

Questions on Ontario's Proposed Framework for Identification of Market Power

February 23, 2007

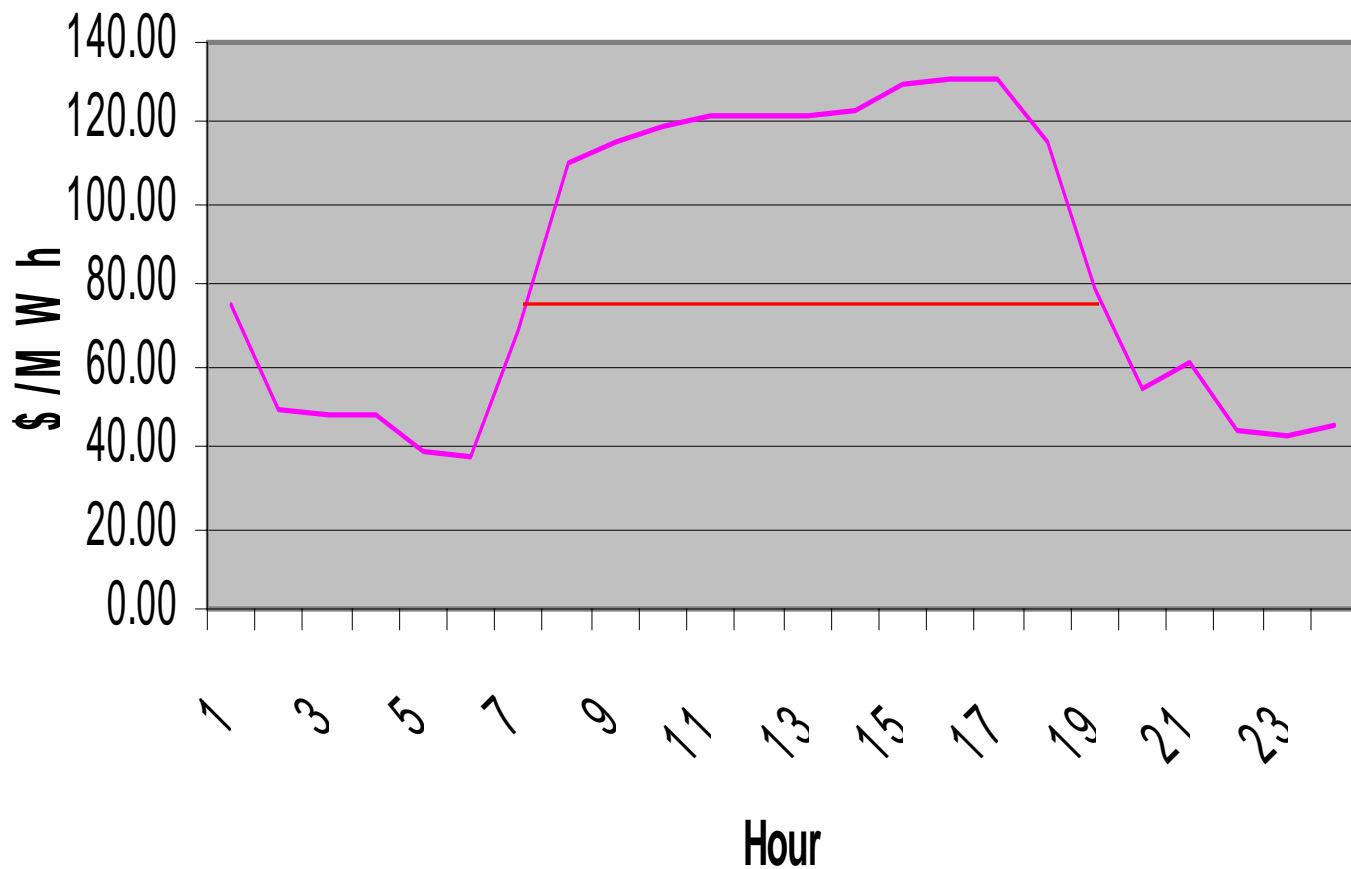
- Q1. Hydro Imports vs Hydro within Ontario
- Q2. Is the ROI a Stable and Meaningful Indicator?
- Q3. Is the WAER a Stable and Meaningful Indicator?
- Q4. Appropriateness of Using After the Fact Data



1. Hydro Imports vs Hydro within Ontario

- Consider a Hydro Generator within Ontario and a Hydro Generator outside of Ontario under the following assumptions:
- Ontario HOEP using actual data from August 5, 2005
- HOEP and PD pricing are the same, and Ontario market price is greater than or equal to surrounding markets – so that Ontario is the importers best alternative.
- Perfect foreknowledge of all prices
- No congestion
- Both hydro generators are energy limited with enough water and operating flexibility to generate at full capacity 12 hours on that day (50% C.F.)

