

# SMALL SOLAR

2014 Nebraska Wind and Solar Conference and Exhibition

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October 29, 2014



# TYPES OF SOLAR PROJECTS

- Concentrated Solar Projects (CSP)
  - Systems generate solar power using mirrors or lenses to concentrate large area of sunlight, or solar thermal energy, onto a small area
    - ◆ Concentrated light converted to heat, which is used to drive a turbine
  - Typically uneconomic
  - Only viable with significant government support

# TYPES OF SOLAR PROJECTS



# TYPES OF SOLAR PROJECTS

- Photovoltaic Solar Projects (PV)
  - What most people think of when they think of solar power
  - System generates electricity via use of solar panels to absorb and directly convert sunlight into electricity.
  - Solar cells are electricity-producing devices made of semiconductor materials. Connected together to form PV *modules* that may be up to several feet long and a few feet wide.
  - Modules, in turn, can be combined and connected to form PV *arrays* of different sizes and power output. The modules of the array make up the major part of a PV system,
  - Ground mount, rooftop

# TYPES OF SOLAR PROJECTS



# WHAT IS “SMALL SOLAR”

- Utility Scale – Not all in agreement
  - Size (e.g., 1 MW or more, 4 MW or more, etc.), sales into grid (not behind the meter), etc.
- Commercial Scale – May be based on MW.
  - Alternatively, size not relevant, non-utility and nonresidential (e.g., rooftop or ground mount solar behind the meter where energy is consumed by non-residential retail customer).
    - ◆ Excess may be sold to utility/net metering

# WHAT IS “SMALL SOLAR”

- Community Solar Garden – Solar electric system that provides power and/or financial benefit to multiple community members. Multiple permutations.
- Residential – Behind the meter where energy consumed by residential customers.
- Nonresidential (i.e., commercial) – Behind the meter where energy consumed by nonresidential customers.
  - Distributed Generation (typically considered behind the meter)

# FINANCING SOLAR PROJECTS

- PV system costs:
  - Cost of financing
  - PV system cost (\$/watt)
  - Sales Tax, Property Tax, Insurance, O&M
  - Payments to site host or landowner

# FINANCING SOLAR PROJECTS

- How fund PV system:
  - Self-funded (equity/debt)
  - Third party financing
  - Other sources

