

Solar in the Midwest

Utility Opportunities to Effect Positive Customer Experience
Modelling Interconnection Process Frameworks

May 28, 2015

BUSINESS
CONSULTANTS

DEEP
TECHNOLOGISTS



Agenda

- ◆ An overview of the Grow Solar Partnership's Published Report: [Current State Findings of Solar Enrollment Processes at Midwest Utilities](#)
- ◆ How updated utility processes can lead to positive customer experiences
- ◆ Solar enrollment processes & supporting technologies
- ◆ A preview upcoming challenges and opportunities in distributed energy like community solar

Speakers



Tom Kerestes is a member of the Energy & Utilities Practice of West Monroe. With nearly 40 years of electric and gas utility experience, including 15 years in the water and wastewater utility industry, Tom executes and advances strategies that drive advantages to Clients through innovative transformation.



Dean Moretton is a consultant with 27 years of experience in designing and implementing a broad spectrum of technology and business processes for energy clients. His expertise includes analyzing, designing & procuring community solar solutions, securing grants and incentives for such projects, and project management.



Emily McGavisk is a Consultant in the Energy & Utilities practice at West Monroe Partners. She began her career in August of 2014 after receiving her Master's degree in Civil and Environmental Engineering from Carnegie Mellon University.



Sean Murphy is an experienced business builder with a proven track record in strategic planning, product management, and innovation. He has more than 20 years experience in companies including Motorola, NEC, Nokia and Microsoft.



An Overview of the Grow Solar Partnership's Published Report

- ◆ Current State Findings of Solar Enrollment Processes at Midwest Utilities

Question: What do you feel is the biggest process challenge related to rooftop solar deployment?

- A. Permit process
- B. Interconnection application
- C. Transparency
- D. Inspections

The Grow Solar Partnership works to reduce the barriers to solar generation across the Midwest

- ◆ Funded through DOE SunShot Initiative’s Rooftop Solar Challenge (Phase II) grant, the Grow Solar Partnership is a network of regional partners working to leverage private, local, and state support to reduce barriers to rooftop solar across the 3-state region of Illinois, Minnesota, and Wisconsin.

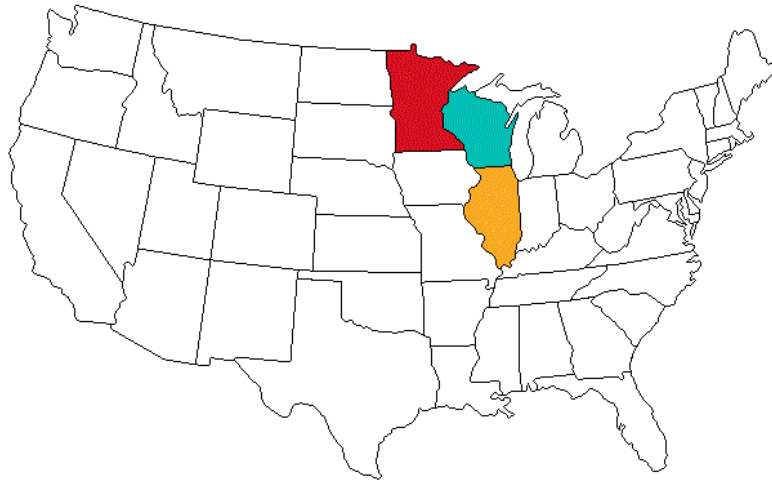
- ◆ The Grow Solar Partnership is a combination of three SunShot Rooftop Solar Challenge Phase I recipients.
 - **Core Partners:** Midwest Renewable Energy Association, West Monroe Partners, Environmental Law and Policy Center, Great Plains Institute, City of Milwaukee, Clean Energy Resource Teams, Illinois Green Economy Network
 - **State Energy Offices:** Illinois Department of Commerce and Economic Opportunity, Minnesota State Energy Office, Wisconsin State Energy Office

- ◆ West Monroe Partners is leading the Utility Interconnection Process workstream:
 - Complete:
 - Current State Findings Report, which highlighted current utility- and stakeholder-identified pain points and best practices across four major target areas: application, information access, processing time, and inspections
 - Next Steps:
 - Developing Interconnection/Net metering process improvements design and implementation paths with regional utility stakeholder groups to feed Best Practices Report
 - Providing technical assistance in creating pilot utility multi-year Solar Adoption Roadmaps with technology / process improvements for six utilities

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 73%)</i>
Cooperative	1,288,454	11%	95
Municipality	760,160	6%	199
Retail Power Marketer (ARES)	1,022,193	8%	28
Total	9 Million Customers	100%	343 Utilities
Total Population (2012, USCB)	24 Million Population		

