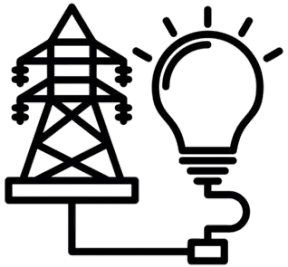
Cold Climate Heat Pumps
IN MUSKOKA

Thursday, Feb 1, 2024

Presented by Audrey Bayens, EcoGreen Interactive Inc.
In partnership with Climate Action Muskoka

Why are heat pumps important?

Heat pump technology grew out of our need to Electrify our Heating and Cooling.



Electricity =
Heating and cooling

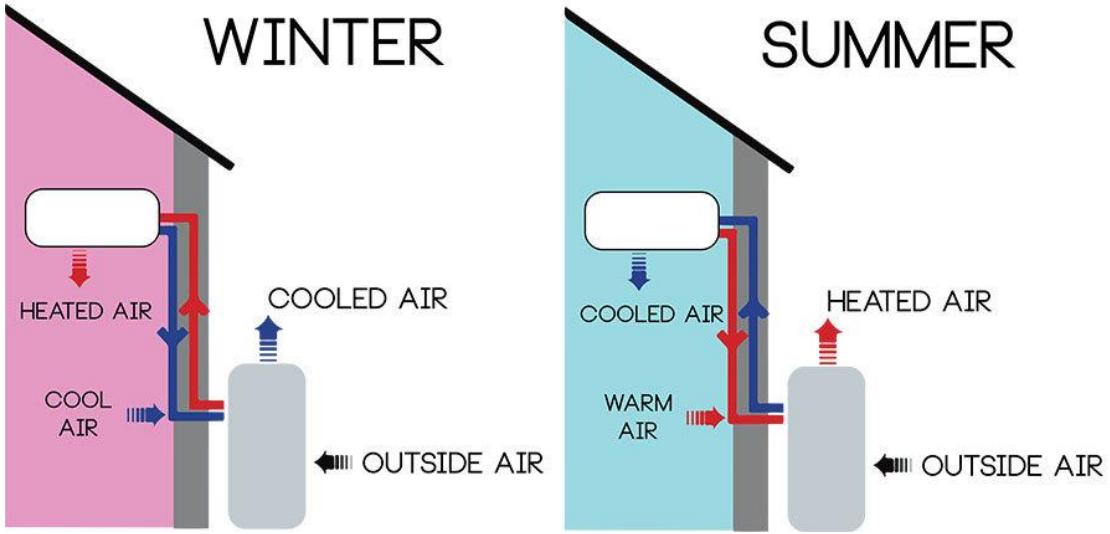
Renewables, hydro

Fossil Fuels =
Heating ONLY

Natural Gas, Oil and Propane

Why are Canadians making the fuel switch?

Solving the mystery of heat pumps?



A heat pump is an air conditioner that is able to REVERSE in the winter.

Two kinds of heat pumps

Both Ducted and Mini Split systems have an outside compressor unit

Mini splits hang on the wall and can be a 1 - 5 head system

Central ductwork is most often used.
Mini Splits solve ductless situations.

How does it work?

The ‘Law of Thermodynamics’
= flow of thermal energy to equalize temperatures.

Hot coffee
Cold cup

Cold cup
Cools coffee

Just right :)

Basic science = Heat Pump technology

High to Low

For any process a natural flow will always be from higher energy value to lower energy value

In the same way that water flows from high to low, heat flows from **hot** to **cold** and cold flows from **cold** to **hot**.

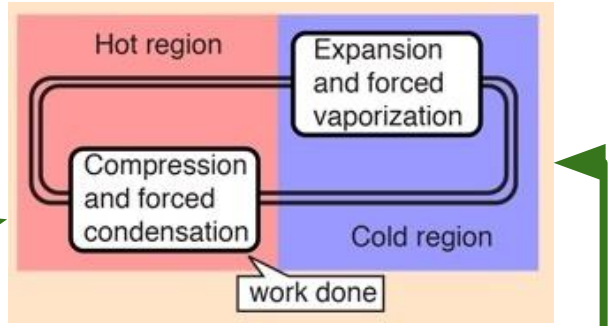
Nature wants to equalize all elements.
Wet to dry and Dry to wet is also basic science.

How does the transfer happen?

This continuous loop a heat exchanger.

