

# Solar Energy Deployment: Industry Trends, Utility Implications, & City of Chicago Project Outcomes

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## Presentation Outline

- Recent solar industry trends
- Electric Utility impacts of increasing distributed solar deployment
- Outcomes of Chicago Solar Project

Over the past decade, the #1 driver of distributed generation (DG) growth has been solar PV installed capacity...

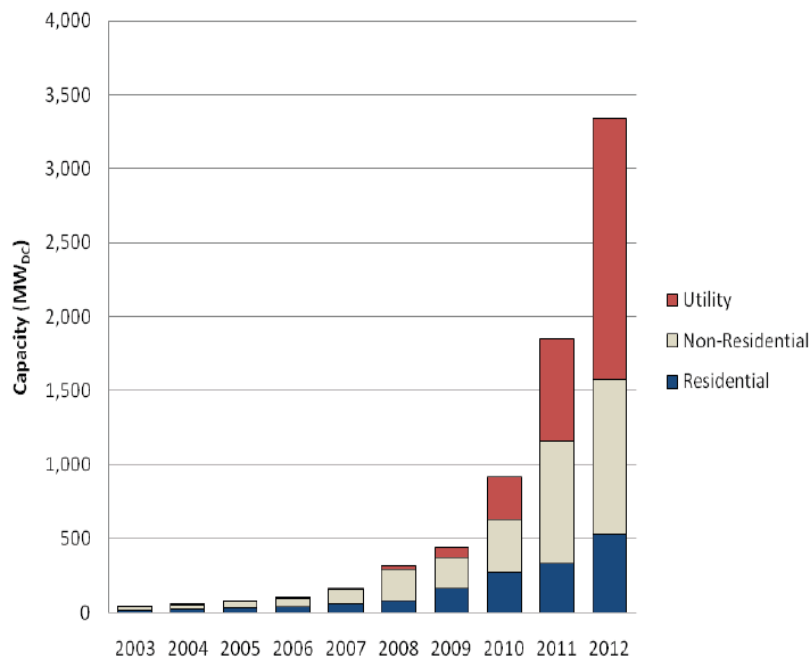
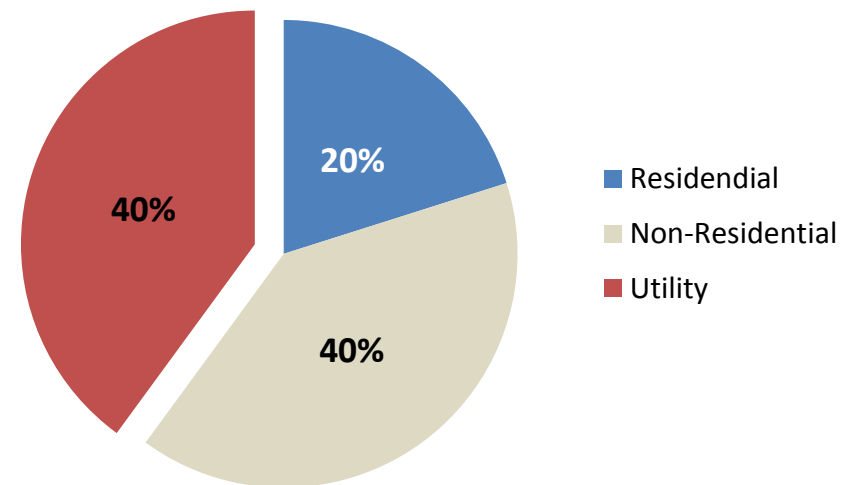


Figure 1: Annual Installed Grid-Connected PV Capacity by Sector (2003-2012)

### Cumulative U.S. Solar PV Installations (7,300 MWdc)



**60% of US solar PV capacity (or about 4 GW) is feeding into distribution grid systems**

... which translate to a large volume of Interconnection and Net Metering applications.

