



SunShot – RSC II Current State Utilities Report

Task 4: Interconnection and Net Metering Processes

January 2015

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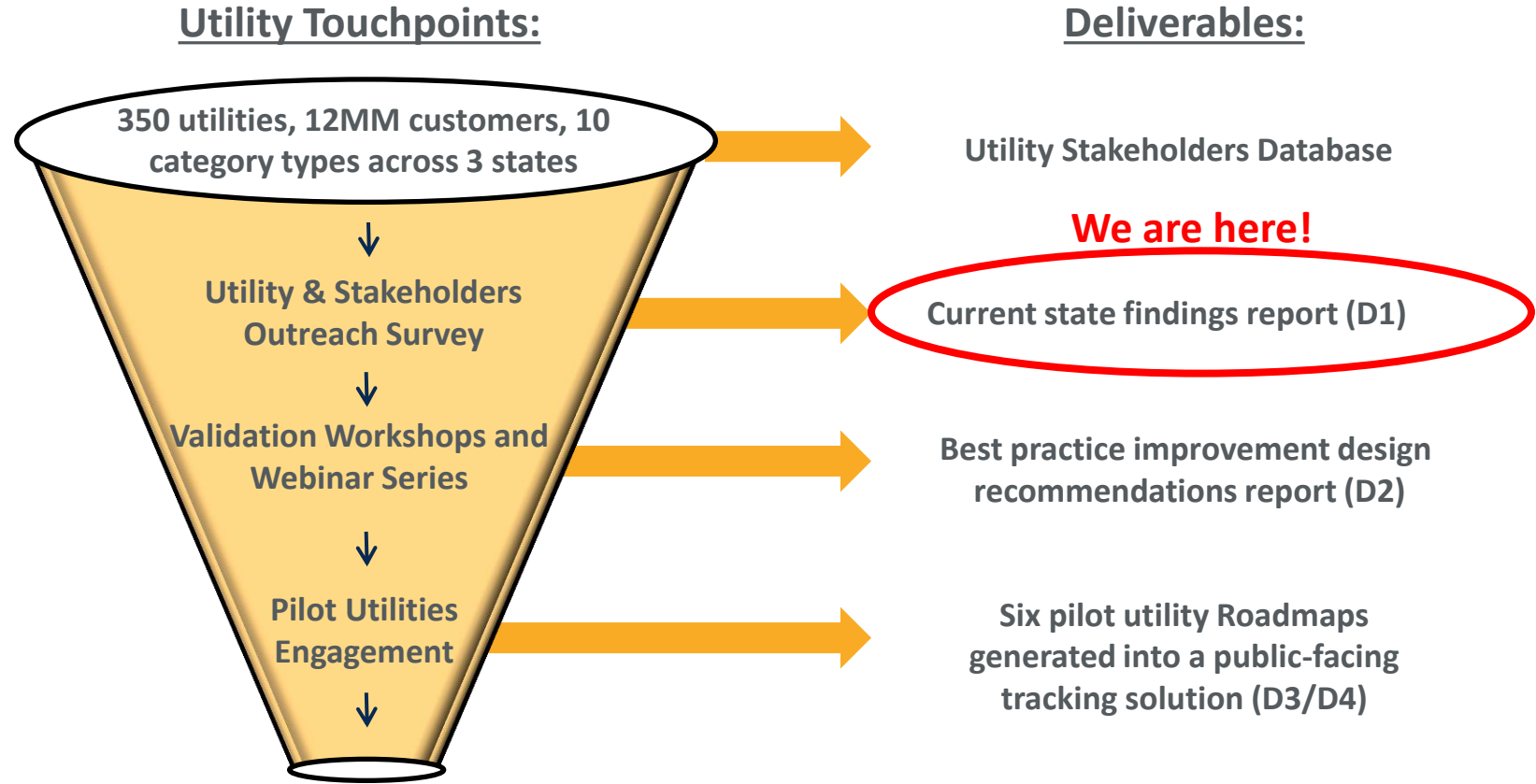
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Rooftop Solar Challenge II

