SOLARIZE!

CORNISH/PLAINFIELD/WINDSOR/HARTLAND

Presented by the Plainfield , Cornish, Hartland and Windsor Energy Committees

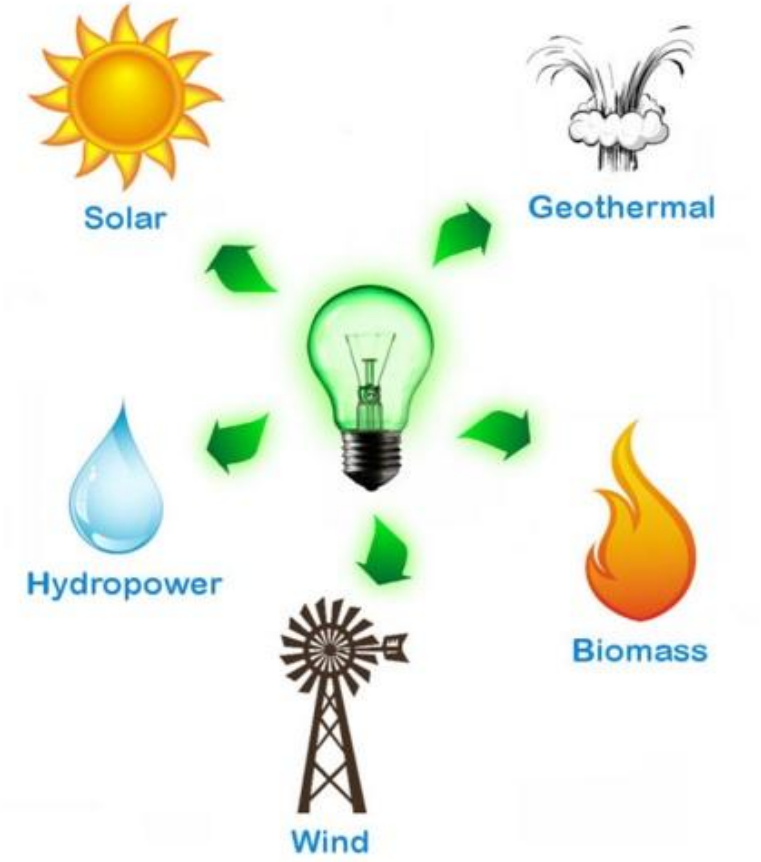
Feb 26, 2022

SOLARIZE!

CORNISH/PLAINFIELD/WINDSOR/HARTLAND

Education
Guidance
Advice

What is Solar Energy?



Renewable energy is the power harvested from natural sources which are not in danger of being depleted

Solar Photo Voltaic Systems are

- Efficient
- Reliable
- Green
- Cost Effective

How does PV work?

One Solar Cell

Converts solar energy into electricity

One Solar panel or module

- 50 -100 cells in series
- Mechanical support and weatherproofing

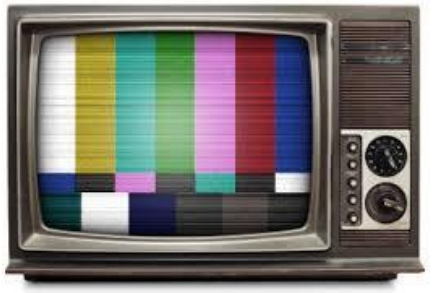
An Array is a set of panels

20 panels can produce 7kW of electricity

What is a kW?

- **watt (W)** – the unit of electric power
- **kilowatt (kW)** – 1000 watts
- **kilowatt-hour (kWh) –** a measure of electric power production or consumption over a period of time

An electric heater rated at 1000 watts (1 kilowatt), operating for one hour uses one kilowatt-hour of electricity



A television rated at 100 watts operating for 10 hours continuously uses one kilowatt-hour of electricity

A 40-watt light bulb operating continuously for 25 hours uses one kilowatt-hour of electricity

What happens when the sun isn't shining?

