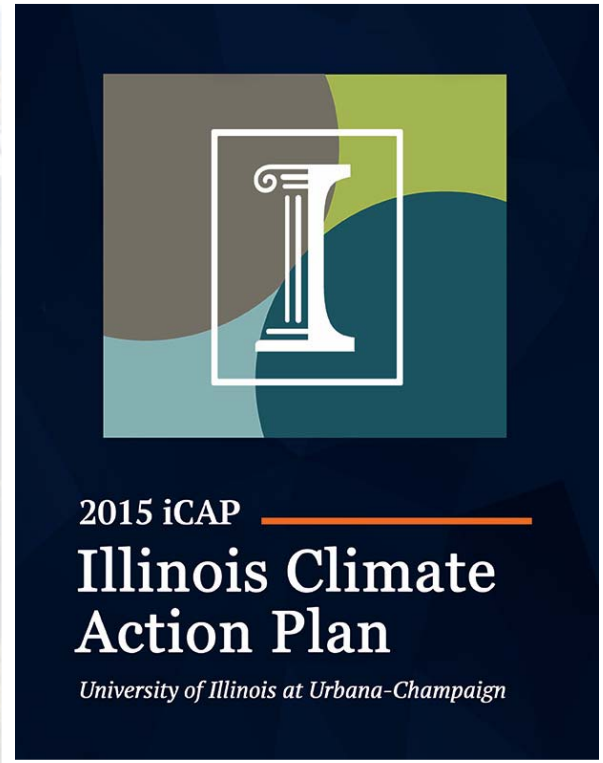
University of Illinois Solar Farm

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

illinois.edu

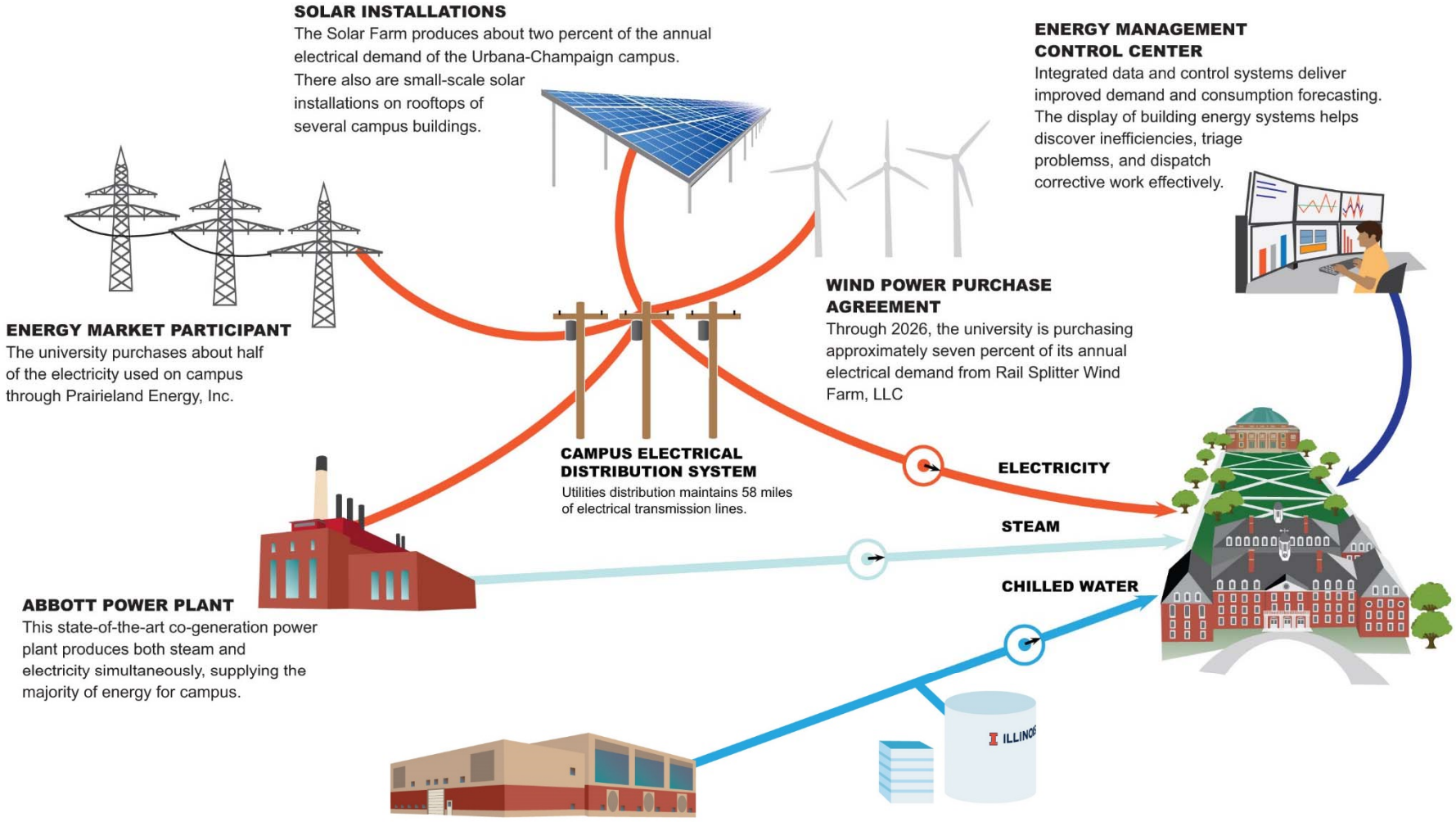
U of I Commitments



ISEE

http://icap.sustainability.illinois.edu

Where does the Solar Farm fit in campus' energy system?



INFRASTRUCTURE FAST FACTS

FACILITIES & SERVICES
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

CAMPUS

6,368	Master Plan Area (acres) (9.9 sq miles)
2,295	University District Area (acres) (3.6 sq miles)

BUILDINGS

Master Plan Area Buildings (13,578,255 NASF) (21,729,743 GSF)	648
Total University District Buildings (13,063,549 NASF) (21,088,393 GSF)	506

UTILITIES

8	miles of Compressed Air
9	miles of Steam Tunnel
11	miles of Steam Direct Buried Lines
24	miles of Chilled Water
47	miles of Telecommunications (CITES)
31	miles of Natural Gas
52	miles of Lighting
40	miles of Sanitary Sewer
58	miles of Electrical
84	miles of Storm Sewer
63	miles of Water
3	miles of Raw Water
4	miles of Fertilizer Systems (ACES)
5,968	Manholes
3,095	Valves
3,164	Light Poles

INFRASTRUCTURE

Parking Spaces	21,664

See other side for definitions and map.