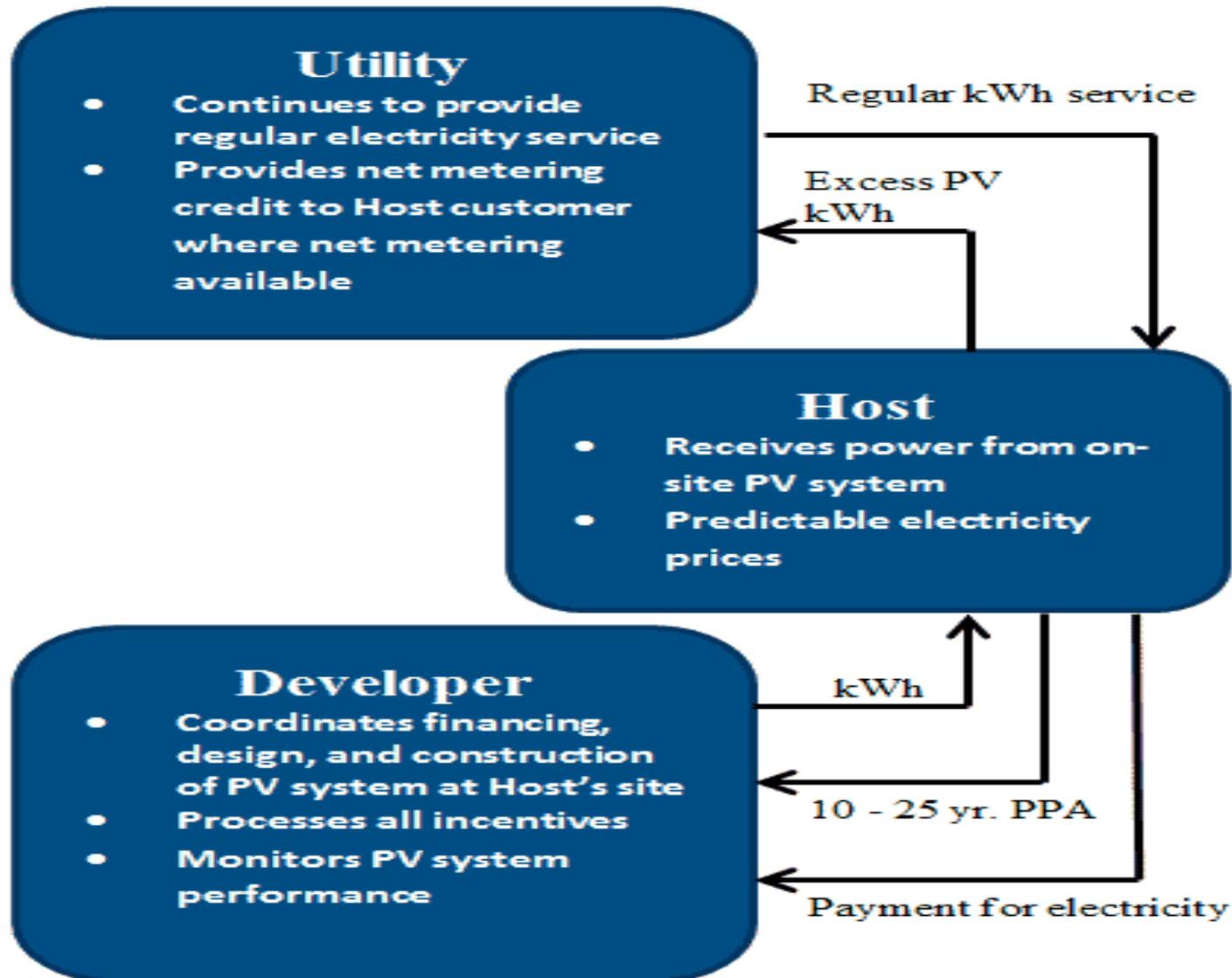
# THIRD PARTY SOLAR FINANCING

- Two primary models:
  - PPA
  - Solar lease
  - Financing based on purchaser or lessee's contractual obligation to pay for power or make lease payments for period of time adequate to support debt service and return on investment.

# 3RD PARTY POWER PURCHASE AGREEMENTS (PPAS)

- Way for developer to finance project
- Large commercial/industrial offtaker that wants to avoid ownership/O&M responsibility
- Issue – public utility reg./exclusive service territory
  - SZ Enterprises, LLC v. Iowa Utilities Board (Iowa 2014)
  - CSGs exempt by statute in some states
- Alternatives:
  - Sell to customer and provide financing and O&M services
  - Lease to customer (monthly/annual rent not tied to kW)
  - Stay under 25 customers

# 3RD PARTY POWER PURCHASE AGREEMENTS (PPAS)



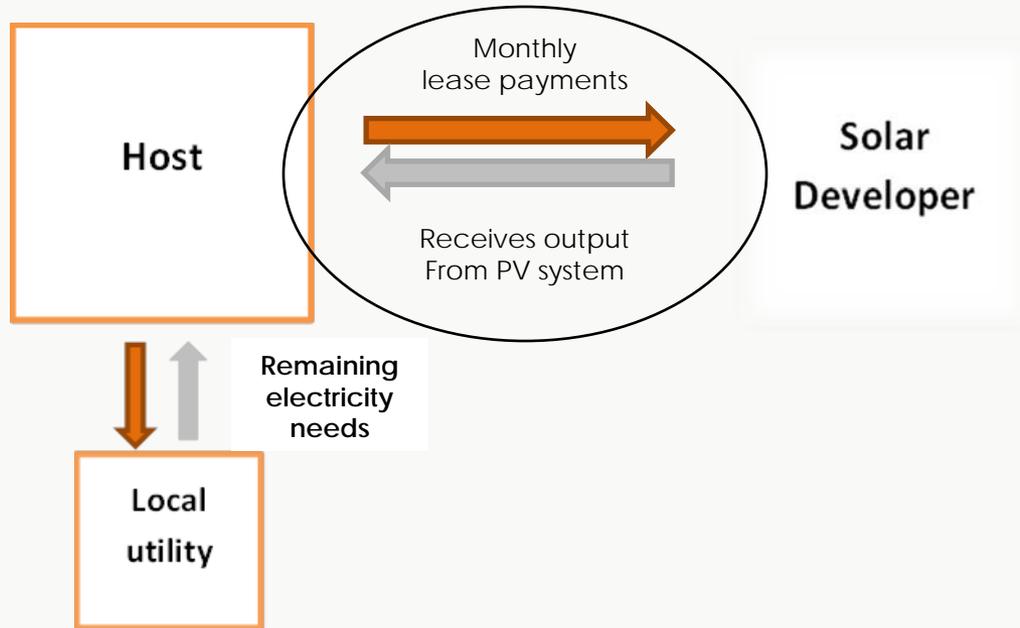
# 3RD PARTY SOLAR LEASE

- Under lease structure:
  - Building owner (i.e., host) agrees to lease PV system from the owner of the system (i.e., developer)
  - Host pays monthly lease payments to developer and received the output from the system
  - Excess power sold to grid via net metering process

# 3<sup>RD</sup> PARTY SOLAR LEASE STRUCTURE

The building owner ("host") agrees to lease the PV system from the owner of the system.