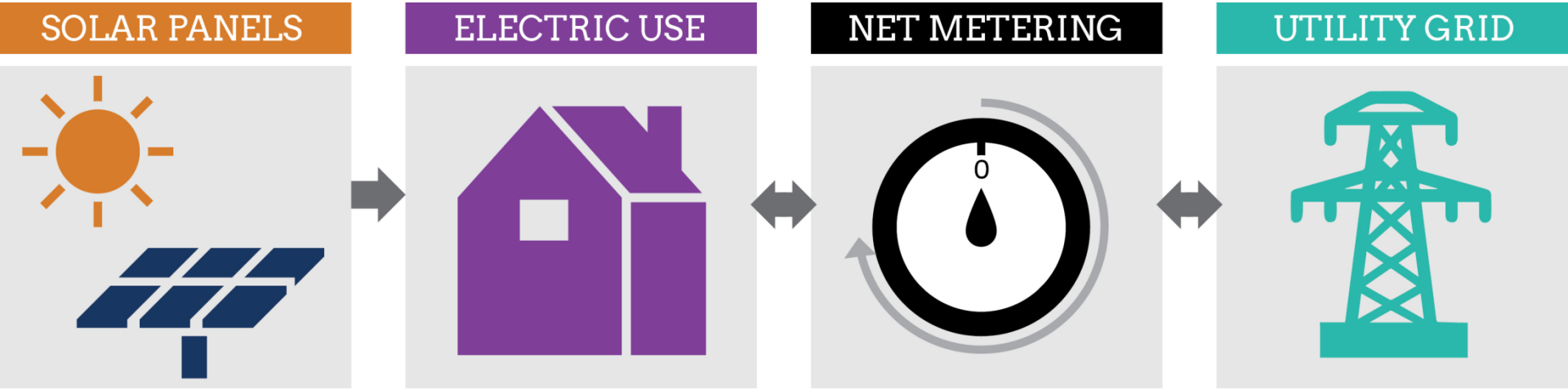
- Use it or lose it

- Store excess electricity : *Battery Storage &Backup*

- Let the Utilities manage the excess : *Net Metering*

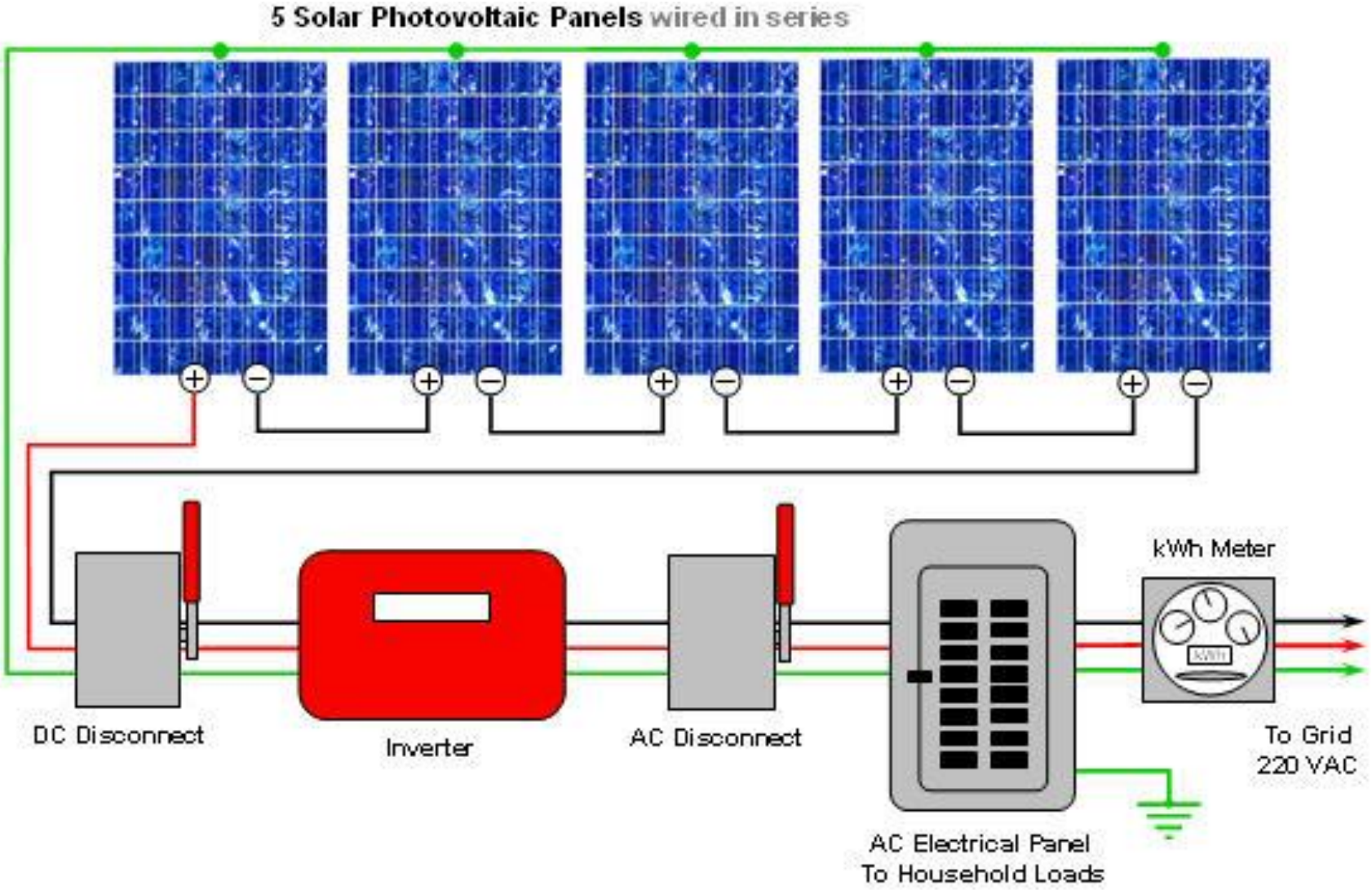
What is Net Metering?