August 5, 2005 HOEP



Hour Ending	Rank	Price
6	24	37.50
5	23	39.52
23	22	42.23
22	21	44.30
24	20	45.01
4	19	47.68
3	18	48.38
2	17	48.75
20	16	53.86
21	15	61.36
7	14	68.70
1	13	74.55
19	12	78.55
8	11	110.34
9	10	115.83
18	9	115.93
10	8	119.34
11	7	121.70
12	6	121.93
13	5	122.40
14	4	123.75
15	3	129.54
17	2	130.89
16	1	131.40

\$75.00 Offer will clear for 12 hours

Hydro Within Ontario – Energy Limited Generation

- With perfect foreknowledge of prices, the generator offers in the narrow range of \$74.55 to 78.55 (The Value of Water in Storage)
- Offer clears for 12 hours
- Daily Water Allocation Efficiency Ratio (WAER) is 100% as have achieved perfect allocation
- Presumably passes Threshold test, given the perfect WAER of 100%
- Note the very narrow offer band in the volatile market need to achieve the ideal WAER.

Import to Ontario from External Hydro Generator

- Similarly, with perfect foreknowledge of prices, the generator offers in the narrow range of \$74.55 to 78.55
- Achieves perfect allocation of the water for 12 hours
- Clearly is behaving rationally and to the benefit of the Ontario market
- Has a different conduct test, “intended to identify unusually high-priced import offers” (p.54)

Import Conduct Test

- Use 50 MW offer lamination
- IBA = Ontario HOEP; all markets at Same Price
- ROI's & Threshold from slide 34 of Feb 15 Presentation

	ROI	Threshold
Manitoba	0.15	0.51
Minnesota	0.92	0.92
Quebec	0.89	1.58

Import Conduct Test Aug 5, 2007

Hour Ending	IBA/ Ontario Price	Manitoba Threshold *IBA	Minnesota Threshold *IBA	Quebec Threshold *IBA	New York Threshold *IBA
1	74.55	38.0205	68.586	117.789	120.771
2	48.75	24.8625	44.85	77.025	78.975
3	48.38	24.6738	44.5096	76.4404	78.3756
4	47.68	24.3168	43.8656	75.3344	77.2416
5	39.52	20.1552	36.3584	62.4416	64.0224
6	37.50	19.125	34.5	59.25	60.75
7	68.70	35.037	63.204	108.546	111.294
8	110.34	56.2734	101.5128	174.3372	178.7508
9	115.83	59.0733	106.5636	183.0114	187.6446
10	119.34	60.8634	109.7928	188.5572	193.3308
11	121.70	62.067	111.964	192.286	197.154
12	121.93	62.1843	112.1756	192.6494	197.5266
13	122.40	62.424	112.608	193.392	198.288
14	123.75	63.1125	113.85	195.525	200.475
15	129.54	66.0654	119.1768	204.6732	209.8548
16	131.40	67.014	120.888	207.612	212.868
17	130.89	66.7539	120.4188	206.8062	212.0418
18	115.93	59.1243	106.6556	183.1694	187.8066
19	78.55	40.0605	72.266	124.109	127.251
20	53.86	27.4686	49.5512	85.0988	87.2532
21	61.36	31.2936	56.4512	96.9488	99.4032
22	44.30	22.593	40.756	69.994	71.766
23	42.23	21.5373	38.8516	66.7234	68.4126
24	45.01	22.9551	41.4092	71.1158	72.9162

Red Cells = Failed Import Conduct Test as the \$75.00 offer is greater the Threshold * IBA

Observations on Import Conduct Test

- Assumes importer offers each hour on the basis of other market prices, not the value of water in storage or marginal cost of thermal generation
- During the lowest priced hours, hydro based importer to Ontario will fail the Import Conduct Test as its offers are based on the Value of Water in Storage (\$75.00), and not adjacent market prices (the IBA)
- If the hydro importer offers at the Threshold * IBA, in all cases the optimum quantity of hydro energy is not cleared into the market at the optimal time
- Identifies more than “unusually high-priced import offers”

