

Glen A. Winn
14 Carlton St.
Toronto, Ontario
M5B 1K5

Telephone: 416-542-2517
Facsimile: 416-542-3024
regulatoryaffairs@torontohydro.com



January 28, 2010

via RESS e-filing – original to follow by courier

Ms. E. Kirsten Walli, Board Secretary
Ontario Energy Board
2300 Yonge St, 27th floor
PO Box 2319
Toronto, Ontario M4P 1E4

Dear Ms. Walli:

**RE: OEB File No. EB-2009-0139
Toronto Hydro-Electric System Limited's 2010 Electricity Distribution
Rate Application**

Pursuant to the Board's Decision on Motion & Procedural Order No. 5, enclosed are two copies of Toronto Hydro-Electric System Limited's responses to Pollution Probe's interrogatories 2 and 3.

Please contact me if you have any questions or comments.

Yours truly,

[original signed by Glen Winn]

Glen A. Winn
Manager, Regulatory Applications & Compliance
416-542-2517
regulatoryaffairs@torontohydro.com

encl.

:GAW/acc

cc: J. Mark Rodger, Counsel for THESL, by e-mail only
Intervenors of Record for EB-2009-0139, by email only

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INTERROGATORY 2:

Reference(s): **Exhibit Q1, Tab 4, Schedules 1-1, 1-2, & 1-3**

In this proceeding, Toronto Hydro filed copies of three sets of materials by Navigant Consulting, Inc. regarding distributed generation in Toronto. Did Navigant Consulting, Inc. prepare any other related reports or materials for Toronto Hydro and/or the Ontario Power Authority (e.g. an Analyst's Report, other additional or more detailed reports/materials, etc.)? If yes, please provide copies of these materials.

RESPONSE:

All materials prepared by Navigant Consulting Inc. for THESL regarding distributed generation are contained in the reports filed in Exhibit Q1, Tab 4 Schedules 1-1, 1-2, and 1-3. These reports integrate and update material previously provided by Navigant Consulting Inc. at workshops conducted with industry stakeholder groups in Toronto on February 25, 2009 and April 17, 2009. The filed reports are the most complete record of Navigant Consulting's analysis and findings.

THESL is not in a position to comment on what additional materials, if any, Navigant Consulting Inc. prepared for the Ontario Power Authority ("OPA").

Board Direction from January 22, 2010 Decision on Motion & Procedural Order No. 5, page 4:

"The Board directs Toronto Hydro to inquire of the OPA if it has within its possession any reports or materials on distributed generation, created by Navigant as part of its joint retainer by the OPA and Toronto Hydro, which have not been produced in this application. Should the OPA advise that it has such reports or

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1 materials, Toronto Hydro shall use its best efforts to obtain the reports and
2 materials from the OPA and produce them in this application.”
3
4 The OPA does not have within its possession any reports or materials on distributed
5 generation, created by Navigant Consulting Inc. as part of its joint retainer with Toronto
6 Hydro, that have not already been submitted by Toronto Hydro in its application EB-
7 2009-0139.

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INTERROGATORY 3:

Reference(s): **Exhibit Q1, Tab 4, Schedule 1-3**

Page 116 of Schedule 1-3 includes a graph showing the evaluated costs of various distributed generation technologies. However, according to pages 108 and 110, the costs for the various CHP technologies appear to be calculated based on the assumption that they would not be properly sized to match their minimum thermal loads. Please re-calculate these costs and reproduce the graph on page 116 assuming that the CHP technologies are instead properly sized to meet their minimum thermal loads. Please provide all of the key input assumptions for your revised cost calculations for each of the CHP technologies.

RESPONSE:

Neither Navigant Consulting nor THESL accept the premise of Pollution Probe's question, which is that the units in question are not properly sized for purposes of the analysis.

The sizing assumptions for the CHP technologies are given on page 81 of the report provided in Exhibit Q1, Tab 4, Schedule 1-3. The thermal energy duration curves for four buildings provided on this page were used to inform Navigant Consulting's sizing assumptions. Both the sizing and cost methodology were presented to industry stakeholder groups in workshops conducted by Navigant Consulting in Toronto on February 25, 2009 and April 17, 2009.

