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EASTERN INTERCONNECTION STATES' PLANNING COUNCIL

Eastern Interconnection States' Planning Council: Formation and Future

Commissioner Lauren Azar
Public Service Commission of Wisconsin
President of EISPC

8th EU-US Energy Regulators Roundtable
26-27 October 2010
Berlin, Germany

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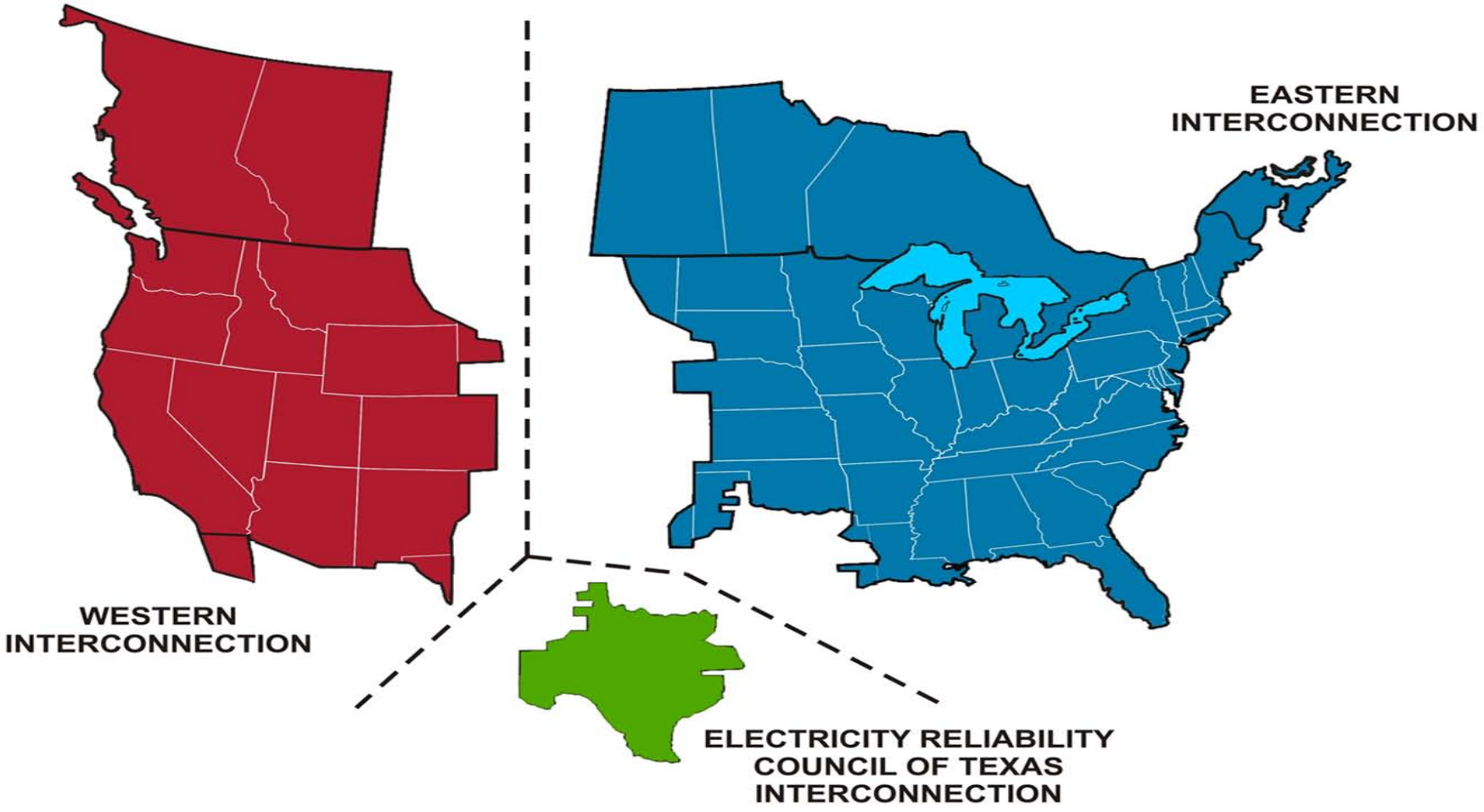
North American Electric Reliability Corporation Interconnections



