EB-2022-0024

ELEXICON ENERGY INC.

COMPENDIUM OF MATERIALS

SCHOOL ENERGY COALITION

Elexicon Energy Inc.

Answer to Interrogatory from

School Energy Coalition

Interrogatory SEC-18:

The ICM Models show the following budget for the project:

RZ		Budget $	Subtotal Hardware $	Subtotal ADMS $
WRZ	WSG - Wood Poles	6,630,000		
WRZ	WSG - OH Load Inter Switch	17,570,000		
WRZ	WSG - Tx Polemount	10,170,000	34,370,000	
WRZ	WSG - SCADA	1,281,502		
WRZ	WSG - ADMS - Computer Software	579,138		
WRZ	WSG - ADMS - Computer Equipment	89,562		
WRZ	WSG - ADMS - Communications Equipment	419,231		2,369,433
VRZ	WSG - SCADA	3,478,498		
VRZ	WSG - ADMS - Computer Software	1,572,007		
VRZ	WSG - ADMS - Computer Equipment	243,106		
VRZ	WSG - ADMS - Communications Equipment	1,137,957		6,431,567
	Total	43,171,000	34,370,000	8,801,000
	NRCan Funding	4,041,000		4,041,000
	Total	47,212,000	34,370,000	12,842,000

The footnote on page 11 of Appendix B-1 states that 'Estimates provided for the VVO and FLISR field hardware herein should be considered Class 4 estimates as defined by AACE and other standard estimate formats. The conditions for a Class 4 estimate presume that 1-15% of Project Definition has been completed. Typical Accuracy ranges of a Class 4 estimate are -30% on the low side and +50% on the high side. All other costs can be considered Class 5 estimates as defined by ACCE.'

a) Does the above budget include Engineering, Project Management and IT support in the percentages as shown in Table 5-1 of Appendix B-5? If so, please show where these are allocated. If not, please explain.

b) How has Elexicon allocated the funding from NRCan between the WRZ and VRZ?

c) Elexicon has included two reports prepared by METSCO for this application. What was the cost of these reports and where are they included in the budget?

d) Is Elexicon applying to the OEB at this time using estimates which are preliminary due to the timing of the NRCan Funding? If not, why has Elexicon not waited until the project is better defined before applying to the OEB?

e) When will Elexicon have produced estimates with a greater level of definition and accuracy?

f) At what budget estimate would Elexicon consider the WSG project no longer beneficial for its customers?

Response:

a) Yes, the budget includes Engineering, Project Management and IT support costs as shown in Table 5-1. Please see Table 1 below for a breakdown of Equipment, Engineering, Project Management, Information Technology ("IT") and Consulting and Legal costs:

Table 1 – Whitby Smart Grid Project Costs

Rate Zone	Asset Category	Budget	Equipment	PM (5%)	Eng (10%)	IT (2%)	Consulting and Legal	Sub-Total WSG (Note 1)	NRCan ADMS Component
WRZ	WSG Wood Pole	6,630,000	5,670,000	283,500	567,000	113,400			
WRZ	WSG OH Load Inter Switch	17,570,000	14,760,000	738,000	1,476,000	295,200	300,000		
WRZ	WSG – Tx Polemount	10,170,000	8,690,000	434,500	869,000	173,800		**34,370,000**	
WRZ	WSG - SCADA	1,281,502	1,095,301	54,765	109,530	21,906			
WRZ	WSG ADMS – Computer Software	579,138	579,138						
WRZ	WSG ADMS – Computer Equipment	89,562	89,562						
WRZ	WSG ADMS – Communications Equipment	419,231	419,231						2,369,433
VRZ	WSG - SCADA	3,478,498	2,973,075	148,654	297,308	59,462			
VRZ	WSG ADMS – Computer Software	1,572,007	1,572,007						
VRZ	WSG ADMS – Computer Equipment	243,106	243,106						
VRZ	WSG ADMS – Communications Equipment	1,137,957	1,137,957						6,431,568
	Total	43,171,001	37,229,377	1,659,419	3,318,838	663,768	300,000	34,370,000	8,801,001
	NRCan Funding	4,041,000							4,041,000
	Total	47,212,001	37,229,377	1,659,419	3,318,838	663,768	300,000	34,370,000	12,842,001
Note 1:	**Subtotal of WSG is rounded to thousands.**								

b) Please see response to STAFF-10 part a.

c) The costs for the two METSCO reports included in the application are estimated at $63,475 and have been allocated 50% to each of the Whitby Smart Grid and Sustainable Brooklin projects. These costs are included in the Consulting and Legal costs shown in Table 1 of this response.

d) Elexicon filed its application to the OEB at this time to meet the Brooklin Landowner's Group's timeline to have Sustainable Brooklin in-service by Q3, 2023. Elexicon also undertook development of the more accurate Class 4 estimate of the Whitby Smart Grid to accompany its Class 4 estimate of Sustainable Brooklin. Elexicon has confidence in both projects' scope and cost estimate.

e) Elexicon's tendering for each project will be the final step prior to commencement of each project.

f) Elexicon has not conducted sensitivity analysis with respect to customer benefits weighed against various cost scenarios. The question poses a hypothetical situation that could entail multiple scenarios. The WSG as proposed provides value to customers via energy savings, improved reliability, and the facilitation of higher levels of DER connection.

Table 2: Forecast Capital Expenditures ($M)

	Capital Expenditures ($'000)
ADMS (Software, Communications Infrastructure, Active Demand Management Program Design)	$8,082
VVO and FLISR Field Hardware	$39,130
Total Capital Expenditure	**$47,212**
NRCan Funding	$4,041
Total Capital Expenditure (Excluding NRCan Funding)	**$43,171**

Table 1 – Whitby Rate Zone Capital Expenditures Including ICM

Whitby Rate Zone																								
Category	2018	2018	2019	2019	2020	2020	2021	2021	Sept 2021 YTD	2022	Sept 2022 YTD	2023	2023	2024	2024	2025	2025	2026	2026
Plan	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
System Access (WRZ)	$ 6,930	$ 2,132	$ 14,276	$ 14,794	$ 10,087	$ 10,694	$ 11,380	$ 8,857	$ 617	$ 13,929	$ 735	$ 2,037	$ -	$ 2,605	$ -	$ 2,955	$ -	$ 2,354	$ -
System Renewal (WRZ)	$ 7,347	$ 7,032	$ 3,275	$ 9,189	$ 4,865	$ 3,249	$ 8,264	$ 5,669	$ 1,343	$ 2,998	$ 483	$ 2,441	$ -	$ 3,321	$ -	$ 6,040	$ -	$ 4,338	$ -
System Service (WRZ)	$ 2,840	$ 476	$ 152	$ 1,035	$ 784	$ 199	$ 227	$ 3,740	$ -	$ 3,916	$ 611	$ 6,087	$ -	$ 1,089	$ -	$ 1,724	$ -	$ 374	$ -
General Plant (WRZ)	$ 3,124	$ 1,309	$ 1,309	$ 205	$ 1,849	$ 1,809	$ 1,597	$ 1,844	$ 359	$ 2,379	$ 215	$ 2,490	$ -	$ 1,310	$ -	$ 1,124	$ -	$ 1,364	$ -
Total Gross (WRZ)	$ 20,241	$ 10,949	$ 19,012	$ 25,223	$ 17,585	$ 15,951	$ 21,468	$ 20,110	$ 2,319	$ 23,222	$ 2,044	$ 13,055	$ -	$ 8,325	$ -	$ 11,843	$ -	$ 8,430	$ -
Contributed Capital (WRZ)	$ 3,671	$ 1,786	$ 5,853	$ 11,438	$ 4,051	$ 3,486	$ 7,417	$ 5,049	$ 578	$ 13,265	$ 648	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Net (WRZ)	$ 16,570	$ 9,163	$ 13,159	$ 13,785	$ 13,534	$ 12,465	$ 14,051	$ 15,061	$ 1,741	$ 9,957	$ 1,396	$ 13,055	$ -	$ 8,325	$ -	$ 11,843	$ -	$ 8,430	$ -
ICM (WRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 63,396	$ -	$ -	$ -
ICM Contribution (WRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-$ 825	$ -	$ -	$ -
Total Including ICM (WRZ)	$ 16,570	$ 9,163	$ 13,159	$ 13,785	$ 13,534	$ 12,465	$ 14,051	$ 15,061	$ 1,741	$ 9,957	$ 1,396	$ 13,055	$ -	$ 8,325	$ -	$ 74,414	$ -	$ 8,430	$ -

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Table 2 – Veridian Rate Zone Capital Expenditures Including ICM

Veridian Rate Zone																								
Category	2018	2018	2019	2019	2020	2020	2021	2021	Sept 2021 YTD	2022	Sept 2022 YTD	2023	2023	2024	2024	2025	2025	2026	2026
Plan	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
System Access (VRZ)	$ 34,018	$ 13,223	$ 28,891	$ 11,586	$ 11,860	$ 13,595	$ 33,301	$ 17,156	$ 1,623	$ 44,914	$ 2,303	$ 7,334	$ -	$ 6,078	$ -	$ 7,244	$ -	$ 8,784	$ -
System Renewal (VRZ)	$ 10,117	$ 10,846	$ 9,885	$ 17,810	$ 8,298	$ 9,917	$ 11,404	$ 14,912	$ 1,523	$ 11,418	$ 1,689	$ 12,286	$ -	$ 13,499	$ -	$ 24,154	$ -	$ 15,136	$ -
System Service (VRZ)	$ -	$ 21	$ 354	$ 63	$ 536	$ 2,972	$ 1,191	$ 5,383	$ 225	$ 2,000	$ 1,043	$ 1,721	$ -	$ 8,067	$ -	$ 3,309	$ -	$ 10,349	$ -
General Plant (VRZ)	$ 2,650	$ 4,857	$ 3,051	$ 5,611	$ 4,315	$ 4,221	$ 10,467	$ 4,830	$ 839	$ 10,752	$ 733	$ 6,171	$ -	$ 3,056	$ -	$ 2,623	$ -	$ 3,182	$ -
Total Gross (VRZ)	$ 46,785	$ 28,947	$ 42,181	$ 35,070	$ 25,009	$ 30,705	$ 56,363	$ 42,281	$ 4,210	$ 69,084	$ 5,768	$ 27,512	$ -	$ 30,700	$ -	$ 37,330	$ -	$ 37,451	$ -
Contributed Capital (VRZ)	$ 4,053	$ 6,345	$ 13,657	$ 5,369	$ 9,451	$ 12,855	$ 25,059	$ 10,616	$ 1,039	$ 33,241	$ 1,550	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Net (VRZ)	$ 42,732	$ 22,602	$ 28,524	$ 29,701	$ 15,558	$ 17,850	$ 31,304	$ 31,665	$ 3,171	$ 35,843	$ 4,218	$ 27,512	$ -	$ 30,700	$ -	$ 37,330	$ -	$ 37,451	$ -
ICM (VRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 46,667	$ -	$ -	$ -	$ -	$ -	$ 6,432	$ -	$ -	$ -
ICM Contribution (VRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-$ 3,216	$ -	$ -	$ -
Total Including ICM (VRZ)	$ 42,732	$ 22,602	$ 28,524	$ 29,701	$ 15,558	$ 17,850	$ 31,304	$ 31,665	$ 3,171	$ 82,510	$ 4,218	$ 27,512	$ -	$ 30,700	$ -	$ 40,546	$ -	$ 37,451	$ -

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Table 3 – Elexicon Total Capital Expenditures Including ICM

ELEXICON																								
Category	2018	2018	2019	2019	2020	2020	2021	2021	Sept 2021 YTD	2022	Sept 2022 YTD	2023	2023	2024	2024	2025	2025	2026	2026
Plan	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual
System Access (Elexicon)	$ 40,948	$ 15,355	$ 43,167	$ 26,380	$ 21,947	$ 24,289	$ 44,681	$ 26,013	$ 2,240	$ 58,843	$ 3,038	$ 9,371	$ -	$ 8,683	$ -	$ 10,199	$ -	$ 11,138	$ -
System Renewal (Elexicon)	$ 17,464	$ 17,878	$ 13,160	$ 26,999	$ 13,163	$ 13,166	$ 19,668	$ 20,581	$ 2,866	$ 14,416	$ 2,172	$ 14,727	$ -	$ 16,820	$ -	$ 30,194	$ -	$ 19,474	$ -
System Service (Elexicon)	$ 2,840	$ 497	$ 506	$ 1,098	$ 1,320	$ 3,171	$ 1,418	$ 9,123	$ 225	$ 5,916	$ 1,654	$ 7,808	$ -	$ 9,156	$ -	$ 5,033	$ -	$ 10,723	$ -
General Plant (Elexicon)	$ 5,774	$ 6,166	$ 4,360	$ 5,816	$ 6,164	$ 6,030	$ 12,064	$ 6,674	$ 1,198	$ 13,131	$ 948	$ 8,661	$ -	$ 4,366	$ -	$ 3,747	$ -	$ 4,546	$ -
Total Gross (Elexicon)	$ 67,026	$ 39,896	$ 61,193	$ 60,293	$ 42,594	$ 46,656	$ 77,831	$ 62,391	$ 6,529	$ 92,306	$ 7,812	$ 40,567	$ -	$ 39,025	$ -	$ 49,173	$ -	$ 45,881	$ -
Contributed Capital (Elexicon)	$ 7,724	$ 8,131	$ 19,510	$ 16,807	$ 13,502	$ 16,341	$ 32,476	$ 15,665	$ 1,617	$ 46,506	$ 2,198	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Net (Elexicon)	$ 59,302	$ 31,765	$ 41,683	$ 43,486	$ 29,092	$ 30,315	$ 45,355	$ 46,726	$ 4,912	$ 45,800	$ 5,614	$ 40,567	$ -	$ 39,025	$ -	$ 49,173	$ -	$ 45,881	$ -
ICM (VRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 46,667	$ -	$ -	$ -	$ -	$ -	$ 6,432	$ -	$ -	$ -
ICM (WRZ)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 63,396	$ -	$ -	$ -
ICM Contribution	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	-$ 4,041	$ -	$ -	$ -
Total Including ICM (Elexicon)	$ 59,302	$ 31,765	$ 41,683	$ 43,486	$ 29,092	$ 30,315	$ 45,355	$ 46,726	$ 4,912	$ 92,467	$ 5,614	$ 40,567	$ -	$ 39,025	$ -	$ 114,960	$ -	$ 45,881	$ -

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1. Executive Summary

Elexicon is at a key juncture to develop a modern, flexible, energy efficient, and resilient high-DER grid that is responsive to signals from the federal, provincial, and local levels of government for an enhanced electricity system that serves an increased portion of customers' overall energy needs.