Net metering allows you to use the electric utility grid like a bank account. You can put electricity into it that you don't use immediately and you can withdraw the same amount later.



Net Metering is regulated by the state PUC

A PV Solar System contains a few components



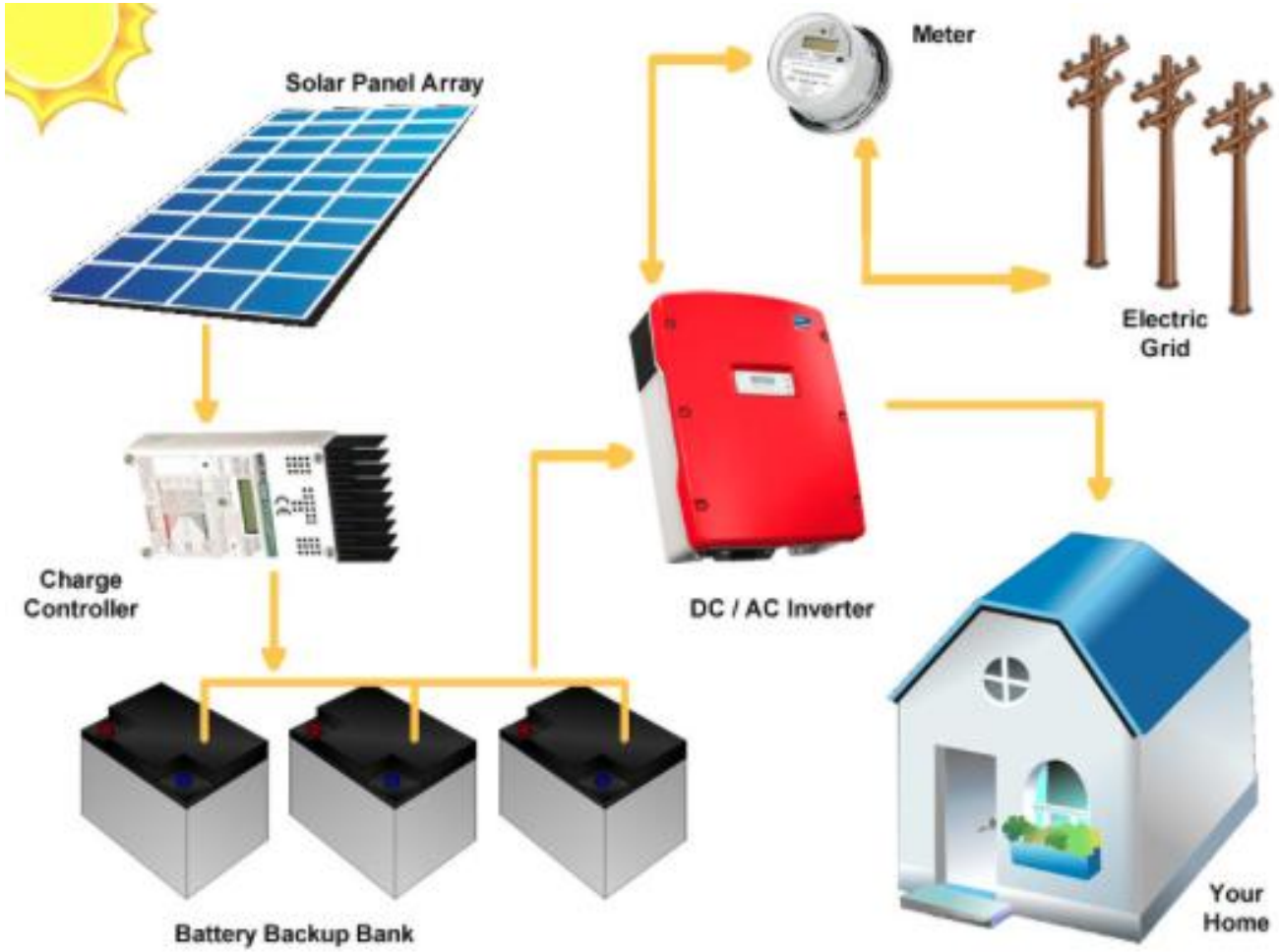
What Kind of PV System do I want?

Decision 1

Grid Tied?

Off Grid?

Battery backup?