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



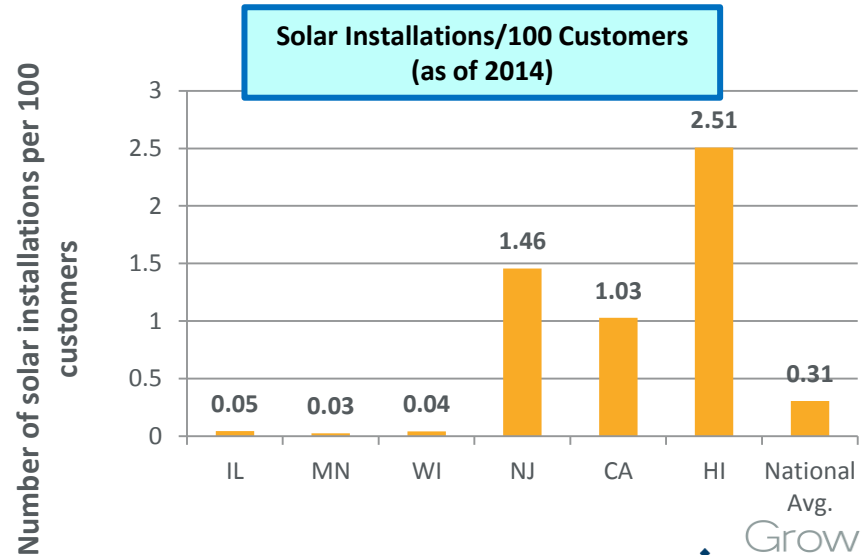
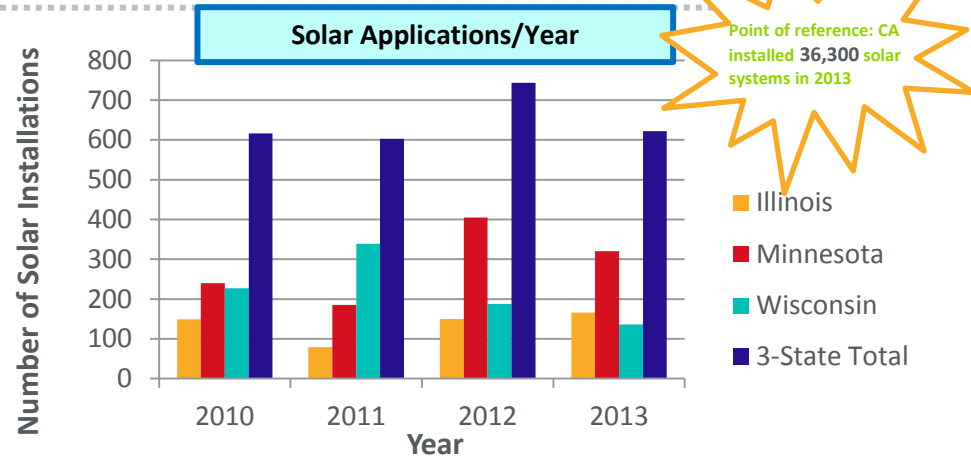
Regulated utilities: subject to regulation by state legislature

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

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

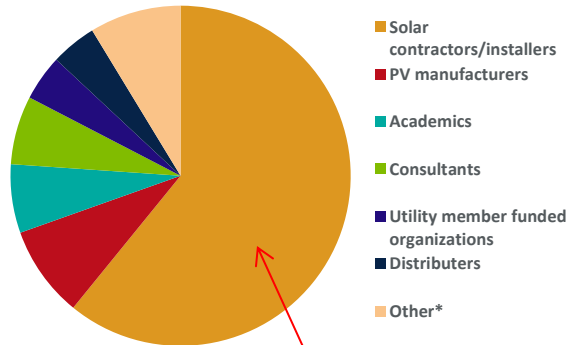
- ◆ No existing public record of number of solar systems installed annually for Midwest states
- ◆ Data collection methodology varied between states
 - Minnesota: MN Department of Commerce, Division of Energy Resource
 - Illinois: Illinois Department of Commerce & Economic Activity, Solar and Wind Energy 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

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

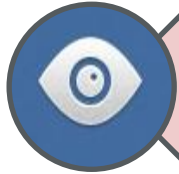
State	IOUs	Muni's /Coops
WI	3	13
MN	2	2
IL	1	0

60% of respondents were Contractors with direct utility application experience

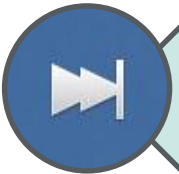
Stakeholder Survey themes were broken down by application, information access, processing time, and inspections



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

Feedback was aggregated to identify widespread pain points and observed best practices