1 Condenser is hot and releases heat.

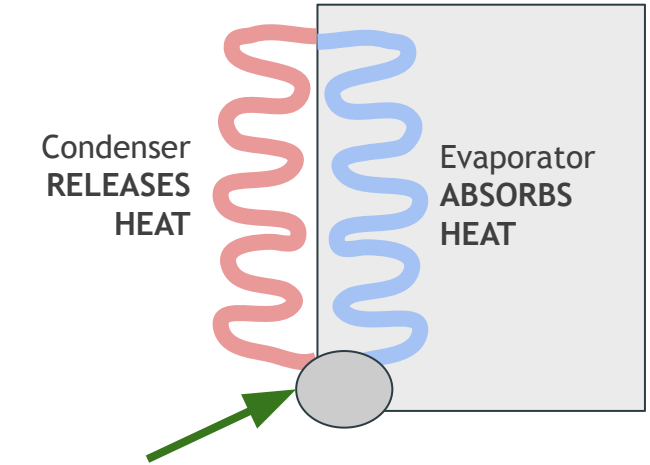
2 Evaporator is cold and absorbs heat.



This is the same as your fridge or Air Conditioner!

Create a cold environment by expelling the heat into another environment.

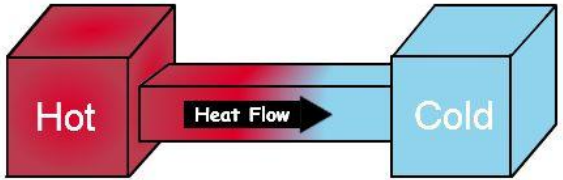
- Fridge into your home
- Air conditioner outside



Why is a **COLD CLIMATE** heat pump more successful in cold weather?

Heat wants to move to cold.

The refrigerant **ATTRACTS** the "warm" air to create heat.



The colder it is outside…

The more the refrigerant is cooled to be BELOW the outdoor temperature.

Heat pumps provide reliable heating when the refrigerant is significantly colder than outdoor temperatures.

Why are cold climate heat pumps 400% efficient?

The features that support this innovation include:

- Cold-Weather Refrigerants
- Compressor Design
- Variable compressors

Cold Climate Heat pumps provide energy savings which saves you money on your energy bills!

Heat Pump Performance at Very Low Temperatures

Fact 1 Cold climate heat pumps can keep your home warm even when it is very cold outside

Fact 2 There are many brands of cold climate heat pumps.

Fact 3 It may feel cold outside, but for most of Ontario temperatures are rarely very cold.

Fact 4 Heat pumps are popular in cold regions for good reasons. Save $.

Prepared by Heather McDiarmid, PhD, McDiarmid Climate Consulting
Prepared for Ontario Clean Air Alliance Research
January 24, 2024
https://www.cleanairalliance.org/wp-content/uploads/2024/01/Heat-Pump-Fact-Sheet-ONLINE-jan-24-v_01.pdf

Talking about the benefits…

Leslie Hastie, Huntsville homeowner

Her story… 18 year old propane furnace and no air conditioning

- Replaced with a heat pump with air conditioning
- No future Carbon taxes and increased Carbon incentive payments
- Install solar panels to support stable electricity pricing

Ian and I both feel that the general comfort level with the heat pump is far better than it was with the furnace, more consistent and uniform. Even though the ducts are exactly the same the heat pump doesn't let the heat drop as much as the furnace did. We can set the thermostat lower to achieve the same heat… and the heat pump is also quieter.

Save $ from propane to Heat Pump

The comparison over 20 mths

BEFORE		AFTER
Hydro	$3,119	$5,284
Propane	$7,017	$2,557
	$10,136	$7,841

$ 2,295

TOTAL SAVED OVER 20 Months

$114.75

TOTAL SAVED PER MONTH

Homeowner testimonial

Why not join the global movement and make the switch?

Across the globe, heat pump sales increased by 11% in 2022.

1. Policy support
2. Incentives for heat pumps
3. Reliance on natural gas
4. Need to reduce electricity costs

For Europe, a 40% increase in heat pump sales was observed as a result of these trends!

Norway has the same climate as Ontario and there were 60 heat pumps installed per 100 households by 2020.

Questions…

Thank you for joining us to learn the technical details about how heat pumps work and hear the success stories of making the fuel switch.

Help to do a green retrofit?

Contact Audrey Bayens
EcoGreen Interactive Inc.
416-660-5873
audreybayens@ecogreeninteractive.com

