

## EXHIBIT 2: RATE BASE

### Ontario Energy Board (OEB) Interrogatories

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#### **OEB #3**

References: (i) *Executive Summary / 2<sup>nd</sup> page*  
(ii) *Exh 2 / pp. 29-34*

Reference (i) states the following:

“London Hydro’s mission includes the pursuit of excellence in reliability. To this end, London Hydro has worked diligently over the last decade to raise its performance ratings from second lowest in the Province to equal with its peers.”

Reference (ii) provides graphs which show historical system performance in terms of SAIFI, SAIDI and CAIDI.

- a) *What measures were undertaken by London Hydro in 2011- 2012 and planned for 2013 to maintain the existing system reliability performance or its trend towards further improvement?*
- b) *Please describe the expected impact on reliability of the measures taken in 2011-2012.*

#### **Response OEB #3**

- a) A key element of London Hydro’s mission is to strive for continuous improvement in reliability. London Hydro carefully monitors its reliability statistics and looks for trends in system performance in an effort to identify, assess, and accordingly invest in the system to improve and maintain the standard of system reliability which London Hydro’s customers have come to expect.

In 2011-2012 and planned for the year 2013, London Hydro has continued to plan for system reliability improvements through its capital spending programs. The following are several examples of these capital projects aimed at achieving this:

- London Hydro has injected its underground 1/0 AWG 27.6kV cables with silicon in order to prolong its asset life as well as improve its reliability. London Hydro views this to be a cost effective means to rehabilitate its aging population of underground cables as prescribed in the Asset Sustainment Plan. (*refer to 12B1, 12B2, 13B1, 13B2 for 2012 and 2013 planned work*)

- Premature failure of air insulated switchgear (*refer to 12B3, 13B3 for 2012 and 2013 planned work*), and pole structures susceptible to pole fires (*refer to 12G2, 13G2 for 2012 and 2013 planned work*) are examples of trends or system deficiencies that adversely affected the overall reliability of the system. Through prudent capital investment, London Hydro has and continues to mitigate these performance issues.
- Replaced numerous depreciated substation primary switches (T1-L switches), which pose a potential risk to the system's reliability and operation as it is part of primary sections of the network. (*refer to 11A2, 12A1*)
- Developed a long-term plan to replace the depreciated distribution plant energized at 4.16kV. The first phases of this work have already been completed in 2012 and more is planned for 2013. In addition to many of the benefits attributed to converting depreciated 4.16kV infrastructure to the common 27.6kV supply, the replacement of these depreciated systems will play a part in improving system reliability by reducing the risk of aged equipment failures. (*refer to 12B9, 12G3, 12G4, 13B9, 13G3, 13G5 for planned work*)
- Deployed system automation to restore power promptly and safely. As a result of targeted planning efforts (*highly automated distribution system; examples; installation of recloser and automated switches, refer to 11H3, 12H1, 13H1*) and enhanced operational capabilities (*Outage Management System*) the response time and visibility into the real time status of the network has and will continue to improve. Prompt restoration response time is critical to maintaining a high standard of system reliability.
- Converted radial underground systems by adding system loops. London Hydro had experienced a number of faults in its residential subdivisions that were serviced approximately 30 years ago with a radial configuration. These radial designs leave London Hydro staff with little option to restore power effectively and promptly; this leads to extended outage and poor system reliability. These system loops allow for operational flexibility which essentially reduces outage durations (SAIDI). Other underground system enhancements to reduce reliability risks are planned for 2013; namely the installation of sectionalizing equipment in the original 27.6kV downtown feed. This will allow the network to be sectionalized in the event of isolated faults. (*refer to 12A4, 13A3 for planned work*)

- London Hydro conducts annual “worst performing circuit” analysis. Other direct measures geared towards improving the reliability of underperforming circuits are planned annually. Based on internal reliability performance indicators, which benchmark and rank a circuit’s performance, the worst performing circuits are audited and appropriate measures are taken to improve its reliability. (*refer to 13G4 for planned work in 2013*)
- London Hydro conducted civil engineering assessments of its underground structural system. In early 2012, London Hydro engaged a civil engineering professional consultant to conduct a comprehensive audit of its underground structural system. Any failure in these structures can interrupt the continuity of power supply to customers for extended periods of time, and hence adversely affecting the system reliability. Upon completion of this audit and submission of the report, London Hydro will continue to plan for the sustainment of these assets accordingly.

The capital projects referenced above are listed in detail under Exhibit 2, Appendix 2B of the 2013 COS rate application.

- b) As assets depreciate and approach the end of their useful life cycle, the risk of failure increases. To offset this risk, in 2011 London Hydro created an Asset Sustainment Plan (ASP), which consolidates a number of internal engineering reports and identifies a replacement/refurbishment rate for each of London Hydro’s major asset groups. The proposed asset replacement rate is designed such that depreciated assets, that put system reliability in jeopardy, are replaced in a timely manner. In this way, London Hydro ensures that it continues to meet its reliability goals into the future.

London Hydro’s system reliability trends have been improving over the last decade. Although it does fluctuate from year to year the trend indicates improvement. London Hydro understands that improvements to system reliability are based on a combination of replacement of depreciated assets, targeting poor performing areas in the system based on ongoing audits and trend analysis, as well as improved operational capabilities.

London Hydro expects the work performed in 2011 and 2012 to continue to result in the same trend for improved SAIDI/SAIFI results, barring any unforeseen environmental events such as tornado, wind storm or ice storm.

**OEB #4**

*Reference: Exh 2 / p. 55*

*Based on the Table in the reference, the annual capital spending on subdivision rebuilds averaged about \$2.7 million per year for the period 2007-2010 and this amount increases to about \$6 million per year for the period 2011-2013. The highest cost item shown is silicone injection of underground cable.*

- a) Please explain why capital spending on subdivision rebuilds continues to be significantly higher (more than double) in 2012 and 2013 than the historical 2007-2010 values.*
- b) Please provide examples of other Canadian utilities that utilize silicone injection for refurbishment of underground cable and comment on its effectiveness and success in prolonging the life of underground cable.*

**Response OEB #4**

- a) Capital spending associated with subdivision rebuilds has increased as a result of introducing silicone injection technology in 2010. As mentioned in Exhibit 2, this technology increases the lifespan of polymeric cable, adding up to another 40 years of service.

The rationale for the capital spending on subdivision rebuilds is supplied in the Asset Sustainment Plan submitted as Appendix 2C of Exhibit 2 and involves the application of a condition based assessment of the cable assets as outlined in section 2 of the Plan. The assessment incorporates a review of: safety, performance, operability, outage risk, and the environment. This type of assessment has allowed London Hydro to maximize the service life of these assets and minimize replacement costs.

In 2011, the evaluation process indicated that it was time to increase the level of expenditure associated with these assets. London Hydro will need to replace approximately 720 km of cable over the next 15 years. In a continuous effort to reduce replacement costs, London Hydro selected silicone injection over replacement as it is estimated to be one-third to one-half of the cost. This approach will allow London Hydro to maximize the impact of the capital dollars on the safety and reliability of the underground system.

- b) Silicone injection technology was used with great success by North York Hydro throughout the 1990's to rejuvenate old power cable at a fraction of the cost of cable replacement.

Based on North York Hydro's success, London Hydro subsequently executed a project involving approximately 6 km in 2002. The area selected was experiencing a high number of failures prior to injection and has not experienced any failures since then. As a result of this success, London Hydro embarked on a second project involving 10 km of cable in 2010. London Hydro has realized the advantages and effectiveness of silicone injection versus replacement. The benefits include less disruption to the customer, cost savings, and ease of implementation. The subdivisions were chosen based on a performance risk analysis; once injection was started, the cable failures were no longer experienced.

Other utilities in Ontario that have used silicone injection include: Powerstream, Brampton Hydro One, Niagara On The Lake, PUC Distribution, Veridian Connections, Hydro Ottawa and Toronto Hydro.

#### **OEB #5**

*Reference: Exh 2 / p. 63*

*Based on the Table in the reference, the annual capital spending on city works averaged about \$513,000 per year for the period 2007-2011 and this amount increases to about \$1 million per year for the period 2012-2013.*

- a) Please explain why capital spending on city works is estimated to be significantly higher in 2012 and 2013 (almost double) than the historical in 2007 to 2011 values.*
- b) Are these higher levels of spending expected to continue beyond 2013? Please explain.*

#### **Response OEB #5**

- a) The work undertaken by London Hydro in this area is totally dependent on requests by the road authority. As a result of road works, London Hydro is required to relocate significant overhead and underground distribution plant as per regulatory obligations under the Public Service Works on Highway Act (R.S.O. 1990 CHAPTER P.49). London Hydro can recover a portion of the labour and equipment expense involved in this work pursuant to the previously mentioned Act.

Capital spending in this area is higher than the previous years because the City of London has scheduled a higher than average number of renewal and major road widening projects for 2012 and 2013. These large projects are a result of the City of London's attempt to aggressively pursue and respond to new development. The projects completed during 2012 as identified by the City of London were in fact large in

scope and spending. Please refer to the Detailed Project Description Sheets for projects 12D1 and 13D1, within the Asset Management Plan submitted as Appendix 2B of Exhibit 2, for the list of projects.

- b) The City of London is aggressively pursuing major planning initiatives. As such, London Hydro believes that it is prudent to include these cost estimates beyond 2013, and has therefore made allowance for the potential for continued road redevelopments in the 2014 and 2015 capital spending forecasts.

### **OEB #6**

*Reference: Exh 2 / p. 72*

*Based on the Table in the reference, the estimated annual capital spending on overhead line works in 2013 is about \$5.4 million which is 49% higher than 2012 and significantly higher than previous years.*

- a) *Please explain why capital spending on overhead line works in 2013 is significantly higher than 2012 and previous years.*
- b) *What is London Hydro's outlook for overhead line works capital spending in 2014? Please explain.*

### **Response OEB #6**

- a) Capital spending in this area forecasted for 2013 is higher than previous years because London Hydro is reallocating its overhead line work efforts to address the requirements outlined in the Detail Project Description Sheet for Project 13G5, within the Asset Management Plan submitted as Appendix 2B of Exhibit 2. The proposed 2013 Test Year budget for Zone A rebuild replaces depreciated infrastructure, meeting the criteria outlined in the Asset Sustainment Plan, 2012 - 2026 Report.

The increased scope and spending outlined in project 13G5 of the Asset Management Plan is partially offset by the decreased scope in other capital budget sections. For example, the budget for 2013 for Rebuild of Fully Depreciated Overhead Areas was reduced to accommodate the larger scope of the 4.16kV program.

In general, London Hydro can only dispatch a fixed amount of overhead resources to install or maintain overhead assets in any given period due to logistical and practical implications. As a result, capital spending will vary among the parts of the budget that require overhead resources based on the needs of the system.

Practical and logistical items must be taken into consideration when developing budgets. For example, in any given year, if considerable overhead work is also being budgeted in Main Feeders or in City and Developer budgets, the overhead replacement programs may need to be reduced to accommodate resources in this area.

As a whole, the spending for 2007 and 2008 for Overhead Line Works was considerably less than the years to follow. The spending for this area was offset with spending in Main Feeders and City and Developer Works. In these two years, there was significant investment in new feeder builds in conjunction with the Hydro One upgrade of the Talbot Transformer Station to support additional capacity and increasing operating flexibility. Several new feeders were also built in the east end of the City to support new load growth.

- b) London Hydro's outlook for overhead line works capital spending in 2014 is similar to that in 2013. In 2014, London Hydro will complete the final year of the three year rebuild program for Zone 'A' as outlined in the Detail Project Description Sheet for Project 13G5 within the Asset Management Plan submitted as Appendix 2B of Exhibit 2. The 4.16kV plan identified three zones that were the highest priority within the initial 10 years of the 25 year planning horizon. Work will continue on the other priority zones following the completion of Zone A. The increased expenditure in this area will continue to be partially offset by reducing spending in other areas of the capital budget.

### **OEB #7**

*Reference: Exh 2 / p. 99*

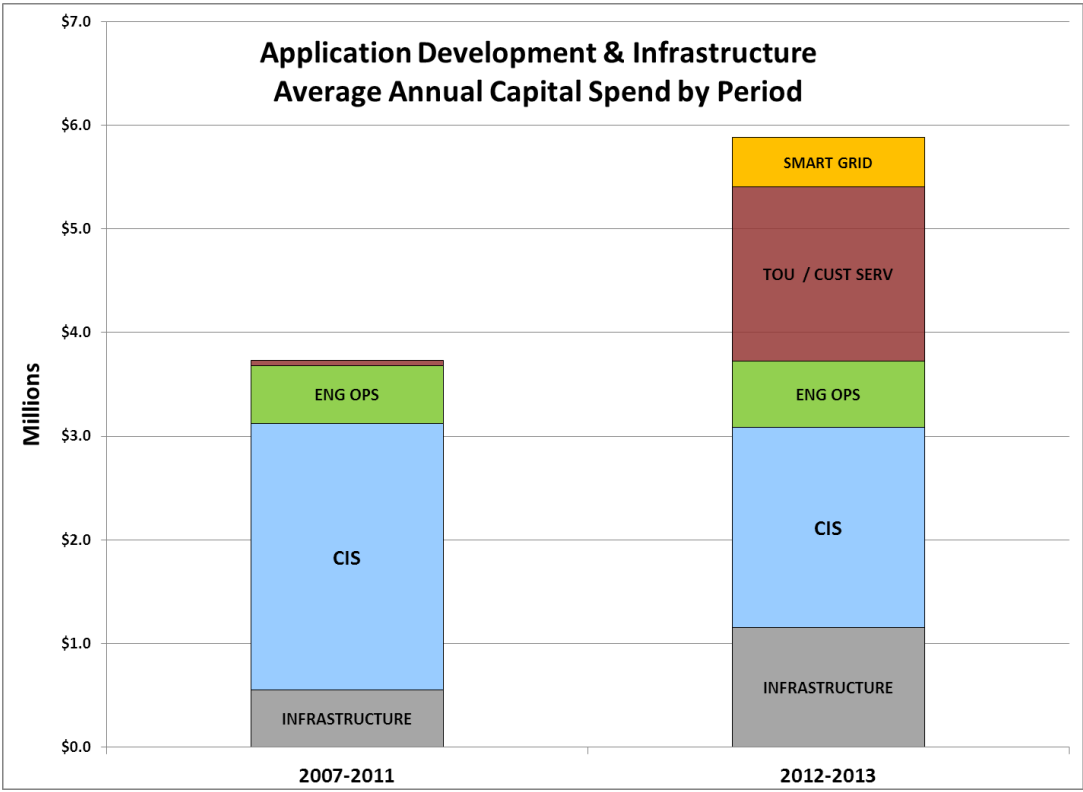
*Based on the table in the reference, the annual capital spending on information systems averaged about \$3.7 million per year for the period 2007-2011 and this amount increases to about \$5.9 million per year for the period 2011-2013, an increase of almost 60%.*

*The largest component of expected capital spending in information systems in 2013 is Application Development with an expected expenditure of about \$4.8 million in 2013.*

- a) *Please explain the significant increase (about 59% higher) in capital spending on information systems in 2012 and 2013 compared to prior years.*
- b) *Please provide a breakdown of the 2009 - 2013 capital spending on information systems according to labour, material and overheads.*
- c) *Are the higher Application Development costs of 2012 and 2013 expected to continue in 2014 and beyond? Please explain.*

**Response OEB #7**

a) The chart below has been provided as an aide to understanding the trend of increasing expenditures in the Application Development and Infrastructure areas by grouping the various Information System projects into 5 major categories. The bullets following this chart discuss each of these major categories to further augment the understanding of the increase in average capital spending from that in 2007 to 2011 in comparison to 2012 and 2013.



**Infrastructure**

- Growth in data and new systems in all business areas requires a larger, more complex asset base (hardware, software, security) which needs to be sustained and upgraded as required. An illustration of the growth in data is provided in Exhibit 2, page 107 and 108, Figures 0-6 and 0-7. As an example, there have been and will continue to be investments in servers and storage, data security / backup solutions and network development



### **Customer Information System (CIS)**

- Although lower, post-implementation costs are required to stay current with high availability and reliability (e.g. applying support / enhancement packs to address break-fix and functionality gaps to stay within vendor supported versions)

### **Engineering and Operations**

- Continued enhancements / upgrades to the Geographic Information System (GIS) to provide more informative and accurate on-line maps
- Increased capability and tools to allow Operations to reduce customer restoration times and provide better communications with internal / external stakeholders during outages

### **TOU/Customer Service**

- Post Smart Meter implementation to sustain Time of Use (TOU) including upgrading MDMR interfaces, compliance with Measurement Canada regulations and end-to-end integration testing from meter to case for 24 hour interval data instead of monthly register read
- Deploy customer engagement solutions such as TOU web presentments to help customers shift demand and reduce consumption
- Enhance customer communication and interaction during planned and unplanned outages (e.g. avoid busy signal on phone lines during snow storm)

### **Smart Grid Platform**

- Initial investment to allow field staff to access near real-time information based on smart devices to reduce outage windows by improving productivity and enhancing safety
- Implement Smart Meter analytics to promote conservation and leverage the Smart Meters investment such as alarm management and pro-active reliability analysis

A listing of the projects included in each major category has been provided below for your reference.