	Pain Points	Best Practice
Application	<ul style="list-style-type: none"> Paper forms or semi-electronic applications Unclear interconnection policies and application instructions Unnecessarily complicated applications for small systems 	<ul style="list-style-type: none"> Adoption of online tools endorsed by customers and installers Adoption of standardized forms and having someone and dedicated to answering customer questions Creation of simplified, 1-2 page applications for small systems
Information Access	<ul style="list-style-type: none"> Lack of transparency in how to access and submit applications No visibility into where application is in approvals process Unexplained required system testing and costs 	<ul style="list-style-type: none"> Providing online application materials Adoption of standardized forms and having someone and dedicated to answering customer questions Required documentation of when and why additional tests/costs are incurred
Processing Time	<ul style="list-style-type: none"> Inconsistencies in application approval timings (even among regulated utilities) Lengthy application reviews resulting from multiple returns of an application for being incomplete Slow review times due to limited staff 	<ul style="list-style-type: none"> Standardizing the time for individual portions of the overall application review Providing clear, user-friendly instructions and identifying a utility contacts to answer questions Creating streamlined review processes for small systems
Inspections	<ul style="list-style-type: none"> A lack of communication exists between solar installers and utility engineers Unnecessary precautions required for small systems Redundancies exist in paperwork required by utilities, cities/ municipalities, and states (for federal grant applications) 	<ul style="list-style-type: none"> Providing interface for communications or providing standardized checklist to both parties Creating less stringent inspection requirements based on system size Creation of integrated application for different entities or a scheduling tool to better coordinate site visits



How updated utility processes can lead to positive customer experiences

Question: What new opportunities for customer engagement do you see that solar interconnection represents?

- A. Very little at this point. The opportunity is still too new.
- B. Improvement of customer satisfaction via improving the interconnection process flow
- C. A chance to cross-sell other services (e.g. energy efficiency)
- D. Analytics-based new services to help customers manage their solar investment

Disruptive technology always brings both challenges and opportunities. Utilities need to do their best to ensure DG is leveraged as a positive opportunity.



Major shifts offer both challenges and opportunities



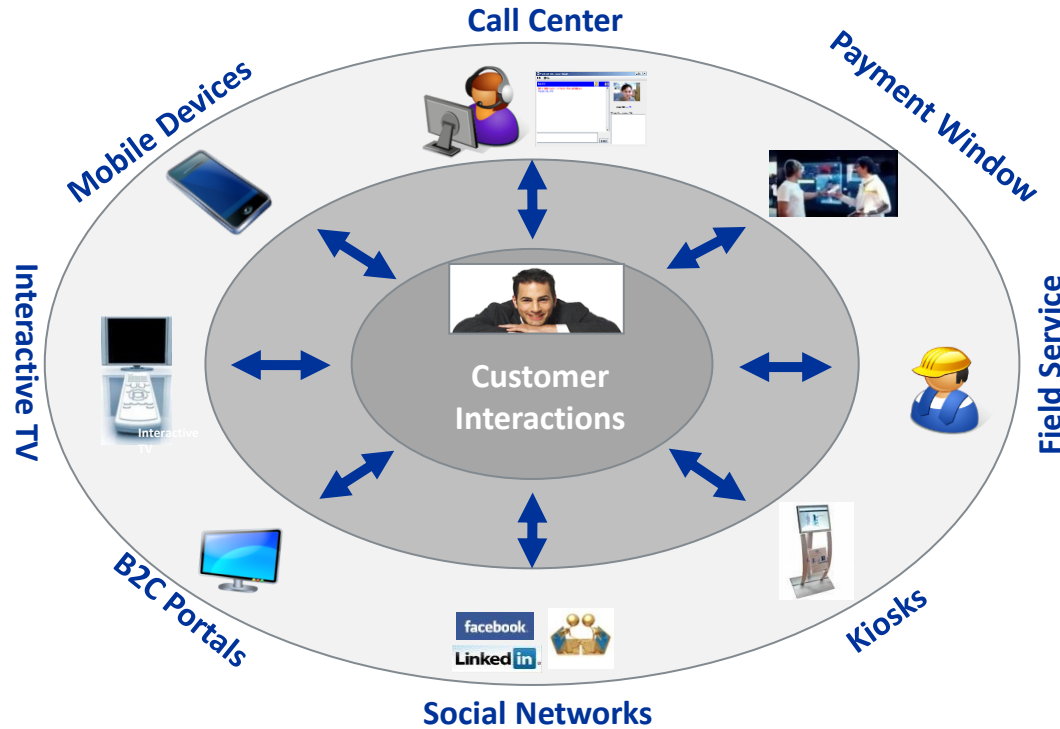
Customer expectations have changed dramatically



DG applications can be about more than reliability

As customer-enabled technologies, social media and cloud solutions change the game, customers needs continue to evolve and utilities need to adapt

Consumers are changing how they interact with companies they do business with due to the explosion of smart devices and communication channels available to them



As a result, companies are questioning where and how customers prefer to **transact, relate** and **experience** their communications with them

Differentiated Service
How do I balance cost effectiveness with customer preference and experience?

