



# Solar Energy

## Application in Canadian Health Care Facilities

Nearly all of the earth's energy originates from the sun. Even fossil fuels are essentially stored solar energy but they contribute toxic greenhouse gases when used as an energy source. As Canada's health care system works toward net-zero emissions, solar energy can offer a powerful, proven and economical solution. Solar technologies ranging from photovoltaic panels that generate electricity to thermal systems that provide hot water enable health care facilities to reduce their carbon footprint, lower operating costs, and strengthen energy resilience.

By integrating solar energy into hospitals, long-term care homes, community health centres and clinics, the health sector can ensure cleaner, more reliable energy for essential services, even during power disruptions. Investing in solar today helps protect both planetary and public longevity.

### Solar Photovoltaic

Solar Photovoltaic (PV) technology generates electricity directly from sunlight using semiconductor materials, most often silicon. When sunlight hits a solar cell, it excites electrons, producing an electric current that can be converted into usable electricity to power buildings and/or feed into the local electrical grid (1, 2). A typical PV system includes solar panels, an inverter to switch direct current (DC) to alternating current (AC), and increasingly with batteries for storage. Since PV produces energy without burning fuel, it creates no emissions during operation, making it a sustainable, clean, power source for rooftops, ground arrays, or even integrated building materials.

While production and end of life disposal of solar panels does have some environmental impact, it is far less than traditional fossil fuel based electricity production (3, 4). Paired with battery storage, solar system use in health care facilities can provide reliable backup power for critical services during grid outages, ensuring continuity of care.

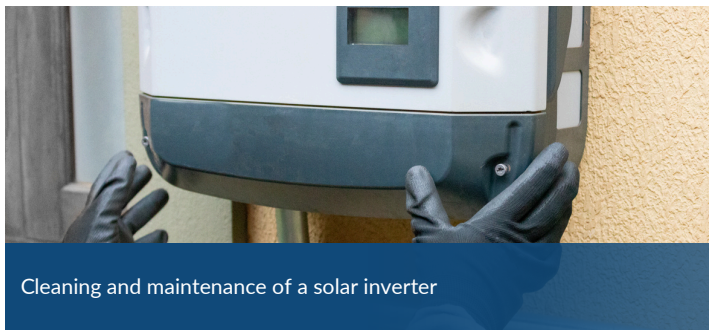


Solar Photovoltaic rooftop installation

By integrating PV into health care infrastructure, Canada's health system can strengthen resilience, advance climate commitments, and may improve health equity through cleaner, more reliable energy (5).

### Micro-Grid (Solar PV and Batteries)

Micro-grid systems combine PV panels with energy storage, usually batteries, and a connection to the electrical grid. Unlike traditional grid-tied systems, which only produce electricity when the grid is active, hybrid systems can store excess solar energy in batteries for use at night or during power outages.



## Solar Thermal

In Canadian health care as well as worldwide, solar thermal energy is mainly used for heating water and reducing reliance on fossil fuels in hospitals, long-term care facilities, and community clinics. Health care facilities consume large volumes of hot water daily for sanitation, laundry, kitchens, and patient care. Solar thermal systems can preheat this water, significantly cutting natural gas or electric heating demand. This not only reduces operating costs but also lowers greenhouse gas emissions, supporting health care's transition toward climate-smart infrastructure (7, 8).

Solar thermal technology is also valuable in northern and remote health care settings, where energy is often supplied by costly and polluting diesel. By providing a renewable source of hot water and heating, solar thermal systems can lessen dependence on imported fuels and improve energy security.

When combined with efficient building design and backup systems, they can help health care facilities maintain reliable services, even in harsh Canadian climates. In this way, solar thermal contributes both to environmental sustainability and to resilient, cost-effective health care delivery. Other examples of solar thermal energy collection include Solar Walls to preheat ventilation air.

If the batteries are full, any additional electricity can still be sent to the grid (6). This setup gives users the flexibility of both grid support and independent energy supply. Hybrid solar systems improve energy security, reduce electricity bills, and provide reliable backup power. Hybrid solar systems can extend the duration that backup power supports essential services such as lighting, elevators, medical equipment, refrigeration for medicines and biologicals, and electronic health records during grid outages caused by storms, wildfires, and other climate-related events.

In Canadian health care, these systems are increasingly being adopted to strengthen both sustainability and resilience. By generating clean electricity from solar panels and storing excess energy in batteries, facilities including hospitals, clinics, community health centres, and long-term care homes can reduce reliance on diesel generators, lower operating costs and emissions, and maintain uninterrupted patient care, particularly in rural and remote communities.

