

Estimated Savings from Virtual Regional Dispatch 2001 to 2003

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ISO-NE Markets Committee

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Introduction

- NYISO and ISO-NE have proposed a virtual regional dispatch (“VRD”) to eliminate seams issues that have prevented full utilization of the interface.
- This presentation provides estimates of the economic benefits of implementing the VRD and eliminating the export fees applied to interregional transactions from 2001 through August 2003.
- The benefits of implementing the seams reforms are measured in terms of production cost savings and consumer savings.
- This presentation does not address other likely benefits of VRD, including improved long-term price signals and forward contracting.



Production Cost Savings vs. Consumer Savings

- References to “savings” often confuse production cost savings and consumer savings.
- Production cost savings measure the reduction in as-bid costs to serve load and are the most accurate measure of short-term efficiency improvements.
 - ✓ Production cost savings are achieved by displacing high cost generation with lower cost generation.
 - ✓ Production cost savings ignore economic transfers;
- The fact that the production cost savings are relatively small does not mean that the impact of the reforms on the market outcomes is small.



Production Cost Savings vs. Consumer Savings

- Consumer savings associated with these reforms will generally be higher than the production cost savings.
 - ✓ VRD will prevent inefficient price spikes caused by poor utilization of the interface, which produce large consumer savings and modest production cost savings.
 - ✓ Although, the load served through bilateral contracts or owned generation is unaffected by changes in spot energy prices in the short-run.
- In an extreme example, assume the proposed reforms resulted in a 10 MW increase in interchange that reduced prices in New England from \$1000 to \$100 (converging with NY) in a single hour:
 - ✓ The production cost savings would equal **\$9000** (10 MW * \$1000-\$100).
 - ✓ The consumer savings would be **\$18 Million** (20,000 MW load * \$900 price reduction ignoring owned generation and forward purchases).
 - ✓ The difference between the two represents an economic transfer between participants.



Cost Savings Methodology

- Several data sources are used to estimate the production and consumer cost savings:
 - ✓ Actual bid data for each hour from 2001 through Summer 2003 are used to create hourly supply curves for the market areas in New York and New England.
 - ✓ The market areas are defined by locational price differences, which accounts for transmission congestion and losses.
 - ✓ Constraint data for New York and New England to determine:
 - (i) the supply available to increase output to support incremental exports (reduced imports), and
 - (ii) any potential limitations on increasing imports to New England.
 - ✓ In addition, data on generation dispatched out-of-merit to manage local transmission constraints in each control area.



Cost Savings Methodology

- Using this data, we estimate the optimal interchange for each hour that would cause real-time prices to converge or fully utilize the interface.
- The optimal interchange is limited by the assumed export fee.
- We then calculate the change in as-bid production costs and consumer costs implied by the supply curves.
 - ✓ Production costs savings = the incremental area under the supply curve in the market producing more power minus the decrease in the area under the supply curve in the area producing less power to facilitate the interchange adjustment.
 - ✓ Consumer savings = the sum of the load in each market area times the change in price net of native generation.
- Demand, interchange on other interfaces, and unit commitment in each control area are held constant.
- The VRD cost savings are calculated assuming (1) the current level of export fees, and (2) no export fees.



Estimating Consumer Savings

- The consumer savings are subject to significant uncertainty due to the effects of bilateral contracts, owned generation, and TCC holdings.
- We assume all loads not served by owned generation would be impacted by the change in real-time prices.
 - ✓ This case assumes that savings in the spot market would be reflected in day-ahead and forward contract prices.
 - ✓ This assumption is reasonable over the longer term, because forward prices and real-time prices are highly correlated.
- In the short-term, the consumer benefits could be discounted to account for bilateral contracts that immunize some of the load from spot price changes.