Current State Findings Executive Summary Report



Task 4 Overview: Budget Period 1 Activities and Deliverables

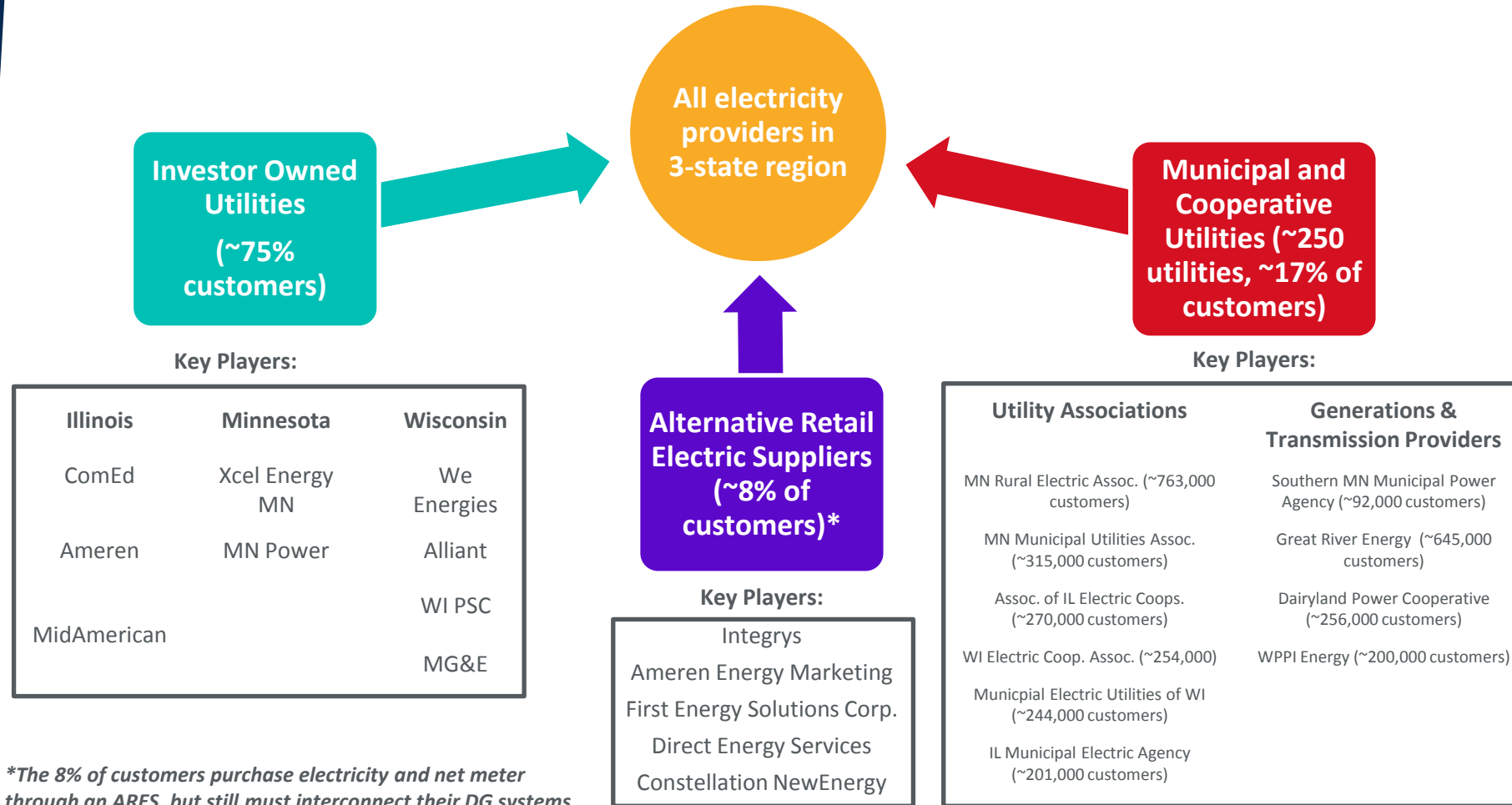


Pilot Utility Solar Adoption Roadmaps

Ownership Landscape: Approximately 9 million customers are served by electric utilities in the 3-state region, and 75% served by investor owned utilities