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

CAMPUS WIDE

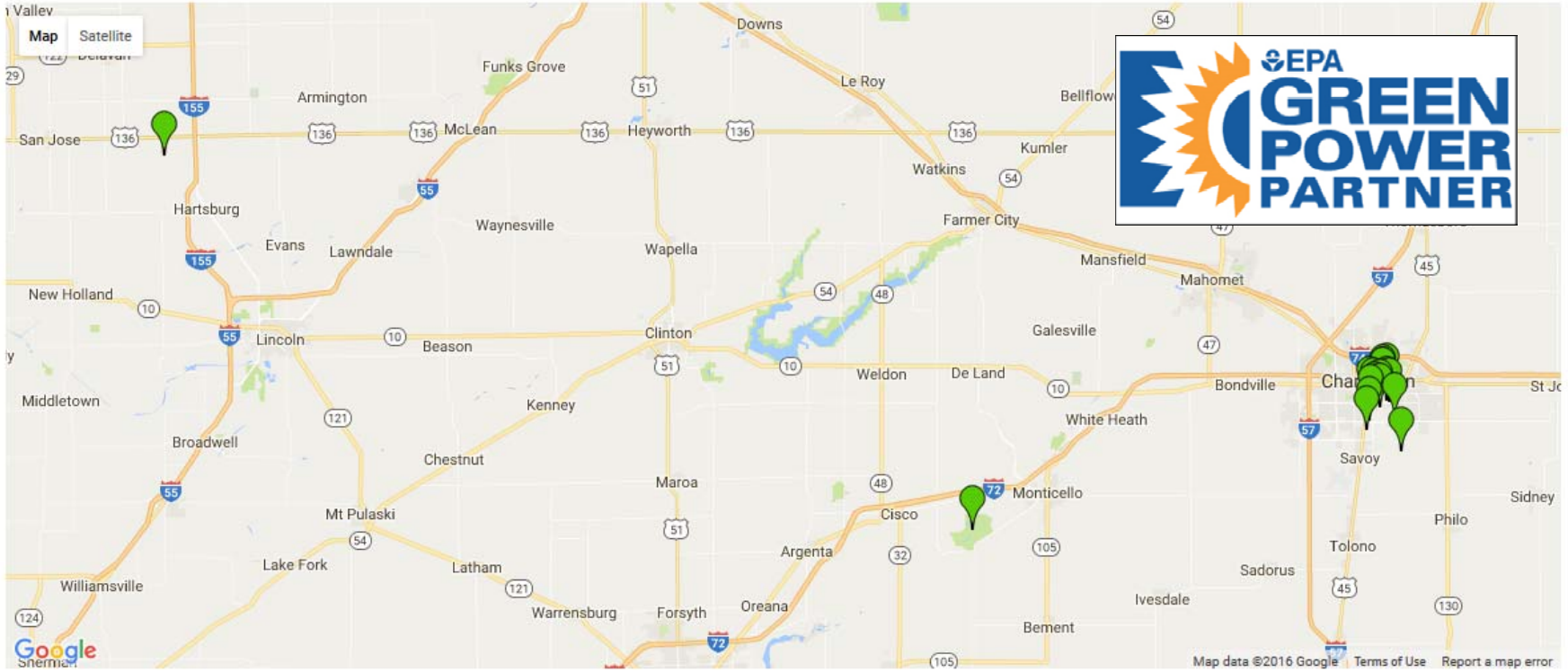
UTILITIES PRODUCTION AND DISTRIBUTION MASTER PLAN

UIUC PROJECT NO. – U11045

Affiliated Engineers, Inc.
Consulting Engineers
5802 Research Park Boulevard, Madison, WI 53719
Phone: (608) 238-2616 Fax (608) 238-2614
Website: www.aeieng.com

DATE: October, 2015

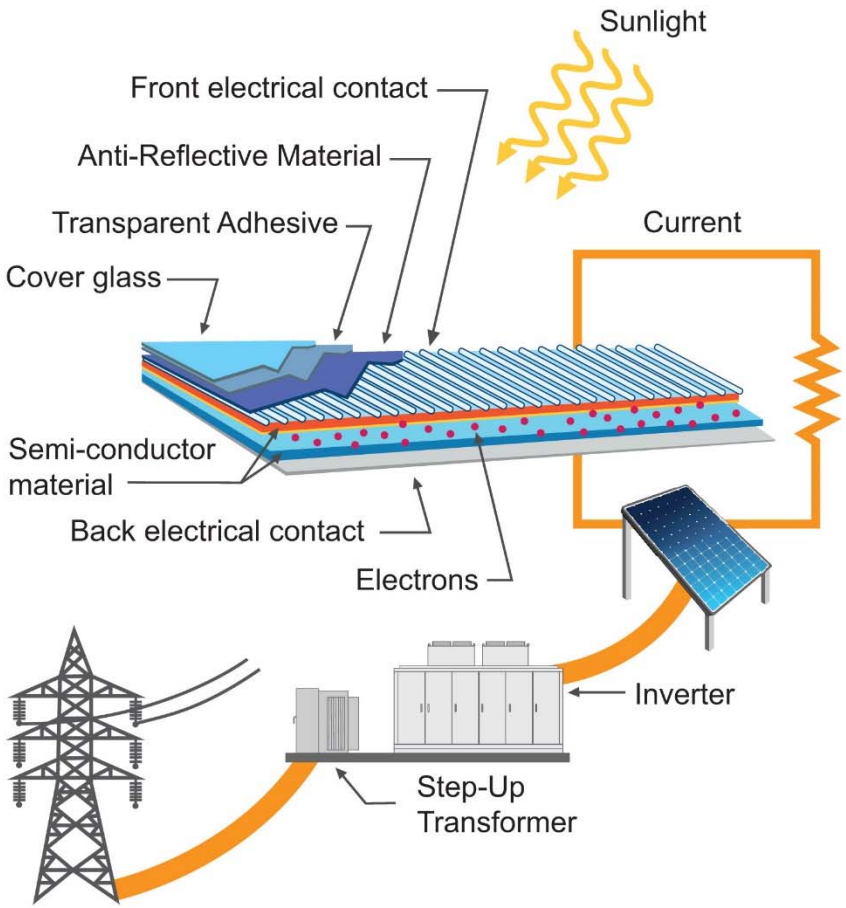
U of I Renewable Energy



Wind PPA and Biomass

Biomass Heating at the University of Illinois at Urbana-Champaign

How do the panels generate electricity?



The panel cells are made of two types of semi-conductor material. When sunlight hits them, it knocks electrons loose. The electrons are captured from the cells in the form of direct electrical current (DC).

Combiner boxes at the ends of the panel rows gather the DC current and send it to the inverters, which convert it to alternating current (AC). Transformers then step up the current and upload it to the grid.

Request for Proposal (RFP)

No. 1KSP1210

South Campus Solar Farm Project

PROPOSAL ISSUED DATE: November 29, 2011

PROPOSAL DUE DATE: Ja

PROPOSAL DUE TIME: 2:0

NOTE: Proposer must complete the enclosed Appendix I Representations, and Disclosures (Exhibits A, B, & C) a Certification. Failure to complete and return these forms being considered non-responsive to this solicitation.