The changing demands of the distribution system is creating a need for a new type of system operation. The "Grid of the Future" will need to support high penetrations of distributed energy resources ("DERs"), manage electric vehicle ("EVs") charging, and support renewable energy such as roof top solar. Looking ahead, the distribution system is expected to take on a distribution system operator ("DSO") role and handle the dispatch and settlement of locally operated distributed generation, and aggregated customer side storage under distributed energy resource management ("DERMs") scenario.

Many of these concepts are future oriented, however there are mature technologies that will support the "Grid of the Future" that while still considered innovative can be deployed under the umbrella of advanced distribution management systems ("ADMS"). Mature technologies that are ready for deployment include distribution automation ("DA"), fault location isolating and service restoration ("FLISR"), volt-var optimization ("VVO") and the associated conservation voltage reduction ("CVR") , outage management systems ("OMS"), advanced metering infrastructure (AMI), engineering systems and asset management ("GIS", "AMS"), as well as a host of customer interfacing systems ("CIS").

The Whitby rate zone's existing distribution system infrastructure's age, plus the substantive growth forecasts in North Brooklin and elsewhere, make this the prudent time for Elexicon to invest in grid modernization and facilitate a high-DER future.

An increase in future demands is expected on the distribution system imposed by higher penetrations of DERs and EVs which are projected by the IESO under Grid Evolution initiatives, by the Provincial Government with its EV charging program, the Town of Whitby's own EV charging expansion program, and an increase in population growth and therefore demand on the system. In addition, opportunities presented by developing in the Brooklin area will include opportunities to deploy DERs at high levels of penetration. Considering the many phases of the "Grid of the Future" there is a need to get started with the mature technologies that are available today.

To enable the "Grid of the Future" Elexicon is proposing the Whitby Smart Grid project. This will involve:

- The installation of Smart Grid Field Technologies/Hardware
- The implementation of an ADMS Software
- A communication infrastructure that enables the connection of the new software with the hardware
- A feasibility study looking at potential Active Demand Management Programs

The Whitby Smart Grid is a set of technologies that can address risks and opportunities with the increase in DERs being installed in Whitby. The increased penetration of new DERs is expected to include commercial entities (including aggregators) with a high need for reliable access to the system. Recent events have also highlighted the increasing need for system hardening relating to storm events. When the provincial system is relying on DERs for supply, there will be a need to restore connections to all DERs possible quickly and reliably. The application of DA will allow for rapid restoration to all customers outside of the outage zone, in a complex switching situation such as a high DER environment, and situations created by storm events.

In addition, the application of CVR to maximize bill reductions means operating near the low end of the allowable voltage window. This condition comes with an increased risk that voltage violations will occur especially during the rapid variations caused by the increased penetration of DERs. In order to get full value of the voltage reduction program, an automated VVO is needed to manage those variations and monitor feeder tip voltage.

Future oriented benefits of the Whitby SmartGrid project include positioning the LDC for increased reliance on DERs and management of residential based energy storage and EV's by providing:

- linkage to DERMs applications to control and monitor DER and EV.
- visibility into system conditions and improved response time for DERs
- storm hardening and the rapid restoration of grid access (often <1minute) during storm events
- improved availability of DERs to the provincial grid.
- risk reduction relating to voltage variations caused by DERs and a maximization of benefit of CVR
- flexibility in feeder layout in normal and contingency mode,
- centralized system management and worker safety.

Elexicon Energy Inc.

Answer to Undertaking from

CCMBC

Undertaking JT1.12:

TO RUN THE ECONOMIC EVALUATION MODEL FOR A NON-RESIDENTIAL CUSTOMER, POTENTIALLY BY ILLUSTRATION A SMALL COMMERCIAL CUSTOMER, BASE CONSUMPTION; TO LIST OUT ALL OF THE ASSUMPTIONS AND PARAMETERS THAT LEAD TO THE ECONOMIC EVALUATION MODEL; OUTPUT IS THE CAPITAL CONTRIBUTION, IF ANY.

Response:

As noted in the response to Undertaking JT2.4, Elexicon's proposal is to calculate the capital contribution associated with connecting a non-residential customer to the Sustainable Brooklin project ("Brooklin Line") and including an apportioned amount of the cost of the Brooklin Line as per section 3.2.27 of the Distribution System Code. Also noted in JT2.4, Elexicon is open to alternative approaches to calculate the capital contribution to connect a non-residential customer to the Brooklin Line. To assist parties, Elexicon has run two economic evaluation models and provided the output of both models in its response to this undertaking.

In Model 1, Elexicon has run the economic evaluation model as per its proposal in this Application. Model 1 **includes** both the apportioned cost of connecting the customer to the Brooklin Line and the construction costs to connect the customers meter to the most cost effective point on the Brooklin Line. In Model 2, Elexicon has run the economic evaluation model to **not include** the apportioned amount of the cost of the Brooklin Line. [emphasis added in bold to distinguish the two models provided in this Undertaking response]

The assumptions and results from running Model 1 and Model 2 are described below:

Model 1 – Economic Evaluation Model Including Apportioned Brooklin Line Cost Plus Construction Cost to Connect Meter to Brooklin Line

An economical evaluation was produced of which the calculation results and assumptions are listed below, and a copy of the model is provided as Attachment 1 to this Undertaking.

In the illustrative example of this undertaking, for a school consuming 150kW, and total cost of the expansion estimated at $0.413 MM, the OEB's Economic Evaluation model calculated that the school would be asked to pay a capital contribution of approximately $0.286 MM.

Table 1 – Example Economic Evaluation Model Using Model 1 Assumptions

Calculation Results		
Expressed in relation to internal construction costs only		
Total Cost of Project	$	412,500.00
Capital Contribution by Customer	$	286,479.60
Elexicon's Contribution	$	126,020.40
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		69%

Economic Evaluation Calculation Results		
Expressed in relation to internal construction costs only…..		
Total Cost of Project	$	412,500.00
Capital Contribution by Customer	$	286,479.60
Elexicon's Contribution	$	126,020.40
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		69%

List of Assumptions Used in the Economic Evaluation Model

- A new General Service load (e.g. a school) will be connected
- The new school will have a load of 150kW in year 3.
- The total cost of the expansion is $412,500.
    - Apportioned cost of Brooklin Line is estimated as $142,500[1]
    - Construction Cost to Connect Meter to Brooklin Line is $270,000[2]

Model 2 – Economic Evaluation Model Including Construction Cost to Connect Meter to Brooklin Line

An economical evaluation was produced of which the calculation results and assumptions are listed below, and a copy of the model is provided as Attachment 2 to this undertaking.

For clarity Elexicon's calculation of construction costs for a non-residential customer attaching to the Sustainable Brooklin project ("Brooklin Line") will not include any of the Brooklin Line costs.

[1] The assumptions are that 150kW is the school's non-coincident peak, the Brooklin Line non-coincident peak is 28,000kW, and the cost of the Brooklin Line is $26.6 MM. (Calculation is (150kWh / 28,000 kWh) x $26.6 MM = $142,500)

[2] The assumption is the connection of a non-residential customer to the Brooklin Line would require 8 spans or 9 poles away from Ashburn & Columbus (i.e. the end of the Sustainable Brooklin project's Brooklin line) or a distance of 450m.

The construction costs used in the economic evaluation will only include an estimate of the costs of expansion from the customer meter to the most cost effective point of the Brooklin Line.

In the illustrative example shown in Model 2, for a school consuming 150kW, and cost of the expansion estimated at $0.270 MM, the OEB's Economic Evaluation model calculated that the school would be asked to pay a capital contribution of approximately $0.148 MM.

Table 2 – Example Economic Evaluation Model Using Model 2 Assumptions

Calculation Results		
Expressed in relation to internal construction costs only		
Total Cost of Project	$	270,000.00
Capital Contribution by Customer	$	147,570.34
Elexicon's Contribution	$	122,429.66
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		55%

Economic Evaluation Calculation Results		
Expressed in relation to internal construction costs only…..		
Total Cost of Project	$	270,000.00
Capital Contribution by Customer	$	147,570.34
Elexicon's Contribution	$	122,429.66
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		55%

List of Assumptions Used in the Economic Evaluation Model

- A new General Service load (e.g. a school) will be connected
- The new school will have a load of 150kW in year 3.
- The total cost of the expansion is $270,000[3].

[3] IBID

JT 1-12

Model 1

Economic Evaluation Model Including Apportioned Brooklin Line Cost Plus Construction Cost to Connect Meter to Brooklin Line

Summary of Customer Data and Economic Analysis Results

Project Name	Model 1 - 27.6kV Brooklin N Dev-ICM - (no line cost)
Project Number	
Developer	TBA
Municipality	Whitby

Technician: **Date Run:** 22-Jan-23 **Version:**

EE Template : Whitby Only

New Customers and Input Data

Customers, Type	kWh per Unit	Number of Units or GS load (kW) Added in Each Year					
		Year 1- 2023	*Year 2- 2024*	*Year 3-2025*	*Year 4-2026*	*Year 5-2027*	*Total*
General Service Load			0	150	0	0	150
							0
							0
Residential	750		-	-	-	-	0
							0
							0
	Total Residential	0	0	0	0	0	0
	Average energy added per Res. customer	0	0	0	0	0	0

Data

Annual O,M, & A

Incremental OM&A, $/Customer	$ 148.32	$ 148.32

Distribution Rates in effect

Monthly, fixed customer charge		
	Residential	$ 33.41
	General Service < 50kW	$ 28.08
	General Service 50 to 2,999 kW	$ 213.88
	General Service 3,000 to 4,999 kW	$ -
	Large User	$ -
Monthly, variable		
	Residential, per kWh	$ -
	General Service < 50kW, per kWh	$ 0.0208
Monthly Variable, per kW		
	General Service 50 to 2,999 kW	$ 4.2717
	General Service 3,000 to 4,999 kW	$ -
	Large User	$ -

Elexicon Energy Use Only

NOTE: Option 2 - EE Different from OTC

N/A

Summary

Statement of Costs

Cost Breakdown:		Project Total Costs (Data Inputs)
Eng & Admin	$	-
Connecting (Section A)	$	-
Material (Section A)	$	-
Other	$	270,000.00
Installation (Section B)		
Inspection	$	-
Total	$	270,000.00

Calculation Results

Expressed in relation to internal construction costs only.....

Total Cost of Project	$	270,000.00
Capital Contribution by Customer	$	147,570.35
Elexicon's Contribution	$	122,429.65
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		**55%**

Expansion Deposit

Elexicon's Contribution	$	122,429.65
NPV of Revenue	$	133,472.18
Expansion Deposit (the lesser of the 2 above)	**$**	**122,429.65**

JT 1-12

Model 2

Economic Evaluation Model Including Construction Cost to Connect Meter to Brooklin Line

Summary of Customer Data and Economic Analysis Results

Project Name	**Model 2 - 27.6kV Brooklin N Dev-ICM - (proportional line cost added)**
Project Number	
Developer	**TBA**
Municipality	**Whitby**

Technician: **Date Run:** **22-Jan-23** **Version:**

EE Template : **Whitby Only**

New Customers and Input Data

Customers, Type	kWh per Unit	Number of Units or GS load (kW) Added in Each Year					
		Year 1- 2023	*Year 2- 2024*	*Year 3-2025*	*Year 4-2026*	*Year 5-2027*	*Total*
General Service Load			**0**	**150**	**0**	**0**	150
							0
							0
Residential	750		-	-	-	-	0
							0
							0
	Total Residential	0	0	0	0	0	0
	Average energy added per Res. customer	0	0	0	0	0	0

Data

Annual O,M, & A

Incremental OM&A, $/Customer	**$ 148.32**	**$ 148.32**

Distribution Rates in effect

Monthly, fixed customer charge		
	Residential	**$ 33.41**
	General Service < 50kW	**$ 28.08**
	General Service 50 to 2,999 kW	**$ 213.88**
	General Service 3,000 to 4,999 kW	**$ -**
	Large User	**$ -**
Monthly, variable		
	Residential, per kWh	**$ -**
	General Service < 50kW, per kWh	**$ 0.0208**
Monthly Variable, per kW		
	General Service 50 to 2,999 kW	**$ 4.2717**
	General Service 3,000 to 4,999 kW	**$ -**
	Large User	**$ -**

Elexicon Energy Use Only

NOTE: Option 2 - EE Different from OTC

N/A

Summary

Statement of Costs

Cost Breakdown:		**Project Total Costs (Data Inputs)**
Eng & Admin	**$**	**-**
Connecting (Section A)	**$**	**-**
Material (Section A)	**$**	**-**
Other	**$**	**412,500.00**
Installation (Section B)		
Inspection	**$**	**-**
Total	**$**	**412,500.00**

Calculation Results

Expressed in relation to internal construction costs only.....

