# MODEL COMMUNITY SOLAR PROGRAMS

## MREA - SOLAR POWERING IOWA

MARCH 24, 2016

FARMERS ELECTRIC COOPERATIVE – WARREN MCKENNA

2.5 KW (2500 connected watts) of local solar per Customer/Member (SEPA Award)

20%+ of our Customer/Members own solar locally

11% of our kWhrs per year are generated with solar locally

5% of kWhrs per year from Wind thru the purchase of Iowa wind RECs

10% Customer/Member participation in Green Power Project (NREL Top 10)

75% of the time solar produces energy during monthly peak demand

UTILITY CEO SEPA 2014 WINNER SOLAR ELECTRIC POWER ASSOCIATION OF THE YEAR

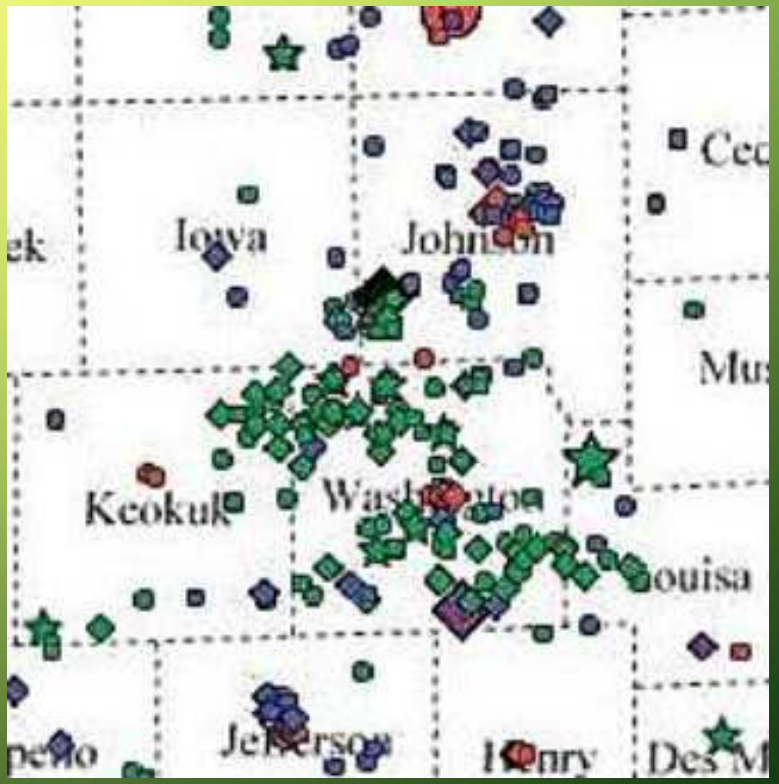
http://www.feckalona.net/renewable-energy-story.html