Board Direction from January 22, 2010 Decision on Motion & Procedural Order No. 5, page 6:

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1 “The Board directs Toronto Hydro to require Navigant to re-calculate and re-
2 graph the CHP’s evaluated costs on the basis of the assumption change described
3 by Pollution Probe in its interrogatory and motion materials.”
4

5 As stated previously, the sizing assumptions for the CHP technologies are given on page
6 81 of the report provided in Exhibit Q1, Tab 4, Schedule 1-3. Both the sizing and cost
7 methodology were presented to industry stakeholder groups in workshops conducted by
8 Navigant in Toronto on February 25, 2009 and April 17, 2009. The CHP technologies
9 are appropriately sized to reflect typical building characteristics and the heat rates used in
10 the study reflect typical seasonal changes in thermal demand.
11

12 Neither Navigant nor THESL accept the premise of Pollution Probe’s question, which is
13 that the units in question are not properly sized for purposes of the analysis. Pollution
14 Probe has not provided any further information as to specific faults in the analysis or
15 what the “properly sized” units would be.
16

17 As requested by Toronto Hydro in response to the Board’s Decision on Motion &
18 Procedural Order No. 5, Navigant Consulting has recalculated the evaluated costs for the
19 various CHP facility sizes assuming that the facilities are able to achieve a uniform year-
20 round heat rate of 5,766 Btu/kWh. Based on this assumption, the inputs for the re-
21 calculation are provided below. Note that only the heat rates for seasons 2 and 3 for the
22 four CHP technologies have been changed from the similar table in the report.
23

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	Units / Season	Large CHP	Medium CHP	Small CHP	Smallest CHP
Overnight Capital Cost	(\$2008/kW)	\$2,500	\$2,900	\$3,200	\$4,000
Fixed O&M (installed)	(\$/kW-yr)	\$125	\$147	\$162	\$200
Variable O&M	(\$/MWh)	\$8	\$8	\$8	\$8
Heat Rate HHV by Season(Btu/kWh)	1	5,766	5,766	5,766	5,766
	2	5,766	5,766	5,766	5,766
	3	5,766	5,766	5,766	5,766
	4	5,766	5,766	5,766	5,766
Nameplate Capacity	(kW, MW)	5-10 MW	1-5 MW	500kW-1 MW	100-500 kW
Total NRR (Fixed + Indexed)	2008 \$/kW-year	\$399	\$469	\$516	\$638
Monthly NRR	2008 \$/kW-month	\$33	\$39	\$43	\$53

The recalculated evaluated costs based on the above assumed heat rates are provided in the following table. Note that technical potential in the following table remains unchanged given the “*all other things equal*” basis for this analysis.

