Solar feasibility report

Sample home, Metro Vancouver (fictional)

Prepared October 30, 2026 · Report SAMPLE

Solar is borderline for this home

In the expected case solar saves a modest $6,794 over 25 years, but in our pessimistic scenario it does not pay for itself. Whether it is worth it depends on getting a good installed price and the incentives.

Suggested system	Production, year 1	Share of your use
4.8 kW · 12 panels	**4,415 kWh**	**45%**

Cost after potential rebates	Bill savings, year 1	Payback (expected)
$8,640	**$573**	**16.6 years**

Payback ranges from 9.3 years (optimistic) to never (within 25 years) (pessimistic). Net savings over 25 years: $6,794 expected.

How to read this report: every figure is an estimate built from your roof data, your electricity use and published prices. Sections 9 and 10 show how much the result could change. The assumptions and sources are listed at the end.

1. Property overview

Item	Detail
Address	Sample home, Metro Vancouver (fictional)
Electricity utility	BC Hydro
Rate used	Residential Conservation Rate (tiered) with Self-Generation Service (RS 2289)
Roof imagery	High resolution, captured 2025-06
Solar data	Google Solar API; seasonal pattern from PVGIS for Vancouver

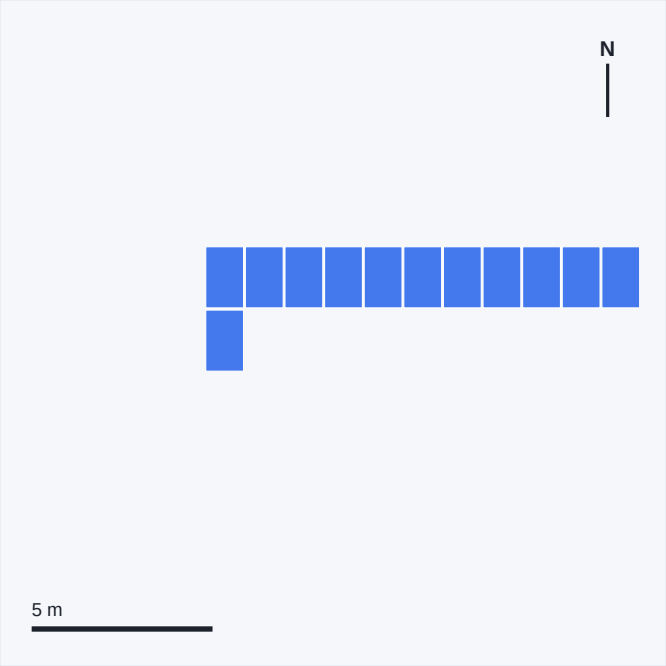
2. Roof suitability

Google identified 3 roof sections with a total area of about 168 m². About 59 m² could hold panels: up to 30 panels (12.0 kW).

Section	Faces	Pitch	Area	Sun (kWh/kW/yr, median)	Panels in suggested layout
1	south (180°)	26°	72 m²	1,180	12
2	west (270°)	20°	24 m²	950	0
3	north (0°)	26°	72 m²	680	0

“Sun” is the annual solar energy reaching the roof section, after shading by trees and nearby buildings, per kW of panels. South, south-east and south-west sections with little shade score highest.

3. Suggested panel layout



Schematic plan view of the suggested panel positions, coloured by roof section. Drawn from Google Solar API panel positions; not to engineering precision. Includes solar data from Google.

Other layouts on this roof:

Layout	Panels	Size	kWh / year	Share of use	Net cost	Year-1 savings	Payback
Smallest layout	4	1.6 kW	1,493	15%	$6,400	$199	Does not pay back
Suggested	12	4.8 kW	4,415	45%	$8,640	$573	16.6 years
About 49% of your use	13	5.2 kW	4,774	49%	$9,560	$617	16.8 years
Covers your yearly use	28	11.2 kW	9,762	100%	$26,360	$1,204	20.5 years
Largest that fits the roof	30	12.0 kW	10,351	106%	$28,600	$1,270	20.9 years

4. Estimated system size

We suggest 12 panels of 400 W, a 4.8 kW system. This is the size with the best long-term value for your home that does not produce more electricity in a year than you use. With BC Hydro’s self-generation rate, exports beyond what you use in a billing period earn 10¢/kWh, less than the electricity they replace, so a system covering less than all of your use often gives better value.

Suggested size or all of your use?

