Society of SAME American Military Engineers Omaha Post

WELCOME

VIRTUAL MEETING WILL BEGIN AT

11:30AM Central

Society of American Military Engineers

Omaha Post

October 10th Meeting

Omaha Post Meeting

Society of American Military Engineers

Omaha Post

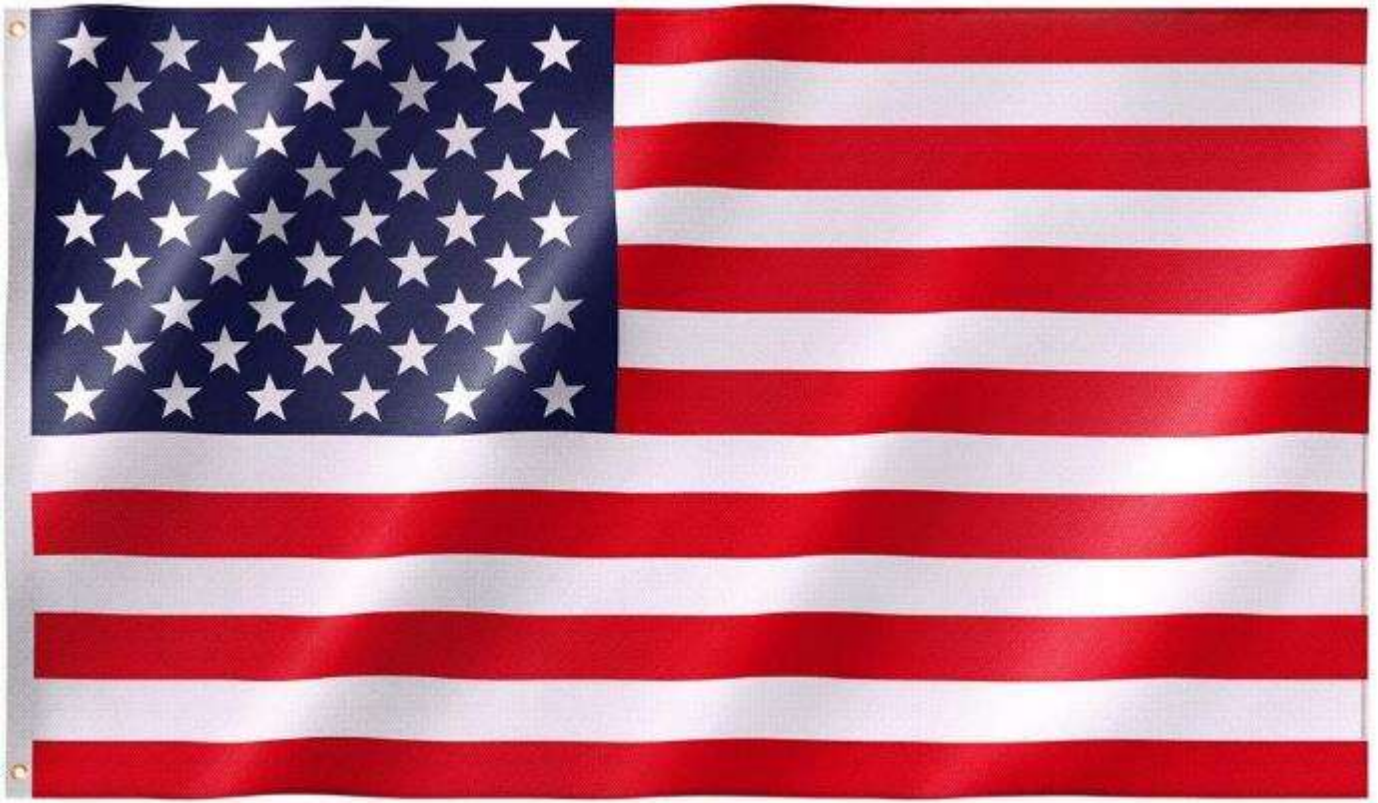
October 10th, 2023 Meeting

Meeting Agenda

- Pledge of Allegiance
- Invocation
- Lunch
- New Member/ Guest Introductions
- Announcements
- Membership Spotlight
- Presentation
- Q&A
- Split Kitty Drawing
- Closing Remarks

Society of SAME American Military Engineers Omaha Post

Pledge of Allegiance



I pledge allegiance to the Flag of the United States of America, and to the Republic for which it stands, one Nation under God, indivisible, with liberty and justice for all.

Invocation

Please remain standing

Lunch

Dismiss by table

Introductions

Introductions

- Welcome to New Members
- Introduction of Guests

Announcements

- **The Nebraska Business Development Center (NBDC) APEX Accelerator program is hosting their biannual Meet the Buyers Government Contracting Conference on October 17-19 in Scottsbluff, Nebraska**
- **Project Healing Waters Fly Fishing - October 21st at Halleck Park - Contact Rob Hufford lawrence.hufford.2@us.af.mil**
- **Student Mentoring Program scheduled field trip to the Luminarium on October 26th. Mentors still needed for 2023. Contact Nicole Hunter at samesmp@gmail.com.**

Announcements

- **Student Chapter Scholarship – Applications open, due October 31. Available at https://www.same.org/omaha/scholarships/**

- **November Membership Meeting – Public Sector Event**
  - ►November 14, 2023 @ Field Club
  - ►Topic: Perkins County Canal – Tom Riley, P.E., Director-Nebraska Department of Natural Resources

Announcements

- **December Membership Meeting**
  - ►December 12, 2023 @ Field Club
  - ►Topic: USACE-Omaha District Program Update
- **Annual Scotch Tasting - December 13th, Registration Coming Soon**
- **E-Week 2024 Banquet – Evening of February 2nd, 2024.**
- **Annual Awards Program has been moved to June.**

Membership Spotlight

FoleyShald ENGINEERING

FoleyShald ENGINEERING

FoleyShald Engineering

CAPABILITIES BRIEFING

Patron

The Society of SAME American Military Engineers Omaha Post

FoleyShald
ENGINEERING

FoleyShald creates solutions through construction-minded design and oversight.

We analyze regulatory/physical constraints and overcome utility/site limitations.

WHY FoleyShald Engineering?

Practical & Cost-Effective Designs:

- FoleyShald Engineering stands out for their construction-minded design approach, ensuring projects are practical and cost-effective.

One-Stop Engineering Solutions:

- Offering a comprehensive suite of services, including property evaluation, stormwater management, and alternative concept studies, FoleyShald provides all-in-one solutions.

Our Engineering Advantage | Midwestern Ethics:

- FoleyShald embodies Midwestern ethics with a **firm knowledge of our states' regulations and terrain**. We tackle engineering challenges comprehensively.

On-Time & On Budget:

- FoleyShald's commitment to **cradle-to-grave project management** ensures on-time, on-budget delivery through construction oversight. We ensure your project's success.

Precision & Efficiency:

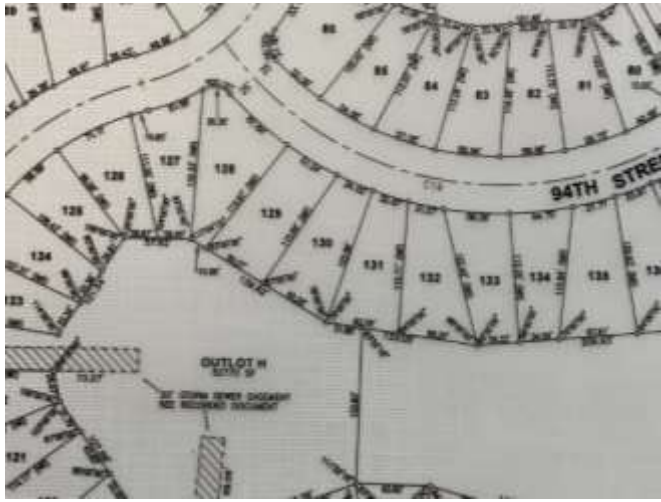
- FoleyShald integrates cutting-edge technology like **real-time GPS/GIS surveys**, enhancing project efficiency and accuracy.

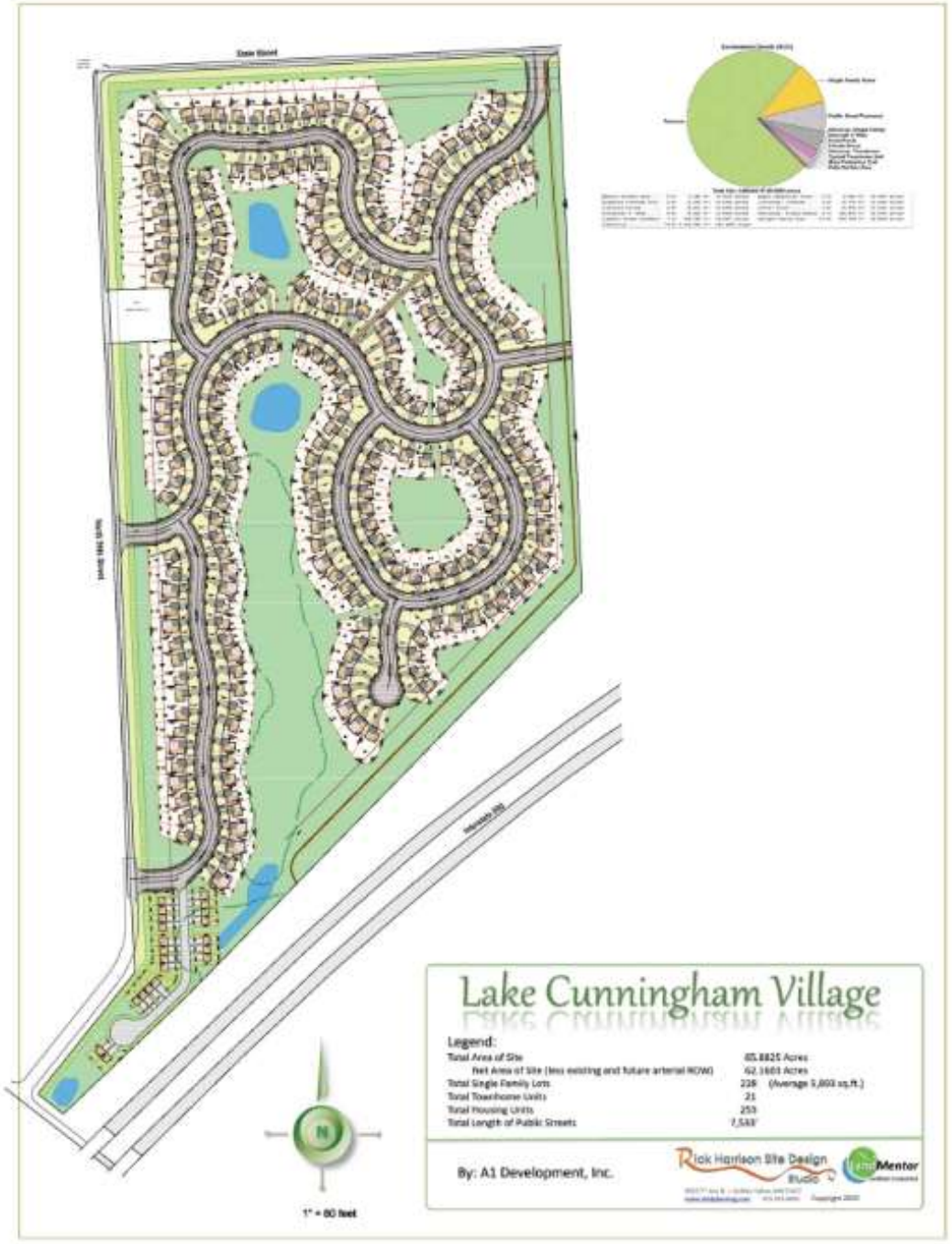
Client-Centric Collaboration:

- Customer satisfaction is paramount as FoleyShald's expert team collaborates closely with clients, transforming visions into reality.