<b>INFORMATION SYSTEMS AVERAGE ANNUAL SPENDING BY MAJOR PROJECT CATEGORY</b>				
	<b>2007-2011 Actuals Average</b>	2012 Bridge	2013 Test	<b>2012 Bridge and 2013 Test Average</b>
<b><u>Smart Grid Platform</u></b>				
Mobile Workforce Management (MWFM)	-	-	450,000	225,000
Business Intelligence / Reporting	-	-	500,000	250,000
	-	-	950,000	475,000
<b><u>Time of Use (TOU) / Customer Service</u></b>				
MDUS / ODS (Operational Data Storage)	-	370,000	-	185,000
MDMR Interface	-	248,000	-	124,000
Measurement Canada Modifications	-	250,000	-	125,000
Customer Engagement / Self Service	30,717	500,000	500,000	500,000
IVR System Enhancement and Upgrade	19,022	-	-	-
Outage Management System (OMS)	-	-	1,500,000	750,000
	49,739	1,368,000	2,000,000	1,684,000
<b><u>Engineering and Operations</u></b>				
Geographic Information System (GIS)	438,682	480,000	-	240,000
Other (accounting, payroll, doc management)	25,033	-	-	-
Outage Management System (OMS foundation)	90,481	800,000	-	400,000
	554,195	1,280,000	-	640,000
<b><u>Customer Information System (CIS)</u></b>				
Customer Information System (CIS)	2,410,494	840,000	835,000	837,500
CIS EBT Optimization	123,701	580,000	-	290,000
CIS Regulatory Requirements	42,208	600,000	480,000	540,000
CIS Customer Relations Management Upgrade	-	-	525,000	262,500
	2,576,403	2,020,000	1,840,000	1,930,000
<b><u>Infrastructure</u></b>				
Hardware and Software	547,701	1,100,000	1,210,000	1,155,000
	<b>3,728,039</b>	<b>5,768,000</b>	<b>6,000,000</b>	<b>5,884,000</b>

b) A breakdown of capital spending for 2009 actuals to the 2013 Test Year has been provided below as requested, along with the internal versus external resource mix:

Category	2009		2010		2011		2012		2013	
	Actual		Actual		Actual		Bridge Year		Test Year	
External labour	2,637,574	80%	2,533,158	89%	2,432,717	82%	3,171,000	69%	2,787,000	61%
Internal labour	374,216		182,771		326,003		884,000		1,101,000	
Benefit overhead	270,780		115,400		205,619		563,000		702,000	
	<u>644,996</u>	20%	<u>298,171</u>	11%	<u>531,622</u>	18%	<u>1,447,000</u>	31%	<u>1,803,000</u>	39%
Total labour	3,282,570	100%	2,831,329	100%	2,964,339	100%	4,618,000	100%	4,590,000	100%
Acquisitions	<u>320,382</u>		<u>553,826</u>		<u>946,412</u>		<u>1,150,000</u>		<u>1,410,000</u>	
	<u><u>3,602,952</u></u>		<u><u>3,385,155</u></u>		<u><u>3,910,751</u></u>		<u><u>5,768,000</u></u>		<u><u>6,000,000</u></u>	

c) London Hydro's outlook for Information Systems capital spending for 2014 and beyond is similar to that in 2013. The anticipated costs in technology investments for 2014 and beyond are expected to continue in order to sustain and evolve London Hydro's systems and networks to accommodate growing customer demand, increasing need for Cyber Security and to be ready for Smart Grid advancements.

**OEB #8**

Reference: Appendix 2G – Green Energy Act Plan / p. 4

Table 1 in the above-noted Reference indicates that there are a total of 104 outstanding Micro-generation projects (<10kW) with a total capacity of 891 kW. Board staff wishes to get additional information on the status and expected connection dates for these generators.

- a) For the outstanding Micro-generation projects please indicate:
  - i. number and total kW of those already connected;
  - ii. number and total kW of those that have received an offer to connect;
  - iii. number and total kW of those that have not yet been approved.
- b) For the projects in categories (ii) and (iii) above, please indicate:
  - i. number and total kW of projects expected to be connected in 2012;
  - ii. number and total kW of projects expected to be connected in 2013;
  - iii. number and total kW of projects expected to be connected beyond 2013.

**Response OEB #8**

Table 1 of Appendix 2G – [Green Energy Act Plan on page 4] lists the number of outstanding microFIT 1.0 applications submitted to the OPA for London Hydro’s territory as of end of June 2012 - the time the GEA plan was originally submitted. Since July 2012 the OPA has re-opened the microFIT program under version 2.0. The new rules allow previous participants to re-apply within a transition window after which all version 1.0 projects without a contract will be terminated. The OPA continues to terminate microFIT 1.0 contracts as their time limits expire. The status of Micro-generation as of December 18, 2012 is listed in the table below:

Status	Number	kW total
(a)(i) Connected (OPA status - contract accepted)	10	90kW
(a)(ii) Offer to Connect (OPA status – LDC has issued Offer to Connect)	7	62kW
(a)(iii) Submitted (OPA status – submitted)	10	94kW
(b)(i) Future connections 2012 (OPA status – LDC has issued Offer to Connect)	7	62kW
(b)(ii) Predicted future connections 2013*	30	260kW
(b)(iii) Predicted future connections beyond 2013*	30+/year	260kW+

\*these numbers are assuming that the OPA’s province wide procurement limit of 50MW has not been reached

**OEB #9**

*Reference: Appendix 2G – Green Energy Act Plan / p. 4*

*Table 2 of the above-noted reference provides information regarding small, mid-sized and large distributed generation projects. Board staff wishes to get additional information on the status and expected connection dates for these generators.*

- a) *Please provide a list of projects listed in Table 2 that are not already in service.*
- b) *For each of these projects please provide the total kW and expected connection date.*

**Response OEB #9**

Please see Appendix A for a listing of projects that are not already in service as of December 14, 2012. The list included in the Appendix contains all of the requests for connection information. During the first round of FIT 1.0, 18 projects were released by the OPA. Of these, 10 have been connected and three have not approached the LDC as of yet. The table below lists the remaining 5 outstanding projects and their expected connection date and kW size.

Location	Expected In-Service Date	kW size
1020 Wonderland Rd S	Early 2013	150kW
665 Adelaide St N	Early 2013	150kW
25 Cuddy Blvd	Early 2013	200kW
15825 Robin's Hill Rd	Early 2013	100kW
15790 Robin's Hill Rd	Early 2013	250kW

**OEB #10**

*Reference: Appendix 2G – Green Energy Act Plan / pp. 6-7*

*Under Section 3.1 - Operating Flexibility, it is stated that “Currently, the main restriction to re-configuring the system when it involves generation is the inability to move generation onto a different TS due to short circuit capability at Hydro One owned transformer stations. Protection modification and studies would also be required to move the generator. Correcting this situation has the potential to cost millions of dollars.”*

*Please describe what action London Hydro has taken and/or plans to take and expected timeframe and costs to address the above-noted restriction.*

### **Response OEB #10**

An impediment to moving generation is the short circuit capabilities at the Hydro One transformer stations. These transformer stations are owned by Hydro One and as such are not within London Hydro's rate base. Therefore any such work to mitigate the short circuit restrictions at existing transformer stations lies with Hydro One, the transmitter. London Hydro has lobbied Hydro One to upgrade fault current capability of its 27.6kV stations. The lobbying efforts have had some success as Hydro One has completed an upgrade to the Clarke transformer station. As a result, the short-circuit constraint has been removed and for the present, renewable generation projects can be connected to feeders supplied from Clarke TS. London Hydro continues to lobby Hydro One to upgrade other constrained transformer stations so that all Londoners are able to take advantage of the benefit of green energy.

If London Hydro is unable to convince Hydro One to upgrade constrained transformer stations, London Hydro might have to seek to build a future Smart Grid enabled, renewable generation connection capable, 27.6kV transformer station that, in addition to supporting existing and new load, would significantly extend the areas within London to accept new generation. If London Hydro were to seek the building of a new 27.6kV transformer station London Hydro would first seek the required approval by the OEB.

To clarify, London Hydro has not made any requests in its 2013 Cost of Service rate application for any application or funding for the suggested transformer station.

### **OEB #11**

*Reference: Appendix 2G – Green Energy Act Plan / p. 7*

*Under Section 3.2 - Protection Equipment, it is stated that "As the amount of connected generation on a feeder increases beyond 50% of the feeder minimum load, additional protection equipment is required."*

*Please describe what action London Hydro has taken and/or plans to take and expected timeframe and costs to address the above-noted issue of additional protection equipment needed due to increasing connected generation.*

### **Response OEB #11**

The installation of additional protection equipment is not triggered until there is an actual project that would put the amount of generation over the 50% limit. This work involves modifications to the protection relays that are owned by Hydro One. These relays are located in Hydro One's transformer stations. The cost of the modification to the transmitter owned asset is borne by the generator. London Hydro has worked with Hydro One and a 2.8MW generator in 2011 to implement modifications at Buchanan TS. There were no cost implications to London Hydro.

### **OEB #12**

*Reference: Appendix 2G – Green Energy Act Plan / p. 7*

*Section 3.3 describes some overcurrent protection considerations including the need to differentiate between reverse current flow and normal current flow in systems with distributed generation and the desensitizing of transformer station relays due to multiple current sources.*

*Please describe what action London Hydro has taken and/or plans to take and expected timeframe and costs to address the above-noted issues associated with overcurrent protection.*

### **Response OEB #12**

Again, similar to the response in item # 11 above, no action is taken until there is an actual need to replace the relays at the Hydro One owned transformer stations due to the amount of reverse current as a result of distributed generation. The cost of the modification to the transmitter owned asset would be incurred solely by the generator.

**OEB #13**

*Reference: Appendix 2G – Green Energy Act Plan / pp. 7-8*

*Sections 3.3 and 3.4 deal with Fault Location techniques and Worker Protection. It is indicated that fault location would become more difficult with multiple sources feeding into a fault. Also worker protection becomes more challenging since it is necessary to ensure that all potential sources are isolated before crews can work on a particular section of line.*

*Please describe what action London Hydro has taken and/or plans to take and expected timeframe and costs to address the above-noted issues associated distributed generation.*

**Response OEB #13**

At this point the LDC is not aware of any practical solution to the generators providing backflow current through the LDC's fault circuit indicators. No additional action or cost is foreseen within the horizon of the GEA plan.

Each generator that is located within a crew's work zone will be visibly isolated for the protection of London Hydro's workers. Isolation costs will vary depending on the number of generators within the work zone; again no significant capital costs are foreseen.

**OEB #14**

*Reference: Appendix 2G – Green Energy Act Plan / pp. 9-10*

*Section 4.3.2 states that there are four transformer station buses that cannot accept any generation due to short circuit capacity. It is also stated that there are two feeders that have restrictions due to the amount of existing generation on a single feeder.*

*Please describe what action London Hydro has taken and/or plans to take, and the expected timeframe and costs, to address restrictions due to:*

- (i) station short circuit capacity, and*
- (ii) existing generation on feeders.*



#### **Response OEB #14**

As stated earlier in item #10 the solution rests with the transmitter since London Hydro does not own those assets. London Hydro has lobbied Hydro One to have these stations upgraded. As mentioned, the efforts have resulted in the upgrade of one transformer station (not one of the four mentioned).

The two feeders in question have reached their capacity and therefore any additional generation requiring connection in these areas would require construction of additional feeder infrastructure.

#### **OEB #15**

*Reference: Appendix 2G – Green Energy Act Plan / p. 10*

*Section 4.3.4 describes London Hydro's downtown network of 94 network transformers fed by 5 separate primary feeders with special protection requirements to ensure safety and reliability that can restrict the amount of generation in order to avoid reverse current flow in a transformer(s).*

*Please describe what action London Hydro has taken and/or plans to take and expected timeframe and costs to address generation restrictions and special protection requirements described above.*

#### **Response OEB #15**

At such time as London Hydro receives an application for the installation of renewable generation in the downtown area, it will perform a Connection Impact Assessment (CIA) on a generation application to determine its impact on the network. To date (and into the foreseeable future) there have been no significant requests that have materialized into a CIA and/or necessitated a review of the configuration of the network system. As mentioned above, if in the future London Hydro did apply and obtained Board approval for a new 27.6kV transformer

station supplying downtown core, circuits from this transformer station will help mitigate this restriction.

**OEB #16**

*Reference: Appendix 2G – Green Energy Act Plan / pp. 10-11*

*Section 5.2 states that “London Hydro does not foresee any required expenditures over the next five years to accommodate renewable generation unless a project comes forward that requires an expansion or voltage upgrade.”*

- a) Please explain/clarify the above statement in light of the issues, restrictions etc. described in the section entitled “Challenges Associated Incorporating Distributed Generation in Urban Utility” and the preambles to Interrogatories #10-15 above.*
- b) Can the issues/restrictions identified be resolved without expenditure for the estimated number of generators and total MW (45 new projects with a total of over 8MW) over the next five years? Please explain.*

**Response OEB #16**

- a) London Hydro anticipates that all future generation connections can be accommodated through system expansion and voltage upgrades if the Hydro One transformer station can accept generation as stated in previous answers.
- b) Each new generation connection requires a Connection Impact Assessment (CIA), at that time any voltage upgrades or system expansions will be assessed.

## Energy Probe Research Foundation (EP) Interrogatories

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### **EP #1**

Ref: Exhibit 2, Page 56

*The evidence states that silicone injection of polymeric cables is expected to extend service life up an additional 40 years.*

- a) *Does London Hydro use the low or high pressure silicone injection method? Please comment on the applicability of each method.*
- b) *How has London Hydro coped with injecting cables with splices in them?*
- c) *Are the cables injected part of a padmounted transformer system or a submersible transformer system? If the latter, does the injection process require the cable to be de-energized during injection?*
- d) *What is the average time a customer must be out of service for the cable injection process?*
- e) *How much does the cable injection cost on a per meter basis? Please include both contractor costs and London Hydro costs for job supervision, switching and isolation etc.*
- f) *How does this cost compare to the cost of replacing the cable by the directional boring method mentioned on lines 6-7.*
- g) *Please provide additional information on the life extension estimate of up to 40 years. Is this estimate based on actual results or on laboratory testing?*

### **Response EP #1**

- a) Both the low and high pressure methods of silicone injection are acceptable to London Hydro. London Hydro has awarded its contract for silicone injection to the lowest cost compliant bidder through a public tendering process.

- b) Splices that won't allow the silicone to flow can be excavated and replaced. If there are too many splices in a section of cable, it is sometimes more economical to simply replace the cable.
- c) London Hydro's cables are all part of a padmounted system.
- d) The outage time varies. At times, where London Hydro has switchable transformers, no outage is required at all. At other times the outage can be up to an hour to accommodate switching for isolation. In some subdivisions, London Hydro's project also requires transformers to be changed out from 2.4 to 16 kV and this can result in an outage time from 2 to 6 hours in length. This outage is unrelated to the requirements for silicone injection but during the outage for the transformer, the silicone injection work would be conducted in parallel.
- e) The cost for silicone injection varies depending on the size of cable but for the most common 1/0 cable size the cost for injection is approx. \$16 per meter. The 'all-in' cost including switching and supervision is approx. \$25 to \$35 per meter, depending on the vintage of the subdivision and the switching capabilities of the transformers and switching enclosures, the number of transformers per km, the number of risers, etc.
- f) London Hydro's experience is that the cost of replacing cables is in the order of \$75 to \$90 per meter and up to \$110 per meter for difficult rear yard installations.
- g) It is our understanding that the 40 year life extension projection is based on laboratory testing. However, there is a 40 year warranty on the process. If a cable section fails in year 39, the vendor refunds the entire original injection cost for that section of cable.

## EP #2

Ref: *Exhibit 2, Pages 56-57 &*

*Exhibit 2 Appendix 2C Asset Sustainment Plan*

*Line 18 on page 56 mentions replacing "depreciated switching enclosures" and line 3 on page 57 mentions replacing "fully depreciated or defective transformers and switchgear replacements, vault transformer replacements and secondary pedestal replacements." The Asset Sustainment Plan also contains a program entitled "Fully Depreciated Overhead Lines – Sustainment Plan" on page 59 of Appendix C.*

- a) *Does London Hydro replace equipment just because it is fully depreciated?*

- b) *Has London correlated end of depreciable life with end of useful life? If yes, please provide the appropriate evidence.*

**Response EP #2**

- a) London Hydro does not replace equipment just because it is fully depreciated. London Hydro optimizes the life cycle value of its physical assets in order to ensure safe and reliable service to London Hydro's customers at the lowest overall cost. The process for determining when to replace assets is generally described in the first section "Background and Discussion" of the Asset Sustainment Plan and details on when particular assets are planned to be replaced are provided in the following sections for each asset.
- b) We are not completely sure we understand this question but believe the answer can be found in the Asset Sustainment Plan on page 17 in the section entitled "Applying the ASP in Practice". This section describes the need to recognize the difference between the average life expectancies discussed in the plan and the average age of assets that are removed from service; although there is a correlation between the two, they are not the same.

**EP #3**

Ref: *Exhibit 2, Page 59*

*Lines 4-5 state that some 27.6 kV feeders have carried "close to 30MW which exceeded the design loading limit under good utility practices".*

- a) *Please describe the design loading limit referred to.*
- b) *Please describe the circumstances under which a 27.6 kV feeder was required to carry 30 MW and the duration of that loading i.e. Were these situations in which the feeder was picking up load from another feeder that had been forced out of service or were these situations normal feeder loading under peak load conditions?*

### **Response EP #3**

- a) Standard 27.6 kV 1000 MCM XLPE cable used on London Hydro ducted 27.6 kV circuits and station egresses is generally limited to operation below 600A which is nominally 29MVA for a 3 phase 27.6 kV circuit. System configuration, operational requirements, protection settings, and other components on the system are also considered.
- b) The heavy loading of some feeders occurred during summer peak conditions under normal feeder loading. As stated in Exhibit 2 page 59, this loading occurred at the beginning of the feeder reinforcement program in 2005 and occurred before Talbot TS #2 was brought on-line in 2007, adding eight new breaker positions and hence eight new feeders.

### **EP #4**

*Ref: Exhibit 2, Page 63*

*Table 2-23 shows London Hydro relocations required by the City of London for road works.*

- a) *Estimated expenditure for 2012 is shown as \$1,186,000. Is this net of recoverable amounts? If not please provide the recoverable amount. Also please provide the actual expenditure in 2012.*
- b) *Estimated expenditure in 2013 is \$825,000. Is this net of the recoverable amount? If not, please provide the recoverable amounts.*
- c) *Does London Hydro have purchase orders for all of the projects covered by this amount? If not, what percentage of the total does London Hydro have purchase orders for?*

### **Response EP #4**

- a) London Hydro confirms that the amount displayed in Table 2-23 for 2012 City of London road works of \$1,186,000 is net of recoveries. The actual capital spending for 2012 is \$1,464,818, which is net of recoveries as well.

