

Department of Energy

**Workshop on Electric Transmission  
Development and Siting Issues**

**Panel III: Are Existing Remedies Adequate?**

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# Key Problems and Proposed Solutions

## Non-Transmission Alternatives

- Consideration of NTAs

## Economic Upgrades

- Congestion Review
- Flowgate Definitions
- "Quick Hits" Solutions
- Funding Mechanisms
- Future Generation
- Upgrade Benefits
- Underbuilt Grid
- Interconnection Process

## Reliability Upgrades

- Operating Guides
- Pre-Existing Conditions
- NERC Criteria

# NON-TRANSMISSION ALTERNATIVES

**Problem #1:** Transmission Providers Are Not Taking Advantage Of NonTransmission Alternatives That Will Bring Huge Economic Benefit To Customers And Grid Users.

- Require Transmission Providers To Employ Proven Technologies In Their Transmission Planning And Operations, Including:
  - Dynamic Line Ratings
  - Phasor Measurement Units
  - High Temperature Conductors

# Economic Transmission Upgrades

**Problem #2:** Transmission Planners Have Inadequate Congestion Review Protocols To Identify Areas In Need Of Economic Transmission Upgrades

- **Solution:** Mandate RTOs and Utilities To Adopt Common Sense Triggers For Congestion Identification, Such As:
  - Price Differentials Between Region And Trading Hubs Of \$3-\$5/MWh
  - Curtailment On A Transmission Element At 200 Hours Annually
  - Regional Redispatch Or Inter-Regional Market-To-Market Payment In Excess Of \$5 Million Annually

**Problem #3:** RTOs Have Inadequate Flowgate Definitions

- **Solution:** Transmission Providers Should Be Obligated To Define Flowgates Covering All The Facilities Under Their Control, Down To 100 kV or 69 kV

# Economic Transmission Upgrades

**Problem #4:** Most Transmission Planners Do Not Have A Mandate To Adopt “Quick Hits” Solutions For Regional And Inter-Regional Transmission Needs.

- **Solution:** Require Transmission Planners To Annually Assess The Need For Quick Hits/Targeted Market Efficiency-Type Of Projects On A Regional And Inter-Regional Basis.

**Problem #5:** Participant Funding Mechanisms Are Ineffectual.

- **Solution:** Mandate That Transmission Planners Adopt More Robust Participant Funding Provisions That Will Incentivize Investment.

# Economic Transmission Upgrades

**Problem #6:** Transmission Providers Fail To Include Proper levels Of Future Generation In Transmission Planning Models.

- **Solution:** Require Transmission Providers To File Their Protocols With The FERC That Define How Amounts Of Future Generation Are Considered In Planning Models.

**Problem #7:** Transmissions Benefits Are Defined Too Narrowly.

- **Solution:** Require Transmission Providers To Apply A 1.0 Benefits-To-Cost Ratio, Define Benefits On A 30-40 Year Basis, And Include All Economic Market Impacts That Result From An Upgrade, Such As Congestion Relief On Neighboring Transmission Elements.

**Problem #8:** Some Transmission Planners Apply A Distribution Factor (DFAX) That Is Too High, Resulting In An Underbuilt Grid And Excessive Curtailment And Congestion, And Unnecessarily High LMPs

- **Solution:** Mandate Use of a 3% - 5% DFAX

# CASE STUDY I –WECC MARKETS

## Regional Transmission Planning And Generation Interconnection Processes Are Uncoordinated

- **Study Delays**

- Significant failures by Transmission Providers (TP) to meet study deadlines.
- Significant queue backlogs.
- In one instance, EDF has been waiting nearly 10 years for a System Impact Study to be performed.

- **Weak Penalty Structure**

- Under section 19.9 of the pro forma OATT, if a TP processes more than 20% of non-affiliates' transmission studies outside of a 60-day due diligence deadline for any two consecutive quarters, it must make a **notification filing** with FERC within 30 days of the end of the triggering quarter.
  - Whether a notice filing is required is calculated by dividing the number of studies that the TP **completed** on time during the quarter by the total number of studies **completed** during the quarter.
- The OATT provides for *de minimis*, \$500/day, operational penalties that kick in under the OATT for late studies **only after a notification filing has been made**.
- Uncompleted studies are not effectively tracked and penalized.

# CASE STUDY I –WECC MARKETS

## Transparency Is A Problem With The Queue

- **Apparent queue jumping?**
  - First-come-first serve is a bedrock principle of firm transmission service policy.
  - Transmission providers are required to maintain public and transparent queues.
- **The reality is that queues are sometimes quite opaque.**
  - Some transmission operators assign and reassign Transmission Service Request (TSR) numbers such that it is very difficult to determine queue priority.
  - An apparent queue jump may or may not be an actual queue jump, depending on a TSR's history of assignments, rollovers and re-numberings that cannot reasonably be reconstructed by a transmission customer.

