SOLAR PHOTO-VOLTAICS (PV)

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Kwalikum Secondary School

40.8 kWp

Background

What is Solar Energy and How Does Solar Generation Work?

- The sun is definitively the most secure source energy source that exists.
- Solar Photovoltaic (PV) is the conversion of light energy into electricity.
- There has been rapid worldwide growth; with the last 5 years seeing more solar PV installed than in the past 4 decades combined.
- In 2017 global solar capacity is estimated at 400 Gigawatts
- Solar PV generates zero greenhouse gas (GHG) emissions during its lifetime operations.
- The DC power that a solar panel produces must be regulated / converted into a signal that usable with traditional infrastructure.
- Enhances energy diversity and hedges against market price volatility, as well as political and regulatory challenges that are associated with conventional energy generation.
- Solar is a predicable resource with a wealth of historical weather data relating to solar resource.

Applications

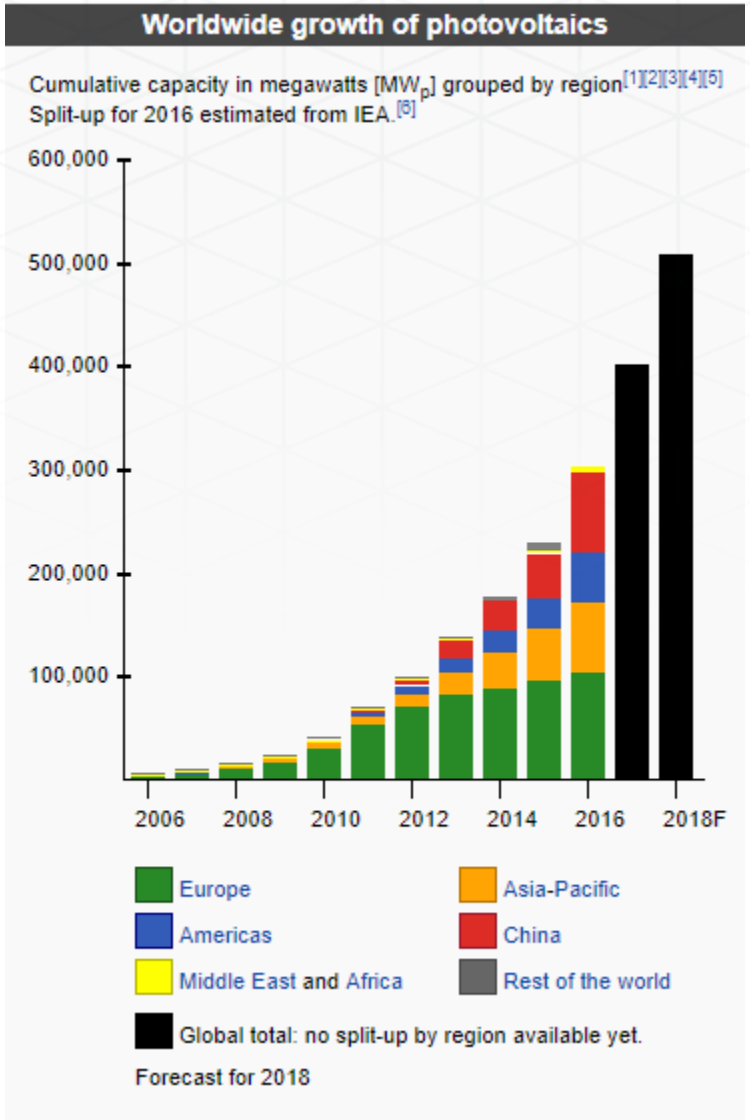
- Solar PV Systems have 3 applications:

Off-Grid

Grid Tied

Grid Tied with auxiliary source

Market Trends



- Deployment of solar electric systems have increased exponentially over the past 10 years
- Cost of PV has reached an all time low
- Utility rates are increasing at a rate that exceeds inflation
- Clean energy technology is beginning to be adopted into regulations