**Table 1: Summary of Types of PV Systems**

System Type	Grid Connection	Batteries	Main Use Case	Typical for Canadian Hospitals
Grid-Tied	Yes	No	Urban/suburban hospitals, clinics	Yes
Grid-Tied + Battery	Yes	Yes	Critical power, outage resilience	Increasingly piloted
Off-Grid	No	Yes	Remote clinics, field posts	Rare (for main hospitals)

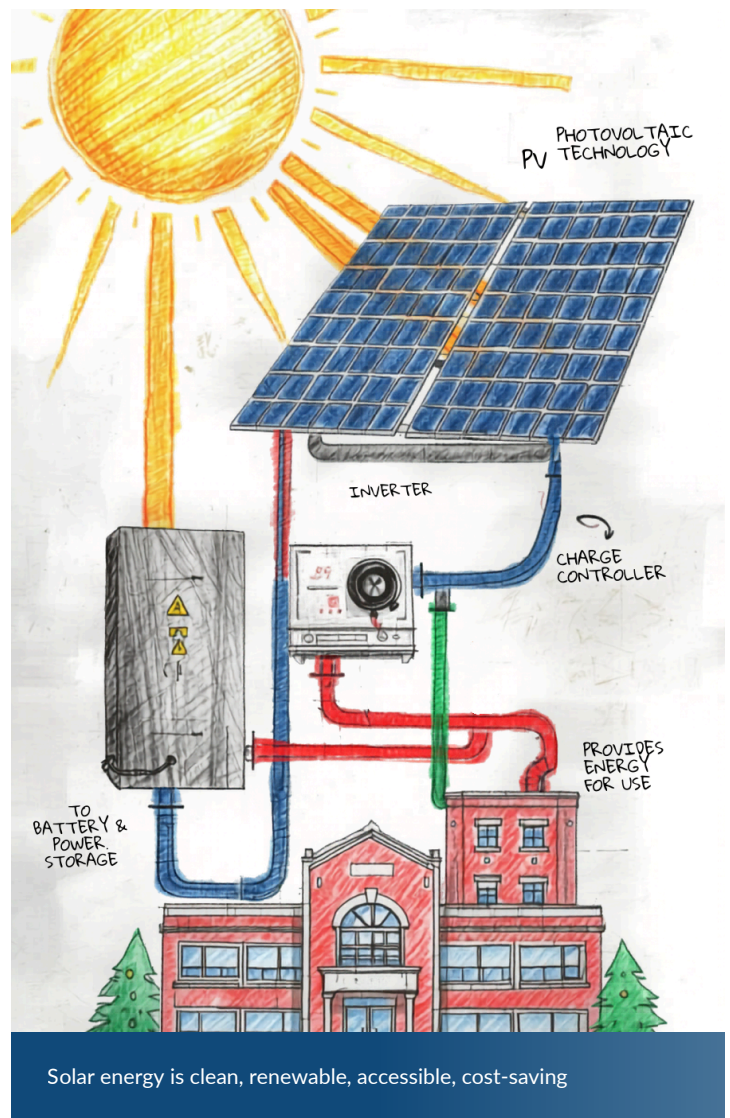
## Hybrid Solar PV-T Systems

Solar energy can be captured in a few different ways. Photovoltaic (PV) panels convert sunlight directly into electricity, while solar thermal systems collect the sun's heat, usually through water or air to produce hot water or support heating. Hybrid PV-Thermal (PV-T) systems combine both approaches on the same surface: they generate electricity while also capturing the waste heat from the panels. This dual use makes better overall use of the sun's energy and can even help the PV panels run more efficiently by keeping them cool (9).

Examples include concentrating solar collectors and facade-integrated PV-T. There are a wider array of ways to integrate solar energy into buildings with examples including hybrid photovoltaic thermal and heat pump systems.

**"The cost of new solar projects declined globally by 88% between 2010 and 2021."**

Clean Energy Canada  
A Renewables Powerhouse  
2023, p. 11



Solar energy is clean, renewable, accessible, cost-saving

**Table 2: Types of Solar Energy Systems in Health Care**

Type	Description
Solar Photovoltaic (PV)	Converts sunlight into electricity for lighting, HVAC, and medical equipment.
Solar Thermal	Captures heat for water heating and space heating.
Hybrid Solar PV and Thermal	Generates electricity and captures heat.
Hybrid Systems	Combines PV and thermal technologies for maximum efficiency.