**Solution:** The DOE or FERC Should Hold A Technical Conference To Discuss How The Two Processes Can Be Synced

# Case Study II - SPP

## **SPP Congestion in Woodward**

- For years, SPP studies had identified Woodward as likely to experience thermal overloads and excessive congestion due to wind projects that had already interconnected to that part of the grid, as well as new transmission facilities.
- However, these studies either (i) did not require a solution or (ii) identified a need date many years after the congestion became problematic.
- Despite years of studies concluding the need for a solution in Woodward, SPP identified the solution, a phase shifting transformer, in the interconnection study process as a transmission upgrade that EDF would have to finance for a planned wind project.

# Case Study II - SPP

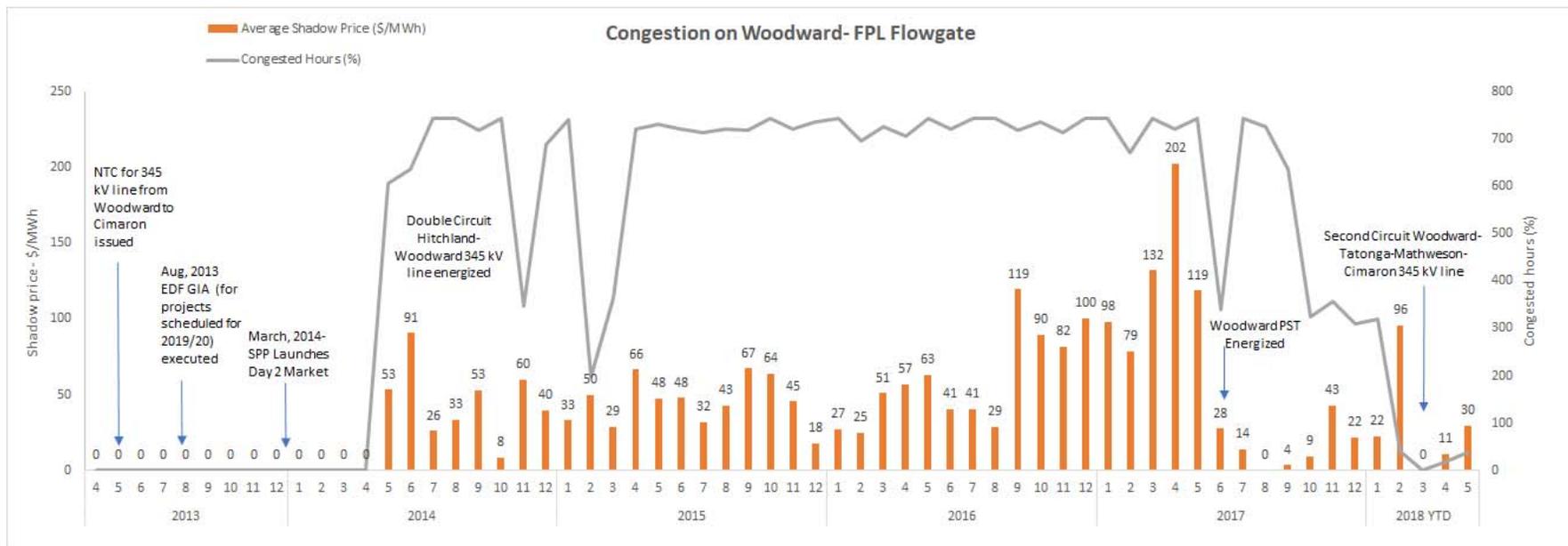
## SPP Congestion in Woodward

- Although EDF is not scheduled for several years to place in service the wind project required to finance the Woodward PST, congestion in the area continued to deteriorate.
- EDF already financed the upgrade, and it was placed in service long before the project SPP deemed to be the “but for” requirement for creating the need for the upgrade.
- The Woodward PST was an immediate success in reducing market congestion benefitting everyone, including pre-existing resources that caused the problem; unfair that SPP used the interconnection process to require a non-existent wind farm to pay for it.