Total Cost of Project	$	412,500.00
Capital Contribution by Customer	$	286,479.60
Elexicon's Contribution	$	126,020.40
Capital Contribution Recovery Rate (CCRR) (% of Project Total)		**69%**

Expansion Deposit

Elexicon's Contribution	$	126,020.40
NPV of Revenue	$	133,472.18
Expansion Deposit (the lesser of the 2 above)	**$**	**126,020.40**

Elexicon Energy Inc.

Answer to Undertaking from

OEB Staff

Undertaking JT1.22:

TO UPDATE TABLE 1,PAGE 11 OF APPENDIX B TO REFLECT THE 2022 TOTAL COST OF POWER IN THE SAME MANNER AS WAS DONE WITH THE CURRENT TABLE 1, INCLUDING THE COST-OF-CAPITAL PARAMETERS FOR THE ICM, TO UPDATE THAT WITH THE 2023 COST-OF-CAPITAL PARAMETERS, THE FINALIZED OEB COST-OF-CAPITAL PARAMETERS, AND, TO THE EXTENT POSSIBLE, ALSO DO THAT WITH THE EXCEL FILE THAT WAS PROVIDED. AND ALSO TO LOOK AT THE RELIABILITY WORKSHEET WITHIN THE STAFF WHITBY SMART GRID WORKBOOK AND SEE IT CAN BE APPLIED TO THE UPDATED TABLE 1.

Response:

The updated Table 1, page 11 of Appendix B, included below reflects the following updated values which are highlighted in yellow:

1. Elexicon's unaudited total Cost of Power for the Whitby Rate Zone as of December 31, 2022 of approximately $112 MM.
2. Whitby Smart Grid ("WSG") Additional ICM Revenue from the OEB ICM Excel model provided in undertaking JT1.15 of $4.477 MM, and
3. Updated Operating Efficiencies from WSG to include the cost of truck assets provided in undertaking JT1.1 of $0.05 MM.

As a result of the above updates, the net benefit of the WSG to Whitby Rate Zone ("WRZ") customers has been reduced from $0.673 MM to $0.433 MM per year. Elexicon did not include an update to the Cost of Capital parameters for the purpose of this response as requested. The OEB's ICM policy requires the use of a distributors most recently approved cost of capital parameters; updating of these parameters to match the OEB's 2023 Cost of Capital parameters would be inconsistent with OEB policy.

In addition to the updated Table 1 requested in this undertaking, Elexicon has included the following additional tables related to benefit calculations that were produced during the interrogatory and technical conference proceeding steps:

1. Updated Interrogatory ED-01 Table 1 – 20 Year NPV Whitby Smart Grid Benefit Calculation
2. Updated Interrogatory ED-01 Table 4 – 20 Year NPV Benefits From Sustainable Brooklin and Whitby Smart Grid
3. Updated Undertaking JT1.5 - NPV Whitby Smart Grid Based on Time Period Equal to Average Lifetime of the Equipment

Updated Table 1 – Annual Net Benefit of WSG to WRZ Customers

Table 1 – Annual Net Benefit of WSG to WRZ Customers

Customer Annual Benefit Summary		
(All Dollars Listed in Thousands CAD)		
2022 Cost of Power (WRZ)	$	112,198
Projected % Energy Savings from WSG		3.00%
Total Purchased Power Savings from WSG (A)	$	3,366
ICM Additional Revenue (B)	$	4,477
Additional OM&A Expenses (C)	$	324
Operating Efficiencies from WSG (D)	$	48
Sub-Total of Savings (E = A-B-C+D)	$	(1,387)
Projected VoLL Benefit from Reliability (F)	$	1,820
Annual Net Benefit to WSG Customers (G = E+F)	$	433

Updated Interrogatory ED-01 Table 1 – 20 Year NPV Whitby Smart Grid Benefit Calculation

Table 2 – 20 Year NPV Whitby Smart Grid Benefit Calculation

Customer 20yr NPV Benefit Summary (5% Discount)		
(All Dollars Listed in Thousands CAD)		
Total Purchased Power Savings from WSG	$	49,363
ICM Additional Revenue	$	45,739
Additional OM&A Expenses	$	4,747
Operating Efficiencies from WSG	$	700
Sub-Total of Savings	-$	423
Projected VoLL Benefit from Reliability	$	26,689
NPV of Net Benefits (20 years) to WSG Customers	$	26,266

Updated Undertaking JT1.5 - NPV Whitby Smart Grid Based on Time Period Equal to Average Lifetime of the Equipment

Table 3 - NPV Benefit Calculation of Whitby Smart Grid Based Using Time Period Equal to Average Lifetime of the Equipment of 27 Years

Customer 27yr NPV Benefit Summary (5% Discount)		
(All Dollars Listed in Thousands CAD)		
Total Purchased Power Savings from WSG	$	60,903
ICM Additional Revenue	$	50,425
Additional OM&A Expenses	$	5,857
Operating Efficiencies from WSG	$	864
Sub-Total of Savings	$	5,485
Projected VoLL Benefit from Reliability	$	32,928
NPV of Net Benefits (27 years) to WSG Customers	$	38,413

Elexicon Energy Inc.

Answer to Undertaking from

Consumers Council of Canada

Undertaking JT2.2:

TO PROVIDE DETAILS OF WHAT WILL BE UPDATED IN ELEXICON'S 2025 WHITBY SMART GRID ICM RATE RIDER UPDATE APPLICATION.

Response:

Elexicon Energy ("Elexicon") has identified in its application and evidence[1] that it proposes to file updated Whitby Smart Grid ("WSG") OEB ICM Excel models for the Veridian Rate Zone ("VRZ") and Whitby Rate Zone ("WRZ") (collectively called "ICM Models") with its 2025 Incentive Rate Mechanism ("IRM") application. The 2025 IRM application is expected to be filed in the summer of 2024.

Elexicon proposes to only update the ICM Models with the most up to date inflation factor, approved 2024 Rates, and 2023 billing determinants (the "Proposed Updated Parameters"). Elexicon does not propose to update the ICM Models for the WSG capital costs as proposed in its application and evidence[2] or any other parameters.

Elexicon has been guided by the OEB's ICM Policy[3] (the "Policy") which would normally have as inputs the Proposed Updated Parameters. While Elexicon requires early ICM approval for the reasons specified in the Application, Elexicon is of the view the ICM models should still be run as contemplated in the Policy prior to setting a final rate rider for 2025 rates. As shown in Figure 1 below which is an excerpt of Appendix A from the Policy, a review of the project actuals will be performed at Elexicon's next Cost of Service application, and any true-up approved by the OEB.

Figure 1 – Appendix A of OEB's ACM/ICM Policy[4]

[1] Appendix B – Incremental Capital Module Whitby Smart Grid & Sustainable Brooklin, Page 32 of 56
[2] The Whitby Smart Grid budget is $43.1 MM after including the $4.0 MM of NRCan funding.
[3] EB-2014-0219 Report of the OEB - New Policy Options for the Funding of Capital Investments: Supplemental Report
[4] IBID

Appendix A
The Capital Module Policy [Unchanged from the ACM Report]

Capital Modules	Cost of Service Application	Price Cap IR Year (in which the capital project goes into service)	Next Cost of Service Application
ACM (Advanced Capital Module)	• Identify discrete projects in DSP which may qualify for ACM treatment. • Establish need for and prudence of these projects based on DSP information. • Provide preliminary calculation of materiality threshold based on information in cost of service application.	• Update materiality threshold based on current information to confirm that the project continues to qualify for ACM treatment. • Provide means test calculation and explanation if overearning in last historical actual year. • If costs are less than 30% above what was documented in the DSP, explain differences in cost forecasts from DSP forecast. • Explain any differences in project timing. • If costs are 30% or more above what was documented in the DSP, re-file business cases as new ICM if seeking recovery of incremental costs. • In all cases, explain any significant differences in capital budget forecast from DSP forecast. • Provide incremental revenue requirement calculation and proposed ACM rate riders.	• Review of actual (audited) costs of ACM project. • Explanation for material variances between actual and forecasted costs (and timing, if applicable). • Based on above, the OEB may determine if any over- or under-recovery of ACM rate riders should be refunded to or recovered from ratepayers. • ACM capital assets reflected in new rate base based on January 1 actual NBV.
ICM (Incremental Capital Module)	• Not applicable	• Provide explanation for any ICM that could not have been foreseen or sufficiently planned as part of DSP. • Establish need for and prudence of proposed projects. • Provide materiality threshold calculation. • Provide means test calculation and explanation if overearning in last historical actual year. • Provide incremental revenue requirement calculation and proposed ICM rate riders. • Explain significant differences in capital budget forecast from DSP forecast.	• Same as above

Elexicon Energy Inc.

Answer to Undertaking from

Consumers Council of Canada

Undertaking JT2.3:

TO PROVIDE EXAMPLES OF SPECIFIC TECHNOLOGIES APPROVED BY THE BOARD

Response:

The project that is specifically OEB approved relating to this application is PUC Distribution's Sault Smart Grid Incremental Capital Module ("ICM") application; as referenced at several points throughout evidence. Additionally, Hydro Ottawa has undertaken a similar project of "VR & Grid Edge Technology as a Non-Wires Alternative for Capacity Reduction & Energy Savings" (Listed on the "EDA Blog" dated August 2021).

As additional examples of Distribution Automation ("DA") and Volt-Var Optimization ("VVO") technology projects, Elexicon has conducted a best efforts basis search of the OEB Regulatory Document Service and included a list of electricity distributors who have implemented DA, VVO and FLISR projects.

Elexicon would also point to archived documents available at the Smart Grid Fund[1] for a list of projects funded by the Ontario Smart Grid Fund and in particular these projects:

- #2 Grid Monitoring and Automation in Oshawa (DA and VVO)
- #3 Comprehensive Voltage Management in Thamesville (VVO/CVR Entegrus)
- #4 dTechs Oakville (wireless sensors)
- #11 Distributed Dynamic Voltage/VAR Control and Monitoring of Distribution Feeders (VVO/CVR London Hydro, Entegrus, and Enwin Utilies)
- #16 Loss reduction pilot at Chapleau (VVO Chapleau PUC)

Also as listed in the CV of Mr. Thompson attached to Appendix B-5 the following is a summarised list of Distribution Automation projects that are within his professional experience:

- Festival Hydro
- Entegrus Powerlines Inc.
- Toronto Hydro
- Brant County, Ontario,

[1] https://www.ontario.ca/document/projects-funded-smart-grid-fund/grid-automation

- Niagara on the Lake
- Manitoba Hydro, WaverlyWest Automation System.
- Kitimat Rio Tinto, Campus Grid and Automation.
- Fortis – IntelliTeamII Installation 30 intelligent devices,
- ENMAX – IntelliTeamII Installation 25 intelligent devices, Studies

The projects listed above and many others are installed and operating within the systems of utilities in Canada, and presumably within capital plans generally approved by their relevant regulators.

In the context of the significant sub-components, a Distribution Automation system is made up of automated line switches from manufactures such as S&C and G&W in Ontario, and a VVO system is made up of voltage regulators and capacitors made by manufactures such as GE, ABB and Eaton to name a few. All of these components have been in use for decades in Ontario.

Table 1 below is a list of electricity distributors who have implemented VVO, Fault Location Isolation Service Restoration ("FLISR"), Advanced Distribution Management System ("ADMS") and Distribution Automation. Elexicon has provided the OEB docket number and taken best efforts to list out the technology component that was implemented under the OEB's approval of the docket.

Table 1 – List of Ontario Electricity Distributors Implementing VVO, ADMS/Distribution Automation, FLISR, and AMI

Utility	Case	ADMS / DA	VVO	FLISR	AMI	Project Name
Hydro Ottawa	EB-2019-0261 EB-2015-0004	Y	Y	Y	N	Volt/var mangement & system automation (Exhibit 2, Tab 4, Schedule 3, Attachment E, Page 397 of 534)
PUC Distributio	EB-2018-0219 EB-2020-0249	Y	Y	N	Y	Sault Smart Grid - DA / VVO / AMI
Canadian Niagara Power Inc.	EB-2021-0011	Y	N	N	N	"Distribution Automation" (s.5.4.3 of DSP)
Bluewater Power Distribution Corporation	EB-2022-0016 EB-2012-0107	Y	N	Y	N	"Smart grid" and " Supervisory Control and Data Acquisition (SCADA)" (s.5.2.1.8 of DSP and s.6.2 & 6.3 Asset Management Strategy)
Milton Hydro	EB-2022-0049	Y	N	Y	N	"Smart Grid" or "SCADA" (IR responses 2-Staff-48, Exhibit 1 s.1.7.6)
London Hydro	EB-2021-0041 EB-2012-0187	Y	N	Y	N	"SCADA Enhancement Project" See 2-SEC-29
Oakville Hydro	EB-2021-0048	Y	N	Y	N	SCADA - ADMS FLISR System
Brantford Powe	EB-2021-0009	Y	N	Y	N	"Automated reclosers"
Grimsby Power	EB-2021-0027	Y	N	Y	N	"Smart grid" & "Automate Primary 3-Phase Switches"
Waterloo North Hydro	EB-2020-0059	Y	N	Y	N	See Exhibit 2, Appendix K, Distribution System Reliability Report or 1-SEC-6
Oshawa Power	EB-2020-0048	Y	N	Y	N	"Automation Controller, Smart Fault Indicators, Lateral Reclosers & IEDs" (see page 101, Exhibit 2 – DSP Appendix A)
Enwin Utilities	EB-2019-0032	Y	Y	Y	N	"SCADA FCI Project", "Distribution System Loss Reduction" and "SCADA Distribution Management System – FLISR " (Exhibit 2, ATTACHMENT 2 – A, pages 27, 28 and 227)
Toronto Hydro	EB-2018-0165 EB-2012-0064	Y	N	Y	N	"Feeder Automation" (Exhibit 2B, Section E7.1, E7.1.3.1)
Power Stream	EB-2012-0161	Y	N	Y	N	"Distribution Automation" (application at PDF page 440 - 6.3.1.4)
Innisfil	EB-2012-0139	Y	N	Y	N	"Smart Grid" or "Mechanized SCADA Controlled Load Interruptors" (Application PDF page 419)
Greater Sudbury Hydro	EB-2012-0126	Y	N	Y	N	"Distribution Automation" (Exhibit 2, Tab 4, Schedule 3, s.9.2)
Lakefront Utilities	EB-2021-0039	Y	N	Y	N	"Distribution Automation" (DSP page 73)
Festival Hydro	EB-2012-0124	Y	N	Y	N	"Distribution Automation" (Application, Appendix I, Capital Budget, page 13)

Elexicon Energy Inc.