# Key Features and Benefits

## Cost Savings

Solar energy can significantly reduce electricity charges, especially with rising energy costs. Most institutional-scale solar systems can typically start paying for themselves within twelve to eighteen years (or more), depending on economies-of-scale and other project factors.

## Environmental Responsibility

Solar power reduces reliance on fossil fuels, lowering carbon emissions and contributing to a greener health care system. Usage also promotes health and environmental awareness among staff and patients.

## Financial Incentives

The Canadian government offers tax credits and other incentives to encourage the adoption of clean technologies, including solar. In this way Solar energy helps to reduce utility bills, with payback periods of 5–12 years.

## Resilience

In regions with frequent power outages, solar power can provide a reliable backup source of energy. Solar panels are typically made to last 25 to 30 years. Solar use also helps health care organizations maintain energy access during climate-related disasters

## Health Benefits

Solar power can improve air quality and societal resilience by reducing systemic reliance on fossil fuel-based power plants, which can contribute to respiratory and other long-term health and societal security issues.



# Application in Health Care

Solar energy is increasingly being adopted by Canadian hospitals and other health care facilities to reduce energy costs and their environmental footprint. Several hospitals across the country have implemented PV systems for generating electricity and solar thermal systems for heating water.

These installations are driven by both financial incentives from governments and a growing commitment to sustainability (see Annex 1. Solar Mini-Case Studies).

## Quick Stats

- **Over 60 health care sites** in Canada have implemented solar installations.
- Solar power can meet up to **20–40% of a facility's electricity demand** depending on size and load.
- A 100 kW solar PV system can save as high as approximately **\$15,000–\$25,000 annually** in energy costs.

## Making the Case

**Health Sector Emissions and Responsibility:** The health care sector accounts for approximately 5% of Canada's total GHG emissions, equivalent to the emissions of over 11 million cars.

**Economic security and resilience:** institutional scale solar assets can save considerable costs of up to 25–75% over their investment life cycle, compared to contemporary grid-tied utility dependence.

**24/7 Energy Demand:** Hospitals and care homes operate continuously, making them ideal candidates for on-site solar systems combined with battery storage.

**Energy Security:** Solar panels offer resilience during power outages, especially when paired with energy storage or backup generators.

**Environmental Leadership:** Transitioning to solar aligns with Canada's Net-Zero Emissions by 2050 goal and the Pan-Canadian Framework on Clean Growth and Climate Change (10, 11).

# Implementation Considerations

**Site Assessment and Design:** Facilities must evaluate local solar potential, roof or land availability, shading, and structural integrity of buildings. Customized design ensures the system meets both energy opportunities and climate conditions (12, 13).

**Energy Needs and Priorities:** Health care facilities must identify which services require guaranteed power, such as emergency departments, intensive care units, or vaccine refrigeration and design systems (e.g., with storage or hybrid solutions) to prioritize these critical energy loads.

**Maintenance and Reliability:** Solar systems need regular upkeep—clearing snow and debris, maintaining batteries, and addressing equipment wear. For small or remote facilities, finding reliable and affordable maintenance can be difficult, making strong performance monitoring especially valuable.

**Financial Planning:** While upfront investments may be high, facilities should explore government incentives, grants, and partnerships. Long-term cost savings from reduced energy bills and carbon credits can often strengthen the financial case.

**Operations and Maintenance:** A plan for routine inspections, panel cleaning (especially dust and/or snow removal), and battery care may be essential. Training and/or service contracts can help ensure systems run reliably over multiple decades.

**Regulatory and Policy Alignment:** Compliance with provincial building codes, health care standards, and renewable energy regulations is required. Facilities should also align with Canada’s health care climate goals and sustainability frameworks.

**Equity and Community Engagement:** Especially in remote northern and Indigenous communities, solar projects should be designed collaboratively, ensuring cultural, logistical, and local needs are respected while building community capacity in renewable energy (13).

**Integration with Existing Infrastructure:** Solar must integrate with hospital electrical, heating, and backup generator systems, sometimes requiring advanced controls and coordination with utilities.

# Funding

**Natural Resources Canada (NRCan):**

Offers tax incentives for businesses.

**Canada Infrastructure Bank (CIB):**

Supports public-private solar energy projects.

**Wah-ila-toos:** Clean Energy Initiatives in

Indigenous, rural and remote communities.

