Economics of a Solar Array for a Homeowner

Solarize Monadnock 2020

March 6, 2020

The scenarios provided are only examples. Your costs and return on investment will be different.

Sample Solar Installation Cost

- Average system about 6 kW (20 panels).
- Estimated installed cost in NH for 2020 $3/W; Overall cost $18,000
- Minus 26% Federal tax credit, or $4,680
- Minus $880 state rebate

***** Net cost: $12,440 ******

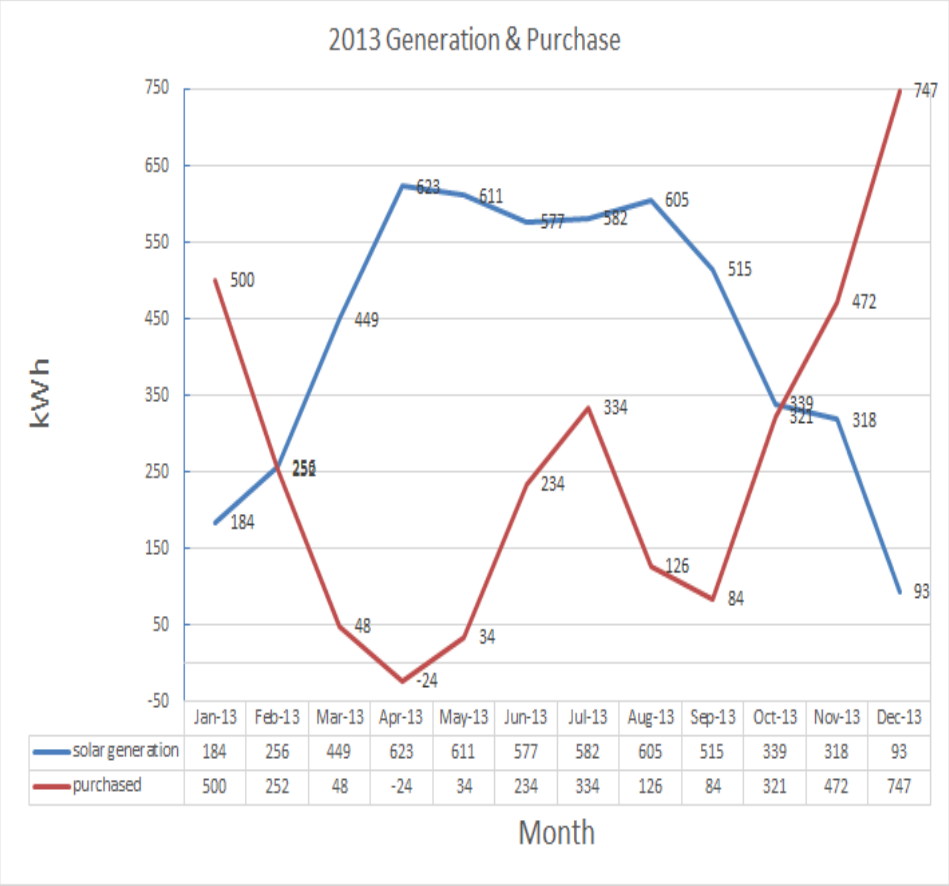
What are you paying for?

1) Physical parts needed like solar panels, rail system, inverter(s), meter all with warranties
2) Labor to install
3) Permits and fees