Answer to Undertaking from

School Energy Coalition

Undertaking JT2.4:

TO EXPLAIN THE PROCESS FOR CUSTOMER CONNECTION OF A COMMERCIAL CUSTOMER TO THE SUSTAINABLE BROOKLIN LINE OUTSIDE OF NORTH BROOKLIN AFTER THE BROOKLIN LINE IS CONSTRUCTED AND IN-SERVICE.

Background:

Elexicon included the following detail in its application and evidence with respect to the connection of a non-residential customer to the Sustainable Brooklin line[1]:

> "Elexicon requests that a condition of the OEB's approval of the DSC Exemption be that all developers that may stand to benefit from the Brooklin Line will construct DER and EV ready homes or buildings as specified in Appendix B-2 of this Application. Should a developer fail to deliver on the construction of DER-and-EV-Ready homes or buildings, that developer or property owner will be required to pay an appropriate capital contribution to Elexicon in support of the Brooklin Line. The amount of the capital contribution would be approximately $2,260 per home or building before Elexicon supplies power[2]. **With respect to non-residential customers, Elexicon would apply the standard requirements of the DSC to calculate a capital contribution commensurate with the capacity required for the customer in question.**" [emphasis added in bold]

Response:

For non-residential customers that are not part of the *quid-pro-quo*, Elexicon Energy's ("Elexicon") proposal is to calculate the contribution associated with the Brooklin Line in accordance with Section 3.2.27 of the Distribution System Code ("DSC") by collecting a capital contribution to the benefit of ratepayers funding the Brooklin Line, over a five year period. The benefit of the Brooklin Line would be apportioned by assessing the relative non-coincident peak demand of the load customer and the relative line length in proportion to the line length being shared, as applicable.

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[1] Appendix B – Incremental Capital Module Whitby Smart Grid & Sustainable Brooklin, Page 8 of 56, Lines 10 to 19

[2] Source Brooklin Landowners Group Inc.

For clarity, Elexicon would use the OEB's standard Economic Evaluation model[3] ("EE Model"), to determine if a capital contribution is required to connect any non-residential customer seeking to connect to the Sustainable Brooklin project ("Brooklin Line"). For the capital cost component of the EE Model, Elexicon would include an apportionment of costs associated with the Brooklin Line as described above plus the costs for the assets to distribute electricity from the location of the customer meter to the Brooklin Line. The customer revenue component of the EE Model would be determined using the proposed load forecasting information gathered by Elexicon in collaboration with the customer.

Elexicon understands the question and concern raised by certain parties during the Technical Conference, and is open to alternative approaches to apportioning the value of the Brooklin Line to non-residential customers that are not part of the quid-pro-quo should the OEB order otherwise.

[3] Appendix B of the Distribution System Code ("DSC")

Elexicon Energy Inc.

Answer to Undertaking from

School Energy Coalition

Undertaking JT2.6:

TO PROVIDE A SUMMATION OF CUMULATIVE BILL IMPACTS, TO SHOW TOTAL BILL IMPACT FOR THE RESIDENTIAL CLASS.

Response:

Elexicon is providing two Notional Estimated Total Bill Impact tables (each a "Bill Impact Table") in this Undertaking response. The first is the Bill Impact Table without the 3% energy savings attributed to the Conservation Voltage Reduction ("CVR") associated with the Volt-Var Optimization ("VVO") component of the Whitby Smart Grid Project (collectively referred to as "Energy Savings"). The second Bill Impact Table includes Energy Savings.

Elexicon reiterates that including the Whitby Smart Grid ("WSG") which is to be placed in-service in 2025 results in the Bill Impact Table is, at this time, a notional amount. In practise, the customer bill impacts shown in Table 2 will not all be experienced by the customer in the same year. For the year 2023, no mitigation is required given the WSG Rate Rider is scheduled for 2025. Rather the bill impacts will be felt more gradually over time. Additionally, the magnitude of the increase set out in Table 1 is a notional estimate that can get affected by changes to multiple parameters that are part of the OEB ICM/ACM Excel model.

Table 1 below shows the notional estimated cumulative Total bill Impacts for a typical residential customer in the Whitby Rate Zone ("WRZ") assuming Elexicon's implementation of the following items:

1. OEB's approval of Elexicon's Sustainable Brooklin ICM project with a 2023 in-service
2. OEB's approval of Elexicon's Whitby Smart Grid Project with a 2025 in-service
3. OEB's approval of Elexicon's Z-Factor claim[1] with Rate Riders effective July 1, 2023

Table 1 – Notional Estimated Total Bill Impact Without Energy Savings

Add ICM Rate Riders x 2 and Z Factor Rate Riders x 2

Customer Class:	RESIDENTIAL SERVICE CLASSIFICATION	
RPP / Non-RPP:	RPP	
Consumption	750	kWh
Demand	-	kW
Current Loss Factor	1.0454	
Proposed/Approved Loss Factor	1.0454	

	Current OEB-Approved			Proposed			Impact	
	Rate ($)	Volume	Charge ($)	Rate ($)	Volume	Charge ($)	$ Change	% Change
Monthly Service Charge	$ 33.41	1	$ 33.41	$ 34.55	1	$ 34.55	$ 1.14	3.41%
Distribution Volumetric Rate	$ -	750	$ -	$ -	750	$ -	$ -	
Fixed Rate Riders	$ (0.06)	1	$ (0.06)	$ 9.35	1	$ 9.35	$ 9.41	-15683.33%
Volumetric Rate Riders	$ -	750	$ -	$ -	750	$ -	$ -	
Sub-Total A (excluding pass through)			**$ 33.35**			**$ 43.90**	**$ 10.55**	**31.63%**
Line Losses on Cost of Power	$ 0.0929	34	$ 3.16	$ 0.0929	34	$ 3.16	$ -	0.00%
Total Deferral/Variance Account Rate Riders	$ -	750	$ -	$ 0.0028	750	$ 2.10	$ 2.10	
CBR Class B Rate Riders	$ -	750	$ -	-$ 0.0002	750	$ (0.15)	$ (0.15)	
GA Rate Riders	$ -	750	$ -	$ -	750	$ -	$ -	
Low Voltage Service Charge	$ 0.0010	750	$ 0.75	$ 0.0010	750	$ 0.75	$ -	0.00%
Smart Meter Entity Charge (if applicable)	$ 0.43	1	$ 0.43	$ 0.42	1	$ 0.42	$ (0.01)	-2.33%
›tal B - Distribution (includes Sub-Total A)			**$ 37.69**			**$ 50.18**	**$ 12.49**	**33.14%**
RTSR - Network	$ 0.0096	784	$ 7.53	$ 0.0114	784	$ 8.94	$ 1.41	18.75%
RTSR - Connection and/or Line and Transformation Connection	$ 0.0072	784	$ 5.65	$ 0.0085	784	$ 6.66	$ 1.02	18.06%
›tal C - Delivery (including Sub-Total B)			**$ 50.87**			**$ 65.79**	**$ 14.92**	**29.33%**
Wholesale Market Service Charge (WMSC)	$ 0.0045	784	$ 3.53	$ 0.0045	784	$ 3.53	$ -	0.00%
Rural and Remote Rate Protection (RRRP)	$ 0.0007	784	$ 0.55	$ 0.0007	784	$ 0.55	$ -	0.00%
Standard Supply Service Charge	$ 0.25	1	$ 0.25	$ 0.25	1	$ 0.25	$ -	0.00%
TOU - Off Peak	$ 0.0740	480	$ 35.52	$ 0.0740	480	$ 35.52	$ -	0.00%
TOU - Mid Peak	$ 0.1020	135	$ 13.77	$ 0.1020	135	$ 13.77	$ -	0.00%
TOU - On Peak	$ 0.1510	135	$ 20.39	$ 0.1510	135	$ 20.39	$ -	0.00%
Total Bill on TOU (before Taxes)			**$ 124.87**			**$ 139.79**	**$ 14.92**	**11.95%**
HST	13%		$ 16.23	13%		$ 18.17	$ 1.94	11.95%
Ontario Electricity Rebate	11.7%		$ (14.61)	11.7%		$ (16.36)	$ (1.75)	
Total Bill on TOU			**$ 126.49**			**$ 141.61**	**$ 15.11**	**11.95%**

[1] EB-2022-0317

Table 2 below show the notional estimated cumulative Total bill impacts from Table 1, with Energy Savings being added.

Table 2 – Notional Estimated Total Bill Impact with Energy Savings

Add 3 % Energy Savings

Customer Class:	RESIDENTIAL SERVICE CLASSIFICATION	
RPP / Non-RPP:	RPP	
Consumption	728	kWh
Demand	-	kW
Current Loss Factor	1.0454	
Proposed/Approved Loss Factor	1.0454	

	Current OEB-Approved			Proposed			Impact	
	Rate ($)	Volume	Charge ($)	Rate ($)	Volume	Charge ($)	$ Change	% Change
Monthly Service Charge	$ 33.41	1	$ 33.41	$ 34.55	1	$ 34.55	$ 1.14	3.41%
Distribution Volumetric Rate	$ -	750	$ -	$ -	728	$ -	$ -	
Fixed Rate Riders	$ (0.06)	1	$ (0.06)	$ 9.35	1	$ 9.35	$ 9.41	-15683.33%
Volumetric Rate Riders	$ -	750	$ -	$ -	728	$ -	$ -	
Sub-Total A (excluding pass through)			**$ 33.35**			**$ 43.90**	**$ 10.55**	**31.63%**
Line Losses on Cost of Power	$ 0.0929	34	$ 3.16	$ 0.0929	33	$ 3.07	$ (0.09)	-3.00%
Total Deferral/Variance Account Rate Riders	$ -	750	$ -	$ 0.0028	728	$ 2.04	$ 2.04	
CBR Class B Rate Riders	$ -	750	$ -	-$ 0.0002	728	$ (0.15)	$ (0.15)	
GA Rate Riders	$ -	750	$ -	$ -	728	$ -	$ -	
Low Voltage Service Charge	$ 0.0010	750	$ 0.75	$ 0.0010	728	$ 0.73	$ (0.02)	-3.00%
Smart Meter Entity Charge (if applicable)	$ 0.43	1	$ 0.43	$ 0.42	1	$ 0.42	$ (0.01)	-2.33%
Sub-Total B - Distribution (includes Sub-Total A)			**$ 37.69**			**$ 50.01**	**$ 12.31**	**32.67%**
RTSR - Network	$ 0.0096	784	$ 7.53	$ 0.0114	761	$ 8.67	$ 1.14	15.19%
RTSR - Connection and/or Line and Transformation Connection	$ 0.0072	784	$ 5.65	$ 0.0085	761	$ 6.46	$ 0.82	14.51%
Sub-Total C - Delivery (including Sub-Total B)			**$ 50.87**			**$ 65.14**	**$ 14.28**	**28.07%**
Wholesale Market Service Charge (WMSC)	$ 0.0045	784	$ 3.53	$ 0.0045	761	$ 3.42	$ (0.11)	-3.00%
Rural and Remote Rate Protection (RRRP)	$ 0.0007	784	$ 0.55	$ 0.0007	761	$ 0.53	$ (0.02)	-3.00%
Standard Supply Service Charge	$ 0.25	1	$ 0.25	$ 0.25	1	$ 0.25	$ -	0.00%
TOU - Off Peak	$ 0.0740	480	$ 35.52	$ 0.0740	466	$ 34.45	$ (1.07)	-3.00%
TOU - Mid Peak	$ 0.1020	135	$ 13.77	$ 0.1020	131	$ 13.36	$ (0.41)	-3.00%
TOU - On Peak	$ 0.1510	135	$ 20.39	$ 0.1510	131	$ 19.77	$ (0.61)	-3.00%
Total Bill on TOU (before Taxes)			**$ 124.87**			**$ 136.93**	**$ 12.06**	**9.66%**
HST	13%		$ 16.23	13%		$ 17.80	$ 1.57	9.66%
Ontario Electricity Rebate	11.7%		$ (14.61)	11.7%		$ (16.02)	$ (1.41)	
Total Bill on TOU			**$ 126.49**			**$ 138.71**	**$ 12.22**	**9.66%**

Note: The Bill Impact above applies the 3% savings to all volumetric charges

Elexicon Energy Inc.

