

An aerial photograph showing two large rectangular solar panels installed on a green grassy field. The panels are tilted at an angle, and their blue surface with a grid of solar cells is clearly visible. The background is a lush green field.

# **On Farm Solar Energy Production**

**Allen Bonthuis, Harvest Solar**

**Potato Grower Winter Conference**



An aerial photograph of two large solar panel arrays installed on a green, grassy field. The panels are dark blue with a grid pattern of silver lines. A semi-transparent orange banner is overlaid across the top left portion of the image, containing the title text.

# Have You Heard?

**Solar doesn't work in Michigan? Too cloudy?**

**If solar worked, it wouldn't need subsidies!**

**Solar uses land we need for food production!**

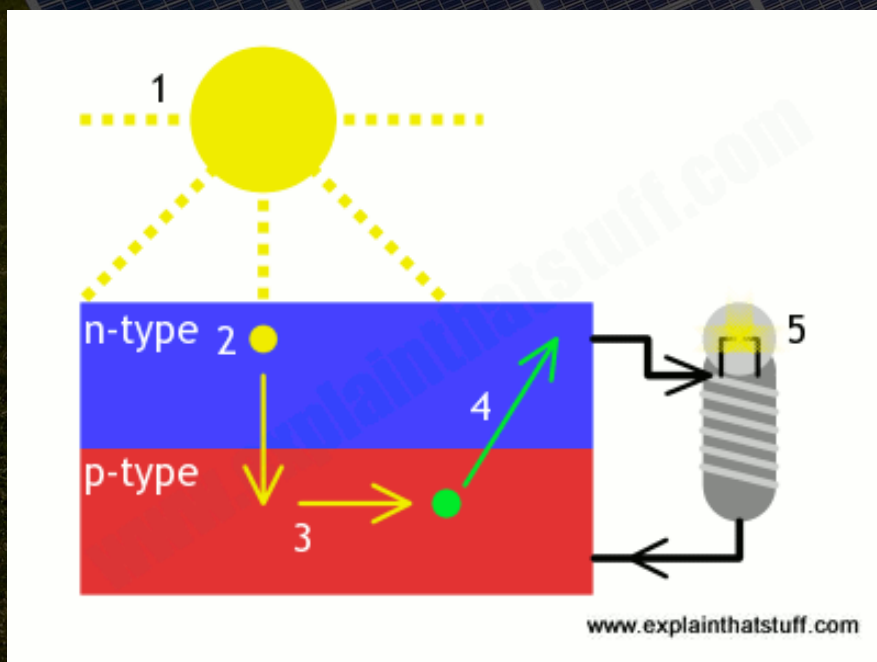
**We only use solar because it is being forced on us!**

**Solar isn't efficient enough!**

harvest  
solar



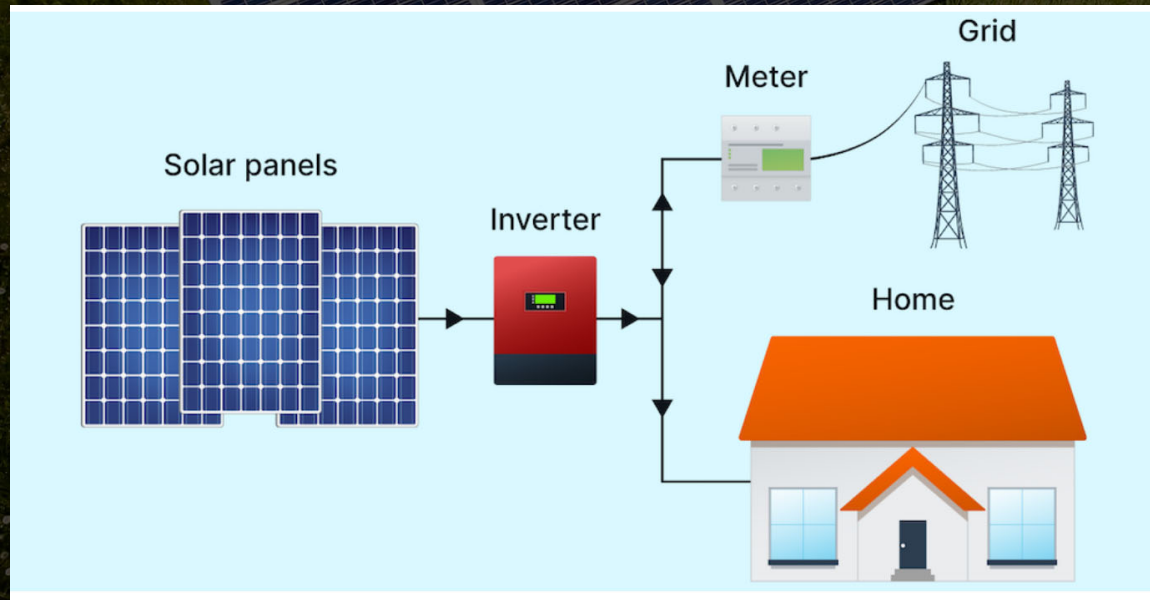
# How Solar Works



Photons from the sun dislodge electrons in a solar panel. We borrow them in a DC system before sending them back to the array.