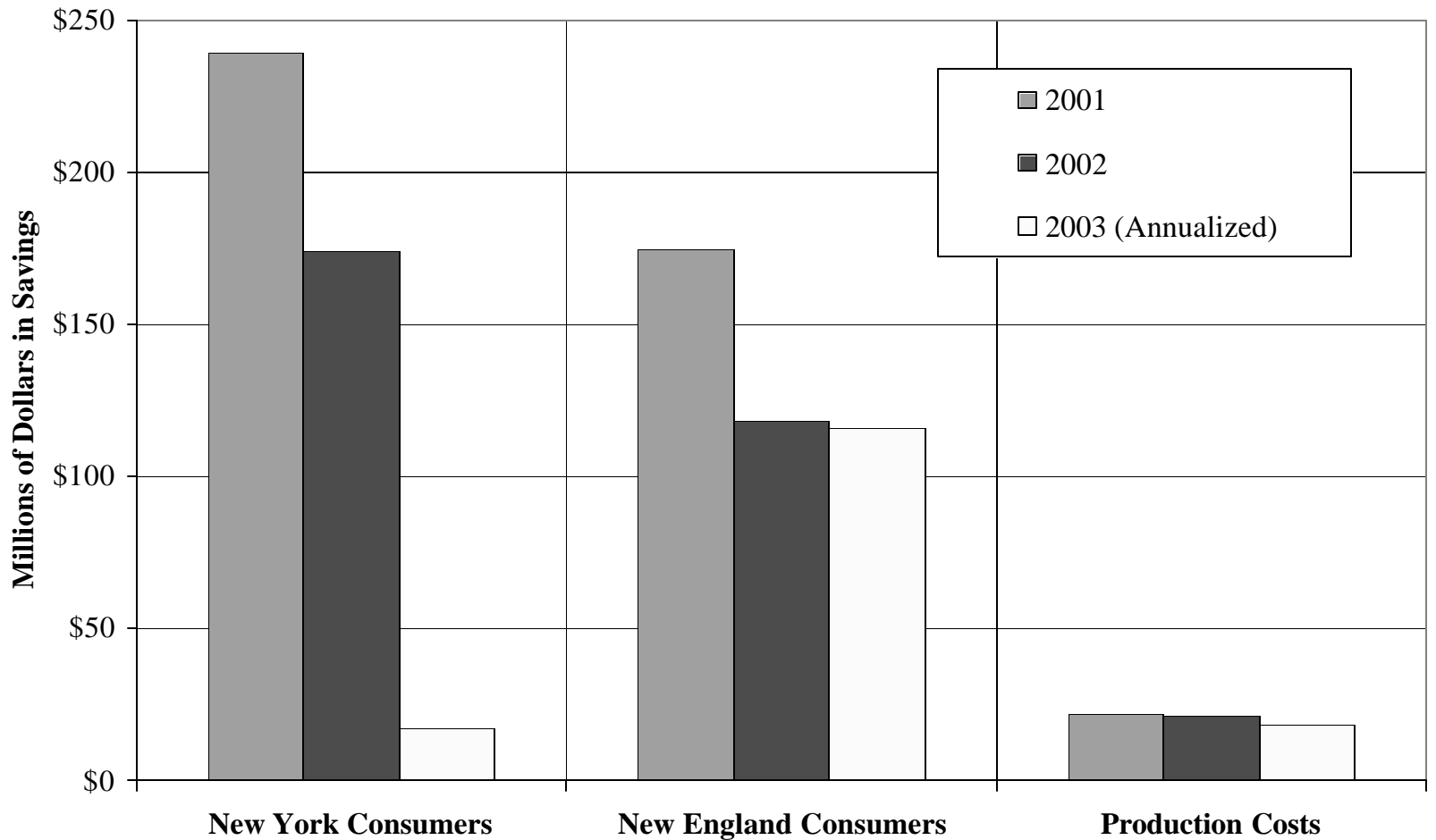


Estimating Consumer and Production Cost Savings

- The following chart shows consumer and production cost savings assuming \$5/MWh fees for exports from each control area.
- Savings for 2003 correspond to the SMD timeframe in New England (March to August) and are annualized.
- These results show that the consumer savings are substantially larger than the production cost savings.
 - ✓ This is primarily because VRD would have helped avoid price spikes by facilitating transfers to the high priced area during shortage periods.
 - ✓ Consumer savings during price-spike periods are much higher than the associated production cost savings.
- These results show substantial consumer savings for New York and New England.
 - ✓ The results decrease from 2001 to 2003 in both areas as the number of hours exhibiting shortage conditions decreased.
 - ✓ The reduction in New York was greatest in 2003, attributable to the reduction in shortage conditions and the increased use of the interface from New England to New York (which limits the VRD adjustment).



Estimated Consumer Savings and Production Cost Savings from VRD Assumes \$5/MWh Export Fees