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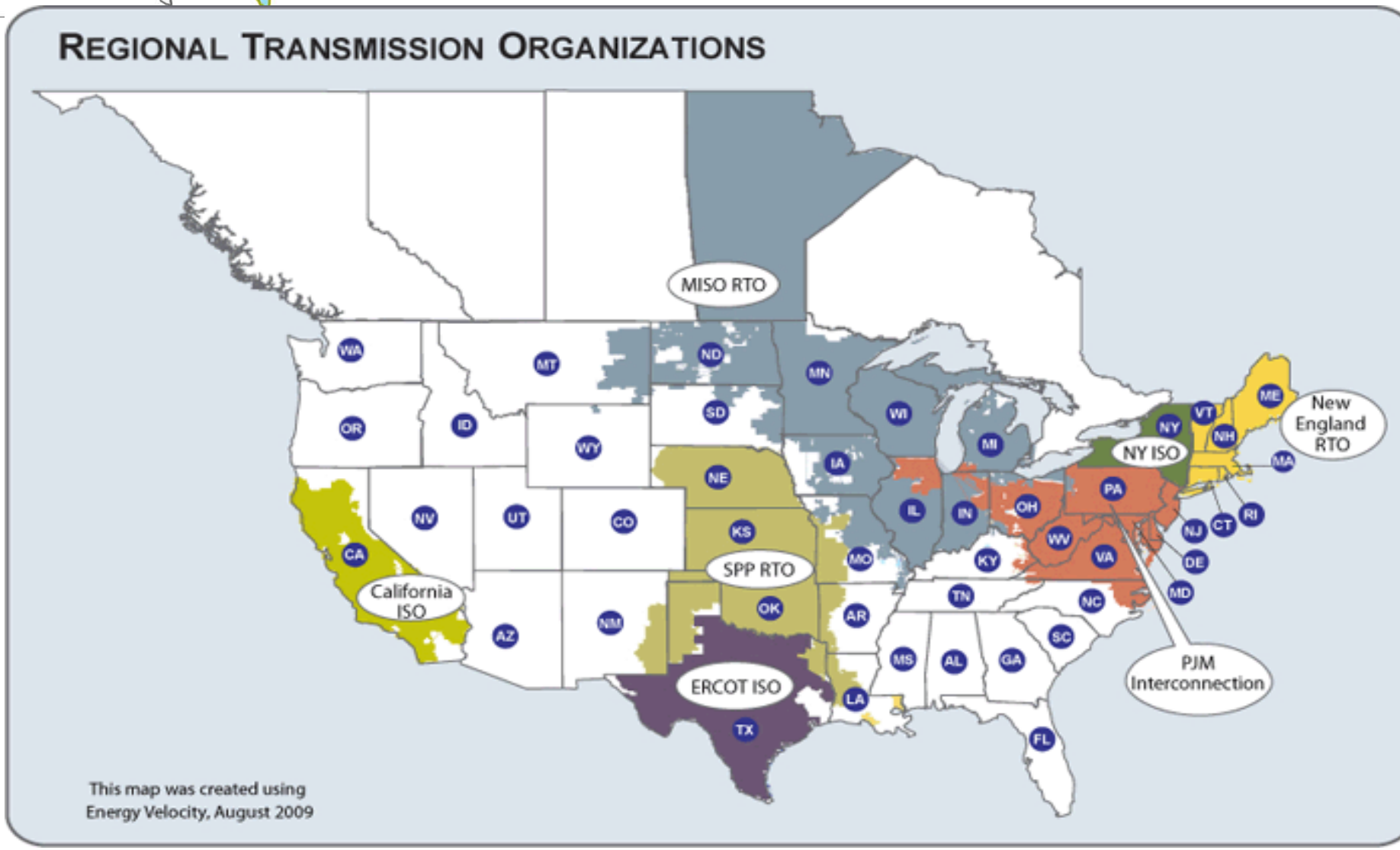

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WHY INTERCONNECTION-WIDE STUDIES?

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Why Interconnection-Wide Studies?