# SOLAR GROWTH 2008 – 2016

## WASHINGTON, JOHNSON, IOWA COUNTIES

**2008 – 600 Watts**

**2016 – 6 Megawatts +**

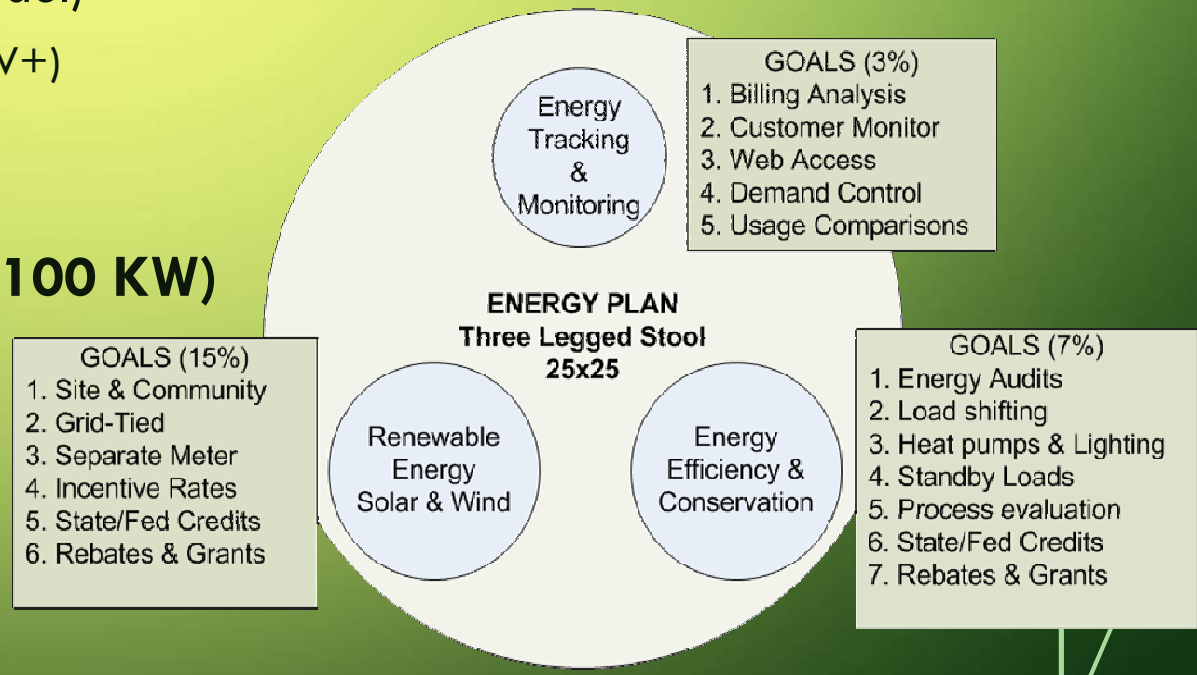



←25 Amish Phone
Booths – off grid

# FEC - THE VISION – 25X25

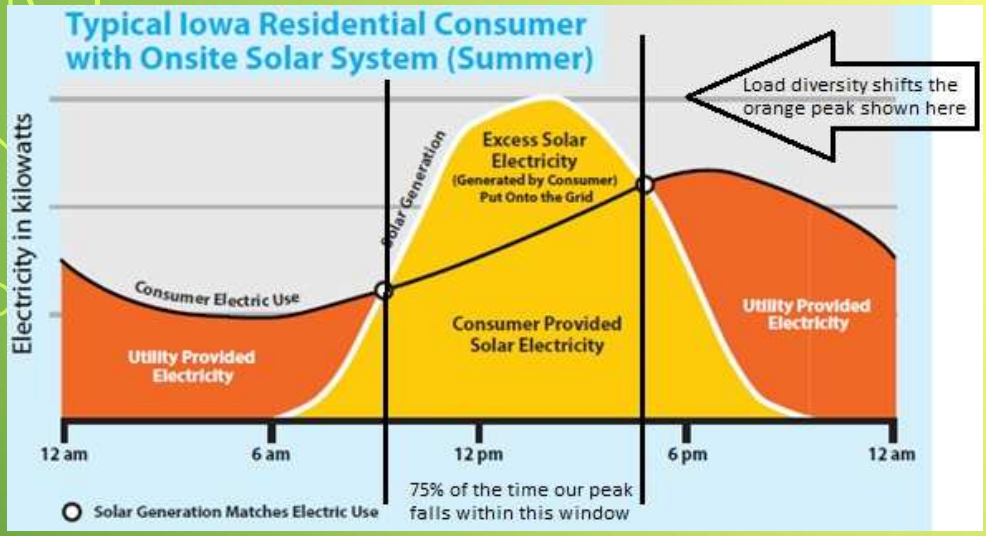
## A LOCAL CLEAN POWER PLAN TO REDUCE OUTSITE ENERGY PURCHASES BY 25% BY 2025

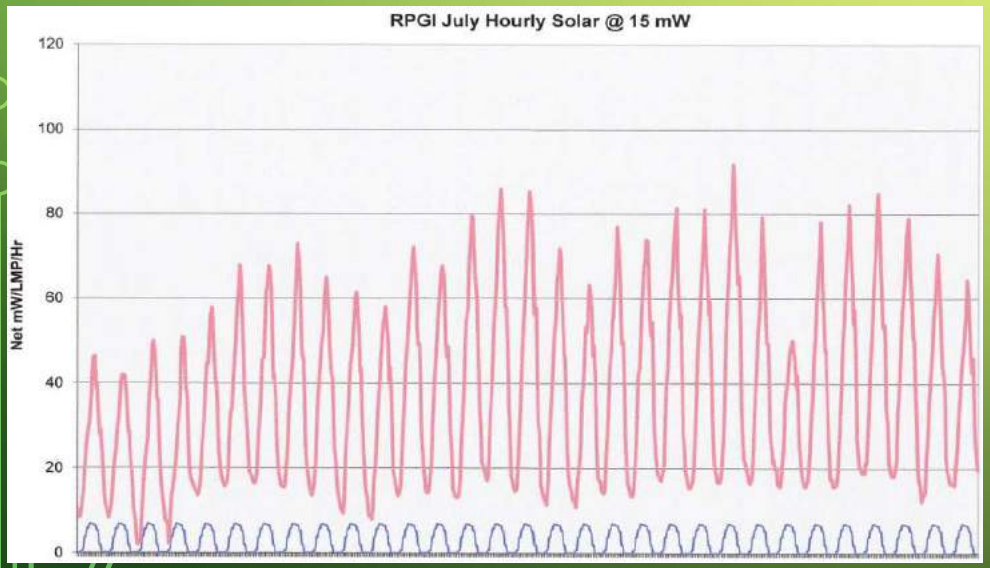
- Energy Tracking and Monitoring (3%)
- Energy Efficiency and Conservation (7%)
- Renewable Energy (15%) (local inside-out model)
  - Solar Schools & Educating the community (55 KW+)
    - STEM & STEAM involvement
  - Site Based – Customer owned (500 KW)
  - **Community Solar / Solar Garden (100 KW)**
  - Solar Farm – Cooperative Ownership (1.6 MW)




Created Vision in 2008 and reached RE Target in 2016

# COST ALLOCATION – HIGH PERFORMANCE DG MODEL




- **Demand Reduction -- 75% of the time**
- **High load factor -- 80% with load diversity**
- **Low Line Losses – < 3%**
- **High Reliability -- Best in Class + 6 MW MISO CATs**
- **Local Multiplier for Energy $**
- **Pairs with Big Wind in real-time energy market**
- **Consumer Integration – Production & Consumption shown on Utility Billing**

RPGI Wholesale power bills

| day | date | time |
|---|---|---|
| Wed | 7 | 7 PM |
| Mon | 23 | 9 AM |
| Thu | 5 | 9 AM |
| Wed | 8 | 11 AM |
| Wed | 27 | 4 PM |
| Wed | 10 | 5 PM |
| Mon | 13 | 3 PM |
| Fri | 14 | 4 PM |
| Thu | 3 | 3 PM |
| Wed | 7 | 3 PM |
| Mon | 30 | 6 PM |
| Thu | 17 | 7 PM |