Vendor Name: _____

Vendor Address: _____

POWER PURCHASE AGREEMENT

between

Phoenix Solar Incorporated

as Provider

and

The Board of Trustees of the University of

as Host Purchaser

GROUND LEASE

BY AND BETWEEN

THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS,
as Landlord

and

Phoenix Solar Incorporated,
as Tenant.

(SOUTH CAMPUS SOLAR FARM)

UNIVERSITY OF ILLINOIS AT URBA

illinois.edu

Solar Farm Projected Costs

$5.3 M Budget

Utilities & Energy Services	**$4.25M**
Student Cleaner Energy Fee	**$1.05M**

STUDENT SUSTAINABILITY COMMITTEE

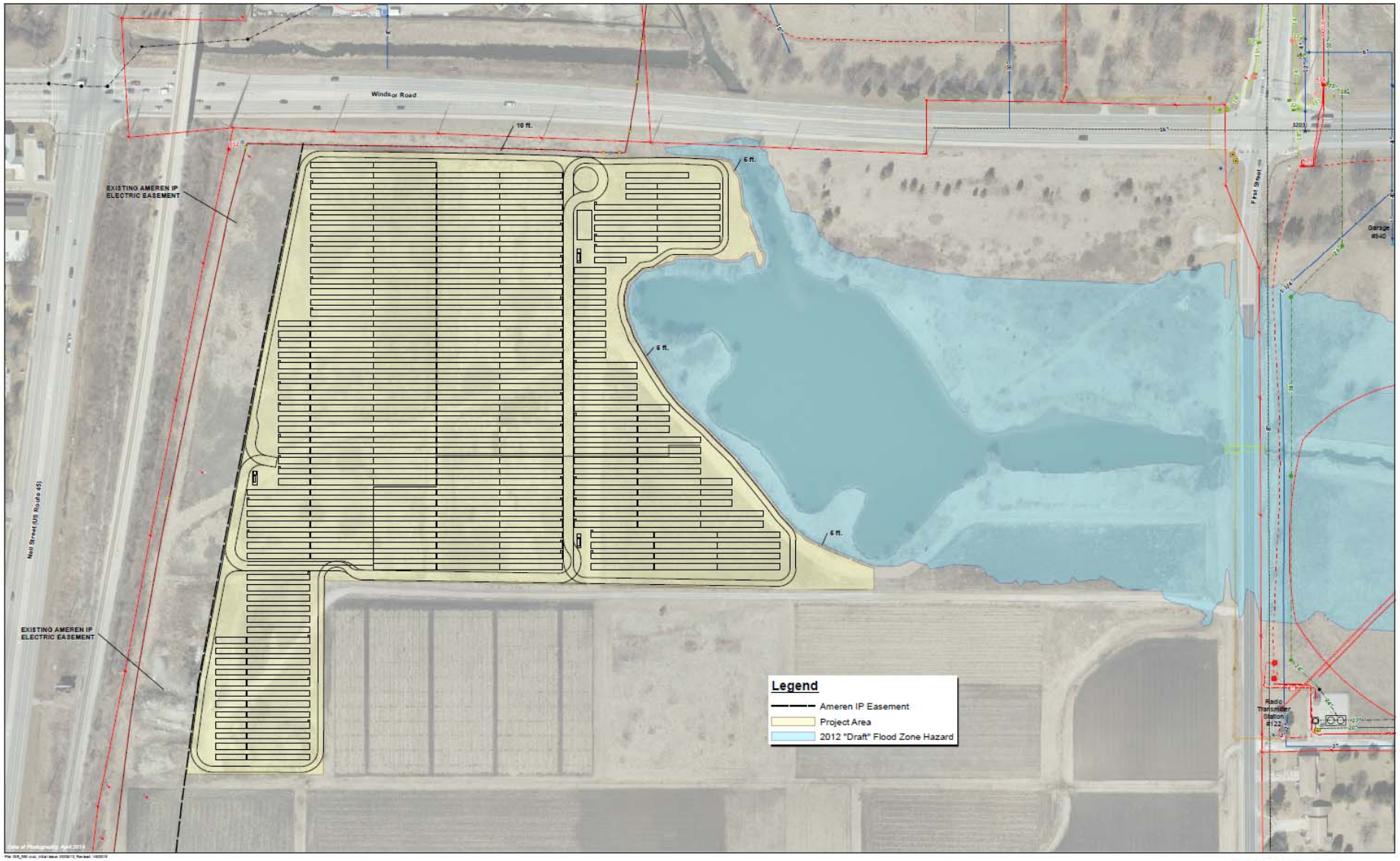
The total cost is actually projected to be over $15M, but there will be a reduction in the cost of electricity purchased from conventional sources.

