



MGA MID-GRID & MGA-OMS Transmission Summit

Panel Discussion: Solutions in the Short-Term:
Deploying Grid Technologies to Boost System
Capacity

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Company Overview

EDFR Capabilities & Global Footprint

EDF Renewables North America

is a subsidiary of EDF Renouvelables, the dedicated renewable energy affiliate of the EDF Group.

EDF Group

A global leader in the generation of carbon-free electricity.

Builder, owner, and operator of distribution and transmission lines, gen-ties, and all associated infrastructure and delivery systems.

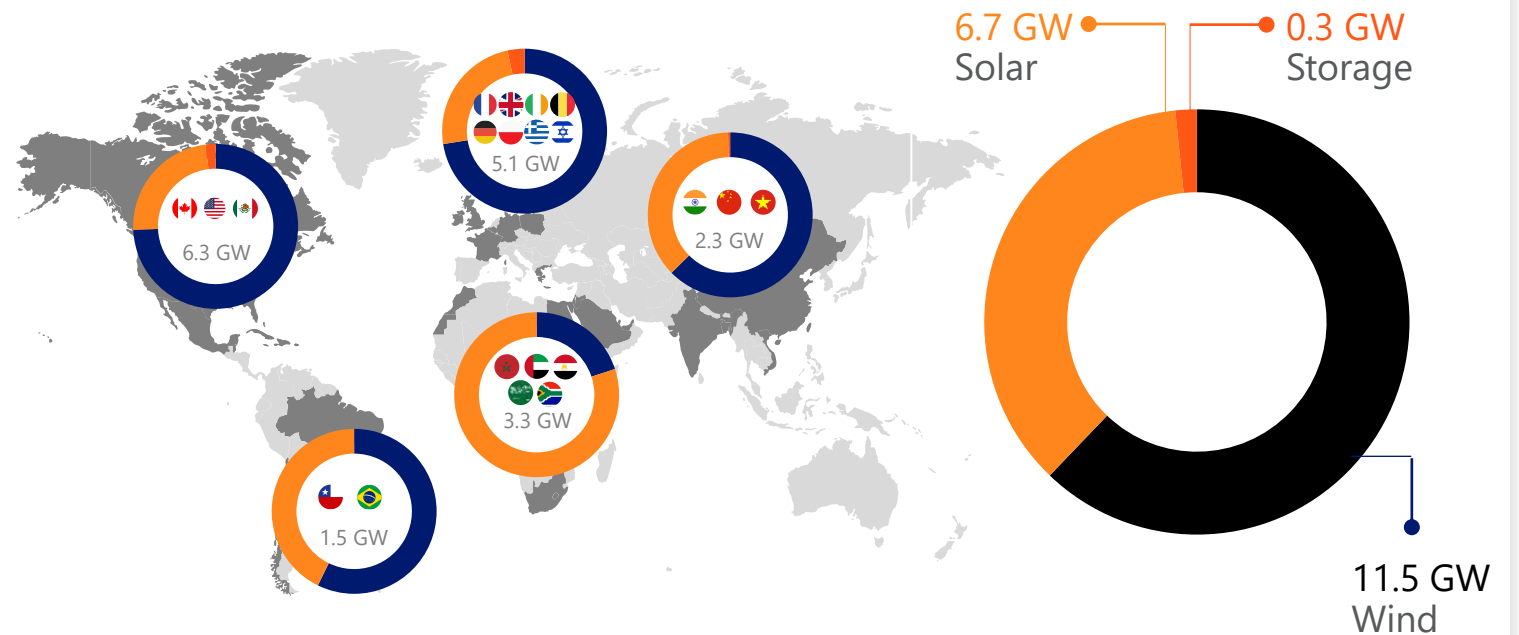
Operator of a global network of customers, clients, and partners across every conceivable industry.

A key international player in the energy transition.