Import Market Price Impact Test

- For Manitoba HE 1
 - Threshold Offer = $(ROI + 2SD) * IBA = \$38.02$
 - Replacement ROP = $ROI * IBA = \$11.18$
 - HOEP = \$ 74.55
- A \$75 offer is higher than Threshold Offer (Conduct or Test #1), and any offer over the Threshold of \$38.02 fail this test
- The ROP will clear in the market, and likely reduce HOEP – so it will fail Test #2 if price impact is greater than \$50 – Market Price Impact Test
- Why are Threshold Offer and ROP different?
- Lower ROP biases Test #2 to false positives

Observations Regarding Manitoba and Quebec ...1

- Test assumes US markets extend to Ontario boundaries with Quebec and Manitoba
- Like saying Manitoba and Quebec don't exist, or are infinite pieces of zero cost transmission with no losses whose sole benefit is to serve the Ontario market
- Test assumes Ontario has priority, particularly for off peak imports, over the Manitoba and Quebec load

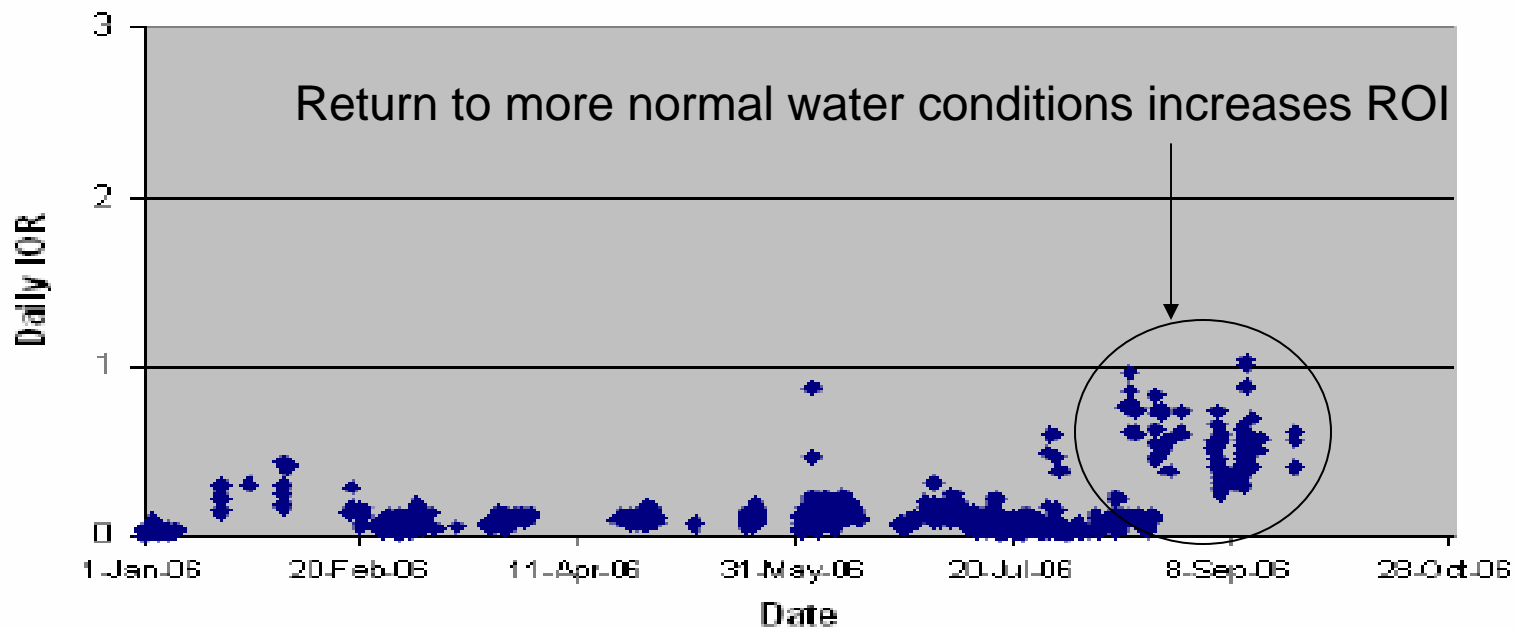
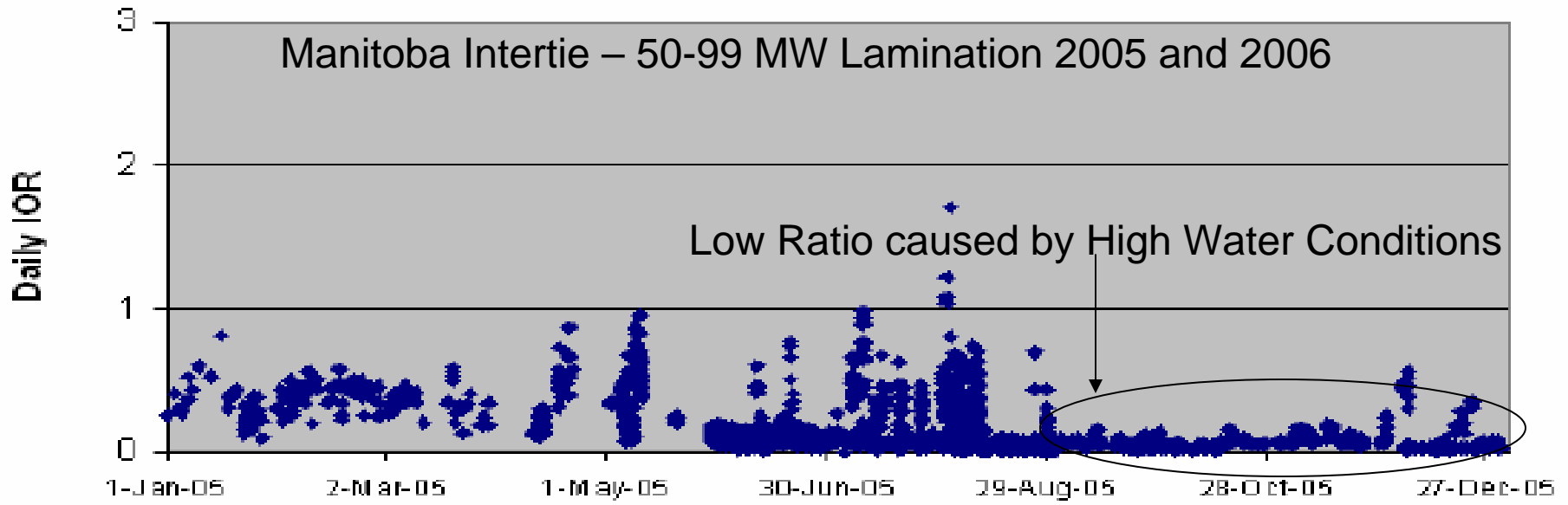
Observations Regarding Manitoba and Quebec ...2

