

Could you run your household on a Tesla Powerwall? (Teacher)

1. Complete an average Home Energy Use Calculation for your home for **one month** (30 days) using the website:

http://www.hydroone.com/MyHome/SaveEnergy/Tools/calc_main.htm

2. How much would your family pay in electricity bills (“hydro”) just for electricity (not including distribution charges or debt retirement) for one month based on a price of \$0.128/kWh for mid-peak energy use?

Example: 652 kWh per month is \$100.30

3. How many of these Powerwall batteries would your family require (fully charged) at 92% efficiency, to operate your household for **one day**? Should these batteries be connected in series or in parallel?

*The average household would use approximately 652 kWh/30 days = 21.7 kWh/day.
They would need 4 Powerwall batteries. $4 * 7kWh * 92\% = 25.8 kWh$.
These batteries should be connected in series.*

4. If each 7 kWh Powerwall battery costs \$3000 (USD), how long before your Powerwall units would pay for themselves?

*A Tesla Powerwall battery costs \$3000 USD for 7 kWh.
4 Powerwall batteries would cost \$12 000.
 $\$12\ 000 / \$100 = 120\ months = 10\ years$*

5. List two drawbacks of using this new technology. Is it worth it?

- 1. Environmental degradation due to mining lithium (also poor labour rights for miners since it is mostly mined in South America)*
- 2. Difficulties and dangers in disposing of (or recycling) lithium-ion batteries (electrical dangers, chemical dangers, burning reactions, and their potential interactions)*