1. **Recognize Interdependence**

2. **Changes in Generation Portfolio**
   - A. Renewable Energy Development
   - B. Carbon Emission Limits
   - C. Other Policy Initiatives (efficiency, etc…)

3. **Economies of Scale**

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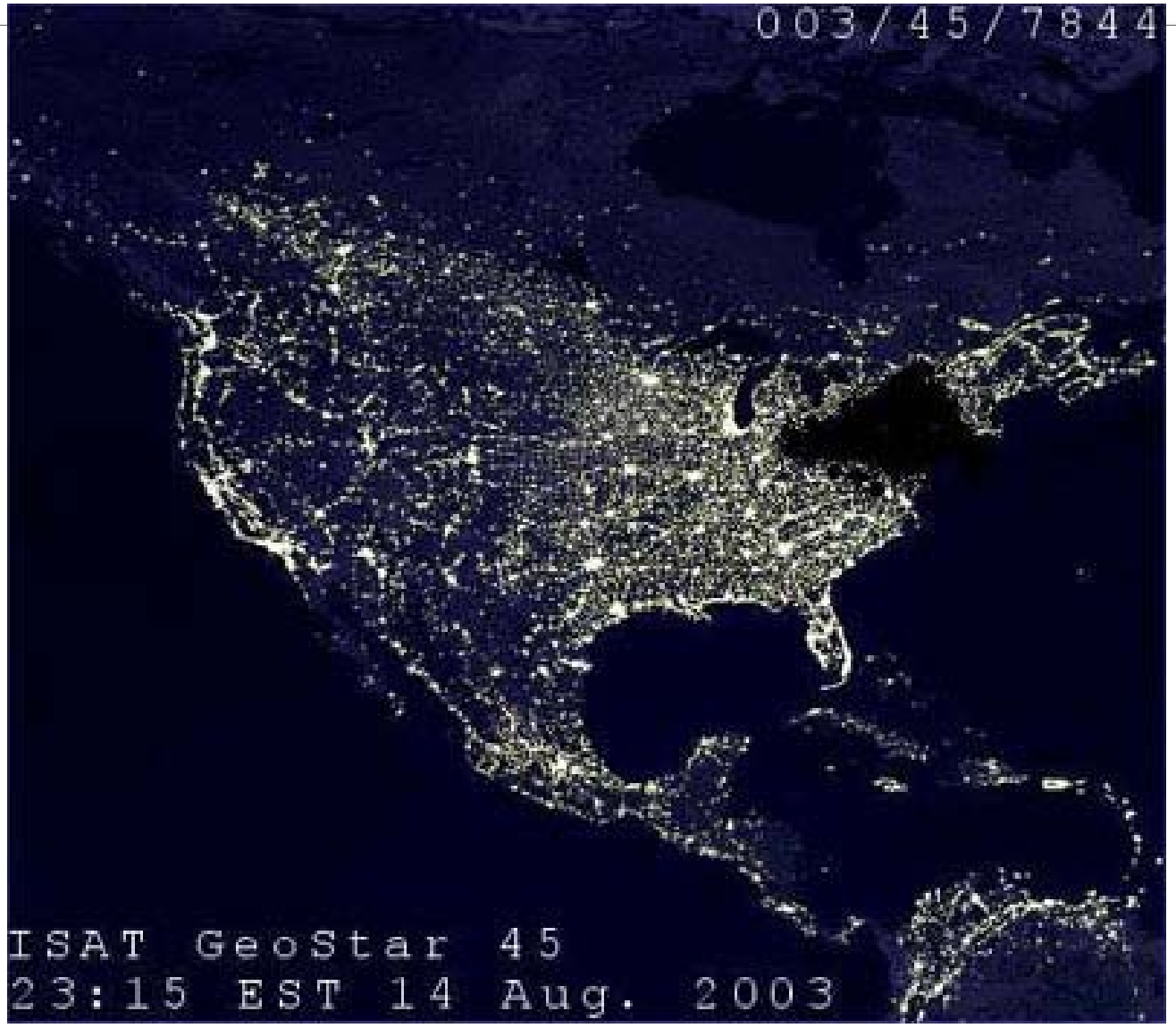
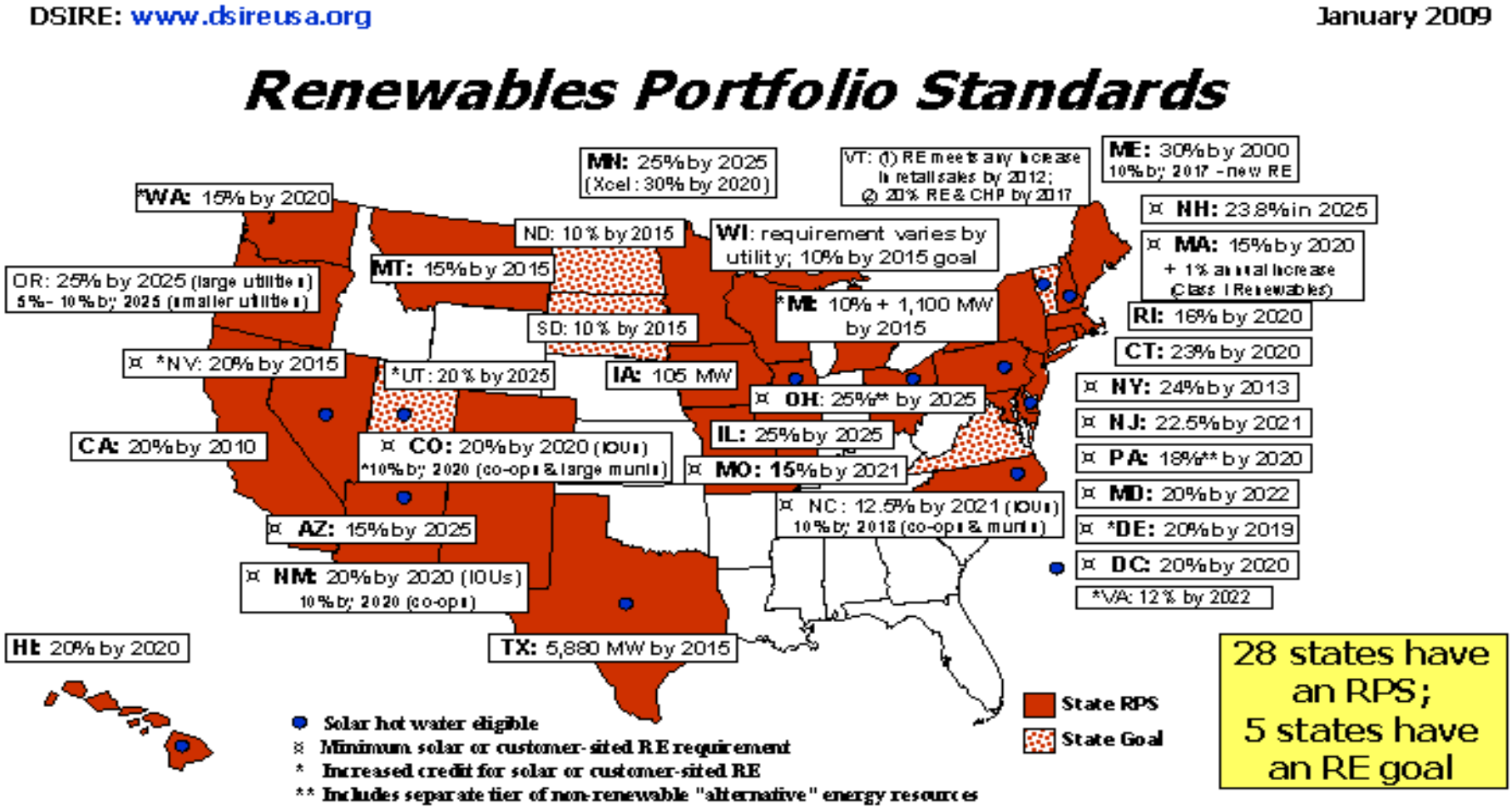
Interdependence

