

U.S. DEPARTMENT OF
ENERGY

Office of
Electricity Delivery
& Energy Reliability



Considerations for a Modern Distribution Grid

Joe Paladino
U.S. Department of Energy

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Influencing Factors for Grid Modernization

“The challenge is to manage the transition and related operational and market systems in a manner that doesn’t result in an unstable or unmanageable system.”
from Grid 2020, Resnick Institute Report, Sept 2012

Federal, State and Local Policies

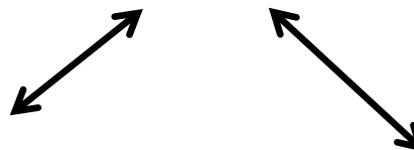
- Renewable and Efficiency Portfolio Standards
- Carbon Dioxide Reduction
- Reliability and Resilience
- Integration of Distributed Energy Resources

Technology Availability

- Information and Communication Technology
- Electric Vehicles
- Solar and Wind
- Energy Storage
- Building Energy Management Systems
- Microgrids

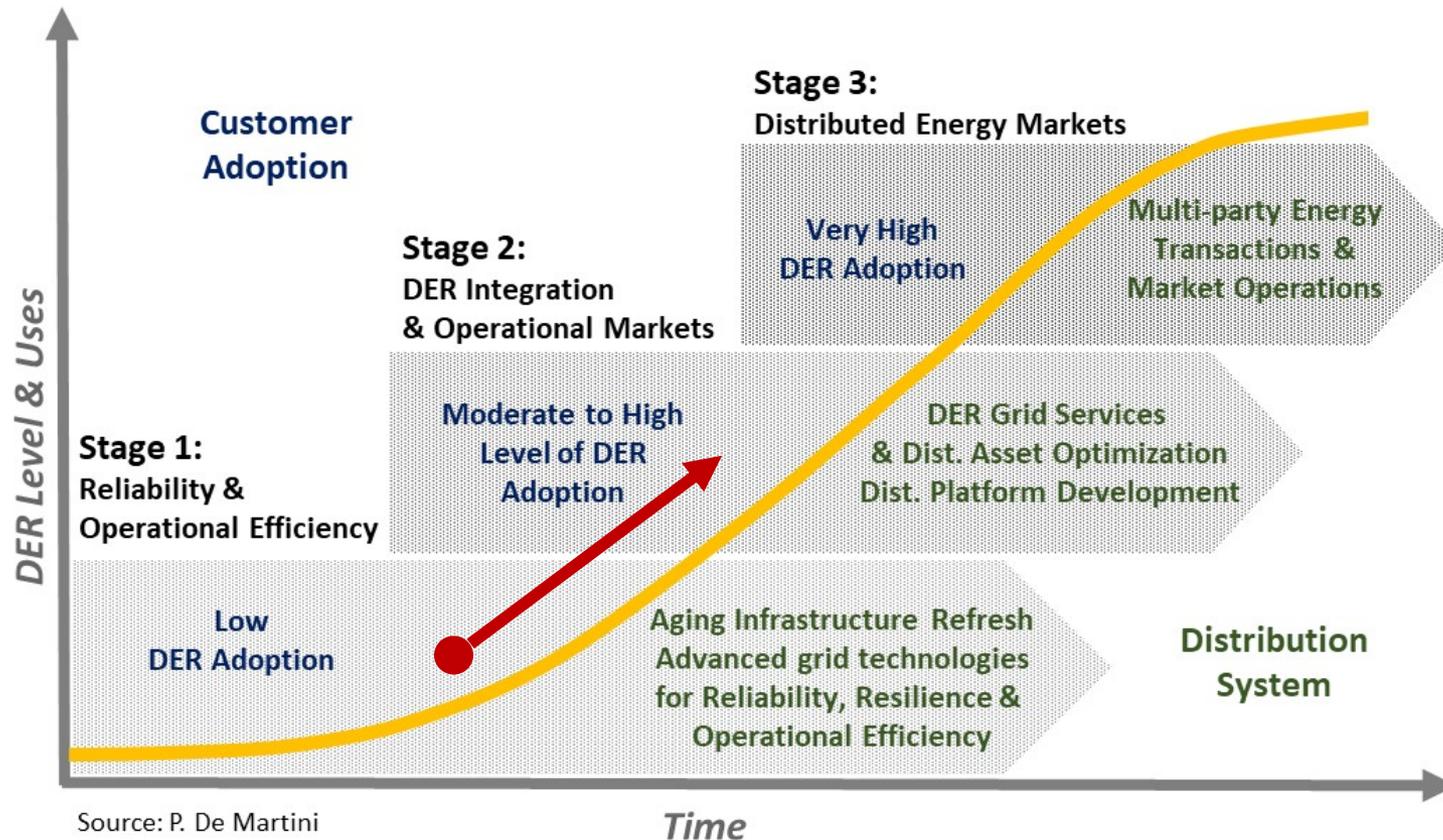
New Participants

- Customers/Prosumers
- Merchants
- Technology Providers