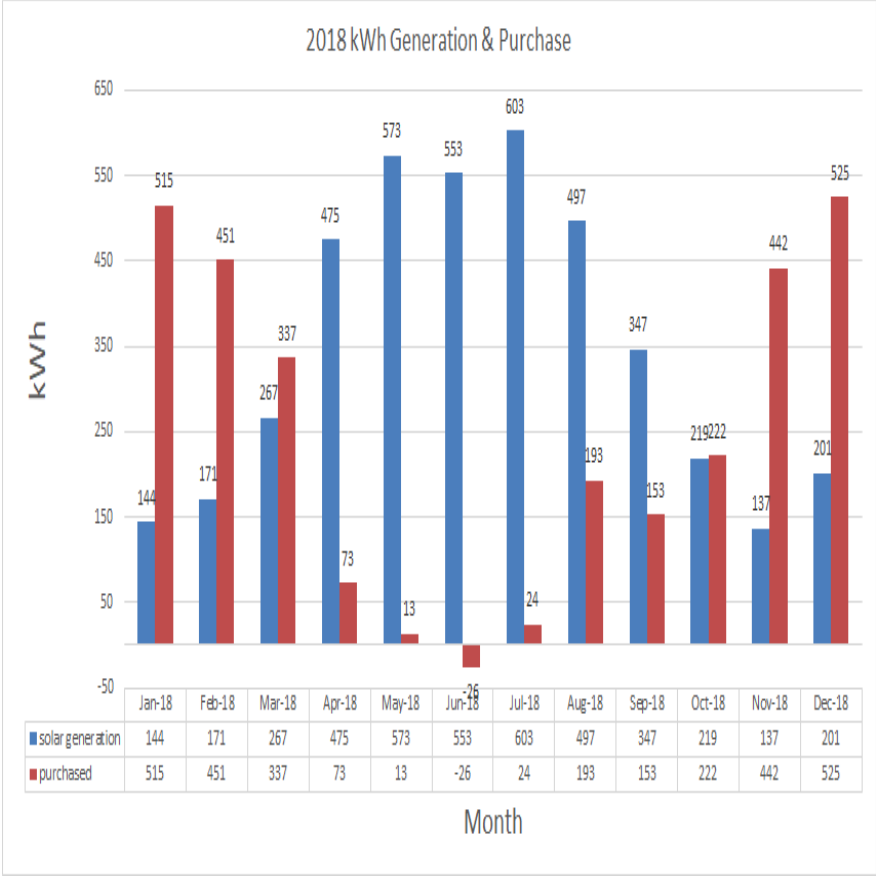
EXAMPLES

Estimated INVOICE COST	$13,000	$18,000	$26,000		
Federal income tax incentive	$3,380	$4,680	$6,760	26	% of total installed cost
NH rebate	$840	$1,000	$1,000		0.20/watt up to a maximum of $1,000.
Federal income tax on the NH rebate	-$101	-$120	-$120	12	% Yes, you must file the State rebate as taxable 'other income'.
NET COST to HOMEOWNER	**$8,881**	**$12,440**	**$18,360**		
number of panels	14	20	30		
system rated kilowatts(kW) at 300 watts/panel	4.2	6	9		
Invoice cost / installed watt	$3.10	$3.00	$2.89		
net cost / installed watt (after rebates)	**$2.11**	**$2.07**	**$2.04**		

Generation & Purchase of Electricity By Month in Keene



	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
solar generation	184	256	449	623	611	577	582	605	515	339	318	93
purchased	500	252	48	-24	34	234	334	126	84	321	472	747



	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
solar generation	144	171	267	475	573	553	603	497	347	219	137	201
purchased	515	451	337	73	13	-26	24	193	153	222	442	525

Now that you own a photovoltaic system, how will you earn money with it?

Payback Period & Return on Investment (ROI)

You will save money each month because you are not buying as much electricity from the grid.

The Grid is the generic term that signifies where electricity is available for a customer to buy.

Payback period is a calculation to help understand how long it will take to pay back your cost of buying something when that something is earning (saving) you money.

ROI tells you the %/year you are earning on your investment over the lifetime (years) of that investment.

Sample Payback Period & Return on Investment

- **Net cost: $12,440**
- Production from a 6 kW (20 panels) system = 6,400 kWh per year
  - Estimated energy cost savings = $565
  - Estimated distribution and transmission savings = $410
- TOTAL YEARLY SAVINGS in ELECTRIC BILLS = $975
- **Payback period: = $12,440/$975 = 12.8 years**
- **Annualized ROI over 20 years: = 2.2%**

20 years is the minimum expected life expectancy for a PV system.
Between 12.8 & 20 years (7.2 years), all the savings is the profit from your initial investment.