No sale of electricity involved

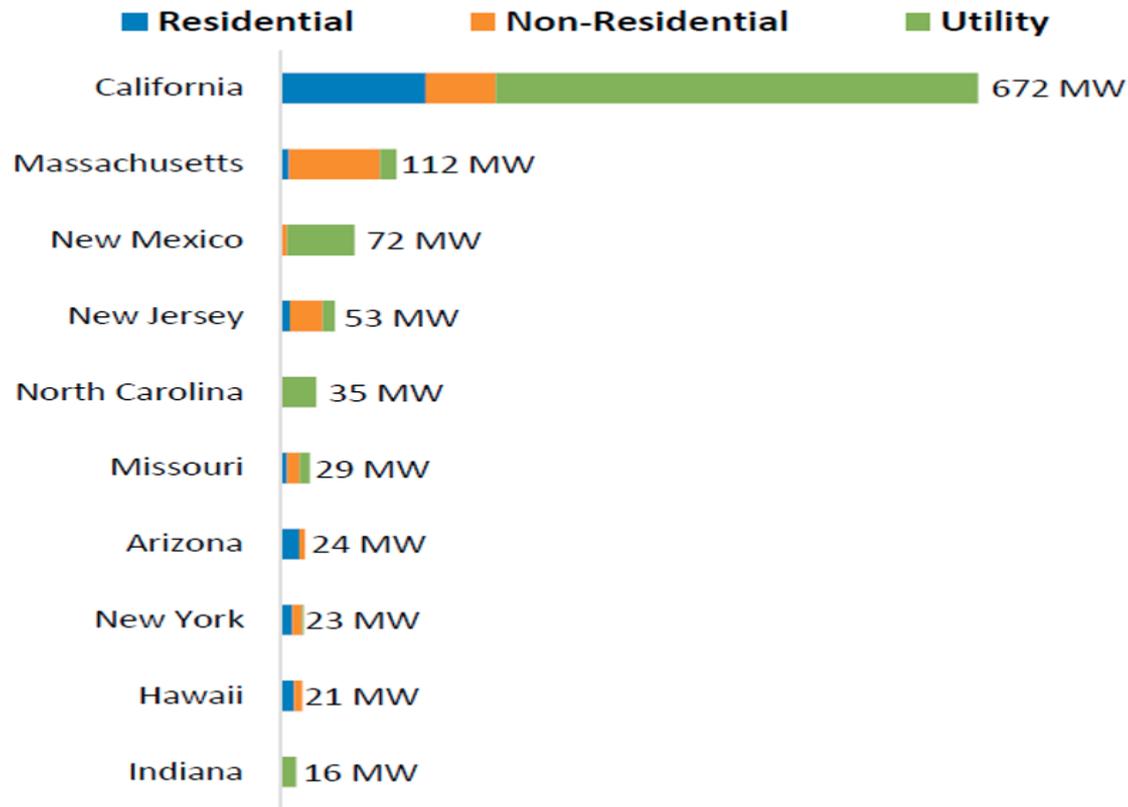


# 3RD PARTY SOLAR PPA/LEASE

- Use of PPA or lease structure:
  - Eliminates upfront capital costs
  - Allows for better utilization of tax credits
  - Establishes predictable payments

