Best Practices in Interconnection of Distributed Generation

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on behalf of the
Interstate Renewable Energy Council

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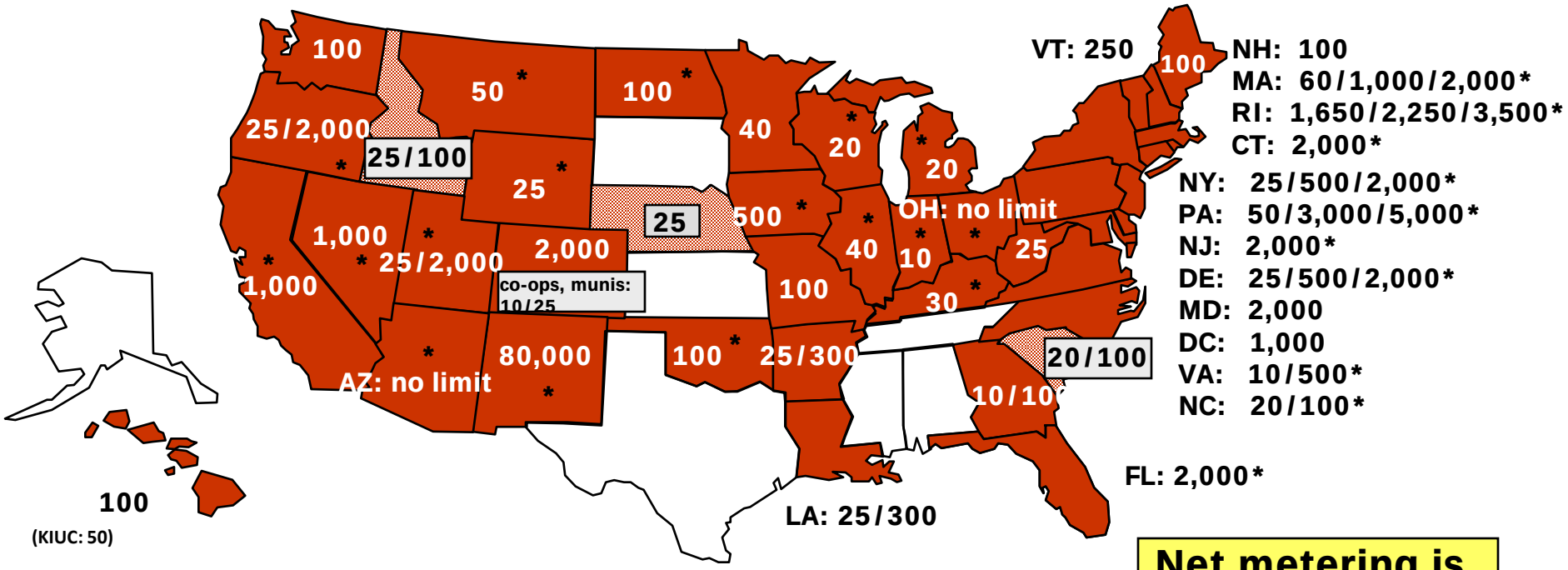
IREC's Activities

- Participate in state utility commission dockets on net metering and interconnection procedures
  - Active in 20 states/29 proceedings in the past year
  - No advocacy regarding incentive programs or subsidies
- Track existing state and local procedures at www.dsireusa.org
- Prepare model procedures and an interconnection guide, *Connecting to the Grid* (both available at www.irecusa.org)
- Assist with development and grading of state procedures in *Freeing the Grid* (available at www.newenergychoices.org)
- Prepare related reports funded by the Solar America Board for Codes and Standards

Net Metering – facility size caps

(the US alternative to feed-in tariffs)

DSIRE: www.dsireusa.org **February 2009**



State-wide net metering for all utility types

* State-wide net metering for certain utility types only (e.g., investor-owned utilities)

Net metering offered voluntarily by one or more individual utilities

Net metering is available in 43 states + D.C.