Mounting

Decision 2

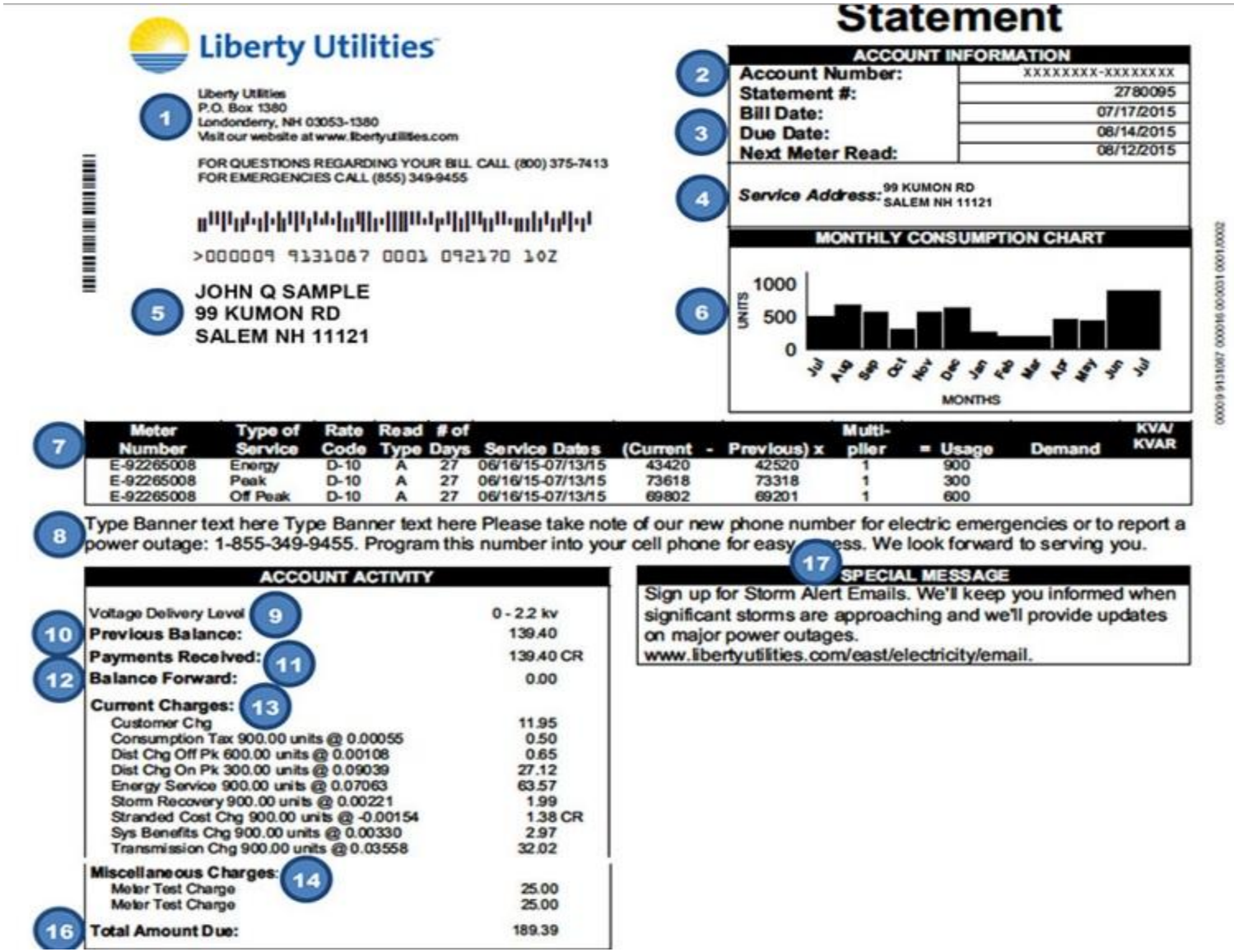
- roof or ground?
- fixed or adjustable?

Decision 3

What size system do I need?

- What are your energy goals?
- **Electric Hot Water Heater? Electric stove? Electric Dryer?**
- The actual amount of electricity produced is dependent on how much solar energy reaches your site.
- Average NH/VT residential electric consumption is 600 kwh/mo (7.2Mw/year)
- Average size of residential PV system is 7kW

Look at your electric bill



Liberty Utilities

1 Liberty Utilities
P.O. Box 1380
Londonderry, NH 03053-1380
Visit our website at www.libertyutilities.com

FOR QUESTIONS REGARDING YOUR BILL CALL (800) 375-7413
FOR EMERGENCIES CALL (855) 349-9455

>000009 9131087 0001 092170 10Z

5 JOHN Q SAMPLE
99 KUMON RD
SALEM NH 11121

Statement

ACCOUNT INFORMATION

2 Account Number:	XXXXXXXX-XXXXXXX
Statement #:	2780095
3 Bill Date:	07/17/2015
Due Date:	08/14/2015
Next Meter Read:	08/12/2015

