EB-2013-0053

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B;

AND IN THE MATTER of an application by Hydro One Networks Inc. for an order or orders pursuant to section 92 of the *Ontario Energy Board Act, 1998* for Leave to Construct upgraded electricity Transmission Line Facilities in the Kitchener-Waterloo-Cambridge-Guelph area.

ENVIRONMENTAL DEFENCE'S ARGUMENT
(Hydro One Guelph Area Transmission Line Leave to Construct Application)

KLIPPENSTEINS
Barristers and Solicitors
160 John Street, Suite 300
Toronto, Ontario M5V 2E5

Murray Klippenstein, LSUC No. 26950G
Kent Elson, LSUC No. 57091I
Tel.: (416) 598-0288
Fax: (416) 598-9520

Lawyers for Environmental Defence

> "*Saving energy means saving money – for families, businesses, hospitals, schools and other public institutions. Reducing or shifting electricity use avoids the need for new generation as well as transmission, reduces strain on the electricity system and improves the efficiency of the power grid. Conservation provides significant economic and environmental benefits; for every $1 invested in energy efficiency, Ontario has avoided about $2 in costs to the electricity system.*"
>
> Ontario Ministry of Energy, *Conservation First, A Renewed Vision for Energy Conservation in Ontario,* July 16, 2013, p.1 [Compendium, tab 1]

Overview and Request

1. The Ontario Power Authority ("OPA") has asked Hydro One to upgrade its transmission system in the City of Guelph to: (1) meet a forecast of rapidly rising demand for electricity in the Kitchener-Waterloo-Cambridge-Guelph ("KWCG") area; and (2) to increase the reliability of its transmission system.[1] As a consequence, Hydro One is now seeking leave from the Ontario Energy Board (the "Board") to construct a new transmission line and related transmission facilities at a cost of between $95 and $105 million dollars.[2]

2. Environmental Defence submits that Hydro One has not shown that the proposed transmission project is in the public interest. On the contrary, it appears that an integrated combination of conservation and demand management ("CDM") and small-scale, local distributed generation ("DG") can meet the KWCG area's electricity needs *sooner, more reliably, and at a much lower cost.* These three factors, which are detailed below, can be briefly summarized as follows:

   a. Timing: the proposed transmission upgrades will not be in place until the second quarter of 2016 whereas incremental CDM and DG could be implemented starting this year;

   b. Reliability: the proposed transmission upgrades increase reliability *only* in relation to local transmission system risks (e.g. a downed local transmission line) whereas CDM and DG increase reliability in relation to local transmission system risks and *also* in

[1] OPA, *Kitchener-Waterloo-Cambridge-Guelph Area*, March, 2013 Ex. B, Tab 1, Schedule 5, ps. 2 & 3 (the "OPA KWCG Report") [Compendium, tab 2
[2] OPA KWCG Report, Ex. B, Tab 1, Schedule 5, p. 28 [Compendium, tab 2

relation to province-wide transmission or generation risks (e.g. a provincial blackout or downed lines outside the KWCG area resulting from extreme weather); and

c. Lower cost: the proposed $100 million transmission upgrades are much more costly than CDM (which can result in net *savings* to consumers through avoided electricity costs) and base load DG (which is more cost-effective because it can avoid the cost of building new generation facilities elsewhere in Ontario).

3. There is significant evidence on the record to suggest that a combination of CDM and DG is a feasible and preferred alternative. However, Environmental Defence need not conclusively establish that CDM and DG are preferred. Instead, Environmental Defence simply must show that the Applicant has not met *its* burden to establish that the proposed transmission project is the preferred alternative; Environmental Defence submits that this burden clearly has not been met.

4. Hydro One did *not* analyze a CDM/DG alternative as part of its decision-making process; it did not even assess the CDM potential in the KWCG area. Furthermore, the OPA's after-the-fact analysis of CDM and DG is fundamentally flawed and completely insufficient, as detailed below.

5. Environmental Defence requests:

a. An order denying leave to construct the proposed facilities pending the creation of a thorough cost-benefit comparison of the proposed project versus an integrated combination of CDM and DG; and

b. A direction or statement that, in the future, Hydro One and the OPA should comprehensively assess CDM and DG as alternatives to supply-side transmission upgrades early in the planning process such that CDM and DG alternatives can be identified and adopted wherever they are the most cost-effective option.

