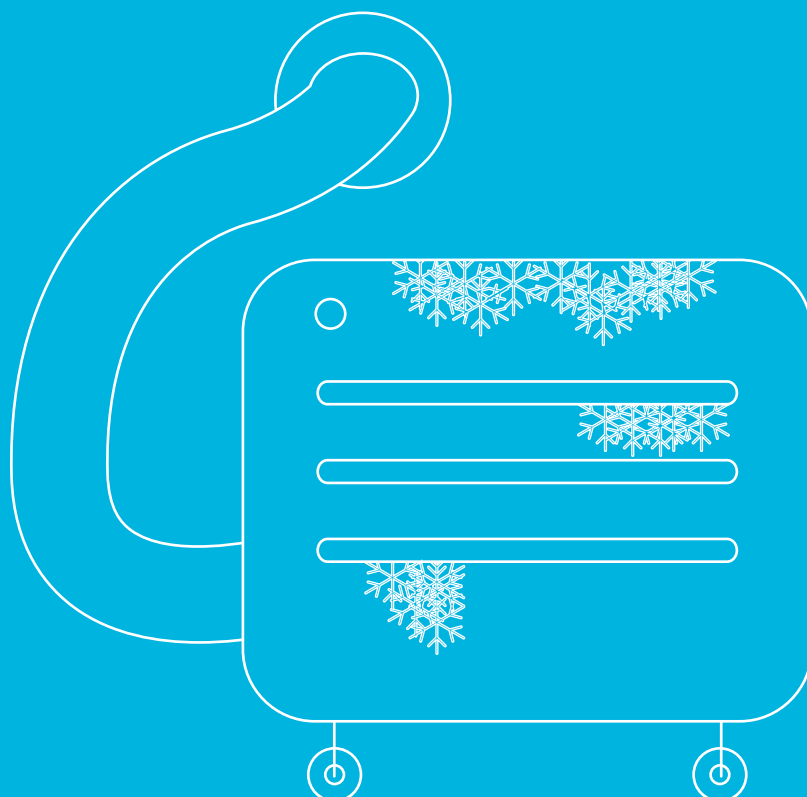


Not-so well-conditioned:

How inefficient A/C use is leaving
British Columbians out of pocket
in the cold



Report

August 2020

BCH20-634

 **BC Hydro**
Power smart

Not-so well-conditioned: How inefficient A/C use is leaving British Columbians out of pocket in the cold

The majority of British Columbians will spend more time at home this summer because of the COVID-19 pandemic, with many purchasing or adding additional A/C units for maximum cold comfort. With A/C use on the rise, there is evidence British Columbians are not cooling down efficiently, leading to higher summer electricity bills.

Highlights

- BC Hydro data shows A/C use in B.C. households has more than tripled to 34% since 2001.
- A recent survey commissioned on behalf of BC Hydro found more than 80% of British Columbians are planning to spend more time at home this summer.
 - Almost 75% have cancelled or altered plans due to the pandemic.
 - Nearly 40% of British Columbians aged 25 to 50 are working from home five days a week.
- Spending more time at home has many British Columbians trying to make their homes more comfortable – especially with the increased temperatures.
- About two thirds of British Columbians agree that the variety of air conditioners available today – at a range of prices and sizes – have made them more accessible.
 - In fact, nearly 30% of British Columbians with a portable air conditioner have more than one in their home.
 - And, 20% of British Columbians without air conditioning are considering purchasing a unit this summer.
 - Further, nearly 15% of people with air conditioning are considering buying an additional unit or upgrading their current unit this summer.
- While those that live in the Southern Interior are using A/C the most, it is steadily increasing across the province partly because of the increased availability of portable air conditioners.
- The survey found most British Columbians are adding an average of \$200 to their total summer bills by using A/C inefficiently.
 - About 90% of those surveyed are setting their air conditioning unit lower than the 25 degrees Celsius recommended.
 - In fact, 30% are setting it below 19 degrees Celsius.
 - In addition, the most popular units on the market are the portable units – these use 10 times more energy than a central air conditioning system or a heat pump and use twice as much energy as a window unit.