- Over 90,000 unique distributed solar PV installations occurred in 2012 (compared to ~500 centralized installations greater than 1 megawatt capacity).
- NOTE: The vast majority of solar is being installed in only a handful of states

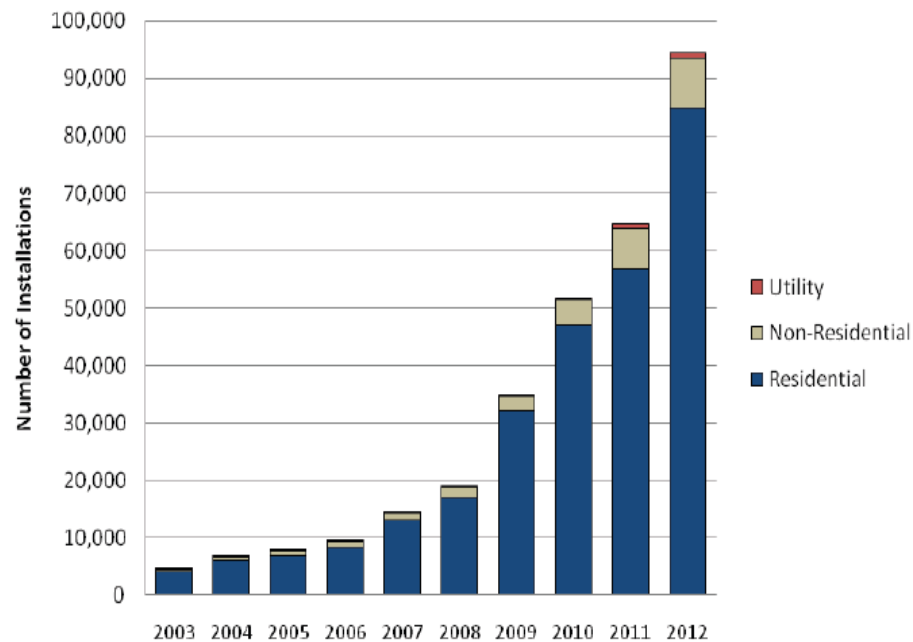
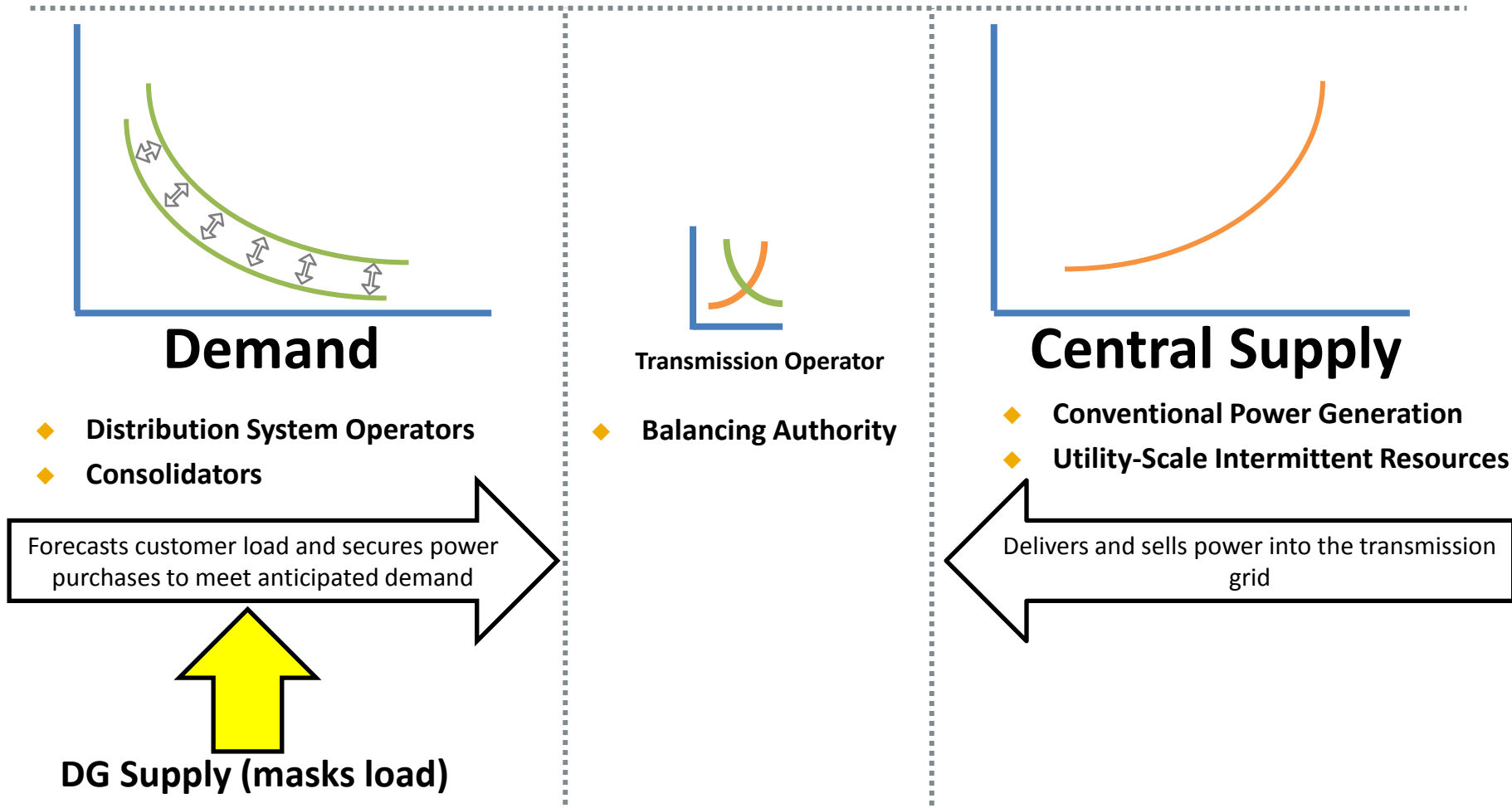