	Suggested (best value)	Covers your yearly use
System	12 panels, 4.8 kW	28 panels, 11.2 kW
Share of your yearly use	45%	100%
Cost after potential rebates	$8,640	$26,360
Bill savings, year 1	$573	$1,204
Electricity bill left, year 1	$779	$149

Payback	16.6 years	20.5 years
Value over 25 years, in today’s dollars	$540	-$5,466

Suggested: 4.8 kW gives the best long-term value of the layouts that don’t produce more electricity than you use. It’s expected to come out $540 over 25 years in today’s dollars, after paying for the system.

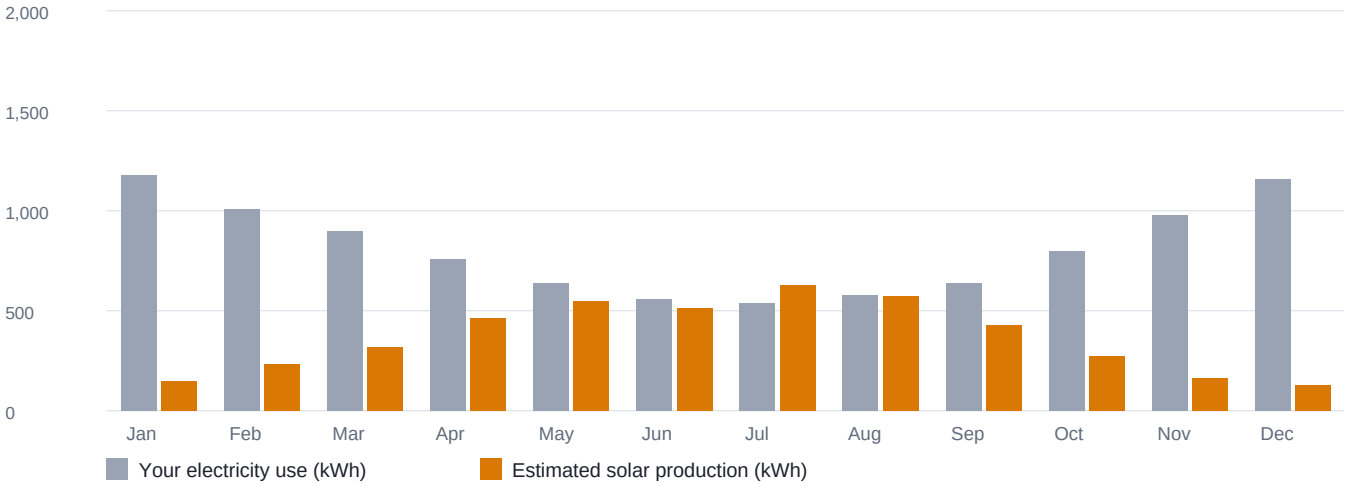
Covers your yearly use: 11.2 kW (28 panels) produces about as much electricity as you use in a year. The extra 6.4 kW costs about $17,720 more after rebates and saves about $631 more in the first year, so the extra panels take roughly 28 years to pay for themselves. Rebates add only $200 for the extra panels, because they are capped. Over 25 years it’s expected to cost about $5,466 more than it saves, in today’s dollars.

Even covering all your use, your bill won’t reach zero: about $149 remains in the first year, because solar credits can’t pay the Basic Charge, and summer surplus earns less than the winter electricity it has to replace.

A larger system can still make sense if you plan to add an electric car, heat pump or other electric load, expect electricity prices to rise faster than we assume, or simply want to produce as much as you use. Section 3 compares other layouts on your roof.

5. Estimated annual production

In its first year the system would produce about 4,415 kWh (AC), falling about 0.5% a year as panels age. That is about 920 kWh per kW of panels.



Cross-check: for a perfectly placed south-facing array near Vancouver, PVGIS estimates about 1068 kWh per kW and Natural Resources Canada about 1007. The best panels on your roof are estimated at 933 kWh per kW.

6. Your electricity use

Annual use: about 9,750 kWh, estimated from your electricity bill. Confidence: high.

- Based on 365 days of billing history, which covers a full year of seasons.

	Without solar	With solar	Difference
Electricity bills, year 1 (incl. GST)	$1,353	$779	$573

About 81 kWh a year would be more than you use in a billing period and be credited as an export.