Engineering Services

- ✓ Civil Design Services
  - ✓ Master Planning
  - ✓ Feasibility Studies
  - ✓ **Infrastructure Assessments**
  - ✓ Subsurface Utility Engineering
- ✓ **Site Development**
- ✓ Land Development
- ✓ Value Engineering
- ✓ **Drainage and Stormwater Mgmt.**
  - ✓ **Hydrologic and Hydraulic Studies**
- ✓ Physical Security & Blast Analysis





Construction Administration:

- Project Management
- Construction Management
  - Construction Inspection Services
  - Construction Support Services
- SWPPP inspections
- Infrastructure Maintenance
- GIS Programming and Management
  - GIS Mapping
  - GIS Quantity Surveys
  - As-built Surveys

Sarpy County Nebraska

Sanitary and Improvement District (SID) 362

Past Performance

DATES: 2020-CURRENT | **VALUE:** **$**3,600,000+ | **ROLE:** Prime Contractor

DETAILS: Provided consulting services including land planning concepts and platting services for 320 acres, wetlands permitting, grading design and permitting, design of underground utilities including sanitary sewer, storm sewer and water, design of the street paving network, and oversight of construction for the district plus all GIS surveying, mapping.

City of Blair Nebraska

West Valley Subdivision

Past Performance

DATES: 2021-2022 | **VALUE: $**77,600+ | **ROLE:** Prime Contractor

DETAILS: Provided civil professional design services for Blair's infrastructure design on the West Valley subdivision in Blair including sanitary sewer, storm sewer and water.

City of Omaha Nebraska

Parks Department: Paxton-Creighton Trail

Past Performance

DATES: 2022-CURRENT | **VALUE:** **$**95,000+ | **ROLE:** Prime Contractor

DETAILS: Provided topographic survey and design plans to convert over two miles of sidewalks into a ten-foot wide shared use trail that connects two major north Omaha parks.

Department of Veterans Affairs

Sheridan Wyoming Geri-Psych Addition

Past Performance

DATES: 2019 | **ROLE:** Subcontractor | **PRIME:** Alesia Architects

DETAILS: Provided Prime structural explosive blast loading and perimeter standoff for 19,114SF ADA compliant clinic.

FoleyShald ENGINEERING

THANK YOU

Get In Touch

Please reach out with any RFP/RFQ or Sources Sought Requests!

OFFICE LOCATIONS

Omaha, NE
Lincoln, NE

GET IN TOUCH

(402) 804-3993 | x: 706
bwilshusen@foleyshald.com

OUR CAGE & UEI

CAGE: 8HDF2
UEI: GXMJZKBEB638

FOLLOW US

https://foleyshald.com

Presentation

Michael Shonka,

Solar Heat and Electric, Inc.

Airports Going SOLAR!

Solar
HEAT & ELECTRIC

Michael Shonka
www.SolarOmaha.com
402-590-5900 / 402-850-7973
michael@solaromaha.com

Agenda

Why Go SOLAR

Solar System Components

System Design

Airports and Glare

Production, PV Watts, Value

Microgrid

Trends

Why Go SOLAR?

FREE and abundant natural resource

Hedge against cost increases

Low maintenance

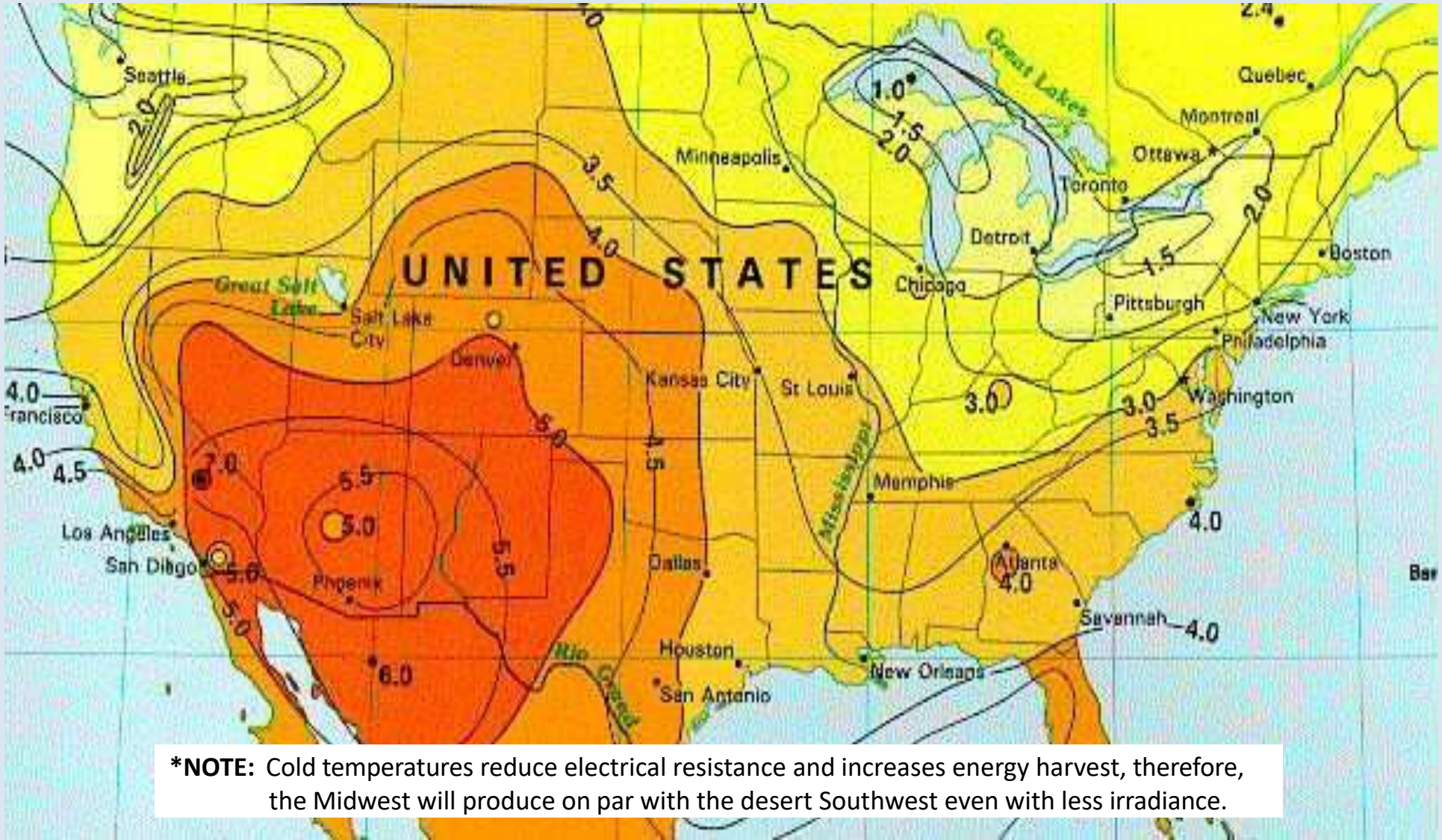
Scalable

Build on otherwise unusable land

Can be on site or off site (coming soon)

Non-polluting

Insolation: The rate of delivery of solar radiation per unit of horizontal surface. Nebraska averages 3.5 to 4 vs. 5.5 to 6 for Arizona.* The measurement is in kWh/m2/day.



***NOTE:** Cold temperatures reduce electrical resistance and increases energy harvest, therefore, the Midwest will produce on par with the desert Southwest even with less irradiance.

Solar Electric System Components

Module → converts sun to electricity

Inverter → DC solar to AC

Mounting → roof, ground, pole

Typical PV Module

POSITIVE POWER TOLERANCE[1]
The rated power is the minimum so you never get less power than you pay for.

INDEPENDENTLY VERIFIED POWER[2]
Four independent test labs regularly check panel power to make sure you get the power we promise.

ANTI-REFLECTIVE GLASS
Delivering 2–3% more electricity compared to panels with standard glass.

TEMPERATURE RATINGS OVER 90%[3]
Maintaining up to 4% higher output than most other crystalline silicon panels under hot conditions.

MICRO-INVERTER COMPATIBLE
Panel voltage compatible with state-of-the-art micro-inverters used to improve performance of residential systems.

SMALLEST CARBON FOOTPRINT[4]
Our String Ribbon® wafers are made with a fraction of the emissions that result from making conventional silicon panels.

12-MONTH ENERGY PAYBACK[4]
Our panels begin generating truly clean electricity faster than any other silicon-based panel on the market.

100% CARDBOARD-FREE REUSABLE PACKAGING
Reduces disposal costs and on-site manpower while eliminating tons of landfill.

PV CYCLE

72-cell or 60-cell

String Inverter

Predominant topology:
3 - 60 kW each unit

Scalable
High volume production
Standardized design
Easy start / service
Reduces DC wiring


DECK

Mounting Systems

Pole

-Small systems
-Low wind
-Higher cost
-30% better performance

Ground

-Small to large arrays
-Good wind tolerance
-Moderate cost
-Average performance

Mounting Systems

Roof - anchored

-Small to medium systems
-Good wind tolerance
-Low cost
-Average performance

Roof - ballast

-Small to large arrays
-Good wind tolerance
-Moderate cost
-Average performance

Solar Electric System Design

Grid-tie solar electric system

-most popular, least cost, best ROI

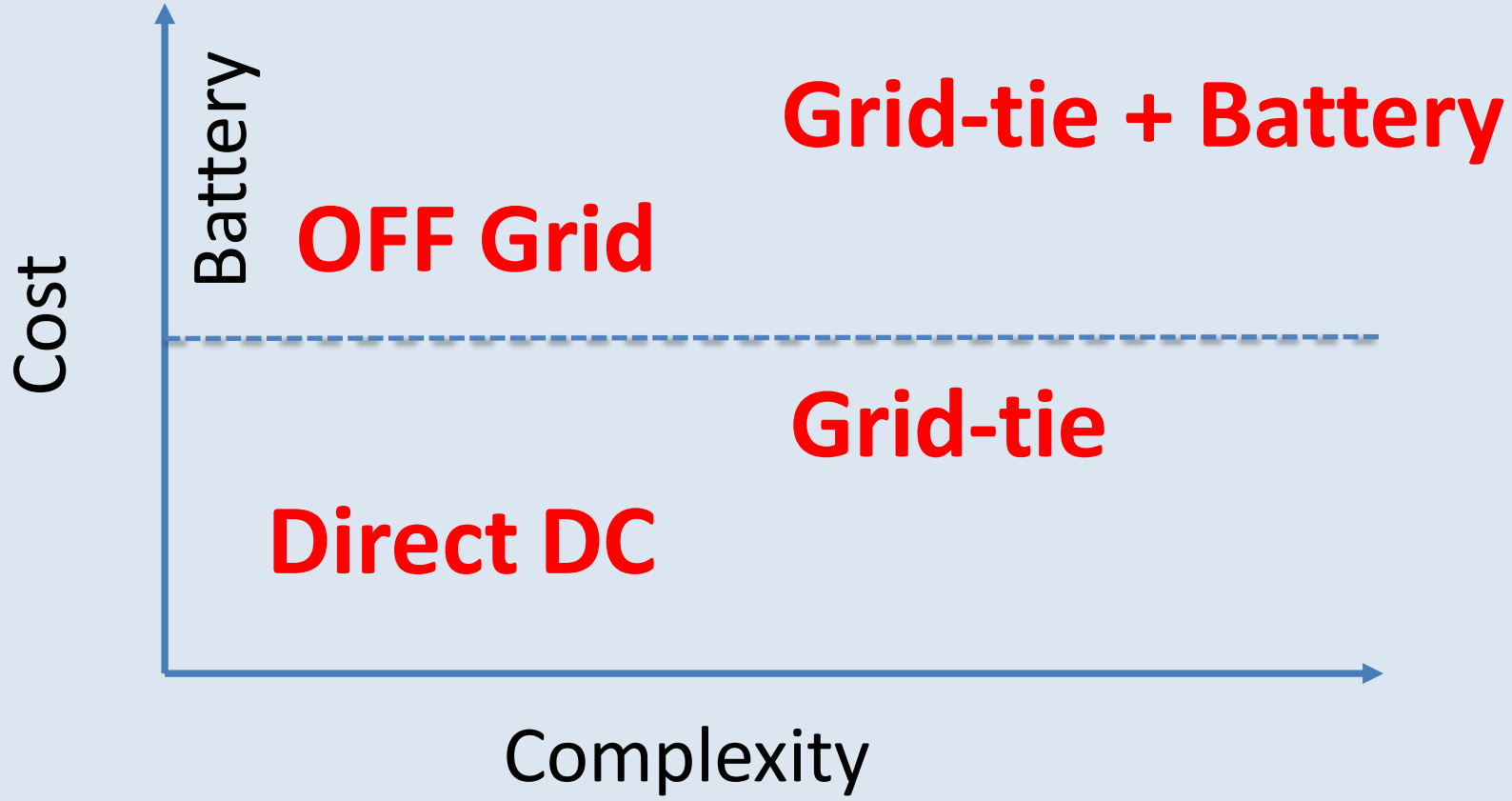
Grid-tie + Battery Back-up

-higher reliability and cost

OFF Grid → Battery

-highest cost, special uses

Solar Electric System Design



Grid Tie Solar Electric System

-the DC energy from the modules is converted to AC electricity in the inverter

-the AC electricity is distributed through the existing service panel

-any excess electricity would be sent to the grid through the utility meter

-there is no storage with this system...
if the grid goes down, so does the system

