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SELECTING A SOLAR PV CONSULTANT

Support for Builders Planning their first Net-Zero / Net-Zero Ready Housing Project to Quickly Define Solar PV Consultant Requirements

LEEP LOCAL ENERGY EFFICIENCY PARTNERSHIPS

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Acknowledgements:

Canadian Home Builders' Association's (CHBA) Net Zero Council identified a lack of knowledge and confidence in builders when approaching a new solar photovoltaic contractor. The LEEP team developed this Scope of Work and PV consultant checklist to highlight the skills and responsibilities that builders should expect from a solar photovoltaic contractor.

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Front cover image: Roof mounted photovoltaic system using south and west facing arrays. Photograph courtesy of Riverside Energy Systems.

Disclaimer:

The aim of this publication is to provide home builders with a framework to help select a solar PV consultant who will provide the type and quality of services that they require, and who will best-fit with the design and construction teams working on the residential Net Zero Housing project. It was developed to respond to a building industry identified gap in the spring of 2021. In what is currently a young and growing residential solar industry, ways of selecting PV consultants are likely to evolve more quickly over time.

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Introduction

Purpose

The **Selecting a Solar PV Consultant Guide** ("GUIDE") is intended to be used by home builders planning their first Net-Zero Ready (NZr) or Net-Zero (NZ) housing project, to help engage a solar PV consultant, who will assist them in integrating solar photovoltaic (PV) technologies into their residential applications. It was developed to address a market gap identified by the CHBA NZ Council.

Scope

The focus of this GUIDE is on helping builders select a solar PV consultant who can work with them and their construction teams during the planning, construction and commissioning phases of a Net Zero housing project. In this document, the term "solar PV consultant" is meant to refer to companies that can provide both solar PV design and installation services, and have wholesale access to solar PV equipment vendors.

Exclusions

- Specific requirements for complying with the Canadian Home Builders' Association (CHBA) Net Zero Home Labelling Program are not covered by this guide. Readers are directed to the CHBA website for further information on the Net Zero Home Labelling Program. https://www.chba.ca/CHBA/HousingCanada/Net_Zero_Energy_Program/CHBA/Housing_in_Canada/Net_Zero_Energy_Program/NZE_Program_Landing_Page.aspx
- Specific details and requirements for solar PV system design, equipment and component selections, permitting, installations, wiring methods, inspections and utility interconnections are not covered by this guide.

Why Builders need this GUIDE

Best practice NZr and NZ housing projects will include a solar PV consultant as a member of the integrated design and construction team. The PV consultant will help reduce project risks and costs by ensuring PV technology is seamlessly integrated into the design and construction processes.

This guide provides information to help builders quickly define solar PV consultant requirements, and assists them with the selection of a consultant who will contribute to the success of their Net-Zero housing project.

The support information is broken down into two pieces.

1. Template Scope of Work for Net Zero PV Design and Installation Best Practices
2. Solar PV Consultant Interview Checklist

The scope-of-work document provides builders with a quick template to define the services required from PV consultants when requesting quotations for their NZr / NZ building projects.

The interview checklist provides a framework for gauging the training, certification, experience and other attributes of prospective PV consultants. Builders can use this checklist to help select a solar PV specialist to round-out the capabilities of their integrated design and construction team.

Template Scope of Work

A template document for a typical scope of work (SOW) for a PV consultant, required for either a NZr or a NZ housing project, is provided as Appendix A.

Builders new to the Net Zero Home Labelling program can customize and use this template document to solicit responses from prospective solar PV consultants they are considering as new members to join their integrated design and construction team.

Tasks are divided into two phases.

Phase 1: Net-Zero Ready Consulting and Design Services

Phase 2: Net-Zero Home PV Installation Services.

The relationship of the two phases with respect to NZr and NZ housing projects is illustrated in Figure 1. An outline of major tasks and deliverables are provided in the following sections.