4 *Service Address:* 99 KUMON RD SALEM NH 11121

MONTHLY CONSUMPTION CHART

6

7

Meter Number	Type of Service	Rate Code	Read Type	# of Days	Service Dates	(Current - Previous) x	Multi-plier	= Usage	Demand	KVA/ KVAR
E-92265008	Energy	D-10	A	27	06/16/15-07/13/15	43420 - 42520	1	900		
E-92265008	Peak	D-10	A	27	06/16/15-07/13/15	73618 - 73318	1	300		
E-92265008	Off Peak	D-10	A	27	06/16/15-07/13/15	69802 - 69201	1	600		

8 Type Banner text here Type Banner text here Please take note of our new phone number for electric emergencies or to report a power outage: 1-855-349-9455. Program this number into your cell phone for easy access. We look forward to serving you.

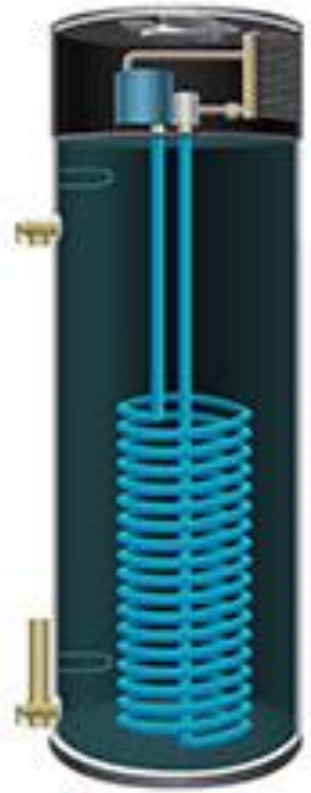
ACCOUNT ACTIVITY

9 Voltage Delivery Level	0 - 2.2 kv
10 **Previous Balance:**	139.40
Payments Received: 11	139.40 CR
12 **Balance Forward:**	0.00
Current Charges: 13	
Customer Chg	11.95
Consumption Tax 900.00 units @ 0.00055	0.50
Dist Chg Off Pk 600.00 units @ 0.00108	0.65
Dist Chg On Pk 300.00 units @ 0.09039	27.12
Energy Service 900.00 units @ 0.07063	63.57
Storm Recovery 900.00 units @ 0.00221	1.99
Stranded Cost Chg 900.00 units @ -0.00154	1.38 CR
Sys Benefits Chg 900.00 units @ 0.00330	2.97
Transmission Chg 900.00 units @ 0.03558	32.02
Miscellaneous Charges: 14	
Meter Test Charge	25.00
Meter Test Charge	25.00
16 **Total Amount Due:**	189.39

17 **SPECIAL MESSAGE**

Sign up for Storm Alert Emails. We'll keep you informed when significant storms are approaching and we'll provide updates on major power outages.
www.libertyutilities.com/east/electricity/email.

More on sizing: Three reasons to potentially "think big" and oversize your system



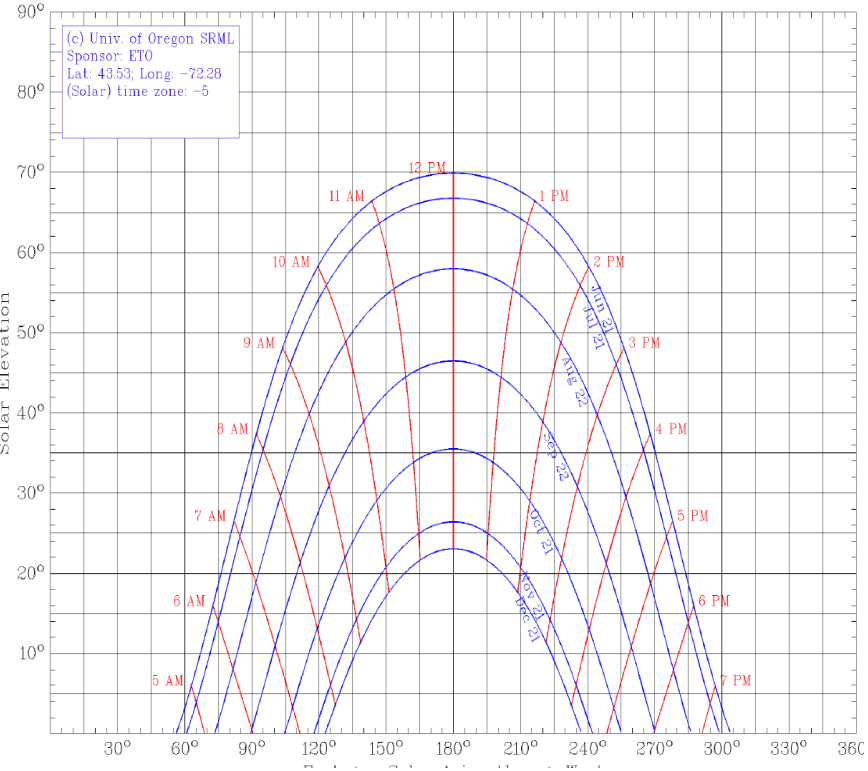
1) **Electric Heat Pump Water Heaters**
   - Relatively new to the market; very efficient
   - **Solar water heating from your PV system!**
2) **Electric Air-Source Heat Pumps**
   - Becoming more viable in this climate
   - **Solar space heating from your PV system!**
3) **Electric Cars**
   - Even if a Tesla Model S isn't in your future, a Nissan Leaf might be…
   - **Transportation fueled by your PV system!**