# FEC COMMUNITY SOLAR GARDEN + GENERATION

# COMMUNITY SOLAR / SOLAR GARDEN

**A SOLAR GARDEN is a community shared solar array(s) with grid-connected subscribers where power is credited to your electric bill, as if the panels were on your own property.**

**For homeowners and businesses that don't have space for a site based solar array on their property, or they don't want to make the huge upfront investment for a complete system.**

Ownership model (buy)

- Virtual Metering – Credit directly on the customer bill based on the number of modules owned and kWhrs generated. Settled monthly. Customer buys the actual module and utility owns the infrastructure.

Subscription model (lease)

- Credit is based on dollars invested as an ownership share. Typical for HOA's, renters, affordable housing, and historic districts. Settled quarterly or annually. Utility or 3rd party owns the entire field and pays investors (customers).

## HOST SITES – WHERE TO PUT IT?

- Near 3-Phase distribution line, transformer, or substation
- About 100-150 kilowatts (kW) per acre
- Industrial sites
- Retired farmland
- Reclaimed landfills, buffer zones, and parks
- Parking lots, storage
- Large roofs
- Water Treatment plants

## SUBSCRIBERS – GRID CONNECTED

- Within Utility service territory
- Residential, Business, Farm
- Non-profits, schools, churches

Example: Eagle Point 2 solar farm property was part of a vacant plant that reopened as a result of FEC property purchase. It create expansion of 4 businesses, some new, with added electrical load. Load tagging as we call it helps justify a higher short term PPA cost over WPC.