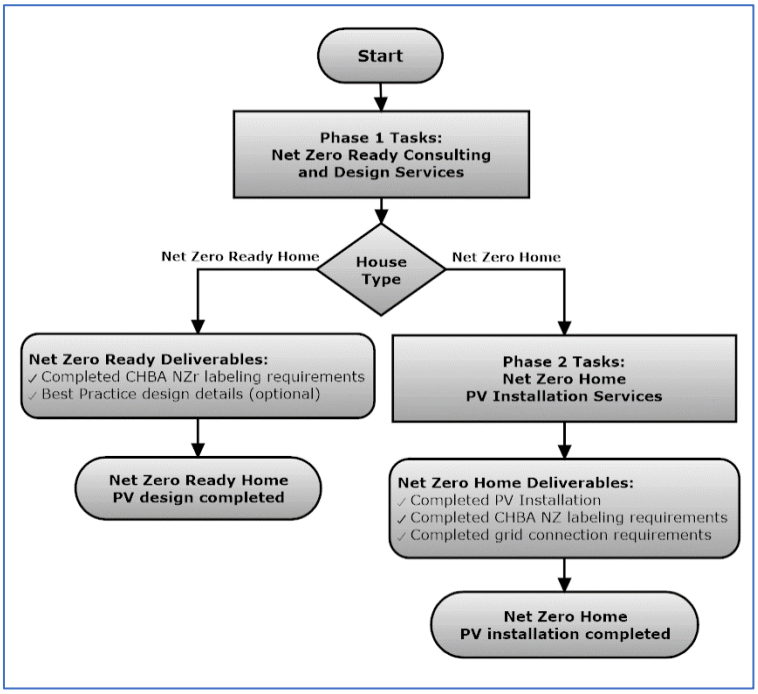

Figure 1: PV Work Phases and Deliverables for NZr / NZ Housing Projects

Phase 1: Net-Zero Ready Consulting and Design Services

Phase 1 tasks are needed for both NZr and NZ housing projects and include:

Task 1.1: Pre-Design Reviews

Task 1.2: Solar PV System Specification, Performance Modelling and Design

Task 1.3: Solar PV System Integration Considerations

Task 1.4: Solar Ready Rough-in

For NZ housing projects, use Phase 1 Tasks as the basis for the procurement and installation of the Solar PV system in Phase 2 of the project.

For NZr housing projects, Phase 1 deliverables include ones required by the CHBA Net Zero Ready Labelling Program, and additional "best practice" deliverables which detail the planned solar PV system. These latter outputs will facilitate conversion of the NZr home to a full NZ home in the future.

2020 CHBA Net Zero Ready Home Labelling Requirements include:

1. Appropriate PV Ready Checklist (i.e., for roof or ground array) completed for CHBA Net Zero Home Labelling.
2. Drawings showing the array layout for the planned PV installation.
3. Solar electricity generation model for the planned PV system.

"Best Practice" deliverables:
(Optional, but recommended for NZr installations; Required prerequisites for NZ installations)

1. List of materials needed for the planned PV installation
2. Racking and attachment methods and component specifications
3. Electrical single-line drawings of the planned PV system.
4. Estimated installed cost of the planned PV system.
5. Advice on key design and construction details required to facilitate installation of the planned PV system in the Net Zero Ready home.

Phase 2: Net-Zero PV Installation Services.

Phase 2 tasks build on the outputs from Phase 1, and are needed for NZ housing projects involving the installation of PV systems at the time of construction. These tasks include:

Task 2.1: Solar Approvals and Permits

Task 2.2: Solar PV equipment procurement

Task 2.3: Complete the Solar Rough-in

Task 2.4: Solar PV Equipment Installation and Commissioning

Task 2.5: Final approvals and PV system connection to grid

Deliverables for Net Zero Home PV installations

1. All necessary permits and approvals from the local distribution wires company and authorities having jurisdiction (AHJs) which are needed for the installation of the solar PV system.
2. Delivery of all system components and materials need to complete the solar PV system installation at the build location.
3. Completion of the solar rough-in to allow the wiring of all components of the solar PV system.
4. Installation, commissioning and facilitate inspection of all solar PV system components.
5. Installation of the PV monitoring system.
6. Completion of CHBA Net Zero PV Commissioning Report.
7. Final connection authorization and connection of the solar PV system to the utility grid.

The full template SOW document is provided as Appendix A, and contains additional details on the services required from a solar PV consultant for a NZr or NZ residential building project.

Solar PV Consultant Interview Checklist

The solar PV consultant has a specific role to play to ensure the success of the PV integration in the build, and contributes during both the planning and construction phases to ensure project success. This requires specialized training and expertise as well as clear two-way communication with other specialists and trades involved in the housing project.

