

Growing Forward 2 Solar PV Equipment Pilot Program Results Report

Background

The Growing Forward Solar PV Equipment Pilot ran from January 2012 to March 2013. Through program funding of over \$900,000, approximately 491.5 kW of farm-scale solar photovoltaic projects on 61 sites were interconnected to the Alberta electricity grid under the Micro Generation Regulation. The total installed capacity of 491.5 kW includes leveraged capacity, where some projects installed more kilowatts beyond the funding. Project sizes were 15 kW and under.

These 61 projects included both solar-contractor-installed projects and self-installed projects. A project was considered a self-installed project if the producer/owner directly purchased and installed the majority of the components, with final electrical connections by a licensed electrician. All contractor installed and self-installed projects were fully permitted and inspected.

All projects had to qualify as a micro generator under the Micro Generation Regulation and be approved for interconnection by their local Wire Service Provider. The projects were spread across at approximately six Wire Service Provider areas and several counties. Some of the smaller Wire Service Providers/Wire Owners had not had any prior experience in dealing with micro generation applications and the municipal by-laws across the local areas had differences in permitting requirements for solar photovoltaics.

There were 11 solar contractor companies that installed 45 projects under the program, and nine solar retail or distribution companies that sold products for self-installation.

Of the 61 total projects, 24 were roof-mounted installations and 37 were ground mount installations (of which 1 site considered as ground-mount had a portion of both roof- and ground-mount). Pole-mounted modules were counted as ground mount. Of the 24 roof-mounted projects, four were self-installed and of the 37 ground-mounted projects, 12 were self-installed).

Commissioning reports were submitted and included total project costs as well as the solar energy meter reading at the time of commissioning. Participants must submit a minimum of three years of quarterly energy production readings. Reporting from the majority of participants will be completed by March 2016.

Market Costs

From the submitted commissioning reports, there was a range of total project costs.

	Median Price			Range – Lowest			Range - Highest		
	\$/Watt			\$/Watt			\$/Watt		
	All Years	2011/12	2012/13	All Years	2011/12	2012/13	All Years	2011/12	2012/13
Solar Contractor: All (Ground + Roof)	\$4.21	\$4.04	\$4.25	\$3.04	\$3.37	\$3.04	\$7.25	\$4.98	\$7.25
Solar Contractor: Ground Mount	\$4.25	\$4.02	\$4.29	\$3.36	\$3.38	\$3.36	\$5.75	\$4.65	\$5.75
Solar Contractor: Roof Mount	\$4.04	\$4.13	\$3.96	\$3.04	\$3.64	\$3.04	\$7.25	\$4.98	\$7.25

Self-Install: All (Ground + Roof)	\$3.03	\$2.42	\$3.33	\$1.85	\$1.93	\$1.85	\$6.94	\$3.64	\$6.94
Self-Install: Ground Mount	\$2.87	\$2.42	\$3.33	\$1.85	\$1.93	\$1.85	\$6.94	\$3.64	\$6.94
Self-Install: Roof Mount	\$3.16	N/A	\$3.16	\$2.13	N/A	\$2.13	\$3.91	N/A	\$3.91

Energy Production

Although not all energy reporting is complete, most sites experienced energy production that is as good as expected for their geographic location, based on the Solar PV Maps published by Natural Resources Canada (NRCan). Some sites have had overproduction, but none to a significant extent. There have been a few sites under-producing, compared to expectations, which may be due to weather related issues, such as more cloudy/rainy periods than expected, especially during the flood year. In general, the estimate that solar photovoltaics (PV) are a reliable, predictable and low-maintenance technology appears to be confirmed.

Issues

Most solar contractors appeared to have been responsive to producers/owners where system issues arose, and overall very few producers/owners reported system problems. The most notable issue was with a site that had about half (approximately 5 kW) of their total system offline for over 1.5 years, which appears to be the result of technical problems possibly from poor installation practices causing equipment damage.

Unfortunately, the installer was largely unresponsive on the issue, which was still unresolved as of October 2015.

Solar PV installations are becoming more common, but are still not widespread. Due to a lack of familiarity of some inspectors with solar PV, electrical inspections may not always catch all deficiencies related to some unique aspects of solar PV. As well, the non-electric-code issues (such as material selection) that relate to best practice on solar PV installations seems to vary between solar contractors, and varies for self-installed projects, and could have at least some minor impacts on system longevity and performance.

Economics

Based on the total installed project costs of producers/owners, many of the installed solar PV systems had a long payback window for their simple-payback calculation (this was influenced in large measure by the retail energy rate they chose to use). Even with the grant received, many projects did not fall lower than a 20-year payback.

Satisfaction

Participants in the program were also asked to voluntarily reply with any comments or rate their overall satisfaction with their solar PV project. Most participants, even those where a strict economic evaluation would show their system to be “uneconomical”, reported being pleased with their system. Additionally many respondents, even those with “uneconomical” systems, indicated they were considering increasing their installed capacity of solar PV.

At least one participant concluded that they were disappointed with their solar PV system's economics, even with the grant amount and indicated that in retrospect they would have rather taken their own financial contribution and invested in a "blue chip stock". Their position is that they would not invest again in solar PV until there were substantial changes in the economic factors (such as energy prices) that would impact investment returns.

Summary

Total installed project costs were quite variable, which appears highly influenced by how competitively the producer/owner sought out pricing. Although it can be great to use local installers, it is still important to be aware of available competitive pricing.

The Alberta solar PV contractor industry, like any industry, has poor performers that do poor work, and there is presently no clear mechanism to eliminate or avoid these contractors, so doing your homework before selecting a contractor is essential.

Even as market pricing becomes more competitive, a true economic evaluation shows relatively long periods for solar PV investment payback. Although you may make purchasing decisions based on more than pure economic evaluation, it's important to be clear on what the system economics look like, including some sensitivity analysis, should relevant factors change in the future.

For more information on the solar PV pilot, please contact Kelly Lund at Alberta Agriculture and Forestry at (780) 644-1197.

News

The On-Farm Energy area of Growing Forward 2 is working on developing a current, lower-value and longer-running solar PV grant program, based on learnings from the Solar PV Equipment Pilot.