# CUSTOMER OWNED PANELS (OWNERSHIP MODEL)

## COMMUNITY SUPPORTED CLEAN POWER

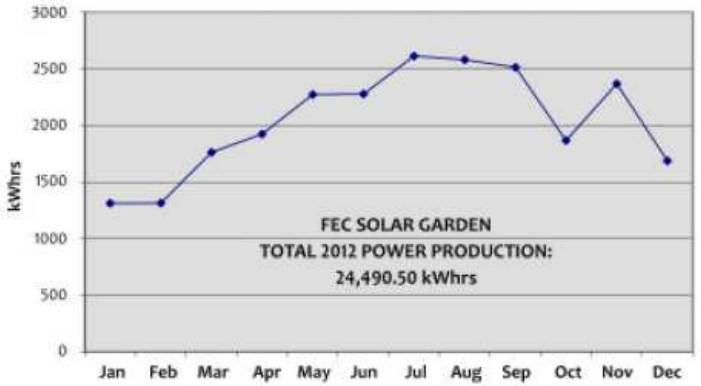
- Individual ownership of panels
- Cost – range from $350 - $ 500 per module

  about $ 1500-2000 / Kw (some as high as $1000/mod)
- Up front payment or loan (we have done short term loans)
- Pay-back time 10 to 15 years (fair ROI/year)
- Low income assignment/allocation (mod assignment)
- Credit on power bill at net-billing or PPA rate

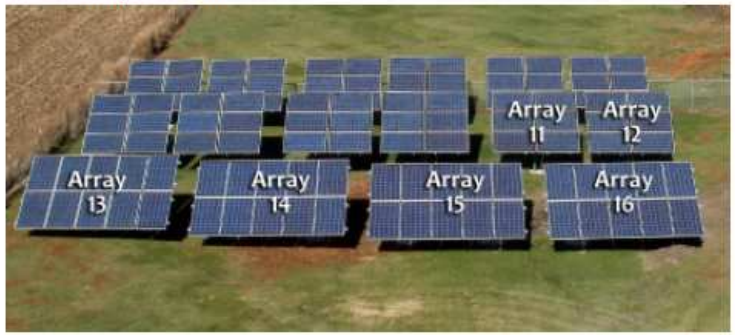
FEC Community
SOLAR GARDEN

*January 9, 2013*

The Farmers Electric community-owned solar garden has now had one full year of generating clean, renewable power for FEC customers. The graph (right) shows power production throughout the year. We were especially pleased with the solar garden's mid-summer performance. Its maximum production often occurred during periods of peak demand. Offsetting the "peak" helps keep our wholesale power rates steady.




*Six new arrays added in 2012*




During 2012, the solar garden expanded to 112 modules on 16 arrays. Many of the new modules came online in November ... which explains that month's spike in production (shown above).

Owners of the 52 new modules are listed below ...

**Arrays 11 & 12**
West Union Mennonite Church (12 modules)

**Array 13**
John Mast
Larry Schrock
Laurel Schlabaugh
Donovan Bender
Kenneth J. Egli
Trent & Tami Yoder
David & Wanda Beachy
Wilmer & Trish Yoder
Galen Yoder (2)

**Array 14**
Mike & Chris Brenneman (4)
The Water Shop (4)
James Graham (2)

**Array 15**
Ed Gingerich (2)
Jon Gingerich (2)
Linton Weaver (2)
John Schrock (4)

**Array 16**
Melvin Schulz (3)
Ken Bender (5)
low-income acc't.
low-income acc't.

- Very popular program!!!
- Production shown on Bill
- Credits averages $ 3.50/mod/mth
- 10 module max ownership
- Separate input rate
- Low income – LIHEAP Committee
- Certificate of Ownership + serial #

