



Solar & Battery Permitting Guide

For Local Governments in BC

communityenergy.ca



Acknowledgements

Thank you to our interviewees, focus group participants, [Technical Safety BC](#), [Building Officials' Association of BC](#), [Province of BC's Construction Standards and Digital Solutions Branch](#), [Municipal Insurance Association of BC](#), [Urban Development Institute](#), [Aboriginal Housing Management Association](#), [BC Sustainable Energy Association](#), [SolarAPP Foundation](#), Adam Wright, Manda McIntyre and Andy Christie. Your contributions were invaluable in helping us understand the complex topic of solar and battery permitting.

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AI Statement

Generative AI tools were used to support non-substantive drafting tasks, including summarization and language editing. All analytical conclusions, interpretations, and the final wording were developed and validated by the project team.



About the Community Energy Association

The Community Energy Association (CEA) accelerates bold action by local governments and Indigenous communities related to climate and energy. CEA functions as a nonprofit consultant with members and a Board of Directors; more than half of CEA's member-organizations are local governments and Indigenous communities.

CEA grew from a committee established by the Government of BC and the Union of BC Municipalities in the 1990s and was incorporated as a non-profit in 2003. Today, CEA's members and staff live in communities large and small and bring their collective expertise, experiences, commitment to Truth and Reconciliation, and passion to help lower local emissions and build healthy, resilient communities.

Executive Summary

Solar and battery systems are becoming an increasingly important part of BC's energy mix, with adoption growing rapidly in response to the [Canada Greener Homes Initiative](#) and [BC Hydro's solar and battery rebates](#), introduced in 2024. As more residents and businesses look to install these systems, local governments play a crucial role in ensuring installations are safe, consistent, and aligned with community climate and energy objectives.

However, local government permitting requirements for rooftop solar and energy storage systems vary significantly across the province. While electrical permits are required in all jurisdictions, decisions around whether to require structural building permits—and what those requirements entail—are left to individual local governments. This has led to inconsistencies in permitting processes, timelines, and costs. Installers working across multiple communities face uncertainty, while building owners encounter administrative barriers and differing costs that can slow or discourage adoption. Local government staff have also reported challenges such as uncertainty around how to interpret building codes, uncertainty around local government roles and responsibilities, and limited access to guidance on best practices.

Recognizing the need for greater clarity and consistency, [BC Hydro](#) partnered with the [Community Energy Association](#) (CEA) to examine the permitting challenges facing local government staff and installers, and to identify opportunities to modernize municipal approaches to solar and battery permitting. This *Solar & Battery Permitting Guide*—developed in consultation with local governments, installers, utilities, and regulatory organizations across BC—provides practical support to help building officials, planners, and climate staff streamline their permitting practices. The guide includes:

- **A detailed overview of codes and standards** pertaining to residential and commercial rooftop solar and battery systems in BC.
- **Key findings from our research** with local government staff, solar installers, utilities and regulators in BC.
- **Recommendations** for local government staff, including building officials and climate policy staff.

The guide highlights several “quick win” actions that individual local governments can implement at minimal cost or risk, including improving online permitting information, offering staff training, hosting information sessions for installers and residents, creating online application portals, and tracking permitting trends. These steps can reduce administrative burden, improve processing clarity, and support safe, efficient installations.

The research also identifies longer-term opportunities that require greater coordination and investment but hold significant potential to advance solar and battery adoption across BC. These include exploring streamlined residential permitting pathways, developing regionally consistent permitting approaches, conducting collaborative studies with engineers and solar professionals, and working toward a province-wide standardized permitting template grounded in best practices and global experience.

By working together to align and modernize solar PV and energy storage permitting processes, local governments across BC can reduce barriers for homeowners and installers, improve safety and consistency, and help accelerate the province's transition toward a low-carbon, resilient, and distributed energy future.

Limitations of this guide

This guide was developed for municipalities within BC Hydro's service territory. Municipalities outside this territory should connect directly with their local utility to confirm applicable electricity rates, interconnection processes, and any available incentives. Utility policies and requirements vary, and local confirmation is essential.

Importance of involving local fire departments

While many municipalities emphasize the importance of involving local fire departments in solar PV permitting, this guide does not fully address fire-safety considerations. As practices and expectations differ between communities, municipalities should consult their local fire departments to ensure that permitting processes align with fire-safety requirements and operational needs. If your municipality has a standard process for internal review, fire departments can identify concerns early. However, if your municipality does not require building permits for certain solar installations, your fire department may not be aware of new solar or battery systems being added—potentially leading to safety or response challenges.

Table of Contents

Executive Summary	4
The Context	7
Growth in solar and battery storage	7
Regulatory Framework	13
Overview	13
Codes, permits and standards	15
Research	22
Our approach	22
Key findings from focus groups	23
Recommendations	25
Introduction	25
Quick wins for local governments	26
Taking it further: comprehensive strategies for solar & battery permitting	30
Conclusion	37
Appendix	i
Glossary & list of acronyms	i
Key elements of the CEC pertaining to solar PV and BESS installation	iv
BC Hydro distribution generator interconnection and load displacement programs	vi
Essential solar PV and storage CSA standards	vii
Jurisdictional scan of permitting requirements for Part 9 residential and commercial solar installations across BC	ix
Question guide: industry focus group	xi
Question guide: local government focus groups	xiii
Further Reading	xv

The Context

Growth in solar and battery storage

Historically, BC has had fewer residential and commercial solar and battery installations compared to neighbouring provinces like Alberta.¹ Several factors have contributed to this trend:

- **Clean Electricity Supply:** BC Hydro’s electricity grid already generates 98% of its power from hydroelectric sources, meaning BC households already benefit from low-carbon electricity.
- **Grid Reliability:** The province’s electricity system has been highly reliable, offering consistent power quality and relatively few outages—typically resolved quickly by the utility.
- **Perceptions of Solar Potential:** Frequently cloudy weather in the Lower Mainland and Vancouver Island has led to solar energy potential often being underestimated and the incorrect belief that solar electricity is not economically viable in BC.
- **Upfront Costs:** High initial capital costs have posed a barrier for many residential customers considering solar photovoltaic (PV) systems.
- **Technology Perception:** Until recently, solar PV and battery energy storage systems (BESS) were largely seen as emerging, high-cost technologies suited mainly to early adopters.

Despite these factors, residential and commercial solar energy is starting to become an increasingly important part of BC’s renewable energy mix. Advances in solar and battery technologies are making these systems more efficient and affordable. Growing residential electrification, including heat pump and electric vehicle adoption, is driving demand for

¹ [By the Numbers](https://renewablesassociation.ca/by-the-numbers/), Canadian Renewable Energy Association, <https://renewablesassociation.ca/by-the-numbers/>

solar PV and energy storage. The adoption of residential solar and storage systems within BC Hydro’s service area is projected to grow significantly in coming decades.²

Time-of-Use Rate

In June 2024, BC Hydro introduced an [optional residential Time of Use \(TOU\) rate](#) that can add an additional economic benefit to buildings with solar and batteries. As solar panels generate most electricity during the day when most people aren’t home to use it, a battery allows this power to be stored and used during peak demand times instead of using electricity from the grid at a higher rate. By incentivizing customers to shift electricity use away from the 4–9 p.m. on-peak period, the TOU rate supports peak shaving and load shifting—helping to reduce demand on the grid while benefiting both customers and the utility.

Incentives driving growth

In July 2024, BC Hydro launched its first [solar and battery rebates](#). These rebates offer residential customers up to \$5,000 for solar PV panels and up to \$5,000 for battery energy storage systems. BC Hydro also introduced solar and battery rebates specifically for Indigenous communities, multi-unit residential buildings, social housing, and businesses. Together, these incentives are expected to significantly increase demand (and permit applications) for solar PV and energy storage systems across the province.

² “Behind the Meter Solar PV and Storage Market Potential Assessment” by Dunskey Energy + Climate. See Appendix B-1 in [Compliance with BCUC Order No. G-39-25 Net Metering Evidentiary Update \(Application Update\)](#), BC Utilities Commission.

Uptake in solar installations

BC Hydro’s [Self-Generation Program](#) (formerly called Net Metering) allows customers to generate their own electricity through solar PV systems and other renewable sources. As shown in Figure 1, self-generation has grown steadily since 2019. By Feb. 2024, the program included 8,844 customers—93 per cent of whom were residential. Of those installations, 99.5 per cent were solar PV systems.