Solar Farm Cost Comparisons

Year	Location	Name-plate capacity (MW)	Annual generation (MWh)	Approx. cost at install	Install Cost per Watt
FY10	Business Instructional Facility	0.0330	43.9	$ 245,663	$ 7.44
FY13	Building Research Council	0.0147	19.6	$ 120,000	$ 8.16
FY16	Solar Farm	4.6800	7283.0	$ 15,500,000	$ 3.31


nearmap

Solar Farm Layout



UTILITIES AND ENERGY SERVICES

0 40 80 160 240 320 Feet

FIGURE 4
SOLAR FARM PROJECT
University of Illinois, Urbana - Champaign Campus

Solar Farm Location

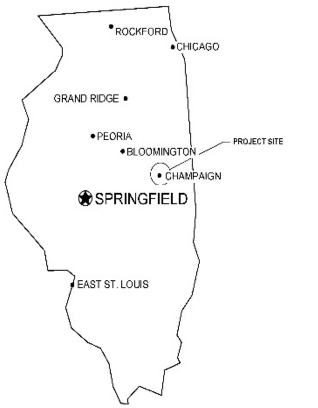
UNIVERSITY OF ILLINOIS SOLAR PROJECT

801 SOUTH WRIGHT STREET

CHAMPAIGN, IL 61820

SOLAR ELECTRIC SYSTEM PROJECT - 4.68 MW AC

PROJECT LOCATION:



PROJECT SCOPE:

SOLAR ELECTRIC SYSTEM

THE PROJECT ENTAILS THE INSTALLATION OF A SOLAR PHOTOVOLTAIC SYSTEM AT THE PROJECT SITE. THE SYSTEM WILL NOT BE A NET ELECTRICITY EXPORTER TO THE UTILITY GRID.

THE INSTALLATION CONSISTS OF NEW GROUND MOUNTED STRUCTURES WITH MOUNTED PHOTOVOLTAICS. THE SYSTEM WILL BE INTERCONNECTED TO AND WILL BE OPERATED IN PARALLEL WITH THE ENERGY PROVIDER ELECTRIC GRID PER THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE.

PERMITTING/PLANNING NOTES:

1. THIS PV SYSTEM INSTALLATION IS SUBJECT TO INSPECTION BY THE UNIVERSITY, PHOENIX SOLAR, AND THE ENGINEERS OF RECORD.
2. THIS PROJECT SHALL CONFORM TO THE FOLLOWING CODE VERSIONS:

   2011 NATIONAL ELECTRIC CODE (NEC 2011)

PROJECT TEAM:

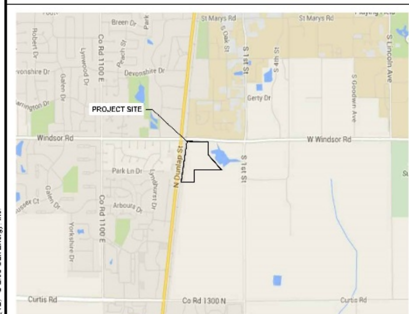
SITE CONTACT
PHOENIX SOLAR
4250 NORTH DRINKWATER BLVD #165
SCOTTSDALE, AZ 85251
CONTACT: NORM SPOONER
TEL: (925) 659-3700 DIRECT OFFICE
(602) 451-5405, MOBILE PHONE
N.SPOONER@PHOENIXSOLAR.US

PROJECT MANAGER
PHOENIX SOLAR
4250 NORTH DRINKWATER BLVD #165
SCOTTSDALE, AZ 85251
CONTACT: JAMES COURTS
TEL: (707) 483-9000 MOBILE PHONE
J.COURTS@PHOENIXSOLAR.US

DESIGN ENGINEERING FIRM
BLUE OAK ENERGY
1550 DREW AVENUE
DAVIS, CA 95618
CONTACT: JAYME GARCIA
TEL: (530) 747-2026
IL PE LIC. #062054094

DRAWING INDEX:

STREET MAP:



APPROX. NORTH

AERIAL VIEW:

APPROX. NORTH

SYSTEM SUMMARY:

SYSTEM SUMMARY		
MODULE MODEL	HANWHA Q.PRO L-G3.1 310	HANWHA Q.PRO L-G3.1 315
MODULE STC DC RATING	310W	315W
INVERTER MODEL	ABB ULTRA 1560 TL	
INVERTER STATION(S)	STATION 2 + STATION 3	STATION 1
MODULES PER SOURCE CIRCUIT	18	19
TOTAL MODULE COUNT	12654	6213
TOTAL STC DC SYSTEM SIZE	3.92 MW	1.96 MW
TOTAL AC SYSTEM SIZE	3.12 MW	1.56 MW
DC: AC RATIO	1.237	1.234
RACKING SYSTEM	FIXED TILT	
GROUND COVERAGE RATIO (GCR)	.57	
MODULE TILT	20°	
ARRAY AZIMUTH	180° (DUE SOUTH)	
SITE LATITUDE	40°04'54"N	
RECORD LOW (°C)*	-23°C	
RECORD HIGH (°C)*	33°C	
* DATA FOR UNIVERSITY OF ILLINOIS, CHAMPAIGN, ILLINOIS		

