




LANDSCAPING AND RECREATIONAL FACILITIES IN A HYDRO-QUÉBEC TRANSMISSION LINE RIGHT-OF-WAY

A GUIDE FOR PROJECT PROPONENTS





THIS GUIDE IS FOR CITIZENS, ORGANIZATIONS AND MUNICIPALITIES THAT OWN OR LEASE LAND IN A TRANSMISSION LINE RIGHT-OF-WAY AND WANT TO LANDSCAPE THAT LAND OR SET UP RECREATIONAL FACILITIES THERE.

Hydro-Québec encourages use of the land crossed by its high-voltage lines. However, to ensure the safety of the public and of Hydro-Québec employees as well as a reliable power supply, there are certain restrictions on the use of such land.

This guide briefly describes these restrictions, explains some basic facts about power transmission systems and outlines what to do before undertaking a project in a Hydro-Québec transmission line right-of-way.

The guide will help you plan your projects. You can also find out more by visiting our Web site at hydroquebec.com/vegetation.

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HYDRO-QUÉBEC'S TRANSMISSION SYSTEM

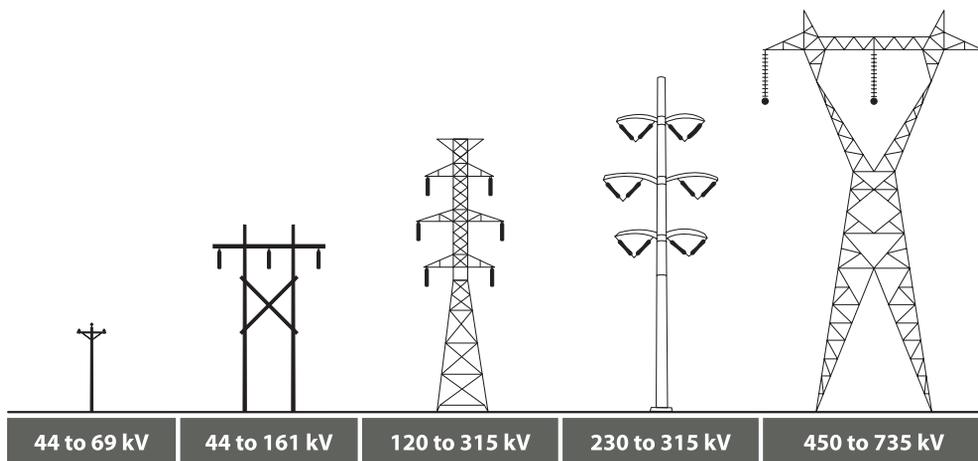
Most of Québec's electricity is generated in remote areas. To bring this electricity closer to the load centres where it is consumed, Hydro-Québec operates an extensive power transmission system with some 34,000 km of high-voltage power lines. The distribution system carries the power from these high-voltage lines to consumers.

THE ABCs OF POWER TRANSMISSION

A transmission line is composed of conductor cables capable of carrying electricity at high voltages—anywhere from 44,000 volts (44 kV) to 735,000 volts (735 kV).

The conductors are mounted on wooden, concrete or metal support structures. It is the voltage that determines the size of the support structure needed: some are more than 100 m tall (see figure below).

Given the voltages involved, transmission lines must be installed within corridors that are cleared. These corridors are called rights-of-way.



