

Consumer Impact Analysis: Regulation Compensation

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KCC

Agenda

- ◆ **History of the Change**
- ◆ **Impact Analysis**
 - *Case Study Overview*
 - *Analysis Summary of Case Studies*
 - *Reliability Measures*

History

◆ FERC Order 755

- ◆ On February 17, 2011 FERC issued a NOPR on Frequency Regulation Compensation
- ◆ On October 20, 2011 FERC issued Order 755 on changes to Frequency Regulation Compensation based upon the NOPR and the comments received.
- ◆ Those changes include
 - *Must compensate resources with a Capacity payment that includes lost opportunity costs.*
 - *Must additionally compensate resources based on their actual performance.*
 - *Two-part bid required.*
 - *Uniform Clearing Price must be market based.*
 - *Must treat all resources equally when measuring accuracy*
- ◆ *Tariff changes ordered by April 28, 2012*
- ◆ *Implementation ordered by October 25, 2012*

Consumer Impact Analysis (IA) Evaluation Areas

RELIABILITY	COST IMPACT/ MARKET EFFICIENCIES
ENVIRONMENT/ NEW TECHNOLOGY	TRANSPARENCY

Consumer Impact Analysis: Regulation Compensation Cost Impact/Market Efficiencies

- ◆ **Regulation costs may increase**

Case Study Overview : Data and Assumptions

- ◆ The IA includes four different cases/scenarios that include
 - *Regulation Capacity MWh Requirement (hourly)*
 - *Regulation DAM Clearing Price (\$/MWh)*
 - *Total Movement in Hour (MW)*
 - *RT Clearing Price (\$/MWh)*
- ◆ Data was used over 5 days (for a total of 113* hours)
 - *January 23, 2012*
 - *July 12, 2011*
 - *July 19, 2011***
 - *October 12, 2011*
 - *April 10, 2011*

**Single hours included from 5 separate days in 2010 & 2011*

***Hours 0-12 used*

Case Study: Detail

- ◆ **Case 1: Expected Upper Bound**

- *This case calculates an expected upper bound on the regulation payments and assumes the movement payments are at the proposed bid cap* between \$2/MW and \$3/MW which were used to determine the upper and lower bounds.*
 - **The capacity payments were assumed to be the same as the current DAM regulation payments**
 - **The movement offers are assumed to be at the Movement Bid Cap**
 - *Expected upper bound (\$) =
DAM Regulation Clearing Price (\$/MWh) * Regulation requirement (MWh) +
Regulation movement (MW) * Movement Bid Cap \$3/MW (\$2/MW)*

- ◆ **Case 2: Maximum Upper Bound**

- *This case calculates a somewhat higher maximum capacity paid by using the greater of the DAM and RT prices to estimate an upper bound on the capacity payments. Like Case 1, the movement payments are at the bid cap* between of \$2/MW and \$3/MW which were used to determine the upper and lower bounds.*
 - *Maximum upper bound (\$) =
Max(DAM or RT Regulation Clearing Price (\$/MWh)) * Regulation requirement (MWh) +
Regulation movement (MW) * Movement Bid Cap \$3/MW (\$2/MW)*

* Bid Cap referenced is still under review

Case Study: Detail continued

- ◆ **Case 3: Regulation Cost using Implied Movement Price**

- *This case uses the DAM total hourly payments to generators for regulation (ie. DAM regulation price * Regulation requirement) and the actual RT Movement (in MW) to find the implied upper bound on the mileage compensation. The average of those prices is used as the average price for the implicit movement.*
- *The average implicit movement price is \$2.36/MW.*
- *This estimate implicitly assumes that generators are able to estimate the movement they expect.*

*Regulation Cost using Implied Movement Cost (\$) =
 DAM Regulation Clearing Price (\$/MWh) * Regulation requirement (MWh) +
 Regulation movement (MW) * Average Implied Movement Clearing Price **\$2.36**(\$/MW)*

- ◆ **Case 4: Regulation Cost using Capacity Clearing Price Reduction by 50% and Implied Movement Price**

- *This case uses half of DAM total hourly payments to generators for regulation and the average implied movement price*
- *Average Implied Movement Price is \$2.36*
- *This case assumes the capacity price will be lower (50%).*

*Reg Cost Capacity CP reduction and implied movement price (\$) =
 50% DAM Regulation Clearing Price (\$/MWh) * Regulation requirement (MWh) +
 Regulation movement (MW) * Average Implied Movement Clearing Price **\$2.36**(\$/MW)*

