

High MW Electronics – Industry Roadmap Meeting

December 11th, 2009

NIST

Hi-MW Roadmap Leadership

- Leo Casey, Satcon Corporation
- Bob Reedy, Florida Solar Energy Center
- Charlie Vartanian, A123 Systems
- Le Tang, ABB Inc.
- David Nichols, Altairnano, Inc.
- Madhav Manjrekar, Siemens
- Sam Biondo, DOE rtd.

- Al Hefner
- Tarek Abdallah, ERDC-CERL

- Ron Wolk
- Colleen Hood

Vision

- Faster Protection & Control
 - More robust
 - More renewable
- More efficient
- More DC systems
- More electronic
 - Higher PQ
 - More μ Grids
 - Improved CF
 - More distributed
 - Reconfigurable



High MW Electronics

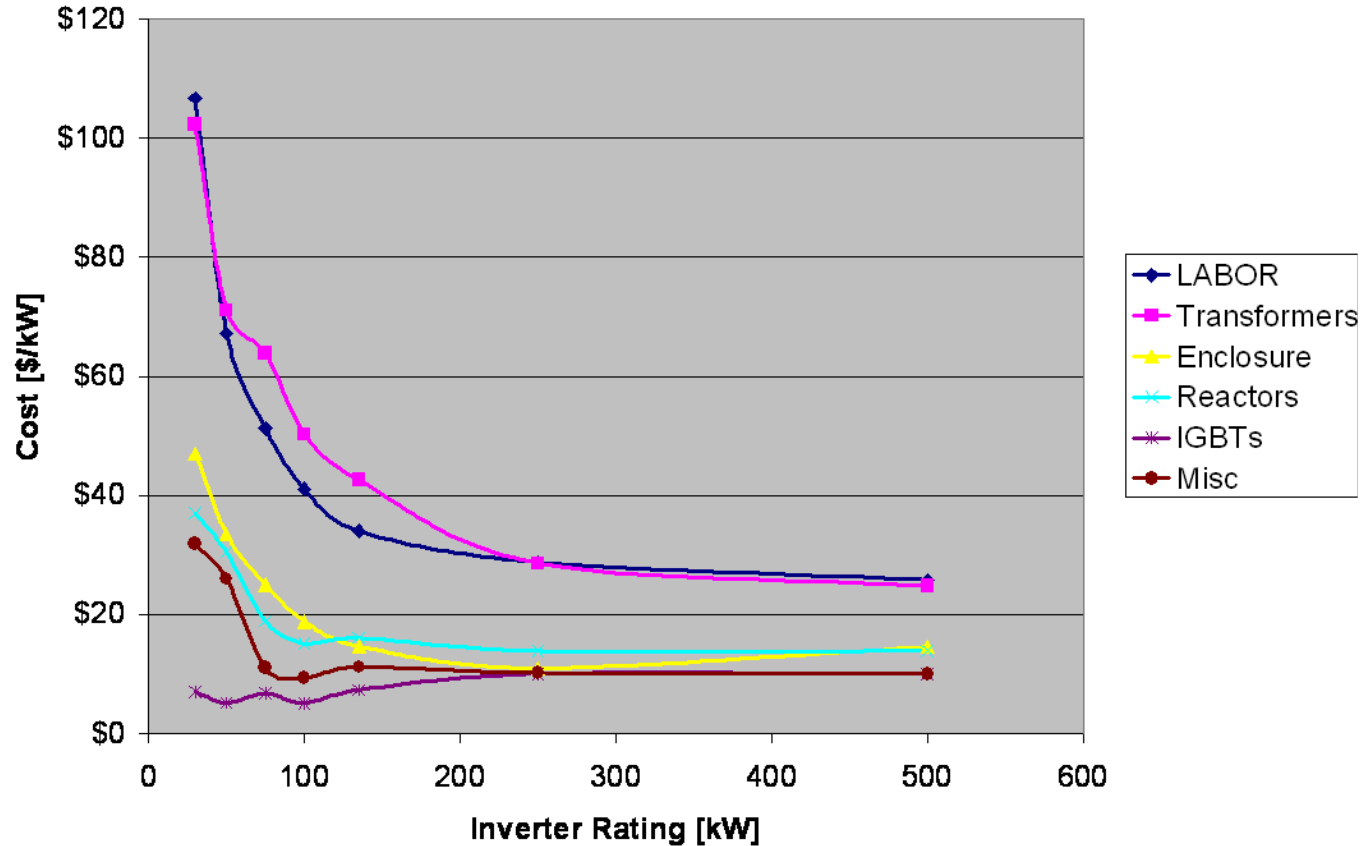
- Technology, Sources and Power Electronics and Systems
- Costs
- Scale
- Integrated/Integration
- Policy
- DC/AC
- Systems
- Safety
- Standards
- Education and Training