EDF Renouvelables Global Capacity

Owned / Installed Capacity: 18.5 GW gross

Capacity by Technology



WE ARE EVERYTHING ENERGY

EDFR NA Overview

EDF Renewables North America is a project developer, owner, and operator with end-to-end solutions for every market...



As developer, owner and operator of one of the largest renewable energy portfolios and second largest project pipeline on the continent, EDF Renewables is active in every market across North America.



With our history of innovation, and deep experience developing and operating renewable energy assets, we bring a full-suite of solutions for grid-scale, distribution-scale, asset optimization and onsite energy.



Our outstanding capabilities allow us to utilize our in-house experts, providing maximal efficiency and end-to-end oversight of any size of energy project.

...with the capabilities, financial strength and global footprint to help you secure your energy future.

EDF Renewables North America

18 GW developed

Grid-Scale Power



14.6 GW service contracts

Distribution-Scale Power



42 GW pipeline

Onsite Solutions (PowerFlex)



35+ years experience

Asset Optimization



1,650+ employees

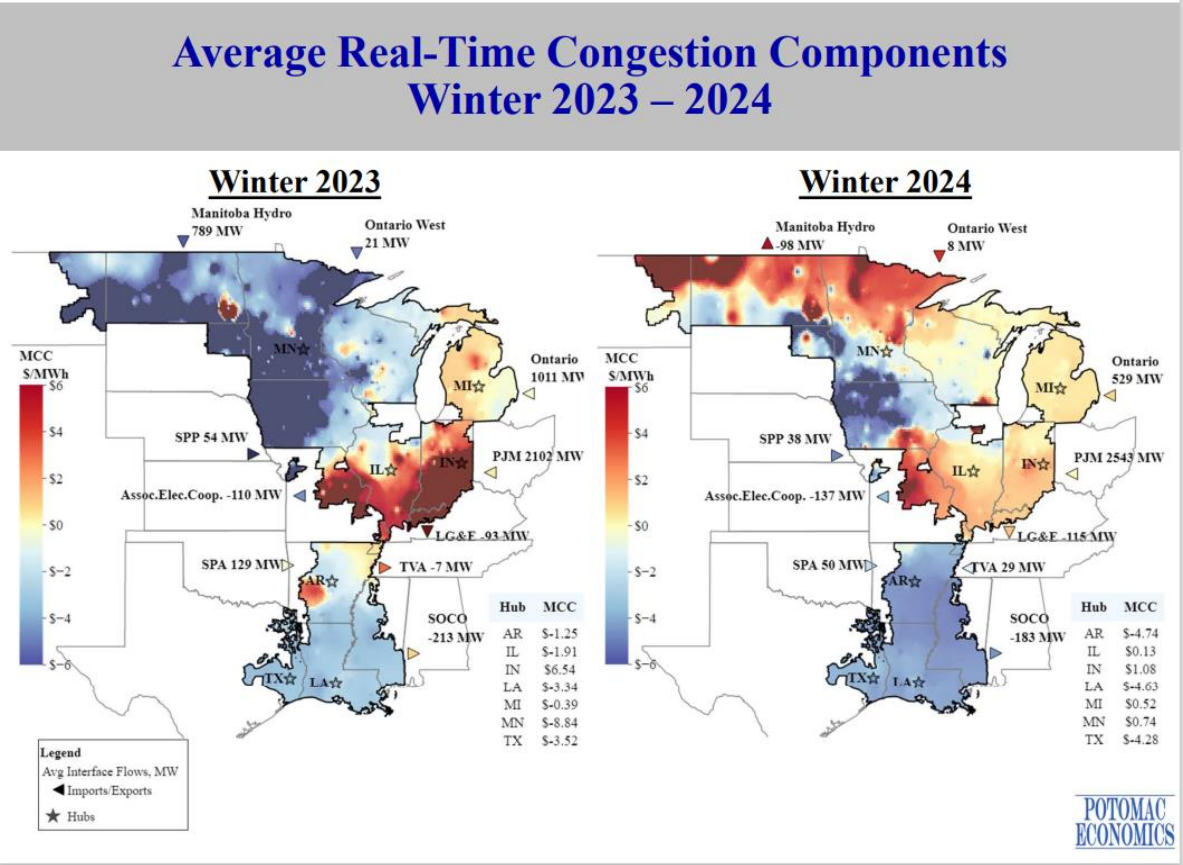
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The Opportunity For GETs To Reduce The Congestion Risk For Renewables:

- the Reconfiguration Example

MISO Congestion Has Been On the Rise

- Congestion costs in the MISO footprint are in the \$ billions
- Negative prices are more widespread and severe, especially in MISO West



MISO Congestion Costs (\$M)

Period	Market	Transmission Congestion Costs (\$M)
Winter 2024	RT	510.1
	DA	371.4
Fall 2023	RT	586.8
	DA	368.5
Summer 2023	RT	378.8
	DA	264.1
Spring 2023	RT	552.4
	DA	302.6
State of the Market 2022	RT	3,672
	DA	2,194

EDFR Perspectives on Renewables & GETs

- **For over 3.5 years, EDFR has been a strong proponent of GETs with their ability to improve market efficiency/ address congestion**

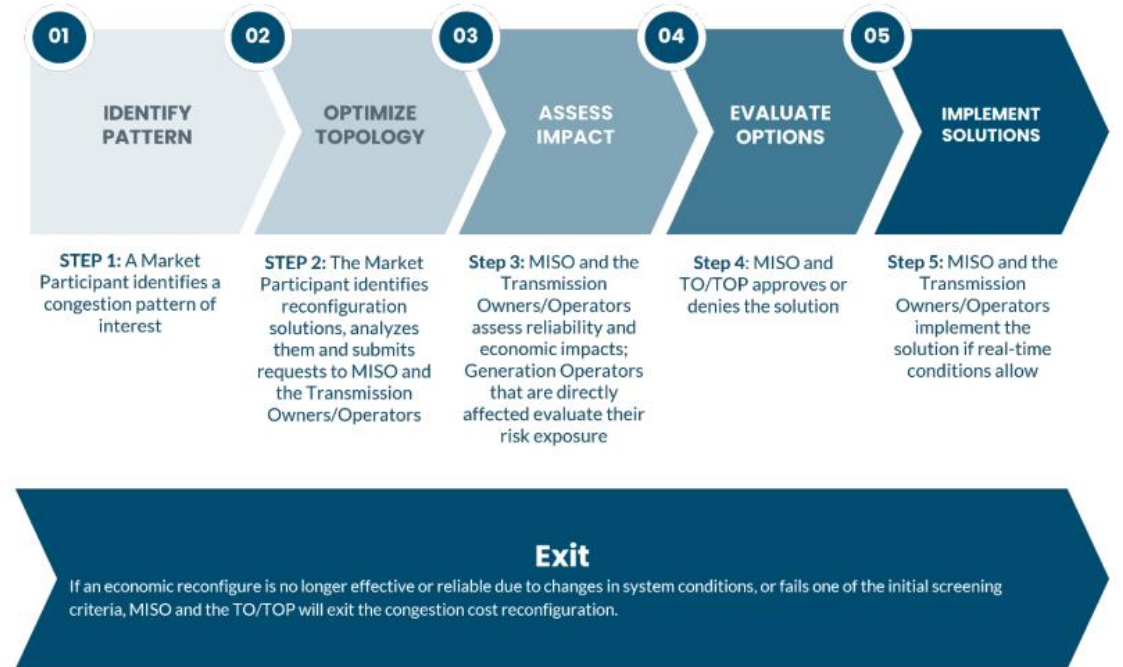
Based on GET studies commissioned by EDFR and in the industry:

- GETs can be implemented for binding constraints in operations and short-term planning
 - GETs can mitigate impact of grid outages
 - Traditional grid planning processes usually target solutions for constraints only when such constraints bind materially (resulting in delayed identification of upgrades)
- GETs can be a bridge solution, pending traditional grid upgrades
- GETs can be used in combination with traditional upgrades
- **EDFR has been advocating for new processes at RTO level to enable GETs to be evaluated in the interconnection, planning and operational processes**
 - Recent progress achieved in MISO, SPP, ERCOT and CAISO for “reconfiguration” solutions in operations

MISO Reconfiguration Process

On June 30, 2023, MISO announced a new “MISO Cost Reconfiguration Process” which allows market participants to request grid reconfigurations to reduce regional congestion

- MISO is the first RTO to create such formal process for receipt, review and approval of economic reconfiguration requests
- This was a collaborative effort with process initially requested by several market participants
 - MISO TOPs showed strong interest in creating a formal process to ensure evaluations are being done in a consistent, transparent and reliable manner
- Process lays out path for third parties to submit reconfiguration requests that need to meet specific documentation and criteria
 - 16 requests from June 2023 - March 2024, 6 approved
 - MISO has received about one reconfiguration request every other week



Source: [MISO Process to Support Congestion Cost Reconfigurations in the MISO footprint](#)

Other RTO Developments: ERCOT

- **As per current protocol language, reconfigurations can only be applied for reliability reasons as language disallows reconfigurations for congestion management if a SCED solution (market redispatch with curtailment or higher congestion costs) exists**
- The Independent Market Monitor (IMM) has identified reconfigurations as top recommendation for improved congestion management:

"We recommend that ERCOT accept a limited number of proposals and independently identify options to reconfigure transmission elements in the network operations model when they are physically feasible and economically beneficial. A process can be established to identify which limited number of reconfiguration options have the biggest benefits."

Source: <http://www.energychoicematters.com/stories/20230530b.html> ; [IMM 2022 State of the Market Report](#)

- **Coalition of stakeholders worked with ERCOT to develop feasible language changes, has filed revision requests to allow certain reconfiguration types to be economically justified** ([NPRR1198](#),[NOGRR258](#))
 - Since its submission in August 2023, EDFR sponsored NPRR 1198 and NOGRR 258 – Congestion Mitigation Using Topology Reconfigurations – passed key votes at ROS, WMS, and PRS in April of 2024.
 - After Impact Analysis review will proceed to TAC, Board, and PUCT, with anticipated effective date late July or September.
 - IMM has filed supportive comments: "...this change will benefit market efficiency substantially by reducing unnecessary congestion."

Other RTO Developments: SPP

A similar 3rd party process as currently exists in MISO has been proposed by EDFR in SPP in 2020 – identified as Strategic Roadmap Initiative #73

- SPP's 2023 roadmap results led to SIR#73 being prioritized for SPP staff review
- At the April 2024 MWG meeting, SPP staff presented a proposal for a process for market participants to submit a reconfiguration request; further discussions expected to occur over the next several months

PROCESS OVERVIEW

- Economic Topology Optimization process
 - Step 1: Market Participant (MP) works with Transmission Operator (TOP)
 - Step 2: TOP submits request to SPP
 - Step 3: SPP analyzes request
 - Step 4: SPP responds with approval status
 - Step 5: If approved, TOP submits reconfiguration request
 - Step 6: SPP reviews on an ongoing basis