Summary of Results

◆ Summary of findings

- ◆ In the days studied, the results were compared to the current Average Hourly DAM Regulation Cost \$3,447.13
- ◆ Case A Movement Bid Cap \$2
- ◆ Case B Movement Bid Cap \$3
- **Case 1A and 1B**
 - **Average Hourly Expected Upper Bound (capacity and movement)**
 - Average Total Hourly Regulation Cost
 - **Case 1A \$7,761.22**
 - **Case1B \$9,918.26**
 - Average Hourly Regulation Capacity Cost
 - **Case 1A/B \$3447.13**
 - Average Hourly Movement Cost
 - **Case 1 A \$4,314.09**
 - **Case 1B \$6,471.13**
- **Case 2A and 2B**
 - **Average Maximum Upper Bound (capacity and movement)**
 - Total Hourly Regulation Cost
 - **Case 2A \$8,220.99**
 - **Case 2B \$10,378.03**
 - Average Hourly Regulation Capacity Cost
 - **Case 2A/B \$3906.90 ***
 - Average Hourly Movement Cost
 - **Case 2A \$4,314.09**
 - **Case 2B \$6,471.13**

*11 hours of the 113 that were changed

Summary of Results **NEW YORK INDEPENDENT SYSTEM OPERATOR**

continued

- **Case 3**

- **Regulation Cost using Implied Movement Price**

- Average Total Hourly Regulation Cost
 - **Case 3 \$ 8530.13**
- Average Hourly Regulation Capacity Cost
 - **Case 3 \$ \$3447.13**
- Average Hourly Movement Cost
 - **Case 3 \$5,083.00**

- **Case 4**

- **Regulation Cost using Capacity Clearing Price Reduction 50% and Implied Movement Price**

- Average Total Hourly Regulation Cost
 - **Case 4 \$6806.56**
- Average Hourly Regulation Capacity Cost
 - **Case 4 \$1,723.57**
- Average Hourly Movement Cost
 - **Case 4 \$5,083.00**

Consumer Impact Analysis: Regulation Compensation

Environment/New Technology

- ❖ *FERC has suggested and NYISO agrees that this proposal may incent the investment for new technology*
 - ❖ *LESRs/Batteries/Flywheels*
- ❖ *Potential reduction on emissions from the use of new technology*

Consumer Impact Analysis: Regulation Compensation Transparency

No change expected – Regulation Services will remain a market based product

Consumer Impact Analysis for Regulation Compensation

- ◆ **Reliability**
 - *No adverse impact*

Next Steps

- ❖ **Presentations also planned for:**
 - ❖ *BIC – March 14*
 - ❖ *MC – March 28*

Questions

Appendix

Case Study Statistical Analysis

	Sample Data	Case 1A and 1B: Average Hourly Expected Upper Bound			Case 2A and 2B: Average Maximum Upper Bound		
		Total Regulation Paid/hour	Capacity /hour	Mvmt/ hour	Total Regulation Paid/ hour	Capacity/ hour	Mvmt/ hour
Average	\$3,447.13	Case A \$7,761.22	\$3447.13	\$4,314.09	\$8,220.99	\$3906.09	\$4,314.09
		Case B \$9,918.26		\$6,471.13	\$10,378.03		\$6,471.13
Median	\$2,200.00	Case A \$7,378.00	\$2200.00	\$4,544.00	\$7,395.00	\$2262.50	\$4,544.00
		Case B \$9,363.25		\$6,816.00	\$9,363.25		\$6,816.00
Min	\$900.00	Case A \$3,928.00	\$900.00	\$668.00	\$3,928.00	\$900.00	\$668.00
		Case B \$5,400.00		\$1,002.00	\$5,442.00		\$1,002.00
Max	\$10,000.00	Case A \$14,590.00	\$10,000	\$7,838.00	\$22,759.35	\$17,710.00	\$7,838.00
		Case B \$16,885.00		\$11,757.00	\$26,169.35		\$11,757.00

Case Study Statistical Analysis

	Sample Data	Case 3: Reg. Cost using Implied Movement Price			Case 4: Reg Cost using Capacity Clearing Price Reduction 50% and Implied Movement Price		
		Total Reg/hour	Capacity/hour	Mvmt/hour	Total Reg/hour	Capacity/hour	Mvmt/hour
Average	\$3,447.13	\$8,530.13	\$3,447.13	\$5,083.00	\$6,806.56	\$1,723.57	\$5,083.00
Median	\$2,200.00	\$8115.01	\$2,200.00	\$5,353.89	\$6,419.20	\$987.44	\$5,353.89
Min	\$900.00	\$4,467.69	\$900.00	\$787.06	\$3,770.58	\$450.00	\$787.06
Max	\$10,000.00	\$15,408.08	\$10,000.00	\$9,234.98	\$11,407.97	\$5,000.00	\$9,234.98

