

Alternative Transmission Solutions

Can Distributed Generation, Energy Storage and Load Control be Selected and Compensated as Transmission?



Authors & Acknowledgements



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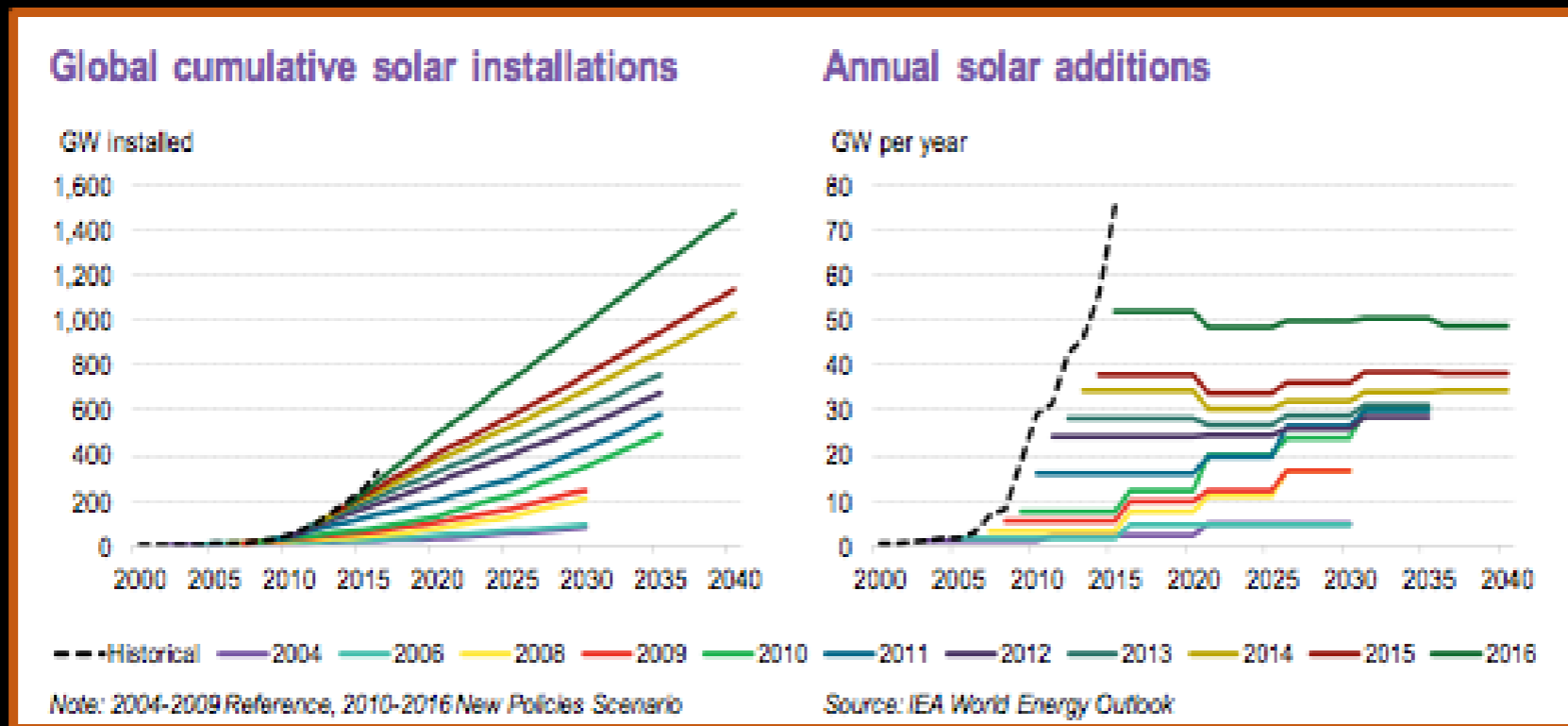
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Ongoing Transformation of Electricity Generation & Load