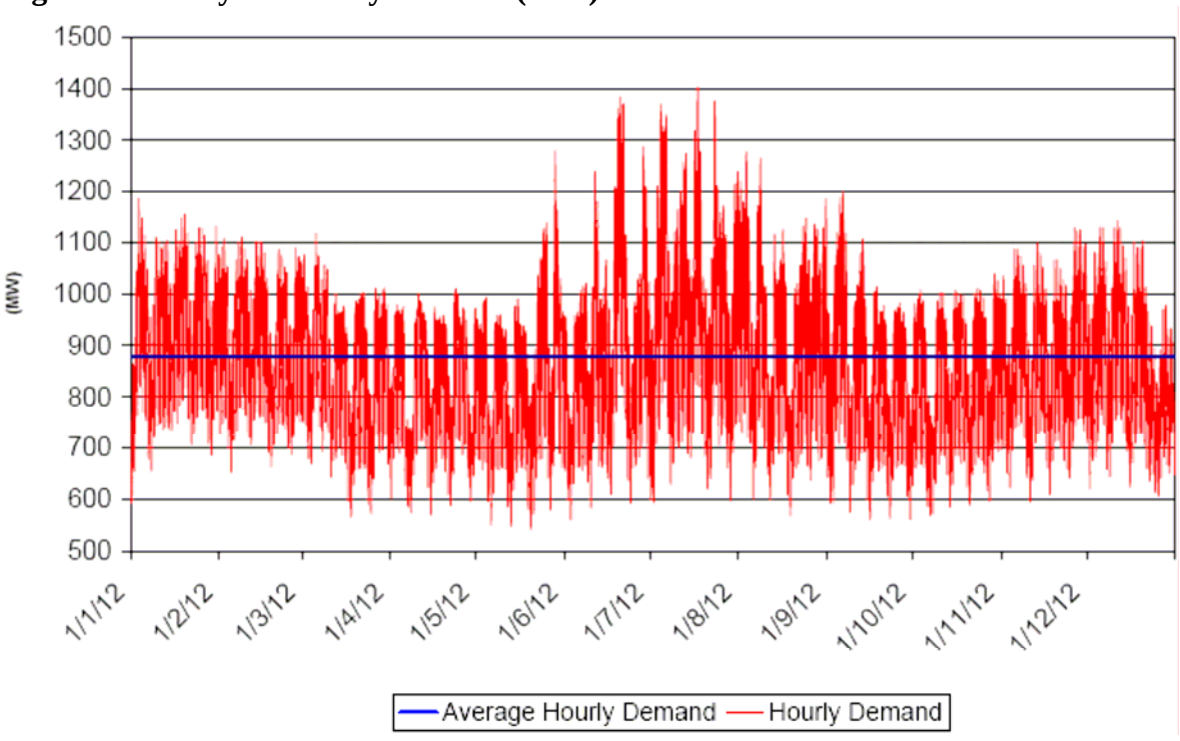
6. Environmental Defence has provided a Compendium containing key materials cited in these submissions. For ease of reference, the citations in this Argument provide the tab number where the relevant material can be located.

The OPA Fails to Account for the "Peakiness" of the KWCG Load Profile

7. The proposed transmission project does not adequately account for, or take advantage of, the fact that electricity demand in the KWCG area is subject to extreme peaks. By way of background, electricity transmission infrastructure is generally sized based on *peak* electricity demand rather than *average* electricity demand, even though peak demand is often far above the average. As a result, efforts to reduce peak demand, such as the "*peaksaver*" program, can have a large impact on transmission infrastructure needs.

8. Figure 1 below plots the demand for electricity in the KWCG area during every hour in 2012.[3] Figure 1 reveals that the demand for electricity in the KWCG area spikes on approximately a dozen very hot summer days when customers' air conditioners are running full out. While the KWCG area's peak hour demand for electricity was 1,403 megawatts ("MW") in 2012, its demand for electricity exceeded 1,200 MW for only 2% of the hours (183 hours) that year. Furthermore, the KWCG area's peak hour demand was approximately 60% greater than its average hourly demand for electricity. The average hourly demand was 877 MW whereas the peak hourly demand was 1,403 MW.

Figure 1: Hourly Electricity Demand (MW) in the KWCG area



[3] All of the charts in this document are based on the data provided in response to ED Interrogatory No. 2 (Ex. I, Tab 2, Schedule 2, Attachment 1

9. The above figure illustrates two important points.

10. First, transmission capacity needs can be greatly curtailed by focusing on just a small number of summer hours when electricity demand spikes. The figure shows that reductions are needed only for short periods of time.

11. Second, the proposed transmission project fails to take advantage of the "peakiness" in demand because it simply increases the overall baseline supply capacity, rather than focusing on the spikes in demand that are the source of the problem.

Load Forecast: The OPA Overestimates the Need for Increased Capacity

12. The justification for this project is based on a forecast that predicts significant electricity growth in the KWCG area for each year until 2026. However, this forecast is highly problematic and appears to have overestimated the need for increased capacity in the area. The flaws in the forecast are discussed in detail below and include that:

    a. The load forecast for the KWCG area as a whole is based on inconsistent and unverified local forecasts provided by the local distribution companies ("LDCs");

    b. The LDC's forecasts are based on unrepresentative and arbitrary historical time periods;

    c. The predicted significant demand growth is inconsistent with recent trends in electricity demand; and

    d. This forecasting method has a track record of grossly overestimating demand.

Load Forecast Based on Inconsistent and Unverified LDC Forecasts

13. The OPA's gross load forecast, which forms the basis for its justification for this project, is based on inconsistent and unverified local forecasts provided by the LDCs. The OPA simply relied on and amalgamated the local forecasts provided by the LDCs.[4] Each LDC used its own, inconsistent methodology to forecast growth. Neither the OPA nor Hydro

[4] OPA KWCG Report, p. 8 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

One independently verified the numbers provided by the LDCs or conducted their own more robust forecasts.[5]

The LDC's Forecasts are Based on Unrepresentative and Arbitrary Historical Time Periods

14. The LDCs' forecasts are not based on sophisticated economic analyses, but are primarily projections of past trends from *arbitrarily* selected historic time periods that are not representative of recent trends in electricity demand.