SIR73-Operational Congestion Mitigation Requests

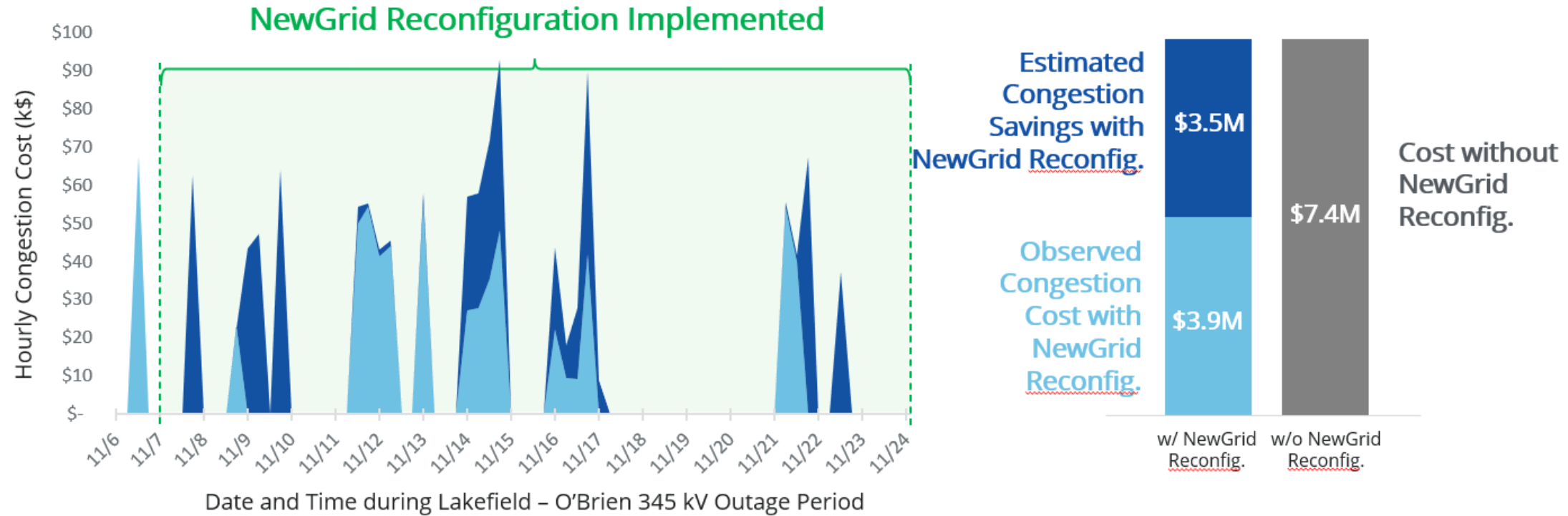
- **Proposal:** Establish a transparent process that will specify:
 - The means for a market participant to submit an operational congestion mitigation request
 - The set of constraints eligible for mitigation through transmission operation actions
 - To avoid concerns about introducing differences between TCR auctions and the DA/RT energy markets, the constraints eligible for mitigation might be limited to those that either
 - Did not bind in the latest TCR auction (and as such did not impact the TCR prices or the cleared quantities), or
 - Did bind in the latest TCR auction but the constraint causes underfunding, indicating that the TCR auction did not reflect current operational conditions for that constraint (e.g., the constraint was oversubscribed in the TCR auction) and as such it warrants constraint mitigation in the energy market.
 - The minimum information needed in the request, such as
 - Target constraint for relief
 - Operational action specification,
 - Conditions under which they would be implemented (e.g., during a specified outage),
 - Duration for the actions.
 - The criteria that the RTO and TOP will use to evaluate
- the requests
- Example economic evaluation criteria: minimum % flow relief on the specified constraint, the actions do not increase flow on other binding constraints and do not lead to new constraints loaded above a certain level (e.g., 95%) under conditions when the target constraint would bind.
 - Example reliability evaluation criteria:
 - System security: actions must lead to secure system state under all specified contingencies for a range of conditions expected for the duration of the period when the actions would be implemented.
 - Maximum load radialization allowed (e.g., none, 10 MW, 30 MW), and under what conditions.
 - The evaluation criteria may vary depending on the TOP, to account for TOP practices and local system characteristics.
- The evaluation, response timeline
 - Example timeline: initial evaluation response to be provided within 5-7 days.
 - Example responses: Approved, Rejected (with specified reason for rejection, e.g., flow on line X exceeds 95% of emergency rating under contingency Y), Request clarification or additional data