Solutions

BC Hydro recommends British Columbians take the following measures to save energy and money on A/C at home:

- Optimizing A/C: Cool homes to 25 degrees Celsius in the summer months when occupied, and the A/C should be turned off when unoccupied.
- Opting for a window unit instead of a portable A/C: If central A/C or a heat pump isn't an option try a window unit – they are twice as efficient than a portable unit if using an ENERGY STAR model.
- Cooling down with a fan: Running a fan costs just \$7 for nine hours a day over the summer months.
- Closing the drapes and blinds: Shading windows can block out up to 65% of the heat.
- Shutting doors and windows: If the temperature outside is warmer than inside, keep doors and windows closed to keep the cooler air in and the warm air out.
- Limiting the use of large appliances: Use a microwave, crockpot or toaster oven to avoid the extra heat produced by larger appliances when preparing meals, and hang clothes to dry instead of using a clothes dryer on hot days.
- For a longer-term project, consider participating in BC Hydro's Home Renovation Rebate program to improve insulation, which will also help keep the house cooler in the summer. Also with this program and via utility partners, municipalities and the B.C. Government, there are options for getting incentives for installing a heat-pump which will cool in the summer and heat in the winter.

A/C use on the rise

As the summer heats up, British Columbians are increasingly turning to A/C for cold comfort. BC Hydro data shows A/C use in B.C. households has more than tripled to 34% since 2001, and that upwards trend is expected to continue this year.

This report will look at how COVID-19 and the increased time at home may be driving more British Columbians than ever before to purchase A/C units, and how inefficient use of these units could lead to higher summer bills.

Staycations and at-home spending

This year, the number of households investing in A/C could rise, as more Canadians will be at home in the summer heat because of the COVID-19 pandemic. A recent survey¹ conducted on behalf of BC Hydro found more than 80% of British Columbians are planning to spend more time at home this summer, and almost 75% have cancelled or altered plans due to the pandemic. In addition, almost 40% of British Columbians aged 25-50 are working from home five days a week.

Spending more time at home has many trying to make their homes more comfortable, whether that means buying new patio furniture, doing small renovations or installing A/C. For example, since June, RBC data² shows that spending on household items, including do-it-yourself construction projects, small appliances and furniture is up 20% from last year.

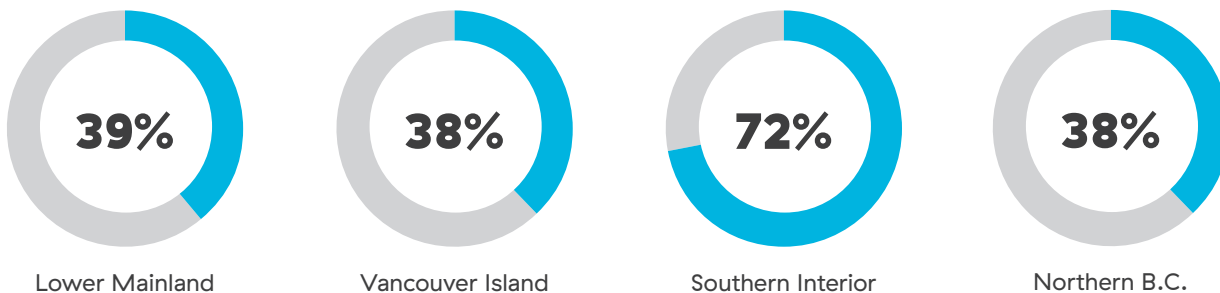
Similarly, the survey commissioned on behalf of BC Hydro found that with increased temperatures and more time spent at home, 20% of British Columbians without A/C are considering purchasing a unit this summer. In addition, 15% of British Columbians with A/C are considering buying an additional unit or upgrading their current model.

Cool, calm and accessible

The survey found 30% of British Columbians are turning up the A/C as their go-to method for cooling down in the summer.

Although the survey found those who live in the Southern Interior are using A/C the most because of the warmer regional climate, use is steadily increasing across the province, even in regions that experience milder summers.