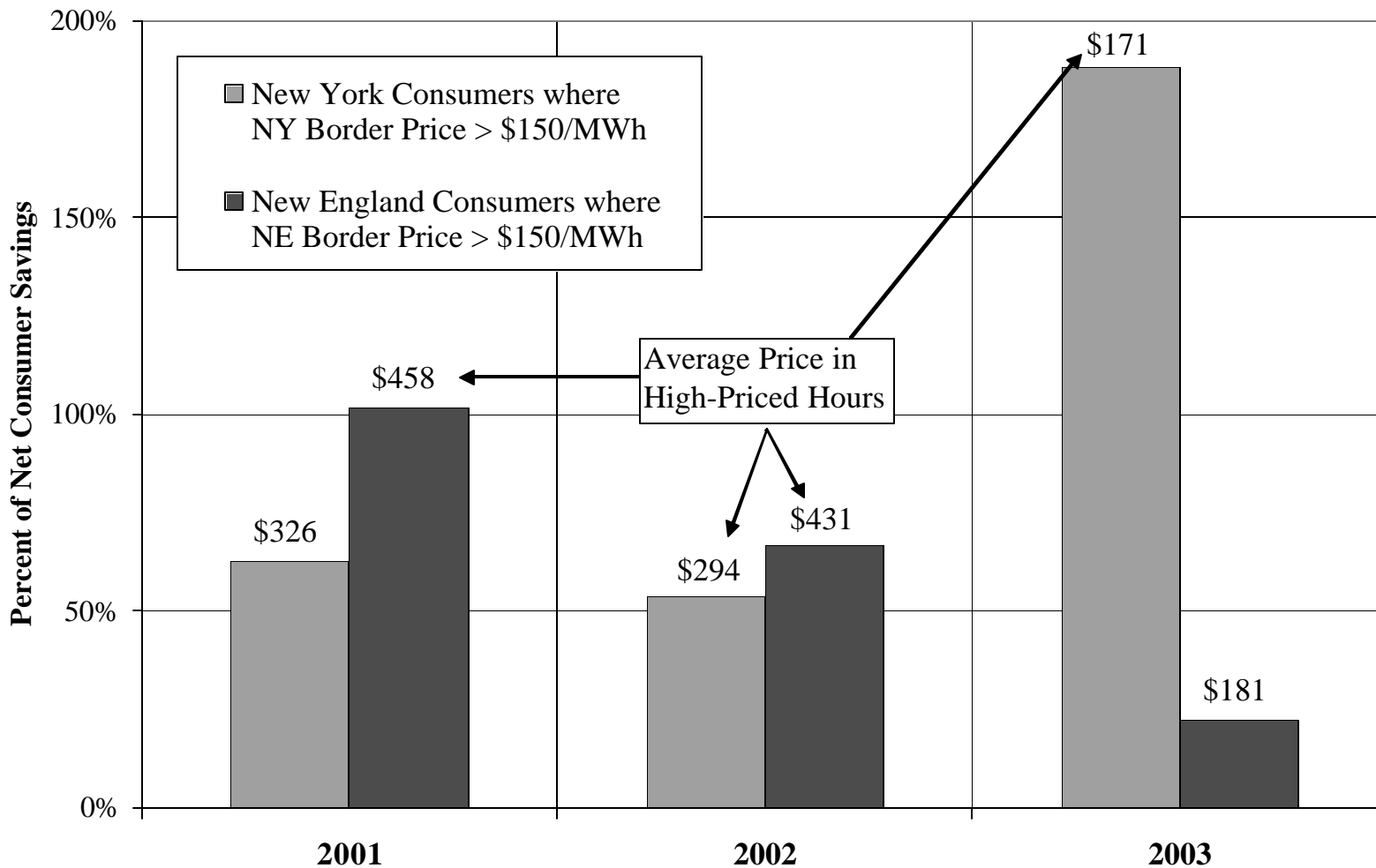


Consumer Savings During High-Price Hours

- The following chart shows that the majority of consumer savings from VRD occur in high-priced hours, although they account for less than 2% of total hours in each year.
- The high-priced hours for each area in the following chart are hours when the price in the area exceeds \$150/MWh.
- In 2001 and 2002, the savings that occur in the high-priced hours in each area range from 54% to 102%.
- In 2003, the chart shows that 188% of New York savings occurred in high-priced hours, while 22% of New England savings occurred in these hours.
 - ✓ New York consumers savings are greater than 100%, because the net savings were negative in other lower-priced hours.
 - ✓ New England savings attributable to high-price hours was lower than prior years because price spikes were less significant -- the average price during these hours in 2003 was \$181/MWh versus more than \$400/MWh in 2001 and 2002.



Estimated Percentage of Consumer Savings from High-Priced Hours Assumes \$5/MWh Export Fees