# Distributed Generation (BTM)



- Grid-Tied Solar – Reliable/Easy
- DC converted to AC by an onsite inverter
- Use the electricity you generate from solar first, push excess back to the grid for credit
- Use from the grid when you don't produce enough electricity
- Grid is down - solar doesn't work



harvest  
solar

Ground, Roof, or  
Other





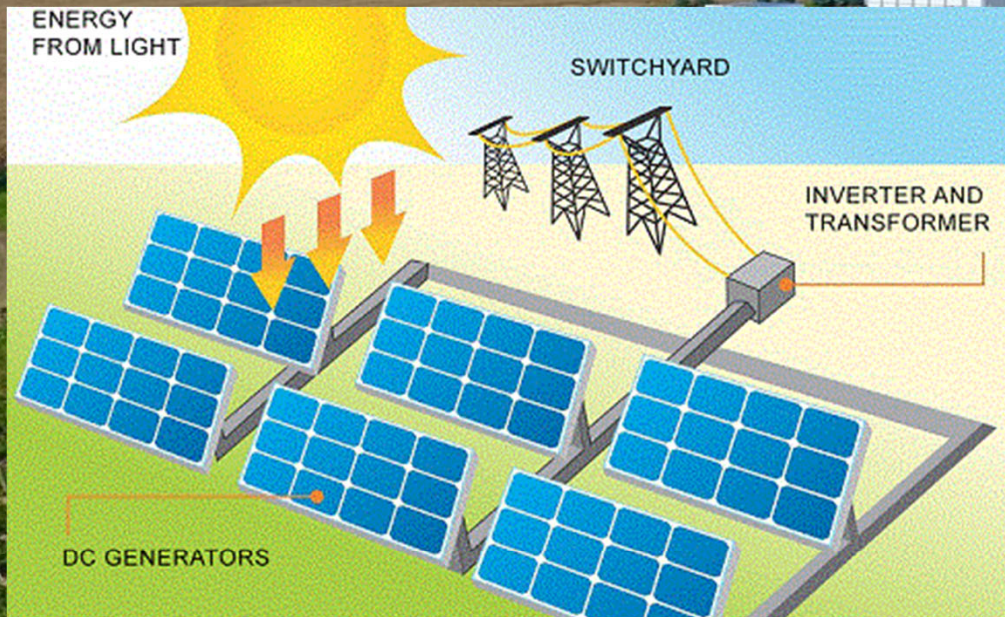
An aerial photograph of a grassy field with two large solar panel arrays. The panels are dark blue with a grid pattern, and they are tilted at an angle. The grass is green and slightly textured. A semi-transparent orange banner is overlaid across the middle of the image, containing the title and a bulleted list.

# Distributed Generation Rules

- Requires permission to connect to the grid
- 110 % of your previous 12 months usage (SB271)
- Utility pays for excess up to 550kW (SB271)
- Co-operatives and small utilities have some exemptions



# Utility Solar



- Produces energy for the grid when the sun shines
- DC converted to AC by an onsite inverter and transformer
- None of this energy goes to the landowner if leased
- Utility wants flat, cleared land close to infrastructure like farm fields





# Utility Solar Rules

- Requires a contract to sell electricity to grid
- Local zoning has authority up to 100MW
- Over 100MW local authority zoning is mandatory to meet state guidelines



# Why use solar



The carbon footprint of solar is 1/3 that of electricity generated by fossil fuels. As a business becomes more sustainable, environmental leadership is increased as dependence on the Utilities is decreased.



Going solar attracts environmentally responsible consumers and employees. Fulfilling this commitment also highlights your business for the 88% of consumers looking for sustainable brands.