Don’t forget…

- You can supply all your electricity with a smaller solar system if you improve electric efficiency.
- A few tips:
  - Stop using old refrigerators.
  - Use LED lightbulbs.
  - Super-efficient “heat pump” dryers are now available in the US.
  - Great resources are at energystar.gov

Do I have a good location for solar panels?

Azimuth - Pointing true south is best

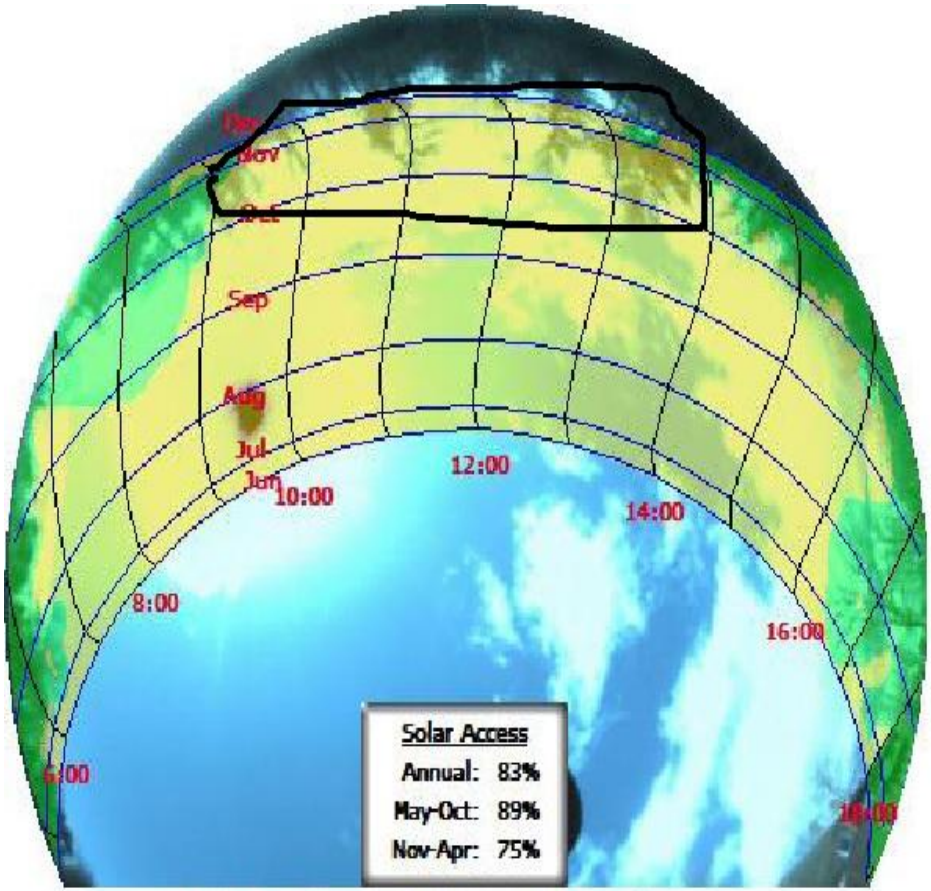


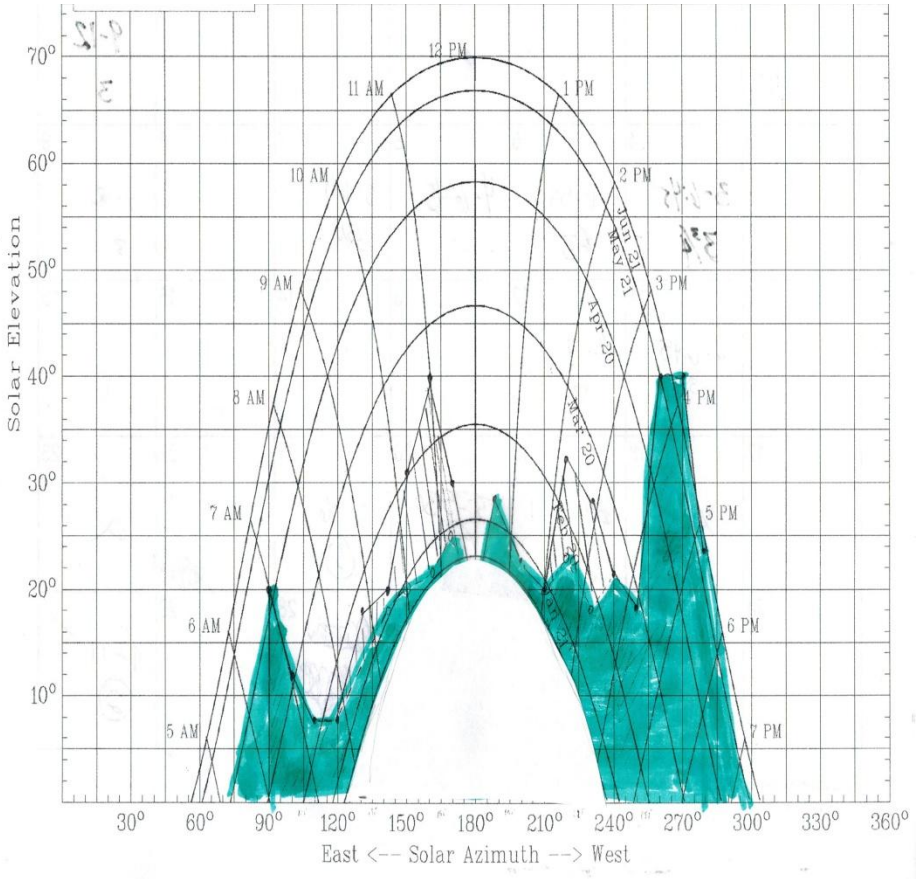
% of optimal generation		W	SW		S		SE	E	