15. For example, Cambridge and North Dumfries Hydro is forecasting that its peak day demand will grow by 3% per year between 2012 and 2030 because its actual growth rate between 1978 and 2012 was 3% per year.[6] However, the actual peak demand in the Cambridge subsystem *declined* by 7% between 2005 and 2012.[7] We submit that a simple projection based on the trend between 1978 and 2012 is arbitrary and not sufficiently robust for transmission system planning, particularly when recent trends are inconsistent with the anticipated growth.

16. Similarly, according to Guelph Hydro, the City of Guelph's electricity demand has grown by approximately 1.95% over the past 20 years. Nevertheless, Guelph Hydro is forecasting that demand will grow by 2.4% per year between 2012 and 2030 based on historical trends and "local knowledge of planned development and City of Guelph development planning information."[8] However, the actual peak day demand in the South-Central Guelph subsystem has *declined* by 3.4% since 2005.[9] In other words, Guelph Hydro is predicting a growth rate in the future that is much higher than its actual historic growth rate over the past 20 years and which is completely inconsistent with the trend since 2005 (which registered a 3.5% decline).

17. Kitchener-Wilmot Hydro used a simple trend analysis "to extend past growth rates of electricity demand into the future." Specifically, its forecast growth rate from 2012 to

[5] Response to Board Staff Interrogatory No. 1 (Ex. I, Tab 1, Schedule 1) [Compendium, tab 3]
[6] KWCG Working Group Report (Ex. I, Tab 2, Schedule 30, Attachment 1, Appendix B.2) [Compendium, tab 5]
[7] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]
[8] KWCG Working Group Report (Ex. I, Tab 2, Schedule 30, Attachment 1, Appendix B.2) [Compendium, tab 5]
[9] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]

2030 is based on the average load growth from 1993 to 2006.[10] However, according to Kitchener-Wilmot Hydro itself, "more recent data of 2007-2009 were biased and ignored due to the loss of the largest load customer and the economic downturn after the credit crisis."[11] This forecast is very suspect as Kitchener-Wilmot Hydro has intentionally excluded time periods where demand might have declined or grown more slowly.

18. Waterloo-North Hydro is forecasting "an overall geometric growth rate of 3.3% up to year 2018 and 2.5% thereafter" despite the fact that actual demand in the Waterloo-Guelph subsystem grew by only 3 MW between 2005 and 2012.[12]

19. We submit that demand growth cannot be forecast based solely on projecting past growth trends into the future. Doing so falsely assumes that the future trend will be the same as the past trend for the chosen time period. Furthermore, a simple extrapolation of past trends fails to account for recent significant changes in demand trends arising from factors such as Ontario's shift from a manufacturing to a service-based economy, increasingly stringent energy efficiency codes and standards, increasing electricity prices, and so on.

20. Regardless, even if it were appropriate to simply project past trends into the future, the forecasts of the LDCs are unreliable because they are based on apparently arbitrary time periods. In some cases, the LDCs forecasts even appear to intentionally exclude periods that would result in a lower growth rate.

The Significant Growth Predicted by the OPA is Inconsistent with Recent Trends

21. The demand growth forecast by the OPA (based on the LDC's individual forecasts) is inconsistent with recent trends in electricity demand in the KWCG area and Ontario as a whole. The OPA is forecasting that the gross peak day demand for electricity in the KWCG area will grow by 2.4% per year between 2013 and 2026 before taking into account the impact of CDM and DG. After subtracting out its forecast of CDM and DG,

[10] KWCG Working Group Report (Ex. I, Tab 2, Schedule 30, Attachment 1, Appendix B.2) [Compendium, tab 5]
[11] *Ibid*.
[12] KWCG Working Group Report (Ex. I, Tab 2, Schedule 30, Attachment 1, Appendix B.2) [Compendium, tab 5]; Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]

the OPA has concluded that the actual peak day demand in the KWCG area will grow by 1.7% per year between 2013 and 2026.[13]

22. These predicted growth rates are inconsistent with recent trends. For example, peak electricity demand *declined* since 2005 in the KWCG area (from 1,410 MW in 2005 to 1,403 MW in 2012).[14] Ontario's peak day demand also declined by 6% during the same period, from 26,160 MW to 24,636 MW.[15] These declines occurred despite the fact that the province's population, number of homes and gross domestic product (GDP) grew during the same time period.

23. Of course, the selection of different time periods will yield different growth forecasts. For example, while demand declined somewhat since 2005 in the KWCG area as noted above, the decline was even larger as between 2005 to 2010, and demand increased as between 2004 to 2012.[16] However, the declining demand since 2005 is an illustration of the problems with the OPA's forecast, such as the arbitrary time periods chosen by the LDCs and the failure to account for changing patterns in electricity usage. More recent trends suggest that electricity demand growth could be negligible or even negative in the coming years.