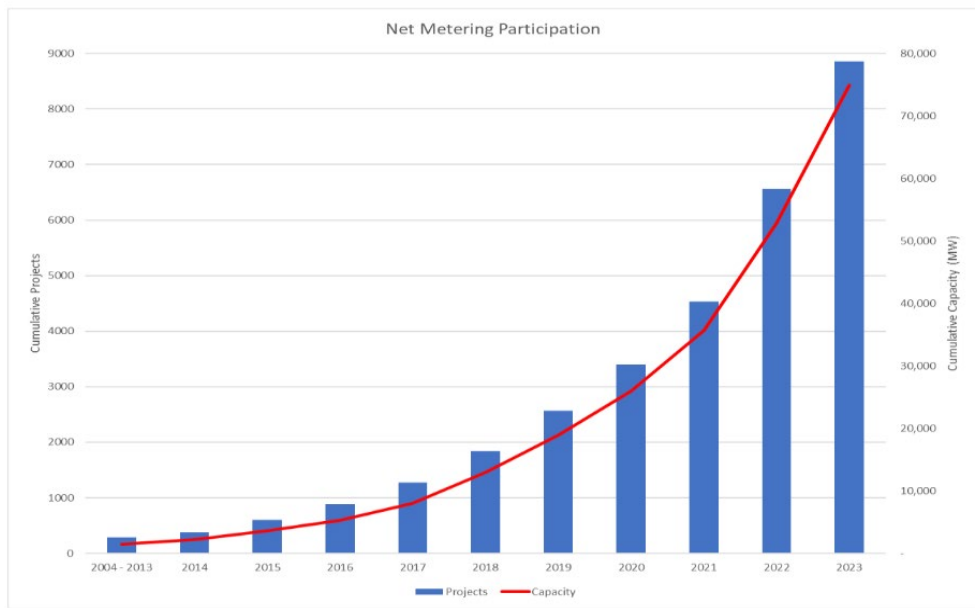


Figure 1: BC Hydro customers participation in self-generation 2004–23

[BC Hydro's self-generation program](#) allows customers to install renewable energy systems—such as solar PV—on their property to generate electricity for their own use.

When these systems produce more electricity than the customer uses, the excess is sent to the grid in exchange for bill credits. These credits can then be applied to future electricity use, helping customers reduce their overall energy costs.

Current challenges are predominantly related to permitting

Despite the positive developments outlined above, professionals in the solar and battery installation industry report there remain significant challenges to increasing adoption. BC Hydro has repeatedly heard from industry about issues with local government permitting. These issues include:

- **Inconsistent municipal regulations:** Not all local governments require building permits for solar PV. For those that do, permitting requirements, processes, timelines, and costs vary significantly.
- **High permitting costs and unclear timelines:** Costs of meeting building permit requirements, slow response times, and often unclear timelines increase expenses for both installers and homeowners.
- **Unclear building code interpretations:** There is considerable uncertainty and variability in how local government staff interpret building codes related to solar PV systems, particularly in regions where snow and seismic loading are concerns.
- **Uncertainty around permitting responsibilities and liability:** Local government staff are unsure of their roles and responsibilities surrounding building permits for rooftop solar installations, particularly with Part 9 buildings.

What this guide covers

Covered

- Behind-the-Meter³ grid-connected residential and commercial rooftop solar photovoltaic systems (solar PV) for new and existing buildings covered by Part 9 and Part 3 of the BC Building Code.
- Behind-the-Meter grid-connected residential and commercial battery storage energy systems, integrated with solar PV, also known as energy storage systems (ESS) or battery energy storage systems (BESS).

Not Covered

- Community solar
- Ground-mounted solar PV systems
- Industrial buildings or facilities
- Solar hot water systems
- Utility-scale Solar and BESS
- Other types of energy storage
- Electric vehicle and e-bike batteries
- Off-grid solar PV and BESS

³ Behind-the-meter refers to solar PV and energy storage systems installed on the customer's side of the utility meter.

Solar & storage 101

For basic information on solar and energy storage technology, read the following BC Hydro resources:

- [Solar panels](#)
- [Batteries for power storage](#)
- [Self-generation](#)
- [Rebates for solar panels and battery storage](#)

Regulatory Framework

Overview

Electrical and building codes are regularly updated to ensure that construction practices—including the design and installation of solar photovoltaic and energy storage systems—meet established performance and safety standards. For solar PV and BESS, code-related safety considerations typically focus on fire risks, electrical hazards, and roof structural integrity. As mature technologies, both are regulated and deployed under the oversight of well-established authorities, including:

- Internationally established mechanical, electrical, and environmental manufacturing quality standards (**CSA**, **IEC**, and **IEEE**).
- Grid-interactive solar system and storage equipment protection, control, and operational standards (CSA 22.2 #107.1, #188, and #257; IEEE 1547, and UL1741SA).
- BC Hydro's **Distributed Generation Technical Interconnection Requirements (DGTIR)** (for systems 100 kW and Below, DGTIR-100).
- The **Canadian Electrical Code (CEC)**, particularly Section 64 which is specific to renewable energy electrical system design, installation, and safety.
 - The CEC requires solar PV and storage systems to be installed under the electrical safety authority permit of Technical Safety BC or a municipal electrical safety authority having jurisdiction.
- **BC Hydro's Self-Generation** application review and operating approval processes, which ensures CSA, CEC, electrical safety authority, and BC Hydro DGTIR-100 compliance.
- The **National Building Code of Canada (NBC)** and **BC Building Code (BCBC)**, which ensures oversight and consideration of rooftop solar PV structural impacts, with commensurate **Truss-Plate Institute of Canada (TPIC)** standards addressing engineered residential truss design and construction.

- Increasingly rigorous storage system fire safety standards including UL9540, and UL9540A called for by CEC, electrical safety authorities, and BC Hydro.
- Continuous improvements to and national oversight of best industry installation practices and training for building and renewable energy professionals, including the Canadian Renewable Energy Association (CanREA), Natural Resources Canada (NRCan), and the Canadian Home Builders' Association (CHBA).

Solar PV systems and BESS are large, rooftop-mounted and building-integrated electrical appliances. As such, they fall under the multiple jurisdictions of the CEC, BCBC, and the Distributed Generation (DG) Interconnection Requirements of the overseeing electrical utility.

The CEC and BCBC are developed by separate overseeing entities. Each has a different mandate, different safety concerns, are enforced by different **Authorities Having Jurisdiction (AHJ)**, and may not align in scope. These gaps contribute significantly to the challenges faced by local governments in managing and streamlining solar PV and battery storage permitting processes.

For instance, the CEC clearly requires electrical permitting for all solar PV and BESS installations, and the electrical permitting process is clearly defined and understood by electrical safety AHJs and the electrical utility approving grid connection of the equipment. However, it is often not clear to AHJs whether they should also require building permits for solar PV, and what those permitting requirements might be.

In some respects, permitting for BESS is simpler than permitting for solar PV due to the absence of structural concerns. However, these projects trigger fire related requirements and compliance with UL9540 and UL9540A safety standards, all of which are enforced by CEC and electrical safety authorities, but are relatively recent and not consistently applied.

These and other code-related permitting challenges are examined more closely below.

Codes, permits and standards

The following details the codes, permits, bylaws, and standards relevant to solar PV and BESS installation in BC. We also examine topics such as electrical and building permits, zoning guidelines, inspection processes, and BC Hydro's Self-Generation Program.

Canadian Electrical Code

The **Canadian Electrical Code** (CEC) is a national CSA standard accredited by the Standards Council of Canada. The CEC sets rules and guidelines for the safe selection, installation, maintenance, and operation of electrical systems in Canada. It covers everything from residential wiring to complex industrial electrical systems, ensuring safety and reliability.

By following the CEC, design professionals and licensed contractors ensure building electrical systems meet safety standards, protecting both people and property, consistently applied across Canada.

The CEC is updated every three years to reflect advances in technology and best practice. Over the past decade, updates to the CEC have clarified and expanded requirements for solar PV and BESS technologies. The most recent edition, CSA C22.1:24, released in 2024, includes important refinements impacting solar PV and BESS design and installation.

While solar PV and BESS systems must comply with all applicable sections of the CEC, Section 64 is particularly relevant. This section outlines specific requirements for renewable energy systems, including design, installation, interconnection, and operational safety for both residential and commercial applications. Refer to the Appendix for a deeper explanation of Section 64's unique provisions.

Electrical Permits

Electrical permits are required for all solar and battery storage installations in BC. For most communities, electrical permitting is managed by **Technical Safety BC (TSBC)**. Several larger cities—City of Burnaby, City of Maple Ridge, City of North Vancouver, District of North Vancouver, City of Surrey, City of Victoria, City of Vancouver and District of West Vancouver—have their own electrical safety departments providing permitting oversight.

Typically, electrical permits are applied for by the solar installation company, which holds an electrical contracting license and acts as a **Field Safety Representative (FSR)**. Homeowners can also apply for electrical permits if they are self-installing solar and energy storage equipment.

For TSBC and most local governments, the permitting process is online. Some local governments still require forms to be filled out in person. In addition to site address, job value, and installation size, electrical permitting typically requires a solar-electric single-line electrical diagram, site plan, and electrical specifications of all equipment.

TSBC charges an annually adjusted fee for electrical permits related to solar PV and energy storage system installations when issued to licensed electrical contractors. In these cases, TSBC may accept the contractor's declaration of work completion in place of a physical final inspection. In contrast, homeowner permits always require a physical inspection.

For local governments that issue their own electrical permits, inspection processes vary, with some communities such as Vancouver being more likely to conduct in-person inspections, even for licensed contractor installations.

Technical Safety BC

Technical Safety BC oversees the installation and operation of equipment and systems in BC that are subject to specific rules and safety guidelines under the [Safety Standards Act](#) and [Railway Safety Act](#). These include energy technologies like electrical, gas, boilers, pressure vessels and refrigeration, as well as transportation technologies like elevating, commuter railways (such as SkyTrain), passenger ropeways (including ski lifts), and amusement devices (like ziplines, roller coasters, and waterslides).

Technical Safety BC is mandated by the Government of BC and is funded by industry. TSBC operates under a [regulatory framework](#) and their [Strategy](#), which is managed by their [executive team](#) and governed by the [board of directors](#).