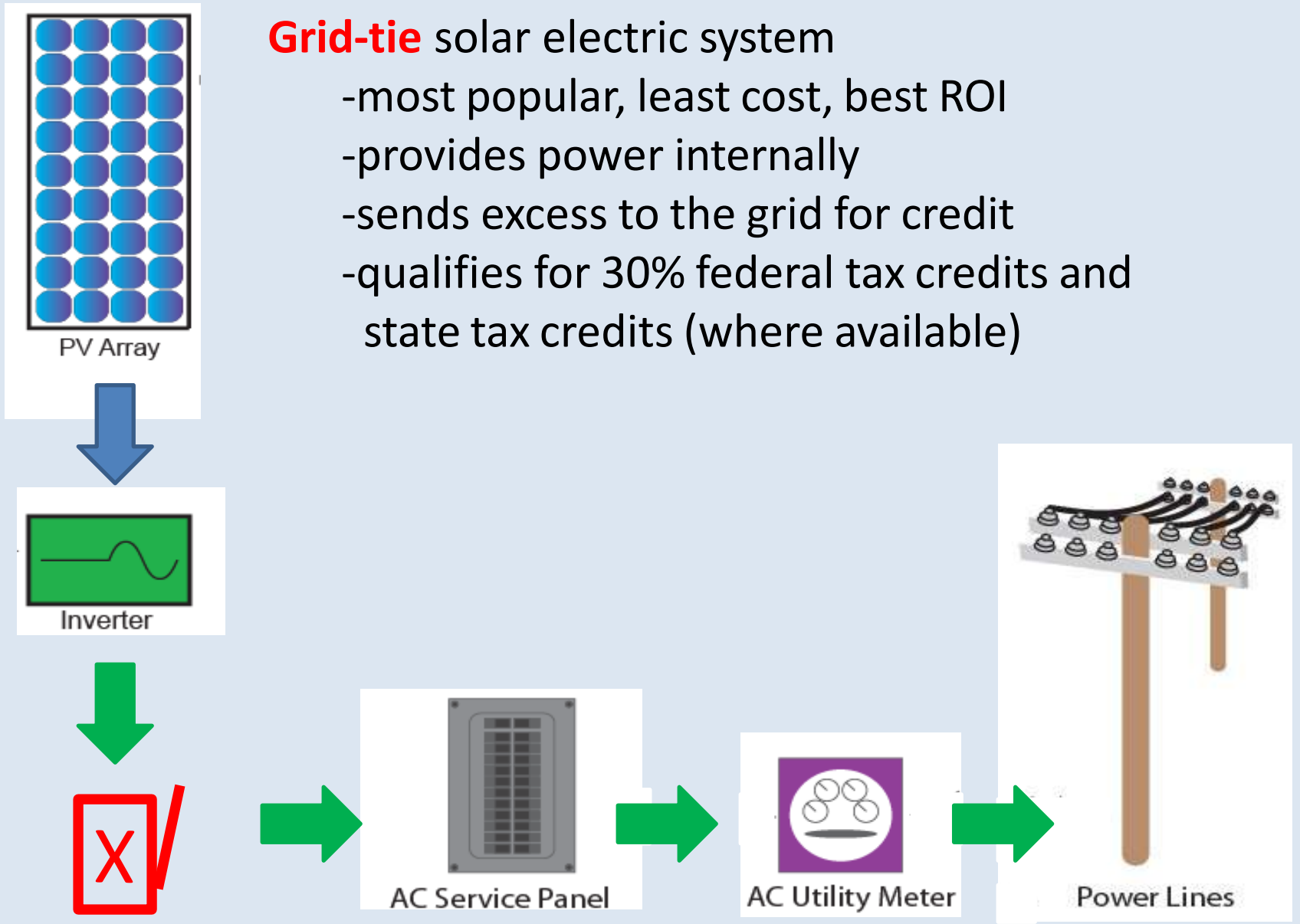
Grid-tie solar electric system

-most popular, least cost, best ROI

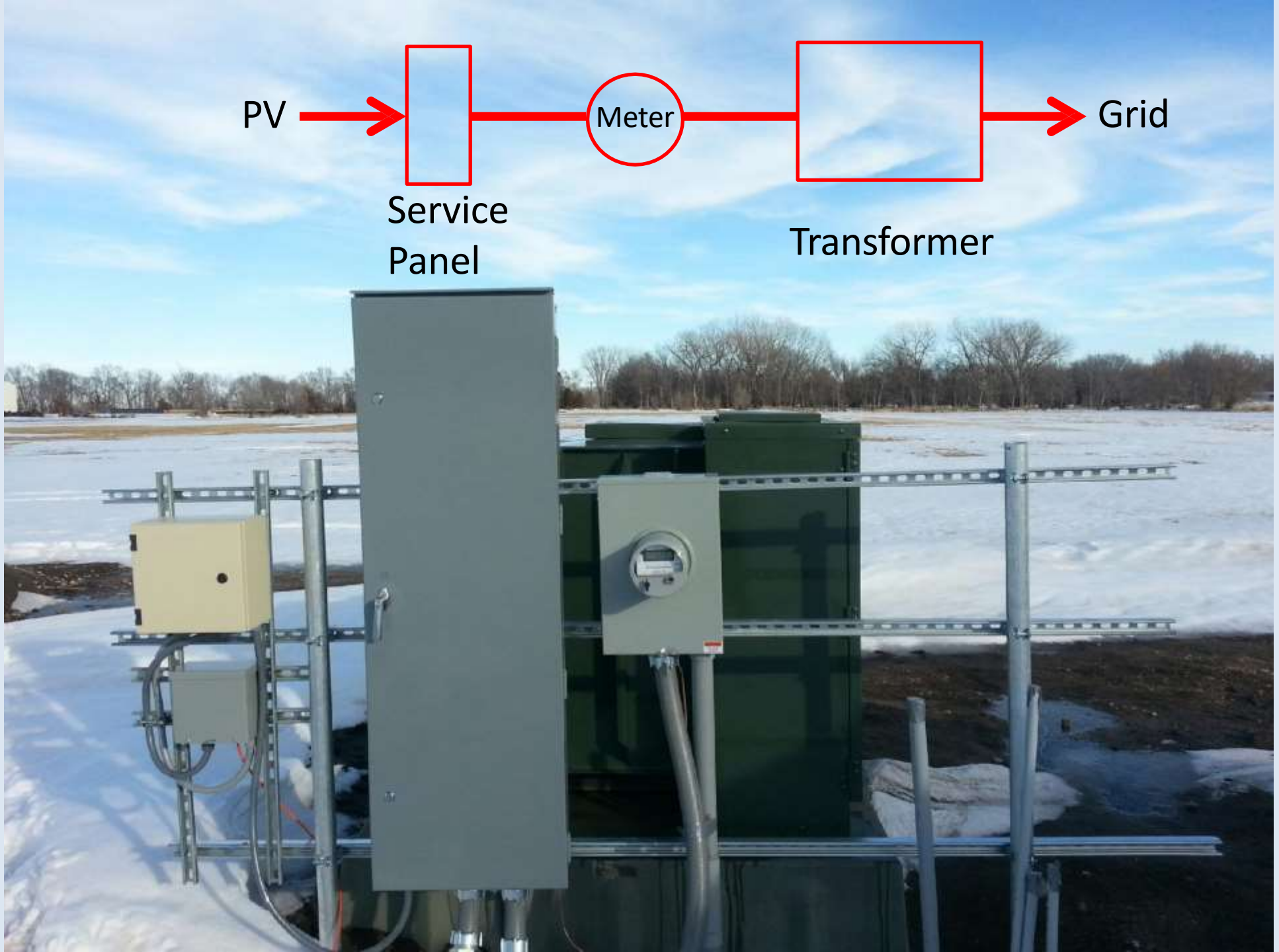
-provides power internally

-sends excess to the grid for credit

-qualifies for 30% federal tax credits and state tax credits (where available)