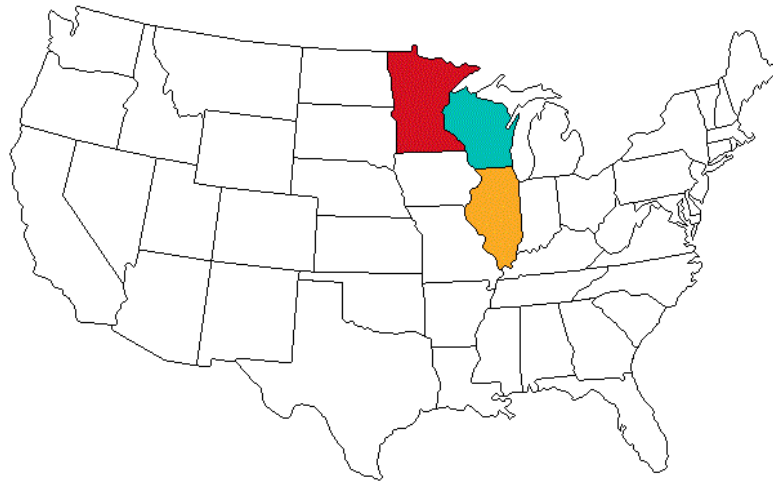
Ownership Type	Number of Customers Served (2012, EIA)	Percent of Total Served	Number of Utilities
Investor-Owned	9,042,032	75%	21 <i>(top 10 serve 97%)</i>
Cooperative	1,288,454	11%	95
Municipality	760,160	6%	199
Retail Power Marketer (ARES)	1,022,193	8%	28
Total	9 MM customers	100%	343 Utilities
Total Population (2012, USCB)	24 MM Population		

A majority of customers in the 3-state region are served by a small number of electricity providers



**The 8% of customers purchase electricity and net meter through an ARES, but still must interconnect their DG systems through the regulated IOU*

Regulatory Landscape: a Utility’s obligation to follow standard rules regarding solar enrollment processes varies by state and ownership type



Regulated utilities: subject to regulation by state legislature

Unregulated utilities: not subject to regulation by state legislature, these entities may follow individual/member-organization/regulation procedures

	<u>Regulated</u>	<u>Unregulated</u>
Illinois	<ul style="list-style-type: none">• IOUs• Alternative Retail Electric Suppliers	<ul style="list-style-type: none">• Cooperatives• Municipals
Minnesota	<ul style="list-style-type: none">• IOUs• Cooperatives• Municipals	<ul style="list-style-type: none">• None
Wisconsin	<ul style="list-style-type: none">• IOUs• Municipals	<ul style="list-style-type: none">• Cooperatives

The DOE's Interconnection Process Metrics can be scored using FERC and IREC best practices

