



# PRELIMINARY STUDY

## SOLAR + STORAGE

Vieux Québec

Québec, QC

Prepared for:

**STROM Spa**



# YOUR BILL BEFORE / AFTER

3% reduction on your annual bill

## TODAY

Current annual bill

**290 527 \$**

/ year

## WITH SOLAR

Estimated annual bill

**281 291 \$**

/ year

**9 236 \$**

Over 25 years, this represents estimated cumulative savings of 230 898 \$.

# PROJECT SNAPSHOT

## Proposed 128 kWp system

### Vieux Québec

515 boul. Champlain, Québec, QC

Annual consumption

**2,953,589 kWh**

Peak demand

**651 kW**

Proposed solar capacity

**128 kWc**

Proposed storage

**0 kWh**

Year-1 solar production

**132,480 kWh**

Solar self-sufficiency

**5%**

LEVELIZED COST OF ENERGY (LCOE)

**0.035 \$/kWh**

CO<sub>2</sub> AVOIDED PER YEAR

**0.3 tonnes**



# Vieux Québec

Québec, QC  
STROM Spa

## YOUR RESULTS

Net profit of 26 412 \$ over 25 years

YEAR 1 SAVINGS

**9 236 \$**

NET INVESTMENT

**73 689 \$**

NET PROFIT (NPV)

**26 412 \$**

Over 25 years

RETURN (IRR)

**9.7 %**

25 years

## DETAILED ANALYSIS

### CONFIGURATION

| Configuration     | Value                  | Finance                          |
|-------------------|------------------------|----------------------------------|
| Solar power:      | 128 kWc                | Gross CAPEX: 230 400 \$          |
| Battery Capacity: | 0 kWh                  | Total subsidies: - 156 711 \$    |
| Battery Power:    | 0.0 kW                 | NPV (25yr): 26 412 \$            |
| Total roof:       | 10,243 pi <sup>2</sup> | LCOE (Energy Cost): 0.035 \$/kWh |
| Solar potential:  | 8,194 pi <sup>2</sup>  |                                  |

Payback: 10.0 years | LCOE: 0.035 \$/kWh

Trees planted (equiv.)

**12**

Cars removed (equiv.)

**0.1**

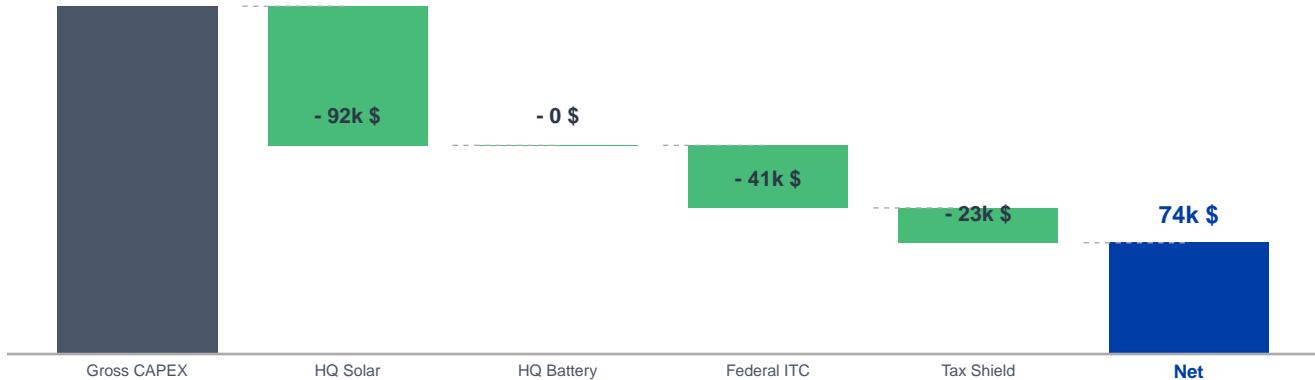
Energy coverage

**5%**



## NET INVESTMENT

68% reduction through incentives



## INCENTIVES BREAKDOWN



Direct subsidies (Hydro-Québec + ITC):

**156 711 \$**

Tax benefit (CCA):