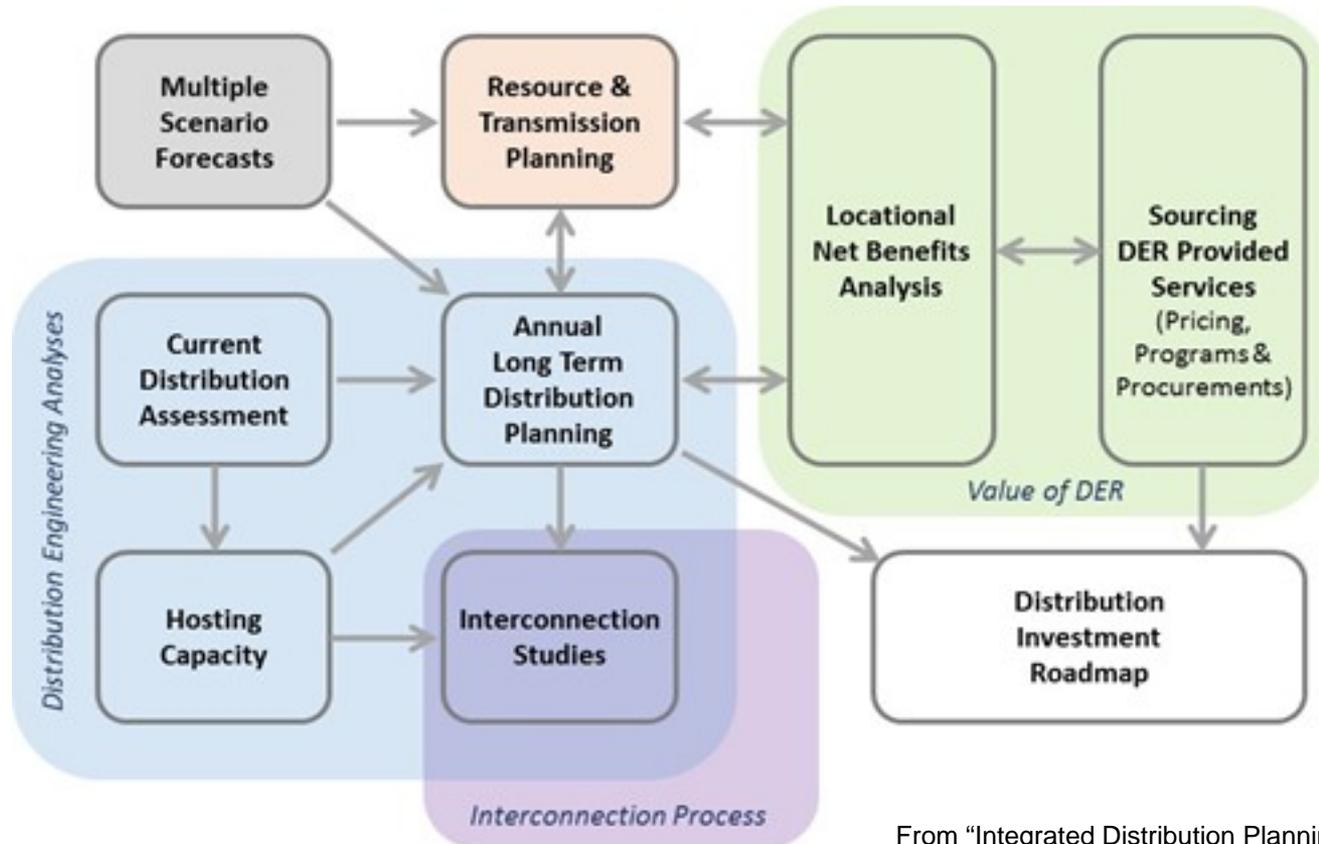
Distribution Grid Evolution

US distribution systems currently have Stage 1 functionality - a key issue is whether and how fast to transition into Stage 2 functionality



Integrated Planning Considerations

Integrated planning and analysis needed within and across the transmission, distribution and customer/3rd party domains



From “Integrated Distribution Planning”, August 2016, prepared for the MN PUC, ICF International

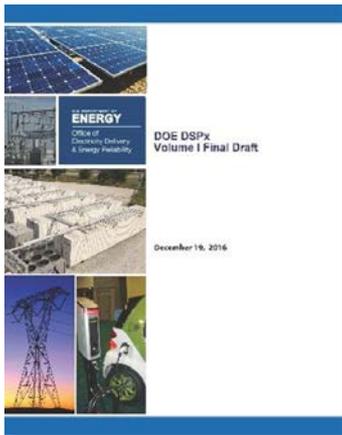
Thank You

Contact:

Joe Paladino, joseph.paladino@hq.doe.gov

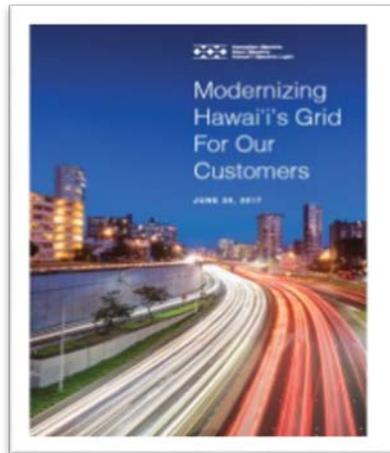
References:

Modern Distribution Grid Report



www.doe-dsp.org

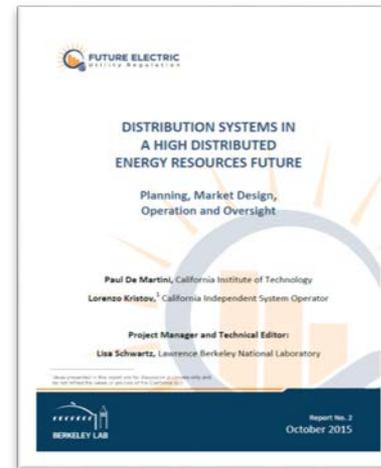
Grid Modernization Strategy



[www.hawaiianelectric.com/
gridmod](http://www.hawaiianelectric.com/gridmod)



DSO Paper



[https://emp.lbl.gov/
projects/feur](https://emp.lbl.gov/projects/feur)

Grid Architecture



<http://gridarchitecture.pnnl.gov>