RESOURCE INTEGRATION PANEL

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Moderator, Reource Integration Panel
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Tetra Tech, Inc.

- Tetra Tech, Inc. is a leading, U.S.-based national and international firm delivering solutions in consulting, construction, engineering, remediation and restoration
- Over 9,000 employees in 300 offices world-wide
- Consistently ranked in *Engineering News Record* as one of the top ten environmental consulting companies
- Supporting development of >200 wind farms; building 20 onshore wind farms nationwide
- Offshore Wind Farm & Interconnections Siting/Permitting
  - Bluewater Wind Delaware, New Jersey & NYPA RFP
    - MMS Met Tower Leases & Army Corps and EPA Permits
  - Deepwater Wind Block Island Avian Studies
  - Offshore MW LLC – Siting wind farm south of Cape & Islands

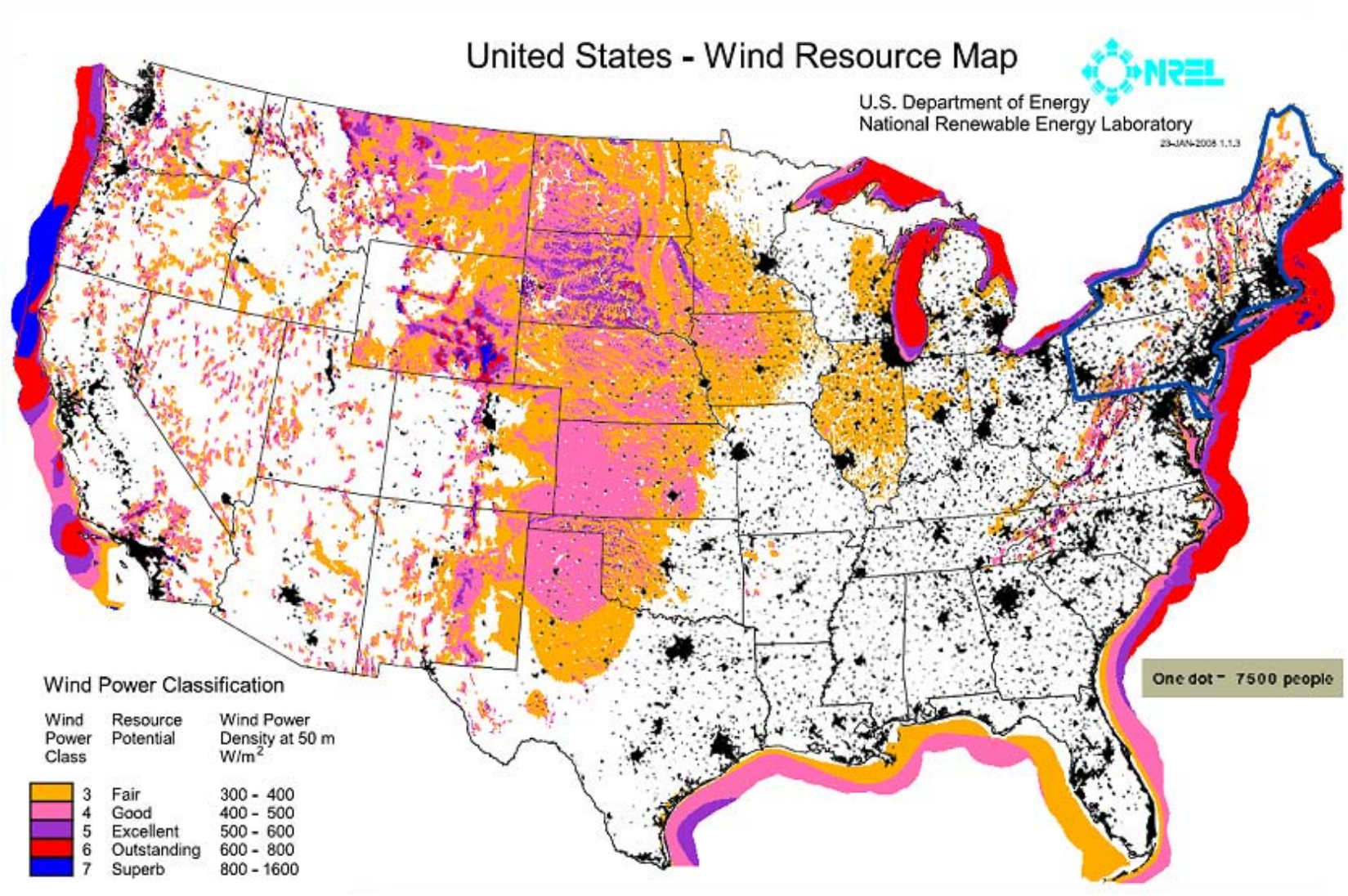
Resource Integration for Dummies

- Reliable Electricity: Demand=Supply
- Variable Energy Resources
  - Wind – Lack or High-Wind Safety Cutoff
  - Solar – Easier to forecast
- ISO-NE Dispatches Resources to Maintain Balanced Grid
  - Optimal Transmission
  - Reserve & Peaking Generation Units
  - Demand Side Resource Programs – Forward Capacity Market??
  - Energy Storage Technologies
    - Batteries
    - Flywheels
    - Capacitors
    - Pumped Hydro
    - Compressed Air