FEC Community Solar Garden

CERTIFICATE OF OWNERSHIP

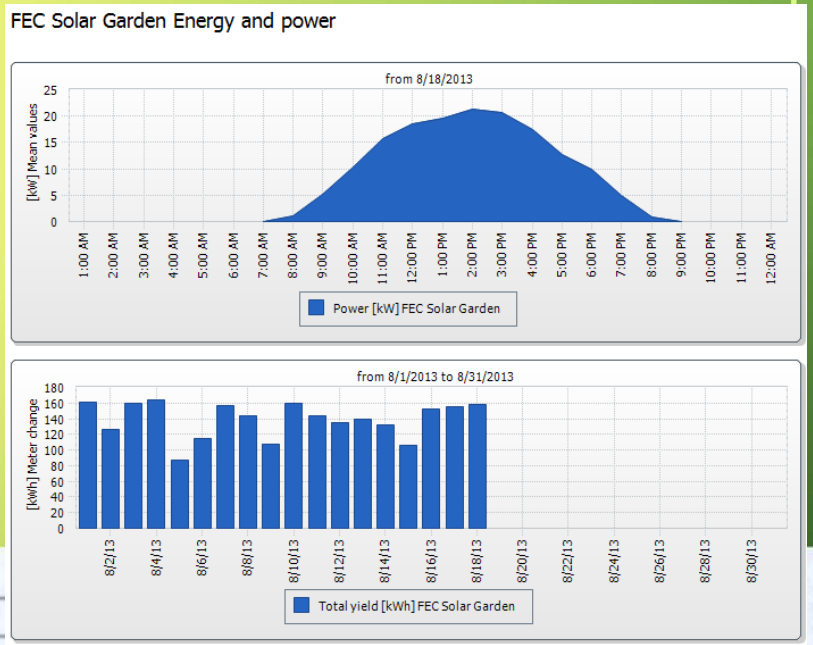
This certifies that

is the legal owner of solar module
**Serial # A14-M4-223048T2160**
located in the Farmers Electric Cooperative Community Solar Garden
1955 Yoder Ave. SW, Kalona, Iowa.

Transfer of Ownership to _____ Date _____

# PRODUCTION CREDITS (FEC MODEL)

- All modules are socialized under a single meter
- 1 kWhr / number of modules = Allocation Factor
- 1/112 = .00892
- .00892 x kWhrs x ModQty = -kWh
- -kWh x Rate = Credit
- averages $3/mnth/mod