To assist builders in identifying an appropriate solar PV consultant, a ***"Solar PV Consultant Checklist"*** is provided as Appendix B. The interview checklist covers four main areas as shown in Figure 2.

Use this checklist to interview prospective consultants. After interviewing a few prospects, review your notes to help select the solar PV consultant who will provide the type and quality of services that you require, and who will best-fit with your design and construction teams.

The following sections provide background and context on how the information collected may be used when selecting a solar PV consultant.

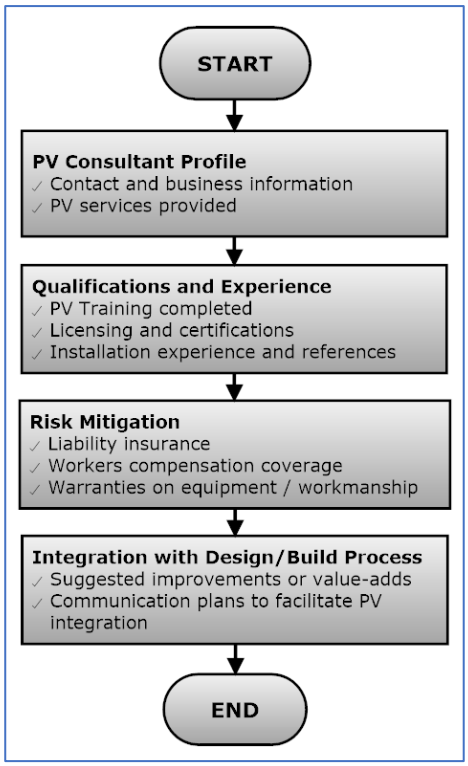

Figure 2: Overview of the Solar PV Consultant Interview Checklist

PV Consultant Profile

Business Information

It may be beneficial to select a PV consultant that is located close to the build site.

- A local PV consultant may have greater familiarity with the municipality, authorities having jurisdiction (AHJs), and utility connection requirements concerning net zero housing and solar PV systems. This will provide the builder's design team with jurisdictional specific guidance during project planning to achieve overall project goals at the build site.
- Using a local PV consultant may also help ensure that your NZ home performs through its full lifetime. A local provider may find it easier to come to the site if there are any issues with the initial PV installation, or later if servicing is needed by the homebuyer.

Check association memberships held, and number and type of solar PV specialists working with the company.

- Use the information to help determine if solar PV consulting and installation services are a main focus, or just a side-line for the business.

Solar PV services provided

The PV consultant will work closely with the builder's energy advisor (EA) and other team members to provide consulting and design services to facilitate the integration of solar PV into the house design. Services could include:

Solar access / shading analysis / photography: Site specific solar access and shading analysis will confirm the solar access quality available at the build site and provide a reliable basis for predicting solar

performance throughout the year. Sites with little or no shading from trees or other structures may not require photographic skyline assessment.

Solar PV production modelling: Modelling of energy production by the PV array(s) based on solar access, azimuth and tilt angle of the array(s) (e.g., roof pitch), and equipment characteristics will determine energy production, and the size of array needed to achieve the net zero energy target for the home. Solar PV production modelling should conform to the technical requirements specified in the Net Zero Home labelling program.

Solar PV system design: The PV consultant should be able to advise on the selection of equipment (e.g., PV panel, inverters, optimizers, roof mounts, racking, etc.) to best fit the overall objectives of the project. Equipment selection can impact project aesthetics, shade tolerance, efficiency, energy production and budget.

Builder support on PV integration requirements: Solar PV build integration requires intentional, ongoing communication between design team, builder, trades teams, and other service providers; from the start of the design phase through to building occupancy. The PV consultant should be willing to participate in this process throughout the life of the project to ensure all solar PV components and unique building requirements are (or can be) integrated into the build as seamlessly as possible.

Performance / Economic Analysis: PV consultants may be able to provide economic performance analysis of the solar PV system on the net-zero home. Builders can use this analysis with homebuyers to promote installation of PV systems at the time of sale, and convert NZr homes to full NZ homes.

Solar PV installation: A trained and experienced PV installer is better positioned to ensure the solar system is installed according to all codes, all applicable regulations, and following manufacturers' recommendations.