7. Estimated installation cost

Scenario	Price per watt	Installed cost	Potential incentives	Net cost
Lower price	$2.30	$11,040	$4,800	$6,240
Expected	$2.80	$13,440	$4,800	$8,640
Higher price	$3.40	$16,320	$4,800	$11,520

- Installed price per watt (DC), before incentives: our low / base / high range is built around published Canadian averages and widened because prices vary a lot between companies and roofs. It is not a quote.
- Small systems cost more per watt because of fixed costs (permits, electrical work, connection); we use a minimum installed price of $8,000.
- A string inverter typically lasts 10–15 years. We include one replacement in year 13 at $0.30 per watt. Microinverters often carry 25-year warranties, which would remove this cost.

8. Potential rebates and programs

Included in the figures above as potential amounts:

- BC Hydro Solar & Battery Rebates: up to $4,800 for this system. Requires BC Hydro technical acceptance before you buy or install, and an HPCN-member installer. Paid while funding lasts.

Other programs to know about (not included in the figures):

- BC Hydro Self-Generation Service (RS 2289) (BC Hydro) - In effect. Production above your use in a billing period earns a 10¢/kWh credit against Energy Charges. Last verified October 30, 2026. https://app.bchydro.com/accounts-billing/electrical-connections/customer-generation/self-generation.html
- PST exemption for solar panels (Province of British Columbia) - In effect. Solar panels, and inverters and wiring bought with them, are exempt from PST. Last verified October 30, 2026. https://www2.gov.bc.ca/gov/content/taxes/tim/pst/psterr/pt-2

Always confirm current rules and get any required pre-approval with the program before you sign a contract or install anything.

9. Savings and payback

	Pessimistic	Expected	Optimistic
Net cost	$11,520	$8,640	$6,240
Year-1 savings	$499	$573	$645
Payback	Does not pay back	16.6 years	9.3 years
Net savings over 25 years	-$1,124	$6,794	$15,849
Value today (discounted at 4%)	-$5,122	$540	$6,492
Lifetime cost of solar electricity	24.0¢/kWh	16.9¢/kWh	12.2¢/kWh

Without any incentives, the expected payback would be 22.7 years and net savings over 25 years $1,994.

Cumulative cash position (starts at minus the net cost; crosses zero at payback):



The scenarios change several things together. Pessimistic: higher installed price, 10% less production, more snow loss, slower electricity price rises, lower use, and any unused export credit lost. Optimistic: the reverse.

10. Important limitations and risks

- On BC Hydro's self-generation rate, electricity you export beyond what you use in a billing period earns 10¢ per kWh, and the credit can only pay Energy Charges. In this design about 81 kWh a year would be credited that way, mostly in summer, compared with about 11.9¢ per kWh for electricity you would otherwise buy.
- BC Hydro Solar & Battery Rebates: $4,800 is a potential amount, not a promise. Requires BC Hydro technical acceptance before you buy or install, and an HPCN-member installer. Paid while funding lasts.
- Installed prices vary widely between companies. Our cost range is based on published averages; your quotes may be higher or lower.
- Electricity prices may rise more slowly than assumed, and export and net-metering rules can change, as BC Hydro’s did in July 2026.
- If your roof will need replacing within the next 10 years, replace it first: removing and reinstalling panels later typically costs thousands of dollars.
- Panels and inverters can fail. Most panels carry 25-year performance warranties; string inverters usually need replacing once (we include that cost).

11. Our recommendation

Solar is borderline for this home

In the expected case solar saves a modest $6,794 over 25 years, but in our pessimistic scenario it does not pay for itself. Whether it is worth it depends on getting a good installed price and the incentives.

Why:

- A 4.8 kW system (12 panels) would produce about 4,415 kWh in its first year, roughly 45% of the 9,750 kWh your home uses.
- Estimated cost $13,440 before incentives, $8,640 if the incentives listed are approved. It would cut about $573 from your electricity bills in year one.
- In the expected case it pays for itself in about 16.6 years; the range across our scenarios is 9.3 years to more than the system’s life.

- Over its life, solar electricity from this system would cost about 16.9¢ per kWh, compared with the roughly 14.8¢ you pay today for each extra kWh (including delivery charges, riders and tax where they apply).
- The financial case depends on getting the incentives: without them the system would barely break even, about $1,994 ahead after 25 years, which is less than the same money would earn in a low-risk investment.

Next steps:

- Get at least three written quotes. Compare price per watt and estimated kWh per year with this report.
- Check rebate rules before signing anything: most programs need approval before you buy or install.
- Ask each installer about the export rules that apply to you and how they modelled them.
- Use our free quote checker to compare quotes with this report.