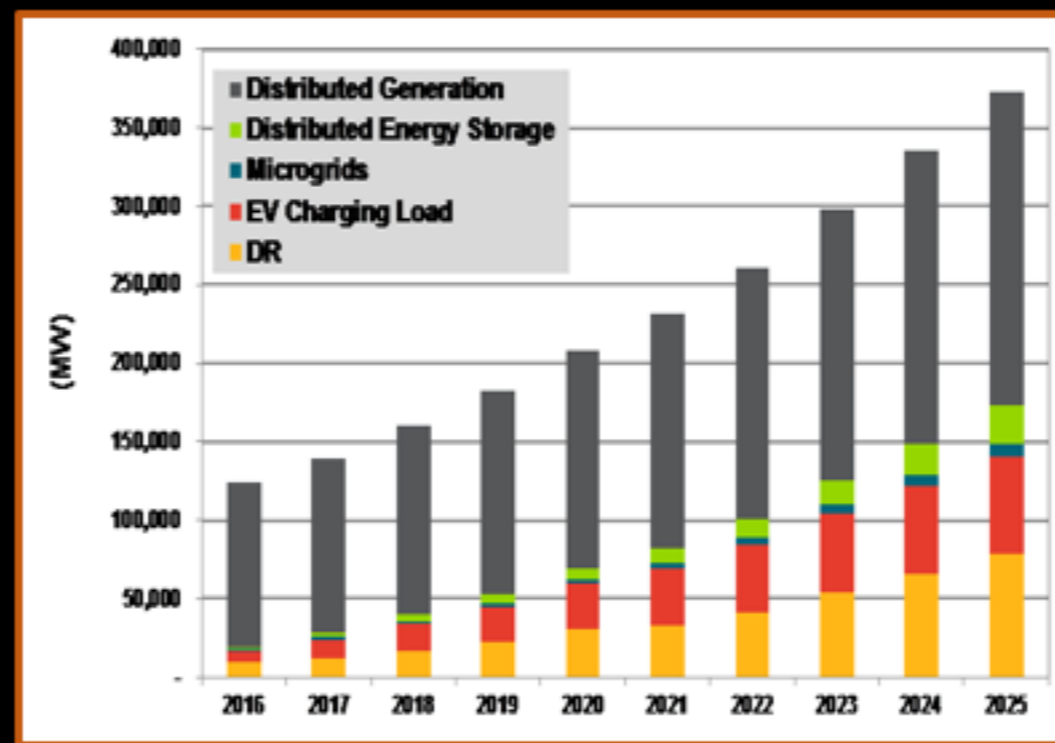
Looking Backward: The Growth of Distributed Generation Outpaced All Expectations



*The Evolution of the Annual IEA Solar Capacity Forecast
(Source: M. Liebreich, Bloomberg New Energy Finance, London Summit, Sept. 2017.)*

Ongoing Transformation of Electricity Generation & Load

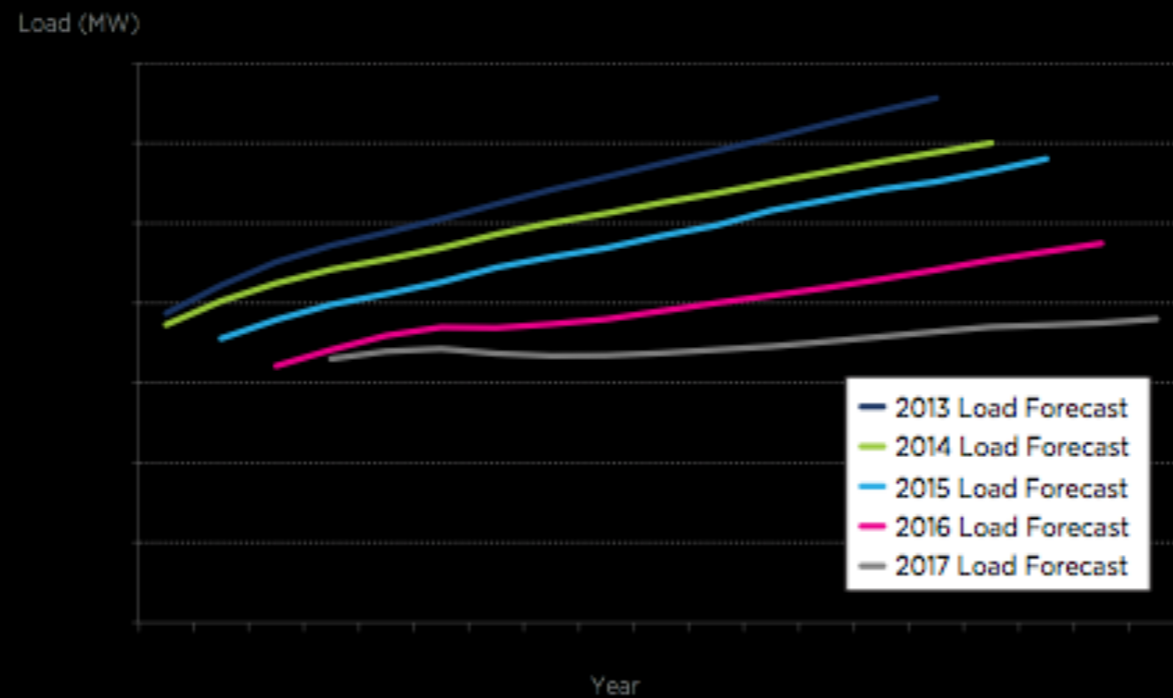
Looking Forward: 200 GW Per Year of Distributed Generation and Flexible Load in 2020?