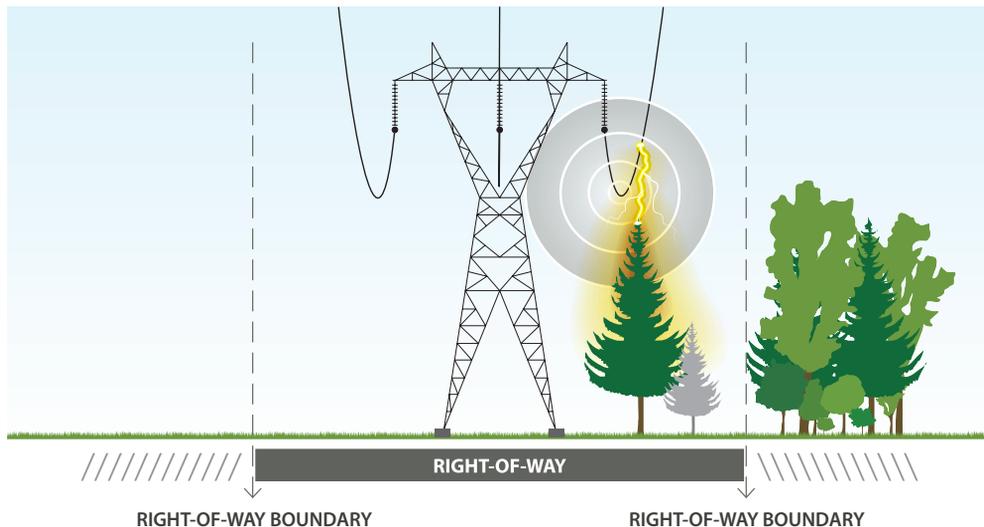
1 kV = 1 kilovolt = 1,000 volts

SAFETY UNDER THE LINE

Hydro-Québec is responsible for reliable operation of the power system and protection against electrical hazards. Among other things, this dual responsibility requires controlling “incompatible” vegetation in the rights-of-way of high-voltage lines. “Incompatible” vegetation means trees and shrubs that could damage the power lines, cause outages or interfere with the work of Hydro-Québec crews.

Transmission line conductors are not sheathed; insulation is provided by the ambient air. Any contact with the conductors can cause fatal injury. In addition, the proximity of an object or a branch to a high-voltage line can be just as dangerous, as it can trigger an electric arc: current jumps the gap between the wire and the object or branch, causing burns, fire or an explosion, depending on the circumstances.

This is why transmission line rights-of-way must be cleared. Hydro-Québec must eliminate or prohibit plant species that could damage its structures or interfere with the work of its maintenance crews. In fact, vegetation control plays a key role in the protection of the public and power system reliability.

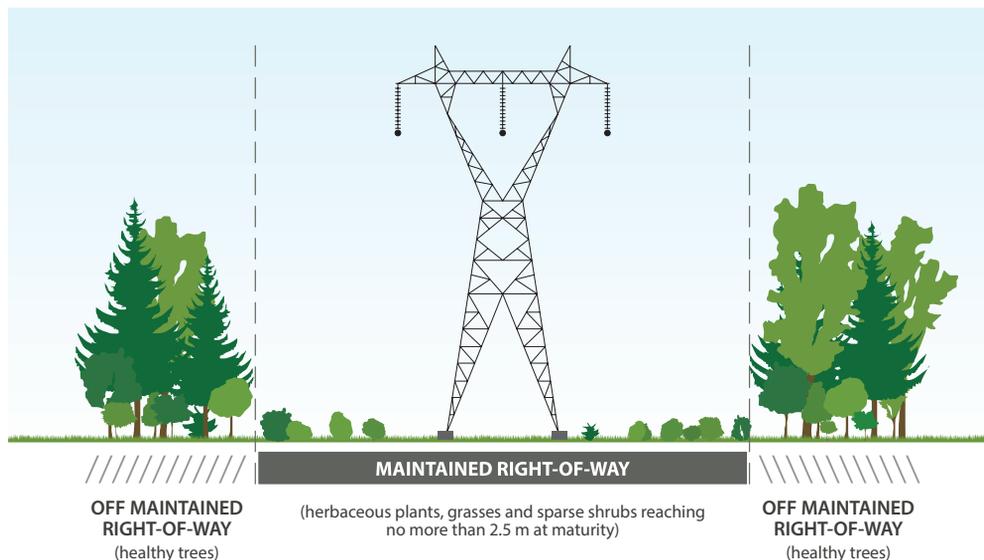


THE TRANSMISSION LINE RIGHT-OF-WAY

A transmission line **right-of-way** is the land required for line operation, maintenance and safety.

Most transmission lines run through private or public lands by virtue of public utility servitudes held by Hydro-Québec. This means that even if you own the land you want to develop, you must first ask for Hydro-Québec's permission. When the land belongs to Hydro-Québec, a lease must be signed with the company.