Channel Optimization
How do I provide channel choice but also influence channel selection to minimize cost to serve?

Seamless Experience
How do we design and realize a seamless and integrated cross-channel customer experience?

Utilities have multiple areas to leverage these fundamental shifts in customer engagement



How do you engage customers to improve Customer Engagement & Satisfaction



Enhance Customer Experience

Segment your customers

Connect the multi-channel experience

Setup a program to measure and act

Build CX capabilities and architecture



Optimize Channels

Channel Strategy

Brand Laddering

Marketing Program Design & Execution

E-Commerce and Digital Portals



Reduce Cost to Serve

Optimize customer service model

Use self service appropriately

Use each touch-point to drive value

Focus on first time call resolution



Enable 1:1 Marketing

Reshape your marketing mix

Personalize offers and relationships

Capture data and unlock insight

Build an efficient technology platform

Like “making sausage”, many activities take place within the utility during the application and approval process that customers won’t want to see in detail

- ◆ Separate internal and external focused items
- ◆ Be transparent on external items
- ◆ Remember most customers don’t speak ‘utilitize’
- ◆ Contractors communicate to your customers
- ◆ Be proactive
- ◆ Implement a scalable process
- ◆ Prepare now for inevitable DG boom



Once the installation is complete, the utility still has the opportunity to be “more than another monthly bill”

- ◆ Highlight and promote customer benefits
- ◆ Leverage interval data to offer proactive analysis and diagnostics
 - Shows the utility is “trying to help”
 - Can also lead to word of mouth awareness on both the value of DG and the customer’s experience with the utility
- ◆ “Close the Loop” and actively seek input and feedback from your customers.

These are opportunities to stay engaged with the customer while providing information they find valuable.



Solar enrollment processes and supporting technologies

Question: What is the current solar interconnection application process approach?

- A. Paper and telephone
- B. Paper and email
- C. Online form and email
- D. Online form and account status

Residential Solar Purchase Lifecycle



Before your customers contact you for interconnection and net metering applications, they have already made significant decisions.

Have I gotten a home energy audit and considered efficiency improvements?

Do I have suitable roof space or space on my property for a solar PV system?

Is it a good long term investment that matches my personal or family's financial goals?

What financing option is best for me?

Who should I select as my installer?

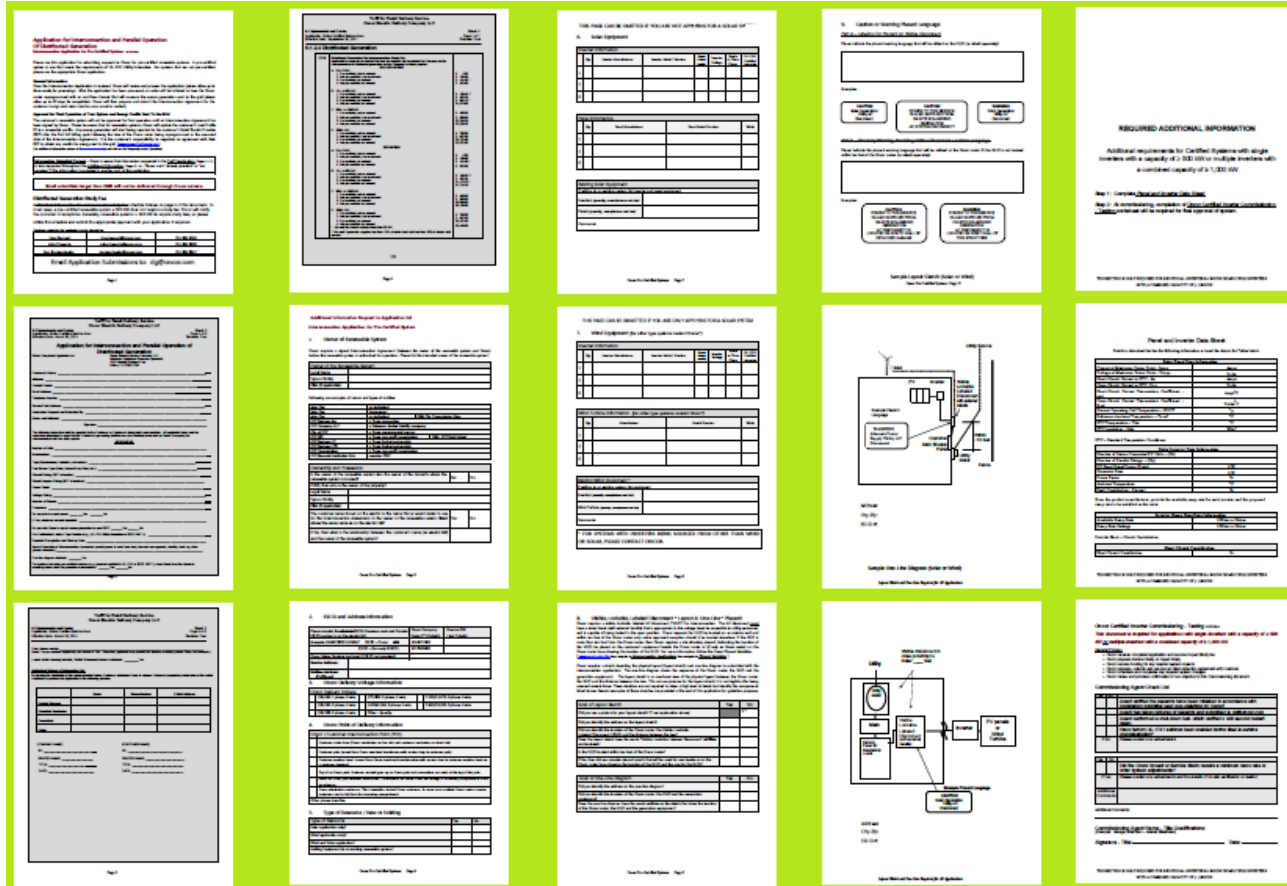
Installing residential solar is a significant investment decision for your customers. They will have already invested significant time and effort before contacting their utility.

