



IRP from Both Sides Now: Updating Utility Planning for DER

Tom Stanton
Principal Researcher – Energy and Environment
National Regulatory Research Institute

tstanton@nrri.org

517-775-7764

www.nrri.org

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Why is this imperative?

- Aging infrastructure
- Flat or declining load & revenues
- Environmental pressures
- Rapidly proliferating DER options
- Consumer choices and customer needs for 21st Century power quality, reliability, resiliency
- Energy/Water Nexus

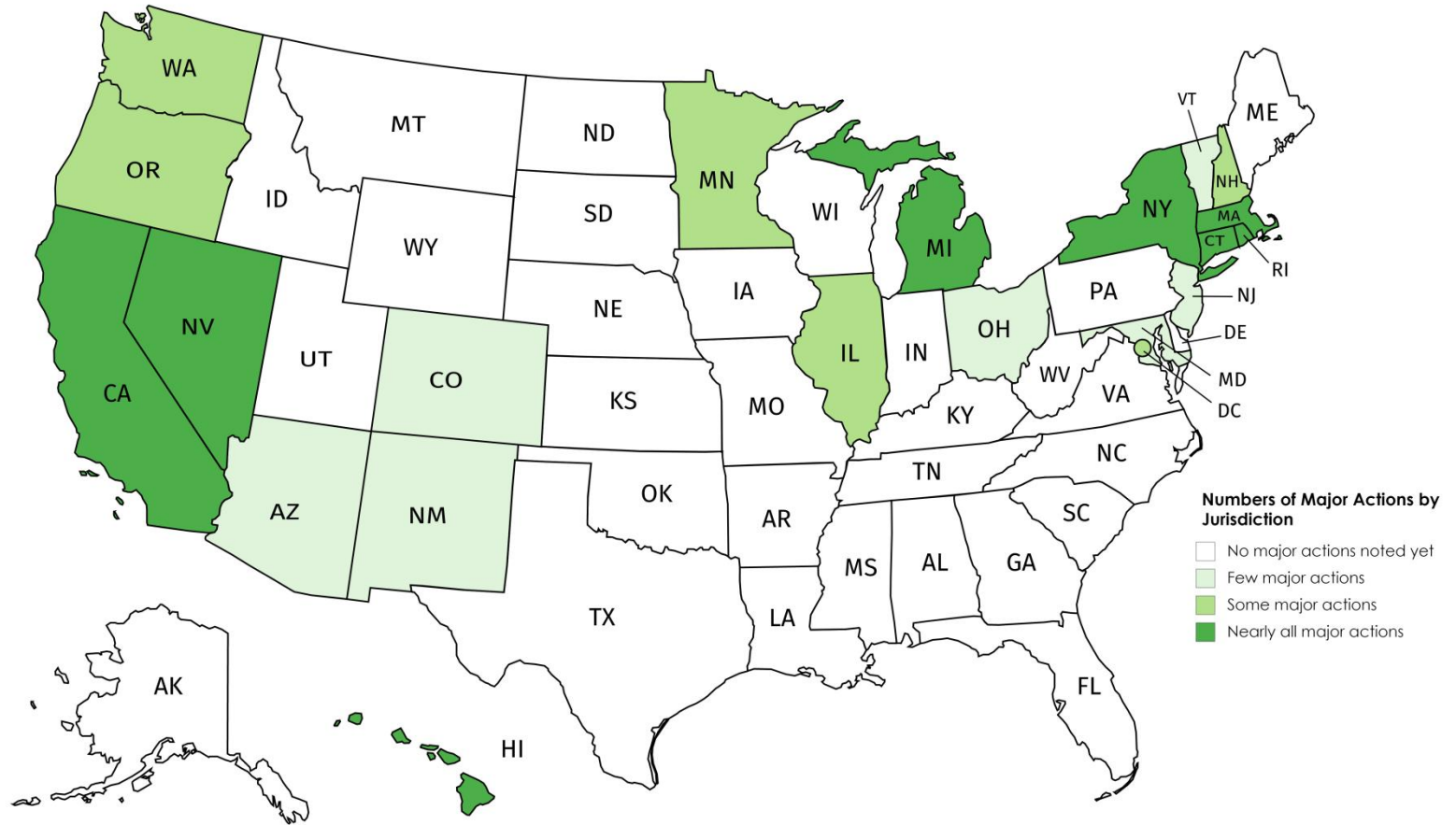


Major actions in 20 states & DC

- Broad grid-modernization dockets (15 states)
- Utility business model reviews (11 states)
- Incorporating DER into IRP (8 states)
- Updating distribution system planning (DSP) methods (12 states)
- Geo-targeting, microgrids, and NWAs (9 states)
- Energy storage studies, procurement (14 states)
- Others (16 states): broad rate reforms (4 states), BTM storage and solar+storage rates (4 states), storage financial incentives (4 states), data access dockets (3 states), and more...