What is Net Metering?

- Net metering is a term to describe when a homeowner is both a buyer of electricity from the grid and a seller to the grid.
- Eversource will install (at no charge) a bidirectional meter that measures electricity flowing into your home (buying) and also measures the energy that you produce but is more then you are using at the moment and that excess electricity goes into the grid (selling).
- Your electric bill will be a bit more complex but you get to see how much <u>you sold to the grid</u>. This monthly bill does NOT tell you how much electricity your panels produced.
- Your inverter website/app will keep track of how much <u>total electricity your panels produced</u>.

How Does Net Metering Affect Me?

If you sell less electricity to the grid than you purchase, you will receive the maximum value for your electricity under current costing regulations[+].

If you sell more electricity to the grid than you purchase in a billing cycle (month), you will receive a dollar credit for the discounted value[*] of the extra kWhs.

This dollar credit is applied toward electricity purchases on future billing cycles.

[+] There will always be the flat fee "customer charge" on your bill. "Stranded Cost Recovery Charge"& "System Benefit Charge" will always be based solely on the electricity you buy from the grid with no credit being given for electricity that you sell to the grid.

[*] There is a 22% discount on the value of the electricity you sell to the grid that exceeds how much you buy from the grid that billing cycle.

PV Bill for Net Buy of kWh

Net purchase of 37 kWh

Service reference: 00000000 Billing Cycle: 03
Service from 09/05/18 - 10/03/18 28 Days
Next read date on or about: Nov 01, 2018

Meter Number	Current Read	Previous Read	Current Usage	Reading Type
S74421993	2182	1767	415	Purchases
S74421993	1666	1288	378	Sales

Purchases of 415 kWh - Sales of 378 kWh = 37 Net kWh Usage

Total Charges for Electricity

Supplier (Eversource)		
Energy Chrg - Rate R	37.00kWh X $0.09412	$3.48
Subtotal Supplier Services		$3.48
Delivery (RATE R RESIDENTIAL SVC)		
Customer Charge		$12.69
Distribution Charge	37.00kWh X $0.04141	$1.53
Transmission Charge	37.00kWh X $0.02039	$0.75
Strnded Cst Recovery Chrg	415.00kWh X $0.02067	$8.58
System Benefits Charge	415.00kWh X $0.00455	$1.89
Subtotal Delivery Services		$25.44
Total Cost of Electricity		**$28.92**

PV Bill for Net Sale of kWh

Net sale of 123 kWh

Service reference: 000000000 Billing Cycle: 08
Service from 09/12/18 - 10/11/18 29 Days
Next read date on or about: Nov 08, 2018

Meter Number	Current Read	Previous Read	Current Usage	Reading Type
000000000	1459	1256	203	Purchases
000000000	1078	752	326	Sales

Purchases of 203 kWh - Sales of 326 kWh = -123 Net kWh Usage

Total Charges for Electricity

Supplier (Eversource)		
Default Energy Service-Net	123.00kWh X $-0.09412	-$11.58
Subtotal Supplier Services		-$11.58
Delivery (RATE R RESIDENTIAL SVC)		
Customer Charge		$12.69
Distribution Charge	123.00kWh X $-0.01035	-$1.27
Transmission Charge	123.00kWh X $-0.02039	-$2.51
Strnded Cst Recovery Chrg	203.00kWh X $0.02067	$4.20
System Benefits Charge	203.00kWh X $0.00455	$0.92
Subtotal Delivery Services		$14.03
Total Cost of Electricity		**$2.45**

Net Metering and Gov. Sununu Veto

Recently Gov Sununu has vetoed net metering on systems greater than 1,000 kW (1 megawatt).

Residential systems are generally 3 - 15 kW. Small businesses in the Keene area are all less than 1,000 kW.

Net metering is NOT limited at all when dealing with systems under 100 kW.

The Governor's veto has no effect on **residential or small business** systems!