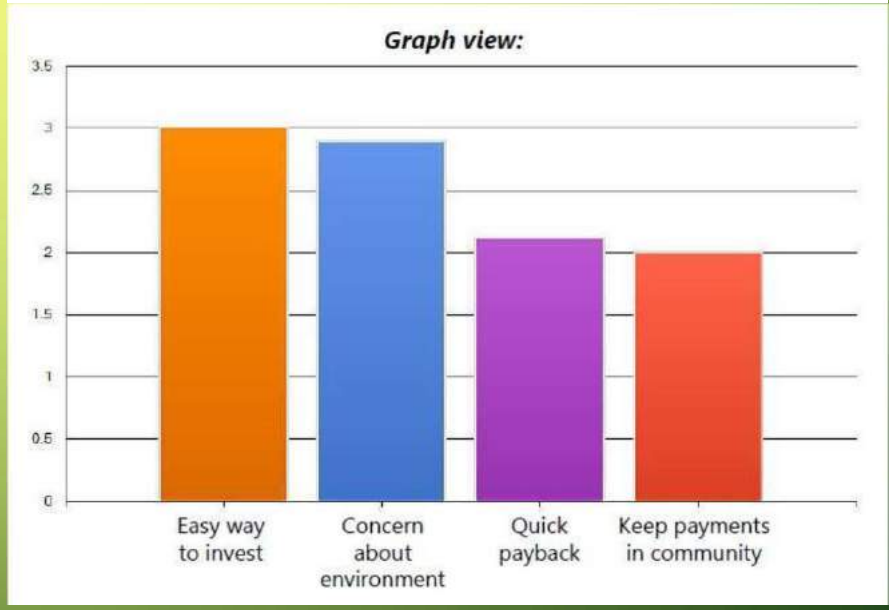

| Ref. No. | Code | Descriptions | | | | |
|---|---|---|---|---|---|---|
| | **PB** | **Previous Balance** | | | | |
| 1483 | MM | Main Meter | 7/28/12 | 8/26/12 | 1,003.00 | 0.1230 | 123.35 |
| 1483 | EC | Energy Cost Adjustment | 7/28/12 | 8/26/12 | 1,003.00 | -0.0025 | -2.51 |
| 113695565 | EC | Energy Cost Adjustment | 7/29/12 | 8/29/12 | 872.00 | -0.0025 | -2.18 |
| 113695565 | MS | Meter Subtract | 7/29/12 | 8/29/12 | 872.00 | 0.1150 | 100.28 |
| | SC1 | Meter Charge | 7/30/12 | 8/30/12 | 1.00 | 17.5000 | 17.50 |
| | LOI | Local Option Sales Tax Iowa County | 7/30/12 | 8/30/12 | 164.53 | 0.0100 | 1.65 |
| | GP30 | Green Power Program | 7/30/12 | 8/30/12 | 1.00 | 3.0000 | 3.00 |
| | PD | Payments | 9/19/12 | 9/19/12 | 1.00 | -200.0000 | -200.00 |
| 113695517 | SW | Solar-Wind Meter | 7/29/12 | 8/29/12 | 337.00 | -0.2000 | -67.40 |
| 113695559 | SL | Solar Garden Meter | 7/29/12 | 8/29/12 | 36.12 | -0.1250 | -4.51 |
| | | | | | | **Current Month Subtotal :** | **-30.82** |
| | | | | | | **Account Balance ( Previous + Current ) :** | **-$340.10** |

# FEC CUSTOMER SURVEY

Decision to purchase

1. **Easy way to invest**
2. **Concern about environment**
3. **Quick payback**
4. **Keep payments in community**

FEC Community SOLAR GARDEN



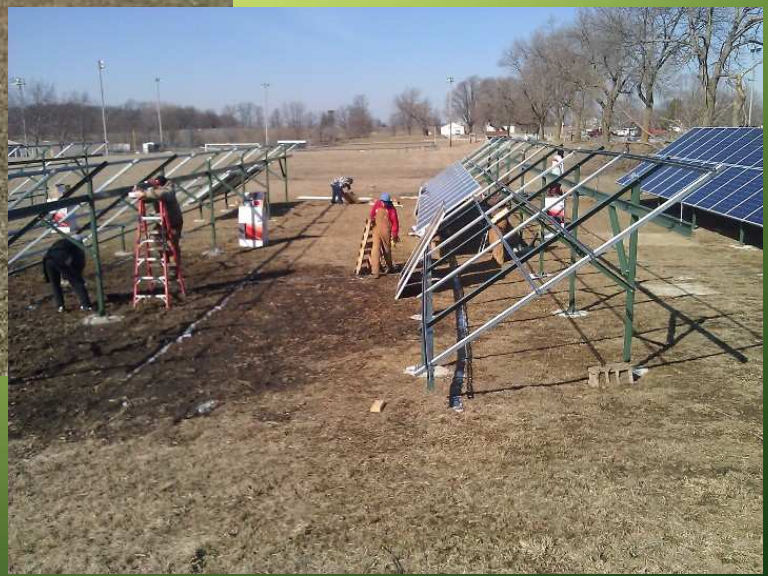
# IOWA MENNONITE SCHOOL COMMUNITY FUNDED SOLAR – 50 KW

**No tax credits available**

**Iowa Energy Center Loan**

**PPA with FEC above net-metering – 10 year payback**

**FEC - GPP funded**



# IOWA SOLAR ENERGY TRADE ASSOCIATION

IowaSETA.org

**Networking**

**Tours**

**Training**

**Newsletter**

**Policy**

**Please consider joining ISETA**

# REFERENCES AND RESOURCES

http://www.feckalona.com

http://communitypowernetwork.com/

http://www.solargardens.org/

http://hint.fm/wind/

**A Guide to Community Share Solar:**

**Utility, Private, and Nonprofit Project Development**

SunShot U.S. Department of Energy

**Community Solar Power - Obstacles and Opportunities**

John Farrell, www.newrules.org

**THANK YOU!**