

Watt's Happening?

Written by Don Pettit
for Peace Energy Cooperative, Dawson Creek, BC Canada
www.peaceenergy.ca ph 250-782-3882



My Solar Year: *what the numbers tell us*

A five-kilowatt grid-tied solar array has been operating on my roof in Dawson Creek for just over a year now, and the numbers for the year are in: instead of my electricity costing me money, I actually made a profit last year!

Many interested folk have asked to “see the numbers” so in this column I will write them out and then discuss what we can learn from my experience. If numbers and calculations cause your brain to go numb, then you can stop reading right now. Just remember my overall conclusion: grid-tie solar power works extremely well in northeast BC.

And the rest of the world too! It's hard to imagine, but last year Japan installed one million solar roofs like mine, and is busily installing another million this year. That's about the equivalent power of 3 or 4 Site C dams every year, but with almost no physical footprint because the solar is covering existing roofs, and no new transmission infrastructure because the power is used right where it's generated. And the fuel is free! Cool.

NUMBERS, NUMBERS . . .

Now for the numbers copied from my BC Hydro bills. “Inflow” is how much power my building used FROM the grid, and “Outflow” is how much solar



This roof-top solar array in Dawson Creek has been feeding green energy into the grid for a year now, and the numbers are in: this solar power system generated more electricity over the year than the building used, eliminating the electrical bills and creating a small profit.

power I fed INTO the grid. These numbers are tracked automatically by the Smart Meter and appear on every power bill in kilowatt hours (kwh), a standard measure of electricity flow over time.

DATE	INFLOW	OUTFLOW
Jan+Feb.	618 kwh	67 kwh
Mar+Apr.	305	895
May+June	145	1537
July+Aug	128	1366
Sept+Oct.	298	452
Nov+Dec.	660	11
Year Total:	2154 kwh	4328 kwh

The gadget (the inverter) that fed my solar power into the grid tracked the total solar power that passed through it, some into the grid and some used up by the building. At the end of the year it read 5479 kwh.

Now we can figure out how much power the building used: subtract the total Outflow (4328 kwh) from the Inverter output (5479 kwh) and we find the building used 1151 kwh of solar plus the Inflow from the grid (2154 kwh) equals 3305 kwh.

We can also calculate how much “excess” power I fed into the grid: subtract the total Inflow (2154 kwh) from the total Outflow (4328 kwh) and you get 2174 kwh. This is roughly the amount I was paid for under the BC Hydro grid-tie agreement, which pays 10 cents per kwh for power fed into the grid (a bit better than the 7.5 cents per kwh most of us are now paying Hydro for electricity).

Last week I was thrilled to receive a “Generation Settlement” statement from BC Hydro showing a \$275 credit to my account. Sweet. (I’m not complaining, but in Ontario that credit would be a lot sweeter: not hundreds but thousands of dollars.)

WHAT THE NUMBERS TELL US

Over the year, my rooftop solar generated almost twice as much electricity (5479 kwh) as I used (3305

kwh). This wiped out my electrical bills for the year plus gave me a cash credit.

This is in part because I run a low-demand very efficient building that used just 3305 kwh over the year. A standard north American home will use anywhere from 5000 kwh (very efficient) to 13,000 kwh per year (very inefficient) with an average home using about 8000 kwh per year. Therefore a somewhat larger array than mine and/or a better solar exposure (I get quite a bit of shading from a nearby building) would be needed to completely eliminate the electrical bills for an “average” home.

Low winter output does not matter. In northeast BC we generate so much power in the spring, summer and fall (up to ten times more than needed each month) that this extra power will more than cover power needed through the winter. That’s why grid-tie, where you stash your extra power in the grid for use later on, works so well here.

Rooftop solar works very well throughout BC, including the Peace Country, and BC Hydro is to be congratulated for streamlining the grid-tie process. Next we need to be paid a higher rate for the solar power we produce, and even a tiny bit of encouragement from the feds would go a long way. The people and technology are ready. It’s time for governments to catch up.

Quick Fact:

FUKUSHIMA AIMS FOR 100 PERCENT: The Japanese province of Fukushima, terrified of another nuclear disaster, has pledged to source 100 percent of its energy from renewables by 2040, mostly in the form of local community initiatives like roof top solar. Across Japan, nearly one million solar roofs are now being installed every year.

Below: one of many solar farms being built in Southern Ontario near Kingston.