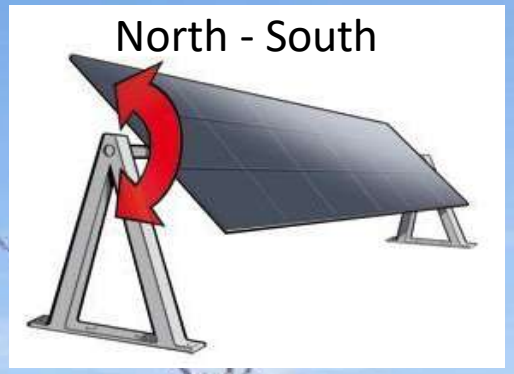


Incremental Design Layout:
25 kW Racks tied to Central Transformer


PV
Meter
Grid
Service Panel
Transformer

Single Axis Tracker - Open Field

DIA



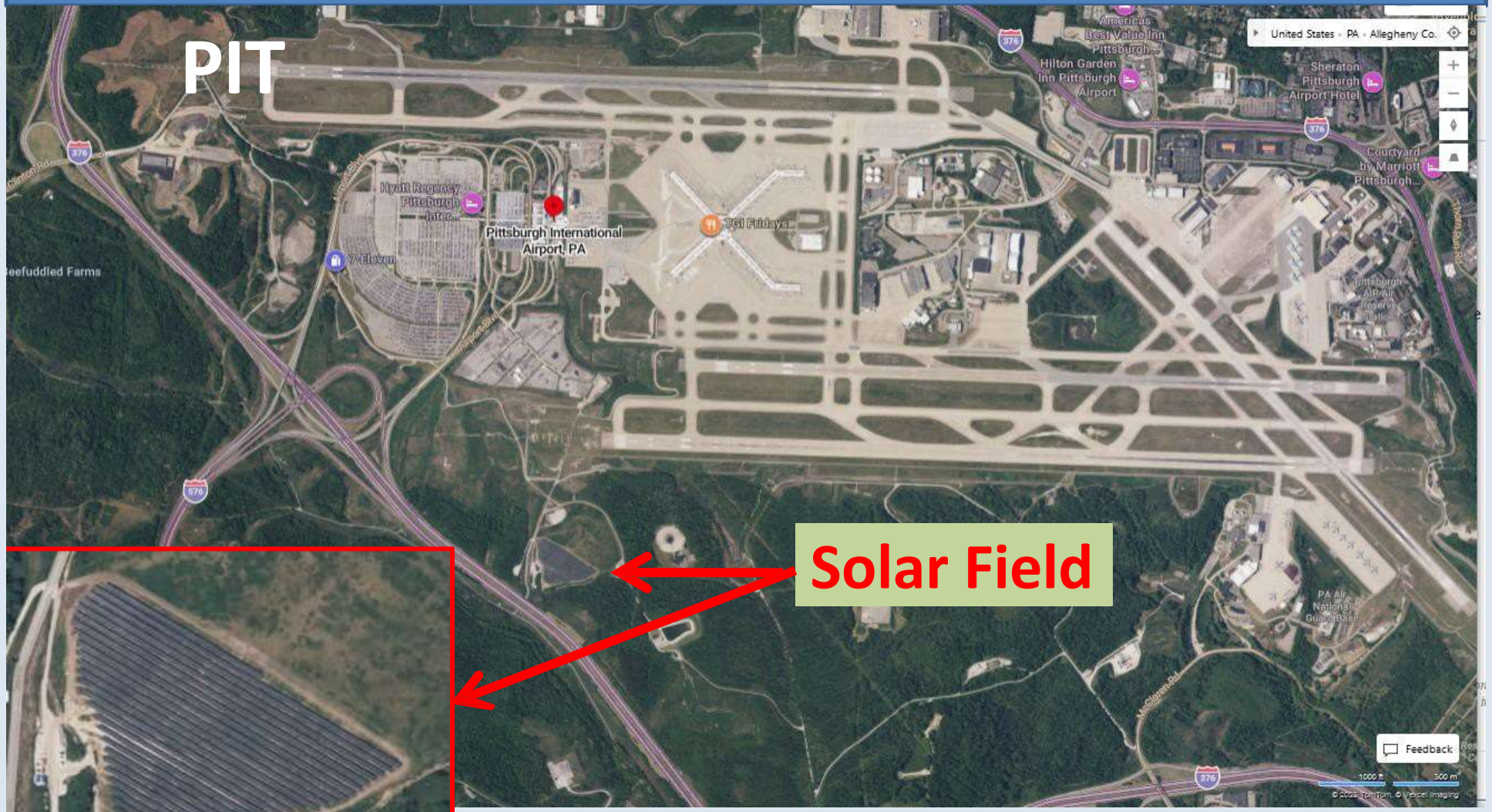
Fixed Rack - Open Field

DIA

Denver International Airport has four solar farms (totaling over 10 MW), including a 4.4-MW project commissioned in 2011 and owned by Constellation. Some of the electricity produced is used directly at the airport, and the rest is sold back to the grid. The airport has a total of 42,358 solar panels spread across 55 acres of solar fields. (Credit: Constellation)

https://www.solarpowerworldonline.com/2016/03/7-cool-solar-installations-at-u-s-airports/

Fixed Rack - Open Field



Fixed Rack - Parking Structure

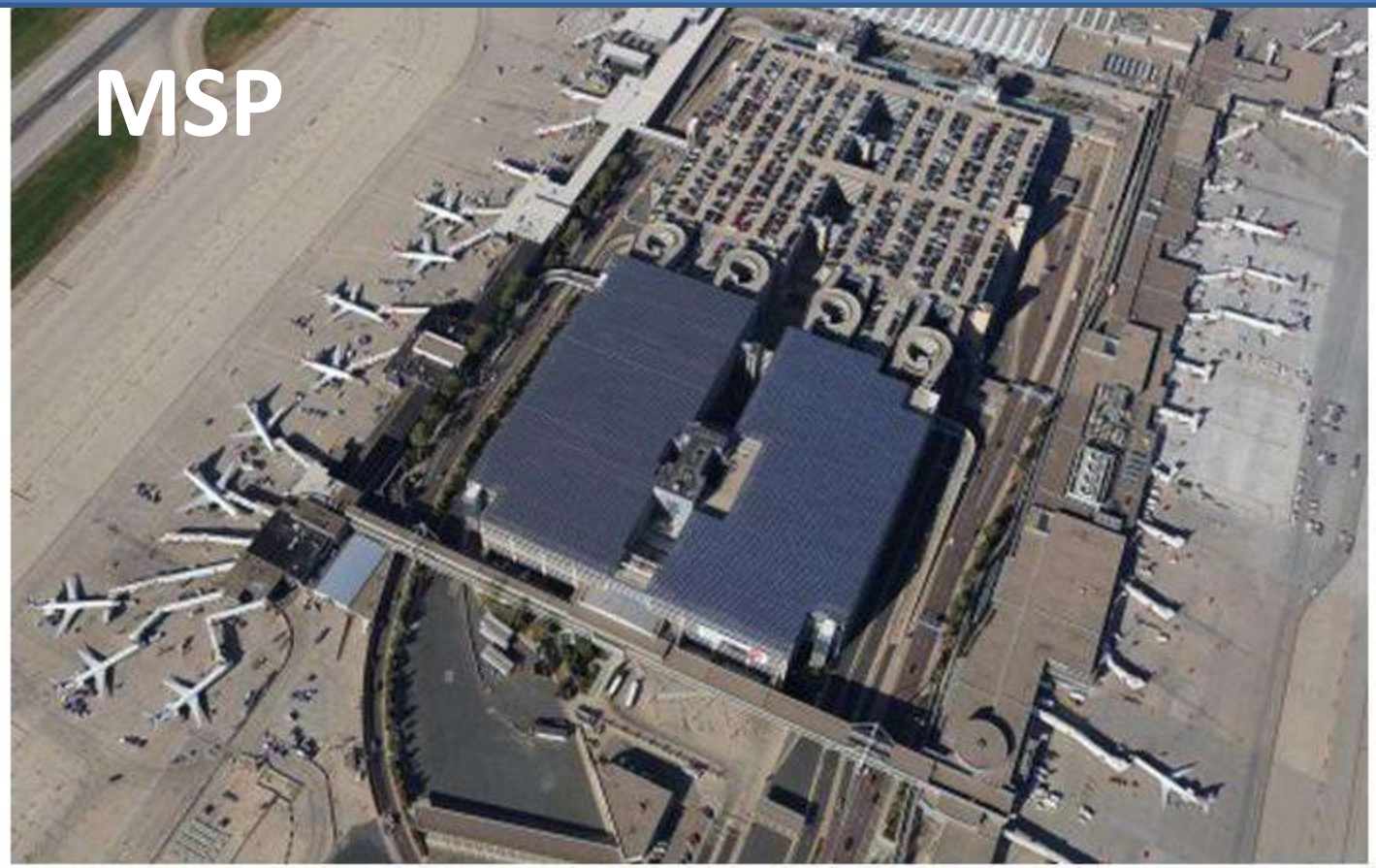
Tampa Electric (TECO) installed its first utility-scale system in 2015 at Tampa International Airport. The 2-MW parking canopy is on top of a parking garage. Florida's Solar Source installed the project, which is a one-of-a-kind concrete structure. (Credit: Solar Source)

Fixed Rack - Shade Structure

The Tucson International Airport has a uniquely designed "solar amphitheater" producing 1.25 MW. The project faces southeast to meet FAA anti-glare best practices. Barker Morrissey Contracting, Natural Power and Energy and Kyocera Solar assisted on the project, which used "Made in the USA" components. The airport plans on a 2.5-MW expansion sometime this year. (Credit: Natural Power and Energy)

https://www.solarpowerworldonline.com/2016/03/7-cool-solar-installations-at-u-s-airports/

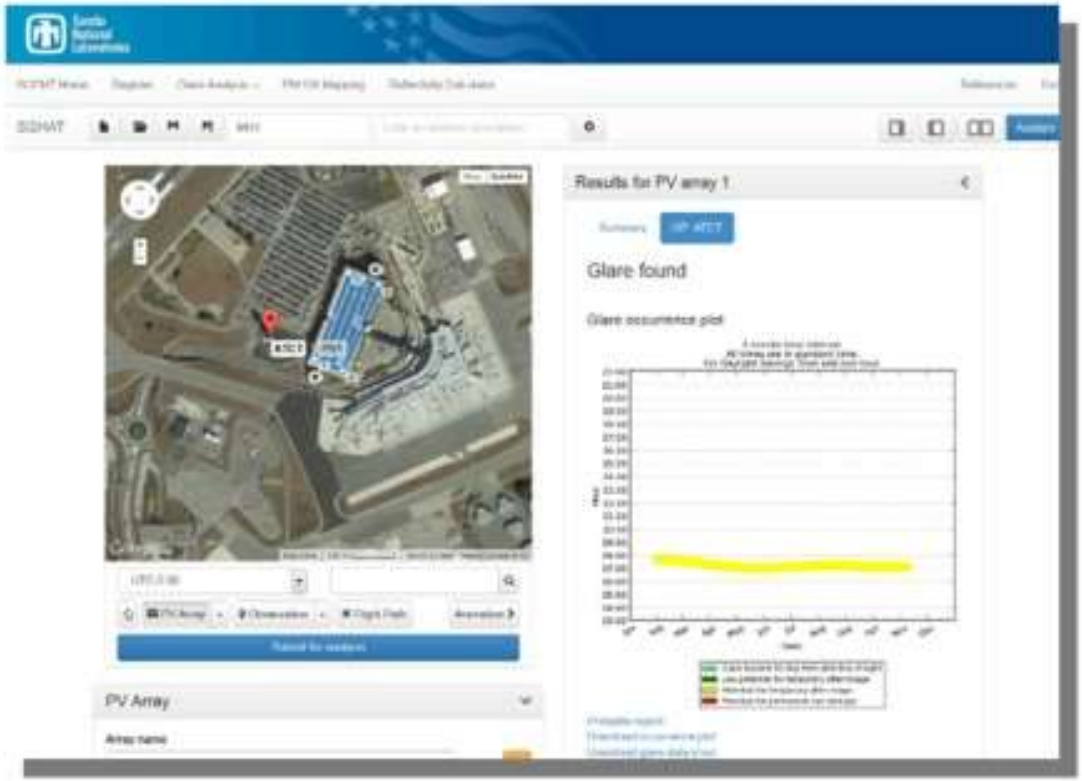
Fixed Rack - Parking Structure



AMERESCO completed a 3-MW project on the top deck of two parking structures at Minneapolis-St. Paul International Airport in late 2015, making it Minnesota's largest solar generation site. In addition to solar, the project converted more than 7,700 light fixtures to LED technology and brought the total number of electric vehicle charging stations to 18. (Credit: Ameresco)

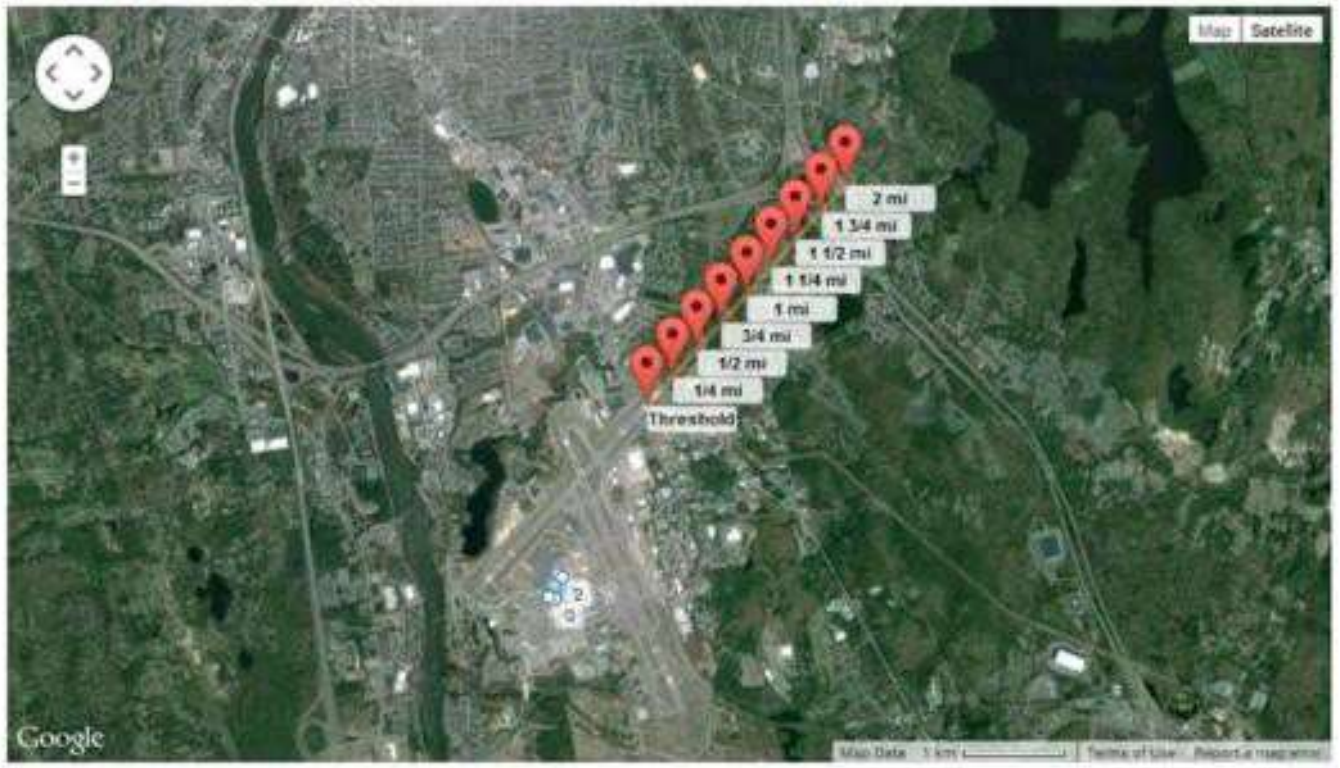
Solar Glare Hazard Analysis Tool

- Web-based software that predicts impacts of glare and annual energy production from photovoltaic arrays