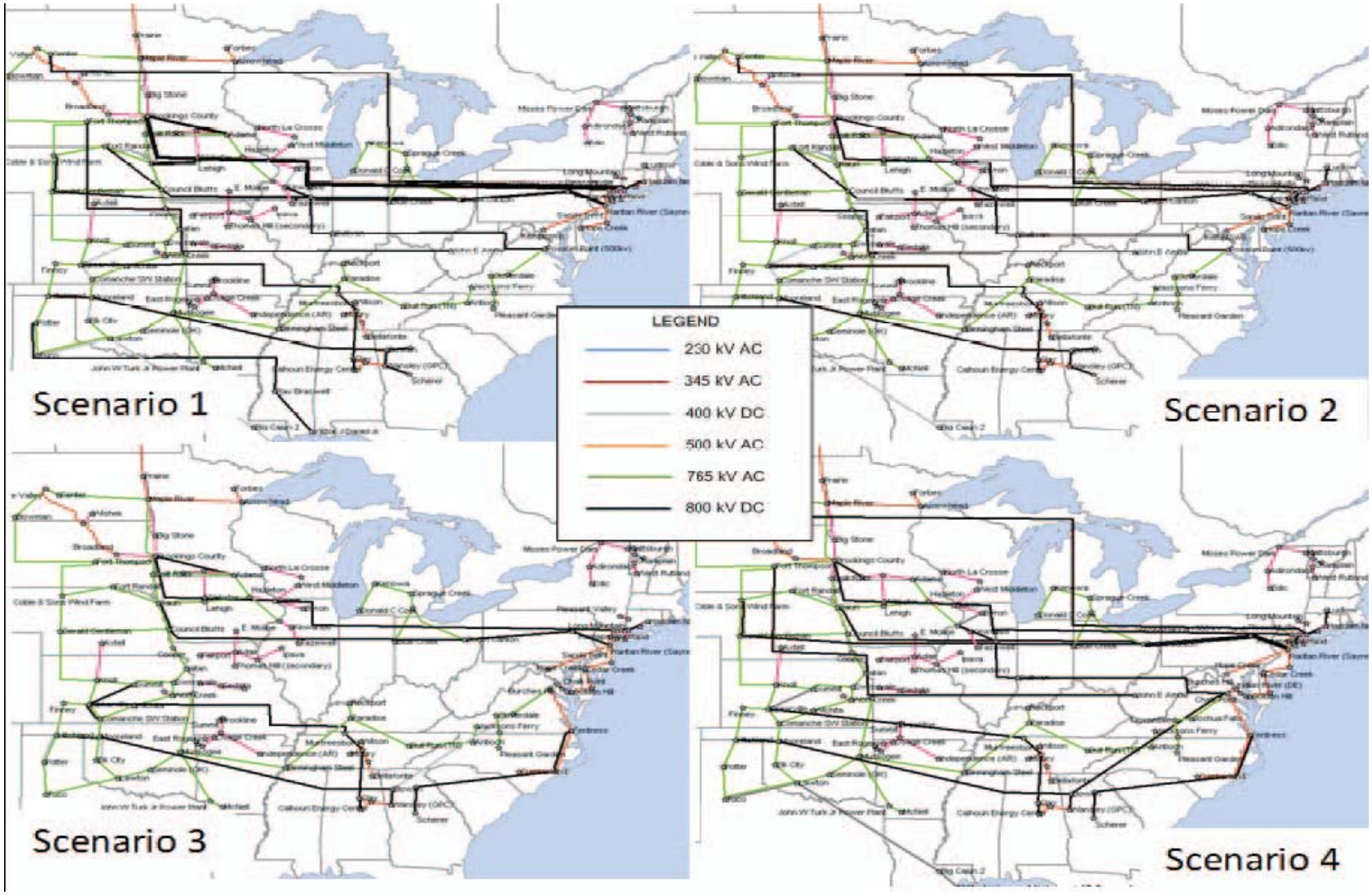
Resource Integration for Dummies

- Renewable Energy Goals & Standards
  - State Renewable Portfolio Standards: 20%
  - American Power Act
    - National Renewable Energy Standard: 20%
    - Inter-regional Transmission Planning
    - New Extra High Voltage Backbones
    - Federal Backstop Siting Authority
- Utility Wind Integration Group
- Transmission System Planning Efforts
  - Eastern Interconnect Planning Committee
  - Eastern Wind Integration Transmission Study – NREL
  - New England Wind Integration Study – ISO-NE
- FERC Variable Energy Notice of Inquiry

Offshore Wind Resource & Population Map



Eastern Wind Integration Transmission Study



Resource Integration Panel

- **Bob Fagan**
  Senior Associate
  Synapse Energy Economics

- **John Norden**
  Manager of Renewable Resource Integration
  ISO New England

- **C. John Messke**
  President
  Energy Market Decisions, Inc.

- **Questions, Answers & Discussion**