BLUE OAK ENERGY
1550 Drew Avenue
Davis, CA 95618
www.blueoakenergy.com
530.747.2025

phoenix SOLAR
2603 CAMINO RAMON, STE 215
SAN RAMON, CA 94583

JAYME GARCIA 062054094 STATE OF ILLINOIS — FOR CLIENT REVIEW ONLY

PROJECT: UNIVERSITY OF ILLINOIS SOLAR PROJECT

DRAWING TITLE: TITLE SHEET

DRAWING NO. W-001

18,867 SOLAR MODULES

12,654 @ 310 W + 6,213 @ 315 W

PRODUCES 5.87 MWdc = 4.68 MWac

SYSTEM SUMMARY		
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6330


SOLAR BOS
WARNING: PHOTOVOLTAIC POWER SOURCE
WARNING: PHOTOVOLTAIC POWER SOURCE
WARNING: PHOTOVOLTAIC POWER SOURCE


DANGER
HIGH VOLTAGE KEEP OUT
DANGER
DANGER! KEEP OUT! HAZARDOUS VOLTAGE INSIDE, WILL SHOCK, BURN, OR CAUSE DEATH.
PELIGRO! MANTENERSE FUERA. ELECTRICIDAD PELIGROSA. RIESGO DESCARGA ELECTRICA QUEMADURA, O MUERTE.
WARNING
WARNING!
IDENTIFICATION OF MULTIPLE SOURCES
SOLAR DISCONNECT
MAIN PHOTOVOLTAIC SYSTEM AC DISCONNECT


SOLAR FARM
FEEDER 10-9A
OAK STREET EXTENDED
FEEDER
FIRE SERVICE INSTITUTE
10-10A

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

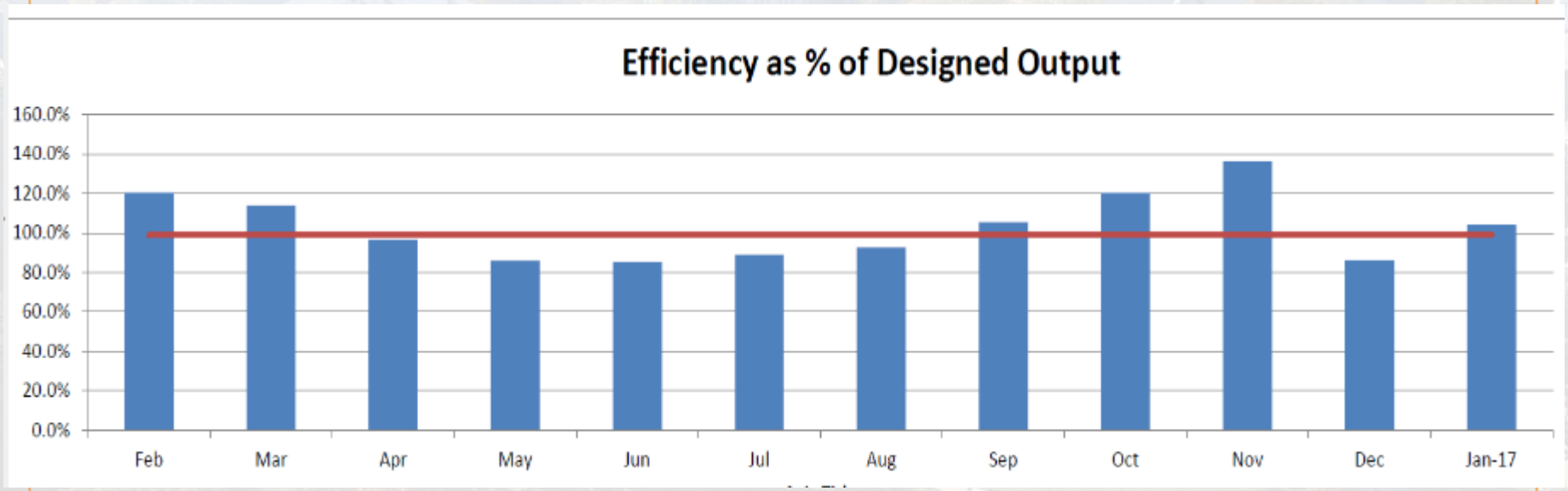
illinois.edu


University of Illinois
at Urbana-Champaign

Solar Farm Year One Results

- Total Solar Farm generation: 7,283,212 kWh
- Power Purchase Agreement Cost: $1,427,510
- FY17 projected demand: 373,653,880 kWh
- Solar Farm % of demand: 1.949%
- Carbon emission reductions: 6,010 metric tons

