SOLAR ABCs

ANNUAL MEETING

OCTOBER 15TH, 2010

UPDATED RECOMMENDATIONS FOR THE FERC SMALL GENERATOR INTERCONNECTION PROCEDURES

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Introduction to FERC SGIP

SGIP most thoroughly vetted by all industry participants and codified in FERC Order 2006 in May, 2005 and 2006-A and 2006-B in the subsequent year (www.ferc.gov, “Legal Resources”, “Major Orders–Electric”,

and see current rule and agreement links at

www.ferc.gov/industries/electric/indus-act/small-gen.asp

Why Update FERC SGIP

- 69,000 grid tied systems installed
- FERC asked for parties to convene every two years to update SGIP
- Area Networks not included (IEEE 1547.6)
- IEEE 1547-2008 written with low penetration
- High Penetration IEEE 1547.8 WG
- Smart Grid

Zero Energy Homes

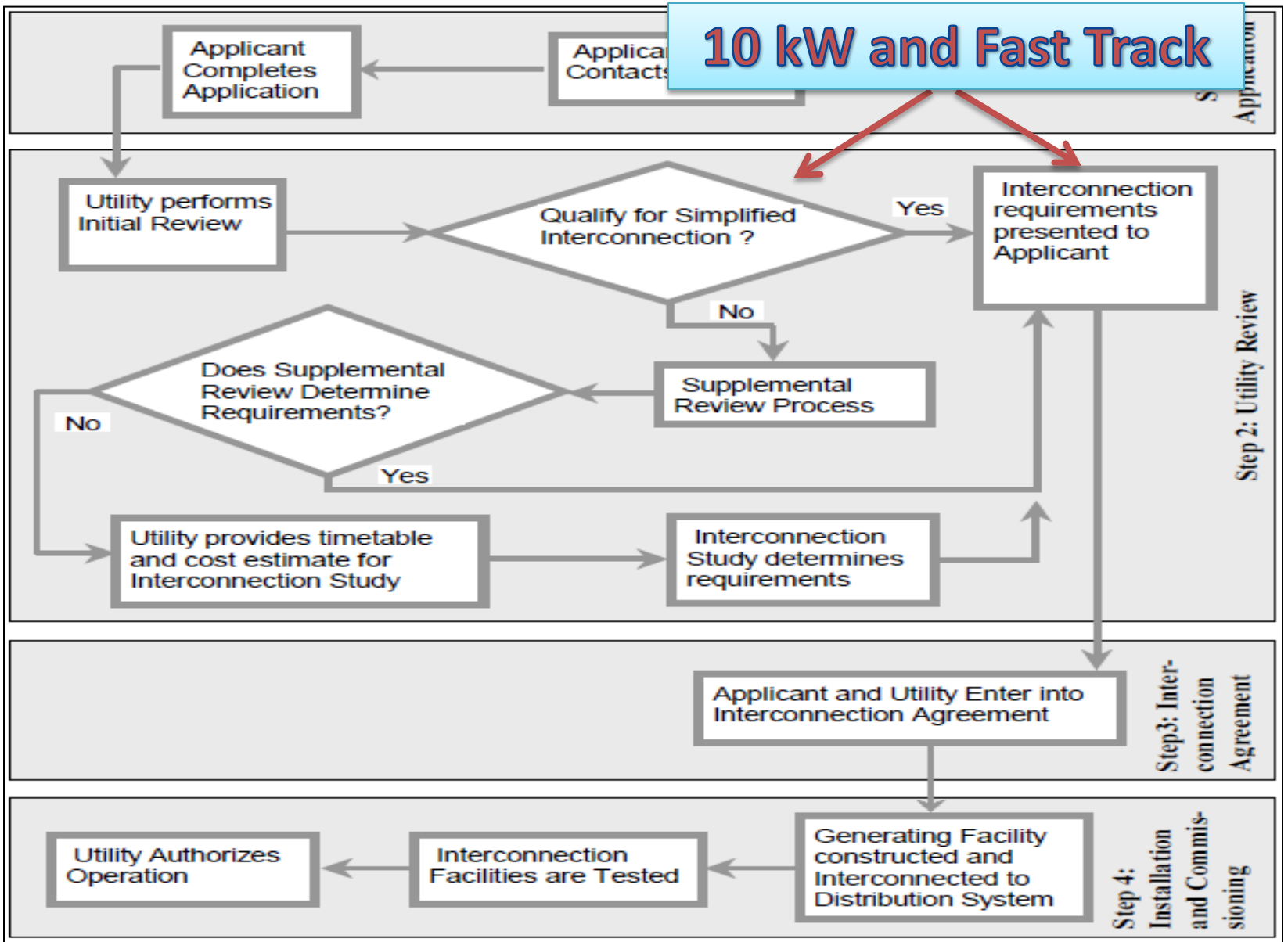