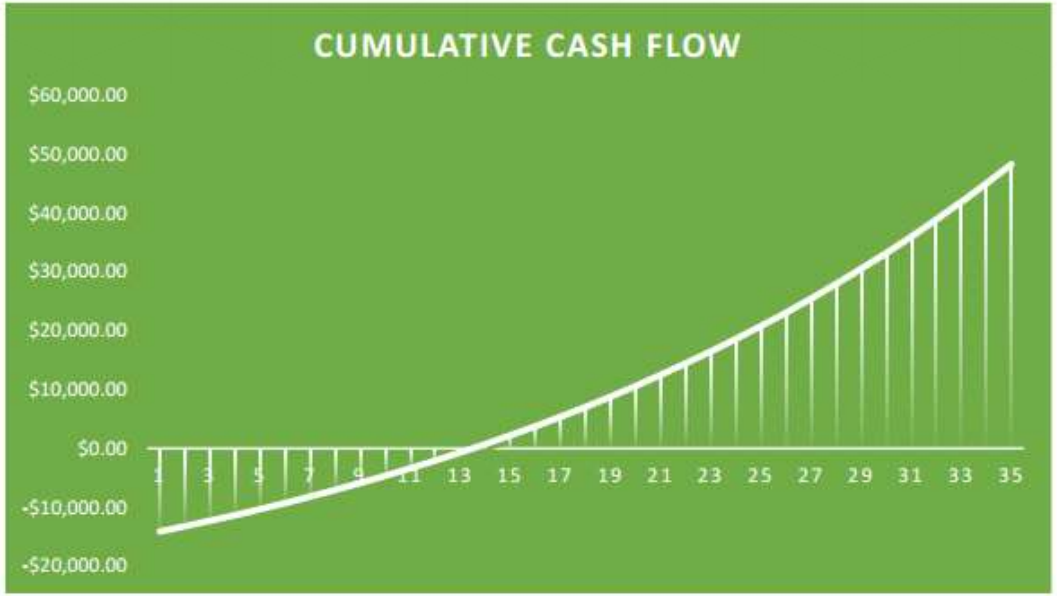
Advantages of Solar Electricity

- Environmental
- Energy Independence
- Predictable
- Reliability / Maintenance
- Financial

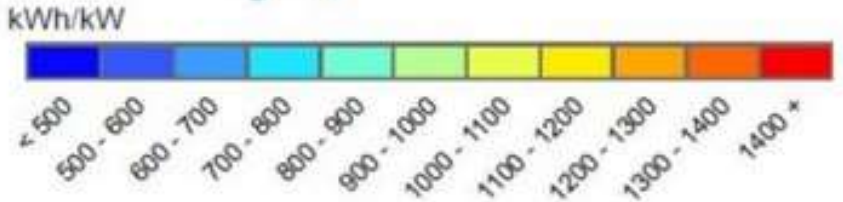
PV System Investment Calculator

System Cost	$15,000.00
System Size (kW)	5.00
Yearly Production (kWh/kW)	1,100
Est. Utility Rate Increase	4.0%
Present Value of Offset Energy (kWh)	$0.156

Annual Solar Production (kWh)	5500
Years For Capital Cost Payback	13
35 Year Investment Yield	$48,365.73
Average Annual Rate of Return	9.21%
Projected Average Annual Cost of Utility Electricity over system lifetime ($/kWh)	$0.33
Projected Average Annual Cost of Solar Electricity over system lifetime ($/kWh)	$0.08
Anticipated Property Value Increase	$20,900.00



Solar Resource



Where to mount solar

Roof

Ground Mount

Top of Pole

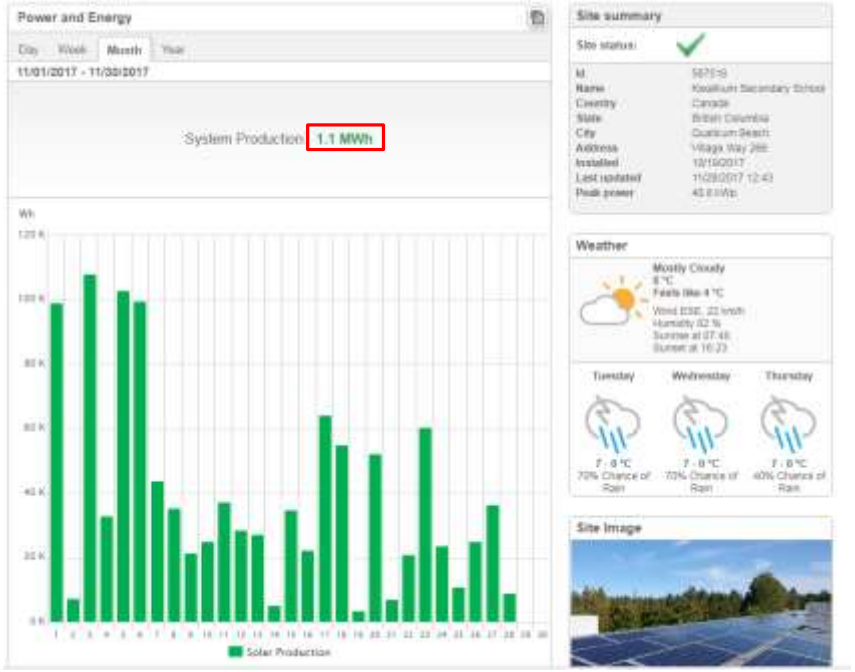
System Performance

https://monitoring.solaredge.com/solaredge-web/p/home#/dashboard

RESULTS **42,684 kWh/Year***

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Energy Value ($)
January	0.96	997	N/A
February	1.86	1,773	N/A
March	3.05	3,210	N/A
April	4.73	4,760	N/A
May	5.73	5,838	N/A
June	5.85	5,663	N/A
July	6.50	6,364	N/A
August	5.75	5,630	N/A
September	4.24	4,110	N/A
October	2.24	2,290	N/A
November	1.16	1,151	N/A
December	0.87	897	N/A
Annual	3.58	42,683	0

