

2011 CARIS 1
Selection of the Three Studies

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Today's Presentation

- ◆ Selecting the three CARIS Studies
- ◆ Additional Background Information

Selecting the Three CARIS Studies

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Two stage process for ranking and grouping

- ***To use production cost savings only for ranking and grouping would require relaxing every constraint one by one***
- ***Historic congestion reports from PROBE do not have each individual constraint relaxed***
- ***Need a filtering method to first rank the elements while still limiting multiple iterations of “relaxing” steps***
- ***Demand dollar congestion is readily available for both historic period and forecasted congestion simulations, and provides an indication of potential production cost savings***

Production Cost Savings Methodology

- ◆ **Lessons Learned from 2009 CARIS and Stakeholder input indicated that this calculation method should be reviewed**
 - *Concern was mixing LMP concepts (marginal spot pricing) with production cost concepts*
- ◆ **Accounting for interchange**
 - *2009 method was based on quantity and price of interchange for each external interface based on LMP*
 - *2011 method is based on production cost changes rather than LMP and interchange*
 - *Change in system production costs is a consistent method of valuing NYCA and interchange impacts resulting from transmission constraint relaxation*

Ranking, Grouping, and Selecting Three CARIS Studies

- ◆ **First Stage - Ranking**
 - *Step 1: First screen ranked elements on demand dollar congestion*
 - *Step 2: Allows for assessment of negative congestion and other exceptions*
- ◆ **Second Stage – Selecting and Grouping**
 - *Selection and groupings for each CARIS study based on production cost savings*

Stage 1:

Selection of Primary Elements for Study Consideration

- ◆ **Step 1 - Prioritization**

- *Line up historic congested elements and projected elements for a fifteen year period based on Demand\$ Congestion*
- *Identify elements that:*
 - Are common to both
 - Are missing from one or the other (orphaned)
 - Show negative projected congestion
 - Are exceptions for diminishing returns
- *Calculate Present Value of congestion (using Demand\$ Congestion metric) for common elements, sort and identify top five for candidates for relaxing test*

- ◆ **Step 2 - Review the exceptions :**

- *Diminishing returns - if a congested element shows a significant decline, exclude from list*
- *Negative congestion – Rank on absolute value and add top two as candidates*
- *Orphaned – Compare ranking value to just the 10 years of projected above and if greater substitute*

- ◆ **Stage 1 provides for flexibility**

- *Given all of the considerations in the above, identify the top five elements as primary*

Present Value of Demand\$ Congestion for Primary Elements 2006-2020

	Present Value of Congestion (\$M)		
	Historic	Future	Sum
CENTRAL EAST	\$3,426	\$1,353	\$4,780
LEEDS-PLSNTVLY	\$2,383	\$1,990	\$4,373
DUNWOODIE-SHOR RD	\$1,526	\$358	\$1,884
GREENWOOD LINES	\$648	\$97	\$744
WEST CENTRAL-OP*	\$135	\$20	\$155
GOTHLS - GOWANUSS	\$1	\$43	\$45
ASTORIAW138-HG5*	\$6	\$4	\$10

* Reported numbers represent absolute values.

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Stage 2: Grouping Elements for CARIS Studies

- ◆ In order to identify additional elements that may have a significant impact on congestion, each primary element being studied will be relieved independently of each other for a mid and horizon year (2015 and 2020).
- ◆ The primary element's constraint is relieved by replacing its limit with 9999, and any potential constraint duplicative or redundant with the primary constraint (e.g. two parallel circuits) (*For those circuits that are significantly above SIL, or have circuits in series above SIL, the impedance was also changed to be reflective of the potential new circuit.*)
- ◆ The resultant list of top congested elements from the two years of analysis will be reviewed to determine:
 - *The effects on NYCA congestion*
 - *If any additional new elements become congested*
 - *Significant increase in the other primary elements' congestion*
 - *Production cost savings from the relaxation*

Stage 2: Grouping Elements for CARIS Studies

- ◆ The primary constraint will be assessed for grouping with a new element if the new element
 - *Is electrically adjacent to the primary element*
 - *Is in the new top five of congested elements based on Demand\$ Congestion*
- ◆ If passes above, the new element's limit will also be increased to 9999
 - *Elements are grouped if the production cost savings increases*
 - *Repeat process if other additional elements pass above criteria*
- ◆ If after an initial grouping, the change in total NYCA production cost is not more than 3 million dollars, the original primary constraint will be removed from the list
- ◆ If more than three groupings are revealed, the three groupings with the highest improvement in production cost savings will be selected as the three studies.