FERC SGIP Processes

- **10 kW Inverter Process**

- **Fast Track Process no larger than 2 MW**

- **Study Process no larger than 20 MW ANOPR, NOPR, Rule**

Typical Utility Interconnection Process



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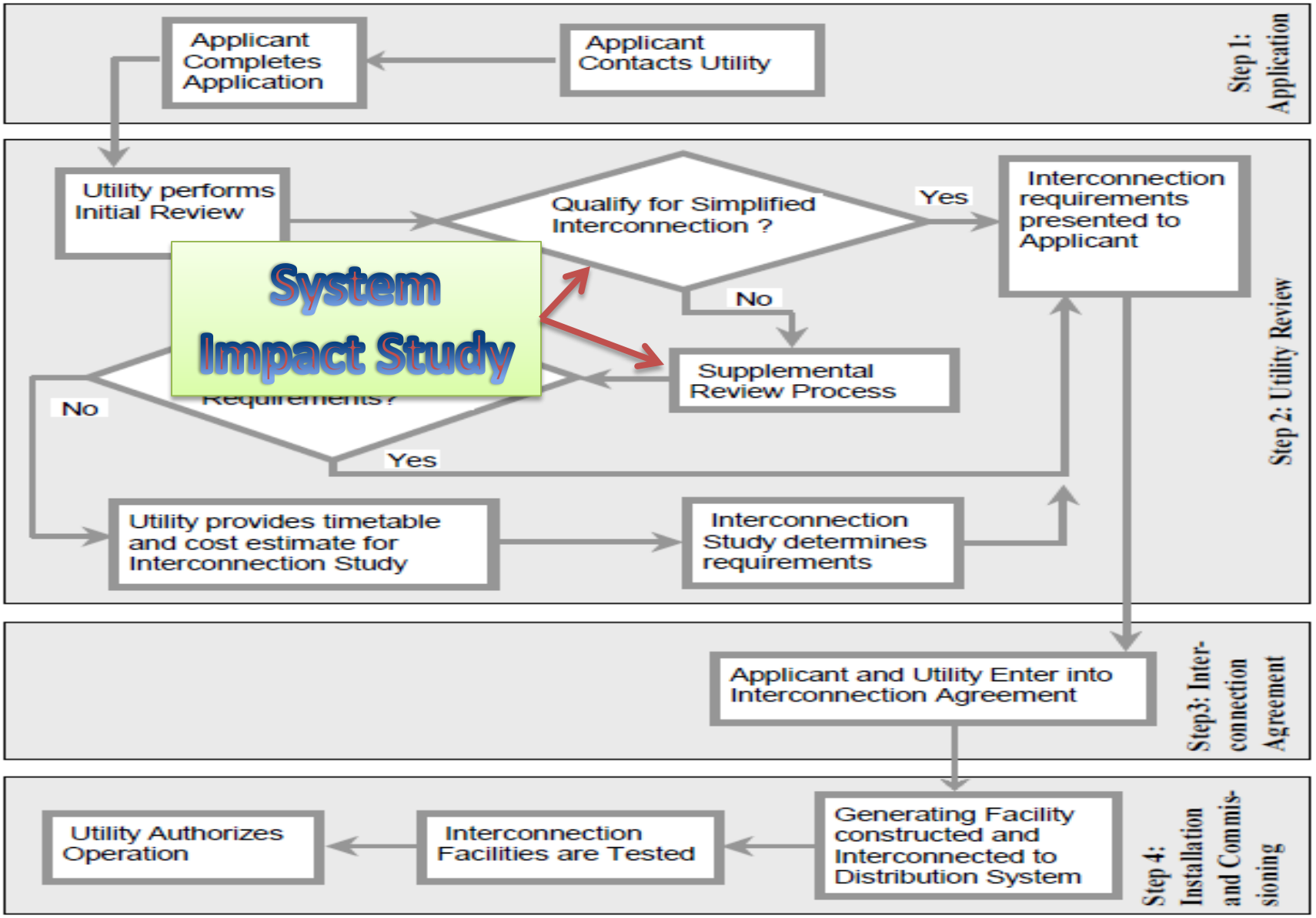


FERC SGIP Screens

Section 2.2.1.1-10
10 screens
15 % rule on line section
Line Section: That portion of the utility's Distribution System connected to a Customer bounded by automatic sectionalizing devices or the end of the distribution line.

PV Systems Are Larger

FERC SGIP Subject Matter Experts (SMEs)

- IEEE P1547.6 Draft Recommended Practice For Interconnecting Distributed Resources With Electric Power Systems Distribution Secondary Networks

- IEEE P1547.7 Draft Guide to Conducting Distribution Impact Studies for Distributed Resource Interconnection