A/C USE BY REGION:

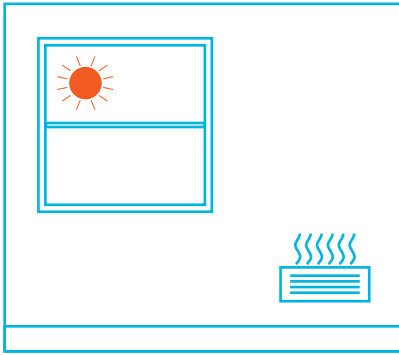


The survey found this is likely because A/C units have become less expensive and more convenient in recent years. For instance, 65% of British Columbians agree that the variety of air conditioners available today at a range of prices and sizes, have made them more accessible.

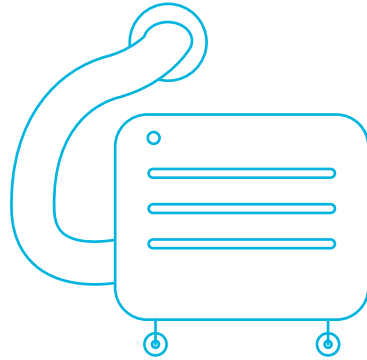
¹ Online survey conducted by Majid Khoury of 800 British Columbians between July 3 and 7, 2020

² RBC consumer spending survey

TYPES OF A/C USED IN B.C.



Central A/C or heat pump
43%



Portable A/C
42%



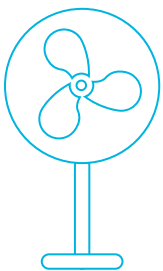
Window unit
22%

Inefficient temperature setting

The accessibility of A/C can come with hidden costs. Air conditioning is often a household's single biggest energy user in the summer, costing around \$0.69 per day (or \$20 per month), for a central unit if kept at the BC Hydro recommended temperature of 25 degrees Celsius.

The survey found one of the big drivers of extra A/C costs is simply setting the temperature too low if it has a thermostat. For instance, about 90% of British Columbians are setting their A/C unit lower than the recommended 25 degrees Celsius, and of those, 30% are setting it below 19 degrees Celsius. Not using A/C efficiently is costing British Columbians an average of \$200 over the summer months.

ENERGY BILL IMPACTS OF FANS VS. VARIOUS TYPES OF AIR CONDITIONERS IN B.C.



Fan for
9 hours
costs
\$7.20



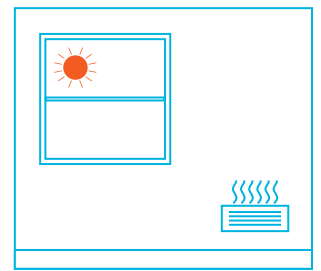
Window A/C
for 9 hours
costs
\$40.50*



Ductless heat pump
for 9 hours
costs
\$88.50*



Portable A/C
for 9 hours
costs
\$99.90*



Central A/C
for 9 hours
costs
\$316.80*

FOR THREE MONTHS

Source/calculation data:

- * Calculations based on three months of usage for 9 hours per day.
- * Room/portable air conditioner based on cooling approximately 450 sq ft.
- * Window unit based on cooling approximately 250–300 sq ft.
- * Central unit based on cooling approximately 2000 sq ft.
- * Ductless heat pump unit based on cooling approximately 1000 sq ft.

BC Hydro data shows that the average central air conditioner runs for 9.4 hours per day when in use.³ And, with British Columbians spending more time at home than likely ever before this summer, small changes can add up to big energy savings. While temperature adjustments may seem insignificant, it is estimated that every degree lower an air conditioner is set, it can add 3% in cooling costs.

When it comes to temperature setting, the survey found those in the Southern Interior are the efficiency experts. About 20% said they set the temperature on their A/C between 23 degrees Celsius and the BC Hydro-recommended 25 degrees Celsius, which is more than any other region.

The portable problem

On top of setting the A/C temperature too low, the survey found 42% of British Columbians are using inefficient portable A/C units, further adding to costs. These units typically use ten times more energy than a central A/C system or heat pump and use twice as much energy as a window unit.