BC building code

In 2020, the National Building Code of Canada (NBCC) introduced several key updates with respect to solar PV in Part 4 – Structural Design. In 2024, these were integrated into the BC Building Code (BCBC), expanding on earlier guidance to clarify how to maintain the structural integrity of buildings in the presence of solar PV systems (e.g., accounting for snow, seismic activity, wind, and roof membrane integrity).

Updates include:

- a) **Division B – Part 4 Structural Design, Section 4.1.6.16. - Roofs with Solar Panels**
Parts 1) through 6) which cover snow loading concerns and analysis related to parallel mounted solar panels (both flush and raised) on sloped roofs, as well as tilted solar panels on flat roofs. Additional detail is added in notes A-4.1.6.16. (3), (4), 5), and (6) respectively.
- b) **Division B – Part 4 Structural Design, Section 4.1.7.13. – Roof-Mounted Solar Panels on Buildings of Any Height: Roofs with Solar Panels**
Parts 1) through 7) cover wind loading concerns related to arrays parallel or tilted to roof surfaces, array placement impacts for various roof zones, and array proximity to roof edges. Additional detail is added in note A-4.1.7.13.
- c) **Division B – Part 4 Structural Design, Section 4.1.8.18. – Elements of Structures, Non-structural Components, and Equipment**
Parts 17) and 18) provide guidance on ballasted solar array seismic loading impacts. Additional details is added in note A-4.1.8.18.

For solar PV installations on new buildings, the BCBC version enforced by the building authority having jurisdiction at the time will normally apply. In the case of retrofitting solar PV to buildings constructed under earlier BCBC versions, professional guidance on suitable structural due diligence may be required.

Fire safety setbacks

Fire safety setbacks are another factor that can affect solar PV installations. The National Fire Code of Canada does not itself set specific rooftop PV setback requirements; such requirements are generally handled through local fire officials, municipal bylaws, or design guidance documents rather than within the NFC model text. Examples include the 2-foot fire safety perimeter in Vancouver and the District of North Vancouver⁴, and other communities with setback requirements related to snow. Leaving a perimeter around the roof can lead to diminished space for solar PV panels.

⁴ See the [District of North Vancouver's zoning bylaw](#), Part 4C Green Building Regulations, which specifies that that installations can be up to a roof ridgeline (no setback) and must be a minimum of 0.6m from the edge of the roof.

Building permits

It is the responsibility of local governments to decide whether building permits are required for solar PV and BESS installations in BC (and to administer the permitting process if required). While many local governments across BC require building permits for solar PV and storage, some do not. Please see the Appendix for a jurisdictional scan.

Where building permits are required for solar PV and BESS, installers must typically provide electrical and mechanical attachment drawings and structural reports with professional assurances. The purpose of permitting is to ensure installations are done safely and appropriately, including suitable consideration of:

- Solar array structural impacts such as roof load redistribution, snow drifting, seismic activity, wind uplift, and roof membrane penetrations.
- Racking attachment methods, and special circumstances such as flat roofs, or ballast systems.

The BC Building Code (BCBC) does not prescribe details such as which type of solar PV equipment should be used on a given roof, or how solar racking systems must be attached. Rather, installation professionals, and local governments (where building permits are required) must interpret relevant BC Building code sections and follow best practices to establish what is considered safe.

Note: building permits are rarely required for BESS alone.

Other municipal or code requirements

It is also not uncommon for real estate developers or neighbourhood associations to impose solar PV related restrictions or prohibitions in selected neighbourhoods and gated communities, above and beyond local government requirements. For example, a single family residential development may prohibit solar PV arrays, inverters, or associated solar-electric equipment being visible from the street, while the local government has no such restrictions.

Zoning guidelines

Local governments may have clauses in their zoning bylaws pertaining to solar PV and BESS.⁵

Form and character guidelines may not allow solar on heritage homes, indicate a preference for certain locations (locating panels toward the rear yard or garage to minimize effect on streetscape), or dictate whether panels should be parallel to roof pitch or can mounted be mounted at an angle. These criteria can have a negative impact the overall generation capacity of the solar PV system (for example, see the [City of Vancouver's solar installation guidelines](#)).

Some local governments may include or exclude solar PV in the overall calculation of building height requirements (see [Regional District of Okanagan-Similkameen](#) for an example). Others may allow solar outright in all zones without zoning bylaw review, while other could have a complex patchwork of different zoning requirements.

CSA standards for solar and energy storage equipment

The Canadian Standards Association (CSA) has established several standards relevant to solar PV and BESS, many of which have been blended with and adapted from related international standards from the International Electrotechnical Commission (IEC), Institute of Electrical and Electronic Engineers (IEEE), Underwriter Laboratories (UL), and the American National Standards Institute (ANSI). CSA compliance is required by both electrical safety authorities and BC Hydro's self-generation program.

These standards are crucial for ensuring the safety, performance, and sustainability of solar PV and BESS in Canada. They provide guidelines that help manufacturers, installers, and local authorities maintain high standards of quality and safety in the deployment of these technologies.

Of particular interest is **CSA SPE-900 (2013)**—currently undergoing a major update—which outlines best practices for the installation of solar PV and BESS. Please refer to the Appendix for a summary of all pertinent CSA standards.

⁵ It is interesting to note that Ontario exempts rooftop and wall mounted solar from zoning bylaws. See Ontario Regulation 508/18 Designations Under Part II.3 of the Electricity Act of 1998 (<https://www.ontario.ca/laws/regulation/180508>).

BC Hydro's self-generation program

BC Hydro's [self-generation program](#) (formerly called net metering) allows customers to generate their own electricity through solar PV and other renewable sources. BC Hydro revenue meters are intrinsically bi-directional, separately measuring both energy inflow from the grid and energy outflow to the grid, with energy reconciliation occurring at the end of each billing period.

Figure 2 shows a solar PV system without energy storage connected under BC Hydro's self-generation program. The homeowner's solar inverter system operates in parallel with the grid, reducing required grid energy purchase during daylight hours. When solar PV power output exceeds home load requirements, energy flows into the grid at a credit. During grid outages, the solar PV system shuts down, returning to service when grid supply is restored.

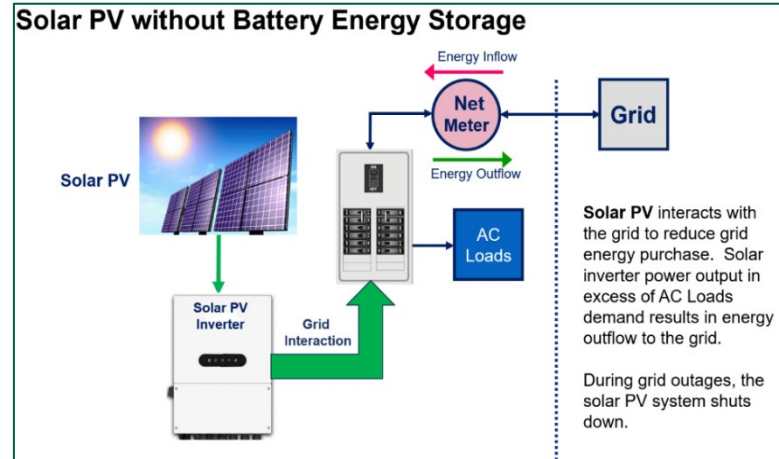


Figure 2: Solar PV Self-Generation without Battery Energy Storage

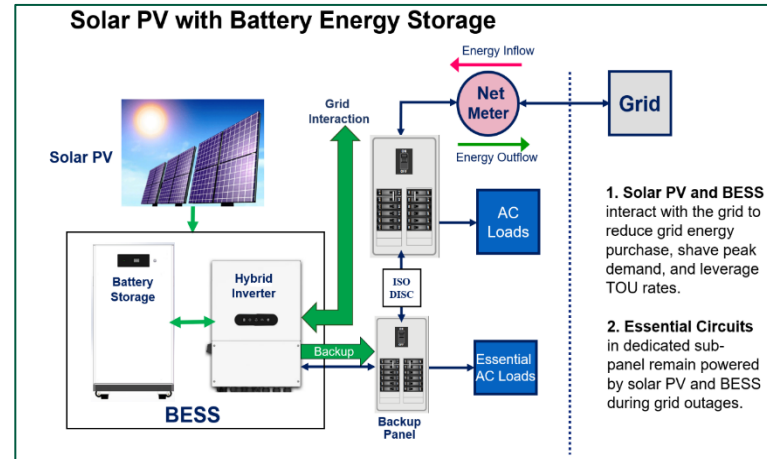


Figure 3: Solar PV Self-Generation with Battery Energy Storage

Figure 3 shows a solar PV system with BESS connected under BC Hydro's self-generation program. This system operates similarly to the system of figure 2 with the following additional functionality:

- The hybrid inverter can either send surplus energy to the battery or to the grid.
- The system can provide backup power during a grid outage.
- The system can use stored energy to reduce grid draw during the home's load peaks, and to leverage BC Hydro's optional Residential Time-of-Use (TOU) rates—for instance, by using stored energy to reduce consumption between 4–9 p.m. when energy costs are 5 cents/kWh higher.

To apply, installers submit a self-generation application to BC Hydro on the customer's behalf. This includes details about the customer's BC account and revenue metering, the proposed solar PV and storage system, technical specifications, and compliance with CSA and international safety standards. BC Hydro reviews the application to ensure the installation meets utility interconnection requirements, technical standards, and electrical safety standards. Once approved, the installation can proceed. On completion, proof of electrical contractor final declaration to the electrical safety AHJ, or successful electrical inspection are required. BC Hydro then issues parallel operating approval and the system may be permanently connected to the grid.