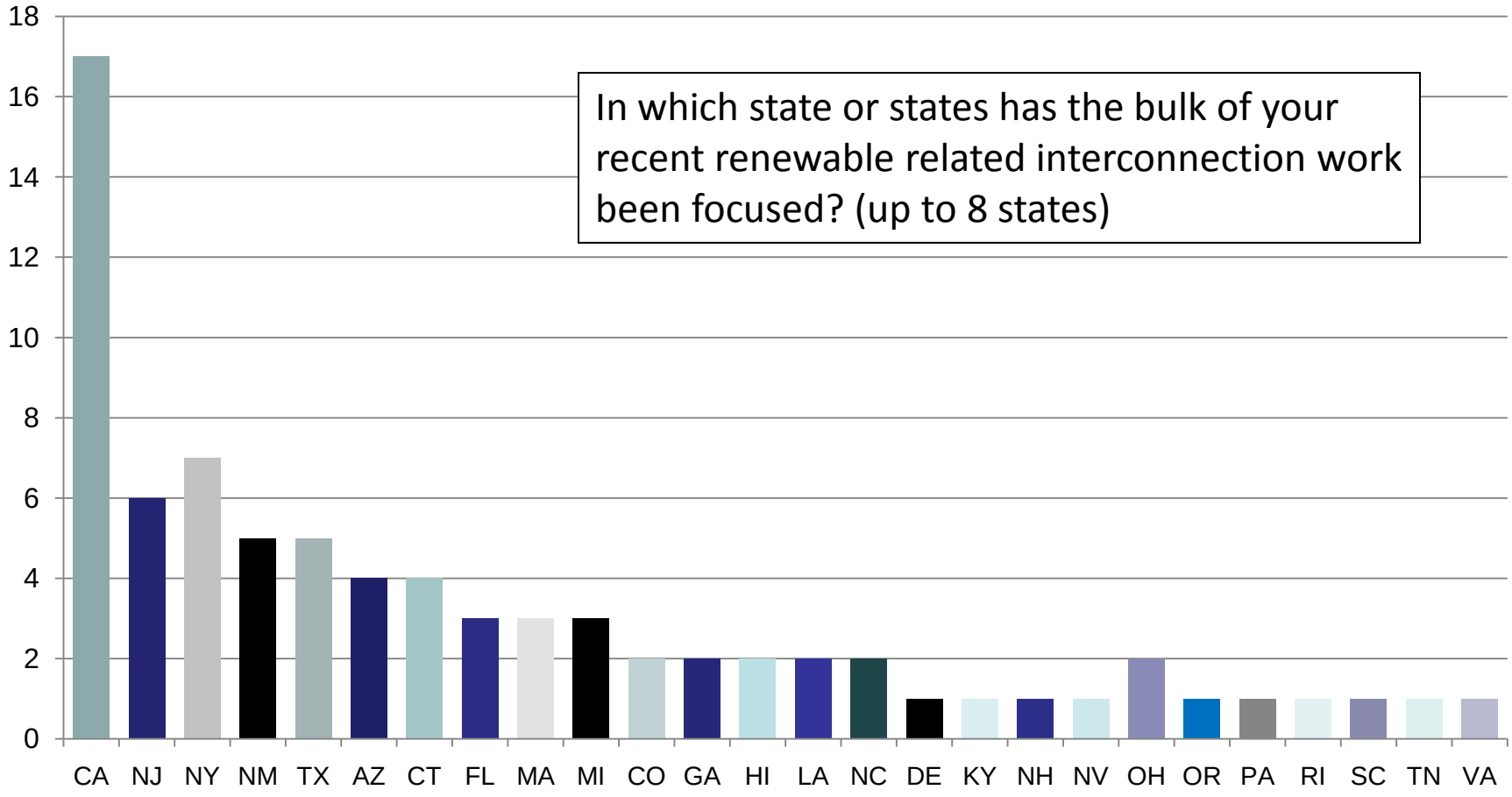
- DOE designated SMEs

FERC SGIP Response Profile

Questionnaire request sent to 157 Subject Matter Experts (SME)

- 37 SMEs Completed Questionnaire
- 12 from IEEE 1547.6 Working Group
- 32 from IEEE P1547.7 Working Group
- 5 Solar ABCs/DOE invites

FERC SGIP Results – Who completed the questionnaire?



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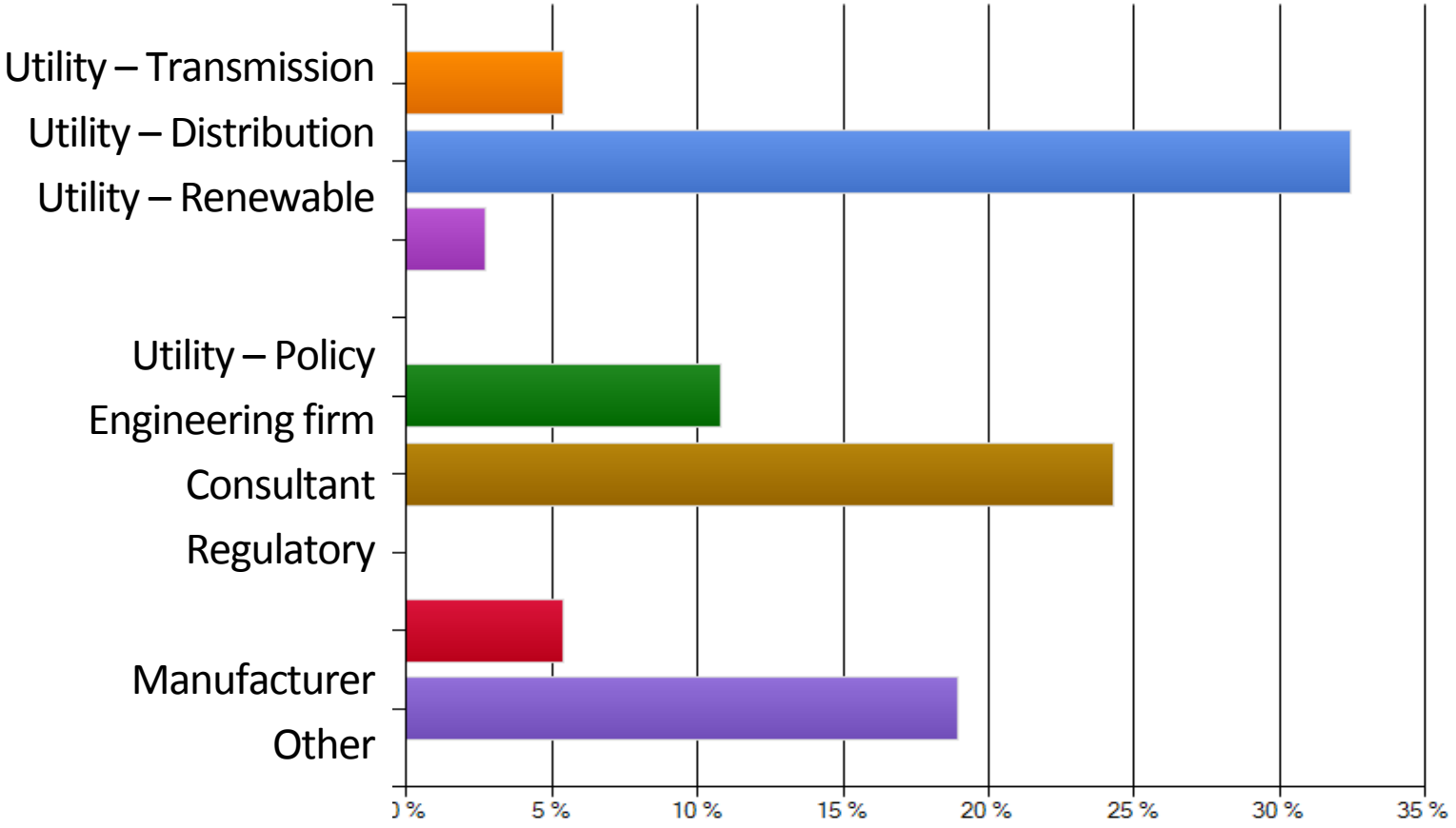


Summary of Recommendations

Screen 2.2.1.7: The limit placed on the size of the aggregate generation on a single phase shared secondary should be updated to be in terms of a percentage of the transformer nameplate rating.