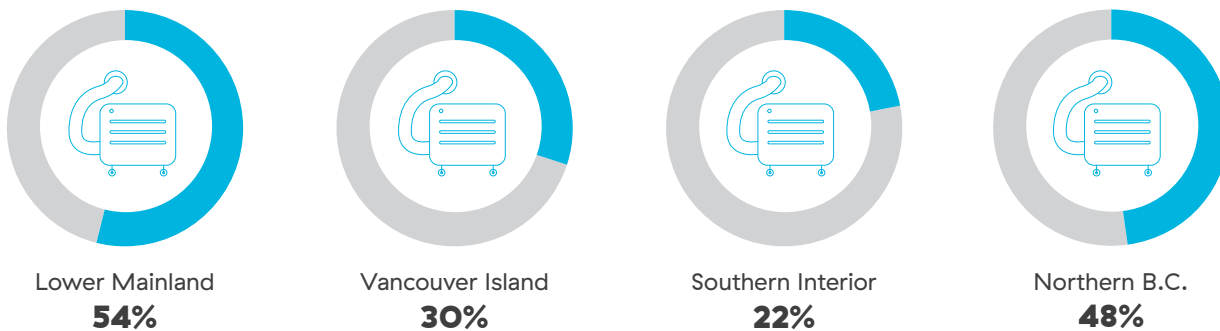
BC Hydro data shows⁴ portable A/C units are the most widely adopted type of air conditioner in B.C., and the survey found those who live in the Lower Mainland are the most likely to use a portable A/C unit. The rise in adoption of portable A/C units in the Lower Mainland can likely be explained by the pitfalls of high-rise condo living, where central A/C and air flow is hard to come by, especially in older buildings.

While an individual portable A/C unit will likely not drive costs up significantly, the addition of multiple portable A/C units in a home will. The survey found nearly 30% of those with a portable A/C unit have more than one.

In fact, almost 10% of British Columbians surveyed who live in the Lower Mainland that use portable A/C admit to having at least three portable units. BC Hydro data⁵ shows that portable A/C units are used for six hours on average per day in the summer.

On the opposite end of the spectrum, those who live in the Southern Interior are the least likely to use a portable A/C – 62% of Southern Interior residents report using central A/C or a heat pump to cool their homes instead.

PORTABLE A/C USE BY REGION:



A/C for Fido

Most British Columbians have been staying close to home since mid-March, many with their pets in close quarters, perhaps confused as to why their humans suddenly will not leave. One perk for the pets is having someone around 24/7 this summer to turn up the A/C – and many are doing just that. For instance, 30% said turning up the A/C at home is their go-to method to help their pet cool down, and on those rare occasions when they do leave the house, almost 30% of British Columbians will leave the A/C on for their pet, adding to costs.

³ BC Hydro 2017 Residential End Use Survey

⁴ BC Hydro 2017 Residential End Use Survey

⁵ BC Hydro 2017 Residential End Use Survey

Solutions

BC Hydro recommends starting with no-cost or low cost actions that can help limit how much a home heats up during the day, including:

- Cooling down with a fan: Running a fan costs just \$7 for nine hours a day over the summer months.
- Closing the drapes and blinds: Shading windows can block out up to 65% of the heat.
- Shutting doors and windows: If the temperature outside is warmer than inside, keep doors and windows closed to keep the cooler air in and the warm air out.
- Limiting the use of large appliances: Use a microwave, crockpot or toaster oven to avoid the extra heat produced by larger appliances when preparing meals, and hang clothes to dry instead of using a dryer on hot days.
- Creating air flow: When it cools down open multiple windows and use floor fans strategically near the windows to draw cool air in from lower levels of the home to the upper, usually warmer parts of the home.

If A/C is the only option that will cool the home effectively, BC Hydro recommends an A/C setting of 25 degrees Celsius for air conditioner thermostats. If the air conditioner is set any cooler, cooling costs from electricity use will rise dramatically.

If Central A/C or a heat pump is not an option, try using an ENERGY STAR window unit. They are twice as efficient as a portable unit. While portable units are not recommended for efficiency, if one is used look for a dual hose model—with both an intake and exhaust hose—these are generally more efficient than single hose units.

BC Hydro also recommends not cranking up the A/C. Cranking the air conditioner up will not cool things down faster because most air conditioning units have a single fan speed and will cool at the same rate no matter how high it is turned up.

If considering a larger home renovation, consider participating in BC Hydro's Home Renovation Rebate program to improve insulation, which will also help keep the house cooler in the summer. Also with this program in partnership with utility partners, various municipal governments, and the BC Government, there are options for getting incentives for installing a heat-pump which will cool in the summer and heat in the winter.