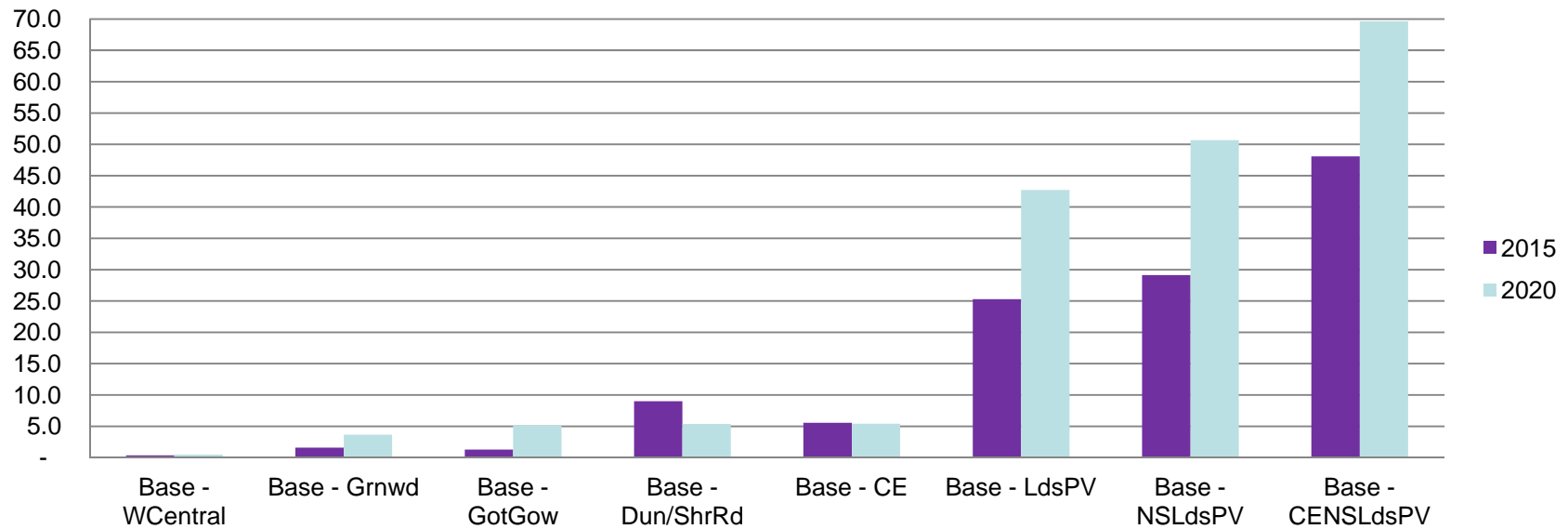
Results of Relaxing the Primary Constraints

Table E-19: Demand\$ Congestion Results for Relaxation of Top Congested Elements

Total Congestion Demand Payment (M\$)	Type	2015					2020				
		BASE CASE	Relax Leeds-Pleasant Valley	Relax Central East (CE)	Relax CE-New Scotland-LdsPV	Relax - New Scotland-LdsPV	BASE CASE	Relax Leeds-Pleasant Valley	Relax Central East (CE)	Relax CE-New Scotland-LdsPV	Relax - New Scotland-LdsPV
LEEDS-PLSNTVLY	Contingency	227	-	318	-	-	466	-	586	-	-
CENTRAL EAST	Interface	158	228	-	-	273	195	289	-	-	386
DUNWOODIE_SHORE RD_345	Contingency	51	58	50	70	61	76	87	26	108	96
GREENWOOD	Contingency	24	26	25	29	28	45	46	36	55	51
WEST CENTRAL-OP	Interface	2	3	6	11	2	5	5	9	16	5
GOTHLS A - GOWANUSS	Contingency	6	4	6	3	3	10	7	10	5	6
LEEDS3_NEW SCOTLAND_345	Contingency	-	76	6	-	-	-	226	13	-	-

Results of Relaxation and Grouping

Production Cost Savings (\$Millions)



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Additional Background Information

Selection and Grouping Process

- ◆ **Tariff Requirement:**

The NYISO, in conjunction with ESPWG, will develop criteria for the selection and grouping of the three congestion and resource integration studies that comprise each CARIS, as well as for setting the associated timelines for completion of the selected studies. Study selection criteria may include congestion estimates, and shall include a process to prioritize the three studies that comprise each CARIS. Criteria shall also include a process to set the cut off date for inputs into and completion of each CARIS study cycle.

- ◆ **Approved Procedure:**

The three congested elements with the highest present value ranking shall be utilized for further assessment under the CARIS process for that cycle. This assessment will be accomplished in multiple iterations to include additional elements that appear as limiting when each of the top three constrained elements are unconstrained. The assessed element groupings will then be ranked based upon change in production cost. The three ranked groupings with the largest change in production cost will then be selected as the three CARIS studies.