Screen 2.2.1.9: The stability requirement should be rewritten for clarity.

Screen 2.2.1.3: Area networks should be covered in addition to spot networks. In addition, limits on maximum load should be revised upward in keeping with recent rules enacted in Connecticut and by Consolidated Edison in New York and with the guidelines defined in the IEEE 1547.6

The competitive fairness needs to be addressed

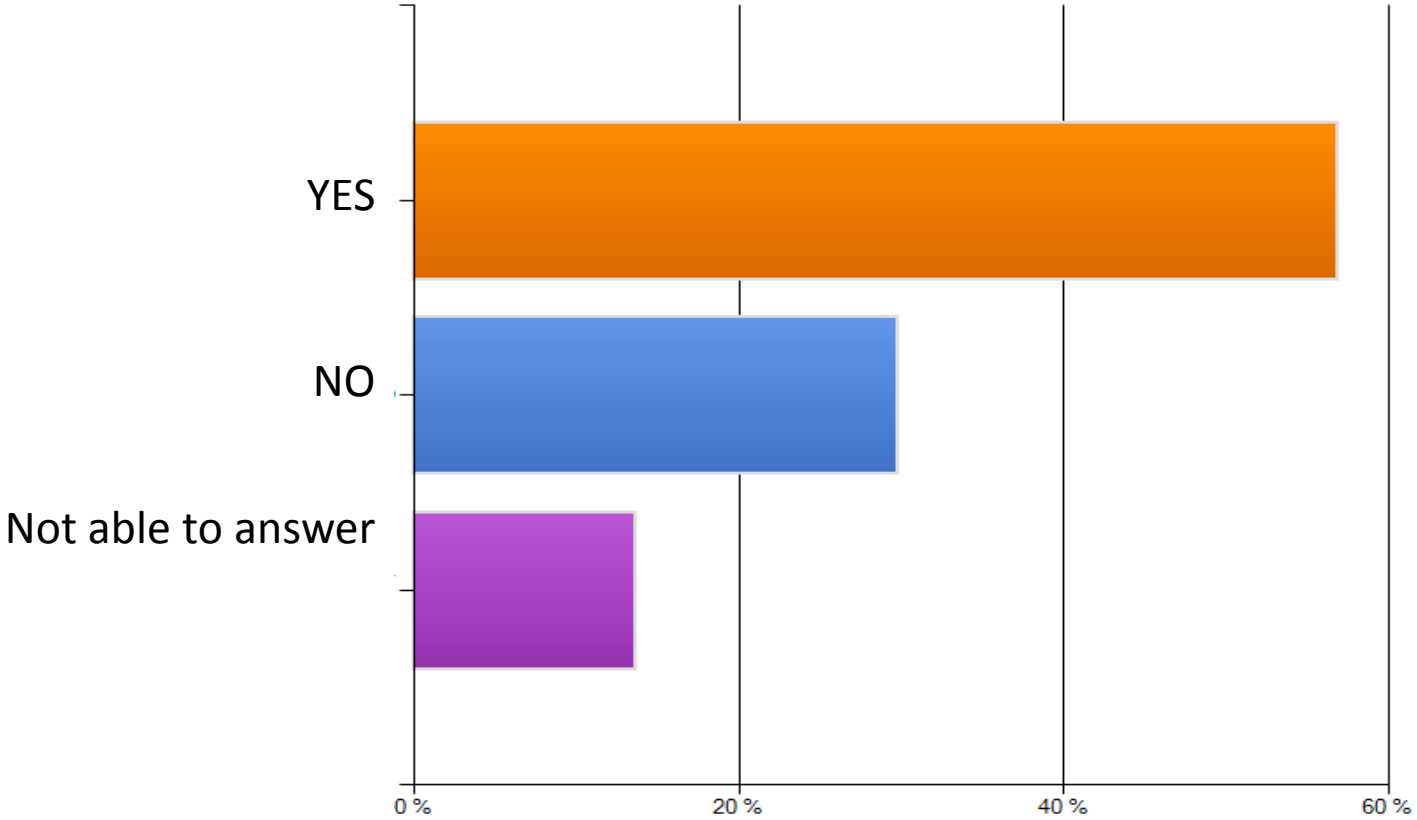
2.2.1.9 – Stability requirement

The proposed generation may not exceed 10 MW if interconnected to the transmission side of a substation transformer feeding the circuit in an area where there are known, or posted, transient stability limitations (e.g., three or four transmission busses from the point of interconnection).

2.2.1.7 – Shared secondary

If the proposed generation is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary including the new generation may not exceed 20 kW.

FERC SGIP Results - #3: Network protectors (limit of 5% of a spot network's maximum load or 50 kW)



Do you support updating this screen?