Questions to ask any installer:

- What is the total installed price, and the price per watt (DC)? Does it include permits, electrical upgrades and the utility connection?
- Which panels and inverter (or microinverters) are proposed, and what are their warranties? Who honours the workmanship warranty if your company closes?
- What annual production (kWh) do you estimate, and what software and shading assumptions did you use?
- Is my roof in good enough condition to last as long as the panels? What does removal and reinstallation cost?
- Will you handle the utility interconnection application and any rebate pre-approval, before anything is bought or installed?
- Are your savings figures based on my actual rate and the current export rules?

Assumptions, calculations and sources

How the numbers are calculated: for each year we work out your electricity bills with and without solar using your utility's rate structure (fixed charges, energy tiers, delivery charges, export rules and GST) and that year's prices and panel output. The difference is the saving. Payback is when cumulative savings, less maintenance and an inverter replacement, exceed the net cost.

- Google's Solar API estimates how much sunlight each panel position receives over a year, in DC kWh, using 3D roof and surroundings models. We convert to AC with Google's 85% factor (inverter, wiring, soiling and other losses).
- We subtract a further 3% (1–6% across scenarios) for snow on the panels in winter.
- Panels lose about 0.5% of their output each year.
- We analyse 25 years, a common panel warranty length. Panels often last longer, which would improve the result.
- Future savings are discounted at 4% a year, roughly what a low-risk investment might earn instead.
- New solar customers since 1 July 2026 are on RS 2289: production above use in a billing period earns 10¢/kWh as a credit against Energy Charges only. BC Hydro does not say whether unused credit carries forward; we assume it does in the expected case and that it is lost in the pessimistic case.
- BC Hydro's rate riders (the Deferral Account Rate Rider and others) are not included because the current percentage could not be confirmed. Leaving them out slightly understates savings.
- PST does not apply to residential electricity in BC; GST (5%) does.
- Price increase scenarios (1.5% / 3% / 4.5% a year) are our assumptions. BC Hydro bills rose 3.75% in April 2025 and April 2026 under government direction.

Sources:

- BC Hydro: Residential tiered rates - https://app.bchydro.com/accounts-billing/rates-energy-use/electricity-rates/residential-rates/tiered.html
- BC Hydro: Self-generation (RS 2289, from 1 July 2026) - https://app.bchydro.com/accounts-billing/electrical-connections/customer-generation/self-generation.html
- BC PST Act Part 6: residential electricity exempt - https://www2.gov.bc.ca/gov/content/taxes/tim/pst/parts/pt-6
- EnergyHub: Cost of solar power in Canada (2023 data, BC $2.52–3.17/W, AB $2.60–3.27/W) - https://www.energyhub.org/cost-solar-power-canada

- NREL: PV O&M cost benchmark (about US$20–31 per kW per year, including inverter replacement) - https://www.nrel.gov/docs/fy17osti/68023.pdf
- Google Solar API: DC to AC conversion of 85% - https://developers.google.com/maps/documentation/solar/calculate-costs-us
- Jordan et al. (2016): median panel degradation about 0.5% per year - https://doi.org/10.1002/pip.2744
- Estimating PV snow losses (Canadian studies: typically 2–5% a year, higher on low-tilt arrays) - https://sustainabletechnologies.ca/app/uploads/2021/01/AEDG-Journal-Article_Estimating-PV-Snow-Losses.pdf
- PVGIS v5.2, PVGIS-NSRDB (2005–2015), 1 kWp, 30° tilt, south, 14% losses. © European Union - https://re.jrc.ec.europa.eu/api/v5_2/PVcalc?lat=49.2827&lon=-123.1207&peakpower=1&loss=14&angle=30&aspect=0&raddatabase=PVGIS-NSRDB&outputformat=

Important:

- This report is an estimate for planning purposes. It is not an engineering design, a structural or electrical assessment, a quote, or financial, tax or legal advice.
- Roof measurements, panel positions and solar production come from the Google Solar API's analysis of aerial imagery and 3D models and may differ from your actual roof. An installer must verify them on site.
- Savings are not guaranteed. They depend on future electricity prices, utility rules, how you use electricity, the equipment installed and its performance.
- Incentive amounts are potential amounts under program rules as we last verified them. Eligibility and approval are decided by each program, often only before you buy or install. Programs can change or close without notice.
- We are independent: we do not sell or install solar systems, and we do not share your information without your permission.
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