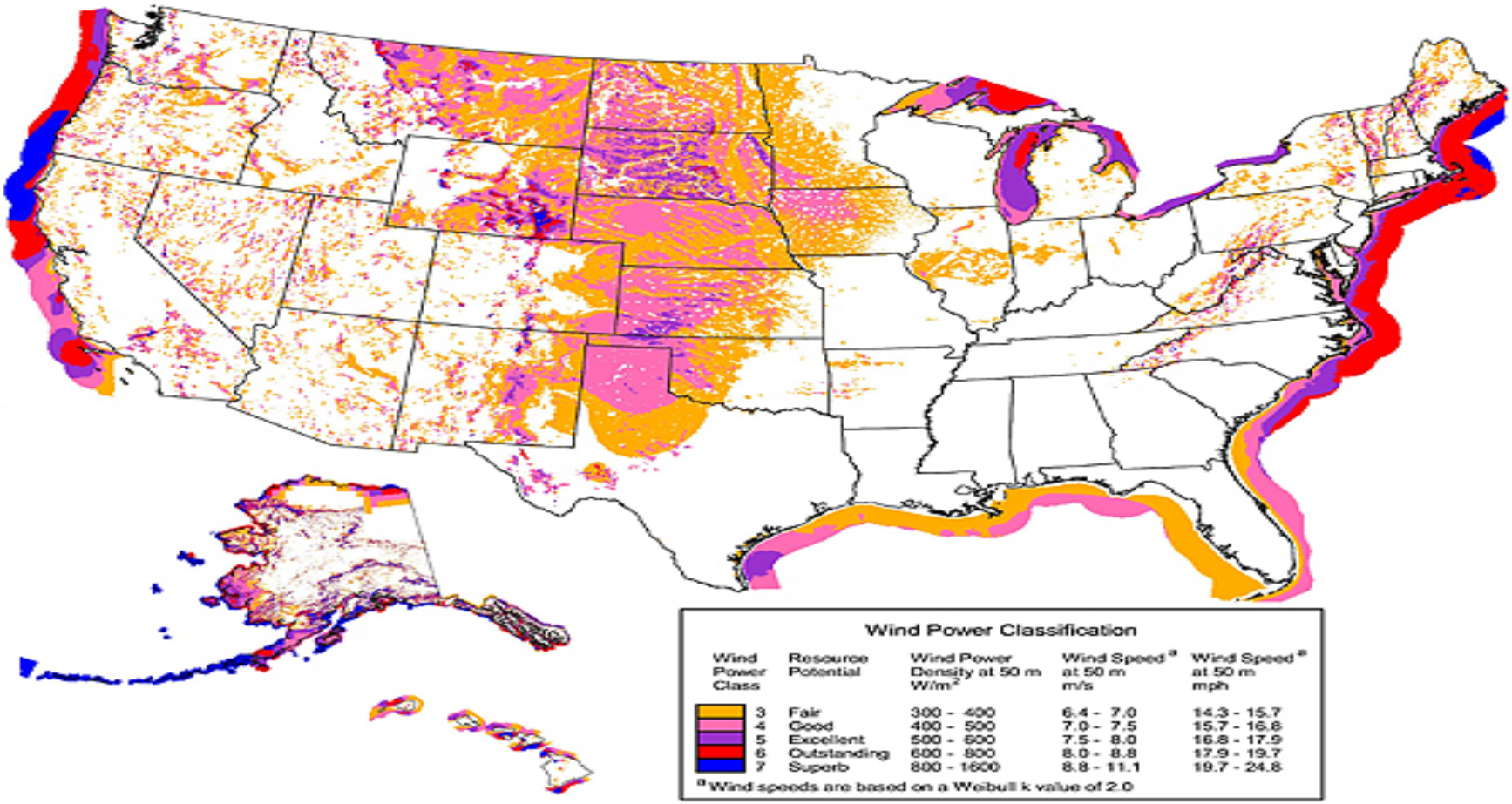
Artist Rendition of 14.8.2003 blackout, at time of voltage collapse