The OPA Recently Overestimated Growth in the KWCG Area

24. The OPA's acceptance of the LDCs' load growth forecasts has led to a very inaccurate load forecast in the recent past. In 2008, the OPA used the LDCs' forecasts to predict that the KWCG area's peak demand would be 1,705 MW in 2012.[17] In fact, the actual demand peak demand in 2012 was only 1,403 MW, or 18% less than was forecast.[18]

25. This significant overestimation in 2008 was based on a similar forecasting method as was used in this proceeding because it was based on an amalgamation of the LDC's local forecasts. One would have expected that, after missing its forecast by such a large degree

[13] Response to ED Interrogatory No. 6, (Ex. I, Tab 2, Schedule 6) [Compendium, tab 7]
[14] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]
[15] IESO, Ontario Peak Demand (http://www.ieso.ca//imoweb/media/md_peaks.asp; and http://www.ieso.ca/imoweb/media/md_newsitem.asp?newsID=6323) [Compendium, tab 8]
[16] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]
[17] EB-2007-0707, Ex. I, Tab 31, Schedules 47 & 48 [Compendium, tab 4]
[18] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]

in recent times, the OPA would have developed its own forecast for this proceeding. The failure to do so casts significant doubt on the OPA's forecast in this proceeding.

Summary re Load Forecast

26. In sum, the OPA's forecast for the KWCG area is inconsistent with the most recent and relevant regional and provincial trends; is based on inconsistent, unverified, and flawed forecasts provided by the LDCs; and follows a forecasting method that recently produced a grossly over inflated demand forecast. Contrary to the OPA's forecast, more recent trends suggest that demand growth could be negligible or even negative in the coming years. Overall, the OPA forecast is not adequate to establish the need for this $100 million project.

27. For this reason alone, Environmental Defence submits that this application should be rejected. However, even if the forecast is taken as given, there is a preferred alternative to meet the needs forecast by the OPA, as discussed below.

The CDM/DG Alternative is a Both Feasible and Preferred

28. Environmental Defence submits that a combination of CDM and DG is potentially a feasible alternative to the proposed project that is preferable from the perspective of cost, reliability, and implementation time. In other words, the evidence suggests that a CDM/DG option can meet the KWCG area's electricity needs *sooner, more reliably, and at a lower cost.* This is the case even assuming that the OPA's demand growth forecast is accurate and that the supply needs are as urgent and significant as the OPA suggests.

Conservation and Demand Management

29. CDM can play a key role in avoiding the proposed $100 million transmission project because it is the lowest cost option to meet Ontario's future energy needs. The Minister of Energy, the Honourable Bob Chiarelli, highlighted the cost-effectiveness of CDM in the Government of Ontario's new white paper entitled *Conservation First*, which was released on July 15, 2013. In particular, Minister Chiarelli stated that "Conservation is the

cleanest and **least costly energy resource**, and offers consumers a means to reduce their electricity bills" (emphasis added).[19]

30. In line with the vision set out in *Conservation First*, Environmental Defence submits that the OPA and Hydro One should pursue all of the cost-effective CDM opportunities in the KWCG area. Any remaining capacity deficit can be made up through additional DG. Unfortunately, the OPA and Hydro One are not pursuing all the cost-effective CDM opportunities in the KWCG area. Rather they are assuming that CDM savings in the KWCG area are arbitrarily capped at its *pro-rata* share of the provincial CDM target that was established by the Ministry of Energy in February 2011 (see Compendium, tab 2 and 9).[20]

31. The OPA has not even *attempted* to estimate the potential for CDM to cost-effectively reduce the demand for electricity in the KWCG area (which it admitted in response to Interrogatory No. 18, which can be found at tab 9 of the Compendium).[21] Furthermore, the OPA has not even estimated the potential for its *existing* CDM programs to reduce the spikes in electricity demand on hot summer days. Specifically, it has not estimated the potential for its *peaksaver* and *peaksaver plus* programs to reduce the demands of residential and small business customers (see Compendium, tab 10).[22] Similarly, it has not estimated the potential for its demand response programs (DR1, DR2 and DR3) to reduce the peak day demands of its large volume commercial, institutional and industrial customers (see Compendium, tab 11).[23]

32. In other words, the OPA did not even calculate the amount of cost-effective CDM potential in the KWCG area, let alone assess whether CDM, supplemented by DG, could avoid or defer its transmission project at a lower cost to consumers.