DOE Success Metrics

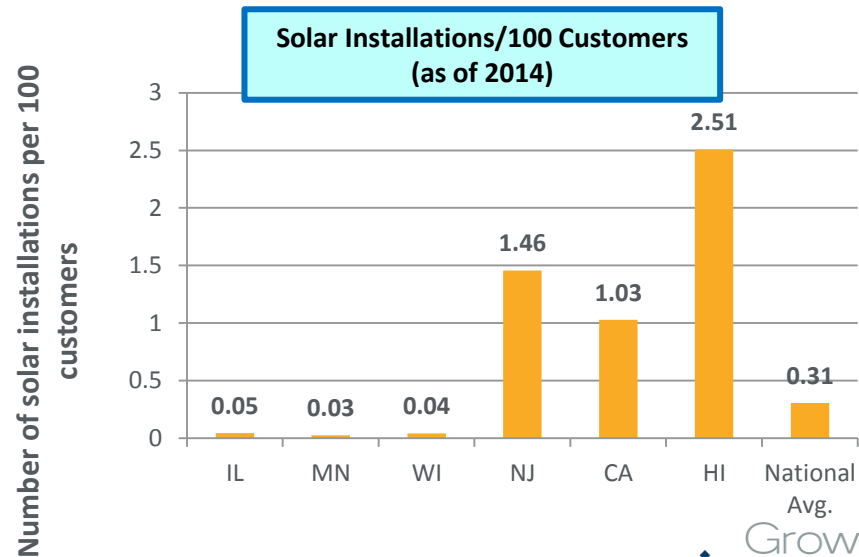
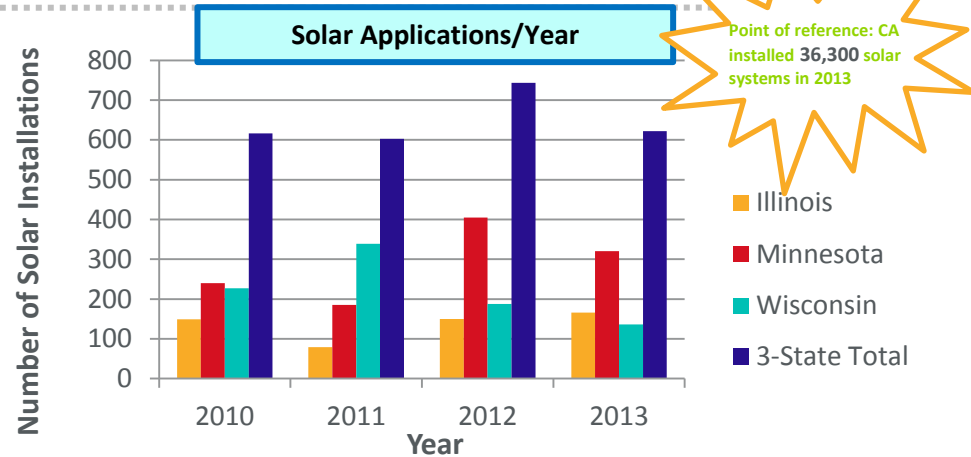
	Regulated Group Coverage	Application	Information Access	Process Time (Level 1 systems)	Inspection (Level 1 systems)
Best Practices	Percent of customer base served by regulated utility: 100%	State-level application forms (required) Online submission & tracking required Tiered technical screens/forms by size and network type	Online information / FAQs, customer information requests and sharing study results	≤3 days for Application receipt confirmation ≤10 days for technical review 10 day buffer window for incomplete applications	No additional cost to customer <10 days from customer request Standard inspection contract Coordination with City
Improved Practices	Percent of customer base served by regulated utility: 90-99%	State-level application forms (recommended) No Tiered technical screens/forms by size only	Response required for customer application requests and sharing study results	Defined, but >3 days for Application receipt confirmation Defined, but >10 days for technical review Defined, but <10 day buffer window for incomplete applications	Potential additional costs to customer (capped) Defined, but >10 days from customer request No standard inspection contract or coordination with City
Undefined Practices	Percent of customer base served by regulated utility: <90%	No state-level application forms Required: No Shared technical screens/forms for all systems	No information access rules	Time allowed for recognition of application receipt: Not specified Time allowed for application review: Not specified Time until restart occurs for incomplete applications: Not specified	Potential additional costs to customer (uncapped) No standard inspection contract, coordination with City, or time reqt

State-level scorecards show that each state currently requires some, but not most, of the best practices