The enrollment and approval along with related activities should be easy, timely, and transparent.



- ◆ Enrollment is often the first interaction the customer has with the utility
- ◆ Visibility into the process and progress is key
- ◆ Establish KPIs can give a measure of the effectiveness of your process:
- ◆ Most customers enrolling are technology savvy, so having a process that meets their expectations may include things such as:
 - Web-Based Enrollment
 - On-Line Payment (of application fee)
 - Ability to trace progress of application on-line
 - Time to complete initial screen
 - Time to move through application to approval

The current “customer experience” for many utility customers with a typical “paper” (or PDF) type of application process.



Paper processes don't scale as application volumes increase

The enrollment process can have the “look and feel” typical of online applications providing a feeling of familiarity (an ease of use) to the customer...

WESTMONROE
POWERED BY ConnectTheGrid

How It Works Contact Login

Register for an Account

Use your account to submit interconnection applications and send correspondence to the utility

STOCK PHOTO: GUY WIREIMAGE, NOT FOR COMMERCIAL USE

First Name

Last Name

Email

Password

Confirm Password

I am a Customer

I am a Contractor

If you install systems on behalf of others, use your own name. You will have a chance to enter your customer's information later.

Your email will serve as your unique username.

Your password must be at least 8 characters, have a number, letter and special character.

If you install systems on behalf of others or are an employee of a company that does so, please sign up as a contractor. This will allow you to manage multiple customers' applications in one dashboard.

WESTMONROE POWERED BY ConnectTheGrid

Applications Notifications

John Smith CUSTOMER

10625 Maine Drive, Crown Point, IN 46307

Level 1: Interconnection Application

Last Update: Aug 15, 2015 LIVENED

Activity

Date	Activity	Status
Aug 4, 2014	Application Submitted	John Smith
Aug 12, 2014	More Information Required	Completed
Aug 13, 2014	Re-Submitted	John Smith
Sep 6, 2014	Approved	Completed

Customer Information

Full Name	John Smith		
Mailing Address	10625 Maine Drive		
City	Crown Point	State	Indiana
Zip Code	46307		
Phone (Daytime)	1 (219) 123-4560	Fax	1 (219) 123-4562
Phone (Evening)	1 (219) 123-4561	Email	john.smith@gmail.com

Contractor Information

Full Name	Jeff Smith		
Mailing Address	404 W. State St. Suite 1400		
City	Chicago	State	Illinois
Zip Code	60606		
Phone (Daytime)	1 (312) 123-4560	Fax	1 (312) 123-4562
Phone (Evening)	1 (312) 123-4561	Email	jeff.smith.contractor@gmail.com

All information and related correspondences can be captured in a single database that customers and the utility can access at any time.

The screenshot shows the 'My Applications' dashboard for a contractor named Jeff Smith. The dashboard lists several applications with their status and dates. A notification pop-up is visible at the top right.