---

[19] Ontario Ministry of Energy, *Conservation First, A Renewed Vision for Energy Conservation in Ontario*, July 16, 2013, Minister's Message [Compendium, tab 1]
[20] OPA KWCG Report, p. 17 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]; Response to ED Interrogatory No. 18 Response to ED Interrogatory No. 18 (Ex. I, Tab 2, Schedule 18) [Compendium, tab 9]
[21] Response to ED Interrogatory No. 18 (Ex. I, Tab 2, Schedule 18) [Compendium, tab 9]
[22] Response to ED Interrogatory No. 10 (Ex. I, Tab 2, Schedule 10) [Compendium, tab 10]
[23] Response to ED Interrogatory No. 12 (Ex. I, Tab 2, Schedule 12) [Compendium, tab 11]

33. The OPA is not pursuing all of the cost-effective CDM opportunities in the KWCG area because it states that CDM is not a feasible means of "*fully*" addressing the KWCG area's near and medium terms needs.[24] Specifically, according to the OPA, conservation cannot "aid in the restoration of power to customers following a major transmission outage, and therefore cannot resolve the KWCG area's supply interruption and restoration needs."[25] The OPA's rationale for failing to pursue all of the KWCG area's cost-effective CDM opportunities is without merit for three reasons.

The OPA Failed to Consider a Combined Option Including Both CDM and DG

34. First, it appears that the OPA assessed CDM and DG in isolation rather than examine them as a combined alternative consisting of *both* CDM and DG. In response to Environmental Defence Interrogatory No. 44, Hydro One states that CDM cannot "*fully*" address all of the KWCG area's incremental electricity needs.[26] Although CDM alone may be insufficient, a combination of DG and CDM can potentially meet the KWCG area's needs.

The Proposed Project is Inconsistent with the Recent *Conservation First* White Paper

35. Second, Hydro One and the OPA's approach is also inconsistent with the Government of Ontario's renewed vision for energy conservation, as set out in *Conservation First*. The recently released white paper states that "Ontario's vision is to invest in conservation first, before new generation, where cost-effective." In *Conservation First*, the Ministry of Energy explicitly notes that CDM should be considered first in part because it provides benefits in relieving stress on the electricity system:

> **Conservation should be the first resource considered in meeting Ontario's electricity needs.** Cost-effective conservation brings environmental, economic and system benefits. It makes sense to invest as much to save a megawatt of power as it would cost to generate that same megawatt. When other benefits are factored in – **conservation** does not involve

[24] Response to ED Interrogatory No. 25 (Ex. I, Tab 2, Schedule 25) [Compendium, tab 12]; Response to ED Interrogatory No. 28 (Ex. I, Tab 2, Schedule 28) [Compendium, tab 13]; Response to ED Interrogatory No. 44 (Ex. I, Tab 2, Schedule 44) [Compendium, tab 14]
[25] OPA KWCG Report, p. 17 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]
[26] Response to ED Interrogatory No. 44 (Ex. I, Tab 2, Schedule 44) [Compendium, tab 14]; See also Response to ED Interrogatory No. 25 (Ex. I, Tab 2, Schedule 25) [Compendium, tab 12]; Response to ED Interrogatory No. 28 (Ex. I, Tab 2, Schedule 28) [Compendium, tab 13]

> construction or the industrial processes that generation requires, it saves consumers money and **relieves stress on the electricity system** – the arguments in its favour become even stronger. (emphasis added)[27]

36. According to the white paper, conservation should be considered *first*. In contrast, the OPA and Hydro One did not even assess the CDM potential in the KWCG area, let alone whether CDM could be part of a more cost-effective alternative to the project.[28] Instead, the OPA and Hydro One have treated the KWCG area's *pro-rata* share of the provincial CDM targets as an arbitrary *cap* (see tab 2 and 9). This directly contradicts the principles set out in *Conservation First* policy, including the underlying goal of achieving the lowest possible costs for consumers.

CDM is Highly Cost-Effective

37. Third, Hydro One and the OPA should pursue all the cost-effective CDM opportunities because this can reduce the need for new, *higher-cost*, supply-side infrastructure (e.g., new transmission lines, new gas-fired peaker plants and new or re-built nuclear reactors). Failing to pursue all the CDM opportunities that can avoid the need for even higher electricity rates to pay for higher cost generation and/or transmission options defies common sense. CDM often can reduce demand at *no net cost* because the cost of the CDM measure is outweighed by the electricity savings that accrue to customers.

38. *Conservation First* expressly emphasizes that conservation is extremely cost-effective, can avoid the need for new transmission facilities, and improves reliability of the power grid:

> **Saving energy means saving money** – for families, businesses, hospitals, schools and other public institutions. **Reducing or shifting electricity use avoids the need for** new generation as well as **transmission**, reduces strain on the electricity system and improves the efficiency of the power grid. Conservation provides significant economic and environmental benefits; **for every $1 invested in energy efficiency, Ontario has avoided about $2 in costs to the electricity system.** (emphasis added)[29]

---

[27] Ontario Ministry of Energy, *Conservation First, A Renewed Vision for Energy Conservation in Ontario*, July 16, 2013, p. 7 [Compendium, tab 1]
[28] Response to ED Interrogatory No. 25 (Ex. I, Tab 2, Schedule 25) [Compendium, tab 12]; Response to ED Interrogatory No. 28 (Ex. I, Tab 2, Schedule 28) [Compendium, tab 13]
[29] Ontario Ministry of Energy, *Conservation First, A Renewed Vision for Energy Conservation in Ontario*, July 16, 2013, p. 1 [Compendium, tab 1]

39. In sum, Environmental Defence submits that Hydro One and the OPA should implement all cost-effective CDM as these measures are so low in cost. This, along with additional DG, can potentially avoid the costly $100 transmission line.