State	Freeing the Grid Score (Interconnection/ Net Metering)	Regulated Group Coverage	Application	Information Access	Process Time	Inspection
Illinois	B / B	Investor owned, alternative retail electric suppliers Percent of customer base served by regulated utility: 93%	Standard application forms developed: Yes No online submission / tracking reqt Tiered Screens: Yes; 4 tiers based on system size, network connection, and component certification	Required Provided Information: The electric distribution company shall provide the applicant copies of any studies performed in analyzing the applicant's interconnection request upon applicant request	Time allowed for recognition of application receipt: 7 days Time allowed for application review: 15 days Time until restart occurs for incomplete applications: 10 days	Maximum cost: not specified Maximum time: not specified Standard contract provided: yes
Minnesota	C / B	Investor owned, cooperative, municipal Percent of customer base served by regulated utility: 100%	Standard application forms developed: Yes Required: No Tiered Screens: No	Required Provided Information: Each utility must publish statement of rates, terms, and conditions of interconnections; a statement of technical requirements; a sample contract containing the applicable terms and conditions; pertinent rate schedules; and the contact information of the person to which inquiries should be directed upon request	Time allowed for recognition of application receipt: 10 days Time allowed for application review: 15 days Time until restart occurs for incomplete applications: none	Maximum cost: \$0 Maximum time: 20 days Standard contract provided: yes
Wisconsin	D / D	Investor owned, municipal Percent of customer base served by regulated utility: 91%	Standard application forms developed: Yes No online submission / tracking reqt Tiered Screens: Yes, 4 tiers based on system size	Required Provided Information: None	Time allowed for recognition of application receipt: 10 days Time allowed application review: 10 days Time until restart occurs for incomplete applications: none	Maximum cost: \$0 Maximum time: <ul style="list-style-type: none"> • Engineering review (to be completed within 10 working days of agreement to proceed) • Distribution system study (to be completed within 10 working days of agreement to proceed) • Required distribution system upgrades (to be completed within time frame mutually agreed upon) Standard contract provided: yes

In recent years, utilities in the 3-state region have annually interconnected between 600 and 750 systems

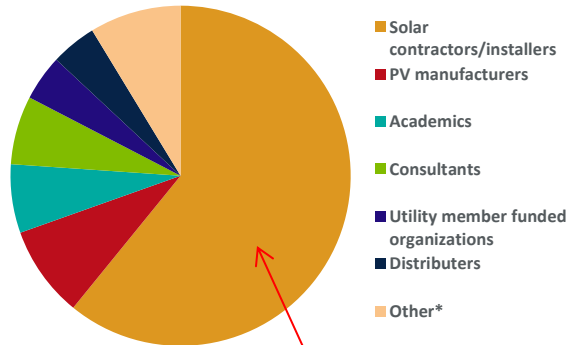
- ◆ No existing public record of number of solar systems installed annually for Midwest states
- ◆ Data collection methodology varied between states
 - Minnesota: MN Department of Commerce, Division of Energy Resource
 - Illinois: Illinois Department of Commerce & Economic Activity, Solar and Wind Energy Rebate Program
 - Wisconsin: Focus on Energy solar rebate applications
- ◆ The estimated cumulative number of solar installations per 100 customers in the 3-state region was **far below** that of the **national average** as of 2014



Online Surveys were circulated to utility contacts and additional distributed generation stakeholders to harvest information about current solar enrollment processes

Stakeholder Survey

- ◆ Almost 50 contractors have participated in the stakeholder survey to-date and report working with 8 of the 10 largest investor owned utilities in the region
- ◆ **Surveyed groups included:**
 - Solar Minnesota, MnSEIA
 - WI SEIA
 - ISEA
 - Clean Energy Project Builders (through CERTS)
 - MREA solar contractors
 - IGEN contractors



*Other: government employee, solar advocacy group employee, PV solar owner, solar developer

60% of respondents were Contractors with direct utility application experience

Utility Survey

- ◆ **21 utilities have participated in the survey to-date and serve approximately 51% of total customer base**
 - Regulated: 20 participants
 - Unregulated: 1 participant