PVWatts predicted value for November =1.1MWh



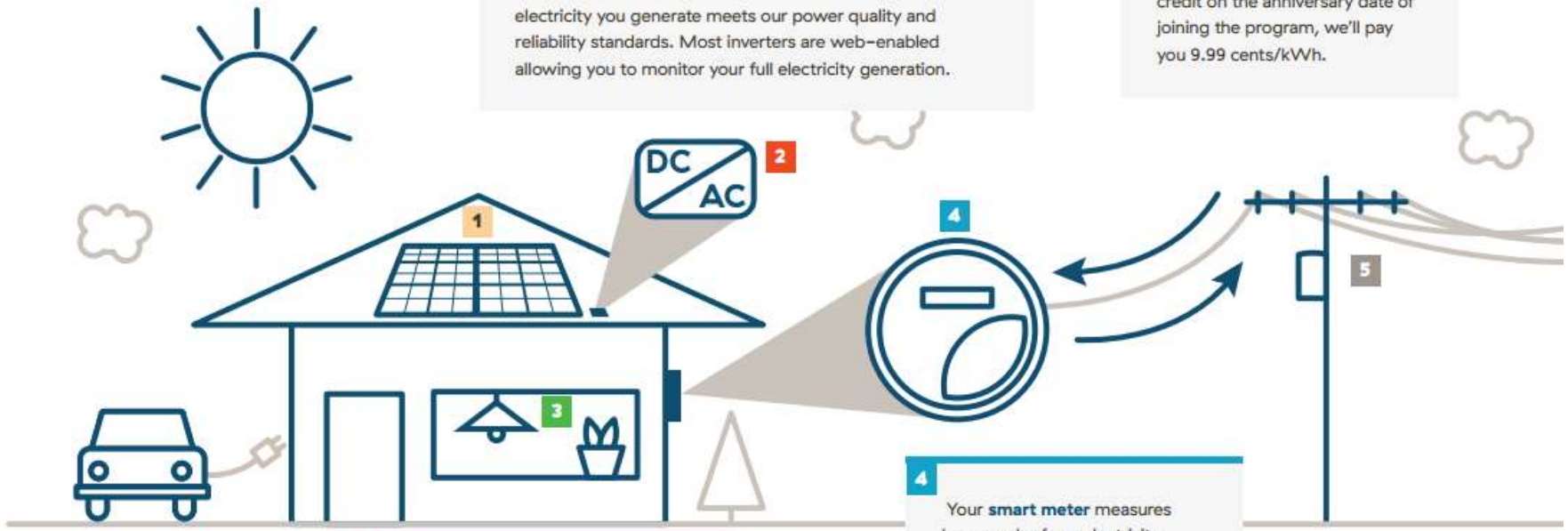
SolarEdge actual measured value for November =1.1MWh

Net metering—how it works

1 **Solar panels*** convert energy from the sun into direct current (DC) electricity.

2 The **inverters** convert the DC electricity into alternating current (AC) electricity, which is what your home or business and our distribution system use. It also ensures that the electricity you generate meets our power quality and reliability standards. Most inverters are web-enabled allowing you to monitor your full electricity generation.

5 Your **excess generation** is credited to you on your next bill. If you're left with a generation credit on the anniversary date of joining the program, we'll pay you 9.99 cents/kWh.



3 The **electricity** generated powers your home or business first, with excess generation sent to the distribution grid.

4 Your **smart meter** measures how much of our electricity you've used, and how much excess generation you've sent to the grid.

*Our net metering program is open to all sources of clean or renewable energy generation as identified in the Clean Energy Act. This includes solar, wind, hydro, etc.

BC Hydro
Power smart

BCH16-324e

Programs available

- There are no incentive programs in BC, however solar PV systems are exempt from PST. The Net Metering program offers a streamlined and no cost connection process.
- Hakai Energy Solutions and the CVRD have aligned to provide the opportunity for a bulk solar purchase.
- Hakai will leverage its volume based supplier discounts to source solar PV for CVRD customers who register by July 1, 2018. Lowest possible cost will be achieved with strong subscription.
- Hakai will provide no charge site assessments for qualified clients.

Find Out More

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