- b) London Hydro confirms that the amount displayed in Table 2-23 for 2013 City of London road works of \$825,000 is net of recoveries.
- c) London Hydro does not have purchase orders for all of the projects covered by this amount due to the fact that the road authority has not fully defined the scope of the work at the time that the budget was prepared. The methodology for estimating the expenditures is provided on pages 63 and 64 of Exhibit 2. London Hydro must comply with the road authority's requests under the Public Service works on Highways Act. London Hydro does obtain a purchase order for each project from the road authority in advance of initiating work on the project. London Hydro presently has purchase orders totally approximately \$340,000 to date for 2013 which represents the value of work defined to date for 2013. The remaining projects have not been fully defined by the road authority yet.

**EP #5**

*Ref: Exhibit 2, Page 64*

*Table 2-24 shows developer works capital spending.*

- a) *Estimated expenditure for 2012 is shown as \$4,818,000. Please provide that actual expenditure for 2012.*
- b) *Estimated expenditure for 2013 is shown as \$4,828,000. How much of this is carryover from 2012? Does London Hydro have agreements in place with the developers for all of the 2013 estimated work?*

**Response EP #5**

- a) Actual capital spending on Developer Works for 2012 was \$4,892,518 as displayed in updated Table 2-16 under Appendix 2G.
- b) The amount of work-in-progress forecasted for December 31, 2012 for Developer Works was \$1,614,689 as illustrated in Exhibit 2 on page 46 in Table 2-18. Actual 2012 work-in-progress for this project category was \$580,158.

Developers typically contact London Hydro throughout the year to request servicing. As a result, London Hydro is constantly receiving new requests for servicing (January to December). Prior to initiating the installation process for a new service, London Hydro issues an offer letter to the customer and secures payment based on this offer. This process forms the agreement between London Hydro and the customer. London Hydro does not have agreements in place with all the developers for all the 2013 estimated work due to the fact that the developers have not yet contacted London Hydro.

**EP #6**

*Ref: Exhibit 2, Page 84, Lines 26-28*

*Please explain how the decision to reduce vehicle leasing mentioned on lines 26-28 of the exhibit was arrived at. What types of vehicles were leased?*

**Response EP #6**

London Hydro leased a sample group of vehicles and equipment on a trial basis to determine the viability and life-cycle costs of leasing vehicles and equipment as compared to ownership. The sample included 17 units consisting of 9 vans, 6 pickups, 1 SUV and 1 brush chipper for a term of 3 to 4 years.

When London Hydro adds a vehicle to its fleet, there are numerous make-ready costs required such as transferring of mounted equipment and the installation of cabinets, roof ladder racks, emergency lighting and so forth. Since vehicles are leased for a traditional period of 4 years and ownership is usually greater than 8 years, it was found that additional make-ready costs outweighed the reduced maintenance costs on newer chassis.

Other factors which lead to move back to ownership versus leasing included receiving the benefit of manufacturer/dealer incentives which are not usually reflected in leasing rates, as well as flexibility in decision making with respect to whether to defer the replacement of a given vehicle.



## London Property Management Association (LPMA) Interrogatories

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### **LPMA #4**

*Ref: Exhibit 2, pages 2-5*

- a) *Please update Tables 2-1 through 2-4 to reflect actual capital expenditures closed to rate base in 2012. If actual data is not yet available for all of 2012, please update the noted tables to reflect the most recent year-to-date information available for 2012 along with an estimate of the remaining months in 2012.*
- b) *At page 4, lines 3-5, the evidence indicates that for 2013 the renewable generation equipment has been excluded from the rate base calculation. Please confirm that there is no renewable generation equipment included in the figures in Tables 2-1 through 2-4 in 2007 through 2012.*
- c) *Please explain what the donations shown in Table 2-5 are related to, and if they are not LEAP related, please explain why they have been included in the calculation of the working capital allowance.*

### **Response LPMA #4**

- a) Please refer to Appendix 2A through to 2D for updated Tables 2-1 through to 2-4 as requested. Please note that due to the concurrent timing of both London Hydro's year-end process and the filing of these interrogatory responses, the 2012 actual results are preliminary pending final management's review and the completion of the year-end external audit. Also, as discussed in LPMA #42, London Hydro made the decision, to adopt the MIFRS amortization rates and overhead burdens for external financial reporting purposes effective January 1, 2012 and, accordingly, MIFRS depreciation and overhead burdens are reported in the 2012 actual results.
- b) London Hydro confirms that Tables 2-1 through 2-4 exclude renewable generation equipment, including those amounts listed for 2007 to 2012.
- c) London Hydro confirms that the donations listed in Table 2-5 are related to LEAP. Please refer to Exhibit 4 starting at page 32 for further details.

**LPMA #5**

*Ref: Exhibit 2, page 10*

*Please provide an updated version of Tab 2-8 that includes actual data for 2012. If actual data is not yet available for all of 2012, please update the table to reflect the most recent year-to-date information available for 2012 along with an estimate of the remaining months in 2012.*

**Response LPMA #5**

Please refer to Appendix 2E for updated Tables 2-8 as requested. Please note that due to the concurrent timing of both London Hydro's year-end process and the filing of these interrogatory responses, the 2012 actual results are preliminary pending final management's review and the completion of the year-end external audit. Also, as discussed in LPMA #42, London Hydro made the decision, to adopt the MIFRS amortization rates and overhead burdens for external financial reporting purposes effective January 1, 2012 and, accordingly, MIFRS depreciation and overhead burdens are reported in the 2012 actual results.

**LPMA #6**

*Ref: Exhibit 2, page 14*

*The table on the bottom of page 14 grosses up actual capital additions, at historical cost, by the Consumer Price Index ("CPI").*

- a) Please explain why the CPI was used rather than the Gross Domestic Product Implicit Price Index Final Domestic Demand ("GDPIPIFDD"). Please confirm that the GDPIPIFDD has been used by the OEB for incentive regulation.*
- b) Please provide a version of the table at the top of page 14 based on the GDPIPIFDD measure of inflation.*
- c) Were the actual capital additions shown in the table on the bottom of page 14 adjusted to reflect that some years included the provincial sales tax in the actual capital addition costs? If not, please adjust the table to reflect the removal of the provincial sales tax from those years in which it was paid and included in the capital cost.*

**Response LPMA #6**

- a) London Hydro used Ontario CPI to display the impact of inflation on capital spending since it perceived this measure to be more provincial and industry-specific and, therefore, more appropriate for estimating the effects of inflation on goods and services used by the Ontario electricity distribution sector.

London Hydro confirms that the GDPIIFDD has been used by the OEB for incentive regulation.

- b) As requested, the table at the top of page 14 of Exhibit 2 has been revised to use GDPIIFDD, rather than Ontario CPI, to illustrate the cumulative impact of inflation as follows:

<b>GDPIIFDD (cumulative)</b>			
<u>Year</u>	<u>Rate</u>	<u>2007-2013</u>	<u>2009-2013</u>
2008	2.4%	2.4%	
2009	1.4%	3.8%	
2010	1.2%	5.1%	1.2%
2011	2.1%	7.3%	3.4%
2012 (est)	1.7%	9.1%	5.1%
2013 (est)	1.7%	11.0%	6.9%

- c) As requested, the table at the bottom of page 14 of Exhibit 2 has been revised to remove the estimated PST component of capital additions during 2007 to June of 2010 as follows:

<u>Average Additions 2007 to 2013</u> <i>(in thousands)</i>	2007 <u>Actual</u>	2008 <u>Actual</u>	2009 <u>Actual</u>	2010 <u>Actual</u>	2011 <u>Actual</u>	2012 <u>Bridge</u>	2013 <u>Test</u>	7 year <u>Average</u>
Capital additions, at historical cost	17,971	22,563	24,762	19,244	25,688	27,244	26,758	
Add inflation (CPI)	12.6%	10.1%	9.6%	7.0%	3.7%	2.0%	0.0%	
	<u>20,235</u>	<u>24,833</u>	<u>27,140</u>	<u>20,591</u>	<u>26,638</u>	<u>27,789</u>	<u>26,758</u>	<b>24,855</b>

**LPMA #7**

*Ref: Exhibit 2, pages 18-19*

- a) *Please update Table 2-10 to reflect actual capital expenditures and capital additions closed to rate base in 2012. If actual data is not yet available for all of 2012, please update the noted tables to reflect the most recent year-to-date information available for 2012 along with an estimate of the remaining months in 2012.*
- b) *Please explain the difference between Cost Recoveries and Capital Contributions shown in Table 2-11.*

**Response LPMA #7**

- a) Please refer to Appendix 2F for updated Tables 2-10 as requested. Please note that due to the concurrent timing of both London Hydro's year-end process and the filing of these interrogatory responses, the 2012 actual results are preliminary pending final management's review and the completion of the year-end external audit. Also, as discussed in LPMA #42, London Hydro made the decision, to adopt the MIFRS amortization rates and overhead burdens for external financial reporting purposes effective January 1, 2012 and, accordingly, MIFRS depreciation and overhead burdens are reported in the 2012 actual results.
- b) Cost recoveries relate to the recovery of costs incurred during the construction of a project that are not the responsibility of London Hydro and are therefore recouped. An example of this is where there is cost sharing for trench building between London Hydro, Bell Canada and Union Gas. Recoveries from these third parties are captured under Cost Recoveries.

Capital Contributions represent monies received from customers towards the cost of construction of capital assets owned by London Hydro. For example, where an expansion has been installed at the request of a customer and the construction costs exceed the estimated net present value of revenues from the asset.

**LPMA #8**

*Ref: Exhibit 2, page 47*

- a) In Table 2-19 please identify which of the line items the capital contributions are related to. If of assistance, please use the line items shown in Tables 2-23 and/or 2-24.*
- b) Based on the response to part (a) above, please provide a table that shows the percentage of capital contributions relative to the gross expenditures in the line items that attract capital contributions for each of the years shown. Please include actual data for 2012. If actual data is not yet available for all of 2012, please update the table to reflect the most recent year-to-date information available for 2012 along with an estimate of the remaining months in 2012.*
- c) Please explain any significant changes in the ratios calculated in part (b) above between 2013 and the previous years.*

**Response LPMA #8**

- a) The line items that capital contributions are related to in Tables 2-19 are listed under the Demand section and labeled 'D – City works projects' and 'E – Developer works projects'. Further details regarding these lines items are provided in Tables 2-23 and 2-24.

b) Capital contributions as a percentage of gross capital additions to fixed assets as a result of demand projects is provided in the table below:

Gross Demand Capital Additions in comparison to Contributions								
	2007	2008	2009	2009	2010	2011	2012	2013
	Actuals	Actuals	Actuals	Budget	Actuals	Actuals	Actuals	Test
<b>Amounts</b>								
D City works projects	958,307	468,958	189,898	459,000	590,782	340,367	551,051	1,738,767
E Developer works projects	5,798,299	5,914,622	6,640,852	7,324,000	6,370,619	6,604,004	5,927,049	3,793,469
Gross Capital Additions	6,756,606	6,383,580	6,830,750	7,783,000	6,961,401	6,944,371	6,478,100	5,532,236
Capital Contributions	(3,325,389)	(3,478,094)	(3,695,508)	(3,202,900)	(2,695,120)	(4,218,741)	(3,780,997)	(1,832,000)
Net Capital Additions	3,431,217	2,905,486	3,135,242	4,580,100	4,266,281	2,725,630	2,697,103	3,700,236
<b>Percentages</b>								
D City works projects	14%	7%	3%	6%	8%	5%	9%	31%
E Developer works projects	86%	93%	97%	94%	92%	95%	91%	69%
Gross Capital Additions	100%	100%	100%	100%	100%	100%	100%	100%
Capital Contributions	-49%	-54%	-54%	-41%	-39%	-61%	-58%	-33%
Net Capital Additions	51%	46%	46%	59%	61%	39%	42%	67%

c) Capital contributions have deviated from historical years as a result of change in the Distribution System Code effective January 2007, and fluctuate from year to year dependent upon the type of project to which the capital asset addition relates.

The Distribution System Code was amended in January 2007 so that final economic evaluations are carried out once the facilities are energized as noted in section 3.2.2. Prior to that date, required contributions were reviewed annually and could be held as deposits until the end of their connection horizon for up to five years. This amendment has resulted in a change in the timing of reclassifying funds from capital deposits towards capital contributions and an inconsistency when comparing activities between 2007 and 2013.

The type of project being capitalized drives the value of capital contributions netted against the cost of construction as well. Capital contributions are for the most part dictated by the amount of load to be consumed as a result of the installation. Specifically, where future consumption is high, capital contribution requirements are lower and conversely, where future consumption is low, capital contribution requirements are higher.

**LPMA #9**

Ref: Exhibit 2, Appendix 2J

- a) Please show how the weighted average payment processing lag of 1.40 days was determined based on the four payment processing methods described on page 6. In particular, please show the percentages of the payments made using each of the methods noted.
- b) Please provide the data and show the calculation of the collection lag of 30.29 days using the 2010 data.
- c) Has London Hydro made any changes since 2010 that would have impacted on the collection of accounts from customers? If yes, please explain.
- d) As shown in Exhibit 3, Table 3-1, London Hydro received approximately 94.3% of its service revenue in 2010 from distribution revenue with the remaining 5.7% received from other distribution revenue such as late payment charges and specific service charges. Have these other distribution revenues been included in the calculation of the retail revenue lag shown on page 5? If not, why not and what is the revenue lag associated with these other distribution revenues?

**Response LPMA #9**

- a) The weighted average lead time for payment processing was calculated based on the lead times associated with the available payments methods as listed below:

	Weighting 1/ (1)	Lead Time 2/ (2)	Weighted Lead Time (3)=(1)*(2)
Electronic, Mail (Int), Site Drop	66.91%	1.51	1.01
Mail (Ext), Bank Walk-In	9.96%	2.76	0.28
PAP, Credit Card	22.74%	0.50	0.11
Cheque	0.39%	0.50	0.00
	100.00%		<b>1.40</b>

- b) The calculation of the 30.29 collection lag using 2010 data is provided in the following table:

**LPMA #9 b)**

**Calculation of Collection Lag**

Aging Intervals	Lag Time [1]
Current [2]	17
1-30 days	32
31-60 days	47
61-90 days	62
91-120 days	77
121-150 days	92
151-180 days	107
> 180 days	199

**NOTES**

[1] Lag Time based upon Mid Point method - see formulae in examples below  
 [2] Current aging interval determined to be 17 days through discussion with London Hydro  
 ex1. 1-30 days  
       32  
 ex2. 31-60 days  
       47  
 ex3. 61-90 days  
       62

	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Total
Current	\$ 25,923,606	\$ 20,515,860	\$ 16,431,865	\$ 19,593,879	\$ 16,604,648	\$ 17,696,044	\$ 18,937,754	\$ 23,274,158	\$ 22,114,145	\$ 16,266,472	\$ 17,622,192	\$ 14,313,630	\$ 229,294,256
1-30 days	\$ 3,801,592	\$ 5,216,862	\$ 5,440,778	\$ 4,171,286	\$ 3,806,972	\$ 3,123,530	\$ 3,743,501	\$ 6,494,905	\$ 3,991,488	\$ 4,575,297	\$ 2,866,828	\$ 4,109,990	\$ 51,343,029
31-60 days	\$ 1,430,742	\$ 676,387	\$ 1,096,253	\$ 791,900	\$ 774,539	\$ 878,585	\$ 816,420	\$ 548,822	\$ 1,021,795	\$ 946,677	\$ 921,599	\$ 713,717	\$ 10,617,435
61-90 days	\$ 409,693	\$ 398,796	\$ 323,150	\$ 265,366	\$ 288,627	\$ 179,658	\$ 391,229	\$ 47,722	\$ 259,296	\$ 264,058	\$ 237,237	\$ 361,690	\$ 3,426,523
91-120 days	\$ 174,825	\$ 148,198	\$ 201,042	\$ 112,564	\$ 176,335	\$ 169,859	\$ 103,071	\$ 60,543	\$ 172,969	\$ 140,578	\$ 166,006	\$ 191,219	\$ 1,817,208
121-150 days	\$ 152,781	\$ 145,418	\$ 154,491	\$ 139,172	\$ 92,189	\$ 144,274	\$ 149,070	\$ 71,590	\$ 210,613	\$ 140,412	\$ 112,577	\$ 141,850	\$ 1,654,436
151-180 days	\$ 139,902	\$ 182,108	\$ 129,857	\$ 128,493	\$ 123,865	\$ 85,930	\$ 133,444	\$ (518,131)	\$ 99,163	\$ 173,887	\$ 119,929	\$ 103,365	\$ 901,813
> 180 days	\$ 920,053	\$ 987,135	\$ 1,096,521	\$ 1,131,040	\$ 1,194,526	\$ 1,240,310	\$ 1,245,932	\$ 1,113,101	\$ 1,323,229	\$ 1,324,434	\$ 1,371,154	\$ 1,388,455	\$ 14,335,889
Total	\$ 32,953,194	\$ 28,270,764	\$ 24,873,956	\$ 26,333,700	\$ 23,061,701	\$ 23,518,191	\$ 25,520,421	\$ 31,092,711	\$ 29,192,696	\$ 23,831,815	\$ 23,417,521	\$ 21,323,917	\$ 313,390,587

PERCENT OF TOTAL	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10	Total
Current	78.67%	72.57%	66.06%	74.41%	72.00%	75.24%	74.21%	74.85%	75.75%	68.26%	75.25%	67.12%	73.17%
1-30 days	11.54%	18.45%	21.87%	15.84%	16.51%	13.28%	14.67%	20.89%	13.67%	19.20%	12.24%	19.27%	16.38%
31-60 days	4.34%	2.39%	4.41%	3.01%	3.36%	3.74%	3.20%	1.77%	3.50%	3.97%	3.94%	3.35%	3.39%
61-90 days	1.24%	1.41%	1.30%	1.01%	1.25%	0.76%	1.53%	0.15%	0.89%	1.11%	1.01%	1.70%	1.09%
91-120 days	0.53%	0.52%	0.81%	0.43%	0.76%	0.72%	0.40%	0.19%	0.59%	0.59%	0.71%	0.90%	0.58%
121-150 days	0.46%	0.51%	0.62%	0.53%	0.40%	0.61%	0.58%	0.23%	0.72%	0.59%	0.48%	0.67%	0.53%
151-180 days	0.42%	0.64%	0.52%	0.49%	0.54%	0.37%	0.52%	-1.67%	0.34%	0.73%	0.51%	0.48%	0.29%
> 180 days	2.79%	3.49%	4.41%	4.30%	5.18%	5.27%	4.88%	3.58%	4.53%	5.56%	5.86%	6.51%	4.57%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

WEIGHTED LAG TIME	26.72	28.76	31.63	29.64	31.72	31.28	30.89	26.04	29.95	33.14	32.38	34.98	30.29
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- c) Changes since 2010 as a result of amendments to the Distribution System Code include:
- extending days notice before disconnection from 2 to 10 days
  - longer term payment arrangements from 5 to 10 months
  - carryover of budget billing plan variances to the next year
- d) Other distribution revenues have not been included in the calculation of the retail revenue lag shown on page 5. Statistical data required to determine the service period, billing lag and collection lag from these varying sources of revenue would require extensive administrative time and costs.