# SOME STATS RE SOLAR

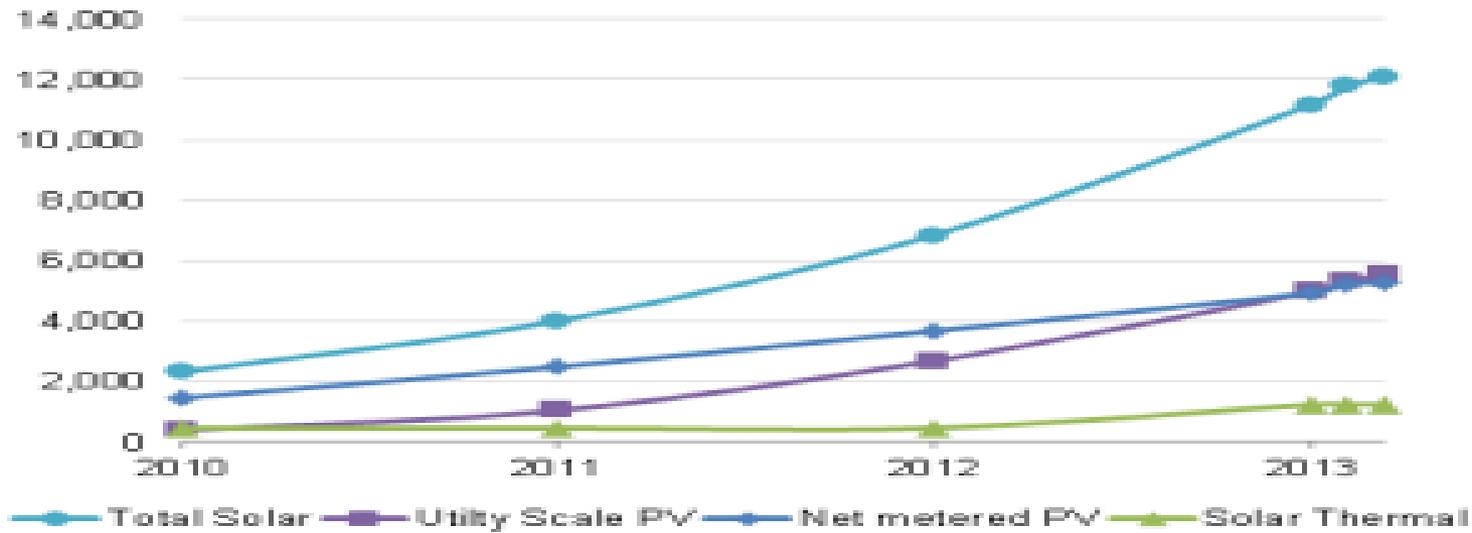
## State Rankings by Q2 2014 PV Installations



# SOME STATS RE SOLAR

U.S. Solar Capacity, 2010 - 2014

Megawatts



1.