- Uses interactive Google Maps
- Very fast annual simulations

SGHAT – Flight Path Tool



Solar Glare From PV

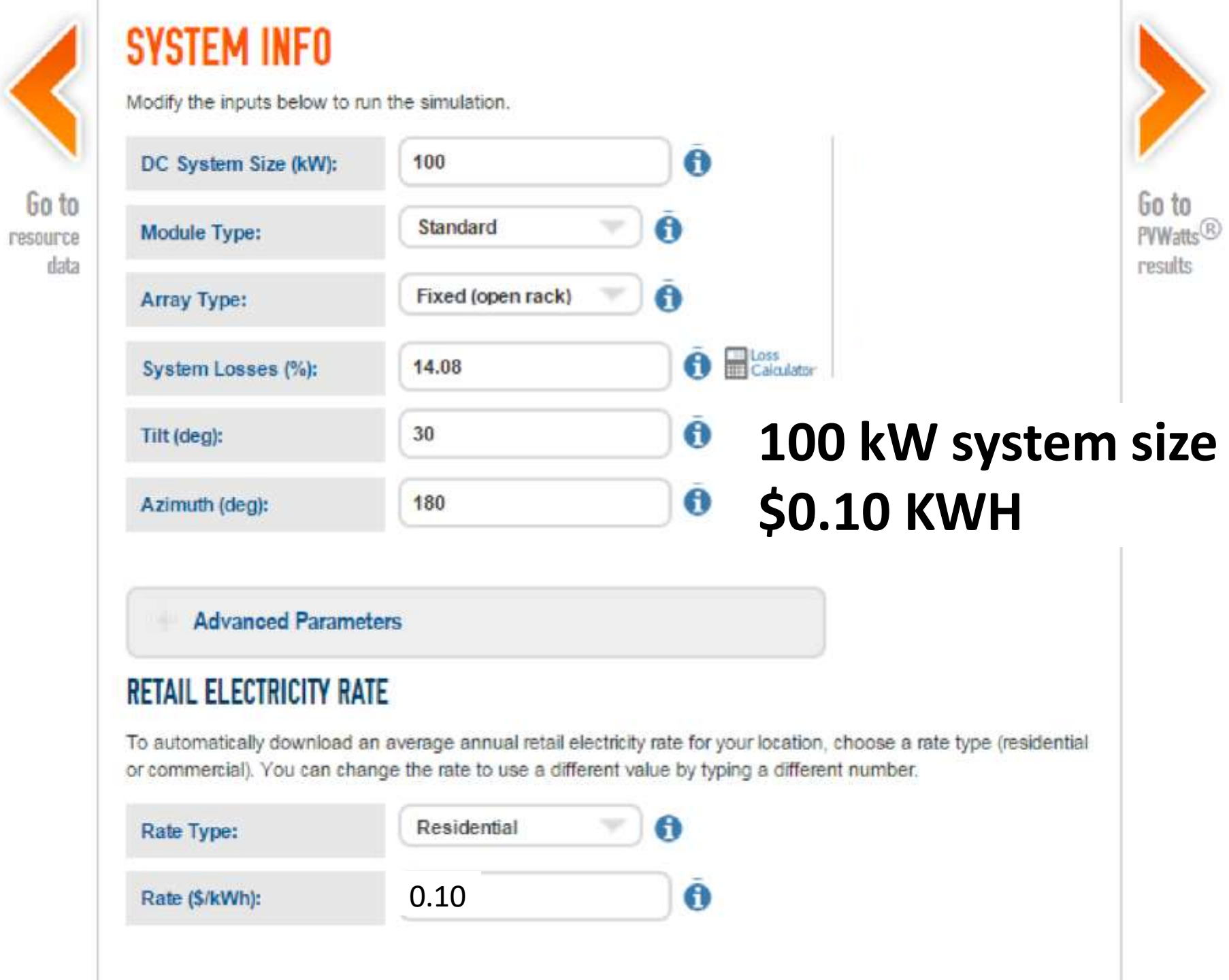
Glare observed from ATCT at Manchester-Boston Regional Airport (May 2012).

$3.5M rooftop array was tarped and eventually re-configured.

Actual view from tower.


Gothenburg, NE
GTE
14
21
Proposed single axis tracker
03
32
Google
Imagery ©2018, DigitalGlobe, USDA Farm Servi

PV Watts - NREL



100 kW system size

$0.10 KWH

RESOURCE DATA SYSTEM INFO RESULTS

Go to system info

RESULTS

Print Results

146,445 kWh/Year*

System output may range from 140,030 to 151,497 kWh per year near this location.

Click HERE for more information.

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Value ($)
January	3.74	9,669	967
February	4.53	10,544	1,054
March	5.26	13,194	1,319
April	5.64	13,150	1,315
May	5.90	13,963	1,396
June	6.18	13,798	1,380
July	6.41	14,408	1,441
August	6.23	14,133	1,413
September	5.90	13,083	1,308
October	4.90	11,772	1,177
November	4.03	10,051	1,005
December	3.36	8,680	868
Annual	5.17	146,445	$ 14,643

Solar Electric - Simple Payback Example of 100 kW System

Initial Cost (~$2.50 / Watt)	**$250,000**
30% Federal Tax Credit	$ 75,000
Balance	$175,000
5-Year Accelerated Depreciation	?
Avoided Costs **($14,000 to $15,000+ / year)**	?
Grant … (state incentives?)	?
Estimated payback period (in years)	5 - 7

(Internal Rate of Return 8 - 12%)

Solar Electric Airports

Reduce costs of operation

Reduce utility peak demand

Simple installation

… but there is a learning curve

Cost <$2.50/Watt - site dependent

Payback 5-7 years with credits and depreciation

Long Term Impacts: Conclusions

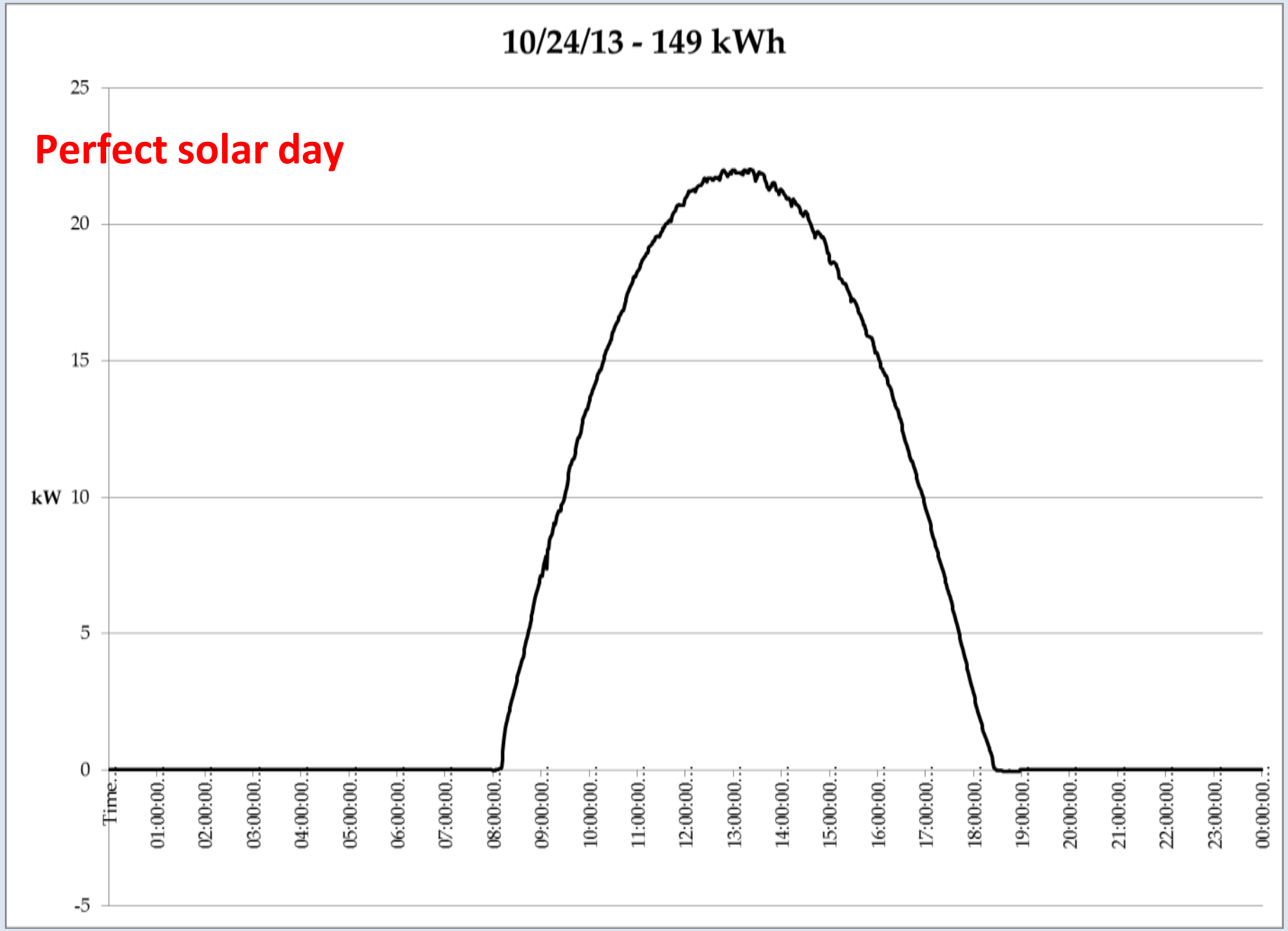
Reduces energy trade imbalance for state's economy