The revenue lag associated with these revenues has been *estimated* as follows:

	<b>2010</b>	<b>Estimated</b>		<b>Weighted</b>
	<u>Actual</u>	<u>Lag Days</u>	<u>Factor</u>	<u>Lag Days</u>
Charges through customer billings	2,639,851	64.90	74%	48.26
Interest and rentals	591,350	31.21	17%	5.20
Sundry	318,613	56.90	9%	5.11
	<u>3,549,814</u>		<u>100%</u>	<u>58.57</u>

In addition to avoiding the associated administrative costs, other distribution revenue has been excluded based on the assumption that including this component would have minimal impact on lead lag study results. For example, combining the above-noted estimated revenue lag associated with other distribution revenues with retail and OCEB revenues used in the 2010 lead lag study has the estimated impact of decreasing weighted lag days by .04 from 64.64 to 64.60. This would result in a decrease in the working capital allowance percentage of .01% from 11.42% to 11.41% as displayed below:

Revenue lag:

	<u>Revenues</u>	<u>Lag Days</u>	<u>Weighting Factor</u>	<u>Retail Revenue Weighted Lag Days</u>	<u>Weighting Factor</u>	<u>Weighted Lag Days</u>
Retail revenue	337,366,592	64.90	99%	64.22		
Other distribution revenue	3,549,813	58.57	1%	0.61		
	340,916,405		100%	64.83	91%	59.00
OCEB revenue	33,736,659	62.29	100%	62.29	9%	5.61
	<u>374,653,064</u>				<u>100%</u>	<u>64.60</u>

Impact on working capital:

<u>Revenue Lag Days</u>	<u>Working Capital %</u>
64.64	11.42%
64.60	11.41%

## **School Energy Coalition (SEC) Interrogatories**

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### **SEC #8**

*Ref: [IR 2-OEB-3]*

*Please provide any data, forecasts, or other information assessing or projecting the impact on reliability statistics (e.g. SAIDI, SAIFI, CAIDI) of the system automation strategy.*

### **Response SEC #8**

Please find attached under Appendix 2H a study entitled “Reclosers on London Hydro’s Electric System” that examines the cost/benefits and investment threshold for various methods of improving reliability, including through automation.

### **SEC #9**

*Ref: [IR 2-OEB-7, p. 14]*

*Please break down the total internal labour capital costs for 2011, 2012, and 2013 (\$531,622, \$1,447,000, and \$1,803,000 between the projects referred to at the top of the page.*

### **Response SEC #9**

As requested, the Table below provides a breakdown of internal capital labour and benefits to Information Systems related capital projects for each of the years 2011 to the proposed 2013 Test Year as presented in response to IR-2 OEB 7, page 14.

<b>INFORMATION SYSTEMS INTERNAL CAPITAL LABOUR 2011 - 2013</b>			
	2011 Actual	2012 Bridge Year	2013 Test Year
<b><u>Smart Grid Platform</u></b>			
Mobile Workforce Management (MWFM)			180,200
Business Intelligence / Reporting			162,200
	-	-	342,400
<b><u>Time of Use (TOU) / Customer Service</u></b>			
MDUS / ODS (Operational Data Storage)		38,200	
MDMR Interface		38,200	
Measurement Canada Modifications		38,200	
Customer Engagement / Self Service	25,354	180,120	180,100
IVR System Enhancement and Upgrade			
Outage Management System (OMS)			617,400
	25,354	294,720	797,500
<b><u>Engineering and Operations</u></b>			
Geographic Information System	259,150	128,870	
Other (accounting, payroll, doc management)			
Outage Management System (OMS Foundation)	12,058	425,750	
	271,208	554,620	-
<b><u>Customer Information System (CIS)</u></b>			
Customer Information System (CIS)	167,982	319,300	300,900
CIS EBT Optimization	44,685	155,560	
CIS Regulatory Requirements	21,706	122,800	173,000
CIS Customer Relations Management Update			189,200
	234,373	597,660	663,100
<b><u>Infrastructure</u></b>			
Hardware and Software	687		
	<b>531,622</b>	<b>1,447,000</b>	<b>1,803,000</b>

**SEC #10**

Ref: [IR 2-OEB-37]

Please provide a table showing the number and value of assets reaching the end of their useful life over each of the last ten years, and over each of the following ten years, to the extent that this can be done by category.

**Response SEC #10**

Two tables have been provided below. The first table represents those assets which have reached the end of their useful life over the past 10 years from 2003 through to 2012. The second table represents the cost of those assets on hand at December 31, 2012 which will become fully depreciated over the next 10 years from 2013 to 2022.

Please note that the number of assets has not been provided since London Hydro does not track quantities within its fixed assets accounting system since most assets are capitalized, depreciated and disposed under grouped accounting.

**SEC #10**

**Last 10 years**

<u>Asset Category</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
<b>Distribution Plant</b>										
1805 Land - Substations										
1806 / 1612 Land Rights										
1808 Buildings - Substations						133,528	57,301			
1820 /1610 Substation Equipment	168,772		34,820			55,365	29,102	222,582	137,508	129,271
1830 Poles, Towers & Fixtures							760,851	538,477	797,263	
1835 OH Conductors & Devices	(25,696)	690,177	2,020,544	1,043,688	1,536,738	1,676,611	558,993	395,616	585,744	
1840 UG Conduit								374,605	278,304	12,953
1845 UG Conductor & Devices		13,045,531			435,032			2,701,146	5,232,554	241,752
1850 Line Transformers		286,719					654,411	1,461,838	2,415,478	
1855 Services (OH & UG)							232,914	164,840	244,060	
1860 Meters		74,635						343,167	238,319	204,447
	143,076	14,097,062	2,055,364	1,043,688	1,971,770	1,865,504	2,293,572	6,202,271	9,929,230	588,423
<b>General Plant</b>										
1908 Buildings & Fixtures					260,593	6,626				33,891
1910 Leasehold Improvements				11,029						
1915 Office Furniture & Equipment	12,780	2,976		76,653	166,726	27,818		181,231	237,722	92,697
1930 Transportation Equipment	1,075,142	459,987	282,419		430,945	302,573	1,141,649	645,393	52,543	302,573
1935 Stores Equipment						60,989			19,122	
1940 Tools, Shop & Garage Equipment						16,242		74,196	163,139	137,755
1945 Measurement & Testing Equipment						205,092		2,449	59,191	
1950 Power Operated Equipment	87,253	99,395			74,483		108,569		9,515	
1955 Communication Equipment										
1960 Miscellaneous Equipment	14,535	133,790	163,102	84,620	50,957					
1980 System Supervisory Equipment		86,927		417,149	512,875	1,233,399	192,009		167,390	748,958
	1,189,710	783,075	445,521	589,451	1,496,579	1,852,739	1,442,227	903,269	708,622	1,315,874
<b>Information Systems</b>										
1920 Computer - Hardware	709,128		594,997	957,969	742,593	667,621	615,216	1,121,029	504,125	624,926
1925 /1611 Computer - Software	604,083		1,062,073	152,557	1,172,384	4,960,697	1,096,065	490,790	526,224	1,910,428
	1,313,211	-	1,657,070	1,110,526	1,914,977	5,628,318	1,711,281	1,611,819	1,030,349	2,535,354
<b>Total Assets Becoming Fully Depreciated</b>	<b>2,645,997</b>	<b>14,880,137</b>	<b>4,157,955</b>	<b>2,743,665</b>	<b>5,383,326</b>	<b>9,346,561</b>	<b>5,447,080</b>	<b>8,717,359</b>	<b>11,668,201</b>	<b>4,439,651</b>

**SEC #10**  
**Next 10 years**

<u>Asset Category</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
<b>Distribution Plant</b>										
1805 Land - Substations										
1806 / 1612 Land Rights									214,211	59,250
1808 Buildings - Substations										
1820 /1610 Substation Equipment	212,235	97,232	108,739	172,404	186,461	179,335		53,172	19,187	31,667
1830 Poles, Towers & Fixtures										
1835 OH Conductors & Devices										
1840 UG Conduit	14,267	7,842			8,957	27,541	36,210	22,533	7,246	5,054
1845 UG Conductor & Devices	201,843	4,448,357	4,446,084	4,592,357	6,144,577	3,800,072	3,844,603	3,850,353	3,205,261	2,745,842
1850 Line Transformers					484,914	681,210	762,746			1,508,195
1855 Services (OH & UG)										
1860 Meters	261,931	242,150			453,204	196,934	178,702	277,674	251,690	94,153
	690,276	4,795,581	4,554,823	4,764,761	7,278,113	4,885,092	4,822,261	4,203,732	3,697,595	4,444,161
<b>General Plant</b>										
1908 Buildings & Fixtures	13,092		56,452	2,273,932	515,352	76,136		1,926,194	655,012	711,841
1910 Leasehold Improvements										
1915 Office Furniture & Equipment	120,051	113,775	177,974	134,227	84,536					
1930 Transportation Equipment	1,167,350	635,631		334,428	629,181	430,095	225,670	1,440,793	482,782	1,878,781
1935 Stores Equipment	7,727	4,104	2,057	27,726	4,347			119		
1940 Tools, Shop & Garage Equipment	116,499	82,312	106,544	123,791	117,694	101,662	181,980	80,784		
1945 Measurement & Testing Equipment		2,290		11,016				87,934		
1950 Power Operated Equipment			48,389	99,042	72,900	373,508	181,113	27,376		
1955 Communication Equipment										
1960 Miscellaneous Equipment										
1980 System Supervisory Equipment				10,015	32,509	361,225	80,431	78,854	10,706	111,273
	1,424,719	838,112	391,416	3,014,177	1,456,519	1,342,626	669,194	3,642,054	1,148,500	2,701,895
<b>Information Systems</b>										
1920 Computer - Hardware	283,350	406,298	1,083,069							
1925 /1611 Computer - Software	228,905	7,659,457	3,592,823	6,752,952	5,236,269					
	512,255	8,065,755	4,675,892	6,752,952	5,236,269	-	-	-	-	-
<b>Total Assets Becoming Fully Depreciated</b>	<b>2,627,250</b>	<b>13,699,448</b>	<b>9,622,131</b>	<b>14,531,890</b>	<b>13,970,901</b>	<b>6,227,718</b>	<b>5,491,455</b>	<b>7,845,786</b>	<b>4,846,095</b>	<b>7,146,056</b>

**SEC #11**

*Ref: [Ex. 2, p. 32]*

*Please explain the 'new weaknesses' found related to porcelain insulators.*

**Response SEC #11**

The 'new weaknesses' described on page 32 of Exhibit 2 do not specifically pertain to porcelain insulators. The intent of the paragraph is to describe an example of how London Hydro has successfully dealt with equipment that has been identified as presenting a reliability or safety concern. London Hydro conducts inspections and analyzes its failed equipment to determine the mode of failure. When repeating failure trends are identified, the cause can be referred to as a 'new weakness'. These 'new weaknesses' are then dealt with through targeted capital programs to address the root cause of the equipment failure or issue.

**SEC #12**

*Ref: [Ex. 2, p.72/3]*

*With regards to City road and expansion, please provide the details of any shared costs related to trenching between Rogers, Bell or Union Gas.*

**Response SEC #12**

As discussed in Exhibit 2 on page 73, London Hydro shares common trenching costs with Rogers Cable, Bell Canada and Union Gas incurred during the servicing of new underground subdivisions. The proportionate costs are calculated by measuring the meters of common trench and multiplying this by the trenching costs per meter and then dividing this total by the number of common trench partners. As an example, if there were three partners in a section of trench, the trench costs would be divided by three and paid equally among the partners.



## **Vulnerable Energy Consumers Coalition (VECC) Interrogatories**

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### **VECC #3**

*Reference: Exhibit 2, pg. 68 / OEB IR # 3*

- a) Please file the results of the annual worst performing circuits for 2009 through 2012.*
- b) When is London Hydro expecting the results of its assessment of underground plant?*

### **Response VECC #3**

- a) Please find attached Quality of Supply Report 2009 and Quality of Supply Report 2010 under Appendix 2I and 2J which contain the results of the annual worst performing circuits for 2009 and 2010. The Quality of Supply Reports have not been completed for 2011 or 2012. Since the Capital Budgets for 2012 and 2013 were prepared in mid-2011, all of the work proposed for improving the performance of poor circuits was based on the results of 2010, 2009 and earlier. In addition, the engineer responsible for preparing the Quality of Supply Reports has been dedicated full time to London Hydro's new Outage Management System project. London Hydro expects to have the Quality of Supply Reports for 2011 and 2012 completed later in 2013.
- b) London Hydro received the results of its civil engineering assessments of the underground structural plant in December, 2012. London Hydro will continue to plan for the sustainment of these assets accordingly.

**VECC #4**

Reference: Exhibit 2, pg. 30

- a) Please indicate whether the Charts 2-1, 2-2 and 2-3 show reliability metrics with or without loss of supply. If the former please revise the charts to show the trends without loss of supply.

**Response VECC #4**

- a) Charts 2-1 and 2-2 show the reliability metrics both with Loss of Supply (solid line) and without Loss of Supply (dashed line). The legend indicates this as (Less LOS).

**VECC #5**

Reference: Exhibit 2, pg. 44, Table 2-16

- a) Please confirm that the column marked “2009 Budget” are the 2009 Board approved amounts.
- b) Please update the table for 2012 actuals.

**Response VECC #5**

- a) London Hydro confirms the column marked “2009 Budget” is the 2009 Board Approved amount for capital spending in that year.
- b) Please refer to Appendix 2G for updated Tables 2-16 as requested. Please note that due to the concurrent timing of both London Hydro’s year-end process and the filing of these interrogatory responses, the 2012 actual results are preliminary pending final management’s review and the completion of the year-end external audit. Also, as discussed in LPMA #42, London Hydro made the decision, to adopt the MIFRS amortization rates and overhead burdens for external financial reporting purposes effective January 1, 2012 and, accordingly, MIFRS depreciation and overhead burdens are reported in the 2012 actual results.

**VECC #6**

Reference: Exhibit 2, pg. 44

- a) Please explain how the capital contributions for the 2013 test year are estimated.
- b) Please provide the amount in 2012 capital contributions. Please include the amount remaining outstanding (receivables) in contributions for projects completed in 2012.
- c) Please provide the capital contributions paid by the City of London for each of the years 2009 through 2013 (forecast)

**Response VECC #6**

- a) London Hydro reviews active projects for 2012 in combination with the value of projects estimated for 2013. Based on these values, London Hydro then estimates the contributed capital requirement by considering historical contribution levels and project classification (eg. residential single family, multi-housing, commercial and relocations).
- b) Capital contributions for 2012 are \$3,780,997 as displayed in updated Table 2-8 under Appendix 2E. These contributions do not include any amounts which are unpaid and included in accounts receivable as at December 31, 2012.
- c) Capital contributions from the City of London in connection with the years 2009 through to the 2013 Test Year are as follows:

	<u>Amount</u>
2009 Actual	281,745
2010 Actual	79,570
2011 Actual	1,742,365
2012 Actual	214,317
2013 Forecast	-
	<u>2,317,997</u>

**VECC #7**

Reference: Exhibit 2, pg. 44

- a) *In the three years prior to 2011 the average spending on vehicles was approximately \$1.7 million. Please explain the decrease in capital spending on vehicles in 2011 to \$685k.*
- b) *Please provide the budgetary directions for the 2011 reduction in vehicle spending.*

**Response VECC #7**

- a) The reduced capital spending on vehicles in 2011 was a result of deferring the replacement of several vehicles including 2 aerial devices, 2 trailers, a dump truck and a pickup.
- b) A 5 year fleet replacement forecast is prepared annually. This forecast is based on an established fleet replacement cycle approved by London Hydro's Board of Directors. Each unit proposed for replacement is evaluated for possible extended or reduced life cycle based on consideration of the units depreciated value, current mechanical condition and effectiveness to meet the corporate requirements. The fleet capital budget is reviewed and approved for consideration by the Board as part of the overall capital budget for London Hydro.

At the time of developing capital budgets in the fall of 2010, it was decided that certain vehicles scheduled for replacement in 2011 be deferred as the vehicles were still in decent working order and provided no safety concerns. Units deferred were then added to the following year's capital spending budget for consideration.

**VECC #8**

*Reference: Exhibit 2, pg. 56 / Board Staff IR #4*

- a) How many kilometres of underground plant does London Hydro have?*
- b) How many kilometres of underground plant was refurbished by silicone injections in each year since the beginning of this program and up to and including the 2013 test year?*
- c) How many remaining kilometres will be left to complete after 2013?*

**Response VECC #8**

- a) Details of London Hydro's distribution system, including the number of kilometers of underground plant are detailed in the Asset Sustainment Plan found in Exhibit 2, Appendix 2C.
- b) In 2010, 30 km of cable were injected with silicone and in 2011, 51.5 km were injected and in 2012, 42 km were injected.
- c) Although the number of kilometers of cable that needs to be refurbished or replaced is known, the precise proportion of this cable that will be injected is unknown. The Asset Sustainment Plan provides a detailed forecast for the number of kilometers of cable that will need to be refurbished or replaced each year for the next 15 years but the decision on whether to inject or replace a cable is a complex one that requires detailed engineering analysis. This analysis is typically performed the year before capital budgets are prepared. The amount of silicone injection work forecasted for 2013 is estimated at 35 kilometers, but some of the detailed engineering work for later in 2013 has yet to be completed.