Preliminary map: Where the action is



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States with broad “grid-modernization” activities

- California
- District of Columbia
MEDSIS
- Connecticut
- Hawaii
- Illinois *NextGrid*
- Maryland
- Massachusetts
- Michigan
- Minnesota *e21*
- New Hampshire
- New York *REV*
- Ohio
PowerForward
- Oregon
- Rhode Island
Power Sector Transformation
- Vermont

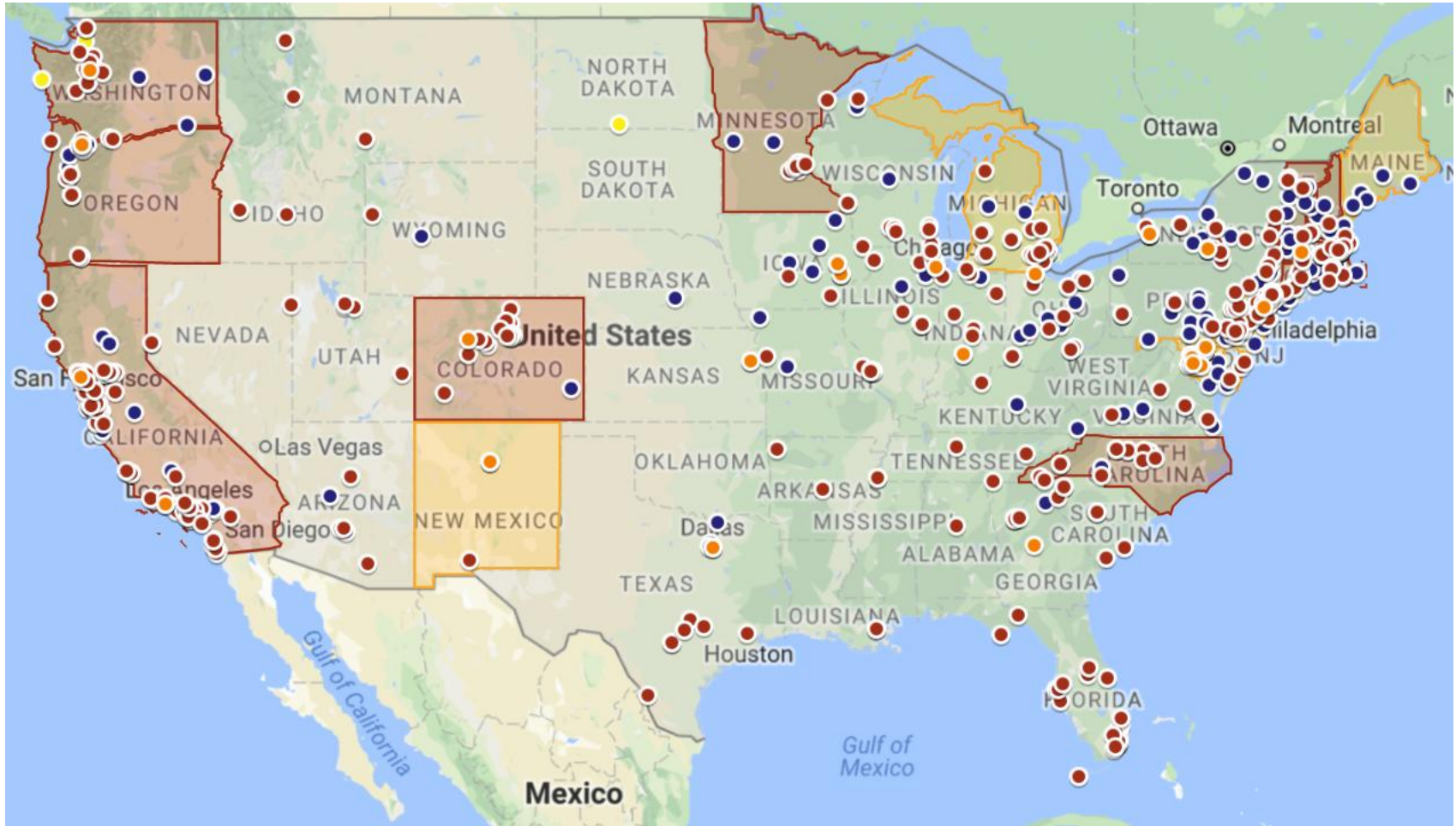
- **Modernizing distribution systems planning (DSP):** California, Connecticut, Hawaii, Maryland, Massachusetts, Michigan, Minnesota, Nevada, New Hampshire, New York, Rhode Island, Washington
- **Addressing how to evaluate DER in IRP:** California, Connecticut, Hawaii, Michigan, Nevada, New Mexico, New York, Washington
- **Address non-wires (a.k.a. non-transmission) alternatives:** California, Connecticut, Hawaii, Illinois, Massachusetts, Michigan, New Hampshire, New York, Rhode Island, Vermont, plus Bonneville Power Administration



