

# **East Central Oklahoma Electric Cooperative Solar**



# Why Solar?

- Green Power
- Environmental Friendly
- Reduce Carbon Emissions
- Gives Members (customers) opportunity to invest in renewable energy
- Not many maintenance issues (no moving parts)

# **Disadvantages of Solar**

- Power only during daylight hours
- Reduce output on rainy/cloudy days
- Storage of excess power
- Available land
- Capacity Accreditation limited??
- Higher cost than fossil power

# Hourly Production

Hourly Production

Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
3	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
4	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
5	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
6	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
7	-0.1	-0.1	-0.1	0.2	0.6	0.6	0.5	0.3	0.0	0.0	-0.1	-0.1	0.2
8	0.0	0.1	0.7	1.5	1.8	1.6	1.7	1.6	1.2	0.9	0.2	0.0	0.9
9	1.0	1.4	1.9	3.0	3.2	2.6	3.2	3.0	2.5	2.3	2.0	1.0	2.3
10	2.7	2.6	3.0	4.2	4.3	3.7	4.4	4.1	3.7	3.4	3.4	2.6	3.5
11	3.8	3.7	3.9	4.8	5.0	4.5	5.1	5.0	4.7	4.2	4.3	3.4	4.4
12	4.4	4.7	4.3	5.2	5.2	4.9	5.4	5.6	5.4	4.5	4.3	4.2	4.8
13	4.4	4.6	5.0	5.2	5.2	5.4	5.6	5.7	5.3	4.7	4.3	4.3	5.0
14	4.1	4.6	5.0	5.2	5.3	5.6	5.7	5.9	4.6	4.5	4.1	4.0	4.9
15	3.9	4.3	4.6	4.7	5.1	5.1	4.9	5.2	4.7	4.1	3.5	3.6	4.5
16	3.1	3.2	3.8	3.7	3.8	4.2	4.3	4.1	3.3	3.0	2.4	2.5	3.5
17	1.5	2.1	2.5	2.5	2.7	3.0	3.0	3.1	2.2	1.6	0.8	0.7	2.1
18	0.0	0.5	1.0	1.2	1.4	1.8	1.7	1.5	0.7	0.1	-0.1	-0.1	0.8
19	-0.1	-0.1	-0.1	0.1	0.3	0.4	0.5	0.2	-0.1	-0.1	-0.1	-0.1	0.1
20	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
21	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
22	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
23	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
24	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
Ave	1.2	1.3	1.5	1.7	1.8	1.8	1.9	1.9	1.6	1.4	1.2	1.1	

One Solar Panel Produces an Average of 37 KWh per Month



# Average Household



- 1 Panel generates average 37 KWh/month
- Average Member uses 1200KWh/month
- With 950 Panels we can generate enough power for 29 average households each month

# Peak Production

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave
11am	3.8	3.7	3.9	4.8	5.0	4.5	5.1	5.0	4.7	4.2	4.3	3.4	4.4
12pm	4.4	4.7	4.3	5.2	5.2	4.9	5.4	5.6	5.4	4.5	4.3	4.2	4.8
1pm	4.4	4.6	5.0	5.2	5.2	5.4	5.6	5.7	5.3	4.7	4.3	4.3	5.0
2pm	4.1	4.6	5.0	5.2	5.3	5.6	5.7	5.9	4.6	4.5	4.1	4.0	4.9
3pm	3.9	4.3	4.6	4.7	5.1	5.1	4.9	5.2	4.7	4.1	3.5	3.6	4.5
4pm	3.1	3.2	3.8	3.7	3.8	4.2	4.3	4.1	3.3	3.0	2.4	2.5	3.5

Average 5,131 KWh per month per hour during peak = 171.03 KWh per hour

Average 1500 sq. ft. home uses between 5KWh and 7KWh during peak usage

# **Orientation of the Solar Panels**

In order to maximize the benefits for the member cooperatives, the orientation of the solar panels will be set at 50 degrees West of South (230 degrees). This will increase the Peak Hour output for July and August by 10% to 16% depending on the called Peak Hour; when this is done annual MWhs will drop approximately 4.5%. It is expected that the value of the increased peak hour production will outweigh the loss of total annual energy production.



# Lay of The Land







# GLARE STUDY

- A glare study was performed on US 75 near the solar site.
- Four (4) points South and Three (3) points North.
- No glare to the South of the Solar Site.
- Glare does occur between 8:00 and 9:00 North of the site up to the ECOEC office entrance but it is classified as “Low Potential for Temporary after-image”.
- For aircraft impact this is considered minor and does not appear to be an issue
- Further North of your entrance road there does not appear to be any glare.

**No significant issues were found**

# **East Central Oklahoma Electric Cooperative Community Solar**

- Construction is Complete
- Back-feeding and Testing will started  
September 29, 2016
- In Service Date to be determined