**VECC #9**

*Reference: Exhibit 2, pg. 63 / Board Staff IR # 5*

- a) *In the interrogatory response London Hydro states that believes that “it is prudent to include these cost estimates beyond 2013, and has therefore made allowance for the potential for continued road redevelopments in the 2014 and 2015 capital spending forecasts”. Please explain what is meant by this statement. Specifically, has London Hydro included any forecast expenditures for 2014 and 2015 in the 2013 capital estimate?*

**Response VECC #9**

- a) London Hydro confirms that forecasted expenditures for 2014 and 2015 have not been included in the capital budget for the proposed 2013 Test Year. The statement noted above was intended to explain that based on historical spending patterns in this area, it is anticipating similar spending in 2014 and 2015 and, accordingly, forecasted spending for 2014 and 2015 provided in the 2012 and 2013 Asset Management Plan in Appendix 2B includes an estimate in this regard.

**VECC #10**

*Reference: Exhibit 2, pg. 99 / Board Staff IR # 7*

- a) *Please provide the business case, including the benefit-cost analysis for the Business Intelligence/Reporting and CIS Customer Relations Management Upgrade IT projects.*

**Response VECC #10**

- a) As stated in London Hydro’s 2013 Cost of Service rate application, the investment in a Business Intelligence and Reporting infrastructure involves the consolidation of data and various disparate existing reporting tools, queries, and reports from all of London Hydro’s systems (operational and financial). The objective is to implement a *single, corporate-wide reporting tool* that will be used by all levels and functional areas to

improve the accuracy and timeliness of information necessary for decision making.  
 Costs and benefits associated with this application are as follows:

Cost	Benefit
Software licensing costs <ul style="list-style-type: none"> <li>no incremental license costs since reporting tool is part of enterprise license</li> </ul>	<ul style="list-style-type: none"> <li>Leverage unused functionality and licenses</li> </ul>
Utilize “out-of-box” functionality <ul style="list-style-type: none"> <li>Avoid the cost of producing custom reports and business reporting silos</li> </ul>	<ul style="list-style-type: none"> <li>Consolidated corporate reporting platform</li> <li>Business “self-service” reporting and more timely reports</li> </ul>
Complexity – smart meter / AMI environment <ul style="list-style-type: none"> <li>Growing complexity of systems and data creates challenges in normalized and consolidating data from disparate systems</li> <li>Increasing volumes of data requires more analytical processing power (over 3M reads per day)</li> </ul>	<ul style="list-style-type: none"> <li>Single reporting tool will create “a single source of truth” for consistency and accuracy of report information</li> <li>This will build confidence in the data and avoid rework and reporting inconsistencies</li> </ul>
Reactive Decision Making <ul style="list-style-type: none"> <li>Current decisions are made on statistical data samples</li> </ul>	<ul style="list-style-type: none"> <li>Build “Proactive” &amp; “Predictive” reporting using near real time from the current smart meter /AMI and future smart grid developments</li> </ul>

As stated in London Hydro’s 2013 Cost of Service rate application, the investment in the CIS Customer Relations Management (CRM) Upgrade reflects the move from version 5.2 to version 7. The SAP CRM system is the *primary user interface for Customer Service staff* to manage customer inquiries and conduct business processes. The targeted CRM version 7.0 will provide a more sustainable, longer term base on which to operate. Costs and benefits associated with this application are as follows:

Cost	Benefit
<p><b>Business Functions Risks</b></p> <ul style="list-style-type: none"> <li>• Current version is at “end of life” i.e. will no longer be supported by SAP</li> <li>• Potential risk to Customers since a software bug could impact meter to cash processing</li> </ul>	<ul style="list-style-type: none"> <li>• Higher system reliability and availability with timely support, latest vendor hot fixes/patches and escalation within the vendor support organization</li> </ul>
<p><b>Security Risks</b></p> <ul style="list-style-type: none"> <li>• Risk to London Hydro IT systems and data as a result of unpatched security issues</li> </ul>	<ul style="list-style-type: none"> <li>• Enable removal of known insecure software versions</li> <li>• Ensure availability, integrity and confidentiality of customer data can be maintained within London Hydro’s IT infrastructure</li> </ul>
<p><b>Leveraging Maintenance Contract</b></p> <ul style="list-style-type: none"> <li>• Avoid time and material costs for consultants to fix out of support bugs</li> <li>• Vendor support requires operating on the current version of software</li> </ul>	<ul style="list-style-type: none"> <li>• Better value of software maintenance contract by staying current</li> </ul>
<p><b>Implementation Cost</b></p> <ul style="list-style-type: none"> <li>• More complex environment and tightly integrated systems requires coordinated upgrades for end-to-end testing</li> </ul>	<ul style="list-style-type: none"> <li>• Lower Life Cycle cost that avoids higher “major” system upgrades with multiple changes at one time that could impact the customer</li> </ul>
<p><b>Customization</b></p> <ul style="list-style-type: none"> <li>• Avoid any customization that could be delivered as part of latest version</li> </ul>	<ul style="list-style-type: none"> <li>• CRM 7.0 has new capabilities for demand side management</li> <li>• Usability improvements for the Customer Service Representatives while dealing with customers</li> <li>• Enhanced customer profiling to improve the customer engagement such as handling multiple accounts</li> </ul>



## **RATE BASE APPENDICES**

- 2A** LPMA #4 Updated: **Table 2-1 - Summary of Rate Base - CGAAP**
- 2B** LPMA #4 Updated: **Table 2-2 - Summary of Average Net Fixed Assets for Rate Base – including Smart Meters**
- 2C** LPMA #4 Updated: **Table 2-3 - Summary of Average Net Fixed Assets for Rate Base – excluding Smart Meters**
- 2D** LPMA #4 Updated: **Table 2-4 – Summary of Fixed Asset Continuity Schedules – including Smart Meters**
- 2E** LPMA #5 Updated: **Table 2-8 – Summary of Capital Additions 2007 to 2013**
- 2F** LPMA #7 Updated: **Table 2-10 – London Hydro Inc. 2012 and 2013 Capital Plan**
- 2G** VECC #5 Updated: **Table 2-16 – Capital Spending by Project Category 2007 to 2013**
- 2H** SEC #8 **Reclosers on London Hydro’s Electric System**
- 2I** VECC #3 **Quality of Supply Report 2009**
- 2J** VECC #3 **Quality of Supply Report 2010**
- 2K** OEB #9 **Projects Not In Service at December 14, 2012**

**Table 2-1 – Summary of Rate Base – CGAAP**  
*(updated to include 2012 actuals)*

<b>LONDON HYDRO INC. RATE BASE BY YEAR</b>						
	<u>2009 Actuals</u>	<u>2009 Board Approved Budget</u>	<u>2010 Actuals</u>	<u>2011 Actuals</u>	<u>2012 Actuals</u>	<u>2013 Test Year</u>
Gross Fixed Assets <i>(Average)</i>	347,524,556	347,025,897	358,087,555	367,942,321	394,905,086	420,817,748
Accumulated Depreciation <i>(Average)</i>	(165,815,269)	(166,116,161)	(171,486,834)	(177,648,091)	(186,150,489)	(195,706,787)
Net Fixed Assets <i>(Average)</i>	181,709,287	180,909,736	186,600,721	190,294,231	208,754,597	225,110,962
Allowance for Working Capital	41,920,424	44,416,243	46,337,665	49,325,638	52,222,652	42,171,179
<b>Rate Base</b>	223,629,710	225,325,979	232,938,385	239,619,869	260,977,249	267,282,141
Annual Change		1,696,269	9,308,675	6,681,484	21,357,381	6,304,891
Annual Change %		0.8%	4.1%	2.9%	8.9%	2.4%

**Table 2-2 – Summary of Average Net Fixed Assets for Rate Base**  
 – including Smart Meters (updated to include 2012 actuals)

<b>LONDON HYDRO INC. SUMMARY OF FIXED ASSET FOR RATE BASE - including Smart Meters</b>								
	2007 <u>Actuals</u>	2008 <u>Actuals</u>	2009 <u>Actuals</u>	2009 <u>Budget</u>	2010 <u>Actuals</u>	2011 <u>Actuals</u>	2012 <u>Actuals</u>	2013 <u>Test Year</u>
Gross Fixed Assets (Average)	313,341,230	330,503,062	347,524,556	347,025,897	358,087,555	367,942,321	394,905,086	420,817,748
Accumulated Depreciation (Average)	(146,538,000)	(157,605,011)	(165,815,269)	(166,116,161)	(171,486,834)	(177,648,091)	(186,150,489)	(195,706,787)
<b>Net Fixed Assets (Average)</b>	<b>166,803,230</b>	<b>172,898,051</b>	<b>181,709,287</b>	<b>180,909,736</b>	<b>186,600,721</b>	<b>190,294,231</b>	<b>208,754,597</b>	<b>225,110,962</b>
Annual Change		6,094,821	8,811,236	9,585,132	5,690,985	3,693,510	18,460,367	16,356,365
Annual Change %		3.7%	5.1%	5.5%	3.1%	2.0%	9.7%	7.8%

**Table 2-3 – Summary of Average Net Fixed Assets for Rate Base**  
 – excluding Smart Meters (updated to include 2012 actuals)

<b>LONDON HYDRO INC. SUMMARY OF FIXED ASSET FOR RATE BASE - excluding Smart Meters</b>								
	2007 <u>Actuals</u>	2008 <u>Actuals</u>	2009 <u>Actuals</u>	2009 <u>Budget</u>	2010 <u>Actuals</u>	2011 <u>Actuals</u>	2012 <u>Actuals</u>	2013 <u>Test Year</u>
Gross Fixed Assets (Average)	313,341,230	330,503,062	347,524,556	347,025,897	358,087,555	367,942,321	382,342,178	395,903,251
Accumulated Depreciation (Average)	(146,538,000)	(157,605,011)	(165,815,269)	(166,116,161)	(171,486,834)	(177,648,091)	(183,692,217)	(189,803,453)
<b>Net Fixed Assets (Average)</b>	<b>166,803,230</b>	<b>172,898,051</b>	<b>181,709,287</b>	<b>180,909,736</b>	<b>186,600,721</b>	<b>190,294,231</b>	<b>198,649,962</b>	<b>206,099,799</b>
Annual Change		6,094,821	8,811,236	9,585,132	5,690,985	3,693,510	8,355,731	7,449,837
Annual Change %		3.7%	5.1%	5.5%	3.1%	2.0%	4.4%	3.8%

**Table 2-4 – Summary of Fixed Asset Continuity Schedules**  
– including Smart Meters *(updated to include 2012 actuals)*

<b>LONDON HYDRO INC. SUMMARY OF FIXED ASSET CONTINUITY SCHEDULES - including Smart Meters</b>								
	2007 <u>Actuals</u>	2008 <u>Actuals</u>	2009 <u>Actuals</u>	2009 <u>Budget</u>	2010 <u>Actuals</u>	2011 <u>Actuals</u>	2012 <u>Actuals</u>	2013 <u>Test Year</u>
<b>Gross Fixed Assets</b>								
Opening balance	305,442,007	321,240,453	339,765,670	336,592,530	355,283,441	360,891,668	374,992,974	414,624,968
Transfer smart meters Jan 1, 2012							24,403,497	
Additions	18,604,518	23,358,935	25,635,758	30,572,005	19,307,955	25,687,989	27,706,380	26,758,000
Disposals	(2,806,072)	(4,833,718)	(10,117,987)	(9,705,269)	(13,699,728)	(11,586,683)	(12,285,654)	(14,372,440)
Closing balance (excluding WIP)	321,240,453	339,765,670	355,283,441	357,459,266	360,891,668	374,992,974	414,817,197	427,010,528
<b>Accumulated Depreciation</b>								
Opening balance	140,901,523	152,174,478	163,035,544	163,009,296	168,594,994	174,378,674	180,917,507	191,996,994
Transfer smart meters Jan 1, 2012							2,593,363	
Additions	14,075,541	15,694,784	15,535,769	15,919,000	16,312,280	17,263,192	20,139,472	21,791,825
Disposals	(2,802,586)	(4,833,718)	(9,976,319)	(9,705,269)	(10,528,600)	(10,724,359)	(12,266,872)	(14,372,240)
Closing balance	152,174,478	163,035,544	168,594,994	169,223,027	174,378,674	180,917,507	191,383,470	199,416,579
<b>Net Fixed Assets (Actuals)</b>	<b>169,065,975</b>	<b>176,730,126</b>	<b>186,688,447</b>	<b>188,236,239</b>	<b>186,512,994</b>	<b>194,075,467</b>	<b>223,433,727</b>	<b>227,593,949</b>

**Table 2-8 – Summary of Fixed Asset Additions 2007 to 2013**  
*(updated to include 2012 actuals)*

<b>LONDON HYDRO INC. SUMMARY OF CAPITAL ADDITIONS 2007 - 2013</b>								
	2007	2008	2009	2009	2010	2011	2012	2013
	<u>Actual</u>	<u>Actual</u>	<u>Actual</u>	<u>Budget</u>	<u>Actual</u>	<u>Actual</u>	<u>Actuals</u>	<u>Test</u>
<b>Distribution Plant</b>								
1805 Land - Substations	-	-	68,736	175,000	-	-	-	-
1806 Land Rights	8,162	15,943	15,944	-	(9,681)	6,283	41,810	-
1808 Buildings - Substations	-	168,322	133,085	55,000	1,943	-	-	75,000
1820 Substation Equipment	567,240	2,070,347	(52,453)	330,000	84,316	3,867,323	652,058	169,400
1830 Poles, Towers and Fixtures	1,745,552	2,079,657	1,901,278	1,837,950	1,091,734	2,329,323	1,819,565	2,890,200
1835 OH Conductors and Devices	3,405,807	4,044,468	2,645,134	3,551,700	2,276,998	3,526,704	2,416,037	3,783,300
1840 UG Conduit	2,479,172	3,164,004	3,651,259	4,853,700	1,970,355	3,201,981	2,637,371	2,146,200
1845 UG Conductor and Devices	3,210,150	3,127,333	4,058,104	4,704,450	3,591,550	4,777,384	3,696,734	4,109,800
1850 Line Transformers	4,246,945	5,613,866	4,147,440	3,120,500	3,966,748	4,274,795	5,779,638	5,106,900
1855 Services (OH & UG)	1,358,409	1,646,654	1,424,559	995,500	1,381,626	2,134,439	2,951,856	1,223,200
1860 Meters	497,681	457,247	515,491	613,200	412,901	823,821	667,492	744,600
	<u>17,519,118</u>	<u>22,387,841</u>	<u>18,508,577</u>	<u>20,237,000</u>	<u>14,768,490</u>	<u>24,942,053</u>	<u>20,662,561</u>	<u>20,248,600</u>
<b>General Plant</b>								
1908 Buildings and Fixtures	856,525	2,104,940	816,813	1,075,000	576,873	1,155,981	1,411,057	575,000
1915 Office Furniture and Equipment	92,697	120,051	113,775	120,000	177,973	134,227	84,536	80,000
1930 Transportation Equipment	-	989,181	1,207,666	1,728,000	2,249,907	223,290	1,924,492	1,300,000
1935 Stores Equipment	2,057	27,726	4,348	10,000	-	-	119	5,000
1940 Tools, Shop and Garage Equipment	106,544	123,791	117,694	105,000	101,662	181,980	80,784	130,000
1945 Measurement & Testing Equipment	-	11,016	-	20,000	-	-	87,934	20,000
1950 Power Operated Equipment	39,949	99,041	81,340	50,000	369,359	181,113	31,526	110,000
1955 Communication Equipment	-	-	-	-	-	6,128	284,020	-
1960 Miscellaneous Equipment	-	-	-	-	-	-	-	-
1980 System Supervisory Equipment	196,519	333,272	100,413	383,000	492,144	194,529	228,447	121,400
	<u>1,294,291</u>	<u>3,809,018</u>	<u>2,442,049</u>	<u>3,491,000</u>	<u>3,967,918</u>	<u>2,077,248</u>	<u>4,132,914</u>	<u>2,341,400</u>
<b>Information Systems</b>								
1920 Computer - Hardware	712,506	191,039	345,288	767,000	283,350	406,298	1,084,969	480,000
1925 Computer - Software	2,403,992	449,131	8,035,352	9,279,905	2,983,317	2,481,131	5,606,933	5,520,000
	<u>3,116,498</u>	<u>640,170</u>	<u>8,380,640</u>	<u>10,046,905</u>	<u>3,266,667</u>	<u>2,887,429</u>	<u>6,691,902</u>	<u>6,000,000</u>
Additions before Contributed Capital	21,929,907	26,837,029	29,331,266	33,774,905	22,003,075	29,906,730	31,487,377	28,590,000
1995 Contributions and Grants	(3,325,389)	(3,478,094)	(3,695,508)	(3,202,900)	(2,695,120)	(4,218,741)	(3,780,997)	(1,832,000)
	<u><b>18,604,518</b></u>	<u><b>23,358,935</b></u>	<u><b>25,635,758</b></u>	<u><b>30,572,005</b></u>	<u><b>19,307,955</b></u>	<u><b>25,687,989</b></u>	<u><b>27,706,380</b></u>	<u><b>26,758,000</b></u>

