Renewables, DERs and the role of the ISO in the evolving Grid

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Role of Manufacturing in Support of Grid Modernization
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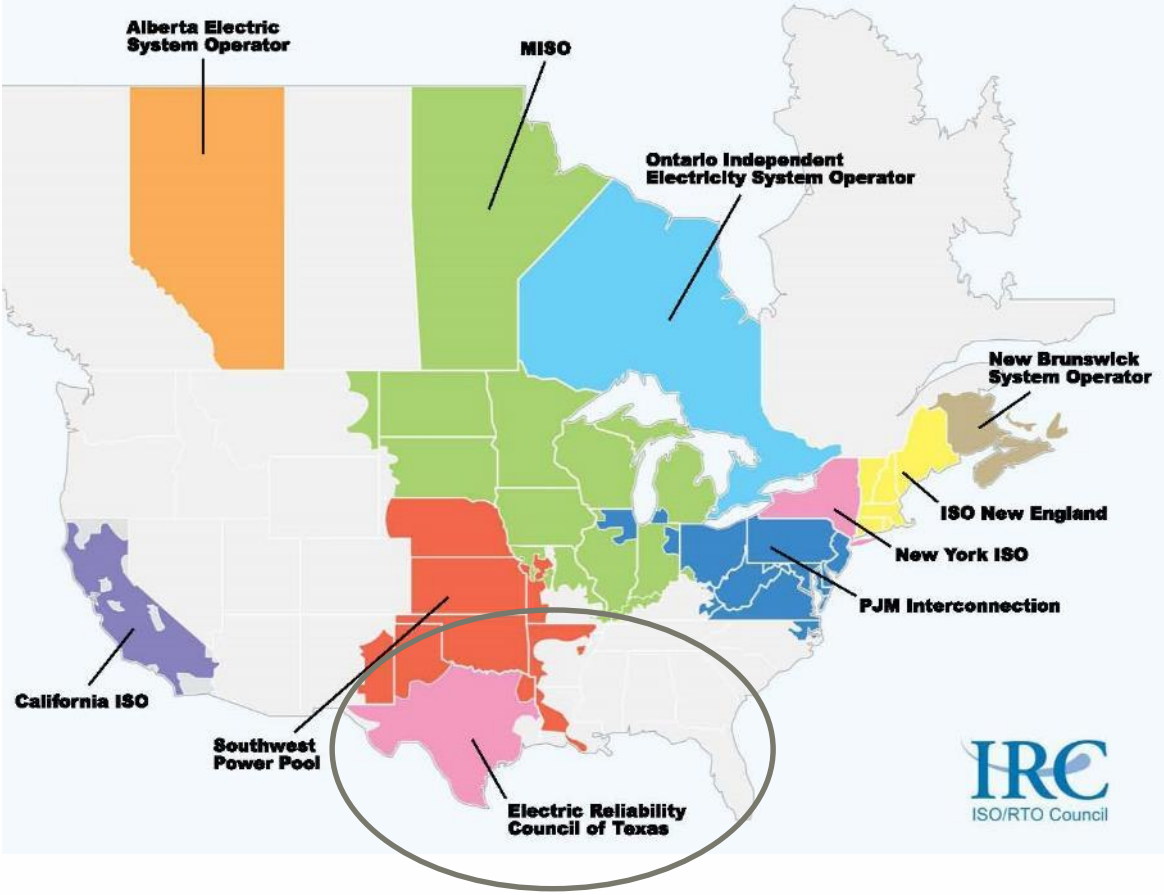
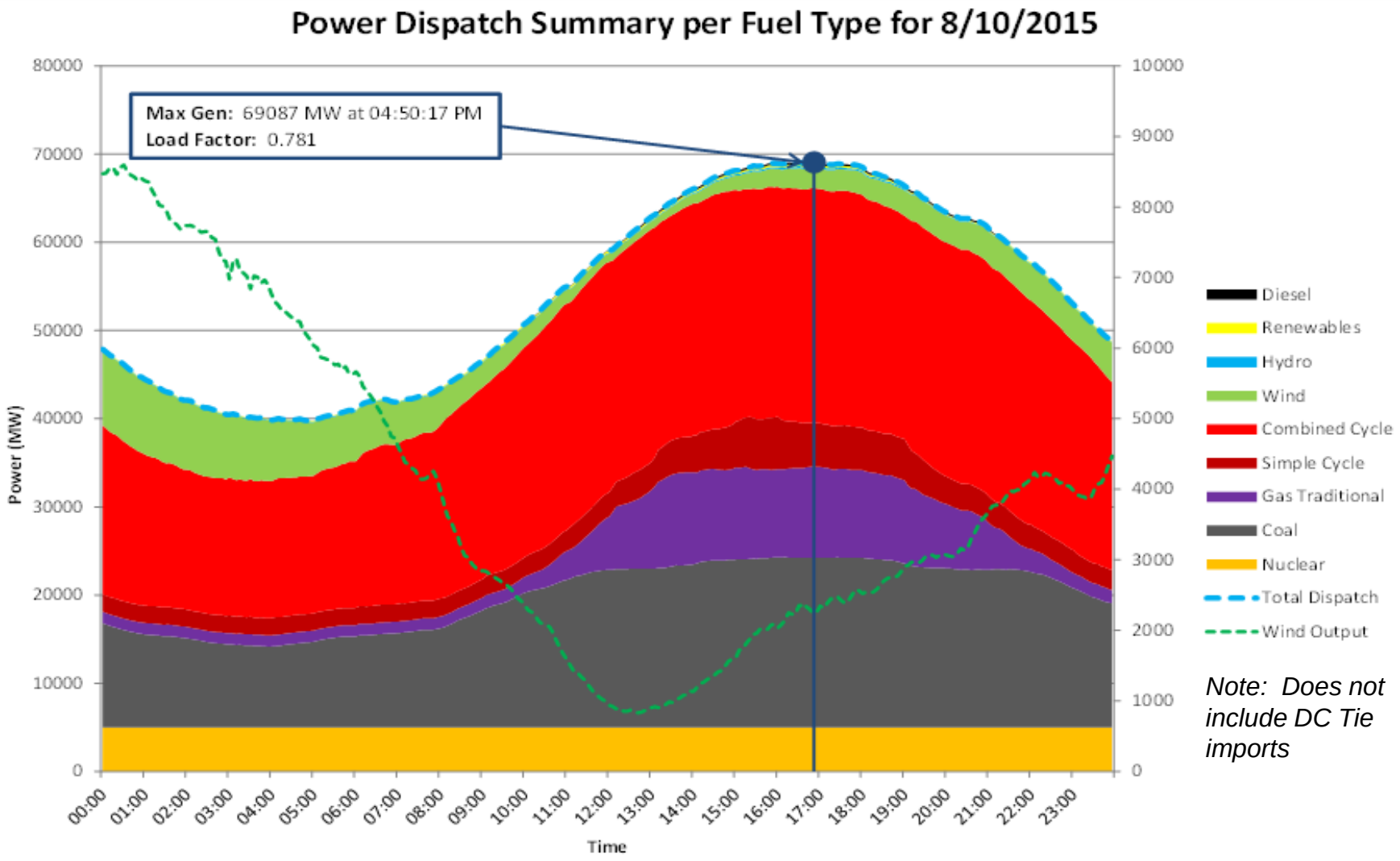
North American ISOs and RTOs