Figure 3: Number of Annual U.S. Grid-Connected PV Installations (2003-2012)

**Translation: Every MW of solar PV capacity translates to 300 – 500 utility applications.**

This has created a challenge for utilities: traditional Power Supply and Demand balancing bodies do not necessarily account for the load impacts of DG



**Grid operators are adapting to the growth of DG systems**

This challenge can be solved through DG resource management, composed of: enrollment, asset management, and operations/forecasting

**To System Owners...**

*Speed-to-market through city and utility requirements*

*Archiving applications, generating RECs, registering the system, inventorying the equipment components*

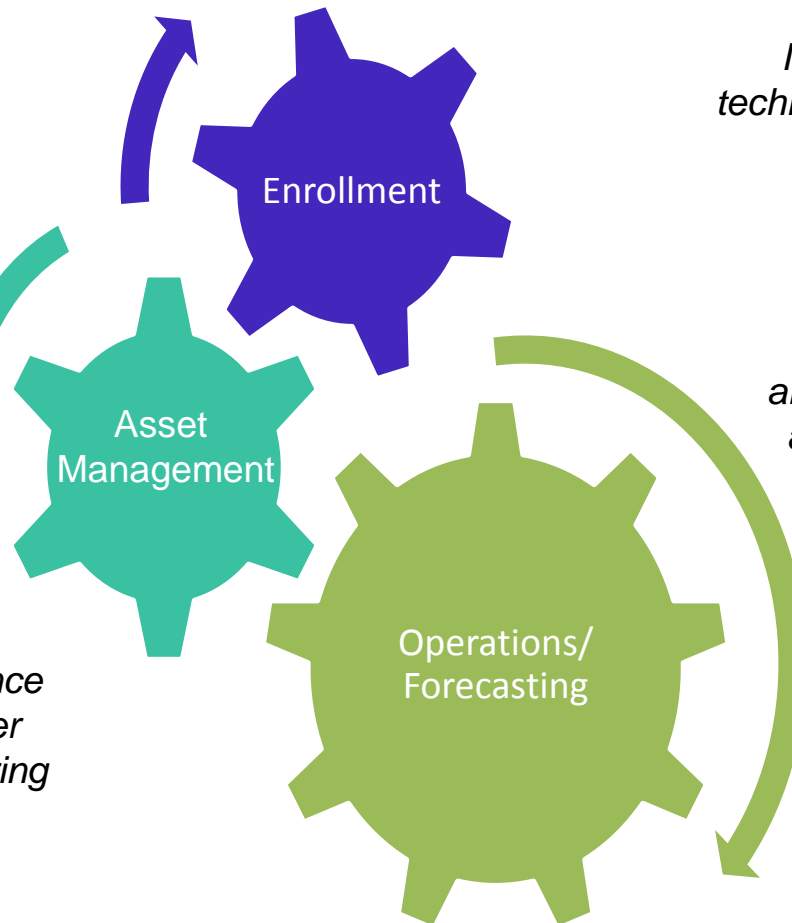
*Ensuring system performance meets expectations; proper billing/maintenance; tampering detection*

**To the Electric Utility...**

*Inter-departmental approvals; technical screening; meter exchange; bill switching*

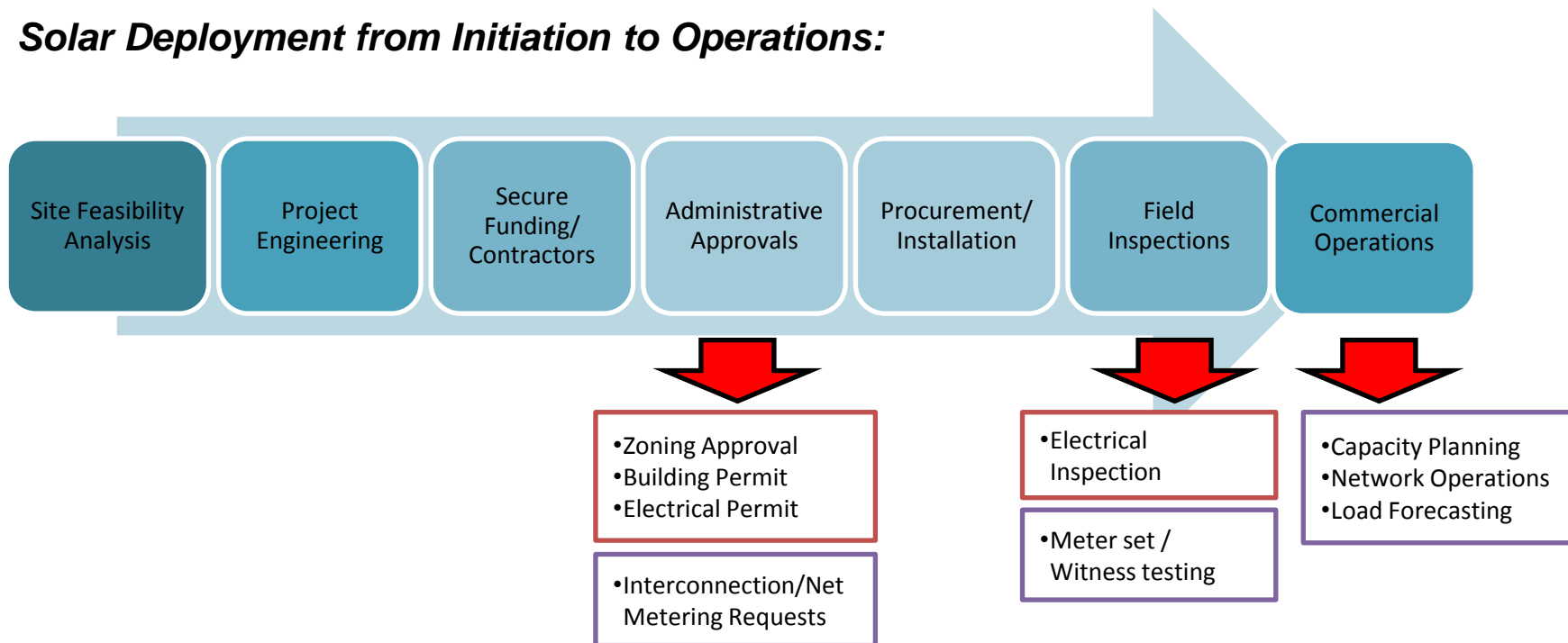
*Standardizing legacy datasets and new systems/information into a 'single source of truth' across IT/OT systems*