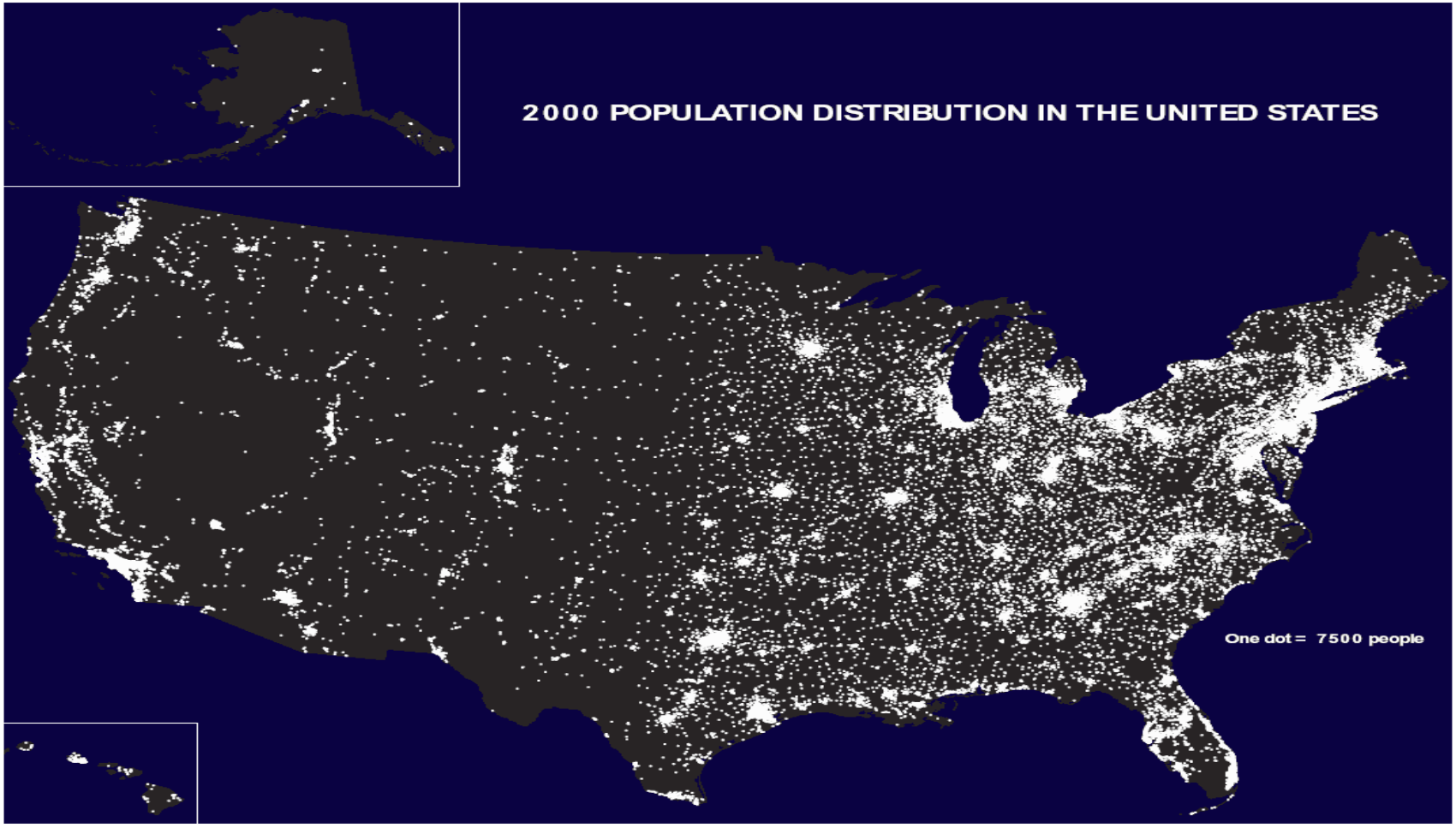
Renewable Requirements in the States – NOT A UNIFORM REQUIREMENT!