Hydro-Québec's servitude rights entitle the utility to access a transmission line right-of-way at any time, to prohibit construction close to the line and to remove vegetation that could pose a threat to public safety or the power system. Property owners must respect Hydro-Québec's servitude rights, including the land development requirements stemming from standards of the Standards Council of Canada.



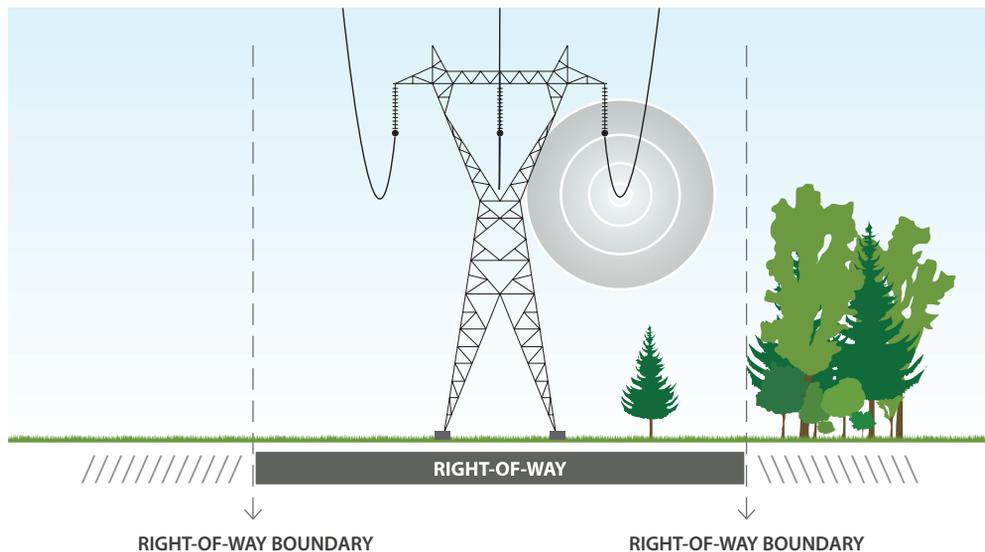
CLEARANCE

Clearance is the minimum safe distance that must be maintained between an electrical conductor and vegetation, the safe vertical distance (from treetops) and the safe horizontal distance (from branch tips).

The clearance required increases in proportion to the line voltage. In addition, in calculating clearance, the effects of temperature, wind and freezing rain on conductors (expansion or contraction, sway, etc.) must be considered.

Clearance requirements apply not only to vegetation but to any activity that could lead to direct or indirect contact with electrical conductors.

Note to project proponents: Do not use tree-pruning tools or machines such as power shovels under transmission lines. In addition, do not fly a kite, a drone or a radio-controlled plane in the vicinity of the conductors.



VEGETATION CONTROL

Vegetation control means keeping vegetation at a height and density compatible with system operation. It does not mean removing all types of vegetation in the right-of-way. Rather the goal is to make it easier for Hydro-Québec crews to do their work and to comply with minimum safe distances.

RESPONSIBILITIES

Vegetation control operations are managed by specialists (forestry engineers and technicians, biologists, etc.). The work is performed by companies certified by Hydro-Québec. The staff of these companies (arboriculturists and silviculture workers) has electrical safety training and must apply Hydro-Québec's technical standards. In addition, Hydro-Québec oversees the work to ensure the utility's environmental and safety requirements are met.

OPERATIONS

There are several steps involved in vegetation control in a transmission line right-of-way:

- Establish a vegetation control cycle based on vegetation growth rate and clearance requirements.
- Identify sensitive environmental elements (fauna and flora in particular) and perform a photo-interpretation inventory.
- Identify protected areas if necessary and select appropriate control measures to eliminate vegetation incompatible with power system operation.
- Request permission from competent authorities as required and inform the public concerned, first and foremost the owners of property that the line crosses.

Note to project proponents: make sure any herbaceous plants or shrubs that you plant will not come too close to any conductors even when fully mature.