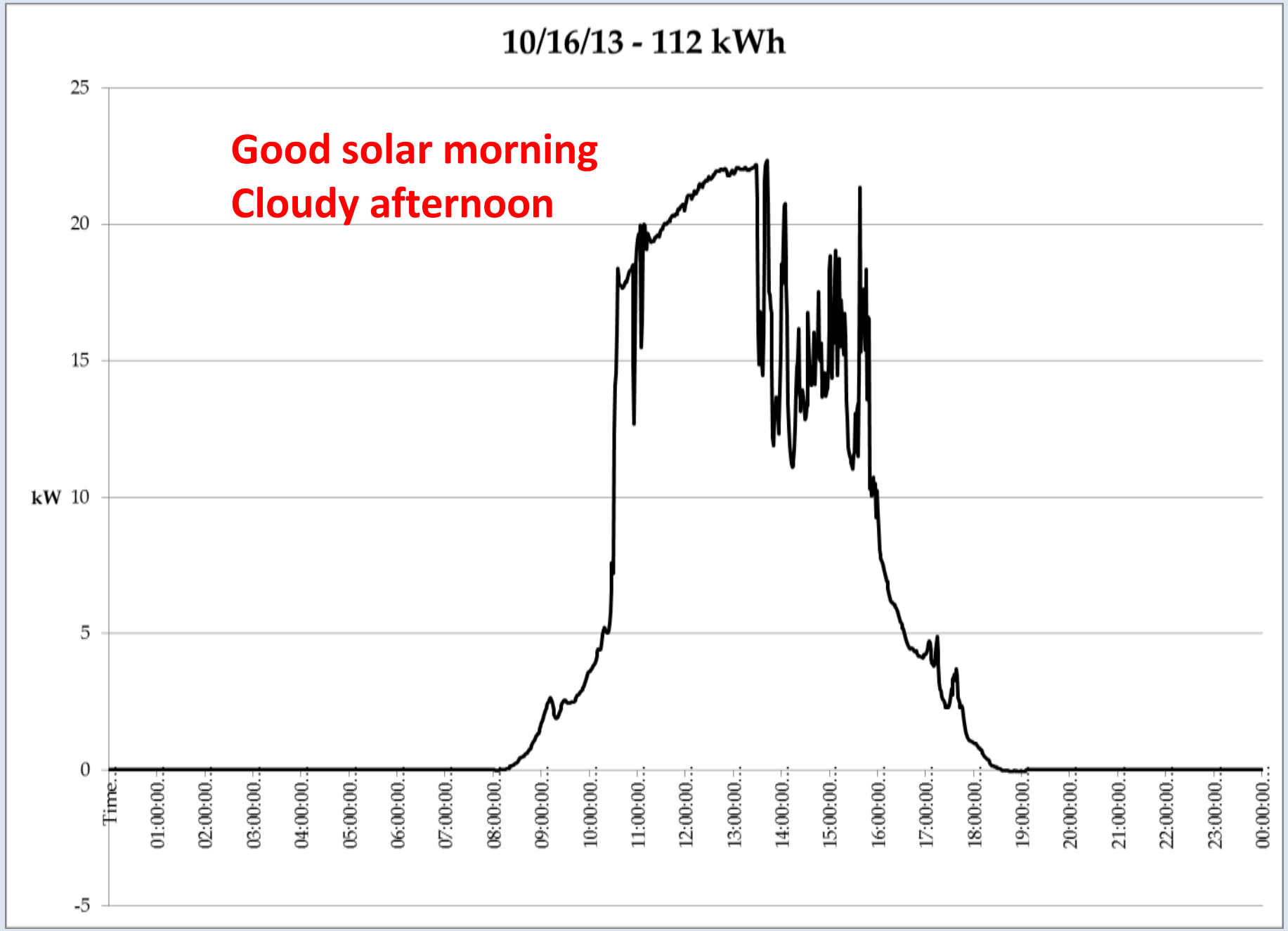
Local investor owners can provide decentralized build out of new capacity

Investment income produces returns which can be reinvested into business operations

Creates sustainable jobs with construction and service of new solar fields

Create new manufacturing opportunities


10/24/13 - 149 kWh
Perfect solar day
25
20
15
kW 10
5
0
-5
Time
01:00:00
02:00:00
03:00:00
04:00:00
05:00:00
06:00:00
07:00:00
08:00:00
09:00:00
10:00:00
11:00:00
12:00:00
13:00:00
14:00:00
15:00:00
16:00:00
17:00:00
18:00:00
19:00:00
20:00:00
21:00:00
22:00:00
23:00:00
00:00:00


10/16/13 - 112 kWh
Good solar morning
Cloudy afternoon
kW
25
20
15
10
5
0
-5
Time
01:00:00
02:00:00
03:00:00
04:00:00
05:00:00
06:00:00
07:00:00
08:00:00
09:00:00
10:00:00
11:00:00
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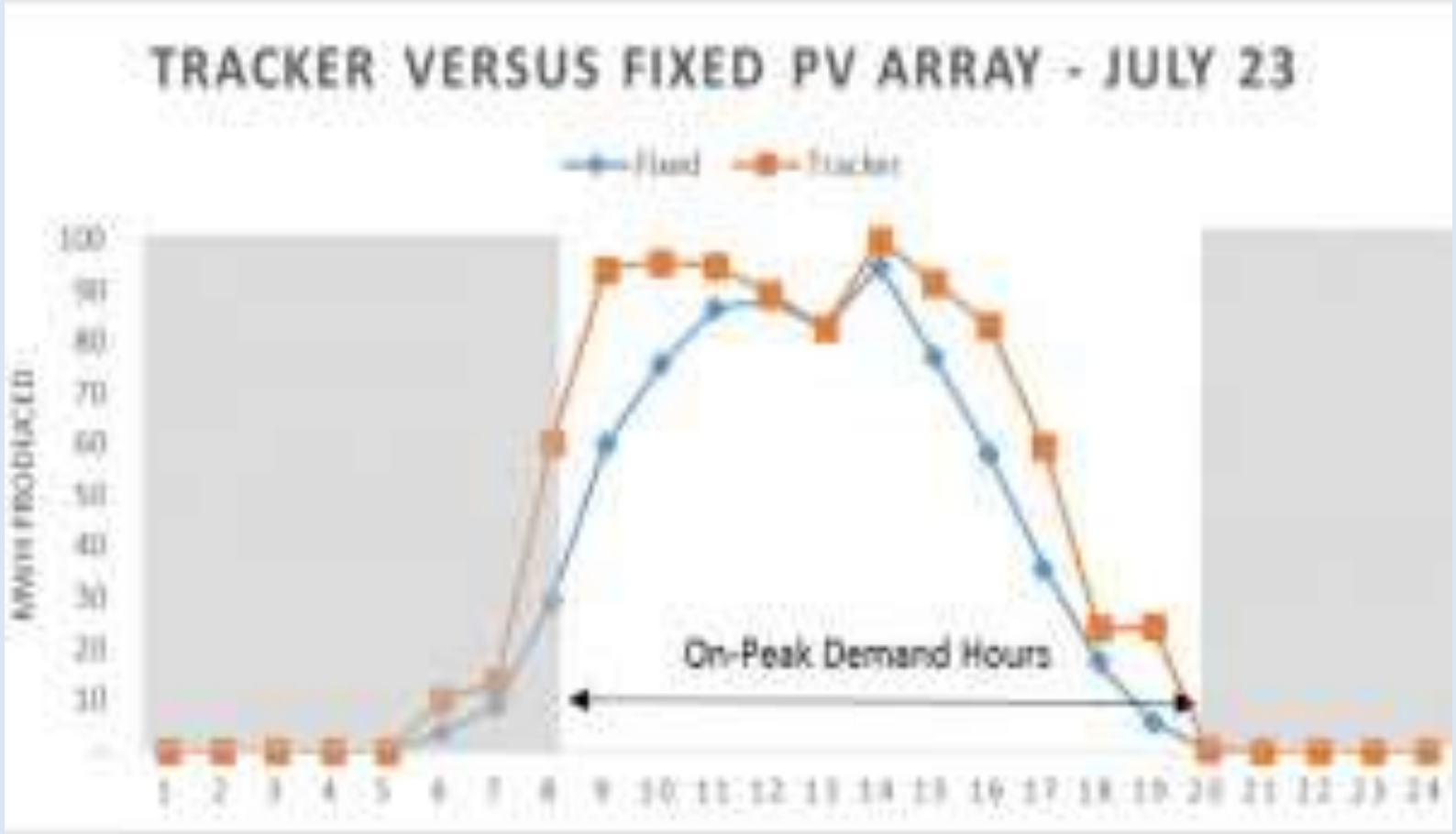
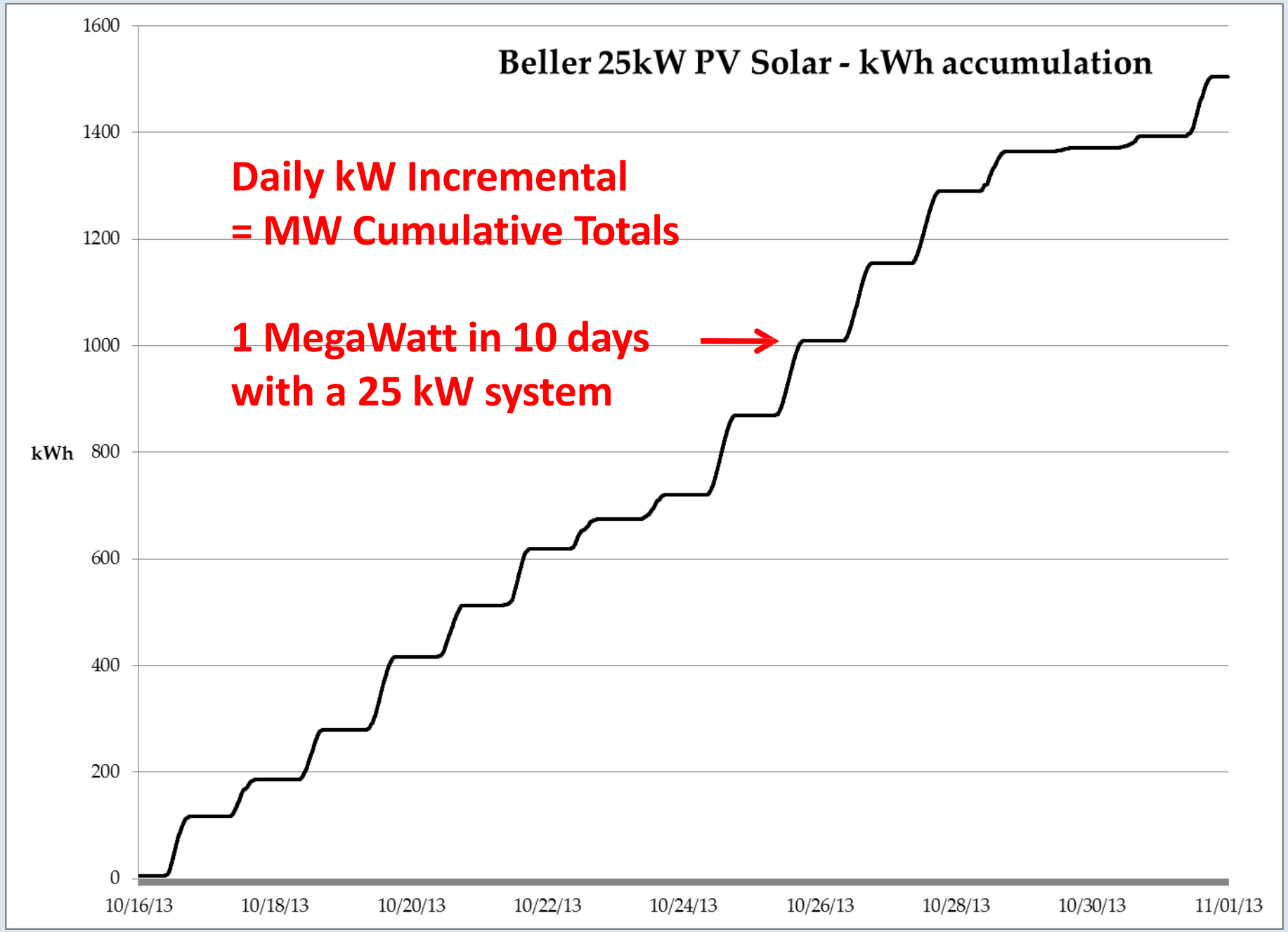
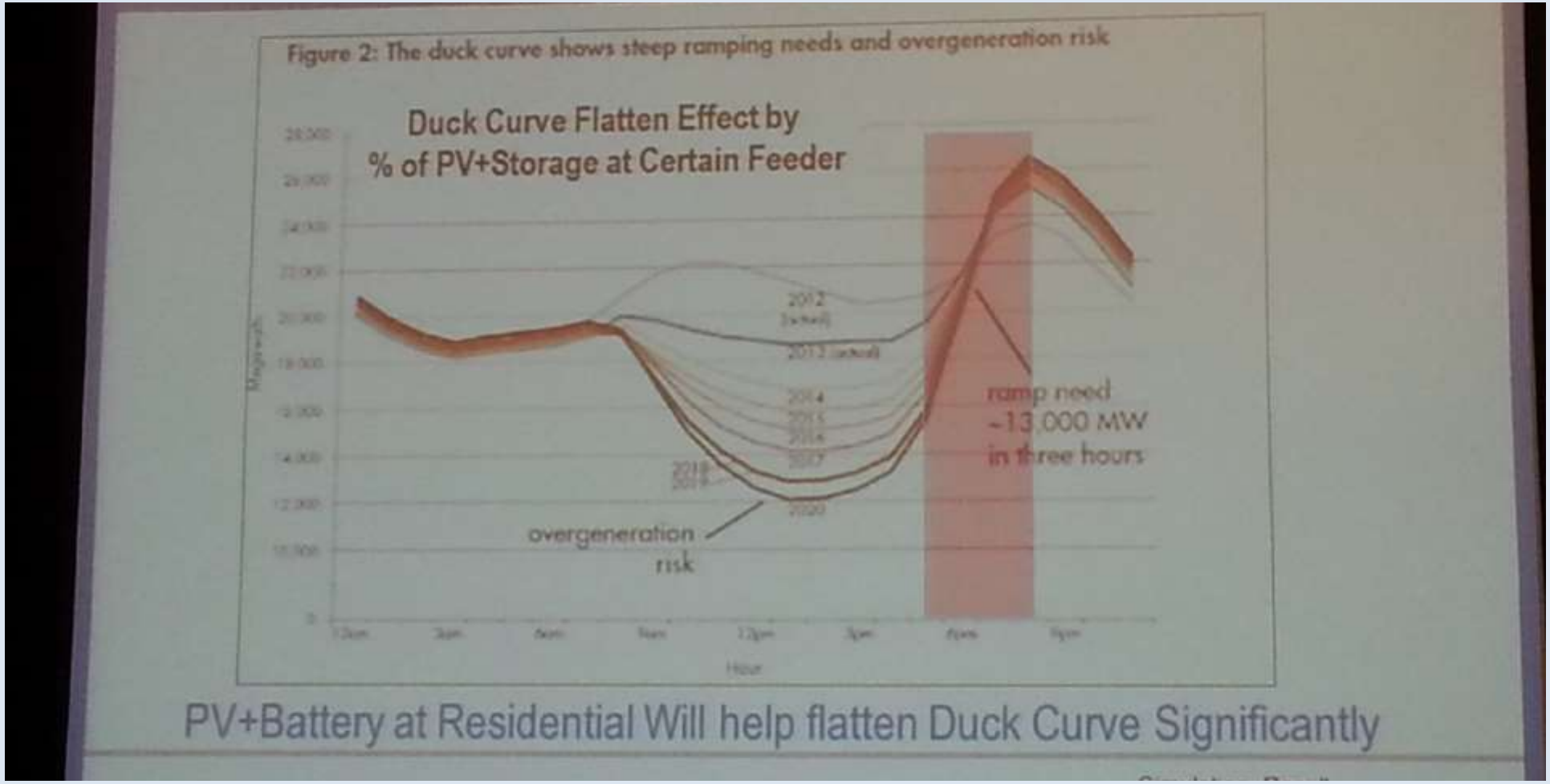