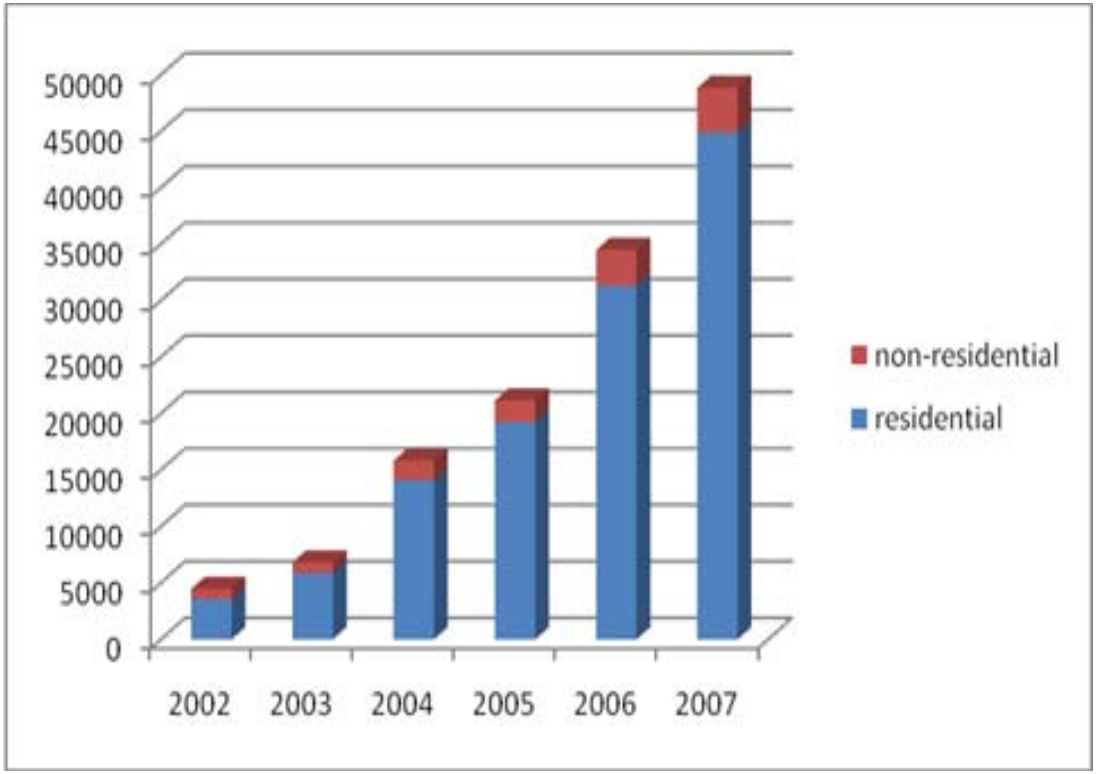
Note: Numbers indicate individual system size limit in kilowatts (kW). Some states' limits vary by customer type, technology and/or system application; this is the case when multiple numbers appear for one state. Other limits may also apply. For complete details, see www.dsireusa.org.

What are “Best Practices”?

- Term introduced in the Energy Policy Act of 2005, directing state utility commissions to consider adopting “best practices” for interconnection procedures.
- IREC interprets the term to mean practices that maximize interconnection and net metering of distributed generation without compromising electric grid safety or requiring subsidization.
- Best Practices continue to evolve as stakeholders gain more experience with distributed generation.
- IREC is currently revising its model net metering and interconnection procedures to incorporate best practices identified since the last revision in 2006.

A Bit of Context

- Over 75,000 net metered interconnections to date
- Best practices handle high volume rapidly at a reasonable, predictable cost without compromising safety or reliability
  - Focus stakeholder resources where they are needed – systems that require further study
  - Avoid small costs for both installers and utilities that are duplicated thousands of times



Number of US Net Metered Systems

Data from United States Energy Information Agency - http://www.eia.doe.gov/cneaf/electricity/page/eia861.html

Consistent Statewide/Regional Interconnection Standards

- Consistency has two levels
  - Statewide – Investor-owned utilities, muni's, coops
  - Regional – between states, power pools, ISOs
- Consistency drives cost savings and safety
  - Consistency drives savings – Installers become familiar with consistent standards drives savings in the areas of design, installation and interconnection
  - Consistency drives safety – installers and utilities become familiar with rules – best practices become commonplace and embedded in the ecosystem
- Both outcomes drive market development and ensure the impacts of ratepayer support and private investment are maximized