**Table 2-10 – London Hydro Inc. 2012 and 2013 Capital Plan**

*(updated to include 2012 actuals)*

<b>LONDON HYDRO INC. - 2012 AND 2013 CAPITAL PLAN</b>		
	<b>2012</b>	<b>2013</b>
	<b>Actuals</b>	<b>Test</b>
<b><u>INFRASTRUCTURE</u></b>		
Substation rebuilds	659,658	220,000
Subdivision rebuilds	6,356,911	5,888,000
Main feeders	1,612,903	989,000
Networks	2,073,721	1,170,000
Overhead line work	3,388,424	5,392,000
Automation	546,841	335,000
	14,638,458	13,994,000
<b><u>CITY AND DEVELOPER WORKS</u></b>		
City works projects	551,051	825,000
Developer works projects	5,927,049	4,828,000
	6,478,100	5,653,000
<b><u>METERING</u></b>		
	719,194	648,000
<b><u>FLEET AND FACILITIES</u></b>		
	3,619,863	2,295,000
<b><u>INFORMATION SYSTEMS</u></b>		
	6,673,348	6,000,000
Stores and fleet overhead adjustment	32,128,963	28,590,000
	(641,586)	
Capital contributions	(3,780,997)	(1,832,000)
	<b>27,706,380</b>	<b>26,758,000</b>

**Table 2-16 – Capital Spending by Project Category 2007 to 2013**  
*(updated to include 2012 actuals)*

<b>London Hydro Inc. Capital Spending by Project Category 2007 to 2013</b>								
Annual Spending	2007	2008	2009	2009	2010	2011	2012	2013
Category	Actuals	Actuals	Actuals	Budget	Actuals	Actuals	Actuals	Test
<b>Infrastructure</b>								
A Substation rebuilds	57,466	2,253,229	3,515,147	3,110,000	1,738,772	618,681	267,619	220,000
B Subdivision rebuilds	2,640,426	3,446,332	2,252,212	1,825,000	3,104,210	5,532,465	5,743,348	5,888,000
C Main feeders	6,894,444	4,042,275	1,008,917	1,050,000	1,257,537	2,151,641	1,204,307	989,000
F Networks	1,010,251	1,022,640	1,614,962	1,250,000	1,173,512	2,420,415	1,762,168	1,170,000
G Overhead line work	705,750	2,419,529	3,168,481	3,455,000	2,634,963	3,454,225	3,559,829	5,392,000
H Automation	347,201	341,378	884,089	610,000	425,282	449,903	292,424	335,000
	<b>11,655,538</b>	<b>13,525,383</b>	<b>12,443,808</b>	<b>11,300,000</b>	<b>10,334,276</b>	<b>14,627,330</b>	<b>12,829,695</b>	<b>13,994,000</b>
<b>Demand</b>								
D City works projects	987,398	406,770	320,483	459,000	519,813	381,586	1,464,818	825,000
E Developer works projects	5,484,387	6,583,142	6,197,817	7,324,000	8,479,731	5,543,992	4,892,518	4,828,000
	<b>6,471,785</b>	<b>6,989,912</b>	<b>6,518,300</b>	<b>7,783,000</b>	<b>8,999,544</b>	<b>5,925,578</b>	<b>6,357,336</b>	<b>5,653,000</b>
<b>Metering</b>								
M Customer meters	286,368	372,733	429,792	482,000	277,352	700,366	736,616	648,000
MM Wholesale meters	592,727	917,499	(233,950)	1,000,000	53,842	702,853	3,220	-
	<b>879,095</b>	<b>1,290,232</b>	<b>195,842</b>	<b>1,482,000</b>	<b>331,194</b>	<b>1,403,219</b>	<b>739,836</b>	<b>648,000</b>
<b>Fleet and Facilities</b>								
N Vehicles and major equipment	39,949	1,546,750	1,845,236	1,778,000	1,607,729	685,016	1,675,405	1,410,000
O Operating equipment	108,601	163,190	121,386	135,000	101,662	181,980	168,837	155,000
Q Office furniture and equipment	87,991	148,019	82,352	120,000	177,974	134,227	84,536	80,000
R Building improvements/renovatio	529,788	2,150,162	1,067,835	1,130,000	464,438	1,452,432	1,053,422	650,000
	<b>766,329</b>	<b>4,008,121</b>	<b>3,116,809</b>	<b>3,163,000</b>	<b>2,351,803</b>	<b>2,453,655</b>	<b>2,982,200</b>	<b>2,295,000</b>
<b>Information Systems</b>								
V Infrastructure and hardware	953,639	411,691	342,726	691,000	543,387	487,064	1,287,407	1,210,000
W Application development	4,292,184	2,083,821	3,260,226	3,011,000	2,841,768	3,423,687	4,311,368	4,790,000
	<b>5,245,823</b>	<b>2,495,512</b>	<b>3,602,952</b>	<b>3,702,000</b>	<b>3,385,155</b>	<b>3,910,751</b>	<b>5,598,775</b>	<b>6,000,000</b>
Stores and fleet overhead adjustment	-	-	-	-	-	-	(641,586)	-
Inventory held for capital projects	16,000	3,000	(171,000)	-	637,689	(309,006)	(292,804)	-
	<b>25,034,570</b>	<b>28,312,160</b>	<b>25,706,711</b>	<b>27,430,000</b>	<b>26,039,661</b>	<b>28,011,527</b>	<b>27,573,452</b>	<b>28,590,000</b>
Capital contributions	(3,325,389)	(3,478,094)	(3,695,508)	(3,202,900)	(2,695,120)	(4,218,741)	(3,780,997)	(1,832,000)
	<b>21,709,181</b>	<b>24,834,066</b>	<b>22,011,203</b>	<b>24,227,100</b>	<b>23,344,541</b>	<b>23,792,786</b>	<b>23,792,455</b>	<b>26,758,000</b>
<b>Year to year change</b>								
Category		2008-2007 Actuals	2009-2008 Actuals	2009 Budget-2009 Actuals	2010-2009 Actuals	2011-2010 Actuals	2012 Actuals-2011 Actuals	2013 Test-2012 Actuals
<b>Infrastructure</b>								
A Substation rebuilds		2,195,763	1,261,918	(405,147)	(1,776,375)	(1,120,091)	(351,062)	(47,619)
B Subdivision rebuilds		805,906	(1,194,120)	(427,212)	851,998	2,428,255	210,883	144,652
C Main feeders		(2,852,169)	(3,033,358)	41,083	248,620	894,104	(947,334)	(215,307)
F Networks		12,389	592,322	(364,962)	(441,450)	1,246,903	(658,247)	(592,168)
G Overhead line work		1,713,779	748,952	286,519	(533,518)	819,262	105,604	1,832,171
H Automation		(5,823)	542,711	(274,089)	(458,807)	24,621	(157,479)	42,576
		<b>1,869,845</b>	<b>(1,081,575)</b>	<b>(1,143,808)</b>	<b>(2,109,532)</b>	<b>4,293,054</b>	<b>(1,797,635)</b>	<b>1,164,305</b>
<b>Demand</b>								
D City works projects		(580,628)	(86,287)	138,517	199,330	(138,227)	1,083,232	(639,818)
E Developer works projects		1,098,755	(385,325)	1,126,183	2,281,914	(2,935,739)	(651,474)	(64,518)
		<b>518,127</b>	<b>(471,612)</b>	<b>1,264,700</b>	<b>2,481,244</b>	<b>(3,073,966)</b>	<b>431,758</b>	<b>(704,336)</b>
<b>Metering</b>								
M Customer meters		86,365	57,059	52,208	(152,440)	423,014	36,250	(88,616)
MM Wholesale meters		324,772	(1,151,449)	1,233,950	287,792	649,011	(699,633)	(3,220)
		<b>411,137</b>	<b>(1,094,390)</b>	<b>1,286,158</b>	<b>135,352</b>	<b>1,072,025</b>	<b>(663,383)</b>	<b>(91,836)</b>
<b>Fleet and Facilities</b>								
N Vehicles and major equipment		1,506,801	298,486	(67,236)	(237,507)	(922,713)	990,389	(265,405)
O Operating equipment		54,589	(41,804)	13,614	(19,724)	80,318	(13,143)	(13,837)
Q Office furniture and equipment		60,028	(65,667)	37,648	95,622	(43,747)	(49,691)	(4,536)
R Building improvements/renovations		1,620,374	(1,082,327)	62,165	(603,397)	987,994	(399,010)	(403,422)
		<b>3,241,792</b>	<b>(891,312)</b>	<b>46,191</b>	<b>(765,006)</b>	<b>101,852</b>	<b>528,545</b>	<b>(687,200)</b>
<b>Information Systems</b>								
V Infrastructure and hardware		(541,948)	(68,965)	348,274	200,661	(56,323)	800,343	(77,407)
W Application development		(2,208,363)	1,176,405	(249,226)	(418,458)	581,919	887,681	478,632
		<b>(2,750,311)</b>	<b>1,107,440</b>	<b>99,048</b>	<b>(217,797)</b>	<b>525,596</b>	<b>1,688,024</b>	<b>401,225</b>
Stores and fleet overhead adjustment		-	-	-	-	-	(641,586)	641,586
Inventory held for capital projects		(13,000)	(174,000)	-	808,689	(946,695)	16,202	292,804
		<b>3,277,590</b>	<b>(2,605,449)</b>	<b>1,552,289</b>	<b>332,950</b>	<b>1,971,866</b>	<b>(438,075)</b>	<b>1,016,548</b>
Capital contributions		(152,705)	(217,414)	275,194	1,000,388	(1,523,621)	437,744	1,948,997
		<b>3,124,885</b>	<b>(2,822,863)</b>	<b>1,827,483</b>	<b>1,333,338</b>	<b>448,245</b>	<b>(331)</b>	<b>2,965,545</b>



**Appendix 2K (OEB Appendix A)**  
**For OEB Response #9 - Green Energy Act Plan**  
**Projects Not In Service at December 14, 2012**

Address	Proponent	Primary Voltage	Transformer Station	Distribution Station	Feeder Designation	Project Size
1275 Hubrey	Bright Power (Jeremy Crane)	27.6kV	Buchanan TS	---	19M22	250kW
30 Adelaide St	Bright Power (Jeremy Crane)	13.8kV	Nelson TS DESN 2	---	13M15	250kW
575 Industrial Road	NEXXSOURCE ENERGY CORP. (Garth Bobb)	27.6kV	Clarke TS	---	70M1	100kW
580 Industrial Road	Sun Edison (Anna Lauritzen)	27.6kV	Clarke TS	---	70M1	250kW
1121 Wellington Road S	RESCo (Michael B. Scott)	27.6kV	Buchanan TS	---	19M37	50kW
1125 WELLINGTON RD. S	RESCo (Michael B. Scott)	27.6kV	Buchanan TS	---	19M37	250kW
1305 Dundas St. E.	RESCo (Michael B. Scott)	27.6kV	Clarke TS	---	70M3	25kW
1875 HYDE PARK ROAD	RESCo (Michael B. Scott)	27.6kV	Talbot TS DESN 2	---	26M54	250kW
1975 DUNDAS ST. E	RESCo (Michael B. Scott)	27.6kV	Clarke TS	---	70M8	250kW
378 HORTON STREET	RESCo (Michael B. Scott)	4.16kV	Nelson TS DESN 1	---	1F2	50kW
15515 Dakota Place	German Solar Corp (Dennis German)		Clarke TS	---		250kW
15701 Robins Hill Road Bldg C	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	95kW
15790 Robins Hill Road	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	250kW
15825 Robins Hill Road Bldg A	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	125kW
15911 Robins Hill Road Bldg G	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	250kW
2351 Huron Street Bldg E	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	250kW
2391 Huron Street Bldg F	German Solar Corp (Dennis German)	27.6kV	Clarke TS	---	70M1	250kW
865 Florence Street	MMM Group (Nicolas Tyers)	27.6kV	Highbury TS	---	4M13	250kW
217 Sarnia Road	David Kay	27.6kV	Talbot TS DESN 2	---	26M55	153kW
355 Wellington Street	Tenedos Energy (Len Eberhard)	27.6kV	Talbot TS Desn 2	---	26M51	500kW
925 Richmond Street	David Kay	27.6kV	Talbot TS DESN 2	---	26M52	30kW

295 Rectory Street	MMM Group (Nicolas Tyers)	27.6kV	Highbury TS	---	4M13	250kW
535 Sovereign Rd	greenlightPROJECTS INC.(Chris Shilton)	27.6kV	Highbury TS	---	4M11	500kW
1100 Green Valley Rd	Casco	27.6kV	Buchanan TS	---	19M26	500kW
1010 Clarke Side Road	Canada Solar Consortium (Chris Carignan)	27.6kV	Clarke TS	---	70M6	250kW
960 Pond Mills Road	greenlightPROJECTS INC.(Chris Shilton)	27.6kV	Buchanan TS	---	19M27	500kW
3691 Manning Drive	Mann Engineering (John Wong)	27.6kV	Wonderland TS	---	32M1	250kW
745 York Street	TD Bank (Jamie Kruspel)	27.6kV	Highbury TS	---	4M13	250kW
99 Ash Street	Bright Power (Jamie Tremaine)	27.6KV	Highbury TS	---	4M13	250kW
629 Fanshawe Park Rd	Alternate Power International (Medy Merriman)	4.16kV	Talbot TS Desn 1	17	26M11	150kW
164 Albert St	Green Power Promotions (Andrew Hall-Holand)	27.6KV	Talbot TS DESN 1	---	26M22	50kW
98 Clarke Side Road	Tenedos Energy (Len Eberhard)	27.6kV	Highbury TS	---	4M16	500kW
3003 Page Street	Ozz Solar (Richard Di Bon)	27.6kV	Clarke TS	---	70M1	100kW
3537 White Oak Road	Bright Power (Jamie Tremaine)	27.6kV	Buchanan TS	---	19M22	250kW
568 Second Street	Ozz Solar (Richard Di Bon)	27.6kV	Highbury TS	---	4M18	100kW
629 Fanshawe Park Rd	ESEI Power Inc. (Harry Yu)	4.16kV	Talbot TS Desn 1	17	26M11	30kW
2797 Manning Drive	Mann Engineering Ltd.(Michal Jaster )	8.32kV	WONDERLAND TS	97	32M6	100kW
3700 Old Victoria Road	OSP - Ontario Solar Provider (Carlos Rodrigues)	27.6kV	Buchanan TS	---	19M21 HO cct	500kW
242 Pall Mall Street	Ozz Solar (Bobby MacCannell)	27.6kV	Talbot TS Desn 2	---	26M46	100kW
3080 Wonderland Road	Southside Property Mgmt (Peter Moreno)	27.6kV	WONDERLAND TS	---	32M7	250kW
105 Cherryhill Blvd.	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M42	40kW
110 Cherryhill Circle	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	25kW
115 Cherryhill Blvd.	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M42	40kW
120 Cherryhill Place	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	50kW
140 Cherryhill Place	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	45kW
160 Cherryhill Place	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	50kW
170 Cherryhill Circle	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	10kW
180 Cherryhill Circle	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	50kW
190 Cherryhill Circle	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M42	10kW

200 Westfield Drive	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	40kW
201 Westfield Drive	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M42	40kW
230 Platts Lane	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 2	---	26M54	20kW
695 Proudfoot Lane	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 1	---	26M13	150kW
1045 Wonderland Rd. N.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 1	---	26M14	186kW
1045 Wonderland Rd. N.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 2	---	26M56	87kW
1105 Florence St	London Hydro /City of London (Allan Van Damme)	27.6kV	Buchanan TS	---	19M29	90kW
1153/1165 Adelaide St. N.	London Hydro /City of London (Allan Van Damme)	4.16kV	Talbot TS Desn 1	27F2	26M11	97kW
1221 Sandford Ave	London Hydro /City of London (Allan Van Damme)	4.16kV	Clarke TS	33F1	70M3	227kW
1345 Cheapside St	London Hydro /City of London (Allan Van Damme)	27.6kV	Clarke TS	---	70M7	100kW
20 Granville St.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 2	---	26M41	159kW
25 Ridout Street South	London Hydro /City of London (Allan Van Damme)	13.8kV	Nelson TS DESN 2	---	13M15	34kW
275 Boler Rd.	London Hydro /City of London (Allan Van Damme)	4.16kV	Talbot TS Desn 1	25F2	26M13	44kW
370 Chippendale Cres.	London Hydro /City of London (Allan Van Damme)	4.16kV	Buchanan TS	40F1	19M38	107kW
656 Elizabeth St.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 2	---	26M53	156kW
663/665 Bathurst St.	London Hydro /City of London (Allan Van Damme)	13.8kV	Nelson TS DESN 2	---	13M15	76kW
675 Grosvenor St.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 2	---	26M52	128kW
710 Southdale Rd London	London Hydro /City of London (Allan Van Damme)	27.6kV	Buchanan TS	---	19M24	136kW
7112 Beattie St.	London Hydro /City of London (Allan Van Damme)	27.6kV	WONDERLAND TS	---	32M6	140kW
746 Wellington Rd.	London Hydro /City of London (Allan Van Damme)	4.16kV	WONDERLAND TS	23F3	32M4	41kW
78 Riverside Dr.	London Hydro /City of London (Allan Van Damme)	27.6kV	Talbot TS Desn 1	---	26M25	62kW
799 Homeview Rd.	London Hydro /City of London (Allan Van Damme)	27.6kV	WONDERLAND TS	---	32M4	275kW
824 Dundas St.	London Hydro /City of London (Allan Van Damme)	13.8kV	Nelson TS DESN 2	2K1	13M15	73kW
25 Cuddy Blvd	Glenbarra Energy Management Corp. (John Hamilton)	27.6kV	Clarke TS	---	70M1	200kW
865 Florence Street	Solera Sustainable Energies Company (Jolanda Allen)	27.6kV	Highbury TS	---	4M13	250kW
720 Proudfoot Lane	Blackstone Energy Services Inc (Grant McArthur)	27.6kV	Talbot TS Desn 1	---	26M13	150kW
2724 Roxburgh Road	NorthGrid Solar (Julie Hand)	27.6kV	Buchanan TS	---	19M22	184kW
1010 Clarke Side Road	Horizon Energy Solutions (John Mayhew)	27.6kV	Clarke TS	---	70M6	250kW
900 Adelaide St South	Lumen Earth (Hamed Ghanbari)	27.6kV	Buchanan TS	---	19M23	110kW
300 Clarke Rd	Smylie & Crow Associates (Jason Allair)	27.6kV	Highbury TS	---	4M17	20kW
9070 Elviage Street	Ontario Solar Provider Inc (Ian Rice)	27.6kV	WONDERLAND TS	---	32M5	50kW
160 Adelaide St South	N//Ergy Solutions Inc.(Bill Moffat)	27.6kV	Buchanan TS	---	19M38	150kW