Permitting / utility connection permissions / inspections: A knowledgeable PV consultant should be familiar with permitting, utility connection permissions and inspections that are unique to solar PV systems at the build location. Builders can engage PV consultants to help expedite these requirements on their net zero home projects.

Qualifications and Experience

Solar PV Training completed

Solar PV consultants / installers should have completed specialized theoretical and hands-on training for solar PV design and installation. PV training is available from a range of sources, including:

- Colleges and trade institutes offering solar PV training courses / certificates
- Private training organizations offering workshops and hands-on solar PV training
- On-line training organizations offering solar PV training
- Solar PV equipment manufacturers' training courses
- On-the-job training completed by working with qualified solar PV consultants / installers

In addition, organizations such as Canadian Standards Association (CSA) and North American Board of Certified Energy Practitioners (NABCEP) administer exams which qualify individuals in specific aspects of design and / or installation of solar PV systems. Both CSA and NABCEP maintain online directories of currently qualified individuals [5, 6].

Licensing and Certifications

The solar PV consultant / installer may hold various licenses and certificates.

- Solar PV system installations typically require working at heights and the PV installer should hold valid certificate for working at heights.
- Some PV consultants may also have NABCEP certifications, either as Associate or Board-Certified Solar PV Professionals [6]. These certifications are optional and indicate the holder has achieved a certain level of training.
- The PV consultant should hold a valid electrical contractor's license in good standing, or have a business relationship with a valid electrical contractor to complete electrical field wiring of the solar PV system.
    - *You may want to look for "Red Seal" electrical contractors who have been tested and met national standards in their trade.*
    - *Some electrical contractors may also be CSA certified construction electricians for solar PV systems by having completed and passed the NOC 7241 course and exam [5].*
- Any other licensing required by the local municipality or authority having jurisdiction (AHJ) (e.g., general contractor's license may be required in some jurisdictions).

Installation Experience

When planning NZr / NZ homes, it is important to select a solar PV consultant with experience in designing and installing solar PV systems. Ask about the number and size of systems installed, and the date range of installations.

- The solar industry changes year by year, and PV consultants with recent experience may be more familiar with the newest products and latest code and regulation requirements.

Request at least three letters of reference from builders, architects, equipment vendors and / or homeowners who have worked with the PV consultant on similar projects.

- Builders and architects could provide additional information on the PV consultant's quality of service and overall fit and integration with the build process.
- Vendors could confirm the PV consultant's relationship, and confirm their access to PV equipment needed for NZ home installations.
- Homeowners may provide insights into the type and quality of post-installation service provided by the PV consultant.

Risk Mitigation

General Liability Insurance

It is important to ensure the PV consultant has appropriate insurance coverage to handle any incidents that may occur during installations.

- Builders should obtain a copy of the PV consultant's general liability insurance certificate, detailing the dollar value of general liability insurance coverage held.

Workers Compensation Coverage

The PV consultant should be in good standing with the local Workers' Compensation Board.

- Builders should obtain a clearance letter to confirm the PV consultant is in good standing and has workers' compensation coverage for the duration of the build project.

Warranties

Builders should obtain written confirmation of what is covered by warranty and who is responsible for servicing and/or replacing components in case of failure.

- Request details on solar PV equipment warranties from the PV consultant, including labour costs for necessary replacements.
- Request details on what is covered by the PV consultant / installers workmanship warranty and the terms of this coverage.

Integration with Design / Build Processes

Improvements and/or value-adds to the project

Solar PV integration should be considered at the planning and design stage to ensure best outcomes. This is especially important when looking to achieve a Net Zero Ready (NZr) or a Net Zero (NZ) designation. It may be advantageous for builders to work with a PV consultant who is willing to review plans and make suggestions for changes at the planning stage to help optimize the cost-efficiencies of integrating PV into their NZr/NZ house design.

Examples of changes could be suggested include altering:

- Roof pitch, orientation, style, or membrane type;
- Placement of vents, skylights, chimneys, and/or other rooftop features;
- Structural roof components, in collaboration with a truss designer or structural engineer, to accommodate additional loads from solar arrays;
- Size and placement of electrical service equipment and raceways to accommodate solar infrastructure and electric utility requirements;
- Placement of solar PV arrays to locations other than the house rooftop.

Communication plans with the Design / Build Team

The PV consultant has a specific role to play to ensure the success of the solar PV integration in the build, and contributes during both the planning and construction phases to ensure project success. This requires clear, two-way communication with other specialists and trades involved in the project.