**23 079 \$**

**TOTAL (SUBSIDIES + TAX BENEFIT):**

**179 790 \$**



# FINANCING OPTIONS

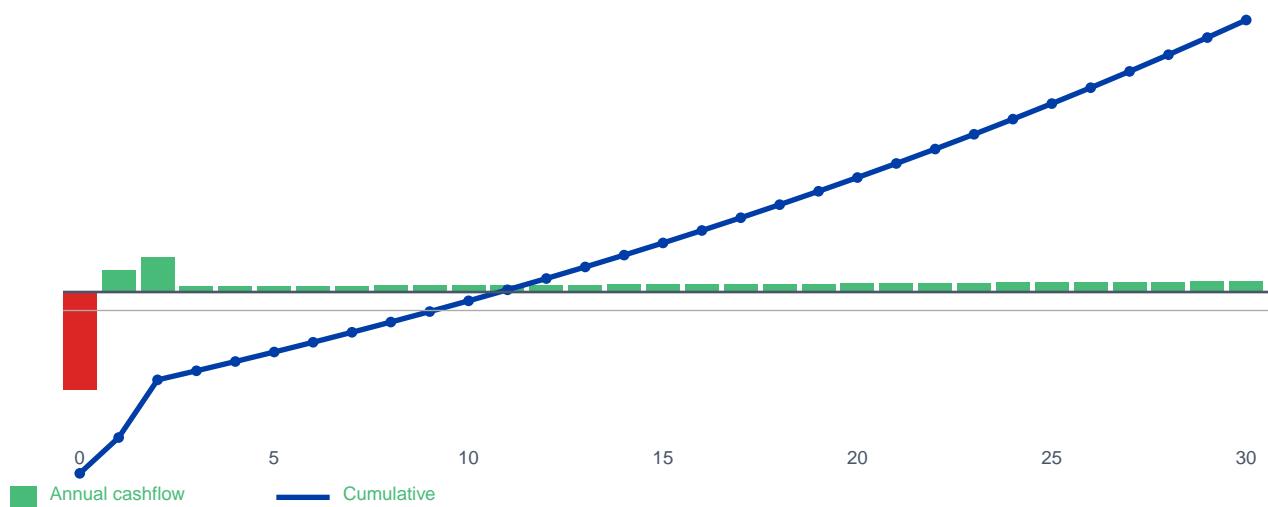
| CASH                                   | LOAN                               | LEASE                              |
|--|------------------------------------|------------------------------------|
| <b>Recommended</b>                     |                                    |                                    |
| Investment<br><b>73 689 \$</b>         | Rate / Term<br><b>5 % / 10 yrs</b> | Rate / Term<br><b>7 % / 15 yrs</b> |
| Year 1 Savings<br><b>9 236 \$</b>      | Monthly Payment<br><b>782 \$</b>   | Monthly Payment<br><b>662 \$</b>   |
| Payback<br><b>10.0 yrs</b>             | Year 1 Savings<br><b>9 236 \$</b>  | Year 1 Savings<br><b>9 236 \$</b>  |
| 25-yr Profit (NPV)<br><b>26 412 \$</b> | Net Year 1<br><b>-143 \$</b>       | Net Year 1<br><b>1 288 \$</b>      |

Rates and terms are indicative. Financing options will be detailed in the firm quote.

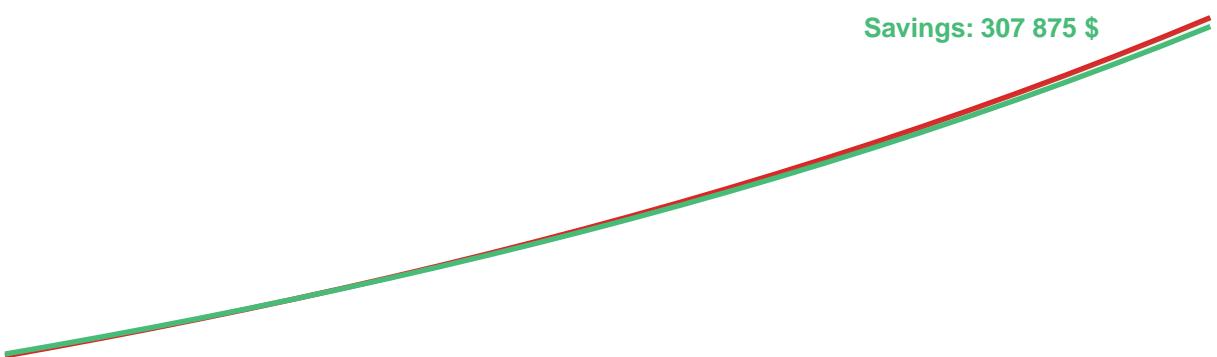
## FINANCIAL PROJECTIONS

Profitable in 10.0 years

Cash flow and return on investment



Why now? (cost of inaction)