Solar Farm Year One Results



University of Illinois

◀◀ ◀ DAY | FIVE DAY | WEEK | MONTH | **YEAR** | LIFETIME ▶ ▶▶ OUR IMPACT | MONTH | **LIFETIME**

phoenix SOLAR

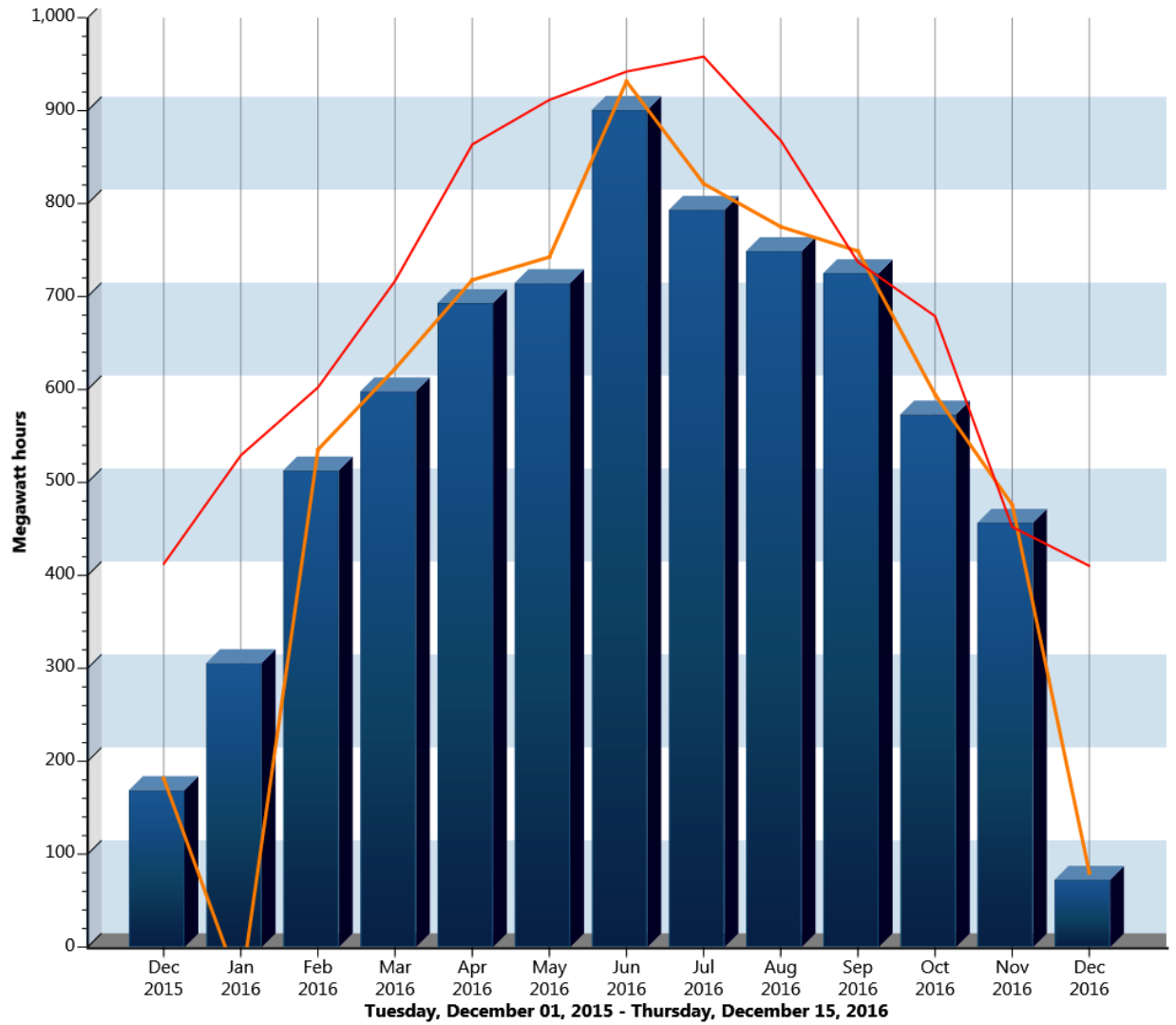
3.14 MW
POWER

5.49 MWh
TODAY

73.3 MWh
THIS MONTH

7.1 GWh
THIS YEAR

7.37 GWh
LIFETIME



gas
571,919
Gallons of gasoline

energy
7.37 GWh
energy produced

water
3,685,475
Gallons of water