- Ask about communication strategies and information exchange methods the PV consultant will use at various stages of the project to communicate with members of the design / build team in order to produce the best outcomes.
- In terms of style and fit, do you feel your team could work with this PV consultant?

Other Resources for Builders

From Natural Resources Canada

1. **"PHOTOVOLTAIC READY GUIDELINES", Version 2.0,** NRCan, CanmetENERGY, Cat. No. M154-122/2019E-PDF https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/canmetenergy/files/pubs/18-206_Photovoltaic-EN_150dpi.pdf

2. **"PLANNING & DECISION GUIDE FOR SOLAR PV SYSTEMS, Procedure for solar designers, builders and their design teams to quickly define solar PV requirements"**, NRCan, CanmetENERGY, LEEP Team. Cat. No. M154-135/2020E-PDF https://www.nrcan.gc.ca/sites/nrcan/files/canmetenergy/files/Planning_and_Decision_Guide_for_Solar_PV_systems_PDF.pdf

From Other Organizations

3. **Canadian Home Builders' Association (CHBA) website for further information on the Net Zero Home Labelling Program** https://www.chba.ca/CHBA/HousingCanada/Net_Zero_Energy_Program/CHBA/Housing_in_Canada/Net_Zero_Energy_Program/NZE_Program_Landing_Page.aspx

4. **Canadian Renewable Energy Association (CanREA) Membership Directory** https://renewablesassociation.ca/member-directory/

5. **Canadian Standards Association (CSA) - Certified Construction Electrician for Solar PV Systems (NOC 7241);** CSA maintains an online directory of currently certified individuals. https://www.csagroup.org/search-qualified-personnel/

6. **North American Board of Certified Energy Practitioners®** - NABCEP® maintains directories of currently certified Solar PV professionals for both their Associate and Board-Certified programs.

   a) NABCEP Associates directory: https://www.nabcep.org/nabcep-associates/

   b) NABCEP Board Certified Directory: https://www.nabcep.org/nabcep-professionals/

APPENDIX A: Template Scope of Work for Net Zero PV Design and Installation Best Practices

Background and Objectives

[-- insert name of builder here --] is planning to design and build residential homes which will be labelled according the Canadian Home Builders' Association (CHBA) Net Zero Home Labelling Program.

To ensure that solar PV technology can be integrate into the overall design and construction of these homes as seamlessly as possible, we require the services of a solar PV consultant to assist with the following phase(s) of the project. *(check all that apply).*

- ☐ **Phase 1: Net Zero Ready Solar PV Consulting and Design Services**
- ☐ **Phase 2: Net Zero Solar PV Installation Services**

Specific requirements for each of these project phases are provided in the following sections.

TASKS - Phase 1: Net-Zero Ready Consulting and Design Services

The following services are required during the design phase of the project.

Task 1.1: Pre-Design Reviews

- Review energy modelling and projected annual energy consumption of the home with the builder's certified energy advisor.
- Review architectural drawings and site plans, to identify possible locations for PV array installations.
- Contact the local distribution wires owner to identify connection requirements and any capacity constraints for grid-connected PV systems at the build site*.

Task 1.2: Solar PV System Specification, Performance Modelling and Design

- Complete a site analysis to determine solar access quality and identify any shading constraints*.
- Specify a grid-connected PV system capacity based on:
  - *Preferred array locations and placement,*
  - *Modelling of locally expected PV system performance,*
  - *Required annual electrical energy harvest for a Net-Zero target, and*
  - *Client preferences (e.g., complete the Solar PV System Integration Worksheet [1]).*
- Prepare a grid-connected PV system design, including:
  - *Panel location drawn onto builder provided plans*
  - *Specify racking and attachment method, which builder can use to consult truss manufacturer*
  - *Equipment specifications and list of materials needed.*
    - *Solar panels*
    - *Inverter type*
    - *Racking and attachment method*

        - *Conduit*
        - *Grid shut off*
        - *Energy monitoring system*
    - *Preparation of an electrical single line drawing of the system*
    - *Area required to accommodate PV system requirements in utility room, and*
    - *Projected annual solar energy harvests by the proposed system.*
- Provide solar PV system installed cost estimates for budgeting purposes, including PV system monitoring required for CHBA Net Zero Home labelling.