At the moment, BC Hydro's self-generation program limits system size by restricting grid power injection to 100 **kWac**.

Research

Our approach

Is BC ready for the expected, rapid growth in solar PV and BESS? Manufacturing, performance, and electrical safety standards are thorough and compliance is well-enforced by utilities and safety authorities. However, installers, local governments, and homeowners face a regulatory and approval environment that is complex to navigate.

The landscape shows inconsistent municipal regulations, differing and high permitting costs, unclear permitting timelines, lack of clarity in interpreting relevant building codes, and uncertainty around permitting responsibilities. For this report, CEA sought to understand how these conditions may challenge or slow the healthy growth of solar PV and BESS. Our research process included the following:

- **Initial interviews with five jurisdictions within BC**, representing a range of permitting processes and geographic areas, to understand the rationales for different local government permitting approaches, challenges and successes.
- **Initial interviews with five jurisdictions outside BC**, representing communities with well-developed approaches to solar permitting, to understand their approaches, challenges and successes.
- **Individual meetings with associations working with housing providers and solar installers**, to understand what their members are saying about solar permitting.
- **A focus group with solar and battery installers across BC** to better understand their challenges with permitting and to gather their recommendations.
- **Two focus groups with local government staff across BC** to share our preliminary findings and learn more about their successes, challenges and needs.
- **Consultation** with BC Hydro, Technical Safety BC, the Government of BC's Construction Standards and Digital Solutions Branch and select local government building officials.
- **Desktop research** from Canadian and US sources.

Key findings from focus groups

The focus groups reveal that electrical permitting generally works well, whether issued by TSBC or by local governments. Industry participants noted some concerns related to the lack of in-person inspections in TSBC communities. They also cited challenges when newly working with inspectors (both TSBC and local government) and in municipalities where electrical code interpretations differ. Local government participants under TSBC electrical jurisdiction noted that they received little communication and data from TSBC. However, these issues were all relatively minor.

Building permits are another story. Both industry and local government participants described challenges navigating the building permit process. Their concerns vary and are, in some cases, contradictory.

For industry participants, a key challenge is the **wide variation in local government permitting practices** across the province, with some not requiring building permits at all for Part 9 buildings, and others imposing lengthy, cumbersome, and expensive processes. Industry participants commented that smaller communities often lack experience with solar PV and BESS, making it harder for installers to get clear building authority guidance.

From a local government perspective, these variations are explained by differences in: snow zones; seismic zones; building typologies; local industry knowledge levels; local government staff capacity, culture, and risk tolerance; and, lack of clarity around local government responsibilities and jurisdiction. Clarifying local government responsibilities can lead to some consistency, but many of these complicating factors will remain.

Industry participants expressed concern over **high permitting costs**, particularly in larger cities. Local government participants put permitting costs around 1% of project cost (i.e. under \$200), but this neglects to account for correlated compliance costs such as drawing preparation, professional engineering assurances, and building schedules—costs which customers must bear.

Industry participants criticized **unclear or lengthy permitting timelines** when working with some local governments. Most local government participants estimated it usually takes less than six weeks to receive a building permit, while electrical permits are typically issued more quickly—essentially immediately for TSBC online applications.

Solar PV and BESS installations are sometimes delayed by unrelated enforcement—i.e., when building permits trigger the discovery of unrelated issues such as a non-permitted basement suite or deck construction. From the perspective of industry participants, this slows down installation and increases homeowner costs. Local governments, for their part, stressed that building inspectors are required to note and call for remediation of all non-compliant work (and some building officials attested that unrelated safety compliance issues would not delay a solar permit application).

Finally, industry participants flagged setback requirements as reducing the number of panels that can be installed. These requirements can include things such as the 2-foot fire safety perimeter in Vancouver and the District of North Vancouver⁶, and other communities with setback requirements related to snow.⁷

⁶ See the [District of North Vancouver's zoning bylaw](#), Part 4C Green Building Regulations, which specifies that that installations can be up to a roof ridgeline (no setback) and must be a minimum of 0.6m from the edge of the roof.

⁷ The National Fire Code of Canada does not itself set specific rooftop PV setback requirements; such requirements are generally handled through local fire officials, municipal bylaws, or design guidance documents rather than within the NFC model text.

Recommendations

Introduction

Our research reveals that, given the range of needs of different local governments across BC, it is not currently possible to point to one solar PV and BESS permitting model as the best practice. Considerations include geographic variability (presence or absence of snow loads; seismic risk), the different building typologies in each community, local government staff capacity, and the risk tolerance of local government staff.

Nevertheless, there are significant opportunities for local governments to learn from one another, work together, and make improvements that streamline their permitting approaches. Below, we identify **quick wins** that can be implemented by local governments at relatively low cost, effort, and risk, and **longer term, more comprehensive strategies** that will require coordination between stakeholders.

Industry Consultation

These recommendations were developed in consultation with [Riverside Energy Systems](#), a full service solar PV installer based in Kamloops and active across BC. Riverside brings over 30 years of experience in renewable energy systems consulting, design, installation, and education.

Quick Reference

Education & Communication

- ☐ Develop clear online materials on solar permitting
- ☐ Familiarize staff with industry best practices for solar PV and BESS installation
- ☐ Provide staff training on solar PV and BESS
- ☐ Hold information sessions for residents and installers
- ☐ Include solar PV and BESS actions in your community's policy documents

Permitting processes

- ☐ Create an online permit application portal
- ☐ Make stamped record drawings, schedules, and professional assurances easy to access
- ☐ Fast track retrofit solar PV applications in your building permit queue
- ☐ Track the number of solar and battery permit applications your community receives annually.
- ☐ Support BC Hydro self-generation applications by clearly marking when permits have been approved

Taking it further

- ☐ Work with neighbouring municipalities and regional districts to develop a consistent regional approach to solar PV permitting
- ☐ Consider a holistic review of opportunities to streamline residential solar permit requirements without increasing risks or liabilities
- ☐ Establish solar PV and BESS permitting criteria grounded in best practices, independent oversight, utility compliance, and global experience
- ☐ Consider a collaborative study with solar PV consultants and structural engineers
- ☐ Establish a collaborative initiative to develop a province-wide template for standardized solar PV and storage permitting

Quick wins for local governments

Education & communication

Develop clear online materials on solar permitting

For homeowners and service providers seeking to install solar panels, it is not always obvious whether building permits are required. In cases where a local government does require permits, the specific permitting criteria, application processes, key contacts, and preferred methods of communication with local government are not always clear. This can result in time-consuming delays for all stakeholders.

To improve permitting processes, local governments can:

- Provide user-friendly online materials that outline your community's solar PV and BESS permitting requirements, processes, fees, and key staff contacts (for example, the [City of Toronto publishes a clear and easy to understand chart](#) that summarizes solar permitting considerations).
- Clearly state which types of solar PV and BESS projects require permits and which may be exempt (for example, installations of different types of buildings (Part 3 or Part 9), rooftop vs ground mounted systems, etc.).
- Use plain language and step-by-step explanations to reduce confusion for homeowners, installers, and even local government staff.
- Assign a main contact for solar and BESS permitting inquiries and ensure they receive appropriate training (see below). Publish contact details online to make communication more direct and efficient.

Best practice examples: online materials on solar permitting

[The City of Edmonton](#) provides clear guidance on its requirements for solar PV installations, including application steps, fees, and inspection processes.

Familiarize staff with industry best practices for solar PV and BESS installation

Local government staff should gain familiarity with best installation practices as advised by reputable sources. This will increase confidence in reviewing permits, making decisions, and discussing projects with homeowners and installers. Suggested reference publications are listed under our Appendices.

Provide staff training on solar PV and BESS

Offer staff training on solar PV and BESS technologies, related electrical and building code concepts, and your community's planning and zoning regulations and permitting processes. Training should focus on:

- Clarifying how grid-connected solar PV and BESS operate.
- Improving awareness of the international manufacturing standards, safety requirements, and utility interconnection reviews that govern solar PV and BESS.
- Reducing confusion about planning rules, zoning regulations, and permitting for solar PV and BESS.
- Clarifying the division of responsibilities and risks between local governments, electrical safety authorities, utilities, and solar designers/installers for solar PV and BESS installations.
- Ensuring building authority, electrical authority, and fire safety authority staff are delivering consistent solar PV and BESS related messaging within your community.

Hold information sessions for residents and installers

Regularly offer information sessions on solar technologies and your community's permitting practices. These sessions can strengthen communications between all stakeholders, raise awareness of established practices, allow local governments to hear and act on legitimate concerns, boost cooperation, and help streamline solar PV and BESS adoption. Contact BC Hydro to request information on their interconnection processes and incentive programs in advance of the sessions.

Include solar PV and BESS actions in your community's policy documents

Demonstrate broad support for solar PV and BESS by including related actions and targets in climate action plans, official community plans, and zoning bylaws. Embedding these actions and targets in policy builds awareness and communication among stakeholders, and makes a clear connection to the economic, climate, and resiliency benefits of adopting renewable energy in the community.

Permitting processes

Create an online permit application portal

Local governments' permit application processes vary widely, and some still rely on Canada Post or in-person submission. Perhaps counterintuitively, paper applications don't normally foster direct communication between staff and applicants—questions, clarifications, and updates are often discouraged, difficult, or impossible.