- Growth

Agenda

- 8:30am Opening Remarks, High MW Roadmap Committee and NIST Host
- 9:00 am David Prend, Rockport Capital, “Barriers to Large Scale Grid Penetration”
- 9:30am John Lushetsky, DOE Solar Program, Program Manger
- 10:00 Colin Schauder, Satcon, Satcon Fellow “Isochronous Grid through Electronics”
- 10:30 – 10:50 BREAK
- 10:50 Jeffrey B. Casady, SemiSouth, “ Recent Advancements in SiC power devices & the impact of normally-off SiC JFETs on PV and wind inverter platforms“
- 11:20 Jerry FitzPatrick, NIST on Smart Grid Interoperability
- 11:40 Al Hefner, NIST on Energy Storage PAP for Smart Grid Interoperability
- 12:00 – 12:45 LUNCH
- 12:45pm Charlie Vartanian, A123 Systems Energy Solutions Group, “Storage; Smart interfaces for Frequency Regulation & Beyond” “Storage, Storage interfaces, Frequency Regulation”
- 1:15pm Madhav Manjrekar, Siemens, “Green Energy and Power Systems”
- 1:45pm Le Tang, ABB “Smart Grids and Power Electronics”
- 2:15pm Kevin Tomsovic, University of Tennessee “Power System Control Issues for Renewable Integration”
- 2:45-3:00pm Concluding Remarks and Adjourn

