

# GOING OFF-GRID:

## HOW FEASIBLE IS HOUSEHOLD ENERGY SELF-SUFFICIENCY?

The arguments for going "off-grid" can seem very appealing: unplug from the electricity grid, install renewable energy such as solar and use 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?

### RULE OF THUMB:

FEWER SOLAR PANELS = YOU NEED MORE BATTERIES  
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= AREA FOOTPRINT OF TYPICAL HOUSE  
(GROUND FLOOR: 1,100 SQ. FT/102 M<sup>2</sup>)

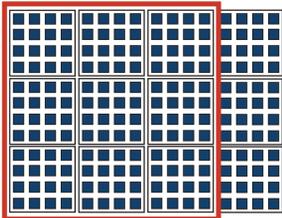


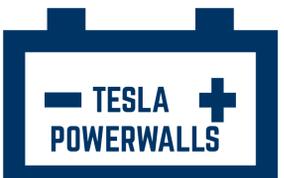
= ONE 1 kW PHOTOVOLTAIC  
PANEL (APPROX 10 M<sup>2</sup>)

## VICTORIA

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

12 kW PV System: 120 m<sup>2</sup> / 1,292 SQ.FT.

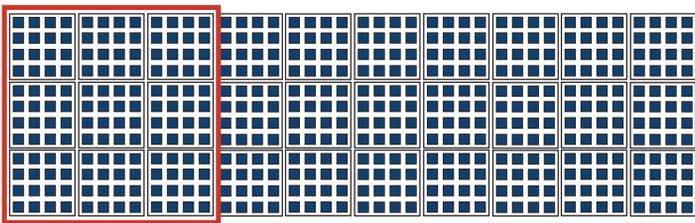


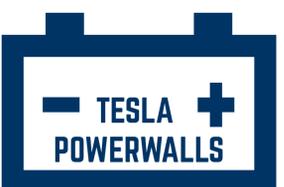
+131  - TESLA +  
POWERWALLS

\*Note that within the red box, the space between and surrounding the PV panels together adds up to another 10 m<sup>2</sup>

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 300m<sup>2</sup>. That's a little larger than a tennis court.

30 kW PV System: 300 m<sup>2</sup> / 3,230 SQ.FT.



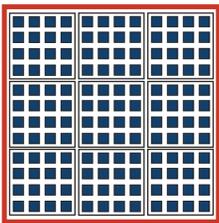
+21  - TESLA +  
POWERWALLS

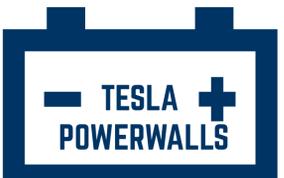
## CALGARY

Shorter daylight hours in winter mean less sunshine to power solar panels. In Victoria, cloudy 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.

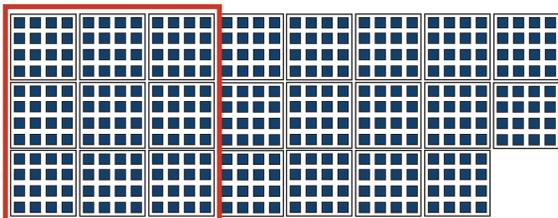
9 kW PV System: 90 m<sup>2</sup> / 970 SQ.FT.

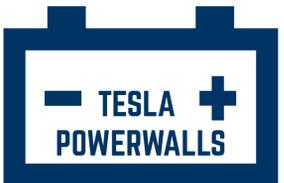


+61  - TESLA +  
POWERWALLS

Or Calgarians could have a larger PV system of 235 kW; that would need 129 kWh of battery backup (9 Powerwalls).

23 kW PV System: 239 m<sup>2</sup> / 2,476 SQ.FT.



+9  - TESLA +  
POWERWALLS

## WATCH OUT!



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 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 modelling done by the Pacific Institute for Climate Solutions' 2060 project. These models are based on a three-bedroom house in Victoria BC, and the same house if it were in Calgary, AB.

<sup>1</sup> Source: [https://www.tesla.com/en\\_CA/powerwall](https://www.tesla.com/en_CA/powerwall)



Pacific Institute  
for Climate Solutions  
Knowledge. Insight. Action.

