

SOLAR PERFORMANCE CHECKLIST

Get more out of your
solar PV system

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Municipal
Climate Change
Action Centre



BACKGROUND

About the Action Centre

The Municipal Climate Change Action Centre was established in 2009 as a collaborative initiative between Alberta Municipalities, Rural Municipalities of Alberta and the Government of Alberta, including the Alberta Municipal Affairs and Alberta Environment and Parks ministries. The Municipal Climate Change Action Centre provides municipalities, schools, and non-profit community-related organizations with support, technical assistance, and funding to implement energy efficiency and renewable energy projects that reduce greenhouse gas emissions and increase community resilience.

If you are interested in learning more about funding programs for solar projects, explore to the Alberta Municipal Solar Program or the Solar for Schools Program at www.mccac.ca.

About the checklist

This checklist is designed to help owners of solar PV arrays ensure their systems are generating as expected, continue to operate effectively, and produce maximum electricity savings. This checklist is primarily targeted towards operators of solar PV systems owned by municipalities or school authorities but may apply more broadly as well.

Use this checklist and use it to ensure you are getting the most out of your solar PV system.

CHECKLIST

Here are a few key tips for ensuring you get the most out of your solar PV system:

1. Get insured

- Confirm your insurance provider is aware of the newly installed PV system and that it is covered in case of accidental damage or vandalism. This ensures you can repair or replace components quickly in the event of damage to the system not covered by warranty or your installer. This will minimize interruption to production and maximize savings.

2. Check your portal

- Confirm the system is operating and reporting by regularly checking your system's online production portal. The online portal is your window for confirming whether the array is functioning, without having to be physically present at the array location.
- Ensure all components are online and reporting, particularly for systems containing more than one inverter or DC optimizers. Contact your solar installer if the overall system, or individual inverters, modules, or optimizers do not appear to be reporting properly, and resolve the issues immediately.

Issues may include:

- unusually low (for the weather and season) or no production from the entire system;
- one inverter in a multi-inverter system, or one optimizer, reporting far lower production than the rest; or,
- the array is not reporting to the monitoring portal at all. This could simply be an internet or connectivity issue or, indicate that the array is malfunctioning.

3. Create and follow operating procedures

- Ensure operational procedures are in place, and being followed, to reconnect the solar PV array each time it is disconnected for building or electrical maintenance. This reduces unnecessary downtime for the system and minimizes production losses. Establish these procedures as soon as the solar PV system is installed. Brief all relevant facility or maintenance staff, including new staff, as part of the onboarding process.
- Provide facilities staff with training on the financial and environmental benefits of the system, and how to ensure it is operated safely and reliably. Keep all solar PV documentation for staff reference (electrical drawings, part specifications, manuals, and system records) in a secure, accessible location.
- Familiarize yourself with the routine maintenance tasks recommended by the module and inverter manufacturers. If staff are properly qualified, add these duties to their existing maintenance activities.

Note: Although designed primarily for those operating and maintaining very large solar arrays, the [Best Practices for Operation and Maintenance of Photovoltaic and Energy Storage Systems](#) from the National Renewable Energy Laboratory in the United States is a great resource, for those looking to dig into the details.

4. Log your production data

- Log and compare the system's monthly production figures year-over-year to identify and address non weather-related inconsistencies. Your log will help you identify situations where the system may have experienced a malfunction or external production interruption and enable you to avoid the same malfunctions for the next year.

To verify that the system is performing consistently and as expected, track and log the following information in a spreadsheet:

- monthly electricity generation (available on the system's online portal),
- monthly electricity from the array exported to the grid (available on electricity bills),
- credits received for electricity exported to the grid (available on electricity bills),
- monthly solar electricity used onsite (subtract the exported electricity figure from the produced electricity figure).

5. Check your utility bills

- Confirm that your retailer is registering and crediting excess electricity produced by your solar PV system by checking monthly electricity bills. This is especially important in the early months of the system, if you have registered for a solar premium, or if you change retailers.
- If you are on a commercial rate and the solar PV array has reduced your peak loads, confirm that your site is registered within the rate category that corresponds to your new annual peak, to ensure you are seeing the savings associated with a lower peak demand.

6. Visually inspect

- Schedule monthly visual inspections of the array(s) to check all equipment (modules, racking, wires, junction boxes, inverters, etc.) for signs of damage, dust, and debris. Ensure the modules are performing at peak capacity by cleaning them when dirty; simply rinsing the modules with water is sufficient if the array is accessible.

Note: Solar arrays are designed to safely operate in wet conditions, but if in-house staff are cleaning the modules, always ensure proper safety protocols are followed when working around live solar electric systems. Contact your solar installer for advice if you are unsure how to safely clean the modules.

- Complete visual inspections after extreme weather events to identify potential damage early. Although solar PV modules are very durable, extreme hail or thunderstorms can occasionally cause damage. With the right warranty and insurance, repair or replacement should be quick and easy.

7. Know your warranty terms

- Be aware of the warranty periods in your contract for your system's installation and equipment. Schedule an inspection of the system before they expire, to ensure any potential issues are dealt with under warranty.

8. Get expert help

- Although it is not necessary to hire an expert solar contractor or other third-party to perform operation and maintenance duties on your system, you may want to consider this option if internal capacity is limited, or if the system is of considerable size.

9. Plan for end of life

- Have a conversation with your solar installer about end of life options available. Plan ahead by setting aside resources to recycle or responsibly dispose of array components when they need to be replaced or reach their end of life.

Solar PV modules often continue to perform well beyond their expected 30-year lifespan, but at reduced capacity. Provide your old array a second life when you upgrade to new components by selling the old modules on the used market. You will recapture a portion of your investment and reduce the cost of transitioning to solar for someone else.

Many of the major components of solar PV arrays can also be recycled and this service is becoming more readily available in Canada. For more information on firms to contact for solar PV component end of life management, contact the Action Centre.

For residential solar PV disposal, the Alberta Recycling Management Authority's new [Electronics Expanded Recycling Program](#) is piloting solar PV module recycling in Alberta. Reach out to Alberta Recycling Management Authority for more information on the Program.

CONTACT

Whether you have questions about this checklist, a program application process, want to request a speaker for your next event, or just get advice on how to take action on climate change, our team is here to help. Contact us and start seeing real savings and real change today.

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