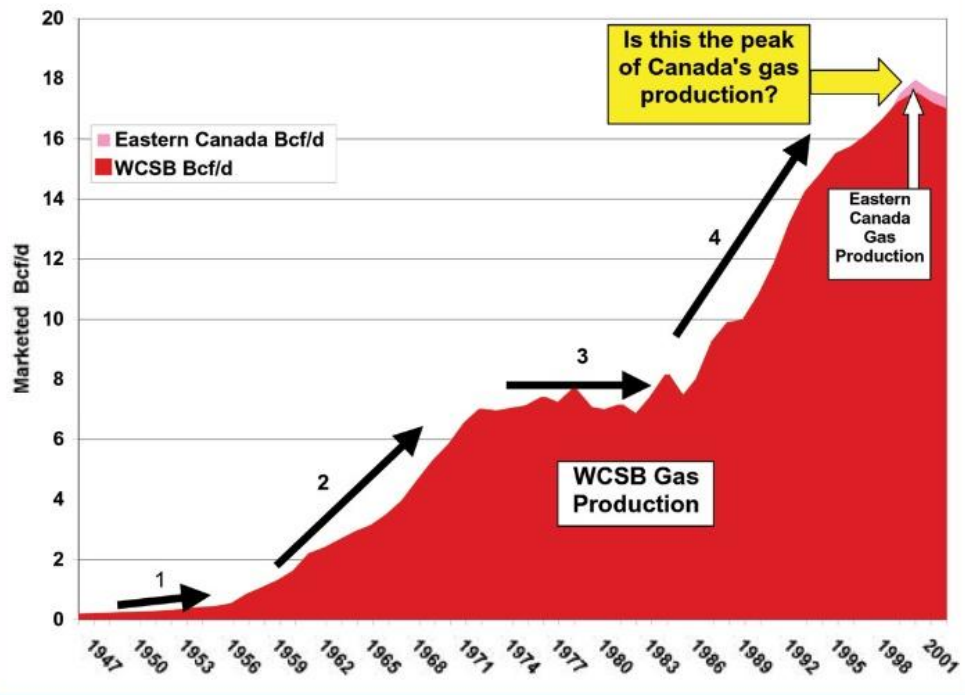
Would like an energy audit?

Contact Audrey Bayens
Goldfinch Energy
416-660-5873
abayens@goldfinchenergy.ca

Appendix

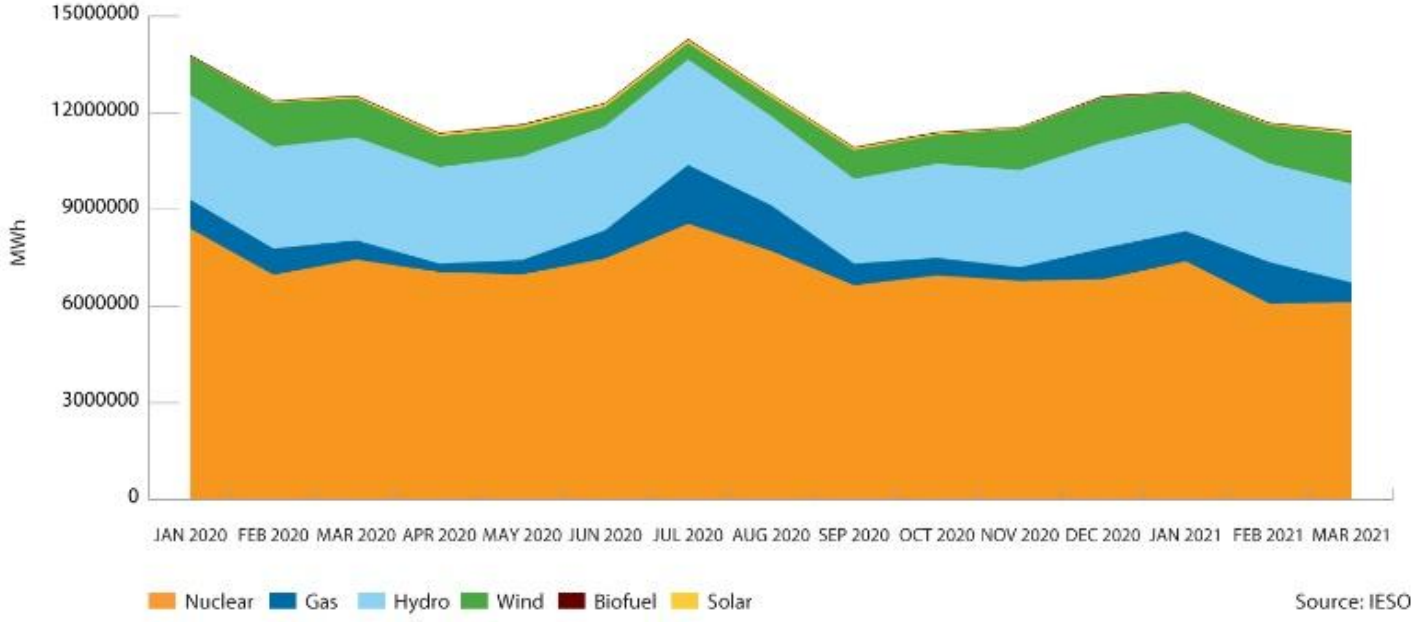
Our transition from the past

We need to reverse the trend…
In Canada, since 1947, we increased the use of natural gas as a fuel. Are we at peak now?



https://csegrecorder.com/articles/view/a-brief-history-of-canadas-natural-gas-production

Our Ontario grid is clean and in a good position for clean electrification.



https://www.ontario.ca/page/ontario-energy-quarterly-electricity-q1-2021#section-1