NREL National Renewable Energy Laboratory
A national laboratory of the U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
Innovation for Our Energy Future

Photovoltaic Systems Interconnected onto Secondary Network Distribution Systems – Success Stories

Mike Coddington, Ben Kroposki, and Tom Basso
National Renewable Energy Laboratory

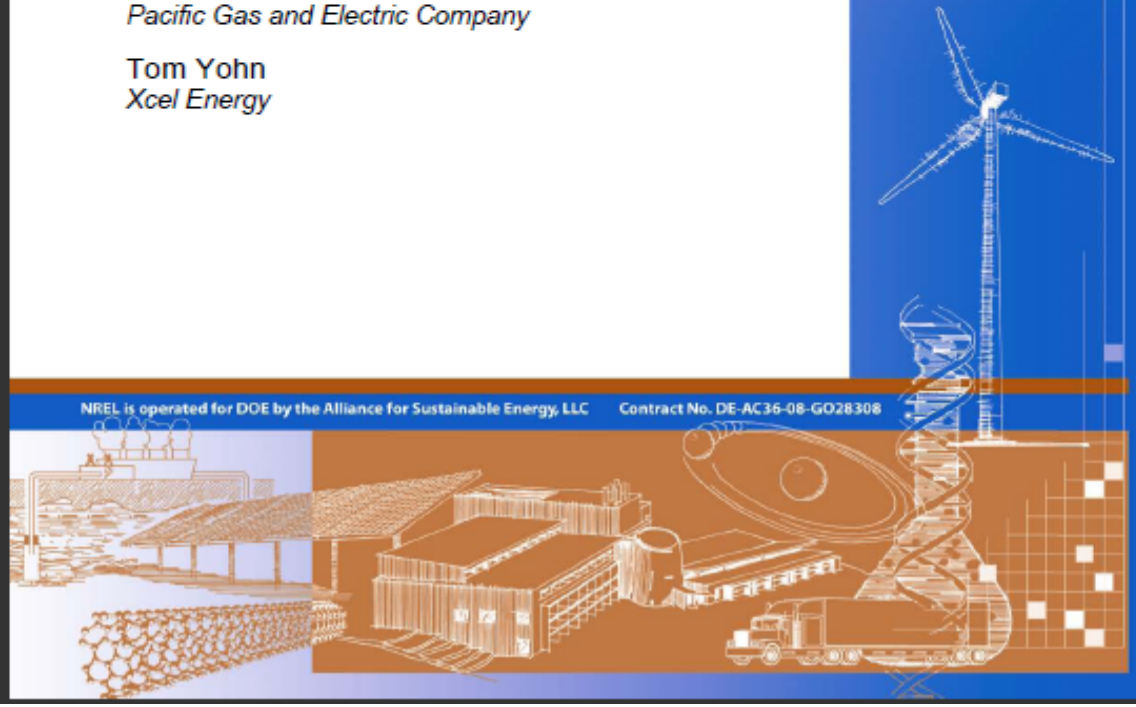
Kevin Lynn
Sentech, Inc.

Dan Sammon
Consolidated Edison of New York, Inc.

Mohammad Vaziri
Pacific Gas and Electric Company

Tom Yohn
Xcel Energy

Technical Report
NREL/TP-550-45061
April 2009



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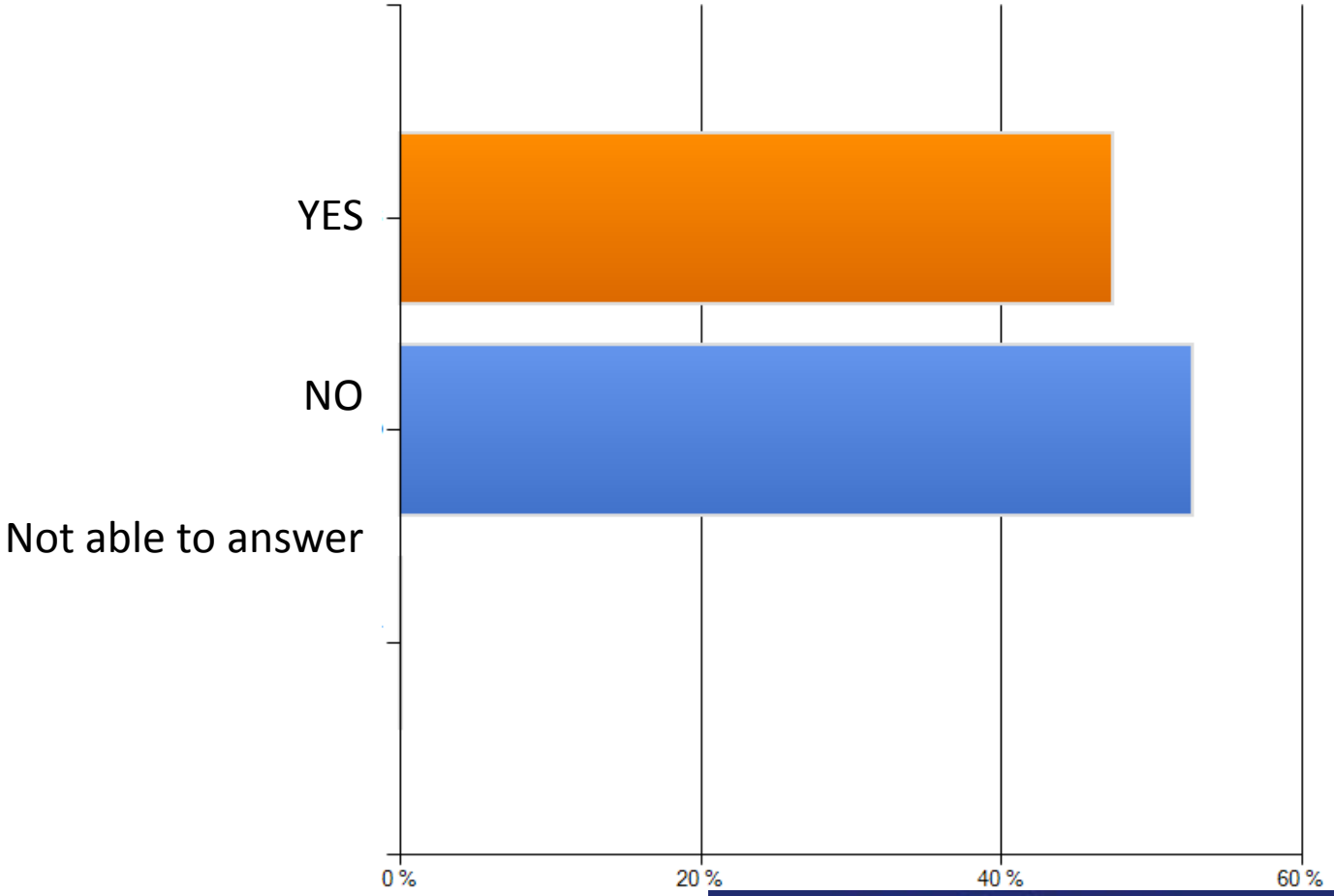
Focus On These Two Screens