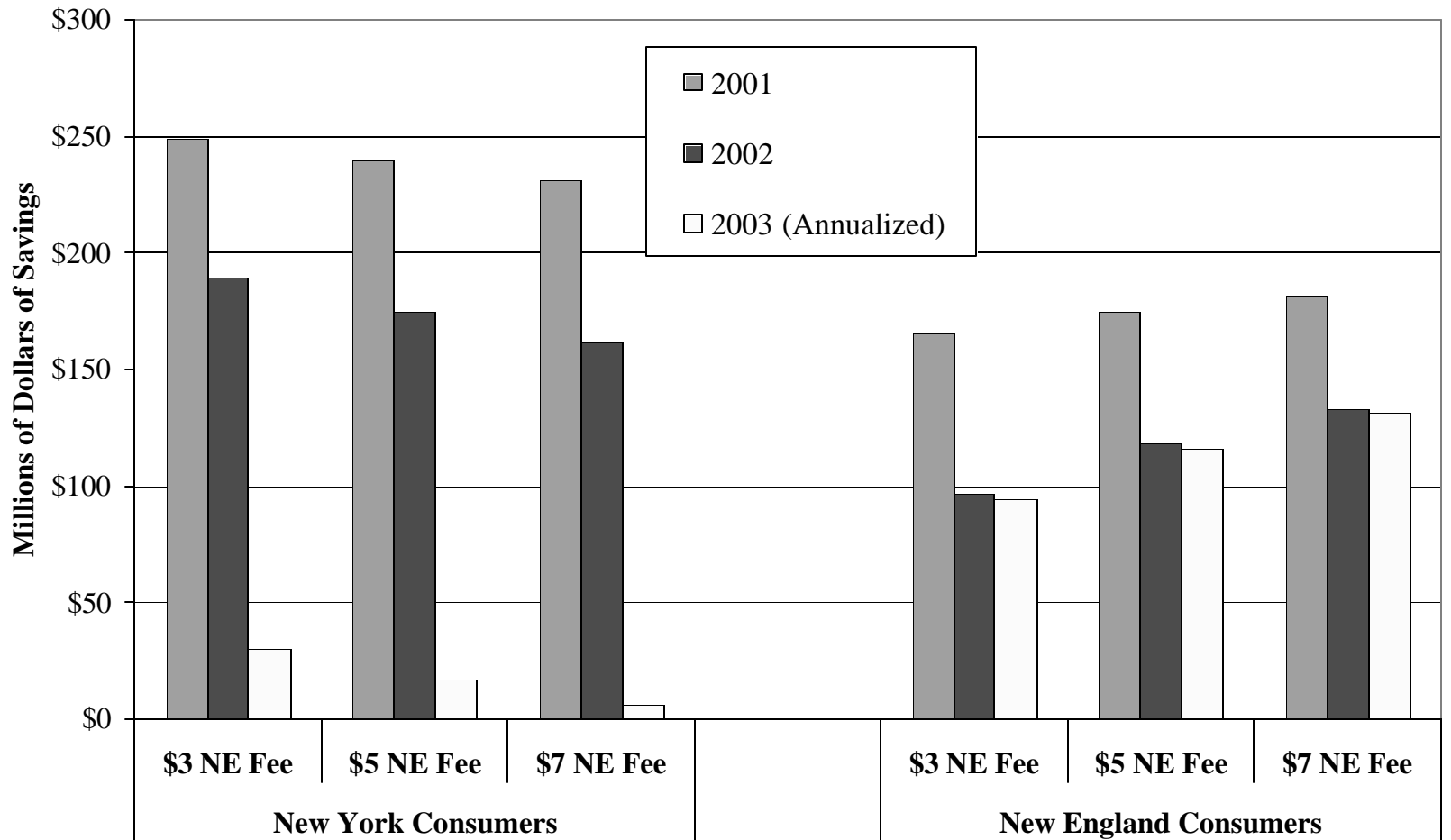


Effect of Export Fees on Cost Savings

- We conducted a number of export fee scenarios to:
 - ✓ Account for varying levels of export fees applied by ISO-New England; and
 - ✓ Estimate the incremental consumer benefits of eliminating the export fees.
- The export fees in ISO-New England have varied substantially due to the allocation of uplift charges and regulation costs to export transactions.
 - ✓ Based on information from ISO-New England, we estimated the export fee to range from \$3 to \$7 per MWh.
 - ✓ The following chart shows the results of the additional cases to estimate the consumer savings over this range.
 - ✓ Higher assumed New England export fees increase the VRD benefits for New England consumers and reduce the benefits for New York consumers, although the magnitude of the changes are relatively small.



Estimated Consumer Savings for Various New England Export Fees
Assumes \$5/MWh New York Export Fee





Effect of Eliminating Export Fees

- To estimate the incremental benefits of eliminating the export fees in addition to VRD, we estimated the consumer savings with no export fees.
- This analysis indicates that eliminating the export fee together with VRD would:
 - ✓ *Reduce* the savings for New York consumers by \$12 million annually over the timeframe studied; and
 - ✓ *Increased* the savings for New England consumers by \$21 million annually.
- This result caused by the relative prices in the two areas in hours when the export fee as assumed to prevent additional interchange.
 - ✓ Prices were generally higher in New England during these hours (62% of the hours between 2001 and 2002).
 - ✓ Hence, additional interchange would have further reduced New England's prices in these hours and increased New York's prices.
- These results do NOT account for additional charges that may be necessary to recover lost transmission revenue.