Annual Installed DER Power Capacity by Technology, World Markets: 2016-2015

(Source: Peter Asmus, "VPPs and DERMS: Moving Toward a Digital Grid with the Help of Artificial Intelligence and Transactive Energy," Microgrid News, Aug. 7, 2017.)

The Importance of “Right Sizing” Transmission



*PJM Load Projections Declines by 30GW in Out Years Between 2013 and 2017
(Source: PJM Regional Transmission Expansion Plan, 2016, Book 1.)*

- *Flat or Declining Load Projections Have Been a Trend Since 2006*
- *Significant Declines in Projected Load Growth in Most ISOs*
- *Possibility of Stranded Transmission Assets?*

Examples of Distributed Resources in Lieu of Distribution or Transmission Upgrades



◦ *Bonneville Power Administration announced in 2017, after a 9 year planning process, to not build 500 kV transmission line along I-5 corridor, opting for combination of solutions, including the deployment of “non-wires solutions.”*



◦ *ConEdison avoids substation upgrade in Brooklyn and Queens by reducing peak load by 69 MW - 52 MW through non-traditional and customer-sited solutions, 17 MW through traditional utility investments.*



◦ *Arizona Public Service chooses 2 MW with 4 hours of energy storage as the solution to defer investment in a 20-mile distribution line. Energy storage solution found to be most cost-effective option.*

Regulations Require ISOs to Consider Multiple Factors When Evaluating Need for Transmission

Reliability

- Failure Scenarios — Ensuring Other Transmission Lines Can Continue to Serve Load Under Specific Failure Conditions*
- Peak Load Conditions — Maintain System Within Specific Operating Limits (e.g., Thermal or Voltage Overload)*

Economics

- Determine if Economic Congestion is Driving Up Prices in Region and, if so, Identify Cost-Effective Solutions*

Policy

- Determine if There Are Policy-Driven Transmission Needs Such as RPS, Clean Air Requirements, etc.*

Getting Selected and Compensated as a Transmission Solution

For the Asset(s) to be Approved as FERC-Jurisdictional Transmission, it Must:

- Fulfill a Transmission Need Identified by the ISO/RTO*
- Meet the Performance Requirements Established by the ISO/RTO*
- Be Selected by the ISO/RTO During Their Competitive Process*
- Provide a Transmission Service Function*
- Comply With FERC Guidelines on Cost-Based Versus Market-Based Revenues*