- If the energy limited systems in Quebec and Manitoba actually “complied” with the Import Conduct Test, it could result in:
 - More off peak imports to Ontario
 - Less on peak imports to Ontario, as the limited energy was supplied in the off peak rather than on peak periods
 - Loss of value of the flexibility of adjacent hydro systems to Ontario
 - Overall increase in prices in Ontario

Q1 Hydro Imports vs Hydro within Ontario

- A) Was the MSP aware of the issue that the Import Conduct Test would result in lost value to Ontario from energy limited importers?
- B) Are historical ROI's appropriate for interfaces dominated by energy limited hydro?
- C) Should the Market Price Impact Test use Reference Offer Price = $(ROI+2 SD)* IBA$ – to be consistent with Import Conduct Test?
- D) Due to the aggregation of data, will more than 2.5% of offers fail the Import Conduct Test?

2. Is the ROI a Stable and Meaningful Indicator?



Drivers of the ROI

- With regard to the Manitoba interface, a key driver of the IOR is the current short term relative water conditions for Manitoba Hydro
- Manitoba Interface ROI is 0.09, but varies monthly in 2005 from 0.08 to 0.75 based on water conditions in Manitoba and the current Manitoba load

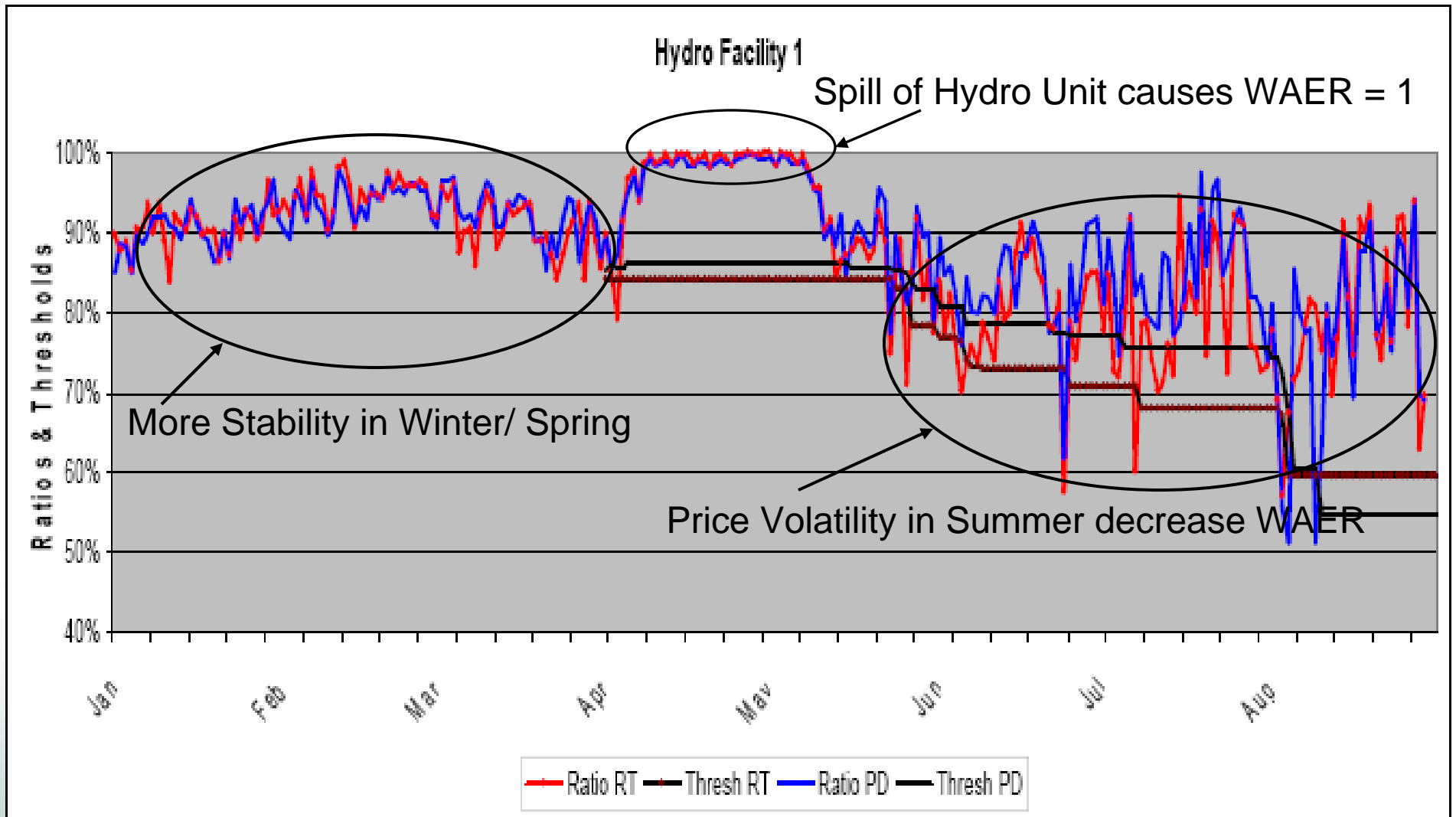
Slide 63, 2005 data

		MB
Annual Threshold		0.34
Annual ROI		0.09
Month	Interval (MW)	Mthly Threshold
Jan	100 - 149	0.75
Feb	100 - 149	0.60
Mar	100 - 149	0.51
Apr	100 - 149	0.18
May	100 - 149	0.50
Jun	100 - 149	0.15
Jul	100 - 149	0.39
Aug	100 - 149	0.29
Sep	100 - 149	0.15
Oct	100 - 149	0.08
Nov	100 - 149	0.25
Dec	100 - 149	0.59

Q2. Is the ROI a Stable and Meaningful Indicator?

- The ROI :
 - Can vary significantly on a monthly basis
 - Is a lagging indicator of regional supply
 - Is aggregated across all hours
- Implies import offers into a market should be based on last years average ROI
- Ignores changes in the market, relative supply including hydro levels, and assumes every hour has equal risk
- Compares IESO offer to clearing pricing in other markets – unlike WAER which considers revenue
- Not a Stable and Meaningful Indicator!

3. Is the WAER a Stable and Meaningful Indicator?



Q3. Is the WAER a Stable and Meaningful Indicator?

- Clearly varies seasonally based on water conditions, so annual WAER is inappropriate, and is aggregated data
- Spill conditions raise annual WAER
- Market Volatility causes a decrease in WAER due lack of perfect foreknowledge of all prices
- Not a Stable and Meaningful Indicator!

Q4 Appropriateness of Using After the Fact Data

- The tests for Non-Energy Limited Generation (Thermal), Energy Limited Generation (Hydro) and Imports all rely on actual after the fact HOEP data.
- Q4 “Is it appropriate to judge any market participant’s conduct on the basis of data that was not available to them when then made their operating and market decisions?”