# SOME STATS RE SOLAR

Figure 2.10 U.S. PV Installation Forecast, 2010-2016E

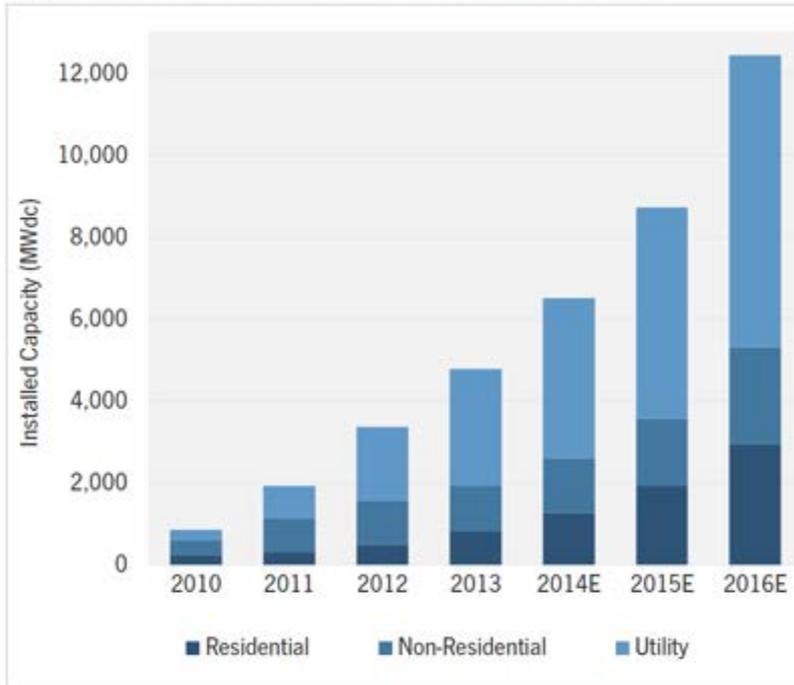
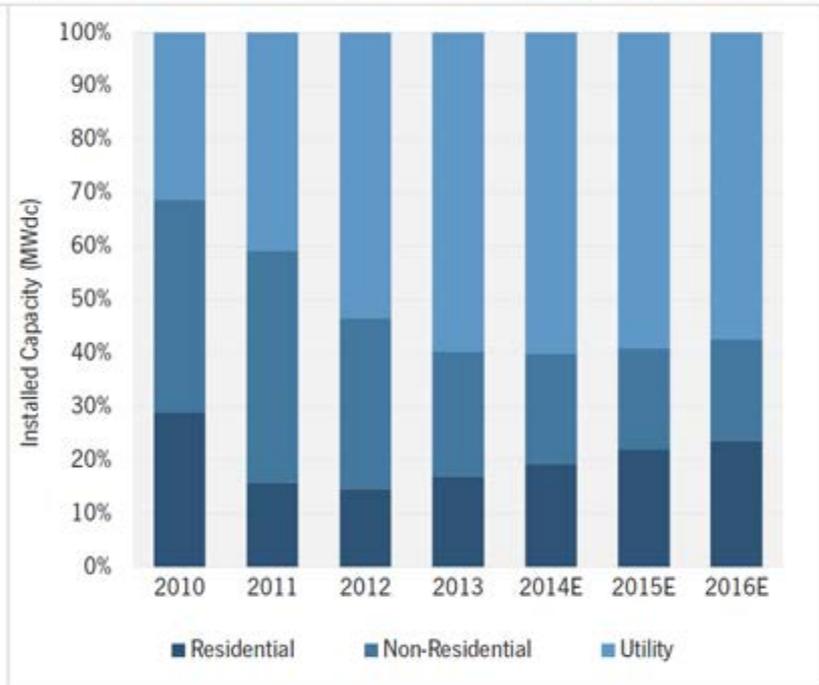
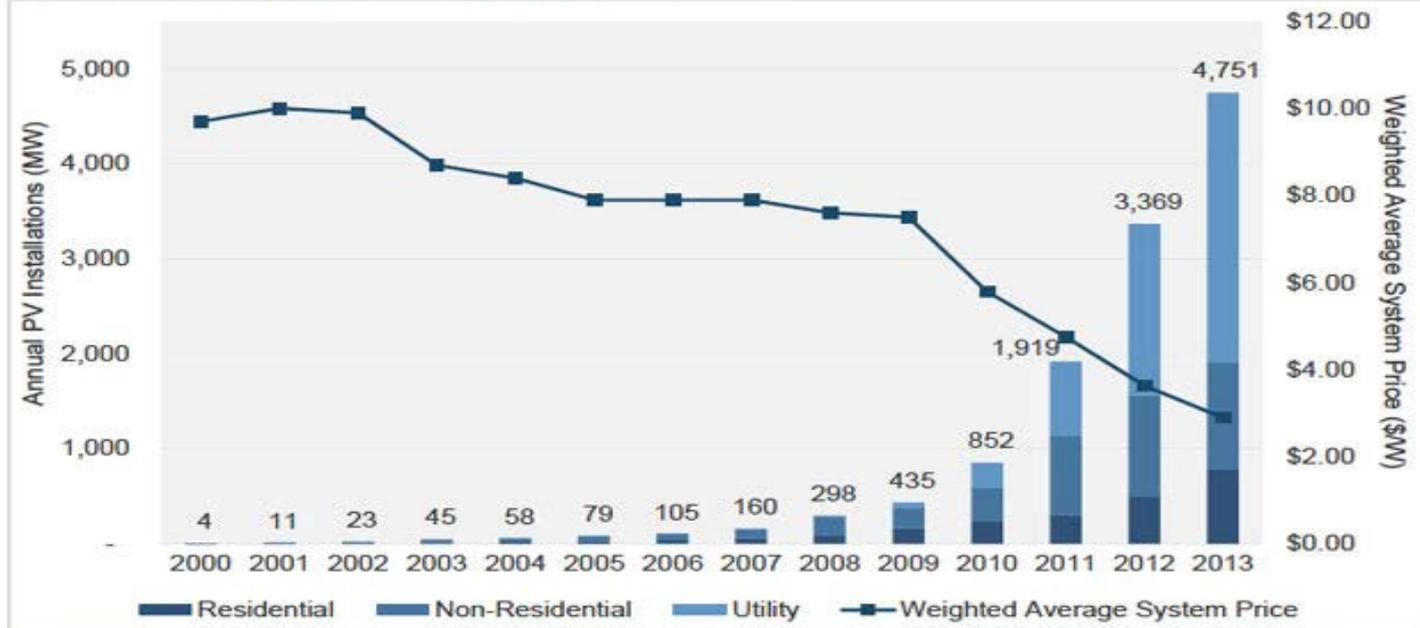


Figure 2.11 U.S. PV Installation Forecast by Segment, 2010-2016E



# SOME STATS RE SOLAR

Figure 2.1 U.S. PV Installations and Average System Price, 2000-2013



Installations (MW)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Residential	1	5	11	15	24	27	38	58	82	164	246	304	494	792
Non-Residential	2	3	9	27	32	51	67	93	200	213	339	831	1,072	1,112
Utility	0	3	2	3	2	1	0	9	16	58	267	784	1,803	2,847
<b>Total Installations</b>	<b>4</b>	<b>11</b>	<b>23</b>	<b>45</b>	<b>58</b>	<b>79</b>	<b>105</b>	<b>160</b>	<b>298</b>	<b>435</b>	<b>852</b>	<b>1,919</b>	<b>3,369</b>	<b>4,751</b>