Instead, develop an online application portal where homeowners and installers can easily learn permitting requirements, apply for permits, submit supporting documentation, check application status, request clarifications, ask questions, and address permitting deficiencies.

Make stamped record drawings, schedules, and professional assurances easy to access

For homeowners, expenses required to meet permitting criteria often far exceed the actual building permit fee. Structural assessment costs are incurred regardless of whether a property is ultimately deemed suitable for solar PV, leaving homeowners to assume significant financial risk when exploring project viability. Communities that require stamped drawings, structural assessments, assurances, and/or professional schedules are adding thousands of dollars to project costs—all of which are borne by the property owner.

Local governments can help by making stamped record drawings, schedules, and professional assurances that are already on-file easily accessible to property owners and installers. This would significantly lower the cost of permitting compliance and support wider solar adoption.

Best practice example: SolarAPP+ automated permitting software

[SolarAPP+](#) is a free, US-based software service that helps local governments issue permits for eligible, code-compliant residential solar systems. It checks applications against local building codes, standards, and site conditions before approving them. While SolarAPP+ isn't available in Canada, it shows how automated permitting can streamline the process and reduce delays.

Fast track retrofit solar PV applications in your building permit queue

Building permits for solar PV installations on existing homes are relatively straightforward—especially when compared to the complexity of permits for new builds. Local governments should consider streamlining or fast-tracking retrofit solar PV applications. Prioritizing these simpler applications can reduce processing times, improve customer experience, and free up staff capacity for more complex files.

Track the number of solar and battery permit applications your community receives annually.

Track successful solar PV and BESS permit applications (potentially as part of climate reporting) to reinforce the importance of investing in permit staffing and solar PV initiatives.

Where electrical permits are issued by TSBC, consider asking for regular data sharing to help refine solar PV and BESS project statistics, and highlight instances where building permit processes may be incomplete.

Support BC Hydro self-generation applications by clearly marking when permits have been approved

To support BC Hydro’s [self-generation program](#), local governments should clearly indicate when a permit has been approved (e.g. by placing a clearly visible and brightly coloured “approved” stamp on the first page of the permit).

Taking it further: comprehensive strategies for solar & battery permitting

While the “quick wins” outlined above can be implemented by individual local governments at relatively low cost, effort, and risk, longer-term improvements will require greater coordination and investment. These efforts, however, hold the greatest potential for driving broader adoption of solar PV and BESS. Intentional collaboration among electrical utilities, safety authorities, solar and storage professionals, engineering consultants, and neighbouring building authorities will be key to realizing these benefits.

Work with neighbouring municipalities and regional districts to develop a consistent regional approach to solar PV permitting

Significant variation in permitting requirements between local governments within the same region—especially between neighbours—can be confusing, cause delays, and frustrate all stakeholders, including municipal staff. Harmonizing permitting requirements among neighbouring local governments will give installers greater confidence to work throughout the region, supporting broader solar PV adoption.

Consider a holistic review of opportunities to streamline residential solar permit requirements without increasing risks or liabilities

It may be valuable to review existing residential solar permitting requirements with an eye toward opportunities for streamlining, while ensuring that risks and liabilities remain properly managed. Some jurisdictions have found it helpful to identify specific permitting objections and then assess whether these concerns stem, at least in part, from misunderstandings or lack of awareness about the extent of liability and risk mitigation already addressed under the jurisdiction of electrical safety authorities, utility interconnection requirements, professional assurances, and installer commercial liability insurance.

Consider reviewing instances of safety incidents related to solar PV and BESS within your municipal boundaries as part of an overall risk assessment process. A useful starting point may be to clearly articulate the specific risk and liability concerns that underpin your jurisdiction's existing permitting criteria. For example, a permitting process may require:

- Professional structural assurances and stamped attachment drawings because solar PV arrays may cause structural failures under snow load, wind load, or seismic activity.
- Professional electrical assurances and stamped solar-electric drawings because solar PV and storage systems create electrical safety and fire hazards.
- Professional electrical and structural schedules C-B, and proof of successful electrical safety authority inspection, to prove solar PV and storage installation work has been completed properly.
- Confirmation of BC Hydro self-generation parallel operating approval, because solar PV and storage systems impact electrical utility operation and safety.

As responsibilities related to risk and liability among stakeholders become clearer, and as electrical and building codes are updated, empirical installation experience is reviewed, and new information emerges, opportunities may arise to adjust policy at key tipping points. Examples could include:

- BCBC 2024 Division B – Part 4 Structural Design, Section 4.1.8.18 solar PV seismic loading guidance should not be a concern for pitched roof solar PV arrays which are always mechanically attached and hence intrinsically seismically restrained.
- New buildings constructed under BCBC 2024 using engineered solar-ready trusses designed for site snow loads with consideration to BCBC 2024 Division B – Part 4 Structural Design, Section 4.1.6.16 solar PV array snow loading guidance, should not require duplicated structural assurances when subsequently installing solar PV.
- Since solar PV array racking systems and standards, mechanical attachment hardware, and best installation practices have advanced significantly, and in compliance with NBCC and BCBC updates since CSA SPE-900-13 was published, some measure of structural risks and liabilities can be offloaded from local governments to installers and homeowners.

- If after careful study of structural risks and liabilities, a neighboring municipality has concluded that most Part 9 buildings⁸, or a specific subset of building such as homes constructed after 1987⁹, do not require solar PV installation permitting, a local government could consider whether similar comfort levels could be established.
- Solar PV and storage electrical safety concerns, including fire hazards, are thoroughly addressed in Canadian Electrical Code. CEC compliance is enforced by electrical safety authorities, and proof of CEC compliance required by electrical utility self-generation interconnection standards and approval processes. Further, licensed electrical contractors installing solar PV and storage carry commercial liability insurance. Accordingly, electrical safety and fire related risks and liabilities might be considered outside of local government scope, and stamped professional electrical assurances or proof of passed electrical inspections less essential to permitting requirements.
- Since solar PV and storage systems are grid connected, they are carefully reviewed and approved by electrical utilities for utility related risks and liability. As part of the approval process electrical utilities are looking for proof of local government or TSBC permitting approval as part of the interconnection process.

Establish solar PV and BESS permitting criteria grounded in best practices, independent oversight, utility compliance, and global experience

Many construction materials and technologies that are now standard—such as natural gas appliances, oriented strand board, engineered trusses, insulated concrete forms, structural insulated panels, heat and energy recovery ventilation systems, heat pumps, and triple-pane windows—were once unfamiliar and concerning to local permitting staff. Over time, permitting concerns typically shifted, either easing as confidence and experience grew or intensifying when real risks became apparent.

⁸ See, for example, the City of Victoria’s [Photo Voltaic \(PV\) & Non-PV Solar Panels \(Solar Panels\) Policy](#), which exempts most Part 9 buildings from needing building permits.

⁹ See, for example, the City of Vancouver’s solar installation guidelines, which exempt many homes designed in compliance with the 1987 Vancouver Building Bylaw or newer: <https://vancouver.ca/files/cov/solar-pv-permit-process.pdf>

Although solar PV and BESS technologies are mature and widely adopted internationally, their uptake in Canada, and especially in BC, remains modest compared to provinces like Ontario and Alberta.¹⁰ Our research suggests that many BC local governments are not yet confident enough in these technologies, subjecting projects to heightened scrutiny. Concerns often focus on theoretical risks, despite low rates of structural or fire-related failures, continuous improvements in technology and practices, and ongoing code updates.

Building on earlier recommendations, local governments can accelerate permitting consistency and confidence by partnering with utilities, reputable installers, and engineering professionals to:

- **Assess structural risks:** Review documented instances of solar PV-related failures under snow, wind, or seismic loads in BC, Canada, and comparable regions abroad. For each case, analyze the consequences, root causes, and stakeholder responsibility (e.g., installer error, equipment failure, inadequate professional assurance, or permitting oversight).
- **Assess fire risks:** Study known solar PV or BESS-related residential fires in Canada and comparable jurisdictions, identifying causes such as inverter arc fault protection failures or battery overheating, and determine how responsibilities and mitigations were allocated.¹¹
- **Learn from other jurisdictions:** Examine policies in other provinces and nations to identify effective measures, such as stronger installer credentialing, specified attachment methods, shifting liability to installers and homeowners, or requiring additional professional assurances.
- **Adjust requirements accordingly:** Consider relaxing or strengthening permitting criteria based on the evidence from structural and fire incident analyses and international best practices.

By grounding permitting requirements in demonstrated risks, established oversight, and the extensive operating experience of other jurisdictions, local governments can build greater confidence, reduce unnecessary barriers, and support broader adoption of solar PV and storage.

¹⁰ [By the Numbers](https://renewablesassociation.ca/by-the-numbers/), Canadian Renewable Energy Association, <https://renewablesassociation.ca/by-the-numbers/>

¹¹ Municipalities should consult their local fire departments.

Consider a collaborative study with solar PV consultants and structural engineers

Develop guidance based on representative residential designs and real-world experience to help streamline permitting reviews.

Partner with solar PV consultants and structural engineers to assess structural impacts and create a database of local solar PV and BESS installations and design archetypes. This reference library will enable local government staff to compare projects against established scenarios, rather than treating each application in isolation (in contrast with the common practice of requiring stamped professional assurances for every project, even when similar designs have already been reviewed and approved).

Clear criteria for when building permits are, or are not, required will strengthen confidence for both staff and applicants. Detailed studies of snow, wind, and seismic load impacts on local archetypes—combined with best installation practices—allow local governments to define conditions under which streamlined permitting can proceed with minimal added risk or liability.

