

# THE TECHNOLOGY OF CANADIAN WELLS A BIOCLIMATIC SOLUTION FOR BUILDING VENTILATION

In 2019, [the EcolInventos magazine](#) has drawn attention to the technology of the *Canadian Wells* that uses geothermal surface energy for building ventilation.

Through a system of buried pipes, the *Canadian Wells* circulate the external air to the house, using the subsoil temperature to reduce the excess of heat or cold in homes. They can be adapted to every kind of subsoil, do not require deep excavations and represent a low cost, ecological, efficient and sustainable solution.

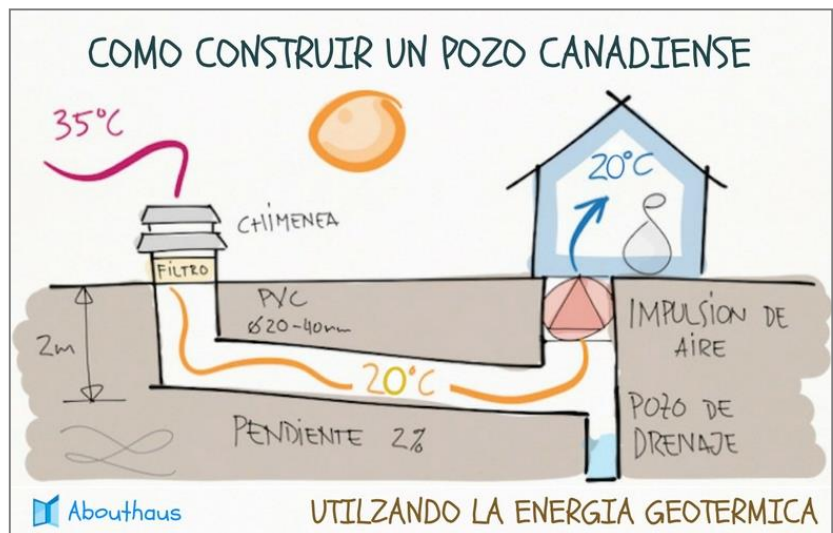
This technology finds different historical traces in the Mediterranean regions where it is known as Provençal well, Roman well or air tunnel. Actually, it is part of the solutions that bioclimatic architecture is rescuing as alternatives to air conditioning, to reduce the use of energy and its negative impact on the environment.

A *Canadian* or *Provençal Well* is a simple and shallow geothermal system, capable of taking advantage of the stable temperatures of the subsoil surface layer.

Its functioning is based on the fact that the subsoil temperature differs from that of the environment. This difference is accentuated at approximately two meters of depth, where it remains stable at between 18° and 24° C. This is an average temperature and it can vary depending on the geographical location and the weather conditions. It is estimated that around 10 or 15 meters deep the temperature is almost stable all year round.

A *Canadian Well* is composed of the following components:

- A network of pipes connected to the house, placed in the subsoil at a depth between 1.5 m and 5 meters and covering a certain number of meters underground. This network of pipes works under the principle of thermal inertia to adapt the air temperature that during the summer is higher than the temperature underground. Therefore, when the air passes through the pipes it releases heat to the ground and cools down, reaching the home with several degrees less and creating a comfortable environment. A longer tube length generates more air-soil thermal transfer. Depending on the specific characteristics of place and soil, the most used values range between 10 and 100 meters in



length while the diameter of the pipe ranges between 20 and 40 cm.

- *An external collection point of the air.* The chimney is located by choosing an area where the air keeps moving and must have a grid that prevents access to the system by insects or animals that can contaminate the air.
- *The filters,* necessary to purify the air and prevent the entry of dust and dirt into the ducts.
- *The drain point.* The condensed water in the pipes, due to the inclination is directed to the drain point where it is removed from the system.
- *A system for air circulation.* The system needs an element that drives the air and circulates it through buried pipes. Depending on the design of the work, it is possible to opt for active (mechanical) or passive elements (solar chimney).

Despite the simplicity of its working principle and components, the design and installation of a well-functioning *Canadian Well* requires the intervention of qualified professionals and masons. Depending on the results of a study on the specific thermal conductivity of the soil, the design defines the parameters of the length, diameter and number of pipes, the depth of pipe burial, the appropriate place to install the air collection point outside, the mechanics of the ventilation system.

*Canadian Wells* have the following advantages:

- They represent an ecological system that takes advantage of a natural resource, reducing the use of energy and fuel needed for artificial air conditioning.
- They require a low economic investment for their installation, especially if the works are carried out in the construction of the house.
- They ensure a low-cost maintenance needed for the periodic cleaning of the pipe, the change of filters, the cleaning of the condensation tank and for the air ventilation system.
- They generate a healthy habitat by ensuring a good level of air renewal and maintaining a healthy degree of moisture inside the home.

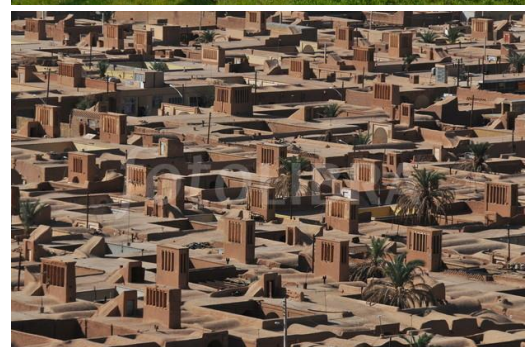
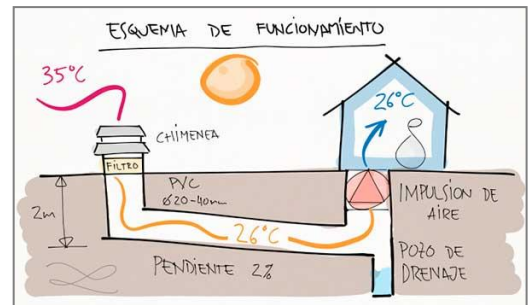
Valuing the source of natural and renewable energy contained in the subsoil and still little exploited certainly represents today an opportunity of great interest. [The Wind Towers of Iran](#) are a successful example of the use of the underground as passive ventilation solution that is spreading in several countries, creating a new generation of professionals and small companies of bioclimatic architecture. The work under way to recover and improve the technology of the *Canadian* or *Provençal Wells* will certainly also succeed in attracting the attention of local governments, environmental agencies, professionals and construction companies to promote its wider use in rural areas.

### To know more

[Pozos canadienses in ecoinventos.com](http://ecoinventos.com)

[Pozos canadienses in about-haus.com](http://about-haus.com)

[Pozos canadienses in espacioeco.es](http://espacioeco.es)



[Tubo enfriador subterraneo in Wikipedia](#)

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[Wind Catchers in Wikipedia](#)