Screen 2.2.1.2: Further investigation and research is needed to determine whether to increase (and by how much) the current 15% limit on generating capacity related to circuit peak load (or whether to change the limit to relate to the circuit minimum load). Researchers should also consider separate treatment of inverter-based generation.

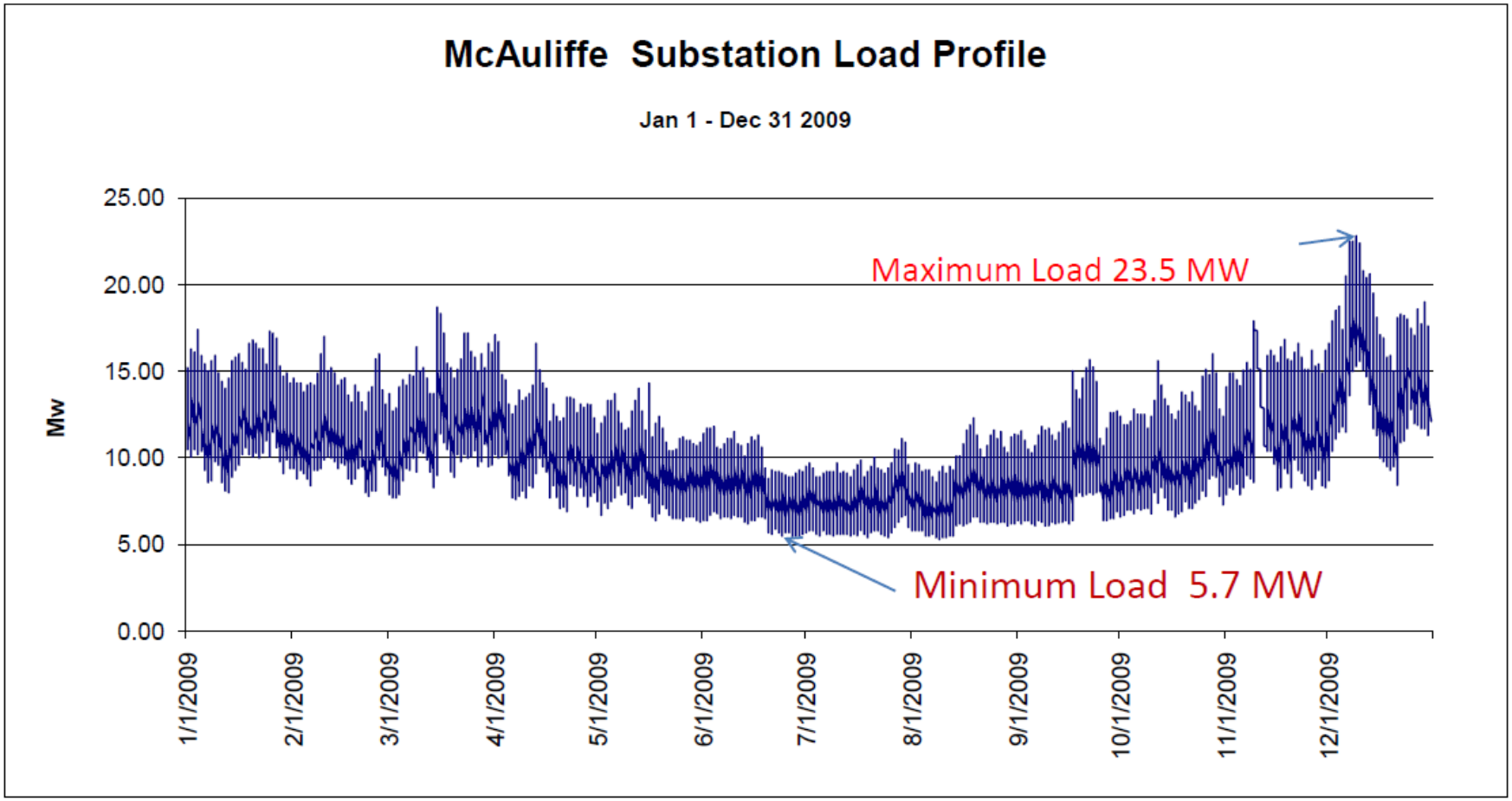
10 kW Inverter Process Size Limit: Further dialogue, and perhaps some research, is needed to determine whether to increase (and by how much) the limit from 10 kW for the simplified inverter interconnection process.