Answer to Interrogatory from

School Energy Coalition

Interrogatory SEC-09:

With respect to the NRCan funding, Elexicon states that it has 'secured approximately $4 million in NRCan funding to deploy an ADMS' and the agreement expires in 2025.

a) What other conditions has NRCan included in its funding agreement?

b) Has Elexicon discussed with NRCan the possibility of extending this agreement?

c) If the funding is to deploy an ADMS then has Elexicon considered doing this portion of the work first and then installing the hardware? If not, why not?

Response:

a) Please see Elexicon Energy's response to STAFF-9, which includes a copy of the NRCan Contribution Agreement.

b) No. Elexicon's project schedule falls within the dates required by the agreement. However, as noted at page 25 of Appendix B-1 of the Application, Elexicon has been engaged with NRCan to seek further funding.

c) Yes. Elexicon has already started implementing both the hardware and software portions of the ADMS project. The immediate benefits to customers realized through additional hardware installations (i.e. VVO and FLISR) are significant. Given VVO and FLISR will be facilitated by the ADMS, the expedient deployment of these technologies will also maximize the value of the ADMS investment for customers.

Elexicon Energy Inc.

Answer to Interrogatory from

School Energy Coalition

Interrogatory SEC-21:

Elexicon states that the WSG ICM project is critical in enabling functionality of the SB project. If the OEB does not approve the SB project, would Elexicon still move ahead with the WSG project?

Response:

Yes. The Whitby Smart Grid will substantially modernize the WRZ grid and bring about material benefits for customers. The value of the Whitby Smart Grid will however be enhanced via approval of Elexicon's application as filed, as the technologies installed will facilitate the Sustainable Brooklin Project, greater proliferation of DERs, and the potential for deferral of material infrastructure investments among other benefits.

Elexicon Energy Inc.

Answer to Interrogatory from

OEB Staff

Interrogatory STAFF-10:

Whitby Smart Grid – Cost Allocation

Ref 1: Appendix B – Incremental Capital Module Whitby Smart Grid, p. 36

Ref 2: EB-2021-0015 – Distribution System Plan – Overview of Assets Managed

For the Whitby Smart Grid, $36.7 million was allocated to Whitby Rate Zone, and $6.43

million was allocated to Veridian Rate Zone. The Whitby Smart Grid involves the installation of a suite of proven smart grid technologies on Elexicon Energy's distribution system in the Whitby Rate Zone and Veridian Rate Zone. In reference 2, it shows that the Whitby Rate Zone has about one-third the number of customers as compared to the Veridian Rate Zone.

a) Please provide the allocation method of costs and calculations for the AMDS and SCADA between the Whitby Rate Zone and the Veridian Rate Zone.

b) Please confirm if the same smart grid technologies are installed in the Whitby and Veridian Rate Zones and whether both rate zones will have the same functionality. If so, please explain why the Whitby Rate Zone bears most of the costs.

c) If only the Whitby Rate Zone will see certain smart grid benefits as compared to the Veridian Rate Zone, please provide a list of differences.

d) Please provide a list of benefits the Veridian Rate Zone can expect from AMDS and SCADA.

Response:

a) The tables below show the allocation of costs between Veridian Rate Zone (VRZ) and the Whitby Rate Zone (WRZ). The costs were allocated based on a proration of customer counts between Elexicon's VRZ and WRZ:

Table 1 – Allocation of Costs between Veridian and Whitby Rate Zone

VRZ

WSG - SCADA	$1,281,502
WSG - ADMS - Computer Software	$579,138
WSG - ADMS - Computer Equipment	$89,562
WSG - ADMS - Communications Equipment	$419,231
Total	$2,369,433

WRZ

WSG - SCADA	$3,478,498
WSG - ADMS - Computer Software	$1,572,007
WSG - ADMS - Computer Equipment	$243,106
WSG - ADMS - Communications Equipment	$1,137,957
Total	$6,431,567

b) No. The ADMS includes modules that are required to operate VVO and FLISR systems. These ADMS modules will only benefit customers in the Whitby Rate Zone, since the VVO and FLISR field hardware will only be installed in the Whitby Rate Zone Therefore, the allocation of costs of the ADMS is greater to the Whitby Rate Zone.

c) The Veridian Rate Zone will only receive the ADMS benefits stated in Table 1 of Appendix B-1. The Whitby Rate Zone will see all the benefits stated in Table 1 of Appendix B-1.

d) Table 1 in Appendix B-1 states the benefits associated with ADMS implementation. Below is an extract of that Table listing only the ADMS benefits, which are what the Veridian Rate zone can expect as well as the Whitby Rate Zone.

Table 2 – Extract of ADMS Benefits

System	Expected Benefit
ADMS	• Leverage the existing metering, Infrastructure Technology, other system software, and communication systems to effectively regulate voltage, mitigate outages, and Distributed Energy Resources (DER). • Increased safety and operational situational awareness for field crews. • Reduction of restoration time. • Increased efficiency through the reduction of overhead costs. • Advanced real-time load flow calculations and load transfer. • Streamlining of switch order and execution. • Improved asset management of devices through the inherent switch operation logging ability of the ADMS system.

MR. MANDYAM: Andrew Mandyam speaking again. Elexicon is -- so it is a bit of a interconnected answer, but Elexicon would like the, in short would like the decision as soon as possible.

It filed the application in July of 2022 with the hopes that the decision by the OEB would be rendered before the end of 2023. We are obviously in 20 -- sorry, end of 2022. I misspoke. We're in 2023. So the long answer that that I just provided is as soon as possible to commence the project, to deliver it before the end of 2025 as currently forecasted or planned.

MR. ROSENBLUTH: And is the longer lead time here is that required due to current supply chain concerns?

MR. BOUDHAR: Hocine Boudhar speaking here. It is related to the long lead items, to be ordered as well as the scope of work that we're trying to implement.

MR. ROSENBLUTH: Okay. Now, if the Board determines that it is too early to approve an ICM based on the timing, can you describe any additional costs or challenges that may arise if the project is, therefore, needed to be completed in a shorter time frame?

MR. BOUDHAR: Hocine Boudhar speaking again. I am not sure if there would be any additional costs, I can't speak to that. But obviously the timing of the project will be a question here. We're hoping to have a look at, as my colleague said, an approval as soon as possible.

MR. ROSENBLUTH: And certainly the timing would obviously shrink, you know, proportionally, but would that

have any effect on the logistical or operational challenges of completing it?

MR. THOMPSON: Daryn Thompson, METSCO. We haven't studied alternative timelines, but generally speaking if you compress a timeline you increase construction costs and lose optimization. But we haven't done a study to find out what would happen.

MR. MANDYAM: Mr. Rosenbluth, Andrew Mandyam. I will add one point. There is a connected -- and it is part of the interconnection that I spoke of, I didn't explain it. But we are -- we have agreement with NRCan for funding contribution of up to four million dollars. It is four million dollars, I should say, in the contract.

So that has a time limit of March 31st, 2025. So there is that constraint, if I could call it.

MR. ROSENBLUTH: And what happens --

MR. SHEPHERD: That timeline is based on, that funding is for ADMS, right? It is not for the rest of it?

MR. MANDYAM: Andrew Mandyam speaking again. Yes, that is correct Mr. Shepherd. It is for the ADMS portion of that project.

MR. SHEPHERD: And you have already started the ADMS work, right?

MS. ELOSIDA: Ingrid Eleosida. That is correct. We started the software

MR. SHEPHERD: So you would be best to, if you could,

[Court reporter appeals.]

MS. ELOSIDA: I was responding to the question that

MR. SHEPHERD: My apologies, thank you.

MR. ROSENBLUTH: Okay, thank you. Still within the Staff responses, moving to Staff 23, and item B, in particular.

The question here was, what percentage of sustainable Brooklin home buyers does Elexicon expect to invest in solar batteries and in EV. The response, as I read it, indicates that approval of the project will create a baseline of quantifiable evidence and that Elexicon's plans to provide a forecast as part of the DER enabling program.

So my question now is, is it still the case that Elexicon does not have a forecast of solar battery and EV update?

MR. MANDYAM: Andrew Mandyam speaking. You are correct, Mr. Rosenbluth. Elexicon does not have a forecast at this time.

Just to give context, Elexicon's plan is within six months to, should the OEB approve the application for the Whitby smart grid, as filed, it would subsequently file a, its DER enabling program, which we outlined some context, concepts around in appendix B-3.

So in that application it does, Elexicon does expect to provide forecasts along with incentive plans that will hopefully achieve those forecasts, DER connected appliances.

MR. ROSENBLUTH: Thank you. But if I am understanding your answer correctly, you know, there may be a forecast down the road. But sitting here today Elexicon does not

However, at the current time it is not intending to own the assets, these assets being the DER, solar, battery, or EV charging ports. It is not intending, at least at this time not.

It will all be finalized in its application, but that is the current thought.

MR. LADANYI: It would be finalized when?

MR. MANDYAM: Oh, sorry. It will be finalized in its proposal. The DER enabling program proposal, which can be expected six months or thereabouts, around six months after the OEB provides a decision that it approves the Whitby Smart Grid Project.

MR. LADANYI: So we actually haven't seen, really, all of the evidence that is relevant to this case. There is some hidden new part that is being prepared?

MR. MANDYAM: No. Disagree, we’re hiding. Disagree with the concept.

We have put out in Appendix B-3 our concepts and high-level thoughts around the DER enabling program.

For Elexicon to complete it and file it, it will require some effort, effort to contact basically parties for potential additional funding. Parties -- and how the actual -- or Elexicon to, you know, plan out and basically process out how it is going to conduct itself as part of the marketing and sales program, figure out how it is going to apply under the CDM guidelines.

So there is a bunch of work that has to be done. But the concepts are out there in the -- or listed out, at

least, in Appendix B3. So that portion is there for you to digest.

As far as the "ask", the ask is all clear and -- well, I am not going to go over it. But it is what you are asking questions about.

MR. LADANYI: In your answer to C, if you look at your answer to C. I am going to read it to you. I asked about the contracting. You said:

"No. Elexicon's sustainable Brooklin project facilitates the construction of DER- and EV-ready homes. With respect to DER systems themselves, the precise commercial relationship between Elexicon and DER owners will be dictated by the details of Elexicon's planned DER Enabling Program, which will be informed by the OEB's decision and order."

So you need the OEB's decision to really decide about these commercial arrangements.

MR. MANDYAM: That statement really relates to Elexicon will proceed with its development and finalizing of its DER-enabling program based on the guidance from the OEB decision and order, which means, really, if the OEB approves as filed, parties can expect an application that DER enabling program -- parties can expect a DER-enabling program application in six months or thereof.

Any other form of approval or denial by the OEB will have to be reviewed by Elexicon management to determine its next course of action with respect to the DER-enabling program. So that is really what that last sentence is

there. Oh, I have to answer the other question about Armstrong's question around how did this all come about.

I did explain -- I am not sure -- I did say to Mr. Ladanyi and I will repeat it, I guess; you tell me when to stop, Ms. Armstrong, if you have heard it. What I said earlier today, there was a convergence of activities that Elexicon management basically encountered and ultimately developed this total solution, the sustainable Brooklin portion of this ICM request and the Whitby smart grid.

This all manifested in 2022. Its origination was determining how to solve the concerns and deal with our customer, which is the Brooklin landowner group, and address that situation.

And the idea of the quid pro quo or the DER enablement -- DER roughed-in homes being built in return for an exemption was just that innovation. And then added on top of that the ICM project for the Whitby smart grid, which, as I stated earlier, was a convergence of internally ADMS being worked through by teams of Elexicon with NRCan and the other external items.

So it is just management coming up with the idea. There is nothing more than that.

MS. ARMSTRONG: Okay. I am going to go on to my next question and it is the supplemental response to CCMBC --

MR. VELLONE: Sorry, Mr. Murray should we mark an undertaking there?

MR. MURRAY: Yes. Just so it is clear. I understand that Elexicon has agreed to provide or file its model, but

MR. MANDYAM: So -- yeah. I am not sure --
MR. LAU: Okay. So --
MR. MANDYAM: -- I mean, we have reprioritized, but that is part of regular DSP management --
MR. LAU: You are correct. Let me read that paragraph in the order. It is:
"PUC Distribution Inc. shall file an updated distribution system plan at the time of its next rebasing application which demonstrates how the SSG project is being accommodated through the reprioritization of other capital projects."
So what I want to know is, now that the WSG is planned for 2025, has Elexicon given any thoughts to deferring anything -- any other capital projects? And from the IR it seems like it is just the ADMS, and I just wanted to confirm that quickly.
MR. BOUDHAR: Yes, that is correct.
MR. LAU: Okay, thank you.
In VECC 7 Elexicon showed that there is about 28 million dollars related to the installation of distribution automated switches, cap banks, regulator banks, and in Staff 5, table 3, it shows that Elexicon plans to spend 1.3 million dollars in line rebuilds, 1.7 million dollars on poles, .68 on -- million on switches, and 6 million on system reliability improvements.
What I really just want to understand is, when you are installing distribution automated switches, cap banks, and regulator banks as part of this project, how many poles

would you need to replace? And would they, you know, overlap like your pole replacement program? Has Elexicon taken a look at that?

MR. THOMPSON: So in the context of the class 4 estimate that was produced as part of this project, all the major equipment is assumed to need a new pole. So the distribution switches, the regulators, might need a couple poles, and the cap banks might need new poles, and that is, generally speaking, because a pole line built in Whitby doesn't have a heavy enough pole to hold a large device.