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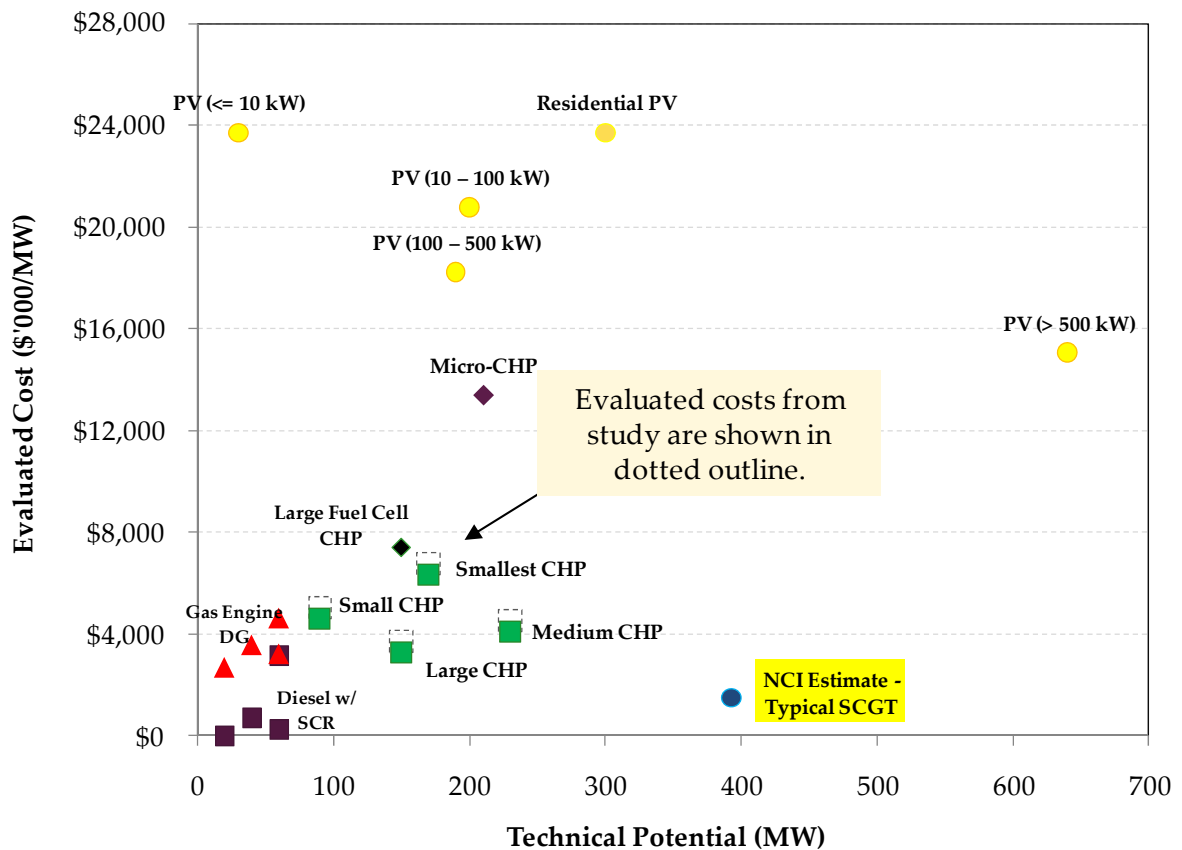
Evaluated Cost and Potential by Generator

Project Type	Technical Potential (MW)	Evaluated Cost from Study (\$'000/MW)	Recalculated Evaluated Cost (\$'000/MW)
Smallest CHP	170	\$6,780	\$6,352
Small CHP	90	\$5,055	\$4,627
Medium CHP	230	\$4,524	\$4,096
Large CHP	150	\$3,728	\$3,300

As shown, the evaluated costs assuming that a 5,766 Btu/kWh heat rate can be achieved year-round are approximately \$430,000 / MW less than indicated on page 113 of Exhibit Q1, Tab 4, Schedule 1-3.

The chart given on page 116 of Exhibit Q1, Tab 4, Schedule 1-3 has been reproduced below with the recalculated evaluated costs from the above table.

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Although the technical potential for each of the four CHP technologies has not been changed in the above table and chart, Navigant Consulting notes that only a portion of facilities in Toronto are likely to have a seasonal thermal demand profile that would allow CHP to operate year-round at a heat rate in the range of 5,766 Btu/kWh. Hence, the technical potential for such CHP facilities to operate year-round at a heat rate in the range of 5,766 Btu/kWh would be less than was indicated in Exhibit Q1, Tab 4, Schedule 1-3, p. 113. Furthermore, some of these facilities would likely require a smaller CHP facility (as a percentage of peak thermal demand) in order to achieve a year-round heat rate in the range of 5,766 Btu/kWh. To the extent that the CHP facility size is reduced,

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- 1 the unit capital cost (expressed on a \$ per MW basis) is likely to increase, which will
- 2 increase the evaluated costs. The net effect of these considerations would be lower
- 3 technical potential and higher evaluated costs than shown in the chart above.
- 4
- 5 To reiterate, Navigant Consulting believes the CHP facilities as presented in the study are
- 6 appropriately sized for the purposes of the analysis undertaken.