Task 1.3: Solar PV System Integration Considerations

- Provide advice to the builder and their construction teams on:
    - *Any modifications and / or restrictions to roof surface areas to be used for solar panel installations (e.g., Keeping specific roof areas free of vents, plumbing stacks, etc.)*
    - *Any solar related structural or roof membrane impacts,*
    - *Any utility export constraints and possible mitigation strategies (e.g., on-site energy storage options), and*
    - *Any electrical service component and service area requirements needed to accommodate the planned solar PV system installation in the future.*

Task 1.4: Solar Ready Rough-in

- Collaborate with the builder to plan the electrical rough-in required for the planned solar PV system. For compliance with the PV Ready Checklists [2] in the CHBA Net Zero Home Labelling Program, this may include:
    - *Installation and termination of PV and utility connection conduits*
        - *Conduit from attic or roof space to the electrical room location, sealed and capped (roof terminations also require flashing)*
        - *Conduit from electrical room to the PV disconnect location, sealed and capped*
        - *Conduit from PV disconnect location to the house electrical service, sealed and capped*
        - *To eliminate the need for future building envelop penetrations, conduits should be installed entirely within the building envelope (except for sections terminating above the roof if applicable)*
    - *Electrical Panel Readiness*
        - *Electrical panel sized to accommodate a PV supply breaker of sufficient ampere rating*
        - *Available double-pole slot at bottom panel for PV breaker*
    - *Wired Network Communications Availability*
        - *Network jack provided at designated PV wall space in electrical room location*

_____

* Recommended best practices; Not specifically required by CHBA NZ Program.

TASKS - Phase 2: Net-Zero PV Installation Services

The following services are required during the installation phase of the project.

Task 2.1: Solar Approvals and Permits

- Prepare and apply all approvals and permits required for the planned solar PV system, including:
    - *Offer to connect application with the local distribution wires owner,*
    - *Electrical, building, development permits and any other approvals required by the authorities having jurisdiction (AHJs).*
    - *Confirm installation schedule with builder and site supervisor*
        - *Solar Rough-in*
        - *System installation and connection*
        - *Approvals and permitting*
        - *Final Grid connection*

Task 2.2: Solar PV equipment procurement

- Confirm the list of materials with the builder
- Order all required PV system components as specified in the final design to meet the Net Zero Home requirements

Task 2.3: Complete the Solar Rough-in

- Complete the electrical rough-in required for the planned solar PV system. Depending on design details and technology selected, this could include:
    - *One or more roof penetrations, flashed and sealed, and installation of PV array wiring (e.g., one roof penetration per sub-array if more than one roof face is used)*
    - *Wiring from the attic (or roof) to the electrical room location*
    - *Wiring from electrical room to the PV disconnect location*
    - *Wiring from the PV disconnect to the house electrical service.*

Note: To facilitate attic installations, solar rough-ins should be scheduled in the building cycle <u>before</u> the installation of drywall and attic insulation.

Task 2.4: Solar PV Equipment Installation and Commissioning

- Install the Solar PV System
- Install the Solar PV monitoring system
- Commission the system and verify proper operation of all components
- Complete the CHBA Net Zero PV Commissioning Report provided by the builder [2]

Task 2.5: Final approvals and PV system connection to grid

- Facilitate submission of the declaration of compliance / electrical inspection request for the PV system.
- Follow up with the AHJs and the builder and/or homeowner as required to obtain final connection authorization and arrange installation of a bi-directional utility meter.
- Connection of the Solar PV system to the grid.

Deliverables

Phase 1 – Net Zero Ready Home Deliverables

CHBA Net Zero Ready Home Labelling Requirements:

1. Appropriate PV Ready Checklist (i.e., for roof or ground array) completed for CHBA Net Zero Home Labelling [2].
2. Drawings showing the array layout for the planned PV installation.
3. Solar electricity generation model for the planned PV system.

Additional Best Practices:
(Optional, but recommended for NZr installations; Required prerequisites for NZ installations)

1. List of materials needed for the planned PV installation
2. Racking and attachment methods and component specifications
3. Electrical single-line drawings of the planned PV system.
4. Estimated installed cost of the planned PV system.
5. Advice on key design and construction details required to facilitate installation of the planned PV system in the Net Zero Ready home.