So you could go, you could put another -- you know, you could put some distribution transformer on a pole, but something heavier, you might run into trouble. So you don't know. So right now is the assumption is a new pole per major device.

The context of how this would integrate with a pole line replacement program, they're spotty poles, they're one-offs, they're all around the city. So the study -- the estimate that I did does not account for the possibility of those poles being replaced anyway, but considering the program that we're going to be in over the next few years, the odds of intersection of those two plans would be a small number of poles, if any.

MR. LAU: Okay. Could Elexicon provide an estimate like that? Or is that too difficult to say?

MR. THOMPSON: Well, those poles aren't selected. The poles that will be replaced aren't selected.

MR. LAU: So you're saying reactive replacement for

MR. MANDYAM: Mr. Daube, just another point. Where the program is offered by Elexicon and participants, you know, sign off on their information being included in the program metrics, we'll be able to, you know, capture some of the items that you talked about, who the participant is, what -- we hope to at least be able to capture who the participant is, what the technology, et cetera.

Now, that is for the -- that would hopefully be for the Elexicon DER program.

Where the customer just on their own installs DER appliances or goes to other sources of funding, we may not be able to get that access to that information.

MR. DAUBE: Are you planning at the moment or considering at least any measures in addition to what you normally do specific to these initiatives that would allow you to obtain a bit more information? That sounds like you are interested in gaining a bit more information on the various measures of success of these initiatives.

So I am just wondering if you are considering doing anything not part of your current routine in order to obtain the information that you identify as helpful to you.

MR. MANDYAM: So I think, you know, as we have alluded to in our evidence, Appendix B-3, it is in planning stage -- well, it is before planning stage, actually, right now.

I can say that Elexicon will stakeholder as part of its process to produce the application for the DER-enabling program with entities, DRC, SEC, others, OSEA, parties who are well-versed in this area. That is a commitment that

Elexicon will undertake.

Through those discussions, there may be items that individuals like yourself or associations like yours or others bring to the table that would be incorporated that may not have been originally contemplated or part of the standard engagement that Elexicon does with its customers.

MR. DAUBE: Okay, thank you.

Could we move to the second paragraph of answer (b), please. I will just give you a second to read it.

And just to give you a sense of where the focus, my questions relate to savings and any plans that may exist for what you are going to do with the savings.

MR. MANDYAM: Yes.

MR. DAUBE: Is there anything in your current evidence where I can find plans for what you are going to do with any savings that result from these initiatives?

MR. MANDYAM: I don't believe we have any statements in the evidence around that.

MR. DAUBE: Have you come to a determination on what you are going to do with any savings from capital deferral?

MR. MANDYAM: Well, let's just do a caucus for that with the team for a second, please. Ashley?

[Witness panel confers in breakout room.]

MR. BOUHDAR: Apologies for taking the time with the caucus. From a planning perspective, I guess we'll have to look at the cost avoidance when it comes to deferral of assets, and then we can basically reprioritize our capital plan or our capital budget then.

MR. THOMPSON: So thank you for your patience.

We faced a challenge which turns out to the definition of "benefits", and we'd like to be clear that benefits exceed both the reliability benefit that was discussed yesterday and the bill reduction benefit that is on the table and other places in the document.

In several places in the document, particularly in Appendix B-1, page 8, the benefits of the Whitby Smart Grid program particularly are listed, which include cost productions, includes reliability improvements, includes system storm-hardening, it includes a general reduction of energy consumption and associated greenhouse gases, deferral of capital programs, enhancement issues, and on.

What we would like to emphasize is that there is a significant need to update what a distribution system grid is. We're going to need more automation, we're going to need control the voltage, we're going to need to minimize consumption and minimize losses, reduce system losses, and all of these are elements of this program.

So what we have here is a project evolving the distribution system into what the system needs for high-impact penetrations of DERs. We have an opportunity to do it at a business case that shows a net benefit.

That benefit is based on proven technology that we know how it works. We know what it will deliver. There is some engineering estimating involved and future reliability improvements [audio dropout] energy consumption. There's engineering involved in what the greenhouse gas reduction

is, but those benefits are known and generally manageable.

So this project has a net benefit and has the opportunity to deliver all of these additional benefits which impact the distribution system, impacts the transmission system, impacts the generation system. A 3 percent across-the-board reduction in generation would eliminate some of the gas plants that are currently in discussion.

These are big numbers, and these are coming. And the opportunity here is to package this in one package that generally pays for itself and delivers all of these benefits.

So I think it is a mistake to isolate individual benefits and say, what if this benefit doesn't occur, what if that benefit doesn't occur. The intangibles basically include bringing Whitby into what the system needs to look like in order to move forward.

MS. GIRVAN: Are you familiar with the PUC project?

MR. THOMPSON: Yes, I am.

MS. GIRVAN: Do you know that one of the sort of conditions of their project is no net bill increase for customers?

MR. THOMPSON: So my approach -- my familiarity with the PUC project is on the engineering side. So I will defer on what the rate conditions are to the experts on the panel. But for the purpose of discussion I can take your point.

MS. GIRVAN: Mr. Mandyam, are you familiar with that

MS. GIRVAN: I am talking about the other project. The Whitby Smart Grid.

MR. MANDYAM: Right. They're all integrated though, Ms. Girvan. The inception of this total package started with, as I have talked about earlier, the Brooklin Landowners Group. So this is part and parcel with the unique situation with Elexicon. This is part and parcel of the system needs of Elexicon being addressed.

And so, did we go solicit and wait for the PUC decision to -- or PUC to -- cost-of-service application to be finished? No.

MR. THOMPSON: If I could chime in on the -- Andrew, your microphone, please.

MR. MANDYAM: Sorry.

MR. THOMPSON: If I could chime in on a technical level. There wouldn't be any learnings from PUC that would be unique. Automation systems are all over Ontario. We know how they work. VVO systems have been tried and tested, even some as locally as here around this area. So we also know how they work.

And so wait for PUC to have some sort of result wouldn't give us new information from what we already have.

MS. GIRVAN: But the similarities are -- it's system-wide, and I don't think we have seen that in other jurisdictions in Ontario.

MR. THOMPSON: On the automation side we do. The large-scale VVO and CVR, this would be the largest that I know of, for sure, or these two projects would be the

largest I know of.

MS. GIRVAN: Exactly. Okay. Thank you. Could you please turn to CCC number 9. I am trying to move along, but I am getting long answers. I am not objecting to that, I am just saying it is taking a little bit longer than I expected.

So you have talked about, you are looking at approaching the IESO for funding. Can you explain to me what kind of funding you are expecting or you are seeking from the IESO.

MR. MANDYAM: It would be in support of our DER enabling program, where -- or if they are up for it, any additional contributions towards the smart grid implementation that they could see maybe connecting to a local distribution system operator model. Any of those and maybe other ideas that I haven't even thought of or we haven't even thought of, Ms. Girvan.

MS. GIRVAN: You have no sense of magnitude or anything?

MR. MANDYAM: No, unfortunately not.

MS. GIRVAN: Okay. CCC 11, please. I am trying to understand, you're talking about significantly modernizing your distribution system to facilitate the integration of high levels of DERs.

You say this, but in fact, you haven't really done a forecast of DERs, have you?

MR. MANDYAM: No.

MS. GIRVAN: Other than what you have seen from the

And so all of those things add up to about $8,400 a year for a typical school. There is about 60 schools, so that is about a half-million dollars.

Again, will you accept that subject to check?

MR. VELLONE: Just so we can do the check, Mr. Shepherd, what are you assuming in terms of consumption of the typical school?

MR. SHEPHERD: 100 kilowatt monthly demand. That is actually on the low side, as I said. The 100 kilowatt is an old standard, and these days schools tend to be built bigger.

MR. VELLONE: I am just trying to make sure we can actually do the check. Thank you.

MR. SHEPHERD: And the 60 schools that I am using for Whitby is actually -- that may actually include some that are in the process of being built, but given that we're looking at the upcoming period, 60 is probably about right in Whitby. I mean, the way Whitby is expanding, it could be 100 before this period is over, before you rebase.

So the reason I ask that is because if we go to the ICM models that you filed, what I get is that for the Whitby Smart Grid you are going to -- sorry, for Sustainable Brooklin you are going to ask each school, each of these typical schools to pay an additional 54.63 a month.

MR. VELLONE: Mr. Boyle, nothing for you to share.

MR. SHEPHERD: You can show that if you want. Anyway it is 53.64 for 100 kilowatt school. Which is $655.00 a

year. Will you accept that subject to check?

MR. MANDYAM: Yes. Subject to check.

MR. SHEPHERD: And for Whitby Smart Grid you are going to ask that same school to pay $104.18 a month or $1,250 a year. Will you accept that subject to check?

MR. MANDYAM: Yes. Subject to check.

MR. SHEPHERD: Those total about $115,000 a year additional costs to schools which I get about 22 and a half percent increase in distribution charges. Am I in the ballpark here?

MR. VELLONE: Is it for Sustainable Brooklin or for both, Mr. Shepherd?

MR. SHEPHERD: For both.

MR. MANDYAM: Yes. Subject to check I think you're -- your base was in the 500,000 range and this value is 115. So one-fifth is about 20 percent, et cetera, yes.

MR. SHEPHERD: Okay. Then you are going to add-on a Z factor claim and am I right in assuming that a typical school might end up paying an additional four or five hundred dollars a month for the Z factor claim? Or sorry four or five hundred dollars a year. Oh, my God.

MR. MANDYAM: That I would have to take away. I don't know that for a fact.

MR. SHEPHERD: Well, you have your chief financial officer here. Am I in the ballpark?

MS. CHAN: I think per what Mr. Mandyam noted I think we would have to check that, take it away and check it.

MR. SHEPHERD: You also have a DER enabling program

MR. SHEPHERD: The current plan is to ask the ratepayers to pay something for it, right?

MR. MANDYAM: No. If it's all optimal, the current plan would have no costs to the ratepayers. It would have funded, be funded from sources such as NRCan or other sources like IESO, et cetera.

MR. SHEPHERD: Isn't the normal practice that NRCan and IESO fund things where you match their funds?

MR. MANDYAM: That I don't know about.

MR. SHEPHERD: Well, take ADMS for example; they're funding 50 percent.

MR. MANDYAM: Yes. Agreed in that situation. I am not certain that it is always the case.

MR. SHEPHERD: It doesn't matter. These additional things that you are planning to do -- and then you have grid of the future which is coming too, right? That is going to cost money. There is more stuff coming. Not just Whitby Smart Grid. There is more stuff coming, right?

MR. MANDYAM: I can't say yes or no to that. I mean, the system plans are to modernize the grid, you are correct with that.

And this project, as you noted, will do some of that, if not a lot of it.

MR. SHEPHERD: So Sustainable Brooklin and Whitby Smart Grid already are a 23 percent rate increase for the schools. Then you are going to add-on the z-factor and DER-enabling if it costs anything. And then all of the other modernization up want to do.

Do you have some estimate as to how much all of these things are going to add to the distribution cost, over and above the 23 percent that you have already put on the record?

MR. MANDYAM: We only have what we've, you know, put on the record, as you say.

MR. SHEPHERD: Can you turn up SEC 12, please.

MR. VELLONE: Mr. Shepherd, is now an okay time to interrupt?

MR. SHEPHERD: Sure.

MR. VELLONE: 2022-0317 completeness letter issued last Friday. I just checked the WebDrawer. There is nothing up there yet.

MR. SHEPHERD: So it was filed in December?

MR. VELLONE: December 12th, correct.

MR. SHEPHERD: Okay. It was filed after the interrogatories were responded to, right? Yes.

MR. VELLONE: Correct. I believe that is right, yes.

MR. SHEPHERD: Okay. I am wondering why you didn't tell the Board in this application the impacts, but I guess -- the reason I am can go is because in SEC 12 you said, we don't think you should be adding together the bill impacts for all of this stuff. Can you explain that?

MR. MANDYAM: Yes. The rationale for that statement is that you're using 2023 OEB models to project 2025 costs or '25 bill impacts, and the more appropriate tool is the 2025 models when they come out and which will be filed in the 2024 application by Elexicon.

MR. SHEPHERD: You're asking the Board to approve the money now, right?

MR. MANDYAM: That's correct, Mr. Shepherd.

MR. SHEPHERD: But you don't think the Board should look at the bill impacts?

MR. MANDYAM: We have provided the bill impacts on a notional basis.

Our qualifier is that these will not be the final bill impacts. There will be a plus or minus associated with that, that we can't predict but will be evident in the 20 -- in 2024 when the application goes in for 2025.

MR. SHEPHERD: Yesterday Mr. Ladanyi asked a bunch of questions about non-residential customers. And I of course am asking along a similar vein.

Where in the application or in any of the materials that you have filed have you told the Board or anybody else that you're planning to increase the distribution bills for distribution customers -- for non-residential customers by 25 to 30 percent over the next couple of years? Where do you say that?

MR. MANDYAM: I don't think we have said that.

MR. SHEPHERD: You haven't said that. But it is true, isn't it?

MR. MANDYAM: We'll have to, you know, a lot of subject to checks that were agreed to earlier. So from that perspective, you know the Board and parties like yourself will present argument around consolidated views of the evidence that's already on the record.

--- Luncheon recess taken at 12:06 p.m.

--- On resuming at 12:55 p.m.

MR. MURRAY: Mr. Shepherd, please continue your questions.