Independent System Operators and ***Regional Transmission Organizations*** are the 'air traffic controllers' of the bulk electric power grids

(69kV and up)



Fuel Mix on ERCOT's Peak Day



Note: Does not include DC Tie imports

What are some of the Issues

- How can Distributed Energy Resource's (DER's) participate in Energy and Ancillary Services in the ERCOT markets?
- How do DER's get paid for energy injections onto distribution circuits?
  - Who is purchasing this energy?
- Should distribution injections get paid at a retail price? Or is Wholesale pricing more appropriate? Zonal Pricing? LMP pricing?

What are some of the Issues

- Does the Transmission ISO (ERCOT) have anything to do with distribution DERs?
- Does the Transmission ISO know where DERs are located?
- How should the Transmission ISO consider DERs in Capacity Planning, Transmission Congestion, Load-Energy forecasting?
- What are the impacts if DERs are not modeled by the Transmission ISO?
- Can a Transmission ISO perform its reliability functions without knowing where DERs are located at high penetrations? What is the penetration limit?

How do DERs operate in ERCOT today?

- PUCT rule 25.211-25.212 establish the rights and obligation of transmission and distribution utilities to accommodate interconnection of distributed generation (DG) and establishes that the sale of power from such facilities are subject to rules 25.191-25.203
- ERCOT protocol 6.6.3.2 establishes that a registered DG injection results in a payment to the QSE representing the DG at the Load Zone price on a 15 minute settlement.
- DG over 1 MW in size and capable of net export is required to register with ERCOT.
- Injections from a non-registered source in a competitive load zone results in reduction of a QSE's net load and consequent reduction in charges to that QSE.
- ERCOT has no involvement in the settlement between the metered entity and the QSE.

How do DERs operate in ERCOT today?

- ERCOT's market for Emergency Response Service (ERS) is friendly to both load response and DG, allowign aggregations and performance against baselines and procuring 4 different types of service:
  - Weather Sensitive ERS-10
  - Non-Weather Sensitive ERS-10
  - Weather Sensitive ERS-30
  - Non-Weather Sensitive ERS-30

ERCOT concept Paper

- In August of 2015, ERCOT drafted a concept paper describing possible ways in which Distributed Energy Resources could participate in ERCOT markets.
- This paper discussed three types of DER installations: Minimal, Light and Heavy.
  - Heavy installations are directly comparable to Generation Resources currently defined in the ERCOT market. (Meters gross generation and gross load)
  - Light installations install only sufficient facilities to support nodal pricing for generation only. (Meters gross generation and gross load)
  - Minimal installations support only zonal wholesale pricing.
- This concept paper proposed locational information for situational awareness and to facilitate nodal pricing where applicable.

DREAM Taskforce

- ERCOT's Technical Advisory Committee created a "Distributed Resource Energy and Ancillaries Market Task Force" (DREAM) to develop market rules associated with Distributed Energy Resources.

Scope:

- The DREAM TF will consider and recommend a potential market framework that allows DERs an opportunity to more fully participate in the ERCOT Wholesale Market including, but not limited to, participation in SCED and the Ancillary Services Market. The DREAM TF's responsibilities are to:
  - Provide a summary report on the findings of a comprehensive review of the background and framework under which the current statutes, rules, protocols and guides related to distributed generation were developed.
  - Recommend potential opportunities for further investigation or development of language that would create a more comprehensive base framework for a distributed resource market, if applicable based on the review in the first item.
  - Consider if the proposed distributed energy resources market options presented by ERCOT are appropriate under the current Distributed Generation regulatory framework, and recommend changes, if any, that would be needed to allow the DER market as proposed. An issues list should be developed that includes…

DREAM report to TAC Feb. 2016 seeking direction

- *To enable and define distributed resources eligible to participate in the DAM with a Three-Part Supply Offer, Ancillary Service Offer, DAM offers/bids, CRR offers/bids, and/or QSE to QSE transactions*
- *To review eligibility for Resource Nodes created for distributed resources to participate in CRR markets*
- *To propose Protocol revisions, consistent with PUCT rules, to allow distributed resources registered with a Resource Node to allow for economic outages*
- *To update the Other Binding Documents and associated Protocols regarding Provisions for Aggregations*
- *Consider who should bear the cost of EPS meters deployed to support distributed resources*
- *Review the market impact of the status quo treatment for price responsive distributed resources.*
- *To enable a distributed resource above a specified size to participate in energy and Ancillary Service markets on equal footing*
- *To enable distributed resources to change their registration on a nodal basis (e.g. for the periodic inclusion and removal systems within an aggregation) and to allow a single registered distributed resource or an aggregation to participate in a Load Zone portfolio dispatch.*

Questions

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