The arguments for going "off-grid" can seem very appealing: unplug from the electricity grid, install renewable energy to help you live closer and clean batteries for storage. No more power bills. Maybe even save money in the long run. But is it feasible? Will it help reduce greenhouse gas (GHG) emissions? And how much would it cost?

For a typical house in Victoria, you could install a 12kW solar photovoltaic (PV) system and you would need to install a 1,766kW battery system. That’s as much storage as 131 Tesla Powerwalls. This would be costly—a single Powerwall retails for ~C$8,800.

Or Victorians could opt for a smaller battery (about 21 Powerwalls’ worth) and install 30 kW of photovoltaics. The downside? The PVs would take up 300m². That’s a little larger than a tennis court.

Shorter daylight hours in winter mean less sunshine to power solar panels. In Victoria, sunny winters reduce the available sun even more, there is less sunshine to generate electricity. In places with clearer, sunnier winters, like Calgary, PV systems generate more electricity during the winter.

In Calgary, the same house could be powered with 9kW PV, which would need an 831 kWh battery (61 Powerwalls) for storage.

These scenarios don’t include electricity needs for home heating or electric vehicles. These decarbonisation steps would further increase electricity demand.

DOES SELF-SUFFICIENCY REDUCE GHG EMISSIONS?

It depends what fuel source you switch from. Electricity is generated through hydropower is already low in GHG emissions, so switching from hydro to solar won’t make much of a dent in your carbon footprint. If you switch from coal fired electric, or another high GHG electricity source, then the switch would decrease emissions.

These figures are based on modeling done by the Pacific Institute for Climate Solutions. These results could be used for more information. These models are based on a three-bedroom house in Victoria BC, and the same house in Calgary, AB.

**Rule of Thumb:**

FEWER SOLAR PANELS = YOU NEED MORE BATTERIES
FEWER BATTERIES = YOU NEED MORE SOLAR PANELS

**How Feasible is Household Energy Self-Sufficiency?**

**Victoria**

For a typical house in Victoria, you could install a 12kW solar photovoltaic (PV) system and you would need to install a 1,766kW battery system. That’s as much storage as 131 Tesla Powerwalls.

**Calgary**

In Calgary, the same house could be powered with 9kW PV, which would need an 831 kWh battery (61 Powerwalls) for storage.

**Powerwalls**

*Note that within the red box, the space between and surrounding the PV panels together adds up to another 10 m²

1 Source: https://www.tesla.com/en_CA/powerwall