800 Commissioners Rd	Honeywell Ltd (Kyle Whittle)	27.6kV	Buchanan TS	---	19M25	75kW
90 Enterprise Drive	Shorex Earth Systems Inc (Cathy Marnoch)	27.6kV	Buchanan TS	---	19M27	200kW
425 Newbold St	Shorex Earth Systems Inc (Cathy Marnoch)	27.6kV	Buchanan TS	---	19M28	75kW
31 Firestone Blvd	Horizon Energy Solutions (John Mayhew)	27.6kV	Highbury TS	---	4M16	250kW
1100 Dundas St	<b>Connect Energy &amp; Consulting (Yaakov (John) Kozak)</b>	27.6kV	Clarke TS	---	70M5	100kW
2323 Trafalgar St	German Solar Corp (Dennis German)	27.6Kv	Highbury TS	---	4M16	220kW
3026 Page St	German Solar Corp (Dennis German)	27.6Kv	Clarke TS	---	70M1	220kW
724 Fanshawe Park Rd. East	CAPREIT (Ofelia Guanlao)	27.6kV	Clarke TS	---	70M4	20kW
744 Fanshawe Park Rd. East	CAPREIT (Ofelia Guanlao)	27.6kV	Clarke TS	---	70M4	20kW
75 Fiddlers Green Rd.	CAPREIT (Ofelia Guanlao)	27.6kV	Talbot TS Desn 1	---	26M13	80kW
85 Fiddlers Green Rd.	CAPREIT (Ofelia Guanlao)	27.6kV	Talbot TS Desn 1	---	26M13	80kW
95 Fiddlers Green Rd.	CAPREIT (Ofelia Guanlao)	27.6kV	Talbot TS Desn 1	---	26M13	80kW
1010 Clarke Side Road	<b>Connect Energy &amp; Consulting (Yaakov (John) Kozak)</b>	27.6kV	Clarke TS	---	70M6	250kW
200 Adelaide St South	N//Ergy Solutions Inc.(Ian Brown)	27.6kV	Buchanan TS	---	19M38	75kW
109 Fanshawe St. East	Efan Green Inc (Tim Ding)	27.6kV	Talbot TS Desn 1	---	26M21	165kW
50 North Centre Rd	Efan Green Inc (Tim Ding)	27.6kV	Talbot TS Desn 1	---	26M21	248kW
600 Third Street	NorthGrid Solar (Julie Hand)	27.6kV	Clarke TS	---	70M8	250kW
825 Wellington Rd	Efan Green Inc (Tim Ding)	27.6kV	Buchanan TS	---	19M24	86kW
148 Stronach Crescent	Toews Power Systems (Ken Toews)	27.6kV	Clarke TS	---	70M5	209kW
295 Rectory St	PQI Canada Limited (Steve Rankin,P.Eng)	27.6kV	Highbury TS	---	4M13	500kW
3040 Osler Street	Efan Green Inc (Tim Ding)	27.6kV	Clarke TS	---	70M1	250kW
327 Sovereign Road	Ontario Solar Provider Inc (Ian Rice)	27.6kV	Highbury TS	---	4M15	350kW
45 Enterprise Drive	Efan Green Inc (Tim Ding)	27.6kV	Buchanan TS	---	19M27	229kW
1400 Global Drive	OMNIWATT (Mike Wolowich)	27.6kV	Buchanan TS	---	19M27	500kW
1425 Max Brose Drive	OMNIWATT (Mike Wolowich)	27.6kV	Buchanan TS	---	19M27	500kW
3020 Gore Road	OMNIWATT (Mike Wolowich)	27.6kV	Highbury TS	---	4M15	250kW
530 Oxford Street	German Solar Corp (Dennis German)	27.6kV	Talbot TS Desn 2	---	26M42	500kW
611 Wonderland Road	German Solar Corp (Dennis German)	27.6kV	Talbot TS Desn 2	---	26M42	250kW
37 Intrepid Court	Energy One Solar Inc (Cathy Marnoch)	27.6kV	Highbury TS	---	4M14	50kW
900 Wilton Grove Road	Efan Green Inc (Tim Ding)	27.6kV	Buchanan TS	---	19M26	86kW
20 Gammage Street	Solar Power Network (Taylor McKay)	27.6kV	Clarke TS	---	70M5	250kW
230 Marconi Blvd	Solar Power Network (Taylor McKay)	27.6kV	Highbury TS	---	4M14	190kW

465 Castlegrove Blvd	Solar Power Network (Taylor McKay)	27.6kV	Talbot TS Desn 2	---	26M55	100kW
15600 Robins Hill Road	OMNIWATT (Mike Wolowich)	27.6kV	Clarke TS	---	70M1	500kW
8 Cuddy Blvd	Bio-en Power Inc (Earl Brubacher)	27.6kV	Clarke TS	---	70M1	2852kW
2867 Dundas Street	Ontario Solar Provider Inc (Ian Rice)	27.6kV	Clarke TS	---	70M1	80kW
2889 Dundas Street	Ontario Solar Provider Inc (Ian Rice)	27.6kV	Clarke TS	---	70M1	100kW
165 Emery St W	Solar Power Network (Taylor McKay)	4.16kV	Talbot TS Desn 2	22F4	26M41	90kW
30 Conway Drive	Solar Power Network (Taylor McKay)	27.6kV	Buchanan TS	---	19M23	105kW
403 Commissioners Rd W	Solar Power Network (Taylor McKay)	27.6kV	Talbot TS Desn 1	---	26M22	140kW
2106 Glanworth Drive	Mann Engineering Ltd (Joan Du)	8.32kV	Wonderland TS	97F2	32M6	100kW
346 Springbank Drive	Solart LLL Corp (Laura Wittebol)	27.6kV	Talbot TS Desn 1	---	26M22	12.35kW
145 Base line Road West	GTS Solar Solutions Inc. (Todd Wootton)	27.6kV	Talbot TS Desn 2	---	26M41	60kW
31 Firestone Blvd	QPA Solar Inc. (Richard Weston)	27.6kV	Highbury TS	---	4M16	500kW
3820 Commerce Road	Sun Edison (Anna Lauritzen)	27.6kV	Buchanan TS	---	19M22	52kW
3915 Commerce Road	Sun Edison (Anna Lauritzen)	27.6kV	Buchanan TS	---	19M22	161kW
1930 Mallard Rd	ES Tache Investments Ltd. (Dave Egles)	27.6kV	Talbot TS Desn 2	---	26M54	100kW
962 Leathorne	ES Tache Investments Ltd. (Dave Egles)	27.6kV	Buchanan TS	---	19M38	100kW
2106 Fanshawe Pk Rd East	QPA Solar Inc. (Richard Weston)	27.6kV	Clarke TS	---	70M4	10,000kW
825 Bradley Ave	German Solar Corp (Dennis German)	27.6kV	Buchanan TS	---	19M28	500kW
185 Ashland Ave	Global Energy Solutions (Tracy Collins)	27.6kV	Buchanan TS	---	19M29	240kW
203 Bathurst Street	Global Energy Solutions (Tracy Collins)	27.6kV	Highbury TS	---	4M13	100kW
3700 Old Victoria Road	OSP - Ontario Solar Provider (Ian Rice)	27.6kV	Buchanan TS	---	19M21 HO cct	500kW
715 Fanshawe Park Road	Global Energy Solutions (Tracy Collins)	27.6kV	Talbot TS Desn 2	---	26M56	135kW
2724 Roxburgh Road	Northern Sun Energy (Craig Hanna)	27.6kV	Buchanan TS	---	19M22	100kW
459 Industrial Road	Solar Power Network (Taylor McKay)	27.6kV	Clarke TS	---	70M1	500kW
6320 Colonel Talbot Rd	Northern Sun Energy (Craig Hanna)	8.32kV	WONDERLAND TS	97F2	32M6	150kW
3410 White Oaks Road	Advanced Solar Investments (Kevin Peckford)	27.6kV	Buchanan TS	---	19M22	250kW
360 Exeter Road	Advanced Solar Investments (Kevin Peckford)	27.6kV	Buchanan TS	---	19M22	250kW
3660 White Oaks Road	Advanced Solar Investments (Kevin Peckford)	27.6kV	Buchanan TS	---	19M22	250kW

2022 Kains Rd	Northern Sun Energy (Craig Hanna)	27.6kV	Talbot TS Desn 1	---	26M13	120kW
2724 Roxburgh Road	N//Ergy Solutions Inc.(Ian Brown)	27.6kV	Buchanan TS	---	19M22	100kW
2800 Roxburgh Road	CarbonFree Technology (Antonio Antonopoulos)	27.6kV	Buchanan TS	---	19M22	250kW
4350 Castleton Road	CarbonFree Technology (Antonio Antonopoulos)	27.6kV	Buchanan TS	---	19M22	250kW
4575 Blakie Road	OSP - Ontario Solar Provider (Luke Slater)	27.6kV	WONDERLAND TS	---	32M1	500kW
37 Intrepid Court	Rumble Energy Inc. (Jared Hampden)	27.6kV	Highbury TS	---	4M14	50kW
3036 Page Street	Marnoch Energy Inc. (Cathy Marnoch)	27.6Kv	Clarke TS	---	70M1	180kW
1050 Hargrieve Road	Ozz Solar (Bobby MacCannell)	27.6kV	Buchanan TS	---	19M28	100kW
350 Sovereign Road	Ozz Solar (Bobby MacCannell)					100kW
375 Sovereign Road	Ozz Solar (Bobby MacCannell)					100kW
575 Industrial Road	Sky Solar Engineering (Frank Ruffolo)	27.6kV	Clarke TS	---	70M1	500kW
747 Hyde Park Road	SolPowered Energy Corp (Marc Viau)	27.6kV	Talbot TS Desn 2	---	26M54	75kW
1105 Wellington Road	Sun Edison (Anna Lauritzen)	27.6kV	Buchanan TS	---	19M28	280kW
1105 Wellington Road	Sun Edison (Anna Lauritzen)	27.6kV	Buchanan TS	---	19M23	280kW
1105 Wellington Road	Sun Edison (Anna Lauritzen)	27.6kV	Buchanan TS	---	19M23	280kW
1680 Richmond Street	Sun Edison (Anna Lauritzen)	27.6kV	Talbot TS Desn 2	---	26M46	430kW
1680 Richmond Street	Sun Edison (Anna Lauritzen)	27.6kV	Talbot TS Desn 1	---	26M21	430kW
330 Sovereign Road	Solar Power Network (Taylor McKay)	27.6kV	Highbury TS	---	4M15	130kW
695 Sovereign Road	Sonnen Pal Energy Inc. (Wade He)	27.6kV	Highbury TS	---	4M14	166kW
10 Artisan's Crescent	Solarize Energy LP (Ileana Olivar)	27.6kV	Clarke TS	---	70M1	75kW
151 Pine Valley Blvd	Sonnen Pal Energy Inc. (Wade He)	27.6kV	WONDERLAND TS	---	32M7	60kW
55 Mid Park Crescent	Greenlight Projects Inc. (Karl Repka)	27.6kV	Buchanan TS	---	19M27	100kW
1050 Kipps Ln	ESEI Solar Inc. (Grace An)	27.6kV	Clarke TS	---	70M7	40kW
140 Ann Street	ESEI Solar Inc. (Grace An)	27.6kV	Talbot TS Desn 1	---	26M14	100kW
695 Sovereign Road	Sol Energy Corp. (Stuart Murray)	27.6kV	Highbury TS	---	4M14	400kW
155 Tweedsmuir Avenue	Ameresco Canada Inc. (Rishi Poddar)	4.16kV	Highbury TS	18F2	4M16	50kW
225 Cairn Street	Ameresco Canada Inc. (Lea Poquerusse)	4.16kV	Buchanan TS	15F3	19M25	30kW
2727 Tokala Trail	Ameresco Canada Inc.(Cathy Cheung)	27.6kV	Talbot TS Desn 2	---	26M54	250kW

5200 Wellington Road South	Ameresco Canada Inc. (Rishi Poddar)	27.6kV	Buchanan TS	---	19M22	110kW
690 Viscount Road	Ameresco Canada Inc. (Rishi Poddar)	4.16kV	WONDERLAND TS	96F1	32M7	30kW
767 Valetta Street	Ameresco Canada Inc.(Cathy Cheung)	4.16kV	Talbot TS Desn 2	39F2	26M42	30kW
1440 Glenora Drive	Ameresco Canada Inc. (Flavia Harriott)	4.16kV	Talbot TS Desn 1	17F1	26M11	30kW
1958 Duluth Crescent	Ameresco Canada Inc. (Flavia Harriott)	27.6kV	Highbury TS	---	4M16	30kW
347 Lyle Street	Ameresco Canada Inc. (Flavia Harriott)	27.6kV	Highbury TS	---	4M13	30kW
430 Industrial Road	Solarize Energy LP (Ileana Olivar)	27.6kV	Clarke TS	---	70M1	150kW
218 Clarke Side Road	Ontario Solar Provider Inc (Kendra Marjerrison)	27.6kV	Highbury TS	---	4M16	100kW
4838 Colonel Talbot	Solar Power Network (Taylor McKay)	27.6kV	Wonderland TS	---	32M6	500kW
2552 Dingman Drive	Discovery Geo Energy (Chris Hall)	4.16kV	Buchanan TS	98F1	19M22	55kW
99 Dundas Street	Ontario Solar Provider Inc (Kendra Marjerrison)	13.8kV	Nelson TS DESN 1	---	13M1	150kW
1700 Hyde Park Road	Green Flow Energy (Brandon Taylor)	27.6kV	Talbot TS Desn 2	---	26M54	70kW
24 Braesyde Ave	MV Power Systems (Harold Vander Glas)	27.6kV	Highbury TS	---	4M15	169kW
6675 Burtwistle Lane	Solarfortis (Darin Wong)	27.6kV	Edgware	---	27M2	1400kW
6675 Burtwistle Lane	Solarfortis (Darin Wong)	27.6kV	Edgware	---	27M2	165kW
765 Exeter Road	Solarfortis (Darin Wong)	27.6kV	Buchanan TS	---	19M28	500kW
1588 Clarke Road	Joe Fontana	4.16kV	Clarke TS	83F1	70M3	2000kW
31 Buchanan Court	Amp Solar Group Inc (Kate Riley)	27.6kV	Buchanan TS	---	19M26	50kW
7236 Colonel Talbot	Amp Solar Group Inc (Kate Riley)	27.6kV	Edgware	---	27M2	175kW
1005 Wilton Grove Road	Bright Power (Jamie Tremaine)	27.6kV	Buchanan TS	---	19M26	500kW
1030 Adelaide Street South	Bright Power (Jamie Tremaine)	27.6kV	Buchanan TS	---	19M28	500kW
1550 Trossacks Avenue	Blackstone Energy Services Inc (Bill Cotter)	27.6kV	Clarke TS	---	70M4	40kW
297 Baseline Road	Blackstone Energy Services Inc (Bill Cotter)	27.6kV	Buchanan TS	---	19M22	30kW
3435 White Oak Road	Bright Power (Jamie Tremaine)	27.6kV	Buchanan TS	---	19M22	250kW
35 Atlantic Court	Bright Power (Jamie Tremaine)	27.6kV	Highbury TS	---	4M17	135kW
470 Scenic Drive	Blackstone Energy Services Inc (Bill Cotter)	4.16kV	Buchanan TS	40F1	19M38	30kW
556 Wonderland Road	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Talbot TS Desn 2	---	26M42	250kW
677 Wharnccliffe Road	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Wonderland TS	---	32M7	250kW

982 Hubrey Road	Bright Power (Jamie Tremaine)	27.6kV	Buchanan TS	---	19M27	250kW
529 Philips Street	Green Flow Energy (Brandon Taylor)	13.8kV	Nelson TS DESN 2	---	13M15	77kW
3435 White Oak Road	Solar Power Network (Taylor McKay)	27.6kV	Buchanan TS	---	19M22	250kW
35 Atlantic Court	Solar Power Network (Taylor McKay)	27.6kV	Highbury TS	---	4M17	135kW
4575 Blakie Road	German Solar Corp (Greg Edwards)	27.6kV	WONDERLAND TS	---	32M1	500kW
580 Industrial Road	Sun Edison (Anna Lauritzen)	27.6kV	Clarke TS	---	70M1	250kW
1717 Oxford Street East	Efan Green Inc (Tim Ding)	27.6kV	Clarke TS	---	70M8	250kW
396 Queens Ave	Blackstone Energy Services Inc (Bill Cotter)	27.6kV	Nelson TS DESN 2	8K6	13M33	30kW
554 First Street	Efan Green Inc (Tim Ding)	4.16kV	Highbury TS	29F1	4M18	130kW
565 Talbot St	Blackstone Energy Services Inc (Bill Cotter)	27.6kV	Talbot TS Desn 1	---	26M22	15kW
770 Wonderland Rd S	Blackstone Energy Services Inc (Bill Cotter)	27.6kV	Talbot TS Desn 1	---	26M25	20kW
1750 Crumlin Road	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	---	70M1	200kW
4300 Wellington Road	Solar Power Network (Luis Jaramillo)	27.6kV	Buchanan TS	---	19M22	250kW
1069 Clarke Road	Green Flow Energy (Brandon Taylor)	27.6kV	Clarke TS	---	70M5	60kW
3435 White Oak Road	Ontario Solar Provider Inc (Kendra Marjerrison)	27.6kV	Buchanan TS	---	19M22	250kW
931 Leathorne Street	Green Flow Energy (Brandon Taylor)	27.6kV	Buchanan TS	---	19M38	60kW
4838 Colonel Talbot	Solar Power Network (Luis Jaramillo)	27.6kV	Wonderland TS	---	32M6	500kW
6675 Burtwhistle Line	Canadian Solar (Markian Silecky)	27.6kV	Edgware	---	27M2	135kW
645 Wilton Grove Rd	German Solar Corp (Greg Edwards)	27.6KVA	Buchanan TS	---	19M28	366 kW
35 Atlantic Court	Ontario Solar Provider Inc (Kendra Marjerrison)	27.6kV	Highbury TS	---	4M17	135kW
111 Baseline Road West	Whitney Engineering (Kyle McIntosh)	27.6kv	Talbot TS Desn 2	---	26M41	60kW
695 Talbot Street	Whitney Engineering (Kyle McIntosh)	27.6KVA	Talbot TS Desn 1	---	26M22	85kW
825 Bradley Ave	Whitney Engineering (Kyle McIntosh)	27.6kV	Buchanan TS	---	19M28	200kW
1010 Wilton Grove Rd	German Solar Corp (Greg Edwards)	27.6kV	Buchanan TS	---	19M22	180kW
1010-A Wilton Grove Rd	German Solar Corp (Greg Edwards)	27.6kV	Buchanan TS	---	19M22	108kW
1420 Global Dr	German Solar Corp (Greg Edwards)	27.6kV	Buchanan TS	---	19M27	120kW
15875 Robin's Hill Rd	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	---	70M1	120kW
1855 Oxford Street East	Ontario Solar Provider Inc (Kendra Marjerrison)	27.6kV	Clarke TS	---	70M8	70kW