# Incentives

Province	Program
Alberta	<a href="#">Clean Energy Improvement Program</a>
British Columbia	<a href="#">Net Metering Program</a> <a href="#">Better Buildings Program</a>
Manitoba	<a href="#">Solar Rebate Program</a> <a href="#">Hydro Net-Billing Program</a>
New Brunswick	<a href="#">Net Metering Program</a> <a href="#">Commercial Buildings Retrofit Program</a>
Northwest Territories	<a href="#">Arctic Energy Alliance Renewal Energy Program</a>
Nova Scotia	<a href="#">Net Metering Program</a>
Ontario	<a href="#">Save on Energy Program</a> <a href="#">Net Metering Program</a>
P.E.I.	<a href="#">Solar Electric Rebate Program</a>
Saskatchewan	<a href="#">Net Metering Program</a>
Quebec	<a href="#">Net Metering Program</a>

# Regional Insights

**Prairies (AB, SK, MB):** Highest solar potential; aligns with several large clinic and hospital PV systems (14).

**BC Southern Interior & Vancouver Island:** Good solar potential leveraged by solar thermal rooftop systems at hospitals and care centres.

**Ontario (Toronto):** Moderate potential; early adopter with solar thermal at Hospital for Sick Children.

**Remote & Indigenous Communities:** Smaller-scale solar PV and hybrid projects (e.g. Little Buffalo Community Health Centre) show potential.

# Call to Action

**Health Facility Leaders:** Assess your site's solar potential using available tools like [RETScreen®](#) or [PVWatts®](#).

**Health Professionals:** Advocate for clean, renewable energy in your workplace and professional associations.

**Policy Makers:** Expand funding and streamline approvals for solar installations in public health infrastructure.

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## Resources

- [Cost of Solar Power in Canada](#)
- [Renewables Powerhouse Report](#)
- [RETScreen® Clean Energy Management Software](#)
- [Solar Power Energy Hub](#)
- [Preparing Canada's Health Care Buildings for Net-Zero](#)

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**About Us:** *The Canadian Coalition for Green Health Care is Canada's leading network dedicated to advancing environmental sustainability in the health sector. Guided by our vision of a sustainable, resilient, and equitable health system for all, we mobilize change-makers, build capacity, and deliver practical tools and strategies that drive meaningful action. This fact sheet has been developed as part of the Coalition's "Preparing Canada's Health Care Buildings for Net-Zero" project, made possible with an investment from the Government of Canada's Low Carbon Economy Implementation Readiness Fund.*

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## Annex 1. Solar Mini-Case Studies

Project Site	Location	Building Type	Scope	Energy Savings	Additional Details
Oak Tree Manor	Nanaimo, BC	Long term care	48.43kW Solar PV System	50,850 kWh per year, 14% saved	Roof-mounted grid-tied (1)
Oxford Gardens Retirement Community	Woodstock, Ontario	Long term care	Solar thermal heating and cooling system	50% (peak times) to 70% (off-peak times) cooling load	162 vacuum tube collector panels Payback time is 12 years (2)
Judith Fisher Health Centre	Lasqueti Island, BC	Health Centre	13 kW PV Solar-diesel hybrid system	75% diesel use reduction	Off grid system with battery storage (3)
Woodstock Hospital	Woodstock, Ontario	Acute care	134kW Rooftop PV Solar	154,618 kWh a year	Payback time is 11 years (4)
Mount Saint Joseph Hospital	Vancouver, BC	Acute care	102 540 w panel Solar PV System	53,750 kWh a year	Installed at same time as new roof (5)

Project Site	Location	Building Type	Scope	Energy Savings	Additional Details
Prince Edward County Memorial Hospital	Picton, Ontario	Acute care	Rooftop solar PV system	275,000 KWh per year, 30% of energy demand, \$1.9 million energy savings	New build- opens 2027 Reduces 2,000 tons CO2 \$600,000 RBC donation (6)
Little Buffalo Community Health Centre	Little Buffalo, Alberta	Health Centre	20.8 kw 80 panel Solar PV system	24,750 Kwh per year	Indigenous health centre Community members installed and maintain the panels themselves (7)
Sherbrooke University Hospital	Sherbrooke, Quebec	Acute care	SolarWall® air heating system 250 m2	149MWh per year reducing 40 tons of GHG per year; 48% energy cost drop	To provide solar heated ventilation air Preheats 27,000 cfm of fresh air through two HAVC units (8)

\*If you have a health care Solar project you would like shared in the Annex or have any questions about the listed projects please email Autumn Sypus, Project Manager, CCGHC at [autumn@greenhealthcare.ca](mailto:autumn@greenhealthcare.ca).

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