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# SOME STATS RE SOLAR

- Nebraska is ranked [13<sup>th</sup>/9<sup>th</sup>] in the nation with the greatest energy potential from solar power
- Cumulative PV capacity – over 15 GW

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Focus on Commercial Scale and Community Solar Gardens
- Property rights/Site control
  - Secure rights to land to construct, own and operate project
    - ◆ Lease or easement agreements
    - ◆ Typically want: control of land for all necessary uses, undisturbed access, exposure to solar rays, flexibility re project modifications
    - ◆ For rooftop and small groundmount – easements
      - Secures use rights when building used or occupied by others
      - Limit developer's responsibilities for areas outside of its use

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Property Rights
  - Key elements of easements (similar lease concepts)
    - ◆ Specific term
    - ◆ Right to install system
      - Install, replace, operate, and remove
    - ◆ Specific scope – critical when share common boundaries
      - Access and use
      - Noninterference
    - ◆ Landowner invitees
    - ◆ Roof/property maintenance
    - ◆ Sunlight access
    - ◆ Sale of leased premises

# SMALL SOLAR PROJECT DEVELOPMENT

- Power Purchase Agreement
  - Focus on distributed generation
    - ◆ On site
    - ◆ Typically connect behind the meter to the site owner's system (host)
    - ◆ Often mostly tax-driven investment due to small scale and limited output (more on this later)

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Power Purchase Agreement
  - Buyer – examples
    - ◆ Building
    - ◆ Warehousing facilities
    - ◆ Schools
    - ◆ Hospitals
    - ◆ Airports

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Power Purchase Agreement
  - Site Host
    - ◆ Often the same as buyer
    - ◆ Rooftop issues
      - Structural improvements
      - Maintenance of roof
      - Wind conditions

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Power Purchase Agreement
  - Purchase and Sale of electricity
    - Typically buy all of output delivered to point of interconnection on buyer's system
    - Often priced at or near current retail rate, but many variations
    - Net metering expectations
      - May vary

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Power Purchase Agreement
  - Term
    - ◆ Varies based on return expectations
    - ◆ 15-20 years
    - ◆ Installation, commissioning and testing
    - ◆ O&M
  - Purchase Options (linked to tax considerations)
- Fewer issues with groundmount projects

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Power Purchase Agreement
  - Other customary provisions (force majeure, default, terminations, payment mechanics, metering, curtailment, RECs)
  - Challenges
    - ◆ Creditworthiness
    - ◆ Costs
    - ◆ Site Host View of Value of Solar

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Lease
  - Similar concerns as PPA
  - Can reduce regulatory risk re classification as utility

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Design Engineering Construction and Installation Agreements
  - ◆ Design and engineering
  - ◆ Equipment procurement
  - ◆ Installation
  - ◆ O&M
  - ◆ May break-up
  - ◆ May do all under one contract
  - ◆ Approach may affect financeability
  - ◆ Relationship between areas of overlap key
  - ◆ Gaps can present issues

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Design Engineering Construction and Installation Agreements
  - ◆ Elements:
    - ◆ Scope
    - ◆ Milestones
    - ◆ Progress Payments
    - ◆ Guarantee Dates
    - ◆ Performance Guarantees
    - ◆ Warranties
    - ◆ Preservation of solar incentives (ITC)
    - ◆ Contractor security
    - ◆ Liens
    - ◆ Insurance/Indemnity

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Transmission and Interconnection
  - Typically not as big of an issue for distributed generation (i.e., behind the meter)
  - Need IA for utility scale projects

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Permits and regulatory matters
  - Building permits
  - Other governmental approvals

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Tax and other incentives
  - Federal
    - ITC – placed in service before January 1, 2017
      - ◆ One time credit against income tax based on investment in facility
      - ◆ 30% of tax basis of facility
      - ◆ Drops to 10% if placed in service on January 1, 2017 or later
      - ◆ Applies to “energy property”
      - ◆ Complex set of rules
    - MACRS – Modified Accelerated Cost Recovery System: Accelerated depreciation (over 5 years)

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Tax and other incentives
  - Tax Equity Investors
    - ◆ Developers typically can't benefit directly from ITC
    - ◆ Identify tax equity investors who can
    - ◆ Various structures evolved over time
      - Tax equity flip
      - Sale leaseback
      - Inverted lease

# SMALL SOLAR PROJECT DEVELOPMENT KEY ELEMENTS

- Tax and other incentives
  - State incentives
    - ◆ Income tax credits
    - ◆ Sales tax incentives
    - ◆ Property tax incentives
    - ◆ Production Based Incentives
- RECs and REC markets