SCALE



\$/kW flat relatively flat at 135kW and above

Large Scale



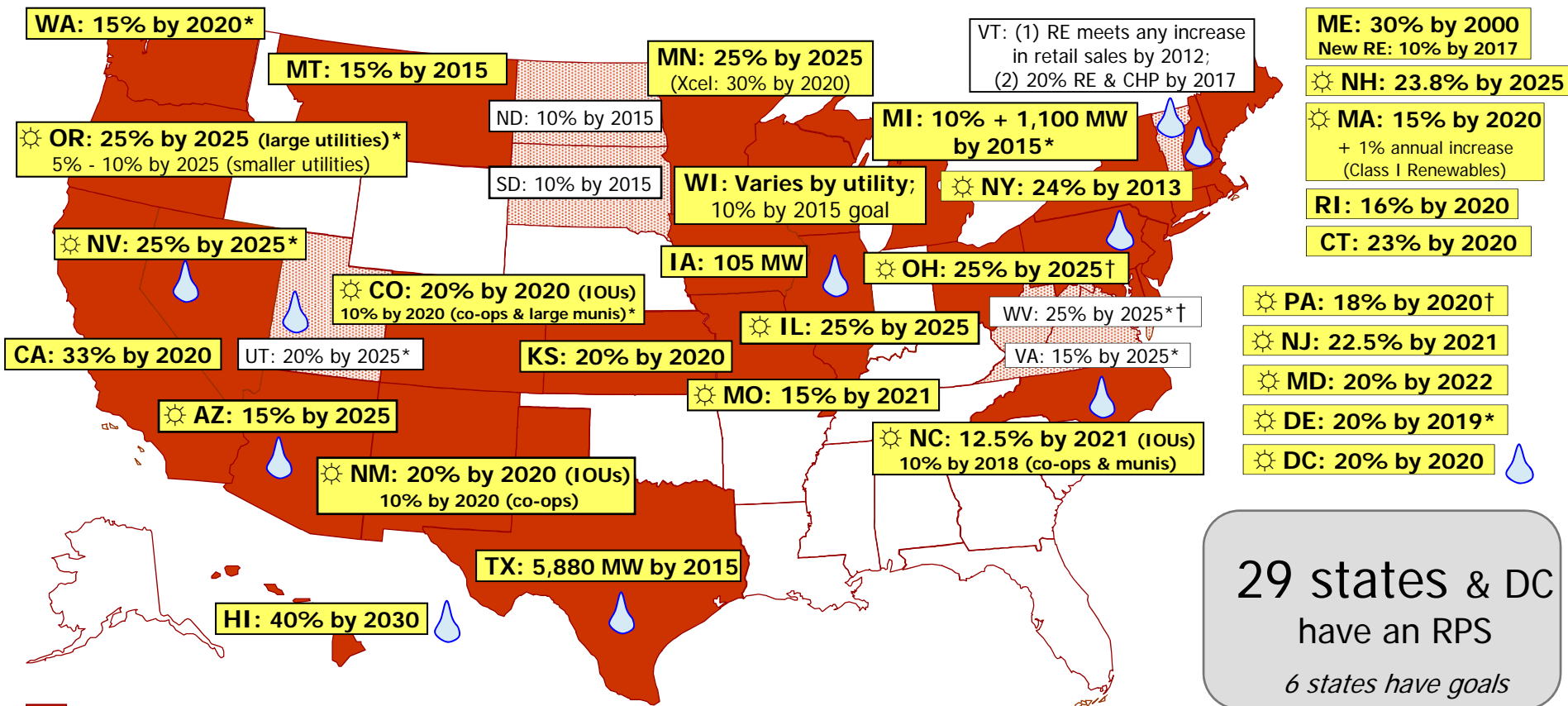
Integrated MV






Policy




Renewable Portfolio Standards

www.dsireusa.org / October 2009

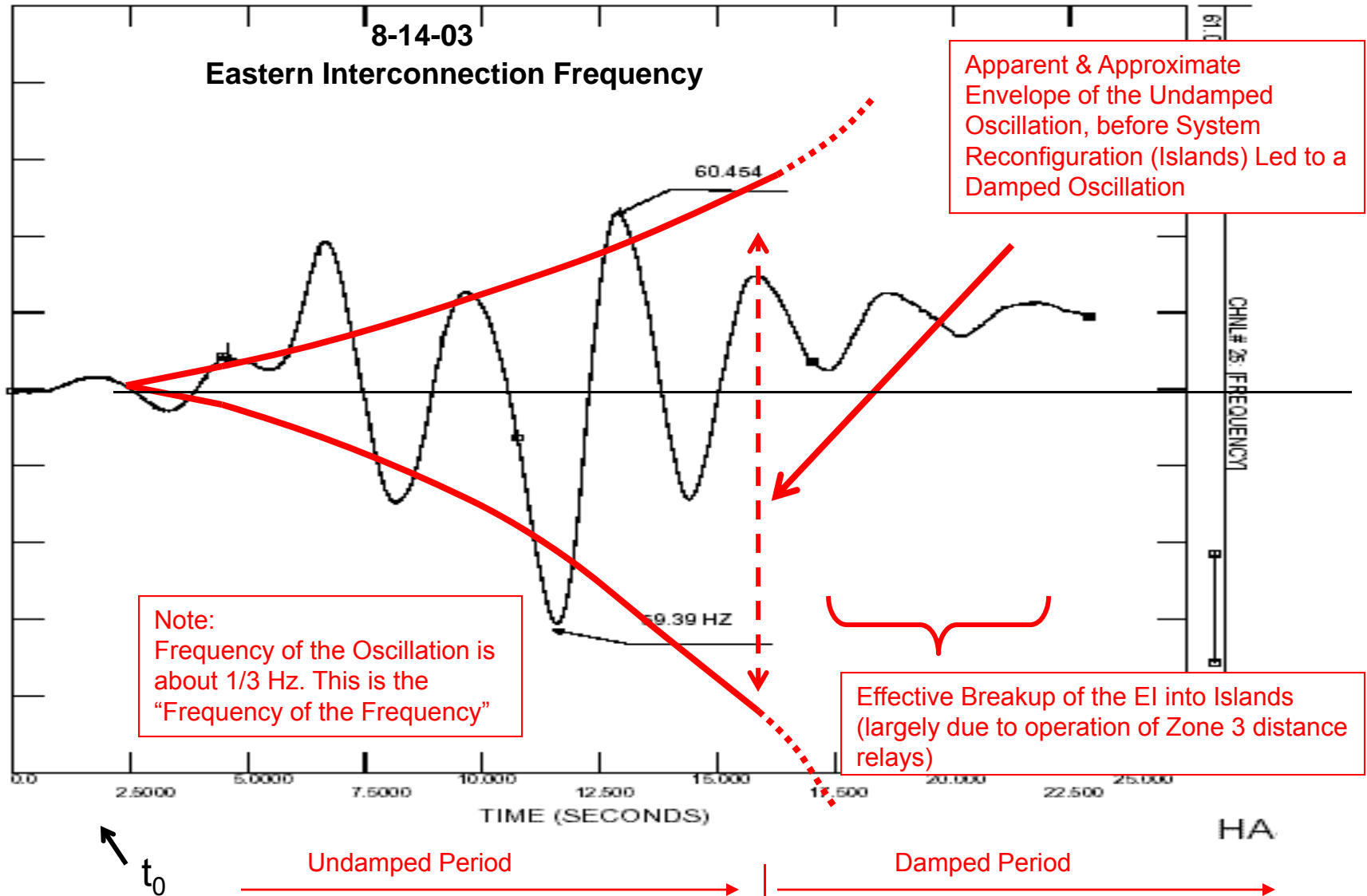


29 states & DC
have an RPS
6 states have goals

-  State renewable portfolio standard
-  State renewable portfolio goal
-  Solar water heating eligible