Phase 2 – Net Zero Home Deliverables

1. All necessary permits and approvals needed from the AHJs for the installation of the solar PV system.
2. Delivery of all system components and materials need to complete the solar PV system installation at the build location.
3. Completion of the solar rough-in to allow the wiring of all components of the solar PV system.
4. Installation, commissioning and facilitating inspection of all solar PV system components.
5. Installation of the PV monitoring system.
6. Completion of CHBA Net Zero PV Commissioning Report [2].
7. Final connection authorization and connection of the solar PV system to the utility grid.

Location and Schedule

Build Location: _____ (enter location)

Phase 1 Deliverables Required: _____ (enter date)

Phase 2 Deliverables Required: _____ (enter date) or ☐ **NOT REQUIRED**

Builder Contact Information

Builder Contact: _____ (enter name)

Phone: _____ (enter number)

Email: _____ (enter email address)

References

1. **"Planning & Decision Guide for Solar PV Systems, procedure for solar designers, builders and their design teams to quickly define solar PV requirements"**, NRCan, CanmetENERGY, LEEP Team.
   Cat. No. M154-135/2020E-PDF
   https://www.nrcan.gc.ca/sites/nrcan/files/canmetenergy/files/Planning_and_Decision_Guide_for_Solar_PV_systems_PDF.pdf

2. **"Canadian Home Builders' Association Net-Zero Home Labelling Program – Version 1.x Administrative Requirements"**, Project Registration Workbook, 2020.
   - PDF document and Excel workbook available from CHBA.

APPENDIX B: Solar PV Consultant Checklist

Use this checklist when interviewing prospective solar PV consultants. After interviewing a few prospects, review the notes to help select the solar PV consultant who will provide the type and quality of services that you require, and who will best-fit with your design and construction teams.

Business Information

Company and representative: _____

Business address: _____

Telephone: _____Cell: _____ Fax: _____

Web site: _____

Years in business: _____ B/N or GST/HST number: _____

Municipal Business License Number *(if required):* _____

Memberships in industry or trade associations: _____

Number of Solar PV Specialists available: Company employees: _____ Sub-contractors: _____

Solar PV services provided *(check all that apply; add notes on type of support available)*

Needed for both Net Zero Ready / Net Zero homes

❑ Solar access / shading analysis / photography _____

❑ Solar PV production modelling _____

❑ Solar PV system design _____

❑ Builder support on PV integration requirements _____

❑ Performance / Economic Analysis _____

Needed for Net Zero homes with planned PV installations

❑ Solar PV installation _____

❑ Permitting / utility connection permissions / inspections _____

❑ Other services *(specify)* _____

Solar PV training completed *(check all that apply; add details on training completed)*

Needed for both Net Zero-Ready / Net Zero homes

❑ Solar PV access / production modelling _____

❑ Solar PV Design *(e.g., PV modules, inverters, racking)* _____

❑ Solar PV System Installation _____

❑ Other training *(specify)* _____

Licensing and Certifications

❑ Electrical Contactor License *(e.g., Red Seal or equivalent – specify)* _____

❑ PV Installation Certification *(e.g., NABCEP, CSA or other – specify)* _____

❑ Safety Certification *(e.g., working at heights certificate, etc. – specify)* _____

❑ Other Certifications *(specify)* _____

Installation Experience

❑ Projects completed: No. ____; Installation years: _____ to _____; Size range: _____ to _____ kW_{array}

❑ Letters of Reference from Builders, Architects, Equipment Vendors and/or Homeowners *(list details)*

1. _____
2. _____
3. _____

Insurance

❑ General Liability Insurance *(Certificate; $-amount)* _____

❑ Worker Compensation or equivalent insurance _____

Warranty

❑ Solar Equipment (*warranty terms)* _____

❑ Workmanship (*warranty terms)* _____

Integration of PV with Design / Build Processes

Did the PV consultant offer suggestions for how to improve your PV project or obtain better value for money? If so, note what they were:

_____

_____

Overall PV Consultant's Fit with the Design / Build Team

The PV consultant has a specific role to play to ensure the success of the solar PV integration in the build, and contributes during both the planning and construction phases to ensure project success. This requires clear two-way communication with other specialists and trades involved in the project.

Do you feel your team could work well with this PV contractor? ❑ Yes ❑ No

Other comments: _____

_____