

Watt's Happening? #235

by Don Pettit

for Peace Energy Renewable Energy Cooperative

www.peaceenergy.ca ph 250-782-3882



Virtual Power Plants

Bringing people together with solar power



When you link thousands of rooftop solar arrays and batteries together, something magic happens.

You may wonder how I stay so positive amid all the doom and gloom around climate change. With just 3 percent of all media coverage of the crisis even mentioning potential solutions, it's easy to get discouraged. I try to correct this imbalance.

Sure, I research the problems, and much of what I find scares the heck out of me. But I also research the answers, and believe me, there are a lot of answers that millions of good folk around the world are working very hard on.

The Virtual Power Plant (VPP) movement is one of those new (and little known) answers.

THE SOLAR MIRACLE

Solar has proven to be a remarkable and little known miracle. Almost not on the energy radar 20 years ago, it

is now the fastest growing energy source the world has ever seen, and rapidly becoming the cheapest and least polluting too.

There are tens of millions of homeowners around the world providing all or much of their own electricity with solar panels on their roofs, and that number is growing rapidly. Even in the BC and Alberta Peace Regions, Peace Energy Coop has now installed just over 1 million watts of solar.

Most of these solar power systems are "grid-tied" meaning they are connected to the grid and can feed extra power they produce into the grid for a credit on the owners' electrical bills.

But what happens when you add some batteries and start to link these solar roofs together? Something amazing, and it's a growing trend worldwide.

LINKING U.S. SOLAR HOMES

Sunrun, a global leader in solar, linked together 5,000 solar homes across Massachusetts, New Hampshire, Rhode Island and Vermont to create a Virtual Power Plant prototype this past spring.

The homes used their home solar arrays and home battery storage to supply power to the grid when energy demand was high, while sharing their power when they needed more too. It was immensely successful.

VPP's are a sort of grassroots cooperative movement, with homeowners sharing their power when needed while being paid for any power they pump into the grid. The grid operators are happy too: they get cheap solar power without having to generate it or store it themselves!

During this year's hot summer in California, Pacific Gas and Electric put out notices for customers to conserve energy. 2,500 PG&E customers with Tesla Powerwall battery systems came together to add up to 16.5 megawatts (MW) of solar power delivered to the grid.

There are some 50,000 Tesla storage systems in PG&E's service area. When the grid is stressed, customers can choose to participate and are paid \$2/kWh for electricity they export to the grid. Some 3,500 homeowners have now joined the Tesla VPP in California for a total capacity of 50 MW. If they all join, that's more than 700 MW of widely distributed solar energy ready to support the grid.

AUSTRALIA LEADS

In Australia, 2.5 million households have rooftop solar and can elect to join the AGL Virtual Power Plant/ Adelaide, which uses cloud-based operating systems to interconnect home and business solar/battery systems across the country, creating the world's largest VPP. Again, very successful!

On the island of Miyako-jima in Japan, Tesla has installed a VPP with Powerwalls in over 300 homes, with 300 more going in this year. These island people experience frequent power outages during typhoons, but between the Powerwall batteries and sharing power with their solar VPP neighbours, their lights, refrigerators and other vital home systems keep working.

A GLOBAL NETWORK?

Now add in electric car batteries to the global VPP network, and pretty soon you have virtual power plants across whole cities, provinces and countries, supplying power when it is needed, and storing it when it is not.

Households with solar and storage are paid for the service, but also become part of something bigger and more important than their own needs. Now they too are a vital part of a very distributed, powerful and secure electrical grid that is much more resilient and reliable than centralized power generators.

Grid-tied solar with storage is one heck of a good idea in the first place. Linking them together is a genuine revolution, where power is truly put back into the hands of the people.

Now they too
are a vital
part of a very
distributed,
powerful
and secure
electrical
grid...