-  Minimum solar or customer-sited requirement
-  Extra credit for solar or customer-sited renewables
-  Includes non-renewable alternative resources

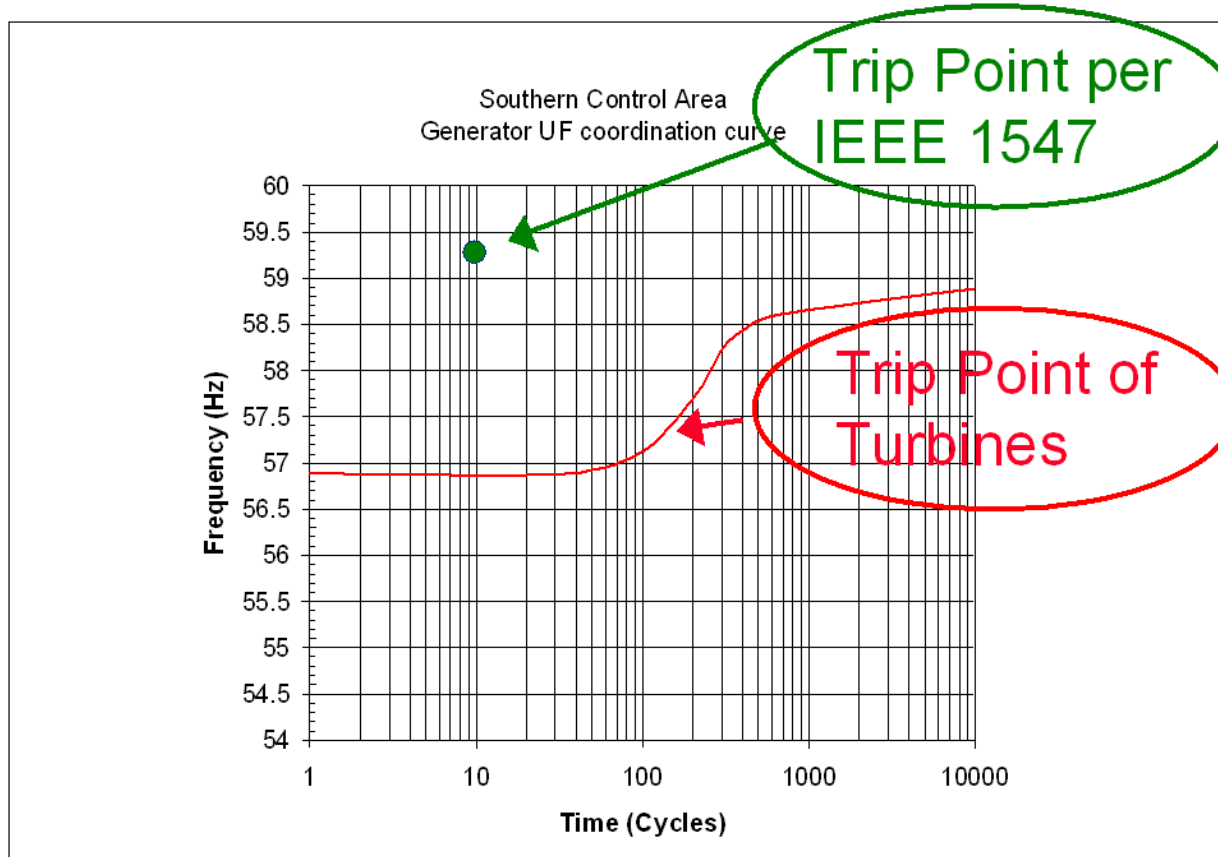
System – Real Time Control



Variability



STANDARDS



Hi-MW Roadmap Leadership

- Leo Casey, Satcon Corporation
- Bob Reedy, Florida Solar Energy Center
- Charlie Vartanian, A123 Systems
- Le Tang, ABB Inc.
- David Nichols, Altairnano, Inc.
- Madhav Manjrekar, Siemens
- Sam Biondo, DOE rtd.

- Al Hefner
- Tarek Abdallah, ERDC-CERL

- Ron Wolk
- Colleen Hood