Further Analysis

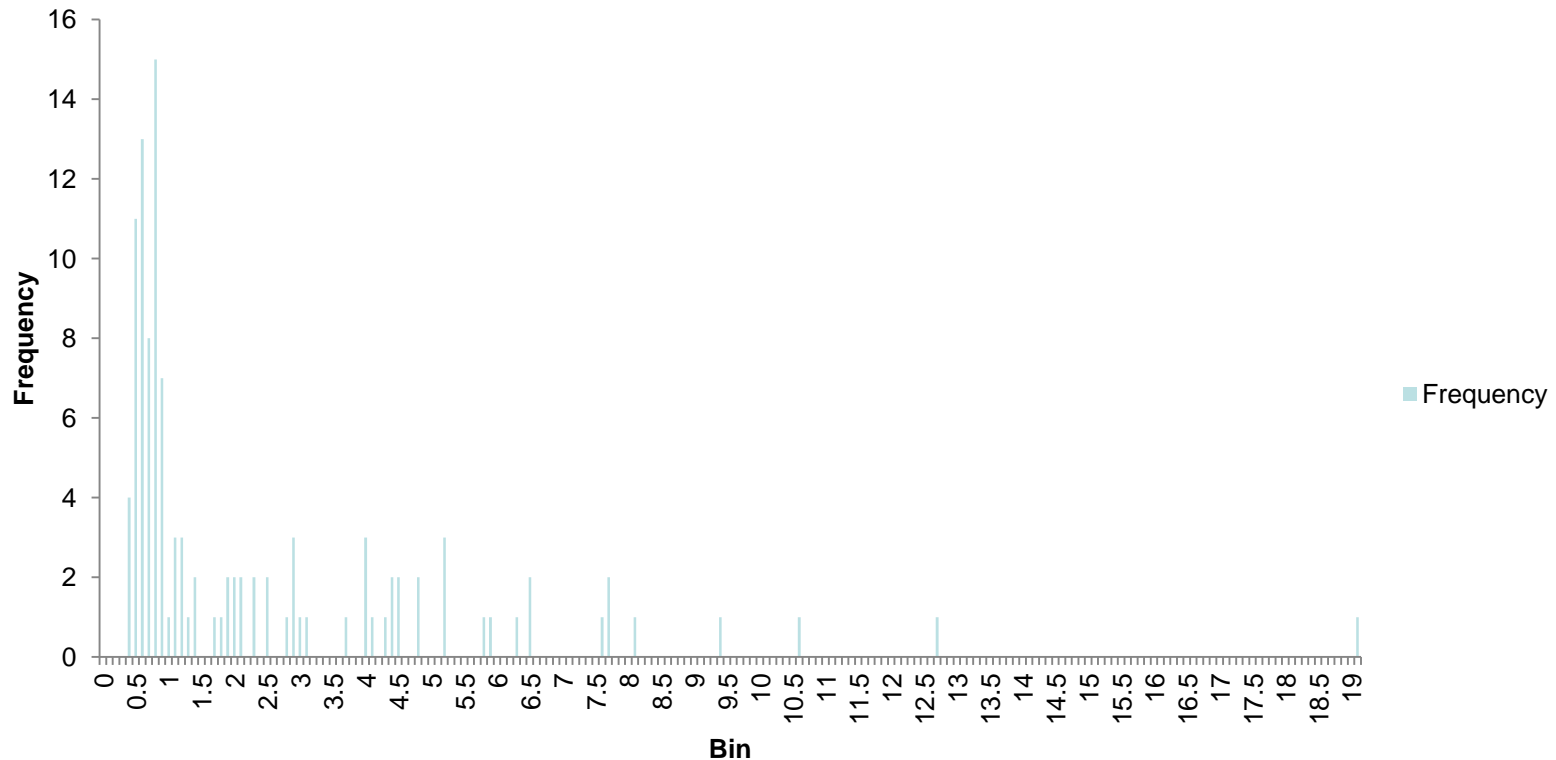
◆ Case Study 3 and 4

Implicit offer	\$/MW
Average Cost of Movement	\$2.36
Median	\$.90
Min	\$.33
Max	\$19.16

