

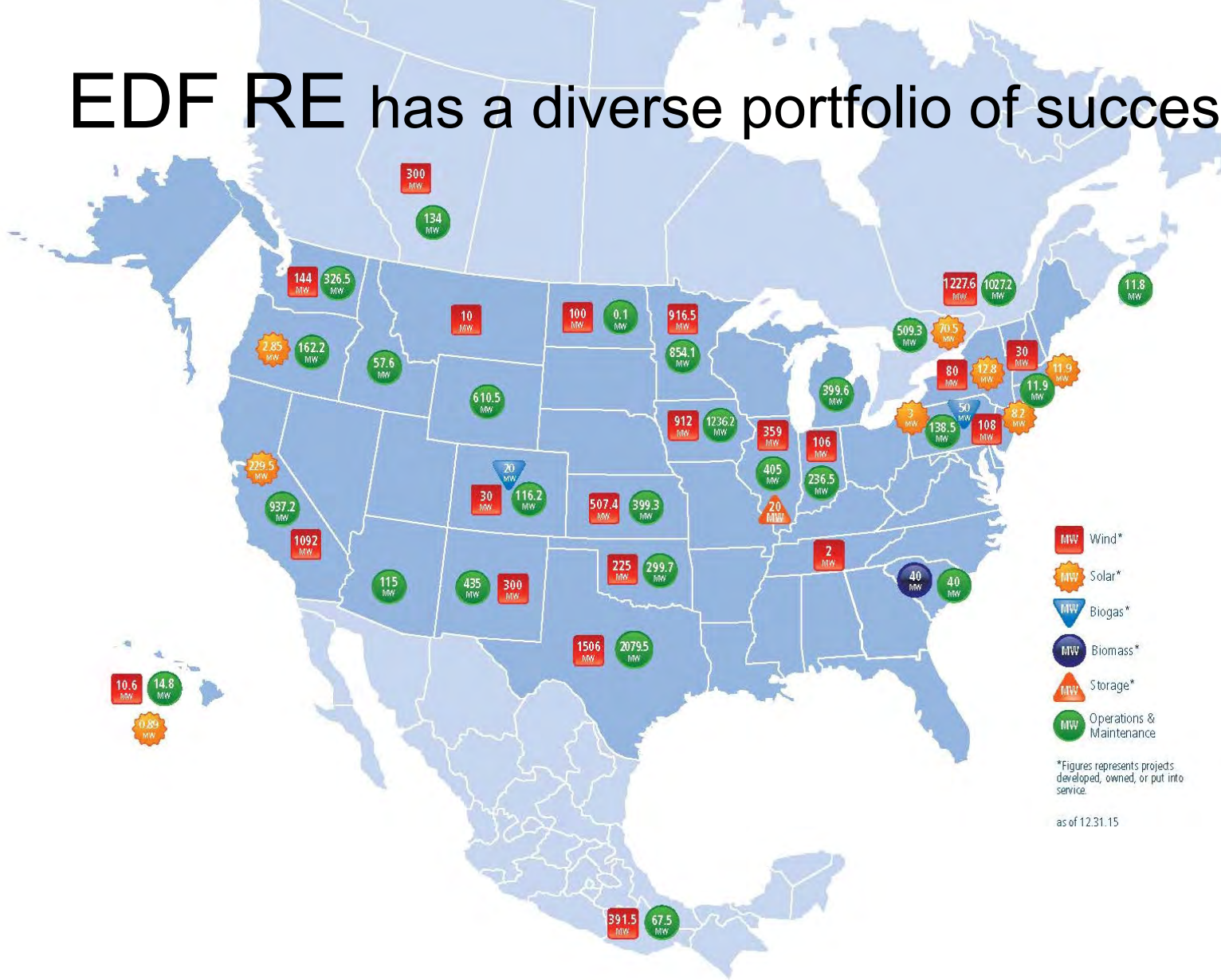
FLOWGATE DEFINITION CONCERNS & SOLUTIONS