Distributed Generation

40. The OPA acknowledges that DG is a technically feasible alternative to the project. According to the OPA, "additional distributed generation is technically capable of meeting the supply capacity needs in the KWCG area".[30] Nevertheless, the OPA is not implementing programs to pursue all of the cost-effective DG opportunities because it does not believe that additional DG is a cost-effective or practically feasible means of addressing the KWCG area's near- and medium-term needs.[31] The OPA's assertions are without merit for the following reasons.

Distributed Generation is More Cost-Effective than the Proposed Project

41. Distributed Generation is more cost-effective than the proposed $100 million transmission project. As detailed below, when the avoided capital costs of alternative base load generation are factored into the cost-benefit analysis, the net cost of DG is over $200 million dollars *less* than the alternative of the Guelph transmission line plus the requisite amount of nuclear base load generation.

42. According to the OPA, 190 MW of natural gas-fired combined heat and power (CHP) would be needed by 2023 to avoid the need for the proposed new transmission. (Although Environmental Defence refutes the capacity deficit forecast by the OPA, in this section the OPA's forecast and needs assessment is assumed to be true.) According to the OPA, the net cost of 190 MW of DG would be $250 million greater than the transmission option. Therefore, the OPA concluded that DG is not a cost-effective option to defer or avoid the need for the proposed transmission line.[32]

[30] Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26) [Compendium, tab 15]
[31] Response to ED Interrogatory No. 25 (Ex. I, Tab 2, Schedule 25) [Compendium, tab 12]
[32] Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26) [Compendium, tab 15]

43. However, the OPA's analysis is fundamentally flawed as it fails to take into account the full economic benefits to Ontario ratepayers of installing additional CHP in the KWCG area. The first benefit of local CHP is that it can avoid the need for a new transmission line to meet the local area's peak day needs on hot summer days. Second, as the OPA has acknowledged, since CHP is a base load electricity supply option, it can also reduce the need for additional base load generation in the rest of Ontario, such as new or re-built nuclear generation.[33]

44. However, when the OPA compared the costs of the DG and transmission options, it failed to take into account the fact that locating an additional 190 MW of CHP in Guelph could avoid the *capital* costs associated with of 190 MW of additional base load generation, such as new or re-built nuclear generation in the rest of Ontario.[34] This omission is a fatal flaw in the OPA's analysis since the capital cost of nuclear generation is very high.

45. When the avoided capital costs are factored into the cost-benefit analysis, the *net* cost of DG is *over $200 million* dollars less than the alternative of the Guelph transmission line plus 190 MW of nuclear base load generation. According to Ontario Power Generation (OPG), the total cost of re-building the 3,512 MW Darlington Nuclear Generating Station would be $8.5 to 14 billion.[35] That is $2.4 to 4 million per MW. Therefore, building 190 MW of CHP in the KWCG area would avoid the need to spend *at least* $456 to $760 million on new or re-built generation in the rest of Ontario (190 MW multiplied by $2.4 to 4 million per MW).

46. When these savings are taken into account, the *net* cost of meeting the KWCG area's needs via the CHP option is approximately $206 million ($250 million - $456 million) to $510 million ($250 million - $760 million) *less* than the transmission and nuclear generation option. This analysis is conservative since it assumes that there would be no capital cost overruns with the nuclear option despite the fact that every nuclear project in Ontario's history has been late and has gone massively over budget.

---

[33] Response to ED Interrogatory No. 17 (Ex. I, Tab 2, Schedule 17) [Compendium, tab 16]
[34] Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26) [Compendium, tab 15]
[35] Undertaking Response re Cost of Darlington Refurbishment (EB-2010-0008, Undertaking JT1.2) [Compendium, tab 17]

47. According to the OPA, DG "may be an effective option to meet an area's needs when low load growth is anticipated and/or the cost of the alternative solution is high in comparison."[36] As we have noted, both of these conditions apply to the KWCG area. The historic trends since 2005 in KWCG and Ontario as a whole suggest that the KWCG area could experience low or negative load growth in the future. In addition, the above analysis has shown, using the OPA's and OPG's own cost estimates, that CHP can meet KWCG's peaking and Ontario's base load electricity needs at a much lower cost than the proposed transmission and nuclear generation alternative.

DG is Feasible and Realistic

48. According to the OPA, additional DG is not a practically feasible option to *fully address* the KWCG area's immediate and near term needs:

> …additional distributed generation is not a feasible means of **fully addressing** these needs due to the immediate nature and magnitude of the needs, the uncertainty associated with the development of further facilities, as well as the siting and connection of facilities at the specific locations at which they are needed. [emphasis added][37]

49. The OPA's assertions are without merit for the following reasons.

50. First, while DG cannot *immediately* address the KWCG area's needs, this is also true of the OPA's proposed transmission solution, which, according to the IESO, will not come into service until the second quarter of 2016.[38]

51. Second, new DG facilities (e.g., CHP and conversion of emergency diesel generators to ensure clean and continuous operation during a blackout) could come into service before the second quarter of 2016. That is, new DG could start to meet the KWCG area's needs *before* the proposed transmission project.