Example conclusions might include statements of the following nature:

- Solar PV permitting is not required in the following circumstances:
 - Where solar ready engineered roof trusses have been used.
 - The building was constructed after 1987.¹²
 - If the local government establishes a policy exempting most Part 9 installations from requiring building permits, such as the City of Victoria’s [Solar Panel Policy](#).
- A structural comfort letter¹³ may replace stamped structural assurances and schedules in the following circumstances:

¹² See the City of Vancouver’s [solar permit guide](#), which states that a building permit may not be required if the “roof is designed in compliance with the 1987 VBBL or newer”. Although the Vancouver Building Bylaw (VBBL) is unique to the City of Vancouver, it is based on the BC Building Code.

¹³ A structural comfort letter is a brief, engineer-issued statement confirming that an existing building or structure can safely support a proposed addition or installation—such as solar panels—based on a review of available drawings, site conditions, and applicable codes. It is not a full structural analysis; rather, it provides professional assurance that the proposed work is acceptable within the limits of the engineer’s review.

- Where solar ready engineered roof trusses have been used.
- The building was constructed after 1987.¹⁴
- For parallel flush solar arrays mounted on sloped roofs where the space between rows is much smaller than panel width ($w_g \ll w_p$), solar array accumulated sliding snow load issues of BCBC 2020 figure A-4.1.6.16.(4)(c) are not a concern, and stamped structural assurances or comfort letters are not required for solar PV permitting.
- For parallel flush solar arrays mounted on sloped roofs where the building's smallest horizontal dimension is less than 73 m, and arrays are no more than 1.2 m from roof edges, solar array wind loading concerns of BCBC 2020 do not apply and a structural comfort letter suffices for permitting purposes.

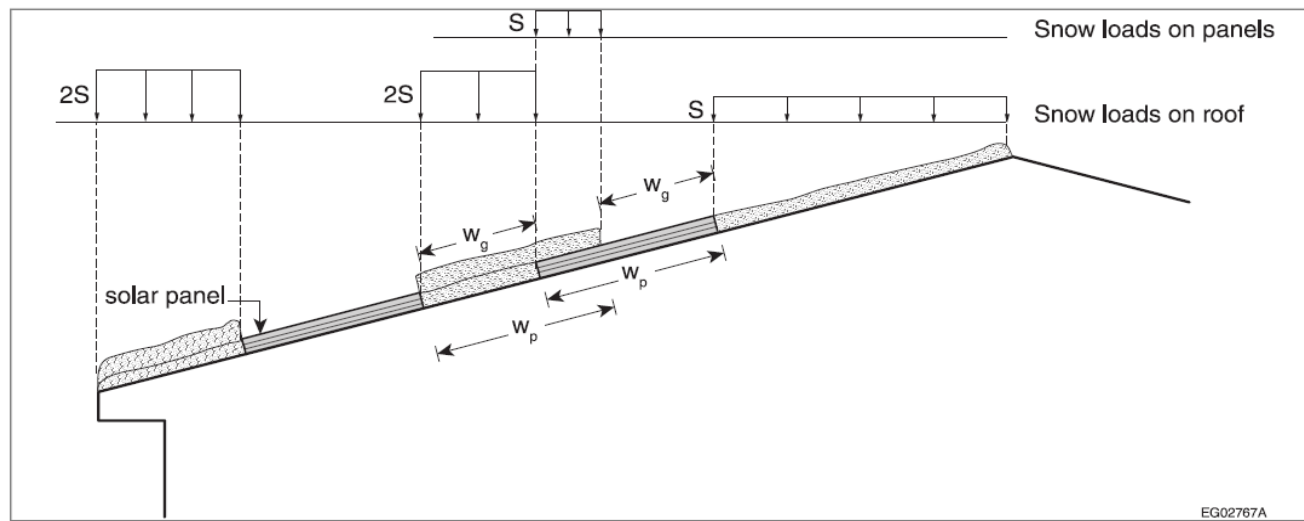


Figure A-4.1.6.16.(4)(c)
Snow loads for a sloped roof with Parallel Flush solar panels where $w_g < w_p$

¹⁴ See the City of Vancouver's [solar permit guide](#), which states that a building permit may not be required if the "roof is designed in compliance with the 1987 VBBL or newer". Although the Vancouver Building Bylaw (VBBL) is unique to the City of Vancouver, it is based on the BC Building Code.

- Solar array related snow and wind loading effects in our jurisdiction have been reviewed internally, and structural assurances are only required for solar PV installation permitting under the following circumstances:
 - If a ballasted racking strategy will be used.
 - If racking attachment interval will exceed 48”.
 - If the building’s smallest horizontal dimension exceeds 73 m.
 - If the building was constructed prior to 1987.
 - If the solar installation does not meet all established criteria.
- For parallel flush solar arrays mounted on sloped roofs where the building’s smallest horizontal dimension is less than 73 m, and arrays are no less than 1.2 m from roof edges, solar array wind loading concerns of BCBC 2020 do not apply and a structural comfort letter suffices for permitting purposes.

Establish a collaborative initiative to develop a province-wide template for standardized solar PV and storage permitting

Join other local governments in a province-wide initiative creating a standard framework for permitting criteria, requirements, checklists, and processes. Focus group participants suggest this is the best approach to solving differing interpretations of code across local governments. Jurisdictions with well-established permitting practices can help refine and strengthen consensus approaches, while those with less experience will benefit from shared knowledge and lessons learned.

Conclusion

Since 2024, BC Hydro rebates have driven a notable increase in residential and commercial solar PV and BESS installation. Despite this momentum, broader uptake of solar technologies is hindered by inconsistent and unclear permitting processes—especially where local governments interpret building codes differently or lack the capacity to streamline their processes.

This guide examined these barriers through focus group engagement with industry professionals and local government staff, highlighting that while electrical permitting is generally working well, building permits remain a source of delay and uncertainty. Installers cited inconsistent permitting fees, timelines, and requirements across jurisdictions, while local governments pointed to differing regional conditions, risk tolerances, and staff resources as factors shaping their practices. Bridging these gaps requires better coordination and clearer guidance—but also an understanding that not all variation can be eliminated due to BC’s geographic and administrative diversity.

Our research identified a range of practical opportunities for local governments in BC to support the streamlined adoption of residential solar PV and battery storage systems. These opportunities include actions such as improving public-facing information and online application tools, providing training on solar technologies and regulations, integrating solar into broader climate and planning documents, and collaborating regionally on consistent permitting practices. By taking these steps—many of which require modest resources but can significantly enhance user experience—local governments can reduce barriers, align with best practices, and accelerate clean energy uptake in their communities.

Looking forward, there is a clear opportunity for local governments across BC to work together, align on best practices, and modernize permitting processes to support the safe, consistent, and widespread deployment of solar PV and energy storage systems. By doing so, they can play a pivotal role in accelerating the province’s transition to a more resilient and efficient energy future.

Appendix

Glossary & list of acronyms

- **American National Standards Institute (ANSI):** A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, and systems in the United States.
- **Authority Having Jurisdiction (AHJ):** The organization, office, or individual responsible for enforcing codes and standards at the local, regional, or national level.
- **Ballasted Racking:** A weighted mounting system used to secure solar panels, particularly on flat rooftops, without penetrating the roofing material.
- **BC Building Code (BCBC):** The provincial regulation in BC that sets out technical requirements for building construction, including health, safety, accessibility, and energy efficiency.
- **Behind-the-Meter:** Refers to energy systems, like solar panels or batteries, that operate on the customer's side of the utility meter.
- **Canadian Electrical Code (CEC):** A set of standards published by CSA that governs the safe installation and maintenance of electrical equipment in Canada.
- **Canadian Standards Association (CSA):** A standards development organization that creates and maintains safety and performance standards for a wide range of industries in Canada.
- **Construction Standards and Digital Solutions Branch (CSDS):** Formerly the Building Safety and Standards Branch (BSSB), this branch of the BC government is responsible for the development and implementation of construction codes and digital solutions in BC.
- **Distributed Generation (DG):** Small-scale electricity generation technologies located close to where the electricity is used, such as rooftop solar or small wind turbines.
- **Distributed Generation Technical Interconnection Requirements (DGTIR) –** Technical interconnection requirements for connecting generators to BC Hydro's Distribution System.

- **Battery Energy Storage System (BESS):** A device or group of devices used to store energy for later use, often paired with renewable generation.
- **Field Safety Representative (FSR)** - An individual certified by Technical Safety BC who is authorized to perform, supervise, and/or sign off on regulated electrical work in BC. FSRs ensure that work complies with the BC Electrical Code and other safety regulations.
- **International Electrotechnical Commission (IEC):** An international organization that prepares and publishes international standards for electrical, electronic, and related technologies.
- **Institute of Electrical and Electronics Engineers (IEEE):** A global professional association that develops technical standards and promotes knowledge in electrical and electronic engineering.
- **Independent Power Producers (IPP):** Non-utility entities that own and operate electricity generation facilities and sell power to utilities or end users.
- **kV (Kilovolt):** A unit of electric potential equal to 1,000 volts.
- **kWh (Kilowatt-hour):** A measure of energy consumption equivalent to using 1,000 watts for one hour.
- **kWac (Kilowatt alternating current):** A unit indicating the power output of a solar system or inverter in AC, after DC-to-AC conversion losses.
- **Load Displacement:** Reducing the amount of power drawn from the grid by generating electricity on-site.
- **Load Shifting:** Moving electricity consumption from peak demand times to off-peak times to optimize cost or grid impact.
- **National Building Code (NBC)** - sets out technical requirements for the design, construction, renovation, and occupancy of buildings across Canada. Adopted by provinces in Canada sometimes with slight alterations, such as the BCBC.
- **Part 3:** Refers to the section of the BC Building Code dealing with complex buildings, generally those over 600 m² or more than three storeys.
- **Part 4:** The section of the BC Building Code that outlines structural design requirements for buildings.
- **Part 9:** Covers smaller residential and commercial buildings under the BC Building Code, typically those under 600 m² and three storeys or less.