FERC SGIP Results - #2:
DG capacity vs. line section peak load (max 15%)

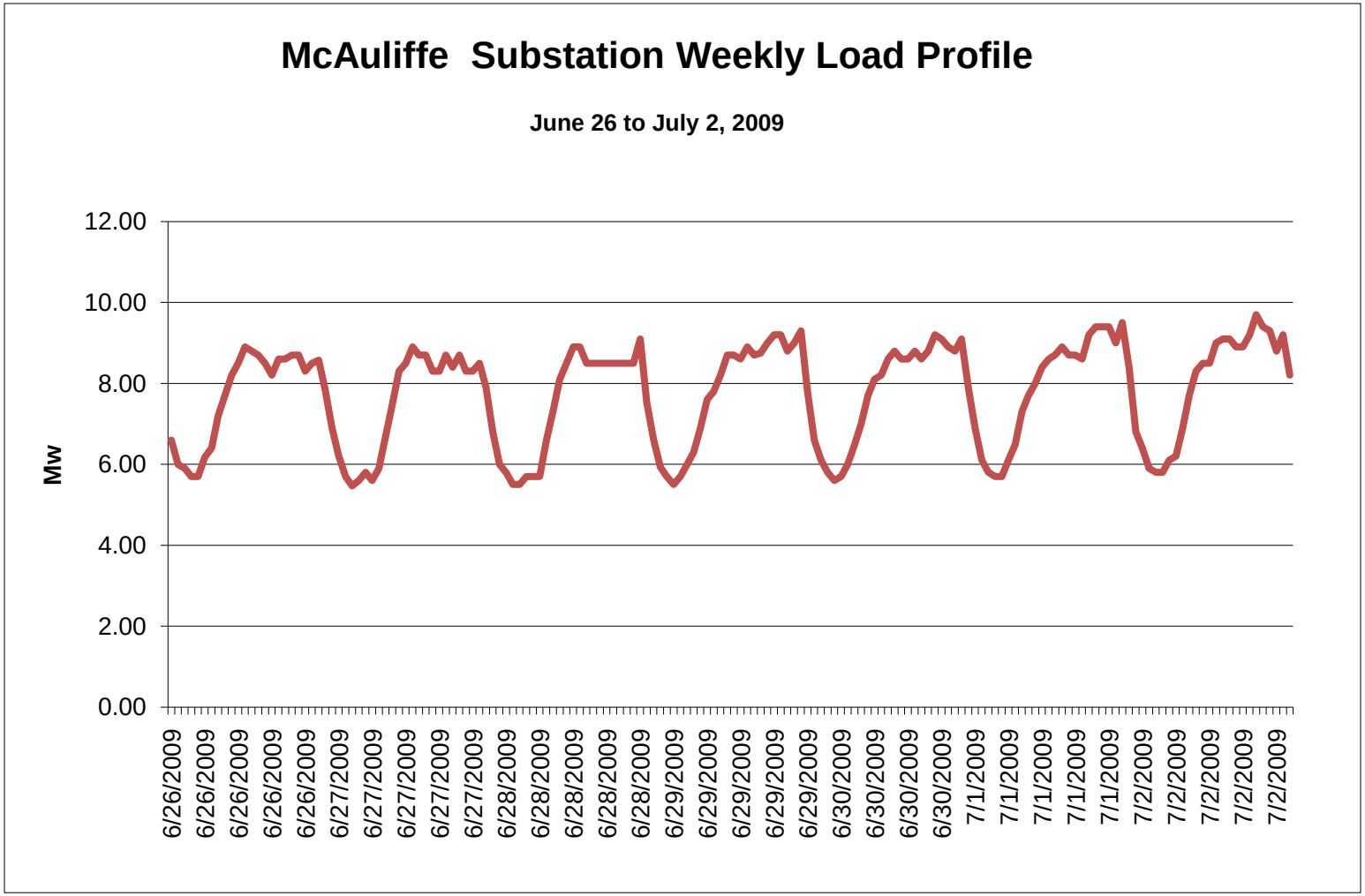


Do you support updating this screen?