52. Third, the OPA's concern about the uncertainty associated with the development of further DG facilities is disingenuous since any uncertainty is due to the failure of the OPA to sign contracts for new DG projects.

---

[36] Response to ED Interrogatory No. 17 (Ex. I, Tab 2, Schedule 17) [Compendium, tab 16]
[37] Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26) [Compendium, tab 15]
[38] IESO, *18-Month Outlook* <http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlook_2013may.pdf> [Compendium, tab 18]

53. For example, according to the City of Guelph, generation projects totalling 60 MW in the City of Guelph *alone* have been submitted to the OPA pursuant to its Feed-in-Tariff and Combined Heat and Power Standard Offer Programs. Specifically, 30 MW of solar, 28 MW of CHP and 2 MW of biogas have been offered to the OPA. Nevertheless, the OPA has refused to state if or when it will contract for any or all of these supplies:

> …the OPA cannot reasonably estimate the amount of additional solar PV, CHP or biogas generation, if any, that may be contracted in the City of Guelph during each year from 2013 to 2026 inclusive.[39]

54. By proceeding with its CHP Standard Offer Program and by improving its demand response program to make it worthwhile for building owners to convert their diesel back-up generators to run on natural gas, the OPA can ensure that DG will quickly and fully address the KWCG area's needs for a reliable supply of electricity.

55. Again, the OPA has acknowledged that DG "is technically capable of meeting the supply capacity needs in the KWCG area".[40] The potential impediment to DG is the OPA itself. If DG is a both technically feasible and more cost-effective, it should be adopted as the preferred alternative to this project along with all of the cost-effective CDM.

CDM and DG will Increase the Reliability of the KWCG area's Electricity Supply

56. A combination of CDM and DG would address the Ontario Resource and Transmission Assessment Criteria ("ORTAC") and would ultimately provide significantly *more* reliability to Hydro One's customers as compared to the proposed project.

57. The OPA's and Hydro One's second reason for the proposed Guelph Area Transmission Reinforcement Project is that it is needed to increase the reliability of electricity supply in the KWCG area. Specifically, according to the OPA, the project is necessary to ensure that, in the event of the loss of the existing *local* Hydro One transmission lines, power can be restored within 30 minutes to loads in excess of 250 MW.[41]

---

[39] Response to ED Interrogatory No. 21 (Ex. I, Tab 2, Schedule 21) [Compendium, tab 19]
[40] Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26) [Compendium, tab 15]
[41] OPA KWCG Report, pp. 14 & 15 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

58. While the OPA's and Hydro One's proposed *transmission* solution will increase reliability in the event of the loss of *local* Hydro One transmission lines, it will do nothing to ensure that the lights will stay on in the KWCG area if there is a loss of electricity *generation or transmission* capacity in the rest of Ontario due to a provincial blackout or an extreme weather event (e.g. Superstorm Sandy).

59. In contrast, DG can address *both* local and province-wide risks by providing a local source of power that is not dependent on the province-wide grid or on outside generation. The OPA has acknowledged that DG located in the KWCG area can "increase the region's security of supply in the event of a provincial blackout or failure of Hydro One's grid."[42] In addition, CDM, when combined with DG, can increase reliability by curtailing demand when system capacity has been compromised (similar to the beneficial role played by *peaksaver* in the aftermath of recent major rainstorms in Toronto).

60. At the present, local DG can meet only 2.7% of the KWCG area's peak day electricity needs.[43] On the other hand, New York City is required by the New York State Reliability Council to be able to meet 80% of its peak day electricity needs from power plants located in New York City.[44]

61. By addressing *both* local *and* province-wide risks, CDM and DG would provide a significantly more robust and reliable electricity system as compared to the proposed transmission project.

CDM and DG can Address the Needs in the Each KWCG area Subsystem

62. CDM and DG can potentially address the specific needs of each specific subsystem in the KWCG area. The KWCG area has five electrical subsystems. According to the OPA, in three of these subsystems (South-Central Guelph, Kitchener-Guelph, Cambridge) the demand for electricity is expected to exceed supply capacity during the next ten years. One of those subsystems, South-Central Guelph, has been operating above the supply

[42] Response to ED Interrogatory No. 23 (Ex. I, Tab 2, Schedule 23) [Compendium, tab 20]
[43] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]; and Response to ED Interrogatory No. 8 (Ex. I, Tab 2, Schedule 8) [Compendium, tab 21]
[44] Remarks by Colin Anderson, CEO, OPA, to the Toronto Board of Trade, *Powering Toronto's Electricity Future*, October 25, 2012 < http://www.powerauthority.on.ca/sites/default/files/news/Andersen-Board-of-TradeOct-25-2012.pdf> [Compendium, tab 22]