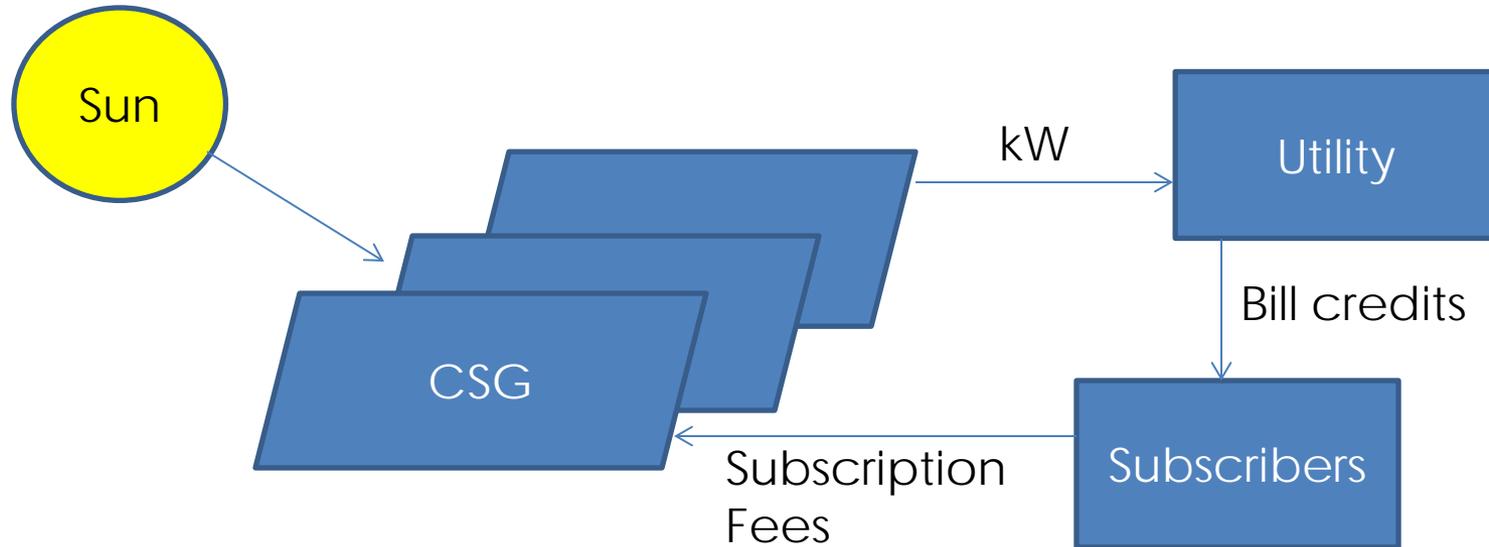
# COMMUNITY SOLAR GARDENS

- Community Solar Gardens
  - Concept
    - ◆ Utility-sponsored
    - ◆ Private/developer model
    - ◆ Non-Profit (not eligible for ITC)
  - Ownership of property (e.g., panels) vs. subscription
    - ◆ Contract with utility
    - ◆ Contract with developer
  - Net metering/billing credit
  - Securities law issues (see below)
  - Generally same financing and tax incentive issues

# COMMUNITY SOLAR GARDENS

- Public Utility-Sponsored Community Solar Programs
  - Several have such programs
    - ◆ Orlando Utilities Commission
    - ◆ OUC's Community Solar Program allows party to choose the number of solar power blocks that work best for household or business, up to 15 kW blocks, and pay a fixed rate. The amount of energy produced on solar blocks will appear on monthly bill as if had rooftop solar panels.
    - ◆ Rate for subscribers is \$0.13/kWh.

# COMMUNITY SOLAR GARDEN (MN EXAMPLE)



- Allow public participation in remote solar facility
- Owned & operated by a third party
- “Virtual net metering”—receive bill credits for share of power generated by the CSG

# COMMUNITY SOLAR GARDEN (MN EXAMPLE)

- Owner/Operator
  - A public utility; or
  - An entity that contracts to sell output of CSG to utility
- Subscribers
  - CSG must have at least 5 subscribers
  - No subscriber can have more than 40% interest in the CSG
  - Subscription must be more than 200 Watts but less than 120% average annual consumption of the subscriber when combined with subscriber's other distributed generation sources
- Size—Must be less than 1000 kW
- Location
  - Service territory of public utility filing the CSG plan
  - Subscribers must be retail customers of the public utility, located in same or contiguous county as facility

# COMMUNITY SOLAR GARDEN (MN EXAMPLE)

1. Subscription purchases/fees from subscribers
  - CSG statute and Xcel plan leave flexible
  - Must structure to comply with securities laws
2. Different rates depending on customer type (value of solar/applicable retail rate)

# COMMUNITY SOLAR GARDEN (MN EXAMPLE)

## 4. Renewable Energy Credits (RECs)

- RECs may belong to utility (different rate)
- Otherwise, RECs belong to CSG:
  - ◆ Sell to market

# CHALLENGES

- Lack of scale
- Costs
- Tax equity without scale is challenging
  - Aggregation
- Policy/ challenges (third party sales, etc.)