Without solar

With solar + storage



## NEXT STEPS

### What the design fee covers (\$2,500 + taxes)

- Complete site visit
- Preliminary engineering
- HQ interconnection application prep
- Detailed firm quote

### What you need to provide

- Hydro-Québec bills (12-24 months)
- Roof information (age, condition)
- Single-line diagram (if available)
- Ownership / lease confirmation

### What you receive

- Firm quote with guaranteed pricing
- Detailed implementation schedule
- Clarified scope and exclusions
- File ready for HQ application

**Contact us to schedule your site visit**

info@kwh.quebec | 514.427.8871 | www.kwh.quebec



# THEY TRUST US

**15+**

Years of experience

**120**

MW installed

**25+**

C&I Projects

*« The detailed analysis allowed us to make an informed decision.  
The expected ROI proved accurate within 2%. »*

— Operations Director, Manufacturing Company

Our clients include companies in manufacturing, institutional, and commercial sectors.

## NEXT STEP

Contact us to schedule your free site visit

**info@kwh.quebec | 514.427.8871 | www.kwh.quebec**



## EQUIPMENT & WARRANTIES

Tier-1 solar panels

**25 ans/years**

warranty

CSA/UL certified inverters

**10-15 ans/years**

warranty

KB Racking mounting structure

**25 ans/years**

warranty

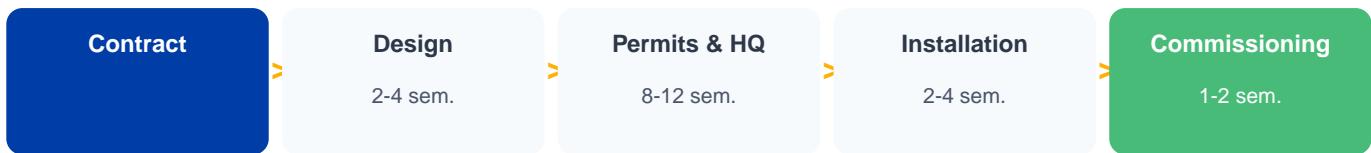
Certified workmanship

**10 ans/years**

warranty

## TYPICAL TIMELINE

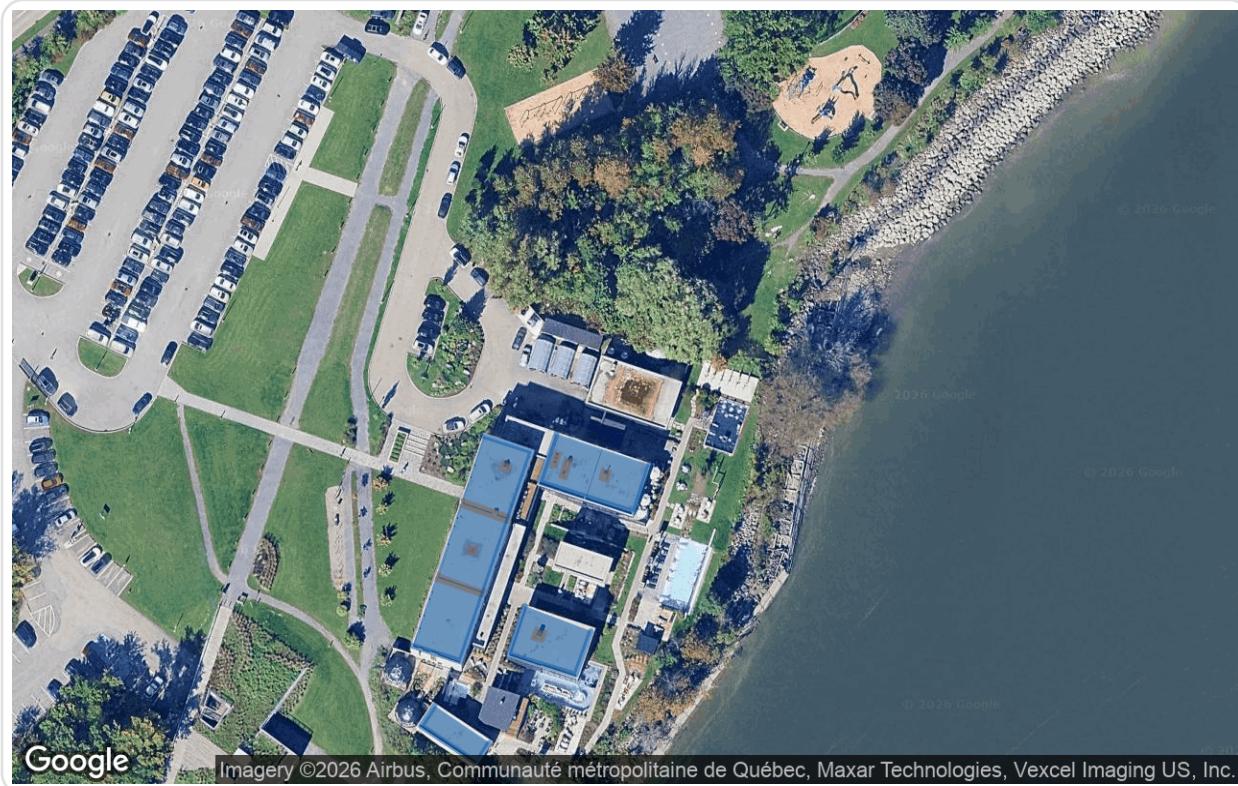
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Timelines subject to Hydro-Québec approval and structural conditions



## ROOF CONFIGURATION



### LEGEND

- Usable solar areas: 952 m<sup>2</sup>
- Constraint areas (HVAC, obstacles): 50 m<sup>2</sup>

**Net usable area: 902 m<sup>2</sup> (9,705 sq ft)**

### SIZING BY ZONE

| Zone         | Area (m <sup>2</sup> ) | Orientation | Panels     | kWp          |