4 - SIR 73



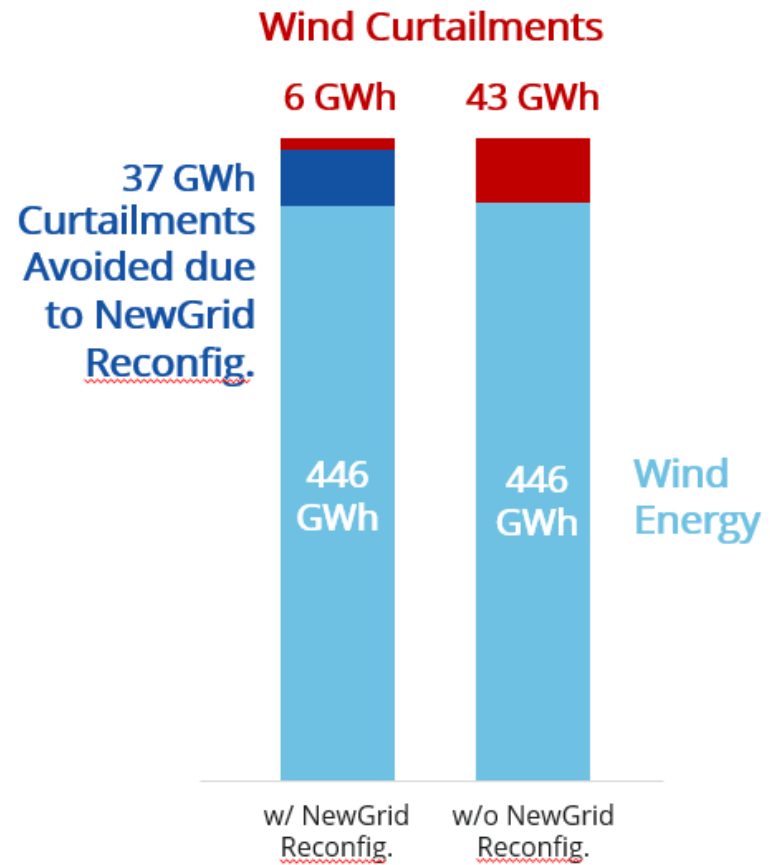
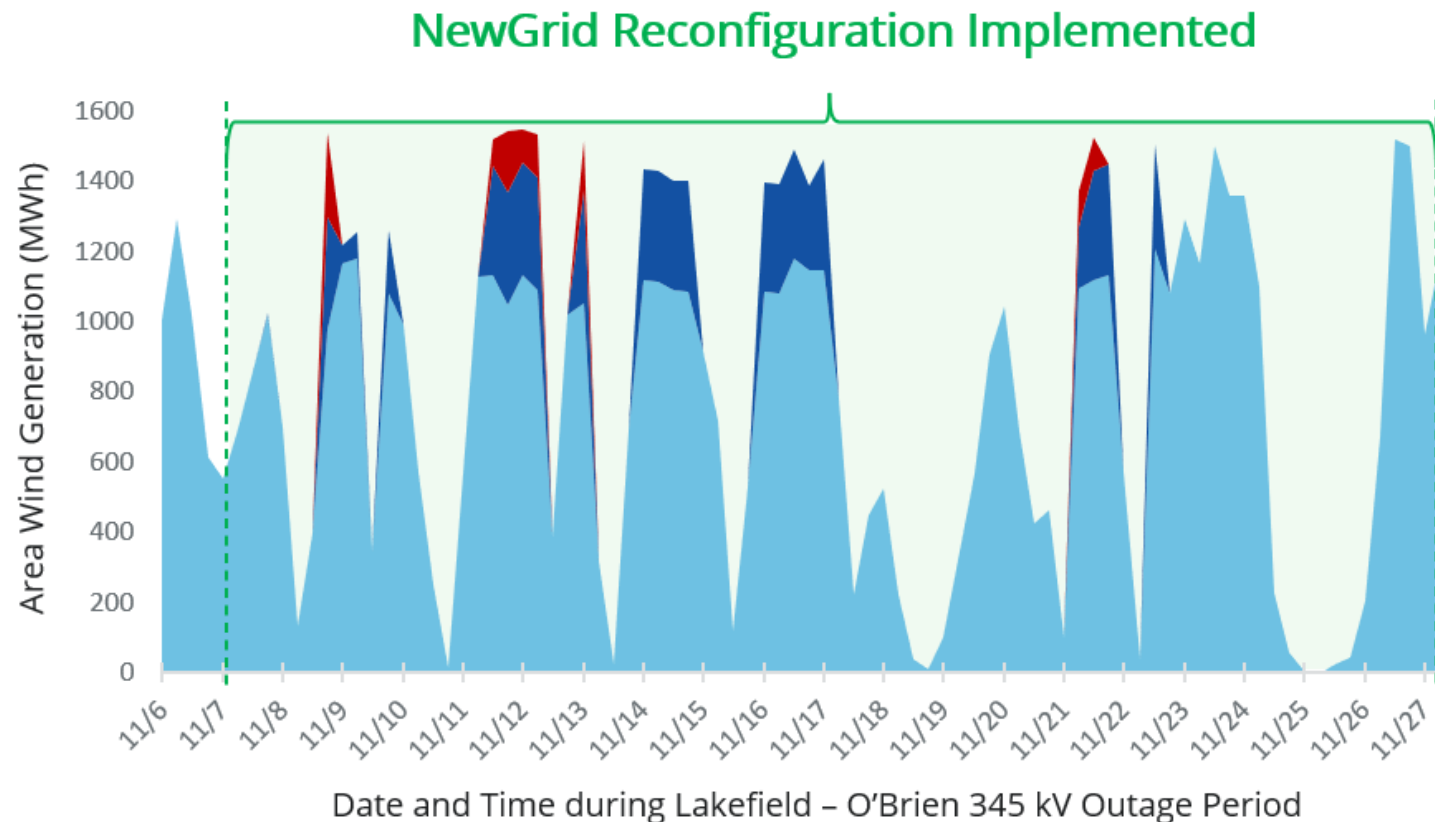
Case Study 1: Congestion cost savings from one reconfiguration

