



# **Harnessing the Power of the Sun**

# **New Renewable Energy Crops: Solar**

November 8, 2016

**Nebraska Wind & Solar Conf.**

Art Tanderup – Farmer - Neligh

# 9 KWH System, 36 Panels





# Frame and Backside



# Four Season Adjustment Increases Efficiency 15%





# Winch System



# Inverters and Panel Wiring



# Inverter Close-up





# Breaker, Disconnect & Power Company Meter



# Fusebox Breaker and Connection to Grid



# The Net Meter





# Obstructions



# So, What Does All This Mean?

- Benefits
- Costs
- Savings
- Grants and Financing
- Future

# Fewer Fossil Fuel Fill-ups





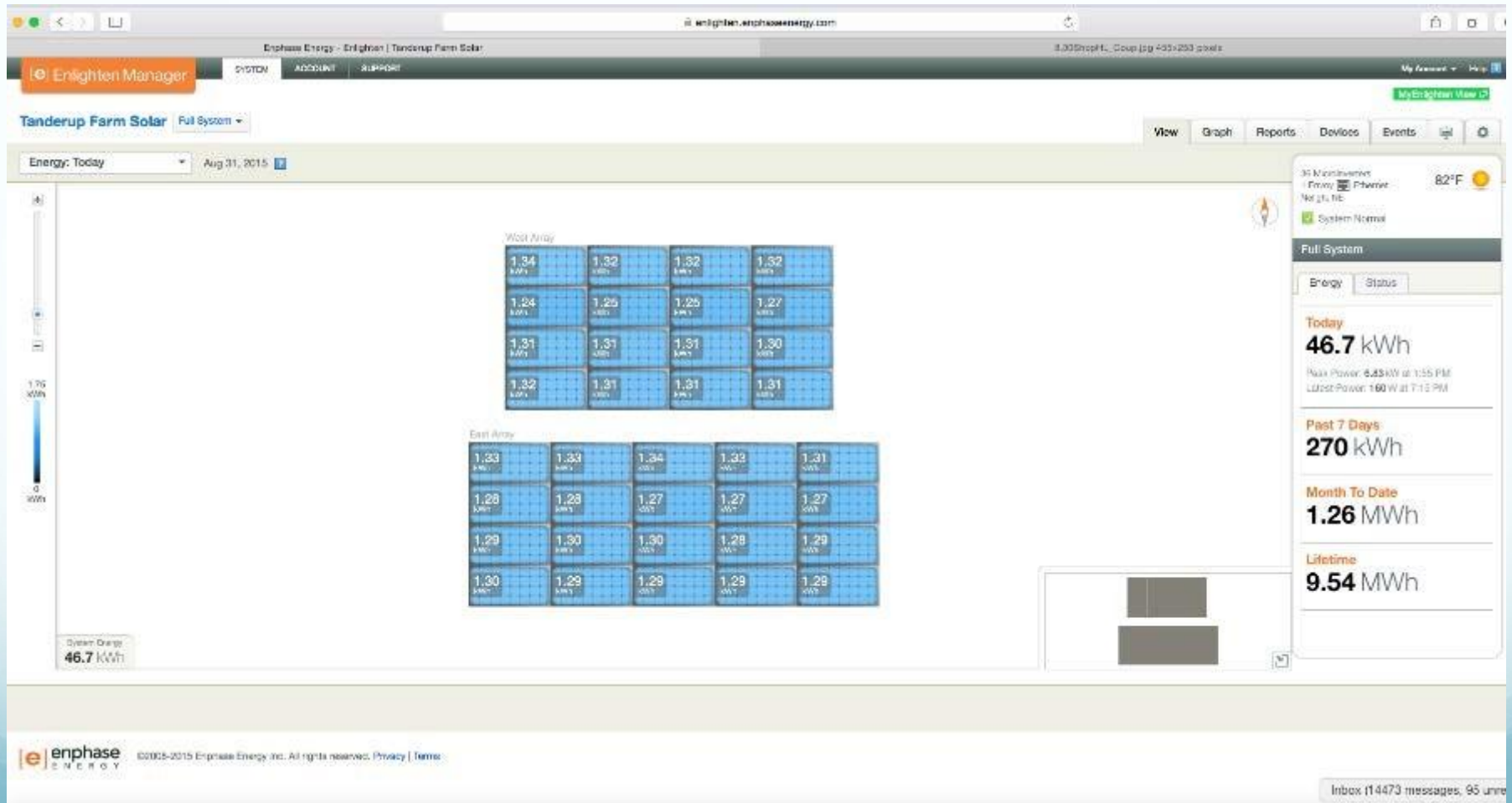
# 2015-16 Monthly Production

|                                   | <u>2015</u> | <u>2016</u> |
|-----------------------------------|-------------|-------------|
| <input type="checkbox"/> January  | 811 kwh     | 667 kwh     |
| <input type="checkbox"/> February | 848 kwh     | 900 kwh     |
| <input type="checkbox"/> March    | 1,382 kwh   | 1,105 kwh   |
| <input type="checkbox"/> April    | 1,234 kwh   | 1,130 kwh   |
| <input type="checkbox"/> May      | 1,141 kwh   | 1,461 kwh   |
| <input type="checkbox"/> June     | 1,392 kwh   | 1,579 kwh   |

# 2015-16 Monthly Production

|                                    | <u>2015</u> | <u>2016</u> |
|------------------------------------|-------------|-------------|
| <input type="checkbox"/> July      | 1,473 kwh   | 1,579 kwh   |
| <input type="checkbox"/> August    | 1,263 kwh   | 1,384 kwh   |
| <input type="checkbox"/> September | 1,109 kwh   | 1,226 kwh   |
| <input type="checkbox"/> October   | 896 kwh     |             |
| <input type="checkbox"/> TOTAL     | 11,547 kwh  | 10,487 kwh  |

# August 31 Report





# August Weekly Production


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**Monthly Energy Production Report** Generated for Art Tanderup on 08/31/2015

Tanderup Farm Solar  
Neigh, NE

| Week                         | Peak Power | Energy Produced |
|------------------------------|------------|-----------------|