Wind Resources in the U.S.



Population distribution in the US.



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ULTIMATE QUESTION

Is it better to build renewable generation:

(1) where the resource is best (far from populations) and transport electricity,

or

(2) close to populations where the resource is less efficient?

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U.S. DEPARTMENT OF ENERGY (DOE) FUNDING FOR EASTERN INTERCONNECTION PLANNING

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EISPC ("Ice Pick") SNAPSHOT

States in Eastern Interconnection requested federal funding to

- facilitate "development of regional transmission plans" and
- "conduct a resource assessment and an analysis of future demand and transmission requirements."

$14,000,000 award

- NARUC => funding administrator
- EISPC => hiring its own staff

EISPC Council

- Two voting representatives per state
- One staffer per state for support

States act in own interest – recognizing collective action may be best

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EISPC DEVELOPMENT

May 2009

- 20 Commissioners meet to discuss how to respond to expected federal funding

June 2009

- US Department of Energy (DOE) issues its Notice of Funding Opportunity
- 33 of the 41 “states” meet and decide to apply collectively for funding

September 2009

- Proposal seeking $14.8 million submitted to DOE
- 38 of the 41 states support proposal; 3 states abstain

June 2010

- NARUC (on behalf of EISPC) signs cooperative agreement with DOE

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TWO TEAMS IN PLANNING EFFORT

Engineering Team

- Planning Authorities =
  - Regional Transmission Organizations (RTO)
  - Transmission Owners
- $16 million
- Run models and prepare the transmission plans
- Stakeholder Committee – provides strategic advice

Policymakers Team (EISPC)

- State representatives
- $14 million
- Provide inputs to modelers through Stakeholder Committee
- Conduct Studies
- Prepare Whitepapers

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WHAT WILL BE STUDIED IN THE EASTERN INTERCONNECTION?

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Engineering Team Tasks

1. **Existing 10-Year Plans**
   - Mostly plans for resolving reliability problems
   - Plans stitched together
   - Stability & Gap Analysis
2. **20-Year Plans for Generation Portfolio**
   - 8 hypothetical “futures” will be modeled for scenario planning
3. **20-Year Plans for Transmission Grid**
   - Transmission grids will be designed for 3 of the 8 hypothetical futures
   - Production costs will be calculated

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EISPC TASKS

1. **Coordinate with Engineering Team**:
   - Identify 8 hypothetical futures
   - Select 3 hypothetical futures for grid design
   - Provide input on grid design
   - Participate in the Stakeholder Steering Committee.
2. **Conduct Studies to Inform Future Transmission Studies and State Decision-Making**
3. **Prepare Whitepapers to Inform Decision=Making**

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EISPC PROGRESS

Defined 5 of 8 futures

(1) Business as usual;
(2) Carbon Constraints;
(3) Renewable Portfolio Standard;
(4) Nuclear Resurgence; and
(5) Energy Efficiency, Demand Response, & Smart Grid

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THE END

APPENDIX:

SHORT DEFINITIONS OF THE

5 “FUTURES” THAT EISPC HAS PRELIMINARILY SELECTED (AS OF 25/10/10) FOR THE 20-YEAR GENERATION PORTFOLIO MODELING

ARE PROVIDED IN THIS APPENDIX.

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FUTURE: BUSINESS AS USUAL

FUTURE IS CHARACTERIZED BY THE FOLLOWING ASSUMPTIONS:

- Existing state renewable portfolio standards, energy efficiency, demand response and emission mandates are modeled in full;
- EPA non-carbon regulations are applied including the draft SO_x, NO_x and mercury rules;
- Penetration of PHEVs – yes;
- Fuel prices and emission prices (where applicable) at moderate levels;
- New generation added based on regional capital and variable O&M costs from an expert database and limited by legal mandates; state-sanctioned resource plans are included;
- Discount and inflation rates at average/mid-range level; and
- Generation expansion would be intra-regional/PA.

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FUTURE: BUSINESS AS USUAL
9 POSSIBLE SENSITIVITIES

1. No new non-carbon EPA regulations.
2. No Build (build nothing, nowhere, not even for reliability), EE is part of the solution.
3. Only use achievable state EE, DR, RPS requirements, regardless of what is mandated.
4. Higher penetration of PHEVs.
5. High load growth.
6. Low load growth.
7. High/volatile gas prices.
8. Increased generation costs.
9. Inter-regional fee/dispatch barriers removed.

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FUTURE: CARBON CONSTRAINTS

FUTURE IS CHARACTERIZED BY THE FOLLOWING ASSUMPTIONS:

- 80% carbon reduction by 2050, including intermediate linear targets of 42% by 2030;
- 15% National RPS as defined by EISPC and the model;
- Carbon capture/sequestration with defined availability;
- Energy efficiency/demand response available at low cost;
- Prices/costs trend upwards (fuel, etc.);
- Load growth defined by MRN model;
- Inflation rate defined by MRN model;
- Lower capital costs for nuclear/nuclear allowed to build or upgrade (in the entire Eastern Interconnect regardless of state restrictions);
- High PHEV/EV penetration;
- Increase access to Canadian exports into the US (priced appropriately including needed transmission and commodity cost);
- Incentives for low and no carbon generation; and
- Allow carbon offsets (may be limited).