SYSTEM SIZE: 4.68 MW

OPERATING SINCE: 11/18/2015

AlsoEnergy

Last Upload: 12/15/2016 10:57 AM

Last Update: 12/15/2016 11:00 AM

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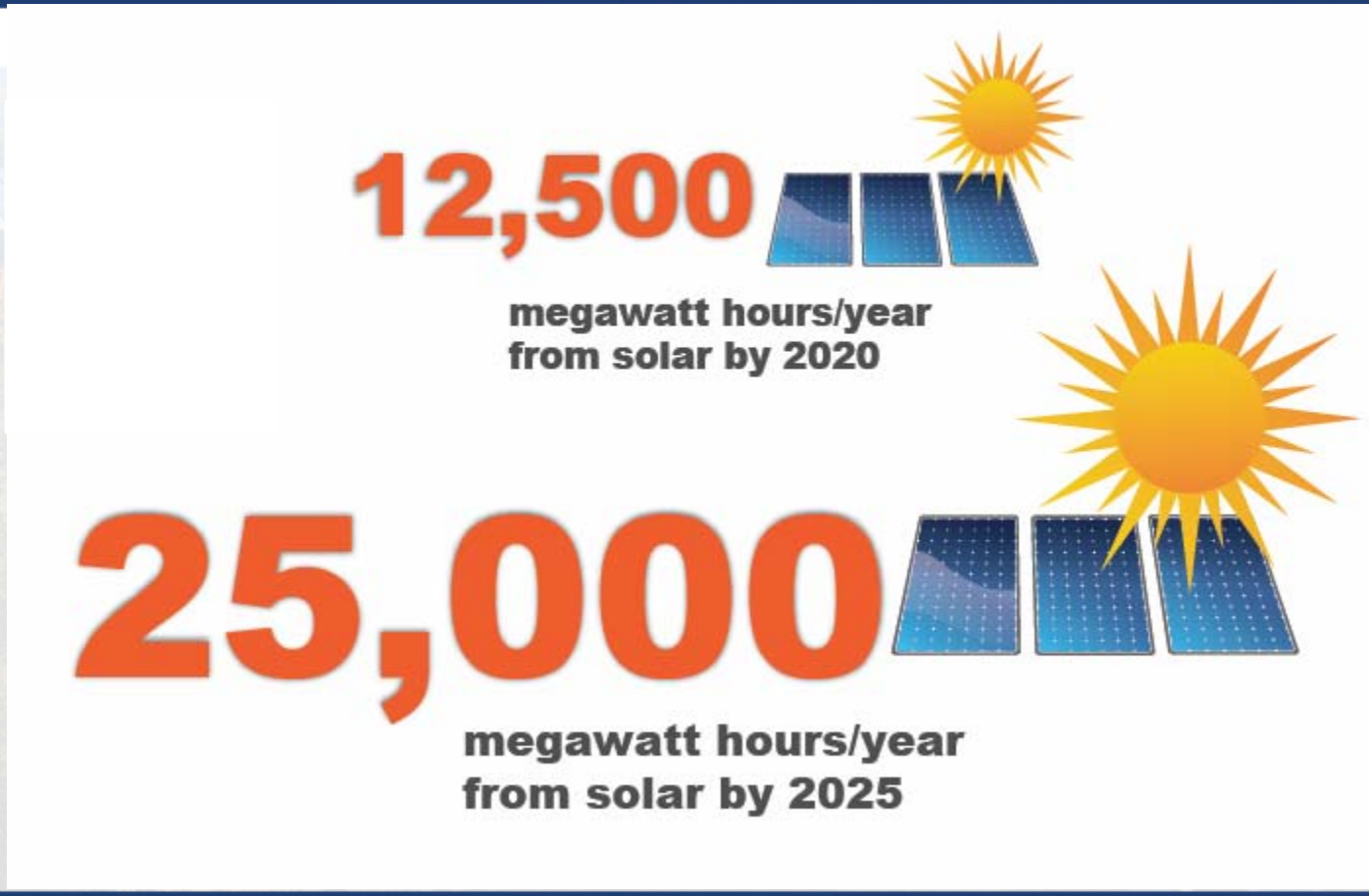
Next Steps for Solar



Questions

Morgan White
Associate Director, Sustainability
Facilities & Services
University of Illinois at Urbana-Champaign
Email: mbwhite@illinois.edu