Address	Application Type	Status	Interconnection Level I Date	Interconnection Level II Date	Net Metering Date
10625 Maine Drive, Crown Point, IN 46307	Solar Photovoltaic	LIVENED	Aug 20, 2013	Sep 3, 2013	Sep 3, 2013
398 Golden Oak Court, Crown Point, IN 46307	Wind Turbine	PENDING	Nov 14, 2014	Nov 15, 2014	Nov 15, 2014
5725 Miller Avenue, Gary, IN 46403	Solar Photovoltaic	LIVENED	Aug 20, 2013	Sep 3, 2013	Sep 3, 2013
9750 Indiana Parkway, Munster, IN 46321	Solar Photovoltaic	PENDING	Aug 20, 2013		

Footer: MENU | My Applications, Account Settings, Frequently Asked Questions | SITE MAP | Home, About ConnectTheGrid, Contact Us | ConnectTheGrid | Copyright 2015, West Monroe Partners, LLC. All Rights Reserved.



The screenshot shows the 'Correspondence' view for a customer named John Smith. It displays two messages related to the application at 10625 Maine Drive, Crown Point, IN 46307. The first message is from John Smith to WMP Utility, and the second is a response from WMP Utility.

Subject: My Application
Sent By: John Smith
September 4, 2014

Hello,
Just checking in on the status of my application.
Thanks,
John

Subject: Re: My Application
Sent By: WMP Utility
September 8, 2014

Hi John,
Your application is still in Technical Review by our engineers. When they give me the final approval, you will get an automated response from the system saying you've been approved.
Let me know if I can assist further.
Best,
Sally Solac, Interconnection Coordinator, WMP Utility

Footer: MENU | My Applications, Account Settings, Frequently Asked Questions | SITE MAP | Home, About ConnectTheGrid, Contact Us | ConnectTheGrid | Copyright 2015, West Monroe Partners, LLC. All Rights Reserved.

From the utility perspective, application can be handled via dashboards, improving communication and cycle times, while reducing soft costs.

My Queue
Requires Attention 5 of 19

Filter: All | Export | New Application

System	Queue #	Assigned To	Last Updated	Days Remaining	Status
222 W. Adams St. Chicago, IL 60626 Interconnection Level I	1200382	Tom Hulsebosch	Aug 20, 2013	7	SUBMITTED
300 S. Wacker, Chicago, IL, 60606 Interconnection Level II	1200939	Chris Miller	Sep 3, 2013	-	APPROVED
175 W. Jackson, Chicago, IL 60606 Net Metering	1200484	Me	Sep 1, 2013	10	TECHNICAL REVIEW
222 W. Adams St. Chicago, IL 60626 Interconnection Level I	1200848	Tom Hulsebosch	Aug 20, 2013	8	SUBMITTED
300 S. Wacker, Chicago, IL, 60606 Interconnection Level II	1200739	Me	Sep 3, 2013	-	APPROVED
175 W. Jackson, Chicago, IL 60606 Net Metering	1200039	Me	Sep 1, 2013	-	APPROVED
222 W. Adams St. Chicago, IL 60626 Interconnection Level I	1200100	Letteer Lewis	Aug 20, 2013	-	INFO REQUIRED
300 S. Wacker, Chicago, IL, 60606 Interconnection Level II	1200998	Chris Miller	Sep 3, 2013	-	COMPLETED
175 W. Jackson, Chicago, IL 60606 Net Metering	1294840	Letteer Lewis	Sep 1, 2013	11	SUBMITTED
300 S. Wacker, Chicago, IL, 60606 Interconnection Level II	1304999	Me	Sep 3, 2013	9	SUBMITTED
175 W. Jackson, Chicago, IL 60606 Net Metering	1399001	Me	Sep 1, 2013	-	DENIED
222 W. Adams St. Chicago, IL 60626 Interconnection Level I	1396036	Letteer Lewis	Aug 20, 2013	-	DENIED
300 S. Wacker, Chicago, IL, 60606 Interconnection Level II	1273028	Chris Miller	Sep 3, 2013	-	APPROVED
175 W. Jackson, Chicago, IL 60606 Net Metering	1299013	Letteer Lewis	Sep 1, 2013	-	DENIED

14 Results | 15 Items | 1 2 .. 4 Next

MENU | My Queue | Dashboard | Account Settings | SITE MAP | Home | About ConnectTheGrid | ConnectTheGrid | Copyright 2015, West Monroe Partners, LLC. All Rights Reserved.