|--------------|------------------------|-------------|------------|--------------|
| Zone 1       | 154                    | N/A         | 51         | 25.5         |
| Zone 2       | 503                    | N/A         | 169        | 84.5         |
| Zone 3       | 223                    | N/A         | 75         | 37.5         |
| Zone 4       | 71                     | N/A         | 24         | 12.0         |
| <b>Total</b> | <b>952</b>             |             | <b>319</b> | <b>159.5</b> |



## KEY ASSUMPTIONS

### Assumption

Utility price escalation

**3.5%/an**

Panel degradation

**0.5%/an**

System lifespan

**25 ans**

HQ Program

**Autoproduction**

Est. self-consumption

**~90%**

Discount rate (WACC)

**7%**

Solar O&M (% CAPEX)

**1.0%/an**

Storage O&M (% CAPEX)

**0.5%/an**

## EXCLUSIONS

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The following items are not included in this preliminary estimate:

- Prior roof work
- Electrical upgrades (if required)
- HQ interconnection fees (TBC)
- Battery storage (optional, if not included)
- O&M contract (optional)
- Crane or specialized lifting fees

Note: These items can be assessed and priced during the detailed design phase.



**APPENDIX A****SCENARIO COMPARISON**

This analysis compares multiple simulated configurations for this site.

| Scenario           | PV (kW) | Battery  | NPV 25yr   | IRR    | Payback |
|--------------------|---------|----------|------------|--------|---------|
| 400 kWc + 120 kWh  | 400     | 120 / 60 | 231 370 \$ | 12.7 % | 7.0 yr  |
| 980 kWc + 120 kWh  | 980     | 120 / 60 | 219 687 \$ | 9.7 %  | 9.0 yr  |
| 400 kWc + 120 kWh  | 400     | 120 / 60 | 210 752 \$ | 12.4 % | 7.0 yr  |
| 1470 kWc + 120 kWh | 1470    | 120 / 60 | 186 759 \$ | 8.6 %  | 11.0 yr |