Program and Facility Size Limitations

- Program caps often set at 1% of utility peak demand, not an immediate issue, but a problem down the road
- Facility size caps create the potential for no applicable procedures for an interconnection
- Federal procedures apply to most transmission line interconnections and certain distribution line interconnections
- Many state and local procedures capped at sizes below one MW, though interconnection of larger facilities are within state jurisdiction

Interconnection Timelines and Certainty

- Time for notice of application receipt
  - federal rules say three days
  - best practice is to allow online/instant notice
- Time for notice of complete application
  - federal rules say ten days from receipt
  - best practice is less time or automated
- Time for review of application
  - federal rules say 15 days for up to 2 MW systems
  - shorter period feasible for small systems
- Witness test
  - federal rules say five day notice, which is reasonable
- Study processes – typically no timelines, but outer bound would help
- GOAL: Increase certainty – allow routine applications for commonplace systems to move through the interconnection process quickly, saving resources for review of more complex/unique applications

Application Fees, Study Fees and Certainty

- Application fees for 10 kW systems or less
  - federal rules use $100 fee, higher than most states
  - Processing costs eat most of fee, so several states have no fee
  - Some states moving to 25 kW or more for “Tier 1”
- Application fees for 10 kW to 2 MW systems
  - federal rules use a flat $500 fee
  - Many states use a sliding scale such as $50 + $1/kW
- Study fees for complicated or larger systems
  - Often open-ended at customer cost (deters applicants)
  - Caps would add certainty; could use sliding scale
  - IREC uses maximum engineering rate
- GOAL: Routine applications need very limited review so fees should reflect that fact. Increase certainty in costs for systems that do require extra attention so applications are not discouraged.

Interconnection Technical Screens

- Federal (FERC) screens widely adopted – need review given experience since 2005
- 15% of line section peak load is first and most significant screen
  - needs exemption for non-exporting systems
  - could use higher percentage for solar systems
  - Need study of grid impacts if line section load is exceeded by generation
- Need short list of screens for small systems
- Virginia leading the pack
  - abbreviated interconnection screens for Level 1 – for up to 500 kW
  - simplified process with virtually no screens for systems under 25 kW
  - Level 2 process uses FERC screens
- GOAL: Focus resources on larger, more complex systems

Standard Form Agreements for Interconnection

- FERC and successful state procedures have standard form agreements
  - Without standard form agreements, utilities have little incentive to negotiate and attorneys may be necessary to assure state procedures are followed
  - Some provisions carry through from procedures, but others may only be in agreements, such as indemnity, rights of access, notification, assignment and dispute resolution
  - GOAL: avoid potential for utilities to add provisions not found in state procedures/increase costs due to attorneys fees

- Simplified “all-in one” standard form agreement for Level 1 applicants
  - Application for Interconnection and Interconnection Agreement are contained in one document which customer-generator agrees to at time of application
  - GOAL: Speed approval and reduce paperwork

Insurance Requirements

- No known insurance claims for utility damages with over 70,000 solar installations in the U.S.
- Homeowner's insurance covers typical net metered systems
- Special insurance not readily or affordably available for residential systems
- Difficult to arrange for larger systems, though feasible for project developers
- Potential for utility damages minute for small systems (NM and IL require insurance only for large systems)
- Naming of utility as an "additional insured" is an unnecessary hurdle and impractical for homeowners
- 12 states have prohibited additional insurance requirements for systems meeting interconnection standards including New Jersey, Oregon, California & Nevada.
- GOAL: Reduce unnecessary cost and remove barrier

Dispute Resolution Procedures

- Potential disputes often relate to small technical matters; fast and inexpensive resolution of such matters worth the risk of error
- Good faith discussions between parties are useful if timeline is short
- Utility commission formal complaint procedures may be functional, but often involve weeks or months of delay
- Non-binding processes add potential for delay and significant cost, and still may wind up before a utility commission or in court; want a quick, low cost process
- 12 States have adopted simple dispute resolution procedures including Illinois, Florida, Colorado, Texas, & New York

Utility External Disconnect Switch

- "Frankenstein" switch on the customer's side of the utility's meter.
- Utility perspective – UEDS provides a visible, lockable, utility-accessible means of disconnecting a generator without disconnecting the customer.
- Safety of Utility personnel is cited for justification: want to be assured that power won't feed to the grid during a blackout.
- Viewed by PV industry as redundant because the DC/AC inverter provides the same protection.

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