- A reconfiguration developed by NewGrid reduced regional congestion costs by **\$3.5 million**.
 - Mitigated the impacts of a 3-week outage (November 6-30, 2023) of a 345 kV line across Iowa/Minnesota border.



Case Study 1: AVOIDED wind CURTAILMENTS from one reconfiguration

- During the outage, the total generation by the area wind plants was 483 GWh. The reconfiguration avoided 37 GWh of wind curtailments.



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MISO Further Improvements & Takeaways

Further Progress Is Achievable!

- **High curtailment and congestion are a risk for both renewables and ratepayers** (burdened with high congestion costs and lost renewable production)
- **Transmission expansion via new transmission build, the deployment of GETs is key to reduce congestion and ensure clean energy is deliverable**
 - Reconfiguration process can/is helping to reap some low hanging fruit congestion mitigation
 - There is an opportunity for MISO to further set a high standard by adopting improvements or expanding processes related to all GETs for short term relief
 - Many opportunities are not conducive to being leveraged yet
 - Stability reconfigurations are deemed outside the regular process
 - Reconfiguration in house at MISO could enable day ahead and real time reconfigurations deployed in larger scale
- **MISO's LRTP initiative is a major step to address the inadequate transmission system that exists today**
 - Tranche 1 is a must happen for some improvement in congestion from current "bloodshed" levels in MISO West
 - Tranche 2 is a necessity for future system reliability and the clean energy transition

Q&A
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