- **Peak Shaving:** Reducing electricity use during peak demand times to avoid high charges or strain on the grid, often using energy storage.
- **Pitched Roof:** A sloped roof, typically with an angle that helps shed water and snow and may impact solar panel mounting.
- **Self-Generation:** The practice of generating electricity for personal or on-site use, reducing reliance on the utility grid. BC Hydro's Self-Generation program allows customers with small-scale renewable energy systems (up to 100 kW) to offset their electricity use and receive credits for any surplus energy sent back to the grid.
- **Solar Photovoltaic (PV) System:** A system that converts sunlight directly into electricity using solar panels.
- **Solar Hot Water System:** A solar thermal system that uses the sun's energy to heat water for domestic or commercial use.
- **SPE-900:** A 2013 CSA standard providing guidelines for the installation of photovoltaic systems in Canada.
- **Time of Use (TOU) Rates:** Electricity pricing that varies depending on the time of day, encouraging consumers to use energy during off-peak hours.
- **Truss (Structural Beam):** A framework, typically triangular, used to support roofs and other structures efficiently.
- **Truss Plate Institute of Canada (TPIC)** - National association representing the Canadian metal plate connected wood truss industry. TPIC develops engineering standards, guidelines, and best practices for the design, manufacture, and installation of wood roof and floor trusses that use metal connector plates.
- **Technical Safety BC (TSBC):** A regulatory authority in BC that oversees the safe installation and operation of technical systems and equipment.
- **Underwriters Laboratories (UL):** A global safety certification company that tests and certifies products for compliance with rigorous safety standards.

Key elements of the CEC pertaining to solar PV and BESS installation

CEC considerations particularly relevant to solar PV and energy storage systems include:

- **DC Arc Fault Detection (64-216):** One of the largest safety hazards with Solar PV systems is high voltage DC and the risk of arc faults. Any circuit over 80V requires arc fault protection.
- **Rapid Shutdown (64-218):** Intended to protect first responders from high voltage DC, rapid shutdown is required for all PV arrays on rooftops that have DC conductors extend beyond 1 meter of the PV array.
- **Point of Connection Bus Capacity (64-112):** to protect electrical panels from overheating conditions and reduce fire risk, this rule limits the parallel generation source circuit breakers to a safe level depending on the service application (commercial vs. residential).
- **Grounding and Bonding (64-066, 64-068, 64-070, 64-072, 64-224, 64-810, 64-916):** Proper grounding and equipment bonding is essential both to preventing electrical shock and protecting equipment. The CEC specifies practices and conductor sizing for appropriate grounding and bonding of solar PV equipment, energy storage systems and the connected electrical service equipment. Each of these rules also refer back to Section 10 of the electrical code.
- **Overcurrent Protection (64-058, 64-214, 64-806, 64-912):** Overcurrent protection devices (OCPDs), such as fuses or circuit breakers, prevent equipment from sustained overload. They also quickly interrupt high currents during electrical faults. OCPDs for solar PV and ESS systems require careful selection to meet the differing protective needs the mixed DC and AC components within the installation.
- **Wiring Methods (64-064, 64-210, 64-814, 64-816):** Unique wire and cable types are often required in solar PV and ESS installations. In particular, ESS systems operation involves relatively high DC currents requiring heavy and flexible conductors. There are also unique requirements for the routing of DC conductors not normally encountered with AC wiring practices.
- **Inverters (64-100->64-112):** There are specific rules and requirements for the safe installation of inverters, ranging from rule 64-100 through 64-112. Inverters convert the direct current (DC) generated by solar panels to alternating current (AC) for use in homes and businesses.

- **Disconnects (64-060, 64-062, 64-222, 64-808, 64-914):** The code includes requirements for the safe installation of disconnecting means. Disconnects allow systems to be safely shut down for maintenance or emergencies.
- **Energy Storage Systems (64-800->64-1100):** As solar installations increasingly include battery storage, the CEC provides guidelines for integrating batteries safely into these systems. These rules are extensive and can vary based on certifications.
- **Labelling (64-074, 64-076, 64-200, 64-902):** Clear labelling of solar and energy storage components is required to ensure that maintenance personnel and first responders can easily identify and understand the system's operation, particularly in emergencies. Other rules in section 64 specify locations and wording for specific equipment.
- **Ventilation and Temperature Control (64-802):** For battery-based energy storage systems, the CEC includes guidelines for ventilation and temperature control to prevent overheating and ensure safe operation. This is especially important for systems using batteries that can emit gases or generate heat during operation. Solar PV systems don't typically require special ventilation, but any related equipment (like inverters) must be installed in a way that prevents overheating.

BC Hydro distribution generator interconnection and load displacement programs

BC Hydro's distribution generator interconnection and load displacement programs allow for the interconnection of generation systems in excess of 100 kWac capacity to the BC Hydro distribution system (up to 35 **kV**) for customers intending to sell electricity to the utility as an **independent power producer (IPP)**, or to offset their load consumption (**Load Displacement**) without exporting energy to the grid. These programs are most likely of interest to commercial and industrial utility customers having high consumption and significant minimum continuous load. Applications to these programs are subject to significantly more extensive BC Hydro design review and approval processes than for the self-generation program. Requirements operate independently of building codes and focus on ensuring that solar PV and BESS:

- Equipment selections and designs comply with established Canadian Standards Association (CSA) and international standards (**IEEE, UL, ANSI**, etc) governing the behaviour and operation of utility interactive inverter-based equipment under both normal operation and abnormal conditions.
- Installations are completed in compliance with CEC, and under the electrical permitting oversight of the Electrical Safety Authority having jurisdiction.
- Customer DG installations are completed under the formal application review, and parallel operating approval processes of BC Hydro Self-Generation (previously Net-Metering) and are managed under the appropriate prevailing rate tariff.

Essential solar PV and storage CSA standards

The Canadian Standards Association (CSA) has established several standards relevant to solar photovoltaic (PV) systems and energy storage systems. These standards are crucial for ensuring the safety, performance, and sustainability of solar and energy storage systems in Canada. They provide guidelines that help manufacturers, installers, and local authorities maintain high standards of quality and safety in the deployment of these technologies. CSA standards particularly relevant to solar PV and energy storage systems include:

Overarching Standards			
	Standard	Title	Description
1.	CSA C22.1 (CEC), Part I	Canadian Electrical Code (CEC)	The national electrical safety standard; governs PV systems, wiring, bonding, BESS, and grounding across Canada.
2.	CSA C22.2 No. 107.1	General Use Power Supplies	Safety requirements for inverters, converters, and power electronics used in PV and BESS installations.
3.	CSA C22.2 No. 2556	Wire and Cable Test Methods	General standards for mechanical, electrical, and environmental testing of cabling used in PV and BESS systems.
4.	CSA C22.2 No. 94.2	Enclosures for Electrical Equipment (Environmental Considerations)	Defines environmental protection requirements (e.g., NEMA/IP ratings) for enclosures like combiner boxes and disconnects.
5.	CSA C22.2 No. 248 series	Fuses and Overcurrent Protection	Specifies safety requirements for fuses used in PV systems and BESS.
6.	CSA C22.2 No. 5	Circuit Breakers	Governs performance, ratings, and safety of breakers for PV arrays, battery systems, and AC/DC circuits.
7.	CSA C22.2 No. 60898-1	Circuit Breakers for Overcurrent Protection in Household/Similar Installations	Additional breaker standards applicable to residential PV/BESS
8.	ULC S524 / ULC S538 (If required)	Fire Alarm and Detection Systems	Fire protection standards applying to buildings with PV, BESS, or combined systems.

9.	CSA C168	Polyvinyl Chloride (PVC) Insulating Compounds for Wires & Cables	Specifies material properties for PVC insulation used in electrical cables, ensuring durability, temperature performance, and electrical safety. Used in PV/BESS wiring as applicable.
10.	CSA C22.2 No. 188	Weatherproof Cables for Use in Above-Ground Applications	Covers cable types suitable for outdoor exposure, often used in PV array wiring, BESS interconnections, and exposed electrical runs.
11.	CSA Z463	Maintenance of Electrical Systems	Provides best practices for maintaining electrical infrastructure, including PV, BESS, switchgear, and interconnections, improving reliability, safety, and system longevity. Not a design/install code, but highly recommended for operational maintenance.