# Case Study II – SPP

## SPP Congestion in Woodward

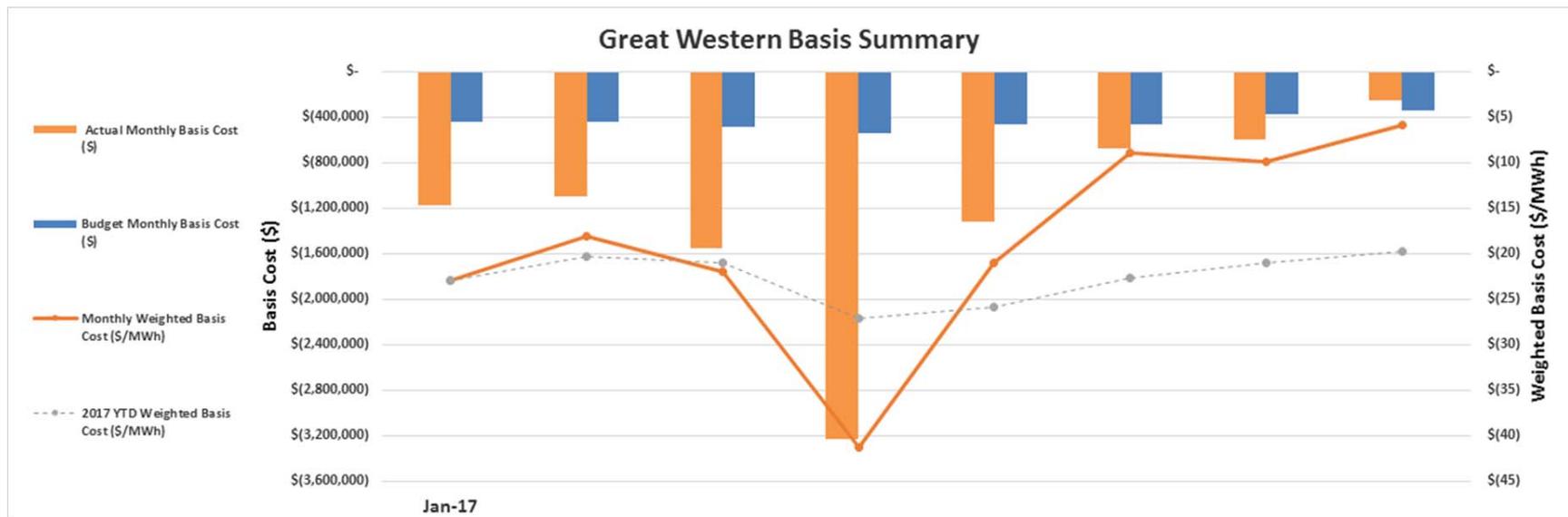
- Result: Individual generator forced to pay for transmission upgrade to cure pre-existing problem.



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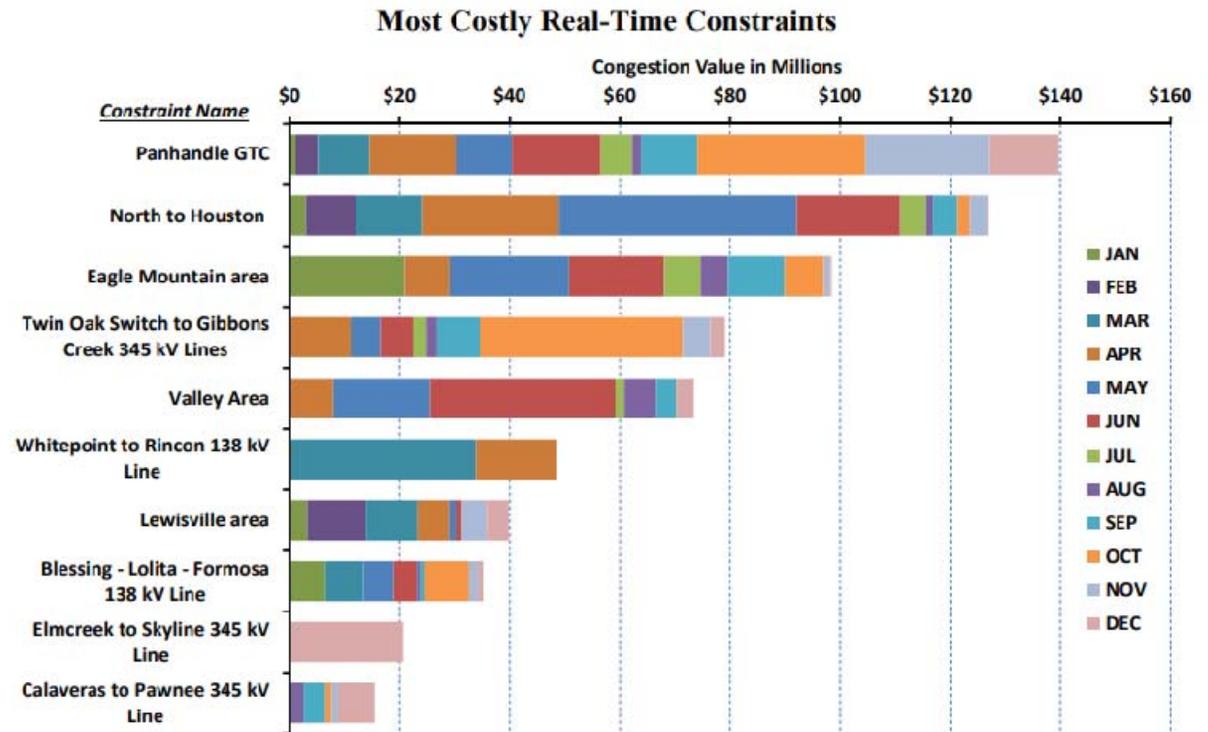