		270°	225°	210°	180°	150°	135°	90°	True
		285°	240°	225°	195°	165°	150°	105°	Magnetic
	60°	65%	85%	89%	92%	88%	83%	63%	
15/12	51°	70%	89%	94%	97%	92%	88%	68%	
12/12	45°	73%	92%	96%	99%	94%	90%	71%	
9/12	37°	77%	94%	97%	100%	96%	92%	75%	
6/12	27°	81%	94%	97%	99%	96%	93%	79%	
	25°	81%	94%	97%	99%	96%	93%	80%	
3/12	14°	84%	92%	94%	95%	93%	91%	83%	
Roof Pitch Tilt Angle									

Tilt – The angle of fixed panels should be close to 37 deg

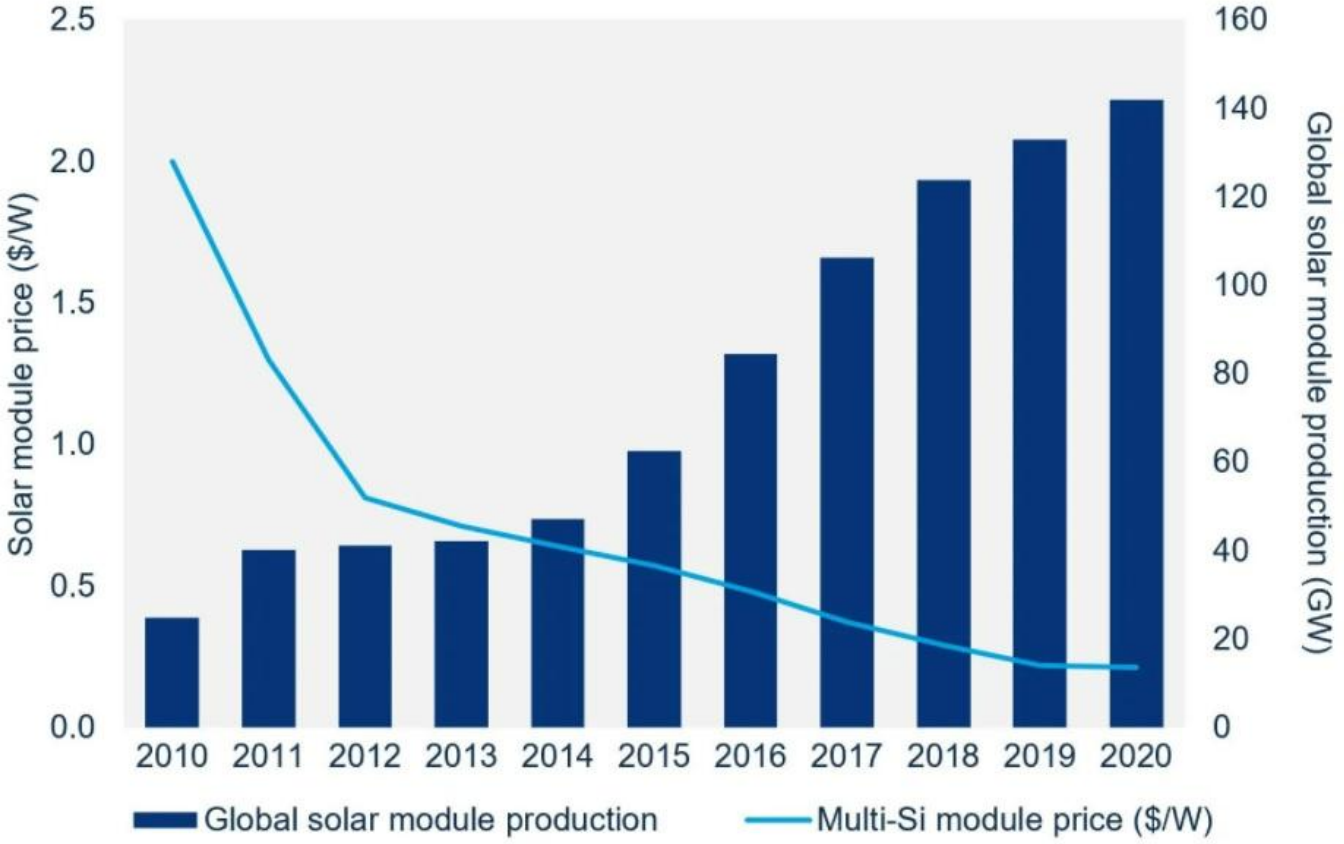
Avoid shading!