State	IOUs	Muni's /Coops
WI	3	13
MN	2	2
IL	1	0

Stakeholder Survey themes were broken down by application, information access, processing time, and inspections



Application: *standardized* and *automated* applications can save customers, contractors, and utilities time and energy



Information Access: customers would like to see *transparency* in application requirements and *tracking* throughout the process



Processing Time: Timely application processing depends on established *utility review* and *customer response* expectations



Inspections: having *defined procedures* (forms, cost, time) and *City coordination* allows customers to efficiently complete their system go-live



Application: *standardized* and *automated* applications can save customers, contractors, and utilities time and energy

Pain Point

Observed Best Practice

"An online automated system should be truly automated. An applicant should not have to 'babysit' an application."

Paper forms or semi-electronic applications



Adoption of online tools endorsed by customers and installers

"ComEd is good example [of a utility with improved interconnection processes] in the Midwest."

"___ has a lot of good info on their website - but they just link to the PSC. For an installer, that might be ok. For a homeowner it seems confusing."

Unclear interconnection policies and application instructions



Adoption of standardized forms and having someone and dedicated to answering customer questions

"Bayfield Electric cooperative has improved its customer interface to solar relations. The liaison is active and positive about embracing solar systems"

"Utilities requiring engineering review should only do so on projects greater than 10kW."

Unnecessarily complicated applications for small systems



Creation of simplified, 1-2 page applications for small systems

"MN Power [has] a 2 page form and is approved very quickly."



Information Access: customers would like to see *transparency* in application requirements and *tracking* throughout the process

Pain Point

Observed Best Practice

"Some utilities don't even have an interconnection application available unless you specifically request it."

Lack of transparency in how to access and submit applications



Providing online application materials

"If the rural cooperatives had an online interconnection application that could be downloaded along with instructions that would be helpful."

"My engineering fee can take anywhere from one day to a week or more to be acknowledged. Engineering review can take a week to a month. Signing of the interconnection from the Utility can take 24 hours to a week."

No visibility into where application is in approvals process



Creation of online tracking system or more frequent communication between utility liaison and applicant

"Multiple states have a program Power Clerk that streamlines the process and allows you to check the status of your application. No wondering if something was received."

"Utility engineers sometimes arbitrarily require transformer and other upgrades that are not necessary and won't explain why. This...costs between \$5000 and \$10,000"

Unexplained required system testing and costs



Required documentation of when and why additional tests/costs are incurred

"The review process [for systems less than 10kW] should be less than 7 days or no review, just automatically approved for interconnection."



Processing Time: Timely application processing depends on established *utility review* and *customer response* expectations

Pain Point

Observed Best Practice

“Eliminate the need for so much applicant participation. I hate having to log on daily to make sure my applications are progressing or approved. Eliminate the uneven amount of time processes take.”

Inconsistencies in application approval timings (even among regulated utilities)



Standardizing the time for individual portions of the overall application review

“I like working with Connexus. Very straight-forward. Communicated well through email and phone calls.”

“On many jobs, our costs double because we are not allowed to deal directly with engineering. They expect us to make submittal after submittal until it matches their approval. Sometimes they are wrong and we need to start all over again.”

Lengthy application reviews resulting from multiple returns of an application for being incomplete



Providing clear, user-friendly instructions and identifying a utility contacts to answer questions

“The more applications the slower the process. A large percentage of applications are for less than 10kW, so utilities could eliminate the review process for such systems and save time and money for everyone.”

“Capacity for application processing is not keeping pace with the number of applications.”

Slow review times due to limited staff



Creating streamlined review processes for small systems



Inspections: having *defined procedures* (forms, cost, time) and *City coordination* allows customers to efficiently complete their system go-live

Pain Point

Observed Best Practice

"The installers must be able to interact with engineering! If there are conditions that are attached to an interconnection approval, make sure that they are presented along with the approval."