# Case Study III - Panhandle Projects

## Sponsored Upgrades and Innovative Technologies Are Not Supported Across all RTOs

Panhandle wind projects have lost millions of dollars due to congestion constraints

- \$139 Million in 2017 in congestion costs
- **Simple \$80M available to solve congestion**



# Reliability Transmission Upgrades

**Problem #9:** Transmission Providers Allow Operating Guides To Persist Instead Of Building Reliability Upgrades.

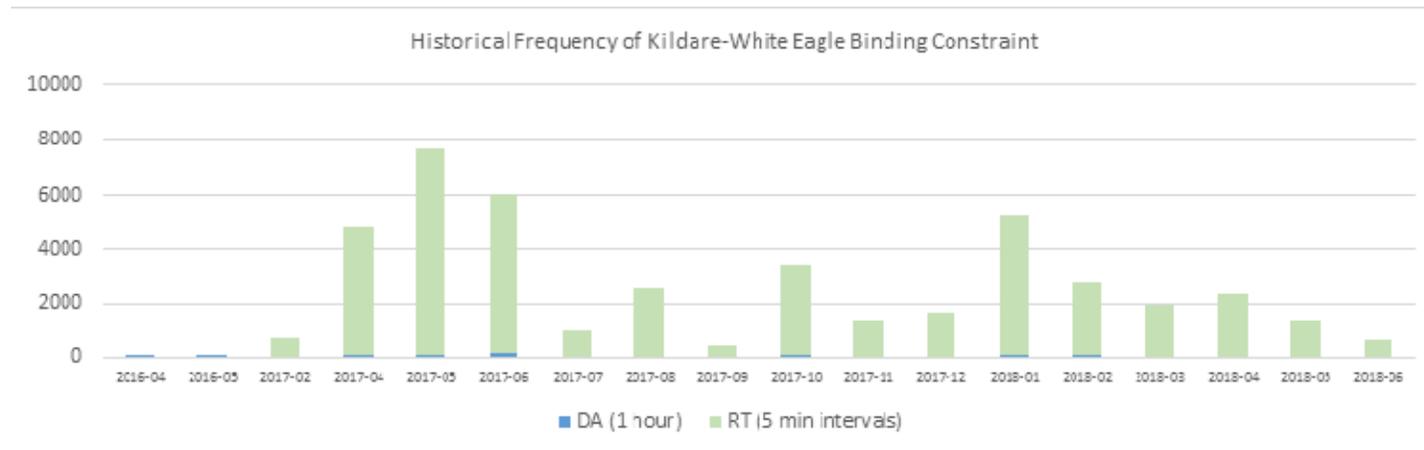
- **Solution:** Require Transmission Providers To Publicly Post Operating Guides So They Are Transparent And Remove Operating Guides After Three Years, Incentivizing The Approval Of Reliability Upgrades.

**Problem #10:** Transmission Planners Are Not Addressing Pre-Existing Conditions.

- **Solution:** A Holistic Approach Is Needed That Equitably Considers Near-Term Reliability And Generation Interconnection Needs.

# Pre-Existing Condition Case Study IV - SPP

- In 2016, EDFR decided to build the RF wind project
- Line Kildare – White Eagle was identified as a future congestion bottleneck
  - Had been binding a couple times in the Day Ahead market
- Due to low wind buildout in the models, once RF was operational, Kildare – White Eagle Line has been binding 6.8% of the time
- EDFR is going through the approval process to sponsor its upgrade
- SPP's current transmission cycle is now identifying K-W as a top congested element



# Reliability Transmission Upgrades

**Problem #11:** Transmission Planners Are Not Applying Consistent NERC Criteria.

- **Solution:** The DOE Or The FERC Should Hold A Technical Conference To Discuss Adopting Uniform Best Practices.



**Questions?**



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