3851 Commerce Rd	German Solar Corp (Greg Edwards)	27.6kV	Buchanan TS	---	19M27	120kW
645 Wilton Grove Rd	German Solar Corp (Greg Edwards)	27.6KVA	Buchanan TS	---	19M28	366 kW
3093 Glanworth Drive	Informed Energy Solutions Inc. (Gary Vida)	8.32kV	Wonderland TS	97F2	32M6	80kW
1840 Oxford Street East	JCM Capital (Jon Rathouser)	27.6kV	Clarke TS	---	70M8	500kW
84-88 Oakville Ave	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Clarke TS	---	70M3	250kW
1010 Clarke Road	Solar Power Network (Luis Jaramillo)	27.6kV	Clarke TS	---	70M6/M8	500kW
955 Wilton Grove Road	Stantec (Craig Wilson)	27.6kV	Buchanan TS	---	19M26	2500kW
1205 Green Valley Rd	German Solar Corp (Greg Edwards)	27.6kV	Buchanan TS	---	19M22	3000kW
1985 Gore Rd	German Solar Corp (Greg Edwards)	27.6kV	Highbury TS	---	4M15	5500kW
2040 Oxford St E	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	49F2	70M6	3000kW
15701 Robins Hill Road Bldg C	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	---	70M1	60kW
15911 Robins Hill Road Bldg G	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	---	70M1	198kW
2351 Huron Street Bldg E	German Solar Corp (Greg Edwards)	27.6kV	Clarke TS	---	70M1	80kW
4047 Dowell Drive	Solarize Energy LP (Ileana Olivar)	27.6kV	Buchanan TS	---	19M22	150kW
1050 Hargrieve Road	Potentia Solar (Michele Smith)	27.6kV	Buchanan TS	---	19M28	100kW
150 Simcoe Street	Sun Connect Canada (Susan Shaw)	13.8kV	Nelson TS DESN 2	1K3	13M34	500kW
335 Sovereign Road	Potentia Solar (Michele Smith)	27.6kV	Highbury TS	---	4M15	75kW
1104 Adelaide St North	Mann Engineering (Ryan Cheddi)	27.6kV	Clarke TS	---	70M7	112kW
1240 Commissioners Rd West	Mann Engineering (Ryan Cheddi)	27.6kV	Wonderland TS	---	32M8	250kW
6171 Colonel Talbot Rd	Arntjen Solar North America (Rich Wilton)	27.6kV	WONDERLAND TS	97F2	32M6	100kW
420 Neptune Crescent	Amp Solar Group Inc (Mona Travale)	27.6kV	Highbury TS	---	4M15	45kW
1120 Dearness Drive	Amp Solar Group Inc (Mona Travale)	27.6kV	Buchanan TS	---	19M28	50kW
3020 Gore Road	Shaka David	27.6kV	Highbury TS	---	4M15	200kW
1425 Max Brose Drive	KBRE Ltd (Jamie Kent)	27.6kV	Buchanan TS	---	19M27	3000kW
1100 Dundas St	Solar Power Network (Luis Jaramillo)	27.6kV	Clarke TS	---	70M5	499kW
23 Buchanan Court	Solar Power Network (Luis Jaramillo)	27.6kV	Buchanan TS	---	19M26	499kW
2809 Roxburgh Rd	Solar Power Network (Luis Jaramillo)	27.6kV	Buchanan TS	---	19M22	499kW
420 Burbrook Place	Solar Power Network (Luis Jaramillo)	27.6kV	Clarke TS	---	70M5	499kW

635 Wilton Grove Rd	Solar Power Network (Luis Jaramillo)	27.6kV	Buchanan TS	---	19M22	499kW
25 Cuddy Blvd	Glenbarra Energy Management Corp. (John Hamilton)	27.6kV	Clarke TS	---	70M1	200kW
2386 Main Street	New Solar Inc (Brian Young)	27.6kV	WONDERLAND TS	---	32M6	68kW
1200 Western Road	Ainsworth Inc (Rehab Rawoof)	27.6kV	Talbot TS Desn 2	---	26M55	140kW
1504 Highbury Ave	Renewable Power Plus (Emmanuel Azzopardi)	27.6kV	Clarke TS	---	70M4	170kW
955 Gainsborough Road	Synergy + Energy Solutions Inc (Todd Gillick)	27.6kV	Talbot TS Desn 2	---	26M54	150kW
4575 Blakie Road	Go Clean Go Green (Erik Rudy)	27.6kV	WONDERLAND TS	---	32M1	500kW
46 Firestone Blvd	Sol Energy Corp. (Stuart Murray)	27.6kV	Highbury TS	---	4M16	150kW
994 Hargrrieve Road	Sun Connect Canada (Susan Shaw)	27.6kV	Buchanan TS	---	19M28	250kW
90 Enterprise Drive	ADELAIDE SOLAR ENERGY INC. (Dervla O'Reilly)	27.6kV	Buchanan TS	---	19M27	200kW
1020 Wonderland Road South	JCM Capital (Amar Kher)	27.6kV	WONDERLAND TS	---	32M7	150kW
1560 Hyde Park Road	QPA Solar Inc. (Marjan Stosic)	27.6kV	Talbot TS Desn 2	---	26M54	10kW
328 Commissioners Rd West	JCM Capital (Amar Kher)	27.6kV	Talbot TS Desn 1	93F1	26M22	50kW
665 Adelaide Street North	JCM Capital (Amar Kher)	27.6kV	Highbury TS	---	4M13	150kW
600 Oxford St West	Solar Tech Northern Lights (Joe D'Urzo)	27.6kV	Talbot TS Desn 2	---	26M42	250kW
1150 Wharnclyffe South	Green Light Projects Inc. (Karl Repka)	27.6kV	WONDERLAND TS	---	32M4	250kW
6886 Colonel Talbot Road	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Edgeware	---	27M2	200kW
2290 Scanlan Street	Moose Power (Jamie Tremaine)	27.6kV	Highbury TS	---	4M15	500kW
5 Cuddy Blvd	Moose Power (Jamie Tremaine)	27.6kV	Clarke TS	---	70M1	500kW
White Oak Rd / 402	Sonnen Pal Energy Inc. (Wade He)	27.6kV	Wonderland TS	---	32M1	10,000kW
Wonderland / 402	Sonnen Pal Energy Inc. (Wade He)	8.32kV	Wonderland TS	step down xfmr	32M1	10,000kW
1921 Huron Street	Ontario Solar Provider Inc (Luke Slater)	27.6kV	Clarke TS	---	70M6	250kW
1045 Wonderland Rd. N.	Ameresco Canada Inc. (Rishi Poddar)	27.6kV	Talbot TS Desn 2	---	26M56	210kW
186 King Street	Solar Stream Green Energy Group (Lorraine Marshall)	13.8kV	Nelson TS DESN 1	---	13M3	50kW
817 Exeter Road	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Buchanan TS	---	19M28	500kW
370 Exeter Road	Built-Rite Energy Systems (Chris Campbell)	27.6kV	Buchanan TS	---	19M22	250kW
540 First Street	Solar Stream Green Energy Group (Lorraine Marshall)	27.6kV	Highbury TS	---	4M12	75kW
1105 Wellington Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M37	500kW

1105 Wellington Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M23	500kW
1105 Wellington Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M23	500kW
1164 Gainsborough Road	Arntjen Solar North America (Mike Meidlinger)	27.6kV	Talbot TS Desn 2	---	26M54	100kW
140 Clarke Road	Arntjen Solar North America (Mike Meidlinger)	4.16kV	Highbury TS	18F3	4M16	20kW
4056 Blakie Road	Arntjen Solar North America (Mike Meidlinger)	27.6kV	Wonderland TS	---	32M1	75kW
425 Newbold St	German Solar Corp (Robert Avison)	27.6kV	Buchanan TS	---	19M28	75kW
25 Cuddy Blvd	Glenbarra Energy Management Corp. (Gary Murakami)	27.6kV	Clarke TS	---	70M1	200kW
570 Industrial Road	Solar Power Network (Keith Richardson)	27.6kV	Clarke TS	---	70M1	425kW
85 MidPark Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M27	170kW
126 Clarke Road	Maple Solar Development Inc.(Jinwoo Song)	4.16kV	Highbury TS	18F3	4M16	150kW
2800 Roxburgh Road	CarbonFree Technology (Ven Seshadri)	27.6kV	Buchanan TS	---	19M22	250kW
4350 Castleton Road	CarbonFree Technology (Ven Seshadri)	27.6kV	Buchanan TS	---	19M22	250kW
300 Southdale Road East	Green Life Power ( Mike Apostol)	27.6kV	Wonderland TS	---	32M7	100kW
640 Wonderland RoadNorth	Green Life Power ( Mike Apostol)	27.6kV	Talbot TS Desn 2	---	26M42	150kW
363 Sovereign Road	Solar Power Network (Keith Richardson)	27.6kV	Highbury TS	---	4M15	325kW
76 Doulton Street	Solera Sustainable Energies Company (Shael Rotman)	27.6kV	Buchanan TS	---	19M29	55kW
7292 Colonel Talbot Road	Solar Power Network (Keith Richardson)	27.6kV	Edgeware	---	27M2	300kW
2552 Dingman Drive	Discovery Geo Energy (Jeff Schlueter)	4.16kV	Buchanan TS	98F1	19M22	55kW
2449 Dundas Street	Solar Power Network (Keith Richardson)	27.6kV	Clarke TS	---	70M1	275kW
1065 Wharnclyffe Rd	Solera Sustainable Energies (Shael Rotman)	27.6kV	Wonderland TS	---	32M4	225.5kW
295 Rectory Street	Solarize Energy LP (Carlos Leite)	27.6kV	Highbury TS	---	4M13	250kW
4047 Dowell Drive	Solarize Energy LP (Carlos Leite)	27.6kV	Buchanan TS	---	19M22	150kW
430 Industrial Road	Solarize Energy LP (Carlos Leite)	27.6kV	Clarke TS	---	70M1	85kW
3502 Manning Drive	Ameresco Canada Inc. (Jim Fonger)	27.6kV	Wonderland TS	---	32M1	800kW
220 Sunnyside Drive	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Talbot TS Desn 2	---	26M47	75kW
329 Hudson Drive	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Highbury TS	---	4M14	60kW
690 Osgoode Drive	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Buchanan TS	---	19M28	82kW
2552 Dingman Drive	SkyFire Energy (Danny Howard)	4.16kV	Buchanan TS	98F1	19M22	50kW

155 Tweedsmuir Avenue	Ameresco Canada Inc. (Rishi Poddar)	4.16kV	Highbury TS	18F2	4M16	50kW
170 Hawthorne Road	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Talbot TS Desn 2	---	26M42	82kW
767 Valetta Street	Ameresco Canada Inc.(Cathy Cheung)	4.16kV	Talbot TS Desn 2	39F2	26M42	30kW
575 Industrial Road	Sky Solar Engineering (Frank Ruffolo)	27.6kV	Clarke TS	---	70M1	500kW
1440 Glenora Drive	Ameresco Canada Inc.(Cathy Cheung)	4.16kV	Talbot TS Desn 1	17F1	26M11	35kW
2330 Dundas Street	QPA Solar Inc. (Richard Weston)	27.6kV	Clarke TS	---	70M8	
347 Lyle Street	Ameresco Canada Inc.(Cathy Cheung)	27.6kV	Highbury TS	---	4M13	35kW
690 Viscount Road	Ameresco Canada Inc.(Cathy Cheung)	4.16kV	WONDERLAND TS	96F1	32M7	35kW
635 Wilton Grove Rd	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M22	500kW
1921 Huron Street	Solartgroup (Sunny Natalia)	27.6kV	Clarke TS	---	70M6	500kW
1958 Duluth Crescent	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Highbury TS	---	4M16	35kW
225 Cairn Street	Ameresco Canada Inc.(Mary-Lynne Marino)	4.16kV	Buchanan TS	15F3	19M25	19.2kW
5250 Wellington Rd	Ameresco Canada Inc.(Mary-Lynne Marino)	27.6kV	Buchanan TS	---	19M22	100kW
25 Invicta Court	Icarus Power Generation Inc (Gus Kokkoros)	27.6kV	Buchanan TS	---	19M28	250kW
400 Newbold Street	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M28	400kW
110 Tower Line Place	SolPowered Energy Corp (Mike Perrault)	27.6kV	Buchanan TS	---	19M28	200kW
1961 Cedarhollow Blvd	QPA Solar Inc. (Richard Weston)	27.6kV	Clarke TS	---	70M4	90kW
31 Firestone Blvd	QPA Solar Inc. (Richard Weston)	27.6kV	Highbury TS	---	4M16	500kW
1036 Green Valley Road	Moose Power (Ephrem Chemali)	27.6kV	Buchanan TS	---	19M26	500kW
3959 Commerce Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M27	250kW
982 Hubrey Road	Moose Power (Ephrem Chemali)	27.6kV	Buchanan TS	---	19M27	250kW
99 Ash Street	Moose Power (Ephrem Chemali)	27.6kV	Highbury TS	---	4M13	250kW
1000 Clarke Road	Moose Power (Ephrem Chemali)	27.6kV	Clarke TS	---	70M6	500kW
1875 Wharnclyffe Road South	Moose Power (Ephrem Chemali)	27.6kV	Wonderland TS		32M6	250kW
2400 Innovation Drive	Solarize Energy LP (Jeremy Leite)	27.6kV	Buchanan TS	---	19M30	250kW
2879 Innovation Drive	Solarize Energy LP (Jeremy Leite)	27.6kV	Buchanan TS	---	19M30	250kW
970 - 1020 Pond Mills Road	Moose Power (Ephrem Chemali)	27.6kV	Buchanan TS	---	19M27	500kW
993 Adelaide Street South	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M28	500kW

1065 Wharncliffe Road South	QPA Solar Inc. (Richard Weston)	27.6kV	Wonderland TS	---	32M4	234kW
590 Wharncliffe Road South	QPA Solar Inc. (Richard Weston)	27.6kV	Wonderland TS	---	32M7	142kW
601 Oxford Street West	QPA Solar Inc. (Richard Weston)	27.6kV	Talbot TS Desn 2	---	26M54	109kW
721 Hamilton Road	Mann Green Earth Rooftop LP (John Wong)	27.6KV	Highbury TS	---	4M13	47kW
4575 Blakie Road	Ray's Electric Inc (Don Payne)	27.6kV	WONDERLAND TS	---	32M1	250kW
111 - 117 Brydges Street	Gemco Solar Inc (Lorraine Howden)					150kW
110 Tower Line Place	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M28	250kW
30 Adelaide St North	Green Power Promotions (Andrew Hall-Holand)	13.8kV	Nelson TS DESN 2	---	13M15	100kW
765 Exeter Road	Eclipsall Solar Corp (Humayun Sheikh)	27.6kV	Buchanan TS	---	19M37	500kW
330 Sovereign Road	Solar Power Network (Keith Richardson)	27.6kV	Highbury TS	---	4M15	135kW
4300 Wellington Road	Solar Power Network (Keith Richardson)	27.6kV	Buchanan TS	---	19M22	250kW
1282 Hyde Park Road	Solarize Energy LP (Erin Cardy)	27.6kV	Talbot TS Desn 2	---	26M54	250kW
1804 Gore Road	Certified Solar (Aman Khera)	27.6kV	Highbury TS	18F3	4M16	260kW
1994 River Road	Certified Solar (Aman Khera)	27.6kV	Highbury TS	---	4M15	100kW
295 Rectory Street	Certified Solar (Aman Khera)	27.6kV	Highbury TS	---	4M13	500kW
2330 Scanlan Street	2318190 Ontario Ltd (Craig O'Brien)	27.6kV	Highbury TS	---	4M15	165kW
900 Wilton Grove Road	2318190 Ontario Ltd (Craig O'Brien)	27.6kV	Buchanan TS	---	19M26	75kW
982 Hubrey Road	2318190 Ontario Ltd (Craig O'Brien)	27.6kV	Buchanan TS	---	19M27	225kW
3410 White Oaks Road	RESCo Energy Inc (Daniel Kishimoto)	27.6kV	Buchanan TS	---	19M22	400kW
2200 Wharncliffe Road	Solar Power Network (Keith Richardson)	27.6kV	Wonderland TS	---	32M6	225kVA
1020 Wonderland Road South		27.6kV	WONDERLAND TS	---	32M7	150kW
1740 Richmond Street		27.6kV	Talbot TS Desn 1	---	26M12	135kW
448 CLARKE Side ROAD	Ozz Solar (Richard Di Bon)	27.6kV	Clarke TS	---	70M8	300kW
600 FANSHAWE PARK RD E	Ozz Solar (Richard Di Bon)	27.6kV	Talbot TS Desn 1	---	26M21	450kW
825 OXFORD STREET EAST		27.6kV	Clarke TS	---	70M5	375kW