**Contact us to discuss the optimal scenario for your needs.**



## APPENDIX B

## FINANCIAL CASH FLOW TABLE

| Year | Rev | O&M | Invest  | Tax | NET      | CUMUL    |
|------|-----|-----|---------|-----|----------|----------|
| 0    |     |     | -74k \$ |     | -138k \$ | -138k \$ |
| 1    |     |     |         |     | 30k \$   | -108k \$ |
| 2    |     |     |         |     | 49k \$   | -59k \$  |
| 3    |     |     |         |     | 8k \$    | -51k \$  |
| 4    |     |     |         |     | 8k \$    | -43k \$  |
| 5    |     |     |         |     | 8k \$    | -35k \$  |
| 6    |     |     |         |     | 8k \$    | -27k \$  |
| 7    |     |     |         |     | 8k \$    | -18k \$  |
| 8    |     |     |         |     | 9k \$    | -10k \$  |
| 9    |     |     |         |     | 9k \$    | -911 \$  |
| 10   |     |     |         |     | 9k \$    | 8k \$    |
| 11   |     |     |         |     | 9k \$    | 18k \$   |
| 12   |     |     |         |     | 10k \$   | 27k \$   |
| 13   |     |     |         |     | 10k \$   | 37k \$   |
| 14   |     |     |         |     | 10k \$   | 47k \$   |
| 15   |     |     |         |     | 10k \$   | 57k \$   |
| 16   |     |     |         |     | 11k \$   | 68k \$   |
| 17   |     |     |         |     | 11k \$   | 79k \$   |
| 18   |     |     |         |     | 11k \$   | 90k \$   |
| 19   |     |     |         |     | 11k \$   | 101k \$  |
| 20   |     |     |         |     | 12k \$   | 113k \$  |
| 21   |     |     |         |     | 12k \$   | 125k \$  |
| 22   |     |     |         |     | 12k \$   | 137k \$  |
| 23   |     |     |         |     | 13k \$   | 150k \$  |
| 24   |     |     |         |     | 13k \$   | 162k \$  |
| 25   |     |     |         |     | 13k \$   | 176k \$  |



## APPENDIX C

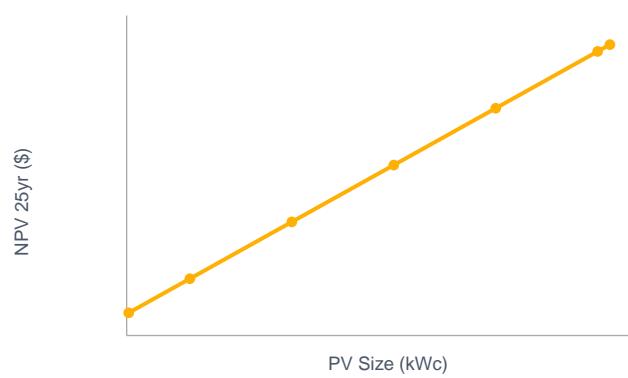
# OPTIMIZATION ANALYSIS

The charts below show how NPV varies with different system configurations. The optimal point is identified.

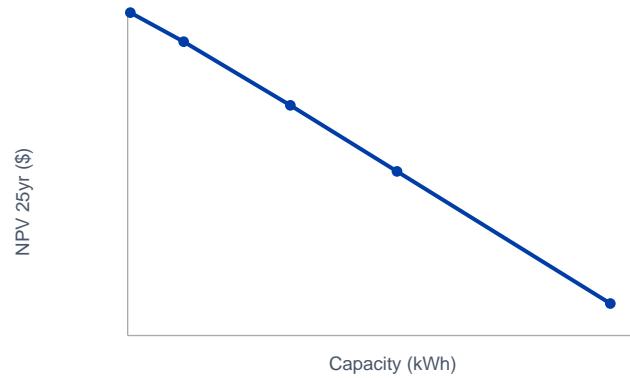
### Efficiency Frontier (CAPEX vs NPV)



### Solar Optimization



### Battery Optimization



### Recommended optimal configuration

|                           |                     |
|---------------------------|---------------------|
| Optimal PV size           | <b>128 kWc</b>      |
| Optimal battery capacity  | <b>0 kWh / 0 kW</b> |
| Self-sufficiency achieved | <b>5.2 %</b>        |
| Payback period            |                     |

**10.0 years**