TRACKER VERSUS FIXED PV ARRAY - JULY 23
Fixed
Tracker
On-Peak Demand Hours

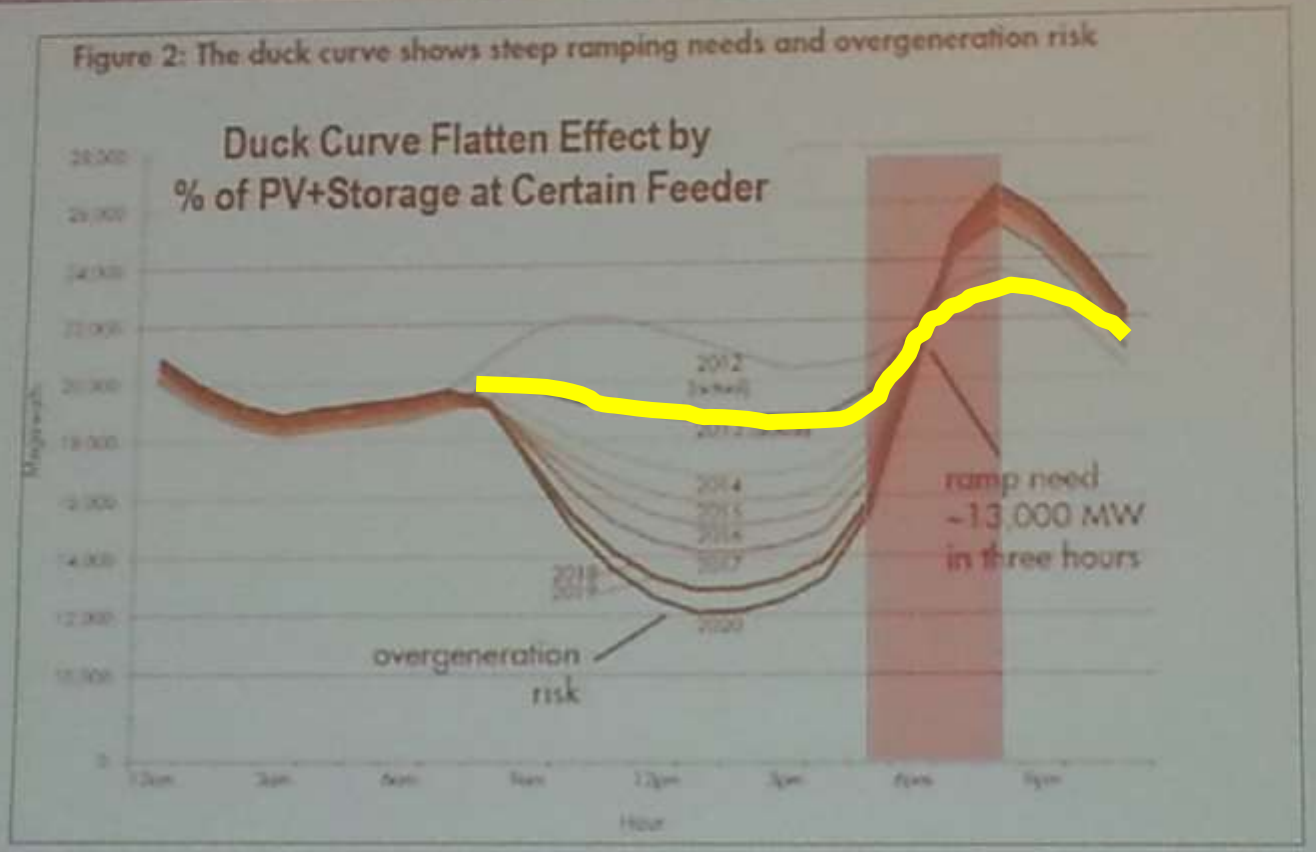

Beller 25kW PV Solar - kWh accumulation
Daily kW Incremental
= MW Cumulative Totals
1 MegaWatt in 10 days
with a 25 kW system
kWh
1600
1400
1200
1000
800
600
400
200
0
10/16/13
10/18/13
10/20/13
10/22/13
10/24/13
10/26/13
10/28/13
10/30/13
11/01/13

Demand Rates Follow “Duck Curve”