Solar PV Standards

	Standard	Title	Description
1.	CSA C22.2 No. 61730-1 & -2	PV Module Safety Qualification	Mechanical, electrical, and fire safety for PV modules. Replaces older standards like ULC C1703.
2.	IEC 61215 / CSA C61215	Crystalline Silicon Terrestrial PV Modules – Design Qualification & Type Approval	Tests PV modules for mechanical durability, performance, and environmental resistance (UV, hail, thermal cycling). Harmonized with CSA standards for PV module certification.
3.	ULC C2703 (or UL 2703 with cUL)	Mounting & Racking Systems for PV	Structural and bonding certification for PV racking and mounting hardware.
4.	CSA C22.2 No. 174	Cables for Photovoltaic Systems	PV-specific cable requirements including weather resistance and electrical ratings.
5.	ULC S137	Fire Testing for Roof Materials with PV	Evaluates flame spread for building-integrated PV or rooftop-mounted PV arrays.
6.	ULC C1703 (Legacy)	Flat-Plate PV Modules (Legacy)	Outdated module safety standard, still recognized for older products.

ESS Standards

	Standard	Title	Description
1.	UL 9540 (with cUL for Canada)	Energy Storage System Safety	Comprehensive safety requirements for complete BESS, including batteries, inverters, BMS, and enclosures.
2.	UL 9540A (with cUL for Canada)	Thermal Runaway & Fire Propagation Testing	Evaluates battery system risks under thermal runaway conditions; often required for large BESS or systems in buildings.

Jurisdictional scan of permitting requirements for Part 9 residential and commercial solar installations across BC

City	Estimated Electrical Permit Fee	Electrical Permit Issued By:	Building Permit Required (Part 9)?	Estimated Building Permit Fee (Part 9)	Drawing or Sketch Required?	Structural Report Required?
Burnaby	Not available	Municipality	Yes	Not available	Yes	Yes
Coquitlam	TSBC standard fee	TSBC	Not required	<i>Not applicable</i>	No	No
Delta	TSBC standard fee	TSBC	Yes	Varies depending on construction value	Yes	Yes
Kamloops	TSBC standard fee	TSBC	Yes	• \$175 application fee • \$20 per \$1,000 of construction value when under \$10,000 • \$200 + \$7 per \$1,000 of construction value when exceeding \$10,000	Yes	Yes
Nanaimo (City)	TSBC standard fee	TSBC	Yes	Based on the value of construction (min. \$105).	Yes, engineered drawings and letters of assurance required	No
Nanaimo (Regional District)	TSBC standard fee	TSBC	Yes	\$150 plus a \$25 Title search fee.	Yes	Yes
Port Moody	TSBC standard fee	TSBC	Yes	Based on the total construction value. Uses Port Moody's fee bylaw, adds value of array to total construction cost.	Yes, the location of the array shown in roof plan and design details shown in structural attachment details.	Captured under structural details.

Richmond	TSBC standard fee	TSBC	Yes	\$100 + 1.7% of total construction value	Yes	Yes
Saanich	TSBC standard fee	TSBC	Not required	<i>Not applicable</i>	No	No
Surrey	Depends on value of the installation fee schedule	Municipality	Yes	\$185	Yes	Yes
Vancouver (City)	\$132	Municipality	Depends ¹⁵	Varies (average fee of \$309)	Depends	Depends
North Vancouver (District)	50% of standard electrical permit fee	Municipality	Not required ¹⁶	<i>Not applicable</i>	Yes	Yes ¹⁷
West Vancouver	Minimum \$145 (based on cost of electrical work)	Municipality	Yes	Minimum \$145 (based on cost of installation)	Yes	Yes
Victoria	Varies	Victoria	Usually not required	<i>Not applicable</i>	No	No

¹⁵ Not needed if pre-established building and material conditions are satisfied.

¹⁶ Building permits for solar PV are generally waived, though a building permit application is required.

¹⁷ Drawings for new homes built in 2012 to present day may not need to be sealed by a structural engineer as additional loading for the installation is already considered as per the BC Solar Hot Water Ready Regulation (2011). Drawings may not need to be signed and sealed if recent structural alterations took place on homes older than 2012.

Question guide: industry focus group

Getting to know you and your work

1. Please briefly share your name, company, the top three cities you work in, and how many solar/battery installations your company typically does per year.
 - a) What types of buildings do you work on (e.g., residential/commercial/simple/complex buildings)?
 - b) Do you do solar installations only, or have you also installed energy storage systems?
2. How do you anticipate BC Hydro's new solar rebates will affect your business? Are you starting to see more inquiries from customers already?
3. How often do your clients need to upgrade their electrical service? Have you found service upgrades to be a financial barrier for many clients?

Local government permitting – challenges and opportunities

3. Of the various local government permitting offices you've worked with, are some easier and better than others? Why?
 - a) Can you share some examples of specific parts of the permitting process that were done well? For example, online applications, short application forms, clear instructions, quick turnaround, easy and quick communication, etc.
4. Some local governments are telling us it only takes a few days to a couple of weeks to issue a building permit for solar. Does this seem accurate to you? Why/why not?
5. Have you run into challenges with any other building regulations, such as height limits?

Your recommendations

6. If you were writing a solar and battery permitting best practice guide for local governments, what would your recommendations be?
 - a) What permits do you think should be required for solar?
 - b) What permits do you think should be required for batteries?

7. Should the permitting process be different depending on factors such as the age and archetype of the building?
 - a) Do newer buildings need a structural building permit for the addition of solar panels?
 - b) Would you recommend different permitting processes for commercial versus residential buildings?
 - c) Would you recommend different permitting processes for simple (BC Building Code Part 9) buildings such as single-family houses versus complex (BC Building Code Part 3) buildings such as apartment complexes?
 - d) Would you recommend different permitting processes for smaller communities with fewer staff and resources, versus larger communities with more staff and resources?
8. When it comes to batteries, how do we best ensure that installations are done safely?
 - a) For those that have worked with batteries, what are the largest safety considerations you must make?
 - b) Are fears about battery fires founded?
9. What are your recommendations for the best ways to ensure the right mix of efficiency and safety for solar and battery permitting?
10. Is there anything else you would like to add?

Question guide: local government focus groups

Getting to know you and your work

1. Please briefly share your name and your local government. If possible, please share how many solar and battery installations your community has in total, and roughly how many solar/battery permit applications you receive per year.
 - a. What types of buildings do you most commonly issue solar permits for? (e.g., residential/commercial/Part 9/Part 3 buildings)?
 - b. Does your local government receive permit applications for solar installations only, or are energy storage systems also being installed?
2. How do you anticipate BC Hydro's new solar rebates will affect your permitting office? Are you starting to see more inquiries already?
3. If your electrical permits are issued in house, what's the process like in terms of application forms, timelines and fees?
5. If your electrical permits are issued by TSBC, what's the communication process with TSBC like?
6. Do you require building permits for solar panels? For energy storage systems?
 - a. Please explain the rationale for why building permits are required or not required.
 - b. What is the building permit application process like? Are forms filled out online? In person? What's required in terms of drawings and other schedules?
 - c. What is your fee structure for building permits?
 - d. How long does it typically take for building permits to be issued?
 - e. How frequently does a building permit application for solar/storage trigger the discovery of something like an illegal deck or basement? What happens to the solar installation when non-code compliant construction is discovered?
6. If a solar/battery installer has questions about permit requirements, or needs to check on the status of an application, how do they contact you and how long would they wait for a response?

8. Do you have any building regulations, such as setbacks and height limitations, that can affect the ability to install solar and batteries?
9. How often do your residents/businesses need to upgrade their electrical service?

Your recommendations

10. As the intended user group for this best practice guide, what do you want to see in the document?
 - a. How much introductory content and background on solar panels and battery systems should we include?
 - b. Would you prefer detailed permitting recommendations? Or high-level, general guidance?
11. What are your recommendations to help ensure the right mix of efficiency and safety?
 - b. When it comes to batteries, how do we best ensure that installations are done safely? Are the fears about battery fires founded?
 1. Should the process be different depending on the age and archetype of the building? Do newer buildings really need a structural permit? Should there be different permitting processes for residential vs. commercial buildings, or for Part 9 vs. Part 3 buildings?
12. Is there anything else you would like to add?

Further Reading

Basic information (all from BC Hydro)

- [Solar panels](#)
- [Batteries for power storage](#)
- [Self-generation](#)
- [Rebates for solar panels and battery storage](#)

Photovoltaic system design

- [Planning and Decision Guide for Solar PV Systems](#)
Natural Resources Canada
- [Photovoltaic Ready Guidelines](#) Natural Resources Canada
- [Solar Ready Truss Design Procedure](#)
Truss Plate Institute of Canada (TPIC) Bulletin #7
- [CSA Group SPE-900-13: Solar photovoltaic rooftop-installation best practices guideline](#) CSA Group
- [Best Practice Guidance for Solar and Zoning – Accessory Use](#)
SolSmart (US)

BC Building Code

- [2024 BC Building Code](#)
- [2024 BC Building Code – LIST OF REVISIONS – Part 4](#)
Building Officials' Association of BC

Canadian Electrical Code (all from Technical Safety BC)

- [Top 10 Changes You Need to Know About the 2024 Canadian Electrical Code](#)
- [2024 Canadian Electrical Code Updates](#)

Fire safety (all from National Fire Protection Association)

- [Electric Vehicle Safety](#)
- [Lithium-Ion Battery Safety](#)
- [Energy Storage Systems \(ESS\) and Solar Safety](#)
- [Fire Safety Challenges of Green Buildings and Attributes](#)

Other resources

- [Solar APP+](#) automated permitting for US jurisdictions
- [Solar Friendly Municipalities](#) | [Permits and Approach](#)
Municipal Climate Change Action Centre (Alberta)
- [National Simplified Solar Permitting Guide](#) SolSmart (US)