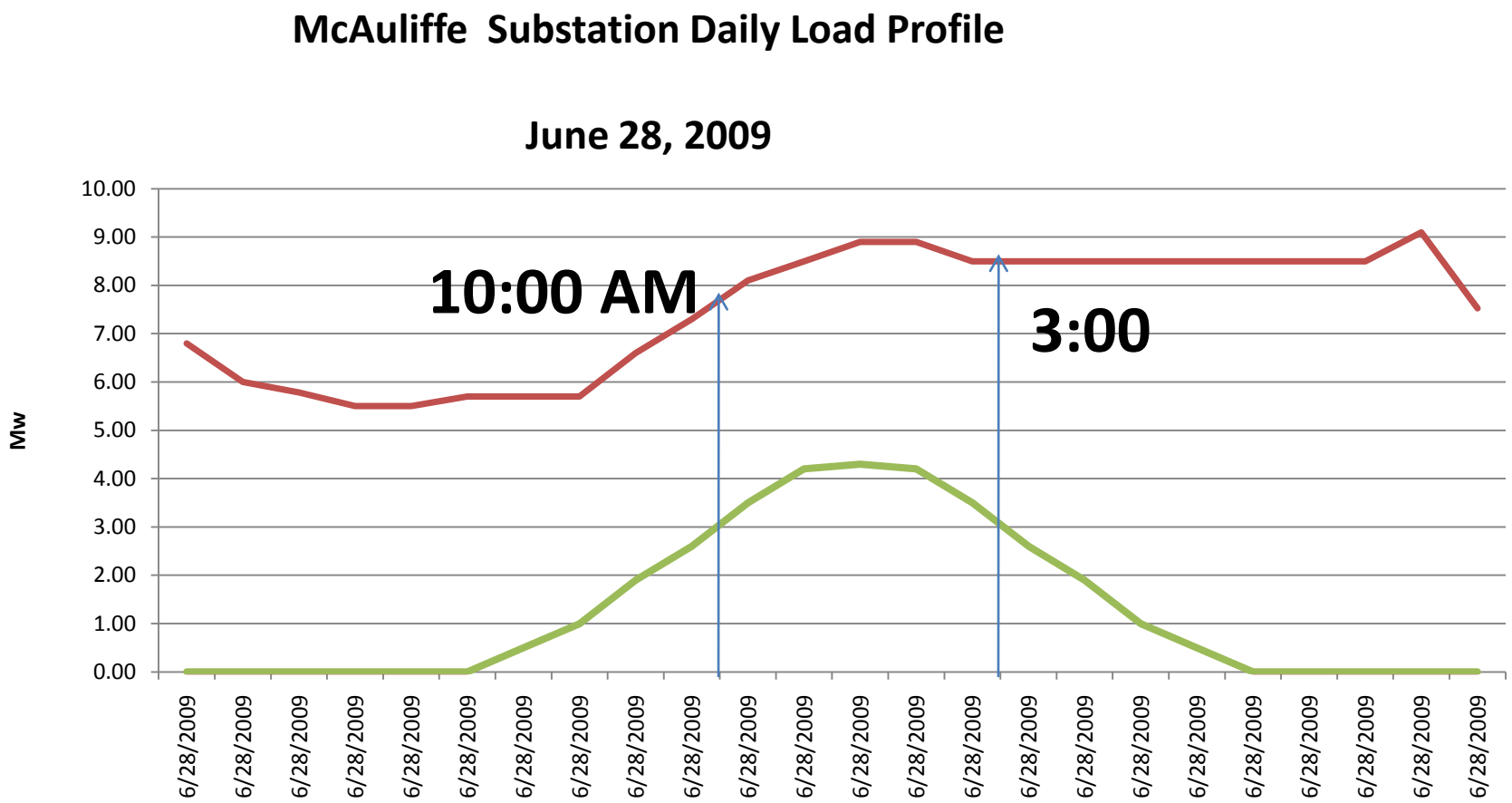
Typical Substation Load Profile



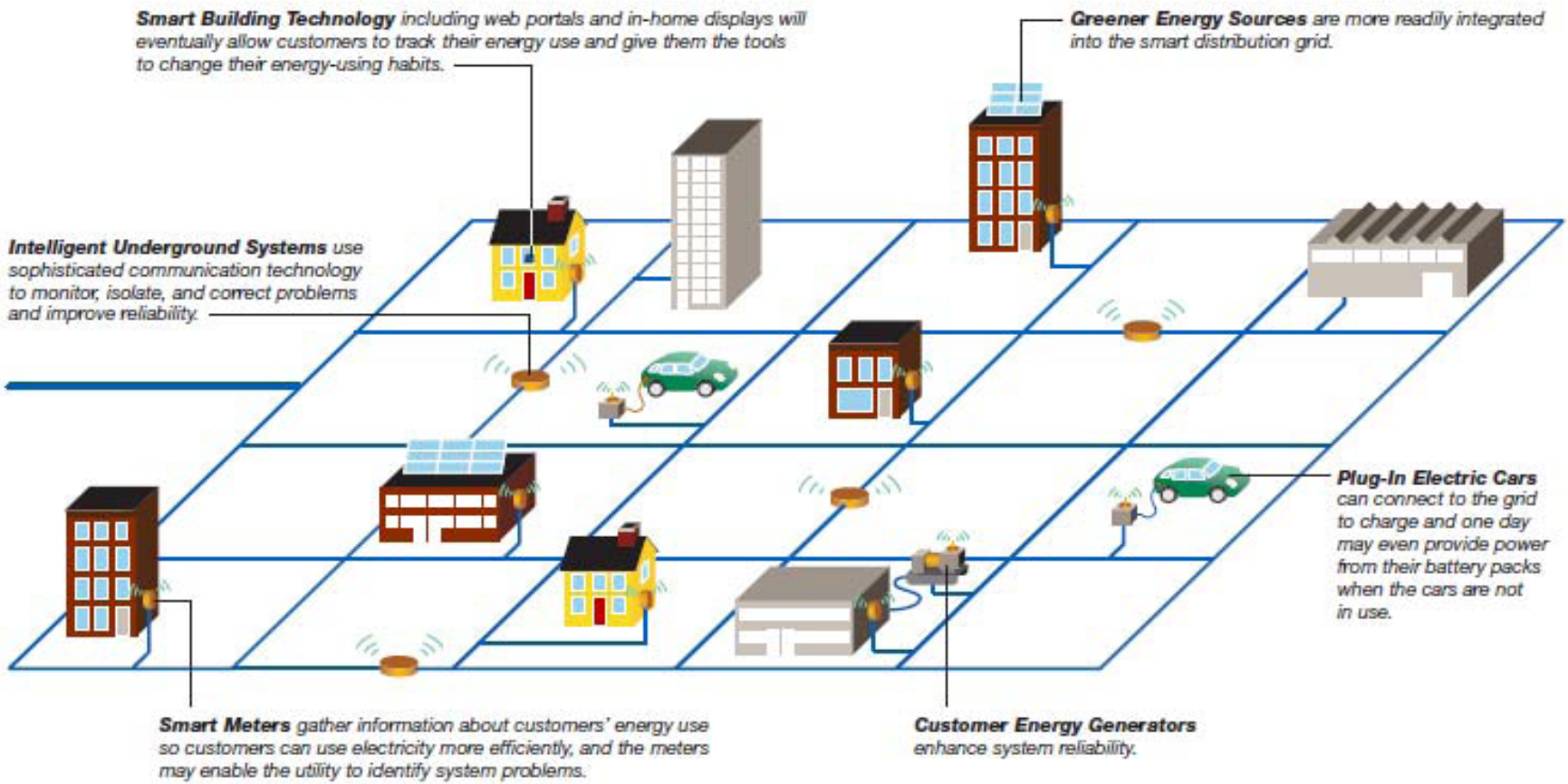
Weekly Load Profile



Daily Load Profile



The Future -- Smart Grid



Next Steps

www.solarabcs.org/FERCScreens

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