EDF Renewable Energy

MISO-PJM IPSAC Meeting
June 17, 2016



EDF RE has a diverse portfolio of successful N.A. projects



KEY FIGURES*

as of December 31, 2015

INSTALLED CAPACITY
4,094.1 MW

3,799.4 MW WIND

U.S. 2818.2 MW
Canada 589.7 MW
Mexico 391.5 MW

183.7 MWp SOLAR

U.S. 160.3 MWp
Canada 23.4 MWp

51 MW BIOMASS (US)

40 MW BIOGAS (US)

20 MW STORAGE (US)

O&M CAPACITY
10,722.9 MW

9,779.6 MW WIND

U.S. 8,519.2 MW
Canada 1,193.0 MW
Mexico 67.5 MW

896.3 MWp SOLAR

U.S. 407.0 MWp
Canada 489.3 MWp

40 MW BIOMASS (US)

7 MW BIOGAS (US)

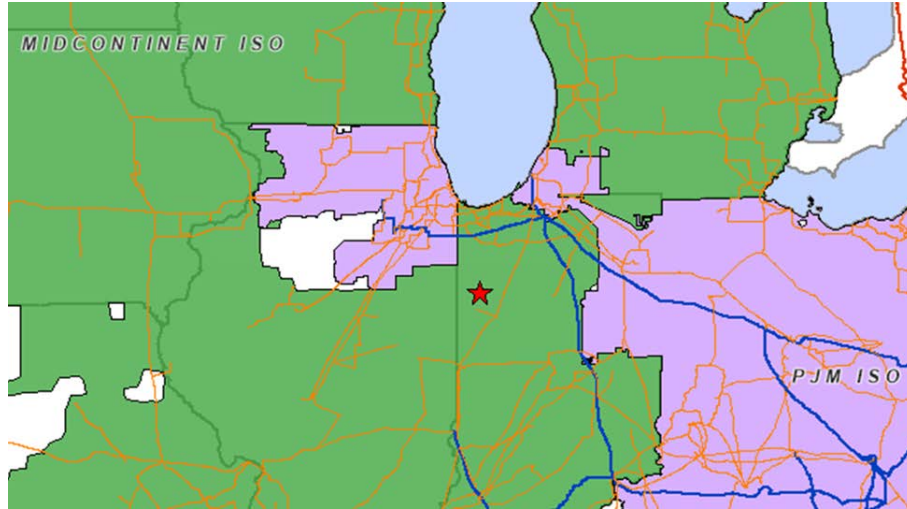
DEVELOPED
7.8 GW

PUT INTO SERVICE
6.7 GW

DIVESTED
3.8 GW

Hoosier Energy Wind Farm

- EDF-RE's Hoosier Wind Farm is located near the MISO-PJM Seam



- Many other generators are located near the seam.
- Hoosier and other generators have invested \$60M+ in post-GIA upgrades to relieve congestion.
- Hoosier and other generators continue to be seriously impacted by congestion that is not fully reflected in flowgates.

NIPSCO Complaint (EL13-88)

- 9/11/2013: NIPSCO requested revisions to JOA transmission planning criteria for congestion relief.
- 4/21/2016: FERC granted requests in part and denied in part.
- 5/23/2016: EDF-RE and others requested rehearing on flowgate definition concerns.
- 6/7/2016: MISO Transmission Owners replied that these concerns should be addressed in MISO-PJM stakeholder process (e.g., IPSAC).

Concerns

- MISO & PJM use inconsistent tests to identify constraints on their own and each other's systems.
 - As a result, MISO & PJM identify different constraints limiting inter-RTO flows.
- There are large discrepancies between planning models and persistent congestion observed in real-time operations.
- Persistent congestion on lower voltage facilities is not being captured in flowgates.
- M2M Payments continue to be significant.
- As a result, cost-effective transmission solutions are not being identified and congestion persists with no means to rectify.

Proposed Solutions - 1/3

Define Flowgates Consistently

- MISO & PJM should:
 - apply the same criteria to define flowgates on their own systems
 - ensure that each RTO uses the same list of flowgates on both systems
- Different criteria → different flowgates → failure to identify transmission solutions.

Proposed Solutions - 2/3

Consider Persistent Real-time Congestion

- Binding constraints that impact generation should be considered when identifying flowgates.
- Binding constraints should be considered in transmission planning to the extent they are not accounted for in planning models.

Hoosier example (April 1, 2016 – June 6, 2016):

Monitored	Contingency	Hours
Reynold4 13857 A	Goodland–Remington 69kV	1036
Goodland B #1 Transformer	Reynolds–Goodland 138kV	748
Goodland-Magnetation 138kV	Dequine-Westwood 345kV	132

Proposed Solutions 3/3

Identify Broader Solutions to Congestion

- Annually, MISO & PJM should:
 - Evaluate transmission facilities impacted by regional & inter-regional flows
 - Regardless of voltage (down to 100kV)
 - Consider congestion, redispatch, curtailment, and M2M payments
 - Consider number of hours a transmission element is constrained
 - Consider extent to which transfers and deliverability are limited within & between RTOs
 - ***Identify & refine flowgates accordingly.***
 - Assess binding constraints in all subregions of both RTOs
 - Regardless of cause (economic or reliability)
 - Identify potential remediation through transmission upgrades

Proposed JOA Language

Insert within 9.3.6.2(b)(iv): The Parties shall apply the same criteria to define flowgates on their respective systems. The Parties shall use the same list of flowgates on the other RTO's system to ensure there is no difference for modeling purposes.

Insert following 9.3.6.2(a)(i): On an annual basis, the Parties shall evaluate all transmission facilities regardless of voltage level that are impacted by regional and inter-regional flows causing congestion, redispatch, curtailment or market-to-market payments and that limit transfers and deliverability within each RTO and between the RTOs for the purposes of identifying and redefining flowgates. Binding constraints in all sub-regions of the Parties' systems, regardless of the cause, i.e., economic or reliability, shall be assessed to identify potential remediation through transmission upgrades.

Conclusion

EDF-RE submits that these changes will identify transmission solutions, currently missed in the MISO & PJM transmission planning processes, that will bring cost-effective relief to persistent congestion.

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