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FUTURE: CARBON CONSTRAINTS
9 POSSIBLE SENSITIVITIES

1. Reduced carbon reduction targets.
2. Lower cost of carbon capture/sequestration.
3. High Load growth.
4. Low Load growth.
5. No new access to Canadian exports into US.
6. Limited new/upgraded nuclear plants.
7. Lower PHEV penetration.
8. Increased/volatility in gas prices.
9. Carbon offsets unless model allows.

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FUTURE: RENEWABLE PORTFOLIO STANDARD

FUTURE IS CHARACTERIZED BY THE FOLLOWING ASSUMPTIONS:

- 25% national RPS with unconstrained transmission possibilities not limited by market or by in-state siting or source preference;
- Renewable resource defined as wind, solar, geothermal, biomass, landfill gas, fuel cell using renewable fuels, marine and hydrokinetic, and hydro;
- Extension of tax credits equalized for all renewable resources;
- Existing state energy efficiency, demand response, and emission requirements continue;
- EPA non-carbon regulations are applied including the draft SO_x, NO_x and mercury rules;
- Low level penetration of PHEVs by 2030;
- Load growth rates per MRN model;
- Emission and fuel prices from MRN model; and
- Discount and inflation rates at average/mid-range level.

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FUTURE: RPS
9 POSSIBLE SENSITIVITIES

1. Use local renewable resources before importing new renewable resources.
2. Low cost v. high cost of renewable resources.
3. Apply existing in-state siting or source preferences.
4. Increase energy efficiency and demand response requirements to meet state RPS requirements.
5. No new non-carbon EPA regulations.
6. High penetration of PHEVs.
7. High gas costs.
8. High load growth.
9. Low Load growth.

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FUTURE: NUCLEAR RESURGENCE

FUTURE IS CHARACTERIZED BY THE FOLLOWING ASSUMPTIONS:

- Low capital costs/increase subsidies for new nuclear generation;
- No limitations on construction (i.e., state moratoria eliminated);
- Force in any nuke plant that has an application pending today (based on timeline in application);
- Assume high availability of new plants starting in 2020 (with shorter lead time through streamlined regulation);
- High fuel costs for coal/gas;
- Low fuel costs for uranium;

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FUTURE: NUCLEAR RESURGENCE

- Increased Canadian exports to US, priced to include transmission and commodity costs;
- Life extensions assumed, and up-rates of existing units allowed (capital costs for up-rate at low levels);
- EPA non-carbon regulations are applied including the draft SO_x, NO_x and mercury rules;
- High availability of modular technology starting in 2025, subject to review of date; and
- Load projections based on MRN model.

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FUTURE: NUCLEAR RESURGENCE
7 POSSIBLE SENSITIVITIES

1. Low coal and low gas prices.
2. EPA carbon regulations (or leg equivalent).
3. High uranium prices.
4. Force in only those nukes with loan guarantees that are currently in the application process.
5. High load growth.
6. Canadian hydro restricted and heavy variable resource penetration.
7. Resurgence only in one or more regions with state moratoria remaining in place.

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FUTURE: ENERGY EFFICIENCY, DEMAND RESPONSE, SMART GRID

FUTURE IS CHARACTERIZED BY THE FOLLOWING ASSUMPTIONS:

- Federal mandate for 1% annual reduction in energy consumption up through 2030;
- Federal mandate for 1% annual reduction in peak demand up through 2030;
- Low costs for energy efficiency, demand response and smart grid;
- Low costs for storage technologies;
- Load growth picked by MRN model;
- Load shapes modified (Let MRN model identify if possible);
- Increase transfer capability based on new technology;
- Mid-level costs for new generation;
- Mid-level fuel costs;
- Lower PHEV penetration;
- Dynamic pricing implemented everywhere; and
- EPA non-carbon regulations are applied including the draft SO_x, NO_x and mercury rules.

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FUTURE: EE, DR & SMART GRID
5 POSSIBLE SENSITIVITIES

1. Increased mandates for reduction in energy consumption and peak demand by 2% and 4% per year.
2. PHEV penetration moderate/high due to technological capabilities of grid.
3. High load growth.
4. High natural gas prices.
5. Increased costs for DR,EE, smart grid, and storage.

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