Water – Energy Modeling

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DOE Energy-Water Modeling

Assessing the Relationship of Water and Energy in Transmission Planning

- ❑ Technology Selection and Siting
- ❑ Water Supply and Demand Model
- ❑ Extended Drought and Climate Scenario
- ❑ WECC and ERCOT Transmission Plan Analysis

Formulating regional policies and best practices with respect to the Energy-Water Nexus

- ❑ Energy-Water Policy Development
- ❑ Energy-Water Case Studies

ERCOTs initial role

- ❑ Assist in developing model parameters
- ❑ Assist scenario development and data verification
- ❑ Assist with benchmarking efforts

❑ Benefits of Study:

- A model that can be use to analyze the implications of water stress on transmission and resource planning
- Comprehensive set of regional planning models, data, and conclusions that are coordinated at the interconnection-wide level
- Improve data quality and consistency on water availability, overall water demand, and water requirements for energy

Project Governance

Water Data and Availability Group

Managed by Western States Water Council

Role:

- Coordinate work by the WSWC and the National Labs on water availability and water demand, including a legal and institutional analysis of water availability

- **Membership**
  Designated and staffed by the Western States Water Council. Membership may include the following:

- WSWC
- Sandia
- USGS (ex-officio member)
- WGA (ex-officio member)

Collaborative Modeling Team

Managed by Sandia National Laboratories

Role:

- Review of key metrics, decision variables, process models, and data such as water use factors;
- Integrate Sandia, WECC, and ERCOT models and conduct desired scenario analyses.

- **Membership**
  Designated and staffed by Sandia National Laboratory. Membership may include the following:
- WECC
- ERCOT
- Sandia
- Argonne
- NREL
- EPRI
- PNNL
- INL
- U-Texas
- WSWC
- WGA (ex-officio member)
- U.S. DOE (ex-officio member)

Energy-Water Steering Committee

Managed by the Western Governors' Association

Role:

- Oversee energy-water project (Topic B),
- Manage stakeholder input
- Provide input into water-related scenario development
- Formulate policy recommendations and develop reports;

- **Membership**
  Approved by Governors and Staffed by Western Governors' Association. WGA staff Council to serve as or appoint co-chairs
- 2 WGA Staff Council designated co-chairs
- 1 WECC
- 1 ERCOT
- 1 Sandia National Laboratory
- 2 Electric Utilities
- 2 Members WSWC
- 2 NGOs
- 1 U.S. DOE (ex-officio member)

DOE Energy-Water Modeling

- **Develop integrated Energy-Water Decision Support System (EWDSS)**
  - Model to examine implication of water stress on transmission and resource planning
- **EWDSS will be an offshoot of Sandia labs Energy-Power Water Simulation (EPWSim) model**
- **Collaborative Modeling Team (CMT) will be formed from the full group to oversee model development**
- **CMT Responsibilities will be to assist modelers in:**
  - Defining key metrics and decision variables
  - Vet model processes
  - Vet the model data
  - Review and benchmarking
  - Scenario analysis

- **Success Criteria of the Model:**
  - EWDSS must easily interface with current transmission planning models used in ERCOT and WECC
  - Model must be sensitive to composition of future power plant fleet
  - Model must address growing water demands in sectors beyond power generation
  - Model must be easily accessible to all stakeholders