*Informing utility distribution engineering and capacity planning on DG information, estimating impacts on customer load*



Utilities are one of two administrative bodies authorized to approve and inspect DG resources prior to commercial operations

### *Solar Deployment from Initiation to Operations:*



### Color-coding:

Authority Having Jurisdiction (e.g., Cities)

Electric Distribution Company

# Standard processes and limited staff resources have utilities turning to technology solutions to ease variable application volumes and manage staffing resources

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## Process Constraints

- Nearly all states are easing the approval process for DG resources, including granting non-discriminatory grid access of DG resources through standard interconnection rules
  - The Federal Energy Regulatory Commission (FERC) encouraged this trend with the 2006 Small Generator Interconnection Procedures
  - In January 2013, FERC published a [Notice of Proposed Rulemaking](#) (NOPR) that intends to further reduce the time and cost to process small generator interconnection requests in a pro forma manner (citing solar PV growth as a driver)

## Finite Staff Resources

- ◆ State Incentive cycles and seasonality cause pressure on utility interconnection staff to meet regulatory timeframes
  - FERC NOPR pre-application reports will add an additional responsibility in staff resources

## Technology Opportunities

- ◆ Online application processing allows improved customer and utility staff experience
  - Main benefits are associated with improved accuracy, automated workflow management, and milestone tracking and transparency
  - The Interstate Renewable Energy Council (IREC)'s "[2013 Model Interconnection Procedures](#)" report lists online application submission as a recommended best practice (NYPSC has adopted this guideline for systems <25 kilowatts)



# The Chicago Solar Market Transformation Team streamlined the DG enrollment process

## Chicago's Solar Market Transformation Team ("Solar Team"):

- Sponsored through the Mayor's office, worked with multiple City, industry, utility, non-profit, and institutional stakeholders
- Work completed in early 2013
- *Origination:* The City of Chicago, along with 21 other teams, received Phase 1 funding from the DOE to induce market growth of residential and commercial-scale rooftop PV systems

### Solar Improvement Areas:

#### Permitting:

<a href="#">Solar permitting guidelines</a>	Instructions manual/workbook; same day review for small projects, accelerated review of large projects
<a href="#">Self-certification matrix</a>	Now includes rooftop solar photovoltaic systems
<a href="#">Administrative Relief from Chicago Building Code</a>	ASCE7-05 and SEAOC PV2 Standards Are Allowed For the Review Of Rooftop Solar Photovoltaic Panel Wind Loading

#### Zoning:

<a href="#">solar zoning policy</a>	
<a href="#">Sustainable Development Matrix</a>	Now includes solar PV waiver from green roof requirements, based on 1:4 area coverage factor

#### Interconnection:

<a href="#">DOE interconnection best practices webinar (slides 23 - 32)</a>	Interconnection and net metering Application Tool provides online submission portal for interconnection/net metering applications (Levels 1 - 4), with error checking, electronic payment, and applicant tracking.
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#### Education:

<a href="#">City of Chicago's Solar webpage</a>	One-stop resource for all solar-related inquiries from contractors, design professionals, and residents
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## Questions?



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