Major voluntary climate actions

- Non-federal mandates on climate change, driving major changes in energy and water use:
 - Architecture 2030 and 2030 Districts – <http://www.2030districts.org/>
 - Climate Action in Financial Institutions – <https://www.mainstreamingclimate.org/>
 - Climate Mayors – <http://climatemayors.org/>
 - [Investment] Portfolio Decarbonization Coalition – <http://unepfi.org/pdc/>
 - [University] Presidents' Climate Leadership Commitments – <http://secondnature.org/who-we-are/network/>
 - “We are still in” – <https://www.wearestillin.com/about>

Climate actions in states, cities, and more



Source: <https://www.climateinteractive.org/programs/us-subnational-climate-action/>,

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Utility-driven developments

- Duke's McAlpine (North Carolina) “utility-controlled, single-customer microgrid”
- Ameren's Champaign, Illinois, microgrid
- SCE, NEST, and SoCal Gas collaborate on the “rush hour rewards” program – 50MW virtual power plant
- Arizona Public Service / Sonnen Mandalay Homes – solar+storage+aggregated-controls in a 2,900-home “clean energy hive” virtual power plant
- Dozens of community-solar projects



Customer driven developments

- Irrespective of geography
 - User-selected market-based solutions
 - Example: corporate clean energy commitments
- Location-specific
 - Department of Defense microgrids; “public purpose microgrids;” university campuses
 - Voluntary climate actions & Net-zero developments
 - Market-based enticing, even contagious solutions, as neighbors emulate neighbors
 - Off-grid and village-scale systems



Customer-favorite DER choices

- REBA for clean power <www.rebuyers.org>
 - “more than 60 iconic, multinational companies” with the goal of adding 60GW new renewable energy in U.S. by 2025
- Community solar, community storage
- “6 to 9 nines” reliability
 - DOD bases and public purpose microgrids
- PACE and on-bill financing – comprehensive energy make-overs, using other people’s money
- Other: LED lighting, Rooftop solar, BTM batteries and PEVs, IOT, precision agriculture, and more



3rd-party driven developments

- Booth Bay Harbor, Maine
- Demand-response aggregators
- Storage for demand-charge savings
- Aggregated solar+storage



Blended developments

- Brooklyn-Queens Demand Management Project, followed by multiple NTA/NWA examples from LIPA, NYSEG, and RGE
- Clean-coalition community microgrid projects
- New York Prize “opportunity zones” open to microgrid developments by all comers, *including rate-based utilities*
- Xcel/Panasonic Peña Station Microgrid, Denver
- Community shared-solar and -storage projects



Sidebar topic: Forecasting DER

- What are the best practices in forecasting DER?
- Forecasting both generic growth rates and geo-targeted spread of DER technologies

- Please nominate more action categories and case studies to be included
- We are looking for any and all ideas about how all interested parties can best move forward together