Approved Procedure from BIC approved CARIS Manual

- ◆ **Proposed Criteria/Metrics:**
 - *Utilize an unweighted present value cost of congestion for the most congested elements considering both historic and projected data.*
 - *The congestion metric to be used will be the change in total bid/forecasted production costs in accordance with Appendix A to Attachment Y of the NYISO OATT.*
- ◆ **The same metric will be used for both historic and projected congestion.**
- ◆ **Historic Congestion Considerations**
 - *Use historic positive unhedged congestion data for the most recent 60 months.*
 - *Utilize the data from the NYISO's quarterly historic congestion reports.*

Note: Not all historic congestion metrics are readily available

Approved Procedure from BIC approved CARIS Manual

◆ **Prioritization Methodology**

- ***Congestion will be identified from the list of most congested monitored element/contingency pairs.***
- ***Based upon the combination of historic and projected congestion metrics noted above, the ranking for each congested element shall be determined by formula:***
 - ***Present Value in Year 1 = [(Sum of the Future Value of Congestion from the Prior 5 Historic 12-Month Periods) + (Sum of the Present Value of Congestion from the Future 10 years)]***
- ***The discount rate to be used for the present value analysis shall be the current weighted average cost of capital for the NY Transmission Owners***
- **The three congested elements with the highest present value ranking shall be utilized for further assessment under the CARIS process for that cycle. This assessment will be accomplished in multiple iterations to include additional elements that appear as limiting when each of the top three constrained elements are unconstrained. The assessed element groupings will then be ranked based upon change in production cost. The three ranked groupings with the largest change in production cost will then be selected as the three CARIS studies.**

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- ◆ ***Exception:*** If future system changes (e.g. – generation, transmission or demand side additions) produce a significant declining trend in congestion over an identified congested element in later years of the study period, such element shall be excluded from the rankings.

- ◆ The NYISO shall perform these computations for each CARIS cycle, and review them with ESPWG.

- ◆ Other Issues
 - ***Provide the flexibility for grouping elements:***
 - ***NYISO to assess and recommend groupings to ESPWG based on the individual rankings and proximity of congested elements.***

Demand dollar congestion

- ◆ **The NYCA Demand Dollar Congestion value for a constraint is basically defined as the sum of the (zonal load) x (constraint shadow price) x (area GSF on the constraint) for all areas and hours. This value is then sensitive to the location of the reference bus (producing negative GSF) and to the direction of the flow on the constrained element**
- ◆ **Negative Dollar Demand congestion is a real congestion as the constrained elements are bottling cheaper generation on one side of the constraint from being delivered to load centers on the other side of the constraint**

Tariff reference to Production Cost Savings

- ◆ 31.3.1.3.3 In conducting the CARIS, the NYISO shall combine the component studies selected and assess system congestion and resource integration over the study period, measuring congestion by the metrics discussed in Appendix A to this Attachment Y.
- ◆ 31.3.1.3.4 In conducting the CARIS, the NYISO shall conduct benefit/cost analysis of each potential solution to the congestion identified, applying benefit/cost metrics that are described in this Section 31.3.1.3. The principal benefit metric for the CARIS analysis will be expressed as the present value of the NYCA-wide production cost reduction that would result from each potential solution.

Additional References to Production Cost Savings

31.6 Appendices

APPENDIX A - REPORTING OF HISTORIC AND PROJECTED CONGESTION

1.0 General

As part of its Comprehensive System Planning Process, the NYISO will prepare summaries and detailed analysis of historic and projected congestion across the New York Transmission System. This will include analysis to identify the significant causes of historic congestion in an effort to help Market Participants and other interested parties distinguish persistent and addressable congestion from congestion that results from one time events or transient adjustments in operating procedures that may or may not recur. This information will assist Market Participants and other stakeholders to make appropriately informed decisions.

2.0 Definition of Congestion

The NYISO will report the cost of congestion as the change in bid production costs that results from transmission congestion. The following elements of congestion-related costs also will be reported: (i) impact on load payments; (ii) impact on generator payments; and (iii) hedged and unhedged congestion payments.

The determination of the change in bid production costs and the other elements of congestion will be based upon the difference in costs between the actual constrained system prices computed in the NYISO's Day-Ahead Market and a simulation of an unconstrained system.



The New York Independent System Operator (NYISO) is a not-for-profit corporation that began operations in 1999. The NYISO operates New York's bulk electricity grid, administers the state's wholesale electricity markets, and provides comprehensive reliability planning for the state's bulk electricity system.

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