222 W. Adams St. Chicago, IL
Solar: Level 1 - Interconnection Application | Last Updated: Dec 15, 2014 | TECHNICAL REVIEW

Assigned To: Chris Miller | Print

Application Information

Submitted Nov 11, 2014 | Payment Received Dec 1, 2014 | Completed Dec 6, 2014 | Technical Reviewed Assignee Chris Miller | Approved | Completed

Correspondence

Technical Review

Activity

- Aug 4, 2014 | Application Submitted | John Smith
- Aug 12, 2014 | Payment Received | Jeff Smith
- Aug 13, 2014 | Application Marked Complete | Jeff Smith
- Sep 6, 2014 | Assigned to Technical Review | Jen Daley

Utility Information | Edit

Account No: 004993000311211
Meter No: 4937
Queue No: 2300031

Customer Information

Full Name: John Smith
Mailing Address: 222 W. Adams St. Floor 11
City: Chicago | State: Illinois
Zip Code: 60606
Phone (Daytime): 1 (312) 123-4560 | Fax: 1 (312) 123-4562
Phone (Evening): 1 (312) 123-4561 | Email: john.smith@gmail.com

Contractor Information



A preview upcoming challenges and opportunities in distributed energy like community solar

Question: You expect significant solar PV to deploy in your area by... ?

- A. We're already seeing it
- B. 2016-2017
- C. 2018-2019
- D. Not likely in the next 5 years

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
- Deploying **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

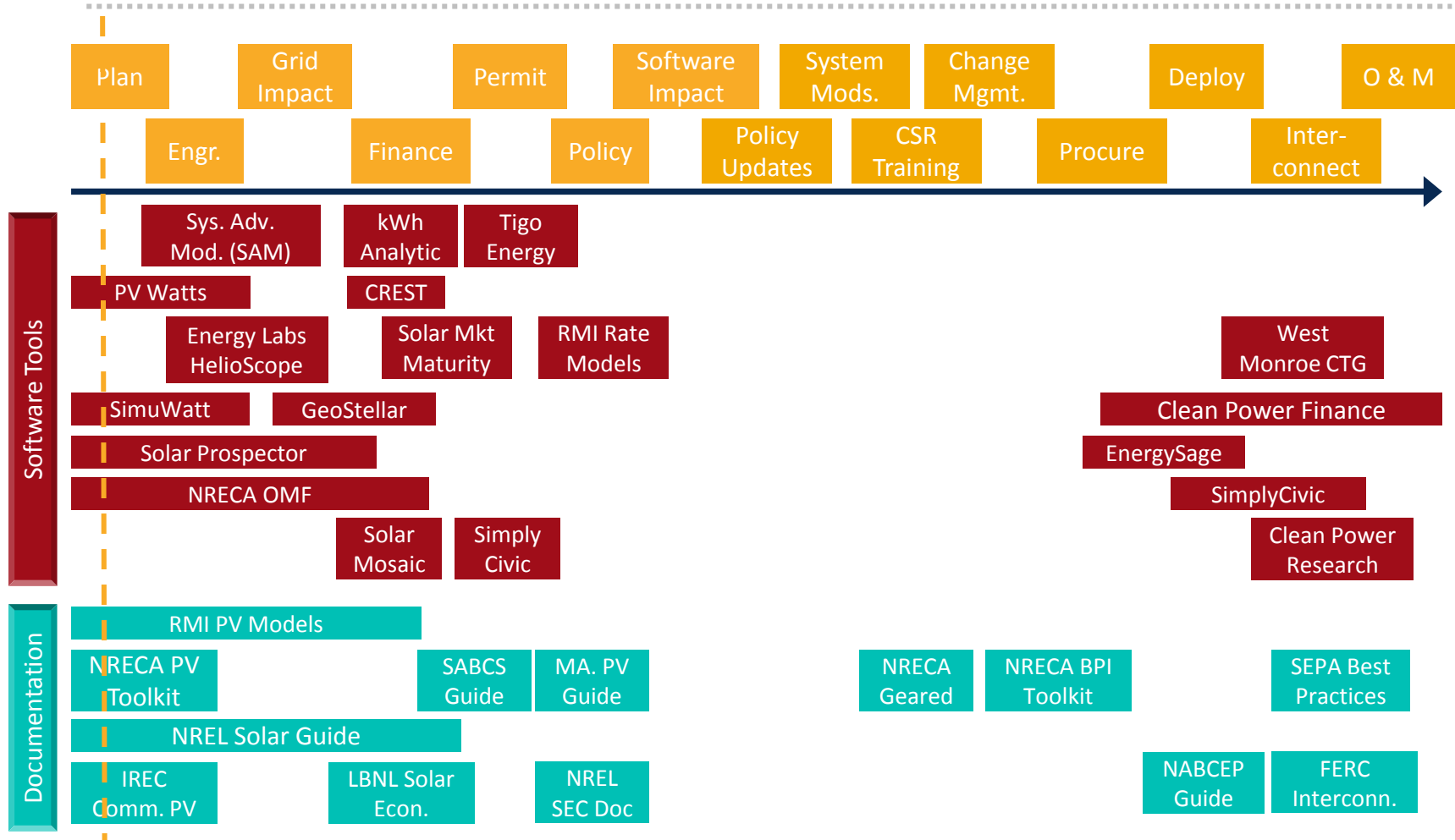
- **Technical evaluation** of the system/grid conditions
- Responding to grid operation impacts of distributed generation (power flows, load forecasts, etc.)
- Ensuring **safe operation** of installed systems
- Adjusting **billing software**/meter reading system to handle net metering issues