Solar Survey

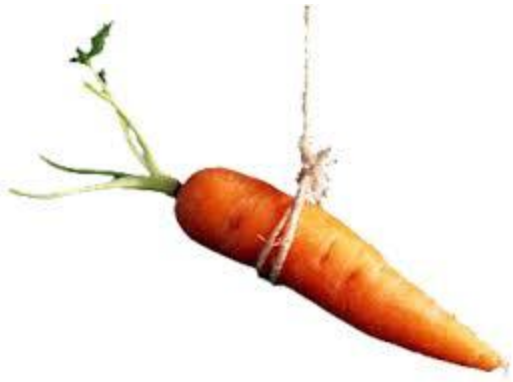




How much does a PV system cost?



Residential Incentives



Federal 26% investment tax credit ("ITC")

Scheduled to decrease to 22% starting next year

How much does a PV system cost?

Example Installed price:	$22,000
Less 26% tax credit:	- $5,720
Actual cost:	$16,280

(RECs $210/yr)

The price used is for an "average" system installed in NH/VT based on a compilation of estimates and average household electricity usage.
The actual price will be higher or lower based on your situation.

Payback / ROI

System cost is $16280
Production/consumption is equal at 7000kW/year
Yearly electricity expense is $1400 at .20/kWh

Your payback period is ~12 years, then you get…

13 years of free electricity worth $19,640!

That's an annualized Return on Investment (ROI) of 7.09%!

And a reduction of 89 tons of CO2 over 25 years!

Financing Options

Home Equity Loans

Green Loans

- Mascoma Bank
- VSECU
- Heritage Family Credit Union

Installer Finance Programs

Community Solar

Application, Permitting and Property Taxes

Utility application for Net Metering (Interconnect)

Your electric utility must approve your Net Metering interconnect application before you build.

Town Permitting

Building Permit **-** Very simple process

May be subject to structural and/or electrical inspection by town inspector or licensed electrician

No property tax impact!

The extra value of your solar system will not be taxed

Reasons to act NOW!

1) The 26% residential investment tax credit decreases next year then is no longer available in 2024
2) Net Metering regulations may change again
3) If you are concerned about climate change: immediate CO_2 reductions are better than future CO_2 reductions
4) Interest rates are low, which makes financing more viable

What you can do to prepare

1) **Figure out how much electricity you consume in a year**
   - Your electricity bill should tell you this, or the power company can
2) **Might your consumption change significantly in the future?**
   - Electric car? New addition to the family, or kids heading off to college? Upgrading to a new efficient refrigerator? Heat pump hot water heater?
3) **Think about viable locations for your PV system**
   - Roof- vs. ground-mount; consider trimming or thinning trees as necessary
4) **Ask questions**
   - The Energy Committees and "solar ambassadors"
5) **Talk with our Solar Installers**
   - Learn from the pros! Schedule a site visit!
6) **Help spread the word!**
   - If you're not ready, maybe you know someone that is!

How to Select an Installer

What *products* do they sell?
What *services* to they provide?
What *support* do they offer?

Talk to your friends and neighbors
Ask questions
Compare quotes

Additional Resources

- A copy of this presentation
- Solar FAQs
- Links to pertinent utility web pages
- Energy Calculators
- Cost/ROI Calculators
- And much more can be found at

  https://tinyurl.com/Solarize-2022

We're here to help

Education

Guidance

Advice

Meet our Installers

Same Sun of VT

Catamount Solar

Solaflect Energy

SunCommon (VT)

Green Mountain Solar (VT)

Granite State Solar (NH)