Further Analysis

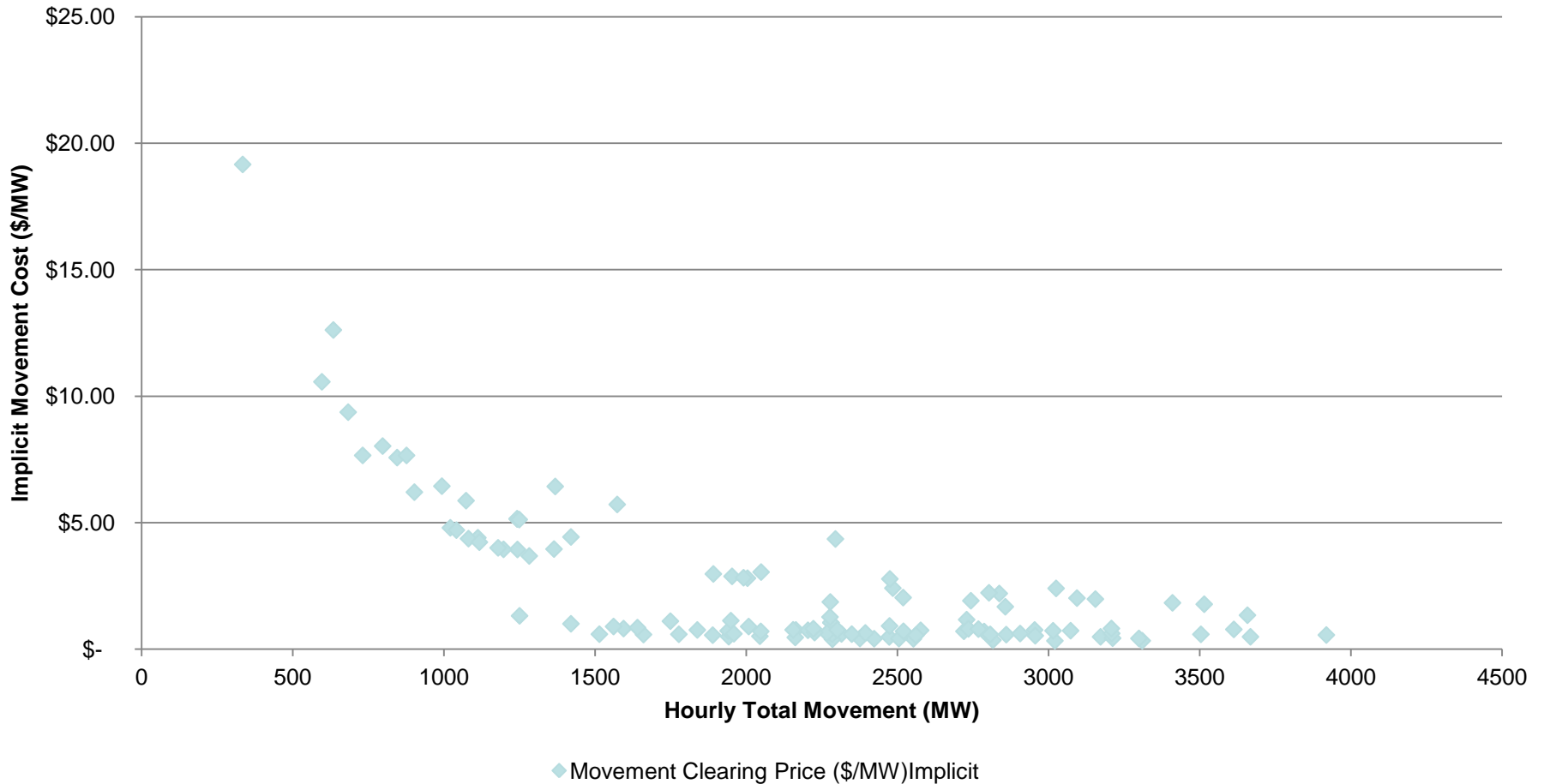
◆ Case Study 3 and 4

Implicit Movement Offer Distribution

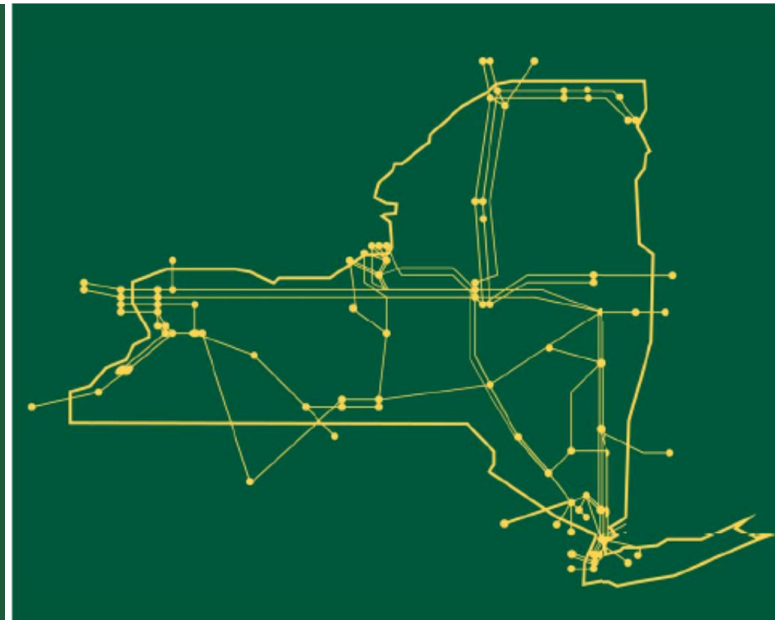


Further Analysis – Case Study 3 and 4

Movement Clearing Price (\$/MW) Implicit



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