MR. SHEPHERD: Mr. Mandyam, this morning -- and I'm trying to understand the interaction between the two projects in this application.

My initial thought is that they're actually like two separate applications that are for convenience being filed together, but then you said this morning that the Whitby Smart Grid project arose out of the discussions about Sustainable Brooklin.

And I wonder whether you misspoke on that, because that doesn't sound like it is consistent with the evidence. Or maybe I misunderstood it.

MR. MANDYAM: Well, the exact genesis -- well, let me take you to -- maybe it is good for me to just explain the genesis of the project and connect back to what is on the evidence. There is an interconnected nature to it, which is the DER enabling of Sustainable Brooklin and the Whitby Smart Grid technologies.

You know, maybe I went too far in saying that the Sustainable Brooklin problem and challenge that Elexicon management was looking for a solution led to directly the Whitby Smart Grid. It was all -- I wasn't privy to the exact genesis moment, the big bang so to speak, Mr. Shepherd. But I can, you know, in one of our responses to your interrogatory SEC 22 we laid out the timeline of all

of the interactions.

The only thing we didn't include which I will add to is between the line item of September of Q4, 2021 and March 2022, in that January/February of 2022 time frame, Elexicon management looked at the convergence of all of these activities going on around it, Sustainable Brooklin problem to be solved, ADMS, NRCan funding seemingly being approved. We've got PUC decision, smart grid technologies being approved and proven. And so through all of that convergence, the convergence of all of those elements the smart grid and the Sustainable Brooklin DER enablement program, sorry, DER/EV quid pro quo program was developed.

MR. THOMPSON: If I could interject --

MR. SHEPHERD: The Whitby Smart Grid was conceived in 2020 and you applied for your NRCan funding early in 2021. But the Sustainable Brooklin wasn't conceived until the end of 2021, is that correct?

MR. MANDYAM: Sustainable Brooklin -- all of this was 2022, my understanding, Mr. Shepherd.

MR. SHEPHERD: Well you applied for NRCan funding April 2021 so that can't be correct.

MR. MANDYAM: The NRCan funding was a project unto its own, it connected to B, the Whitby Smart Grid in 2022. That is the convergence I am talking about.

So management had part of its innovation leadership and team were pursuing NRCan funding.

And the Sustainable Brooklin -- what the Brooklin developers were presenting their concerns and issues in

the record. That's when the quid pro quo was arranged.

MR. MANDYAM: If that's --

MR. VELLONE: Q1, 2022 or Q4, 2021, somewhere around there.

MR. SHEPHERD: The reason I am following this up is, my impression is, maybe we can turn to CCC 6. Because my impression is these benefits, $673,000, that has nothing to do with Sustainable Brooklin, right? Those benefits are exactly the same without Sustainable Brooklin. Isn't that correct?

MR. MANDYAM: Correct.

MR. SHEPHERD: Okay. And so, can you go to SEC 7, please. And in SEC 7, you talk about the various benefits of the projects collectively. And I am just looking at that list. System reliability, conserve energy, total bill impacts, reduce losses, facilitate increase DER penetration to avoid future costly capacity upgrade. That is the benefits, right?

MR. MANDYAM: Correct.

MR. SHEPHERD: Okay. And the system reliability, conserve energy, reduces losses, they are Whitby Smart Grid. They're not Sustainable Brooklin, right?

MR. MANDYAM: That's correct.

MR. SHEPHERD: And increase DER penetration to avoid a future costly capacity upgrade, that is both, right?

MR. MANDYAM: That's correct.

MR. SHEPHERD: But that's only to the extent that the DERs are actually installed. The actual roughing-in

doesn't cause that. It just facilitates it.

MR. MANDYAM: That's correct.

MR. SHEPHERD: Okay. And if I understand correctly, you've already started the ADMS project, right?

MS. ELOSIDA: That's correct.

MR. SHEPHERD: Thanks. But -- and am I right that if the -- if Sustainable Brooklin were not approved, but Whitby Smart Grid was approved, you would still go ahead with Whitby Smart Grid?

MR. MANDYAM: Yes. The short answer is yes. Obviously management as you would appreciate, Mr. Shepherd, management would have to look at the decision and obviously read it, but if it was approved as filed -- maybe that is your hypothetical -- yes.

MR. SHEPHERD: And the benefits to the customers that you have talked about would be the same.

MR. MANDYAM: The same as what we have put in table 1?

MR. SHEPHERD: Yes.

MR. MANDYAM: Yes, yes, correct.

MR. SHEPHERD: Take a look at CCC 4, please. So this talks about the two feeders. And are the -- that cost of 26.6 million for those two feeders, does that include some of the Whitby Smart Grid stuff? Are these just sort of standard 27.6 feeders?

MR. BOUDHAR: No, the cost is only for the feeders as stated in the Whitby Smart Grid.

MR. SHEPHERD: Is the reason for that because these feeders aren't directly serving any customers? They are

that. It is better with DER-enabled homes in Brooklin, as you would appreciate. It doesn't need it.

MR. SHEPHERD: All right. Let me just briefly ask a question about ADMS. And please, please be nice to me here, because I am not an engineer and I had to look up what ADMS meant.

But --

MR. MANDYAM: We provided that in the glossary, Mr. Shepherd.

MR. SHEPHERD: I know. I found it.

MR. MANDYAM: Good. Good.

MR. SHEPHERD: But am I right in understanding that ADMS has benefits by itself? Like, it doesn't depend on the other technologies to deliver benefits; is that right?

MS. ELEOSIDA: Yes, that's correct. And I believe we had listed out those benefits in -- let me just find it here. Appendix B-1.

MR. SHEPHERD: Understood. And then if you install FLISR and VVO, do those things enhance the benefits of ADMS? Or are they separate benefits?

MS. ELEOSIDA: I would -- I would say that it enhances the benefits that ADMS has to offer as a stand-alone application, but I can turn it over to Mr. Thompson to explain what the VVO and CVR benefits would be.

MR. THOMPSON: If I could offer, Mr. Shepherd -- your mic.

If I could offer, Mr. Shepherd, ADMS is more or less a package with multiple modules inside it.

MR. SHEPHERD: Yes.

MR. THOMPSON: So the Elexicon ADMS application includes a number of modules that have benefit. Within those modules is the FLISR module and the VVO module, which is -- which is our field implementation.

VVO and --

MR. SHEPHERD: Hold on. Sorry, sorry, sorry, I just want to stop you, because that came out of left field, and I just want to understand that.

My understanding was that FLISR and distribution automation were a separate additional cost over and above the 8 million for ADMS. Is that --

MR. THOMPSON: Let me clarify that for you. So the ADMS includes a number of software modules, but the field work, the switches, the regulators and capacitors, the station upgrades and whatever, voltage sensors, everything that's in the field, is what we are calling the FLISR and VVO projects, or sub-projects, if you like.

So the ADMS sub-project is detailed in Appendix B-1 and has three phases. It was a list of modules there that include things like outage communication, switch order management, load flow analysis. Those benefits would be accrued regardless of VVO and FLISR.

But the advantages to reliability and the advantages to VVO and, in particular, the foundational work for DER-enabling, that occurs with the other two sub-projects.

MR. SHEPHERD: If I understand this technically -- which I don't -- the FLISR and distribution automation

component is field stuff, stuff out in the field, stuff on the system. And ADMS includes a central module, like a management module, to use the information that you get in those field devices. Is that right?

MR. THOMPSON: Sort of. The ADMS itself is made up of a dozen or 15 sub-modules.

So ADMS stands for more or less advanced management systems, mass distribution management systems. What makes it advanced is that it is integrated. So a person can go out and buy, like, a VVO software package or a DA software package, but the two don't talk to each other. So when you integrate them you start to have what is called an ADMS.

And then there is an argument in the field as to how many of these modules you actually have to have before you have an ADMS.

But in the context of the ADMS project that is being developed, there is a significant number of packages proposed. Those packages in summary would qualify as an ADMS. But in order to get the benefits of the VVO or the CVR -- really, the CVR is the benefit -- or the reliability improvements or any DER-enabling, you need the field work.

MR. SHEPHERD: All right. I'm applying for my degree in electrical engineering after this set of questions.

So let's talk about FLISR and distribution automation. If I understand from SEC 17 and table 19 in the -- in the material -- in the pre-filed material, the reliability benefit associated with distribution automation is that approximately 75 percent of what would otherwise be one-

hour or more outages become momentary outages, and this is what you said the other day, right?

MR. THOMPSON: Right. For a specific set of outages, which we would consider to be feeder lockout outages, which are the most significant outages on the system.

MR. SHEPHERD: And that benefit would happen basically on all the feeders that you install the field equipment on, right? You are not going to install all feeders all at once. You are going to do it a bit at a time, right?

MR. THOMPSON: Well, we're proposing a fairly rapid project. In the context of reporting, it would look like all at once. And then, of course, the benefit only occurs on those feeders that have, A, automation, and B, experience a full feeder lockout.

MR. SHEPHERD: Okay.

MR. THOMPSON: So if a feeder doesn't have an operation that year, it doesn't see any benefit.

MR. SHEPHERD: Understood, understood. But you are talking probabilities here. You cover a whole area because you know some of them will have outages.

MR. THOMPSON: That's right.

MR. SHEPHERD: All right. Now, in SEC 23 you talk about a distribution automation pilot. That pilot is not yet completed, right?

MR. THOMPSON: So that is correct. There should be a terminology correction about the word "pilot". It is not specifically a pilot in the context of an exploration. It was considered, or the phrase "pilot" was being used to

out by rate zones once they merged.

MR. SHEPHERD: Okay. So you're saying you don't have this information?

MR. MANDYAM: I think OM&A is a consolidated value. Like, it is not like bill impacts by rate zone.

MR. SHEPHERD: All right. So can you update that 652 dollars to include these ICMs?

MR. MANDYAM: So I am just thinking through this. You are asking us to update for a 2025 value without a benchmark of what the actual base customer cost per customer would be.

MR. SHEPHERD: You're asking for approval for the money now.

MR. MANDYAM: Hmm-hmm.

MR. SHEPHERD: Tell the Board what the impact on your total cost per customer is going to be.

MR. MANDYAM: Well, yes. We can do that obviously with... Okay. We will take it away, actually, one second. Let's caucus, before I commit to it, Mr. Shepherd, we are going to caucus.

MR. SHEPHERD: Can I join the caucus? Just a thought.

[Witness panel confers in breakout room.]

MR. MANDYAM: Mr. Shepherd, we're back. Thanks for indulging us. I was corrected in my thinking.

Our understanding is that that total cost per customer is actually derived and not produced by Elexicon, but rather the OEB's econometric PEG benchmark process.

So it is really a number that isn't hours to produce.

slide appears to suggest that you could do this without -- that one option is to do it without FLISR. Is that right? Maybe I am misreading it, but that is what I thought it said.

MR. VELLONE: Mr. Shepherd, are you on the same slide that is showing on the screen? Or perhaps the next one?

MR. SHEPHERD: Maybe the next one.

MR. MANDYAM: Yes, Mr. Shepherd. That wasn't a separation of the proposal. That was just a segmentation. It was thought at the time that management should inform the Whitby Town Council about all of the components and the impacts of all the components.

So it wasn't a proposal as a recommendation that the project should be split up in any way.

MR. SHEPHERD: Because you wouldn't actually do it -- like, the ADMS component gives you some benefits, right, and VVO gives you some benefits.

But you really want the reliability benefits in order to make the whole thing cost-effective. Is that right?

MR. MANDYAM: I can say from Elexicon's management perspective you are correct. It is under the observation that the total package delivers the full benefits, as you are describing.

Now, there is a technology piece of it that Mr. Thompson or others, if they choose to, can add to the record.

MR. SHEPHERD: Perhaps one of the technical people can technically more knowledgeable people than me or even

Andrew can explain, would you do this without FLISR?

MR. THOMPSON: That actually isn't a technical question, but the technical answer is you can do it without FLISR.

MR. SHEPHERD: But the loss of benefits is a lot more than the reduction in cost?

MR. THOMPSON: You would lose benefits if you didn't use FLISR, yes.

MR. SHEPHERD: Well, no, my question was: The big net benefit comes from the reliability benefits, right?

MR. MANDYAM: Right. If you look at table 1, that's exactly right, Mr. Shepherd.

MR. SHEPHERD: Okay. Can you go to SEC 15, please. And one of the possibilities was to scale back the project, the Whitby Smart Grid and complete it by the end of 2028, right, that is one of the alternatives you looked at. Right?

MR. MANDYAM: Correct.

MR. SHEPHERD: And if you did that, you wouldn't need an ICM. You would include it within your existing capital budget. Is that right?

MR. BOUDHAR: No, that's not correct.

MR. SHEPHERD: I thought that is what it said. Using Elexicon's existing capital expenditure allocation.

MR. BOUDHAR: Sorry. I am trying to find out where we say that.

MR. SHEPHERD: A, "using Elexicon's existing capital expenditure allocation."

MR. LADANYI: May I interject here? Tom Ladanyi for CCMBC.

So if these assets are operational but not in-service, do they remain in the work-in-progress account and collect return on the work-in-progress account?

MR. MANDYAM: Using the ICM models, I don't believe -- the only thing that is in the ICM models, if I remember, that are work-in-progress, I think, is interest is calculated as part of that on a formulaic basis, but I don't believe there is other WCA.

MR. LADANYI: I think you are guessing this. Maybe we might have Ms. Chan explain how this is going to work, if these assets are -- where would be they for the intervening, let's say two years? Will they sit in -- what account would they be in?