A lack of communication exists between solar installers and utility engineers



Providing interface for communications or providing standardized checklist to both parties

"Having a standard application form and a standard checklist for inspections would greatly improve the [solar enrollment] process."

"For _____, 3 utility representatives usually come to the commissioning (meter tech, interconnection engineer and application coordinator)."

Unnecessary precautions required for small systems



Creating less stringent inspection requirements based on system size

"Other utilities do not require as many man hours and will come and swap out the meter without any interconnection verification, requirement/request of the homeowner or installer to be present, and paperwork can be signed at some point by the owner prior to the meter being swapped out."

"Eliminate redundancy, in MN we have just about everyone, state, city and utility and inspectors all wanting paperwork and info about the system, so paperwork time and costs are about 40 hours + per system installed."

Redundancies exist in paperwork required by utilities, cities/municipalities, and states (for federal grant applications)



Creation of integrated application for different entities or a scheduling tool to better coordinate site visits

"If we could have city inspection and commissioning be scheduled on same day - that'd be amazing."

Utilities are anticipating administrative, technical, and legislative challenges when responding to increased solar applications and grid installations



Administrative Challenges: processing increased numbers of solar applications may cause a *burden to utility staff*



Technical Challenges: more grid interconnections is a concern for ensuring *safe* and *reliable* grid operations



Legislative Challenges: many utilities are facing new legislative mandates related to distributed generation requiring them to set up *additional programs* and *track regulatory compliance*

Specific utility concerns include developing online tools for customers, adjusting billing software, and responding to grid operation impacts



Administrative Challenges

- Having staff in adequate number to process applications in a timely manner
 - **67%** of respondents reported that they expect the **administrative burden** on staff to review applications to be a **high or medium concern** for their company in coming years
- Developing **online tools** to efficiently manage applications
 - Only 38% of utility survey respondents make applications available online and **10% have an online submission processes in place**



Technical Challenges

- Technical evaluation of the system/grid conditions
- Responding to grid operation impacts of distributed generation (power flows, load forecasts, etc.)
- Ensuring **safe operation** of installed systems
- Adjusting **billing software**/meter reading system to handle net metering issues



Legislative Challenges

- Responding to **legislative carve out** requirements
- Creating **shared solar** programs (legislative or voluntary)
- Creating appropriate applications and paying structures for self-regulated utilities
- Regulatory reporting on application timeframes and approvals

Looking ahead, The Grow Solar Partnership will focus on three trends influencing Utility solar enrollment processes

Trend # 1: Increased Distributed Solar Applications

- Customers driven to install PV by decreases in cost of PV and greater interest in environmental matters
- 80% of large IOU respondents are anticipating increased solar applications in the next 3 years
- State-level rebate and performance-based incentive program adoption

Trend #2: Increased Distributed Solar Grid Penetration

- Legislative mandate: Minnesota's 2013 legislation requires 1.5% of electricity be generated by solar by 2020
- Legislative mandate: 6% of annual generation must be supplied by solar PV in Illinois in year 2015-2016 and thereafter (1.5% of total sales in compliance year 2025-2026)

Trend #3: Direct Utility Participation in Solar Projects

- Minnesota: Xcel's Community Solar Gardens ([Article 10, Section 2](#))
- Minnesota: Made in Minnesota (MiM) performance based incentives
- Illinois: possible community solar carve out in Supplemental Photovoltaic Procurement Plan
- Cross-Collaboration with multiple DOE-funded Solar Market Pathways grants

Next Steps, Q3 (Feb-15 thru Apr-2015) Activities

- ◆ Deliverable #1 (Current State Findings) completed, presented, and published
- ◆ Complete regional sub-meeting workshop series to address local challenges
- ◆ Conduct validation webinar with unregulated utility stakeholders to define current landscape, challenges, and opportunities regarding to interconnection & net metering processes