| 08/01/2015 - 08/07/2015      | 7.62 KW    | 295 kWh         |
| 08/08/2015 - 08/14/2015      | 7.78 KW    | 321 kWh         |
| 08/15/2015 - 08/21/2015      | 7.72 KW    | 248 kWh         |
| 08/22/2015 - 08/28/2015      | 7.97 KW    | 271 kWh         |
| 08/29/2015 - 08/31/2015      | 6.83 KW    | 127 kWh         |
| <b>August 2015 Total:</b>    |            | <b>1.26 MWh</b> |
| <b>Previous Month Total:</b> |            | <b>1.47 MWh</b> |
| <b>Year to Date:</b>         |            | <b>9.54 MWh</b> |

Your **Carbon Offset** for this month: 1,923 lbs  
You have offset the equivalent of: 22 Trees



Weekly

kWh

295

321

248

271

127

1263

# Our Usage – 10 Months 2015

- 11,547 KWH generated
- 2857 KWH purchased
- 14,404 KWH total used
- 80.2% of our energy used was solar

# Our Usage – 9 Months 2016

- 10,487 KWH generated
- 855 KWH purchased
- 11,342 KWH total used
- 92.2% of our energy used was solar



# 2015 Savings

- \$588.79 – 2015, 10 Month Cost
- \$1700.97 – 2014, 10 Month Cost
- \$1112.18 – Savings Over Last Year
- 65.4% Decrease From Last Year
- \$1270.17 – 2015, 10 Month Generated Income
- 73.3% Of Total Electric Bill Covered

# 2016 Savings

- \$298.35 – 2016, 9 Month Cost
- \$1597.88 – 2014, 9 Month Cost
- \$1299.53 – Savings Over 2014
- 81.3% Decrease From 2014
- \$1299.53 – 2016, 9 Month Generated Income
- 81.3% Of Total Electric Bill Covered

# Return On Investment

- \$38,000 Investment
- \$3,000 Approximate 2 Year Savings
- 4% Return On Investment

# Residential Renewable Tax Credit

- 30% Of \$38,000 = \$30,400
- \$3,000 Approximate 2 Year Savings
- 4.9% Return On Investment
- Farm Depreciation – Unknown At This Time



# Grants / Financing

- USDA REAP Grants - 25% of Cost
- Green Retrofit Grants
- Dept. of Energy Tribal Energy Program
- Nebraska Energy Office 2.5% 10 Year Loan Program
- Section 179 Depreciation for Farms & Businesses
- Bold Nebraska's Build Our Energy Grants and Mapping Project - \$500 - \$2000

# Cleaning Up Solar Spills For a Better Climate