MR. SHEPHERD: Sorry, just before you go on, Tom, I didn't get the sense that the company was saying that the assets would be completed but not in-service.

My sense was that you were saying that some assets will be in-service in 2023 and some assets will be in-service in 2024, and the accounting rules will require you to include them in fixed assets and depreciate them. Isn't that right?

MR. MANDYAM: Yes, that's correct. Yes.

MR. LADANYI: Well, I am under the impression -- again, I could be wrong here, and that is why I would like it clarified -- that for OEB purposes you're going to treat these assets as if they're in work-in-progress.

Elexicon Energy Inc.

Answer to Interrogatory from

Vulnerable Energy Consumers Coalition

Interrogatory VECC-02:

Ref: Appendix B – Incremental Capital Module Whitby Smart Grid & Sustainable Brooklin P11

Table 1 provides the WSG net benefits.

a) Please provide references for the Cost of Power, ICM Additional Revenue, Additional OM&A expenses, Operating Efficiencies from WSG and the Projected VoLL Benefit from Reliability.

b) Please discuss and quantify the impact on reliability benefits if the scope of the WSG work component was reduced by 50%.

c) Please provide all sensitivity analyses undertaken by Elexicon with respect to the annual customer benefit.

Response:

a) Please see below:

Cost of Power:

For the year 2021, Elexicon completed a reconciliation of its Cost of Power between the WRZ and VRZ in the course of its audit. The outcome of that reconciliation was a Cost of Power for the WRZ of $108,526,471.

ICM Additional Revenue:

The "ICM Incremental Revenue" listed in the table noted can be found in Elexicon's ACM-ICM Model filed for the Whiby Smart Grid in the WRZ[1], as submitted in Elexicon's pre-filed evidence. The figure can be found under tab "Incremental Capital Adj." in row 93, titled "Incremental Revenue Requirement".

[1] File name "EE_WRZ WSG_2023_ACM_ICM_Model_1.0_20220727"

Additional OM&A Expense and Operating Efficiencies:

Assumptions and calulations informing Elexicon's estimated Additional O&M Expense and Operating Efficiencies are further detailed in the table below:

Table 1 – O&M Costs and Benefits

O&M Costs & Benefits

Estimated Additional FTEs	Hourly Rate	Cost Loading	Total Hourly	Annual Hours	Annual Cost	Qty	Cost
Supervisor	$ 55.00	25%	$ 68.75	2080	$ 143,000	1	$ 143,000
Hourly Staff (e.g. operator, electrician)	$ 46.33	25%	$ 57.91	2080	$ 120,458	1.5	$ 180,687
						Total	**$ 323,687**

Estimated OM&A Savings	
Average Annual Outages	117
Average Reduction to Response Time	1
Total Annual Outage Response Time Reduction	117
Hourly Cost of Truck Roll (2 Tech & OH)	$ 350.00
O&M Savings	**$ 40,950**
Net O&M Impacts	**$ 282,737**

Projected VoLL Benefit from Reliability:

To calculate an estimate of the Value of Lost Load (VoLL) Elexicon relied on a U.S.-based Lawrence Berkley National Laboratory (LBNL)[2] study updated in 2015, which had been previously relied upon by Navigant Consulting Ltd. (Navigant) in their analysis of the PUC Distribution Sault Smart Grid, as approved by the OEB in EB-2020-0249.[3] The LBNL values recognize the different economic value (loss) of service interruptions amongst different customer sizes. The LBNL study, as referenced by Navigant, provides costs per customer (by size) per 60 minute outage, represented in 2015 Canadian Dollars. The table produced by Navigant, relying on the LBNL study referenced, is provided below:

[2] Michael J. Sullivan, Josh Schellenberg, and Marshall Blundell. Updated Value of Service Reliability Estimates for Electric Utility Customers in the United States. Updated January 2015
[3] EB-2020-0249, Appendix AA5 – Appendix 4 JTC1_18 Copy of PUC SSM UDM Business Case Analysis_FINAL 20160504

Table 2 -- LBNL Costs per customer

LBNL Customer Class[7]	Cost per Customer per 60 Minute Outage ($CAD[8])
Medium & Large C&I (> 50,000 Annual kWh)	$22,737
Small C&I (< 50,000 Annual kWh)	$826
Residential	$6.50

For the purpose of estimating VoLL, Elexicon escalated these costs by actual GDP-IPI as presented by Statistics Canada for the period of Q1 2016 through Q1 2022.

To complete the VoLL estimate, Elexicon relied on its actual WRZ customer count by customer size and the forecast SAIDI improvement resulting from the Whitby Smart Grid. The resulting calculation is presented in the table below:

Table 3: Reliability Benefit

	Cost/Customer per 1hr outage	GDP-IPI Escalation: Q1 2016 to Q1 2022	SAIDI Reductions	Cost/Customer per 0.58 hr outage	Customers	Reliability Benefit
Residential	$ 7	$ 7	$ 1	$ 4	$ 43,441	$ 183,970
GS <1 MW	$ 826	$ 928	$ 1	$ 538	$ 2,737	$ 1,472,952
GS >1MW	$ 22,737	$ 25,541	$ 1	$ 14,814	$ 11	$ 162,952
					Total Benefit	**$ 1,819,874**

b) Reducing the WSG scope by 50% would result in all customers in the WRZ paying for the project, but only a subset of those customers gaining the benefits. Elexicon cannot precisely quantify the impact of a reduction of 50% in the Whitby Smart Grid project scope. A hypothetical impact of any value would require a detailed plan and corresponding results estimate based on specific stations, feeders, and other assets which were excluded from the Whitby Smart Grid. Elexicon intends to modernize its entire WRZ system, and has completed no such hypothetical design.

c) Elexicon did not perform any sensitivity analysis with respect to customer benefit.

Attachment 1

ICM Application Update:
Whitby Smart Grid & Sustainable Brooklin

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ICM Application: Vision & Scope

- Project is first step in implementation of **Elexicon's Grid of the Future**
  - **Enable Net-Zero homes & implement base elements to support climate change goals**
- Implementing known and available innovation technologies with well understood customer and system benefits to support Grid of the Future
- **Whitby Smart Grid**:
  - Volt-VAR Optimization (VVO), Fault Monitoring and Distribution Automation (FLISR), Advanced Distribution Management System (ADMS)
- **Sustainable Brooklin:**
  - **Approximately 10,000 new homes over 20 years in North Brooklin encouraged to adopt DERs** as 1st tranche of Whitby Smart Grid
  - Developer group committing ~$2,260 per home to rough-in homes for Distributed Energy Resources (DERs) and EV adoption
  - **Seek OEB approval of exemption from developer group capital contributions** relating to the $26 million cost to build extension of grid to North Brooklin (specifically, exemption applicable to Section 3.2 of Distribution System Code (DSC))
- Long term establishment of Local Electricity Market

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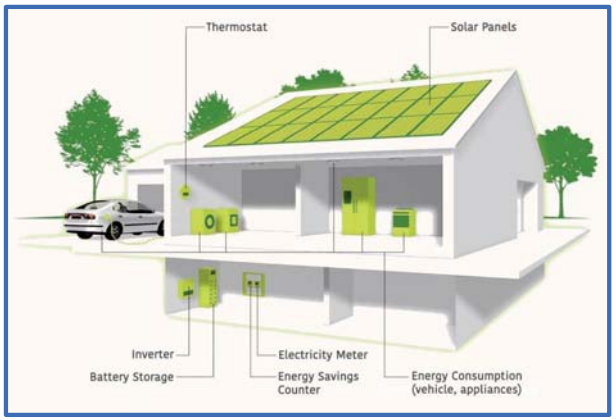
ICM Application: Whitby Smart Grid

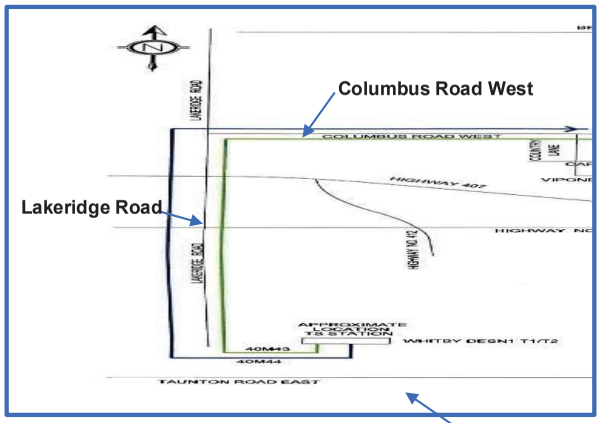
- Benefits
  - VVO can be operated to drive energy/capacity conservation benefits across distribution system
    - **Approx. ~2% to 5% - help to reduce all ratepayers' total bill**
    - Reduce Greenhouse Gas (GHG) reductions through energy conservations – Net-Zero
  - FLISR will improve system reliability
    - Helps Elexicon identify issues (e.g., outages, tree contacts) more quickly
    - **Allows Elexicon to respond to issues more efficiently** (e.g., by isolating the affected segment of line & rapidly restoring power to all other customers)
  - ADMS
    - This is the "brains" – the control hardware and software that Elexicon uses to deliver benefits from VVO and FLISR
- Modelled on the OEB approved Sault Ste. Marie Smart Grid project https://saultstemarie.ca/Newsroom/May-2021/Smart-Grid.aspx

ICM Application: Sustainable Brooklin

Developers pay for DER rough-ins:



In return, Whitby ratepayers would pay for "Extension Cord":



- Grid extension to North Brooklin cost ~ $26.3M
- Developer commitment (EV & solar, batteries rough ins) ~$19.9M - $30M
  - Cost varies based on rough-in cost of just over $2K per, times # of units
  - Cost varies based on impact of inflation on current cost estimates

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ICM Application: Project Financials*

Project	Asset Grouping	Cost Estimate ($ Million) (Class 5)	Estimated Total Bill Increase ($/month)
Whitby Smart Grid	VVO (CVR System)	$16.2	$2.59
	FLISR (& CFCI)	$16.0	
	ADMS (NRCan 50% funded)**	$4.0	
	Project Support Costs	$7.4	
	Sub-Total	$43.6	
Sustainable Brooklin	Extension of Grid to North Brooklin	$26.3	$2.60
	Total	$79.9	$5.19

Notes: (Estimates as of June 15, 2022)
*: Costs net of benefits to be recovered from Whitby ratepayers
**: NRCan funding $4.0 million of $8.0 million project budget

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ICM Application: Bill Impacts

- Estimate average Whitby customer's total bill is approx. $126/month
- Normal OEB formulaic inflationary increase anticipated to increase rates by $3.83/month in 2023
- Incremental Capital Module (ICM) increases are in addition, and vary based on scope and conservation assumptions*:
  - Sustainable Brooklin + Whitby Smart Grid** ~ $5.19 / month
  - Whitby Smart Grid (Full scope)** ~ $2.59 / month
  - **Whitby Smart Grid (No FLISR)** ~ $0.39 / month**
- Opportunity to further reduce bill impacts by getting more federal funding from NRCan will be pursued under all scenarios

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Notes:
***: Conservation assumptions still being modelled and finalized as of June 15, 2022**
****: Conservation assumption of 2.5% savings used for Sustainable Brooklin + Whitby Smart Grid, Whitby Smart Grid (Full Scope), and 3.0% savings used in calculation of Whitby Smart Grid (No FLISR)**

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ICM Application: Summary

- **Elexicon Grid of the Future**:
  - Implement plans and technologies to address 2040 climate change goals, and enable transformation for customer adoption of DERs and construction of Net-Zero homes
- **Whitby Smart Grid**:
  - Technologies of VVO, FLISR and ADMS are proven, verifiable and have been implemented in multiple North American jurisdictions
  - Chosen technologies will deliver benefits (i.e., savings) that have being accepted by multiple North American energy regulators
- **Sustainable Brooklin**
  - Cost consequence of capital contribution exemption is substantially matched by developer contributions to rough-in new homes for DERs
  - “Extension cord” is the most cost effective solution to bring new capacity to North Brooklin
  - Alternative of building a Transformer Station does not address transformational environment (i.e., addressing climate change) and is not in IESO or Hydro One Regional planning outlook

Findings

In order to manage the risks associated with this Project and appropriately monitor its progress, the OEB approval is subject to the following conditions:

1. PUC Distribution shall file its next rebasing application for 2023 rates no later than August 31, 2022.
2. PUC Distribution shall file an updated Distribution System Plan at the time of its next rebasing application which demonstrates how the SSG Project is being accommodated through the re-prioritization of other capital expenditures.
3. PUC Distribution shall provide a detailed report as part of its next rebasing application, which compares the SSG Project costs and benefits as implemented to what was forecast in this application.
4. PUC Distribution shall file all available information on the proposed Project performance metrics that it intends to track, along with proposed targets, in its next rebasing application. This shall include an appropriate metric and targets to symmetrically link the VVO performance of the Project to PUC's allowable ROE for this Project.
5. PUC Distribution shall post on its public website a report, within 18 months of Project completion, and with annual updates for 10 years thereafter which shows the actual benefits of the SSG Project, broken down by customer class.
6. Any EPC Contract liquidated damages resulting from "performance" or "delay" shall be used to reduce the Project capital cost and would be settled at the time of the next rebasing.
7. The OEB does not find it necessary for PUC Distribution to file an updated ICM model as part of its 2022 IRM application. As noted in the findings on Materiality, the rate riders to be utilized are those that were provided in the updated ICM Model filed by OEB staff in its interrogatories.[87] PUC Distribution shall include the approved ICM rate riders on its proposed tariff for its 2022 rate application.

[87] Confirmed by PUC Distribution