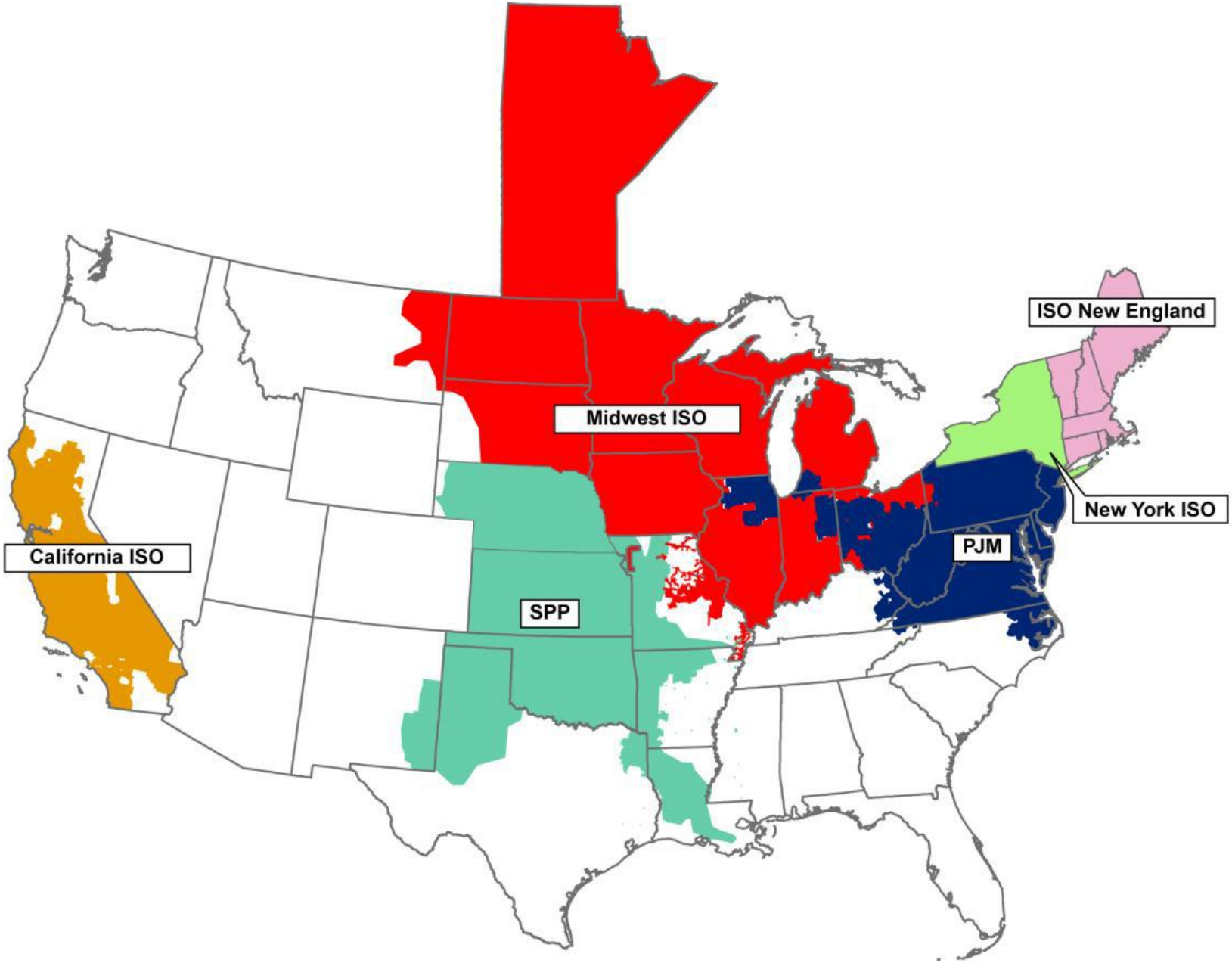
Understanding MISO

A Bit of History

- Early utilities were vertically integrated and electrically isolated
- Over time transmission capability between systems was built
  - Connected merged utilities
  - Reduced reserve margin requirements and improved overall reliability
  - Allowed for economic exchange of power between utilities
- Federal law began to support independent generation (i.e. generation not owned by the traditional vertically integrated utilities)

A Bit More History

- The Federal Energy Regulatory Commission (FERC) began to encourage the development of regional transmission organizations (RTOs) also known as independent system operators (ISOs). FERC did this to
  - Enable non discriminatory access to the grid
  - Further encourage economic interchange
  - Improve reliability


ISO New England
Midwest ISO
New York ISO
PJM
California ISO
SPP

RTOs/ISOs

- Voluntary organizations formed by transmission owners
  - Contractual agreements define the organization
  - Most transmission owners also owned generation at the time of the RTO/ISO formation but in some regions some of the vertically integrated utilities have split into independent parts
- Independent of its members
- Regulated by FERC because it functions at wholesale level
  - Each RTO/ISO has its own tariff

RTO/ISO Functions

- **Monitor the high-voltage transmission grid for reliability**
- **Balance generation and load on an instantaneous basis**
- **Operate competitive, non-discriminatory markets (energy, ancillary services, and in some cases capacity)**
- **Plan for transmission expansion on a regional basis**

RTO/ISO Scope

- An RTO/ISO does:
  - Direct operation of the transmission system
  - Remain profit neutral
  - Maintain independence from its members
  - Coordinate maintenance of grid facilities
- An RTO/ISO does not:
  - Own any transmission or generation assets.
  - Function as a publicly traded company.
  - Take ownership of the energy on the system.
  - Perform the actual maintenance on generators or transmission systems.
  - Serve, directly, any end use (retail) customers

What You Saw Yesterday

- In the pre-MISO days the dispatch center (big board with transmission system schematic) would have performed all of the functions needed to operate MidAmerican's system
  - Monitor the MidAm transmission and distribution system
  - Perform transmission switching functions
  - Dispatch generation
  - Buy/sell energy between MidAm and other utilities

What You Saw Yesterday

- Today with MISO
  - Separate transmission dispatch center and trading floor to ensure that MidAm's generation does not have access to information that would give them an unfair competitive advantage in the market
  - MISO dispatches all of the generation in its footprint based on
    - Bids that generation owners have submitted (second group you visited)
    - Physical constraints of the transmission system
  - MidAm's transmission dispatch center focusses on local issues. Much of its former function is now handled by MISO.

Market Energy Prices

- https://www.midwestiso.org/MARKETSOPERATIONS/REALTIMEMARKETDATA/Pages/LMPContourMap.aspx