Batteries flatten the "Duck" curve

Figure 2: The duck curve shows steep ramping needs and overgeneration risk

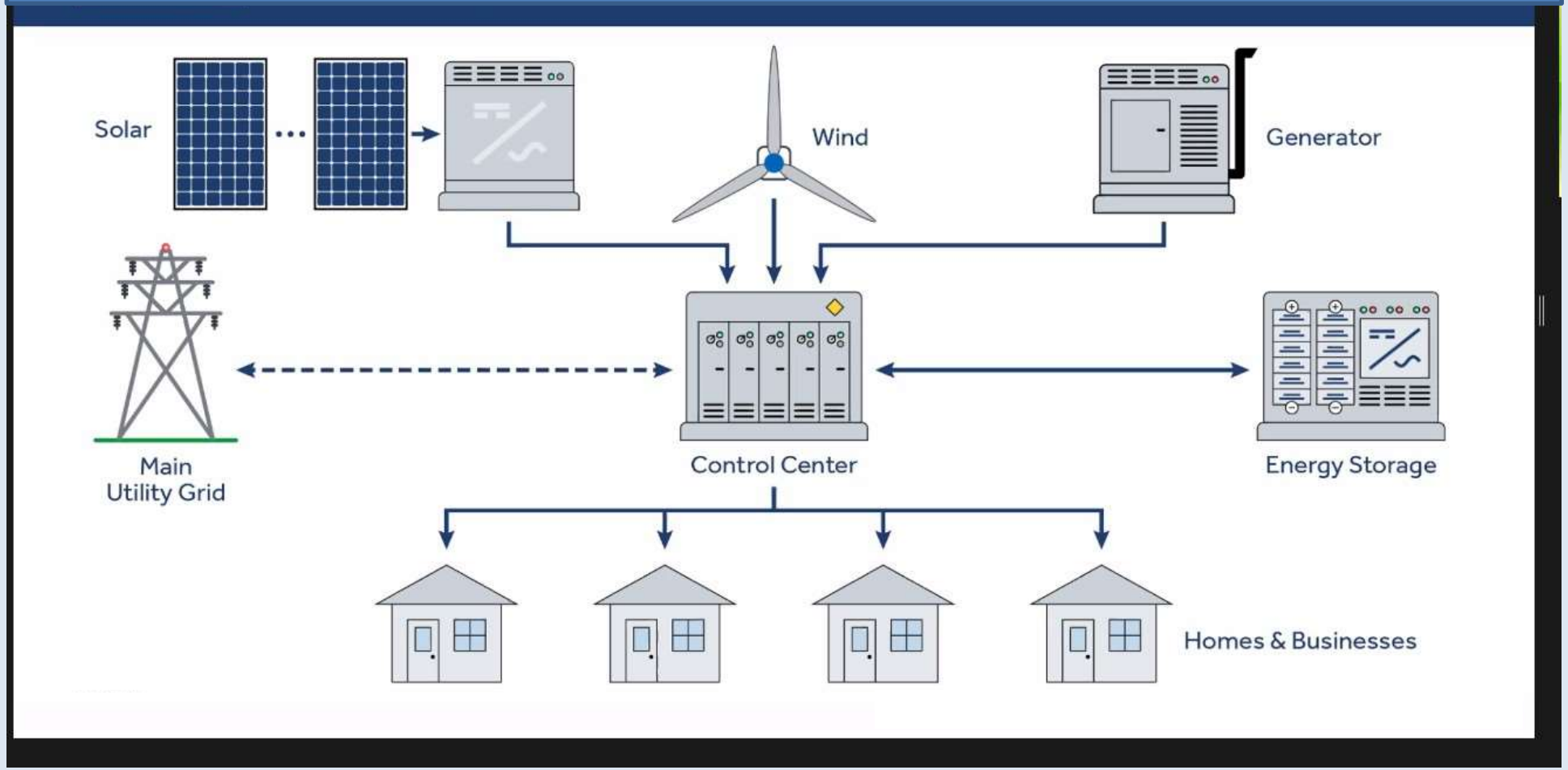


PV+Battery at Residential Will help flatten Duck Curve Significantly

TABUCHI ELECTRIC

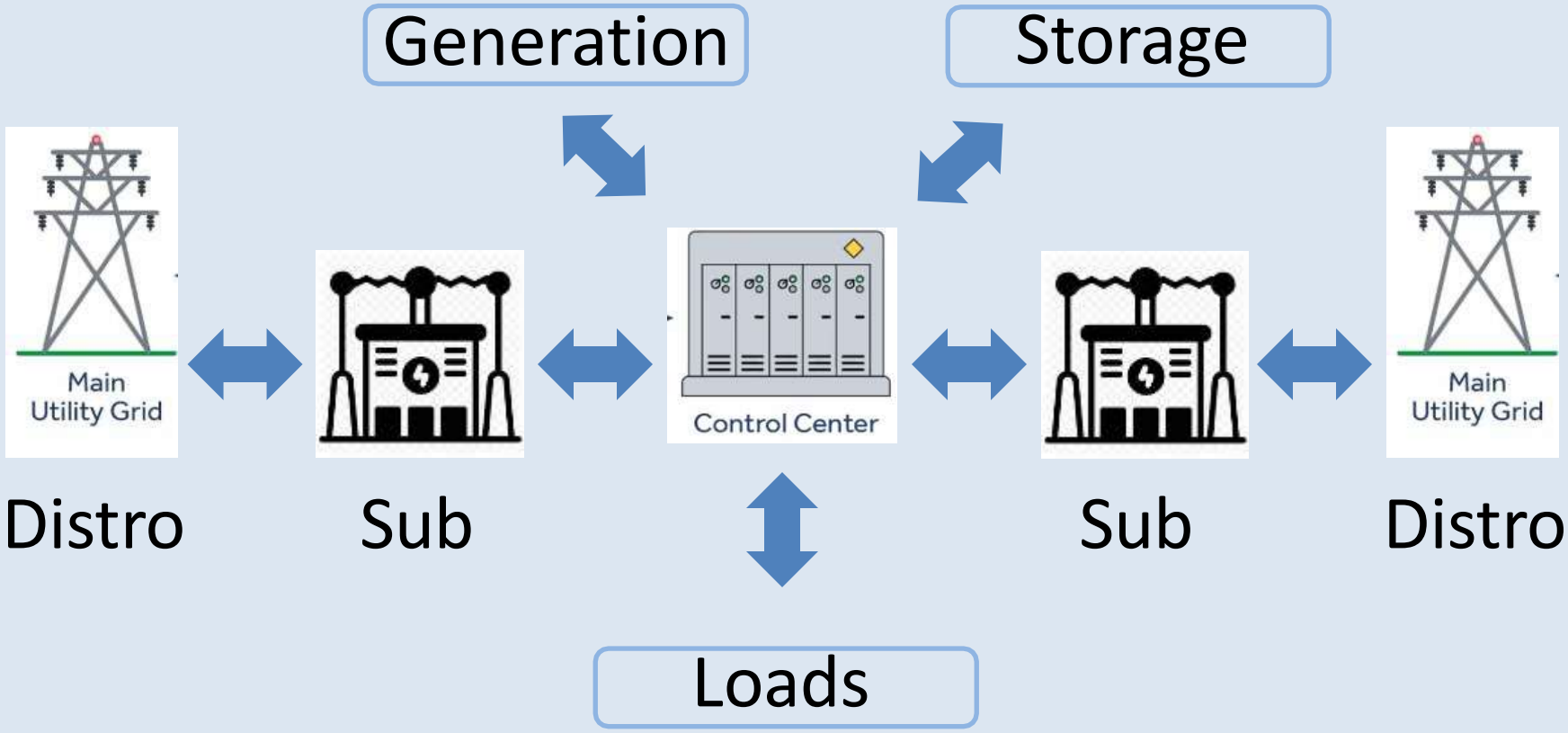
Simulation Result
by Tabuchi Electric

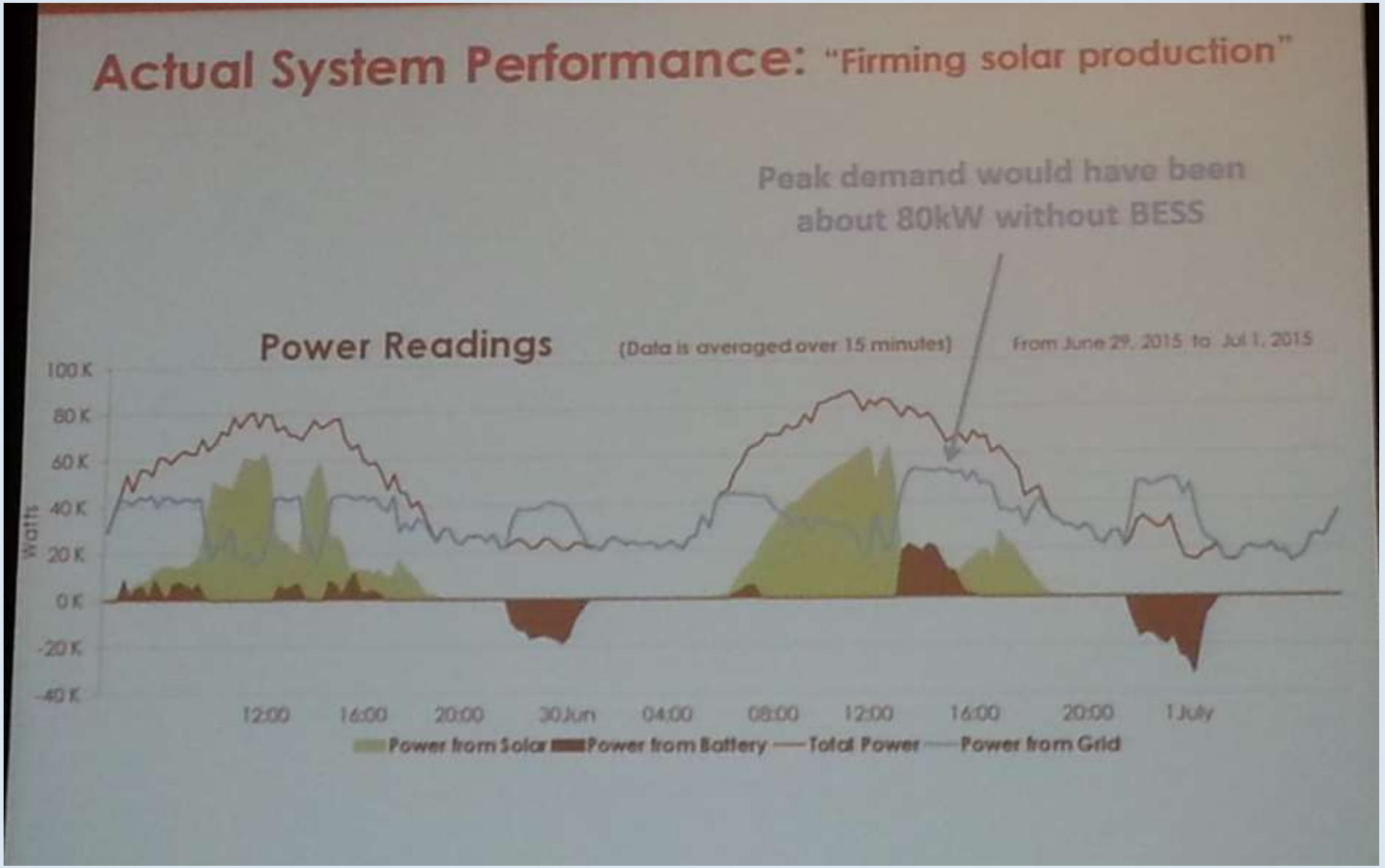
Microgrid: Components

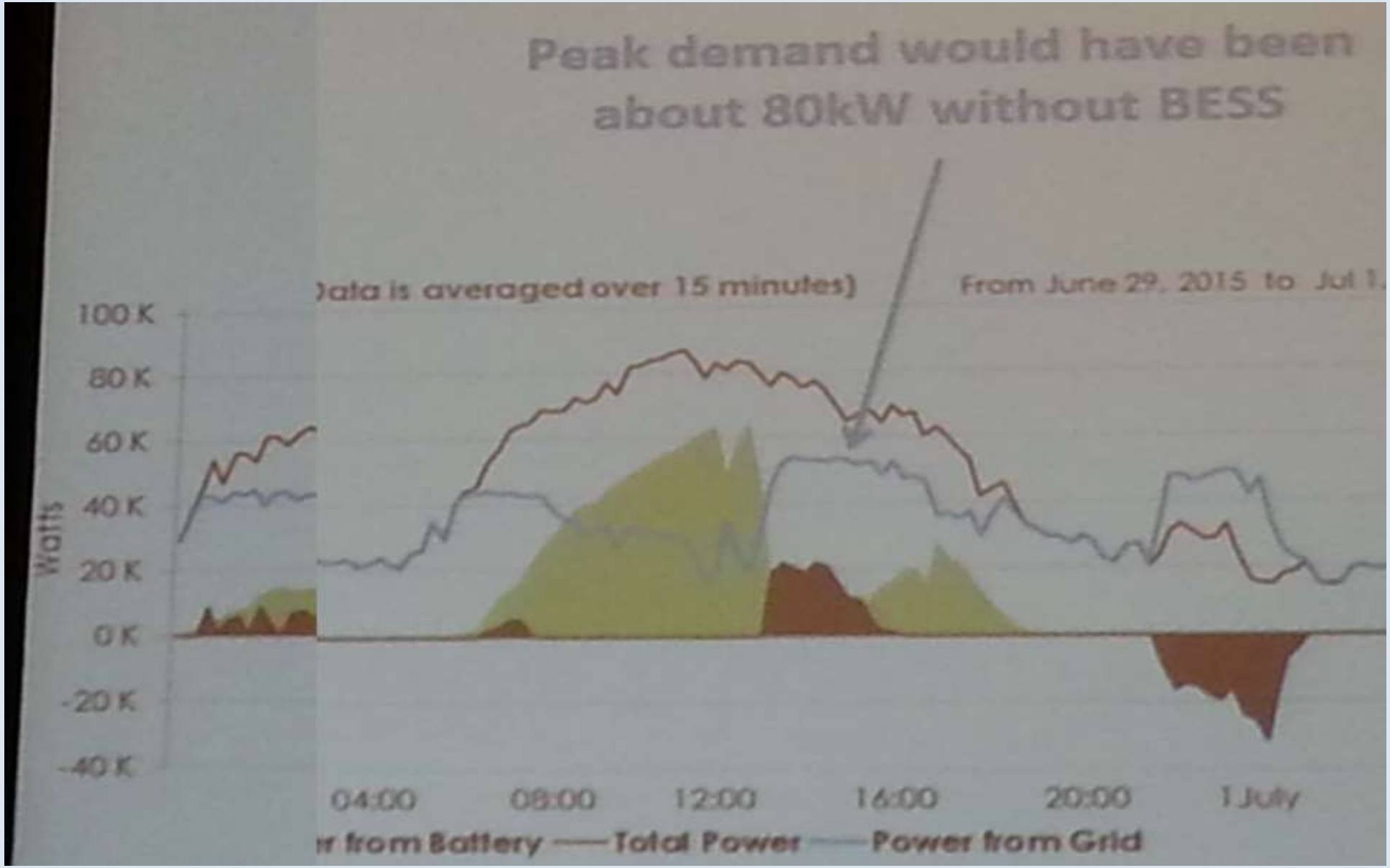


Microgrid: Topology

PV / Wind / Biogas / Genset




Actual System Performance: "Firming solar production"
Peak demand would have been about 80kW without BESS
Power Readings
(Data is averaged over 15 minutes)
From June 29, 2015 to Jul 1, 2015
100 K
80 K
60 K
40 K
20 K
0 K
-20 K
-40 K
Watts
12:00
16:00
20:00
30 Jun
04:00
08:00
12:00
16:00
20:00
1 July
Power from Solar
Power from Battery
Total Power
Power from Grid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From June 29, 2015 to Jul 1,
100 K
80 K
60 K
40 K
20 K
0 K
-20 K
-40 K
Watts
04:00
08:00
12:00
16:00
20:00
1 July
r from Battery
Total Power
Power from Grid

Future Trends

Energy Costs are rising

Transition away from carbon

Renewable cost slight decline

Technology drives adoption & practices
- Sting Inverters
- Storage
- Microgrids

Policy must lead because markets cannot

Reduce peak demand: conservation and storage

There is a continuous learning curve

Airports Going SOLAR!

Solar
HEAT & ELECTRIC

Michael Shonka
www.SolarOmaha.com
402-590-5900 / 402-850-7973
michael@solaromaha.com

Meeting Close

- Split Kitty Drawing
- PDHs available from the Omaha Post Website
  - https://www.same.org/omaha/resources/