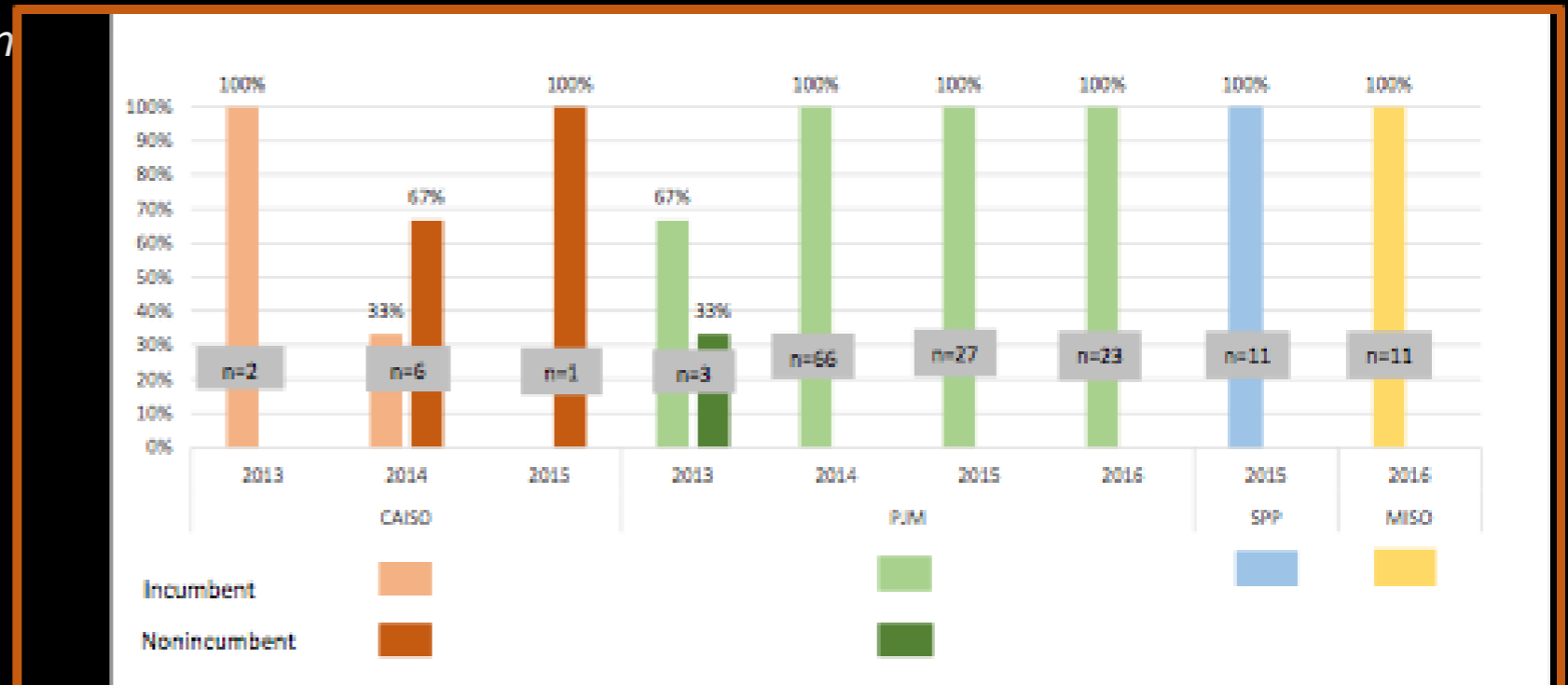
Analysis of Recent Transmission Awards

ISO Track Record of Selecting Non-Incumbent Solutions

- CAISO: Awarded 9 Projects, of Which 5 (56%) Went to Non-Incumbents
- PJM: Awarded 119 Projects, of Which 1 (0.8%) Went to Non-Incumbents
- SPP: Awarded 11 Projects, of Which 0 Went to Non-Incumbents
- MISO: Awarded 11 Projects, of Which 0 Went to Non-Incumbents
- ISO-NE: Has Not Yet Held a Competitive Solicitation
- NY-ISO: Has Not Awarded a Solution for the 2 Competitive Solutions Held to Date

FERC Analysis of ISO/RTO Transmission Awards to Regional Distribution Utilities and Non-Incumbents

(Source: Rahim Amerikhail et al., 2017 Transmission Metrics, Staff Report, FERC, p. 26, Oct. 2017.)



A photograph of the Federal Energy Regulatory Commission (FERC) building. The building is a modern, multi-story structure with a light-colored facade. The words "FEDERAL ENERGY REGULATORY COMMISSION" are prominently displayed in large, black, sans-serif capital letters above a large glass entrance. To the right of the entrance, the number "888" is displayed in large, black, sans-serif digits. The building is surrounded by a paved sidewalk and some landscaping.

FEDERAL ENERGY
REGULATORY COMMISSION

888

FERC Orders and ATS

- *Order 888 (1996)*
- *Order 890 (2007)*
- *Order 1000 (2011)*

Order 888

- *Legal Definition of Transmission*
 - *Infrastructure Capable of Providing Transmission Services*
- *Transmission Services*
 - *Transmitting Electrons and/or:*
 - *Scheduling and Dispatching Services*
 - *Load Following Service*
 - *Energy Imbalance Service*
 - *System Protection Service*
 - *Reactive Power/Voltage Control Service*
 - *Loss Compensation Service*

Order 890

- *Required Transmission Planning for All TOs*
- *Defined Transmission Planning Principles*
 - *Coordination*
 - *Openness*
 - *Transparency*
 - *Information Exchange*
 - *Comparability*
 - *Dispute Resolution*
 - *Regional Participation*
 - *Economic Planning Studies*
 - *Cost Allocation*

Comparability (Order 890)

*“When evaluating the merits of such alternative transmission solutions, ** public utility transmission providers in the transmission planning region also must consider proposed ... alternatives on a comparable basis. If the public utility transmission providers in the transmission planning region, in consultation with stakeholders, determine that an alternative transmission solution is more efficient or cost-effective than transmission facilities in one or more local transmission plans, then the transmission facilities associated with that more efficient or cost-effective transmission solution can be selected in the regional transmission plan for purposes of cost allocation.”*

***Include All ATT (Ref Sec. 1223 of EPAAct 2005) Offered as ATS*

Western Grid Development, LLC (2010)

- *Declaratory Order Request to FERC*
- *Built on Order 890*
- *Advance Transmission Technology (Sec. 1223)*
- *Provides Order 888 Transmission Services (“Mimics” TS)*
- *Declared Transmission Infrastructure by FERC (Ratebase)*

Order 1000

- *Requires TOs Participate in Regional Transmission Planning*
- *Reinforces “Comparability”*
- *Reinforces Use of ATT as ATS (Cites Western Grid)*
- *Eliminates “ROFR” in Most Instances*

Conclusions and Recommendations

Recommendations for:

- *Alternative Transmission Solution Stakeholders*
- *ISOs*
- *State Commissions*
- *FERC*

Questions?

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