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
- EPA's proposed 111(d) rule for existing power plants

Solar DG Project Lifecycle – Analytics & Design Tools/Documentation



Leveraging Future Technologies

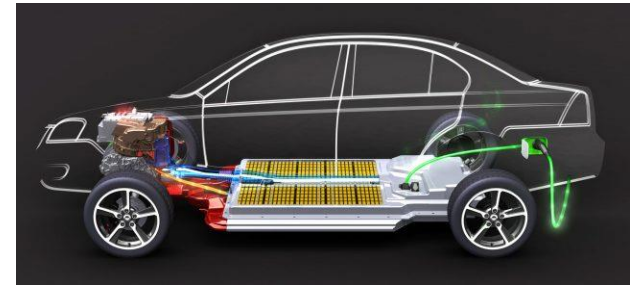
Optimal DG Placement

- ◆ Distribution System Plan
- ◆ Optimal Locations
- ◆ Enabling Infrastructure



Evolving DG Technologies

- ◆ Storage
- ◆ Electric Vehicles
- ◆ Microgrids (renewables, CHP, fuel cell, IC engine)



Managing DG Resources

- ◆ Net Metering
- ◆ Energy Markets (capacity & ancillary services)

21 cents per kWh just to provide regulating capacity!

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Eastern Date Hour	\$		
Annual Average \$/MWh-hr														
California (Reg = up - dc)														
Regulation	26.9	35.5	28.7	35.1	38.5	26.1	33.4	12.6	10.6	16.1	10/1/2009 0:00	28		
Spin	4.3	6.4	7.9	9.9	8.4	4.5	6.0	3.9	4.1	7.2	10/1/2009 1:00	28		
Non-Spin	1.8	3.6	4.7	3.2	2.5	2.8	1.3	1.4	0.6	1.0	10/1/2009 2:00	28		
Replacement	0.90	2.9	2.5	1.9	1.5	2.0	1.4				10/1/2009 3:00	28		
ERCOT (Reg = up - dc)														
Regulation	16.9	22.6	38.6	25.2	21.4	43.1	17.0	18.1	31.3		10/1/2009 4:00	45		
Responsive	7.3	8.3	16.6	14.6	12.6	27.2	10.0	9.1	22.9		10/1/2009 5:00	45		
Non-Spin	3.2	1.9	6.1	4.2	3.0	4.4	2.3	4.3	11.8		10/1/2009 6:00	209.02		
MISO (day ahead)														
Regulation							12.3	12.2	10.8		10/1/2009 7:00	39.5		
Spin							4.0	4.0	2.8		10/1/2009 8:00	43		
Non Spin							0.3	1.5	1.2		10/1/2009 9:00	41.5		
New England (Reg = mileage)														
Regulation	54.6	30.2	22.7	12.7	13.8	9.3	7.1	7.2			10/1/2009 10:00	28		
Spin							0.3	0.4	1.7	1.8	1.0	10/1/2009 11:00	41.5	
10 Minute							0.1	0.3	1.2	0.5	1.6	0.4	10/1/2009 12:00	41.5
30 Minute							0.0	0.1	0.1	0.1	0.4	0.3	10/1/2009 13:00	41.5
											10/1/2009 14:00	28		
											10/1/2009 15:00	28		
											10/1/2009 16:00	41.5		
											10/1/2009 17:00	41.5		
											10/1/2009 18:00	41.5		
											10/1/2009 19:00	41.5		
											10/1/2009 20:00	41.5		
											10/1/2009 21:00	41.5		
											10/1/2009 22:00	41.5		
											10/1/2009 23:00	28		

Courtesy of Brendan Kirby

From EIA, NREL, Active Power Control from Wind

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 by June 1, 2015 and thereafter

Trend #3: Direct Utility Participation in Solar Projects

- Minnesota: Xcel's Community Solar Gardens (MN PSC [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

Questions?