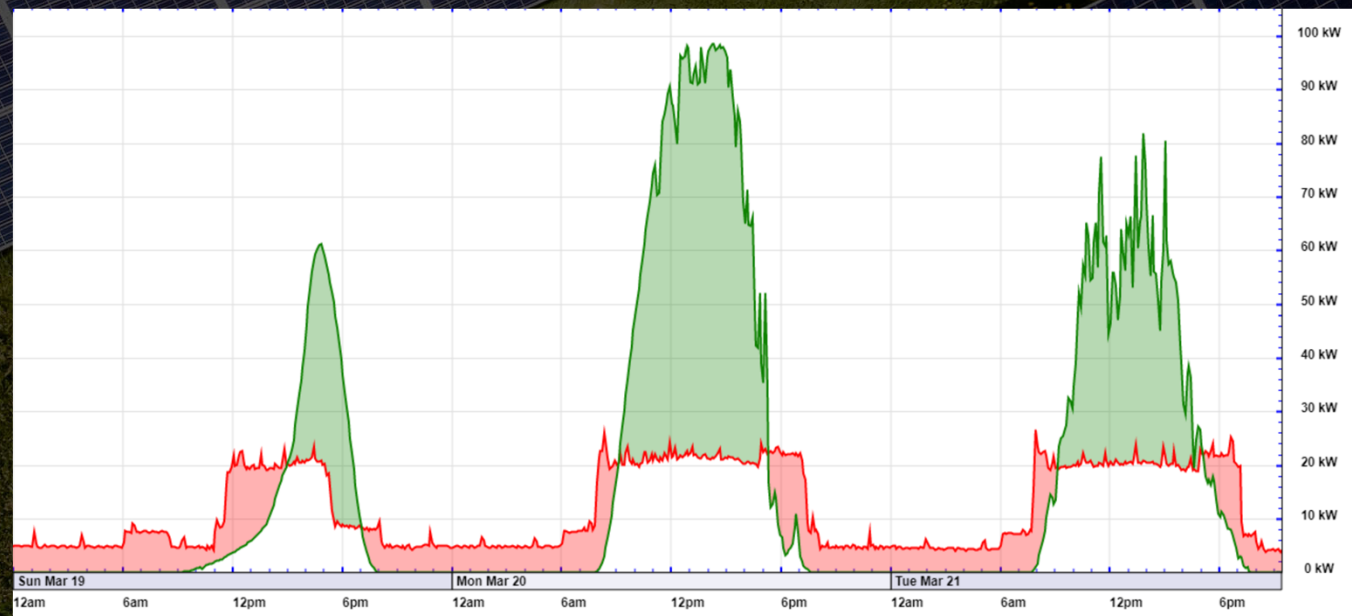


Solar energy drastically lowers operating costs for your business. Solar costs less than traditional utility power providing immediate and long-term cost savings.



# How Distributed Generation Works

- Born in 2018 from PA341 and PA342 of 2016
- Private home and business owners generate electricity for their own use, primarily from renewables
- Send excess energy back to the grid (outfeed)
- Buy energy from the grid when they don't produce enough (infeed)



3-day March e-Guage example



# How can DG preserve farmland?

- You do not have to give utility and solar investors all the control.
- 10% of the Michigan renewable energy mandate is reserved for Distributed Generation. That means using roof tops and green spaces can save 20,000 – 40,000 acres.
- When we hit the cap, a new cap will likely be put in place.
- Take control now, the pressure will continue, and the clock on the opportunity will run out.
- REAP is locked in for 10 years
- ITC is locked in for 10 years

This solar  
installation  
is part of a program  
to preserve  
30,000 acres  
of farmland



# Paying for Solar

- Energy Savings
- Investment Tax Credit 30-60%
  - Depends on equipment and location
- USDA REAP Grant 50%
  - Taxable
- Depreciation
  - 5 Year
  - Cost-1/2 of ITC





# Returns

## Financial Investment - Cash

IRR	NPV	Lifetime Savings	Levelized Cost of Energy	Payback Period
26.17%	\$281,685.02	\$283,769	\$0.03/kWh	1.9 Years

## Cash Flow

Year	Annual Bill Pre Solar	National Depreciation Benefit	Annual Bill Post Solar	Annual Cashflows	Cumulative Cashflows
0	0	0	0	(79.6k)	(79.6k)
1	4,978	3,343	651	71.2k	(8,343)
2	5,208	5,348	668	9,792	1,449
3	5,449	3,209	686	7,876	9,325
4	5,703	1,925	706	6,827	16.2k
5	5,969	1,925	726	7,072	23.2k
6	6,248	963	748	6,367	29.6k
7	6,542	0	770	5,675	35.3k
8	6,850	0	794	5,959	41.2k
9	7,173	0	820	6,257	47.5k
10	7,513	0	847	6,570	54.1k
11	7,870	0	875	6,898	61k
12	8,244	0	905	7,243	68.2k

- **Proposals should include Cash Flow, IRR, and Payback Periods**
- **Ask to see a proposal without REAP so you determine when you should start construction.**
  - Price increases
  - Utility changes
  - Historical awards



An aerial photograph showing several rows of solar panels installed on a grassy field. The panels are dark blue with a grid pattern, and the grass is green. A semi-transparent orange banner is overlaid on the top left of the image.

# What Harvest Solar Does

- Design, helping you navigate the options of a solar design
- Engineering, verifying and supplying all engineering documents
- Permitting, working with local authorities that issue permits
- Installation, in-house installation crews familiar with agricultural operations
- Interconnection, work with utility to get permission and follow to the end
- We DO NOT write grant proposals – Referred to expert grant writers







Questions?

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