# POLICY ISSUES

- **THE “UTILITY” ISSUE WITH RESPECT TO THIRD PARTY SALES**
- Public utility reg./exclusive service territory
- Nebraska -- Current law essentially prohibits power suppliers from providing retail service to customers already located within a public power agency's service area.
- Minnesota -- “No person shall be deemed to be a public utility if it produces or furnishes service to less than 25 persons.”
- SZ Enterprises, LLC v. Iowa Utilities Board (Iowa 2014)
- CSGs exempt in some jurisdictions (if enabling legislation)

# POLICY ISSUES

- **SECURITIES ISSUE WITH RESPECT TO SELLING SUBSCRIPTIONS AND SIMILAR INTERESTS (CSGs)**
- Critical factor in determining whether an interest (i.e., subscription) is a security is whether the investor has a reasonable expectation of profit.
- If a community solar garden subscriber/investor is making the investment for social reasons and there is no expectation that it will profit from the investment, then the interest would not be considered a security.

# POLICY ISSUES

- **SECURITIES ISSUE WITH RESPECT TO SELLING SUBSCRIPTIONS AND SIMILAR INTERESTS (CSGs)**
- If a community solar garden subscriber is making the investment in exchange for credits on future electric bills that will allow the subscriber to recoup its investment along with additional amounts, then the subscription may begin to resemble a security in that the subscriber may have an expectation of a return on its investment
  - Limits – profit, amount of investment, limitations on transferability and remuneration
  - Exemptions from registration: Accredited investor, state exemption/manner of solicitation
  - Other state exemptions for non-accredited investors

# POLICY ISSUES

- What states can do to improve solar project economics and encourage solar project investment
  - RPS
  - PPA legislation to allow for 3<sup>rd</sup> party financing
  - Rebate and incentive programs
  - Income tax credits
  - Sales tax reduction
- Local government steps
  - Permit fees and processing
  - Building codes
  - Property tax exemptions

# POLICY ISSUES

- Nebraska is only entirely public power state in the U.S.
- Regulated by publicly elected board and city council representatives
- Neither State legislature nor Nebraska Power Review Board have mandated that the state's public power utilities include distributed generation or renewable energy in their mix
- Discretion left with public utilities re integration of solar projects

# POLICY ISSUES

- RPS
  - No. of states with ( E.g., Minnesota ([E]ach public utility shall generate or procure sufficient electricity generated by solar energy . . . so that by the end of 2020, at least 1.5 percent of the utility's total retail electrical sales to retail customers in Minnesota is generated by solar energy." )
  - At least 10% of the 1.5% goal must be from PV devices with a nameplate capacity of 20 kW or less
  - Nebraska does not currently have one

# POLICY ISSUES

- Interconnection Process – National Research Energy Laboratory:
  - NE processes and procedures currently structured for processing a limited number of distributed generation applications
- Net Metering
  - NE has net metering rules in place – set floor allowing utilities to increase size and reimbursement rate.
  - In top solar states utilities required to net meter larger solar PV systems

# POLICY ISSUES

- Solar Rights Laws
  - Many states enacted laws placing limits on ability of homeowner associations to restrict installation of solar PV projects.
  - Nebraska does not have one
- Community Solar
  - Some states with enabling legislation
  - Nebraska does not have any, but its public utilities can implement own policies.
  - LES SunShares

# NEBRASKA INCENTIVES

- Renewable Energy Tax Credit
  - Production tax credit
  - 0.0005/kWh for energy generated on or after January 1, 2013
  - Reduces producer's NE income tax liability or obtain refund of state sales
  - Limited budget (\$50,000)
- Lincoln Electric System – Renewable Generation Rate
  - Owners of system between 25kW and 100kW allowed to parallel LES and sell energy to LES at Renewable Generation Rate
  - Net metered

# NEBRASKA INCENTIVES

- Sales Tax Incentive
  - Exemption from sales and use tax imposed on gross receipts from sale, lease or rental of personal property for community-based energy development (C-BED)
  - Sales Tax Incentive refund of sales and use tax for renewable energy systems if investment over \$20,000,000
- Loans
- Others (e.g., limited net metering – credit at avoided cost rate)

# QUESTIONS?



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