BIODIVERSITY

Respect for the environment and for biodiversity in transmission line rights-of-way is very important to Hydro-Québec in both urban and rural environments.

Studies conducted by Hydro-Québec demonstrate that in general the biodiversity in its rights-of-way is similar to or greater than that of adjacent forests. The following species were observed in inventories of rights-of-way typical of three biomes (evergreen forest, mixed forest and deciduous forest):

- 449 vascular plant species
- 75 bird species
- 13 micromammal species
- 16 amphibian species
- 4 reptile species

Hydro-Québec uses a number of vegetation management techniques to promote biodiversity. Selective cutting, for example, ensures a good plant cover by sparing small shrubs such as alder and arrowwood.



Example of selective cutting with maintenance of a sparse shrub cover

MADE-TO-MEASURE SOLUTIONS

Hydro-Québec uses a variety of approaches and measures to maintain the biodiversity of its rights-of-way.

Here are some of them:

- Before control operations begin, checks are made for presence of designated species whose status demands paying special attention to their habitat; if necessary, appropriate measures are taken (for example, work plans might be designed to take nesting and migration periods of special status bird species into account).
- If special status species are found, the situation is analyzed in order to promote their conservation, rare species in particular.
- A sparse low-growing plant cover, composed of shrubs and herbaceous plants in variable proportions, is maintained.
- Activities that disturb the soil (such as grading, drainage and grubbing) are restricted, to preserve microhabitats. For this purpose as well, wood debris is dispersed over the ground.
- Vegetation along streams is carefully managed.
- Temporary ponds (ponds or pools that generally dry up in summer) are preserved to promote maintenance of amphibian populations that use these wet areas to reproduce.
- As needed, fauna or flora development projects are implemented based on studies conducted by Hydro-Québec specialists or other organizations.
- Research is conducted on species that nest in the rights-of-way.



Immediately after vegetation control (on the left) and several weeks later (on the right)

USING TRANSMISSION LINE RIGHTS-OF-WAY

ANY PROJECT TO USE A TRANSMISSION LINE RIGHT-OF-WAY, WHETHER ON PRIVATE LAND SUBJECT TO A POWER-LINE SERVITUDE OR ON LAND BELONGING TO HYDRO-QUÉBEC, MUST GUARANTEE UNRESTRICTED ACCESS TO ELECTRICAL EQUIPMENT. IN ADDITION, HYDRO-QUÉBEC'S SERVITUDE RIGHTS AS WELL AS ITS SAFETY AND OPERATING STANDARDS MUST BE RESPECTED. LAST, AUTHORIZATION MUST BE OBTAINED FROM HYDRO-QUÉBEC VERY EARLY ON IN THE PROJECT PLANNING PROCESS.

RIGHT-OF-WAY DEVELOPMENT PROJECTS

You are ...

- the owner of neighboring property and you would like to plant a hedge for privacy?
- a municipality that wants to create a park in a power line right-of-way?
- an organization that wants to plant a community garden?

Hydro-Québec rights-of-way can be used for many types of projects.



Parc Boisclair in Brossard

POSSIBLE PROJECTS

Some examples of the ways that a Hydro-Québec transmission line right-of-way can be used are given below. This list is provided for information purposes only. No matter what the nature of your project, you must always ask for authorization from Hydro-Québec before undertaking any work. Your safety is at risk.

- Concrete curbing for daily parking of cars
- Landscaping (trees and shrubs, concrete curbing, lighting, etc.)
- Ground elevation alteration
- Retention pond (land must be purchased if it belongs to Hydro-Québec)
- ATV trail
- Bike path or hiking trail (including borders, lighting, etc.)
- Infrastructure (storm or sanitary sewer, aqueduct, street, public services, etc.)
- Tree planting (Christmas trees, cedars, etc.)
- Growing berries

PROHIBITED PROJECTS

To ensure the safety of the public and its employees as well as continuity of service and system maintenance, Hydro-Québec must exercise strict control over the use of power line rights-of-way. This is why Hydro-Québec may require demolition of any project deemed incompatible with the operation of electrical equipment. Here are some examples of installations and projects that are officially prohibited in transmission line rights-of-way:

- Construction or expansion of a structure (home, garage, hangar, shed, tank, etc.)
- Storing, stacking or piling up of material of any type (wood, snow, earth, waste, debris, etc.)
- In-ground or aboveground swimming pools
- Trampolines, water play facilities, camping trailers, clothes lines

DEVELOPING A PROJECT

No matter the nature of your project, certain conditions apply. Hydro-Québec would like to work with you throughout the project development process to make it all easier. Consult us, for example, to make sure that you have followed the instructions below and to obtain authorizations that might be needed for you to carry out your project:

- Submit a plan drawing for your project, indicating the heights of the different components. In some cases, the plan drawing must bear the signature or seal of a professional.
- In case of a landscaping project, identify the species selected (Latin name is mandatory) and where they will be placed. The selected trees or shrubs must not be more than 2.5 m high at maturity.
- Any installation (underground facility, trail, bike path, etc.) must be designed to support traffic of heavy vehicles. Hydro-Québec may require the installation of mechanical protection, such as concrete blocks or guardrails, to protect its equipment.
- There must be an unobstructed work area around all electrical equipment. Hydro-Québec can help you determine how big this work area has to be; its size depends on the voltage of the line.
- There must be a corridor at least 4 m wide, ideally right under the conductors, so that heavy machinery and Hydro-Québec's inspectors and maintenance crews can move around unimpeded in the right-of-way.
- Any fence or hedge that is put up must have an opening at least 4 m wide to allow access to Hydro-Québec crews. Hydro-Québec may require that a fence be grounded.
- If ground elevation is modified, there must be a slope that allows access to the Hydro-Québec work area.

TREES AND SHRUBS IN RIGHTS-OF-WAY

It is recommended that you consult an expert (nursery grower, horticulturist, landscaper, etc.) who can guide you in selecting plant species that will not be more than 2.5 m high at maturity.

EXAMPLES OF COMPATIBLE SPECIES



Juniperus chinensis (Chinese juniper)



Kalmia angustifolia (sheep laurel)



Prunus triloba var. *multiplex* (flowering almond)



Lonicera canadensis (fly honeysuckle)

AUTHORIZATION

After you have consulted us about your project and we have accepted it, you must sign a contract with Hydro-Québec:

- If the project concerns land that belongs to Hydro-Québec, you will be asked to sign a lease (rent at market value).
- If the project concerns land for which Hydro-Québec holds a servitude or other rights, you will be asked to sign a technical permission.

In case of a servitude or other rights on property that you do not own, you will also have to obtain a guarantee from the owner of the property.

You are also responsible for ensuring that your project complies with applicable laws and regulations, including municipal bylaws.

Last, if the work must be carried out by a contractor, the latter must obtain from Hydro-Québec the form entitled *Convention – Intervention près des lignes électriques* (agreement – working near power lines) and comply with the requirements of the CSST.

PROCESSING TIME

Application processing time varies from one case to the next. To avoid any delays in the processing of your application, make sure you have provided all necessary information.

FEES

Depending on the nature of your project, Hydro-Québec may require a fee to process your application to use its right-of-way. The amount of any fees required will be specified in the acknowledgement of your application.

ADMINISTRATIVE FEES

- \$250 (plus tax) for an individual
- \$500 (plus tax) for a business
- \$500 (plus tax) to lease property for commercial purposes (all applicants)
- \$250 (plus tax) for a new residential lease (change of property ownership)

In your application, you must indicate if the fees will be paid by the applicant or by a representative of the applicant. Administrative fees must be paid at the start of the process and are non-refundable if you withdraw your application or Hydro-Québec refuses your project.

Please send your application to the address on the back of this guide.

TO CONTACT US

Please contact us to find out what type of information you must provide given the nature of your project.

BY E-MAIL

cspeidemandesdeservice@hydro.qc.ca

WEB SITE

www.hydroquebec.com/electricity-and-you/servitudes-and-property-rights/

(The application form can be completed on line.)

BY MAIL

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