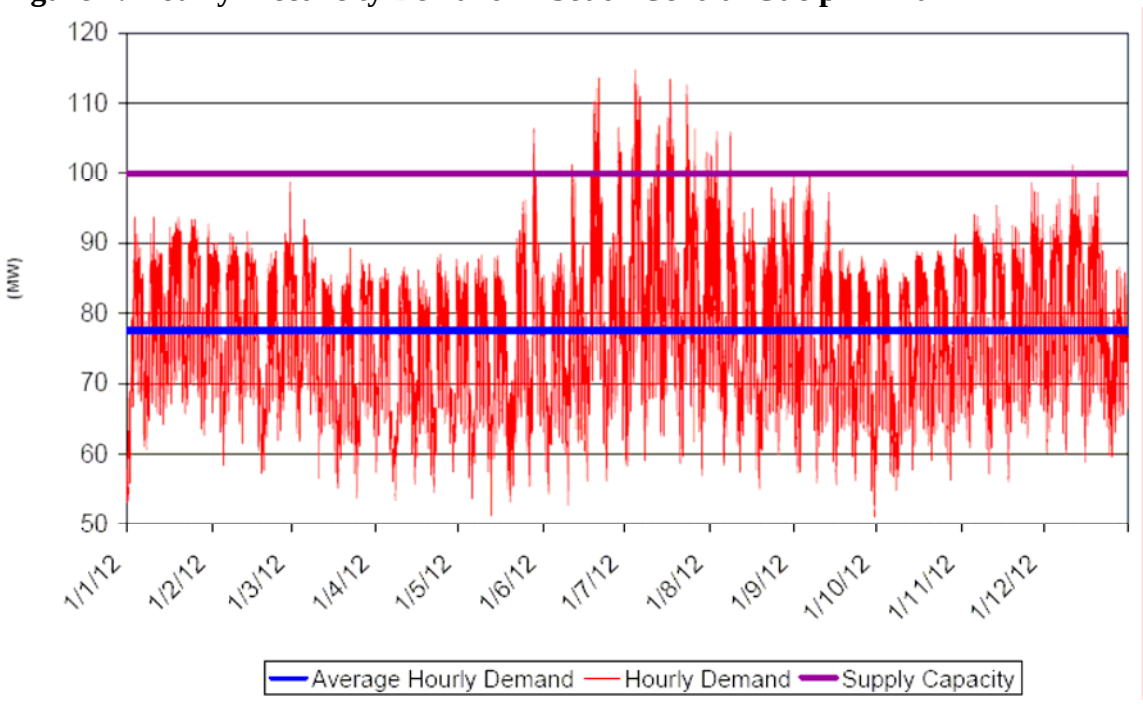
capacity for some time now, and first breached that limit in 2004.[45] Additionally, two subsystems (Kitchener and Cambridge, Waterloo-Guelph) are not in compliance with Ontario's reliability criteria.[46] The following analysis addresses the electricity needs for each of these subsystems and why it appears that CDM and DG can address these needs.

South-Central Guelph Subsystem: Capacity Needs can be met with CDM and DG

63. South-Central Guelph is the primary driver for the proposed transmission project seeing as its supply capacity has been exceeded by summer peak demand every year since 2004.[47] The proposed transmission line would directly serve this area. However, the needs in South-Central Guelph can likely be met with CDM and DG instead.

64. Figure 2 below shows the hourly electricity demand in South-Central Guelph in 2012. As Figure 2 shows, South-Central Guelph's peak hourly demand in 2012 was 112 MW and its average hourly demand was approximately 78 MW. The horizontal purple line at 100 MW represents the supply capacity, the horizontal blue line at 78 MW represents the average hourly demand, and the vertical red line plots the electricity demand by hour.

Figure 2: Hourly Electricity Demand in South-Central Guelph in 2012



[45] Supplementary Response to ED Interrogatory No. 5 (Ex. I, Tab 2, Schedule 5-S) [Compendium, tab 23]
[46] *Ibid.*
[47] OPA KWCG Report, pp. 22 & 24 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]; Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]

65. According to the OPA, South-Central Guelph's electricity supply "capacity" is approximately 100 MW.[48] Therefore, in 2012, South-Central Guelph's electricity demand exceeded its supply capacity during 2.3% (205 hours) of the total number of hours in the year.

66. As discussed above, the OPA's proposed solution to South-Central Guelph's excess demand for electricity on hot summer days is to upgrade Hydro One's Guelph transmission line from 115 kV to 230 kV. It is Environmental Defence's submission, for the reasons noted above with respect to the KWCG area as a whole, that a lower cost and quicker solution to meet these short-lived spikes in electricity is an integrated combination of CDM and DG.

67. For example, as of 2010, only approximately 3% of Guelph's approximately 46,000 residential and small commercial customers had enrolled in *peaksaver*.[49] If all of these 46,000 customers were to enroll in *peaksaver* or *peaksaver plus*, peak day demand would be reduced by approximately 27 additional MW.[50] Even this one CDM program alone could address the immediate capacity needs in this subsystem.

68. Similarly, over 60 MW of local generation projects in the City of Guelph have been submitted to the OPA.[51]

69. There are specific CDM and DG programs that could be implemented in South-Central Guelph area to address those urgent needs, and which could do so far more quickly than the 2016 in-service date for the proposed transmission line.

Kitchener-Guelph and Cambridge Subsystems: Capacity Needs can be met by CDM and DG

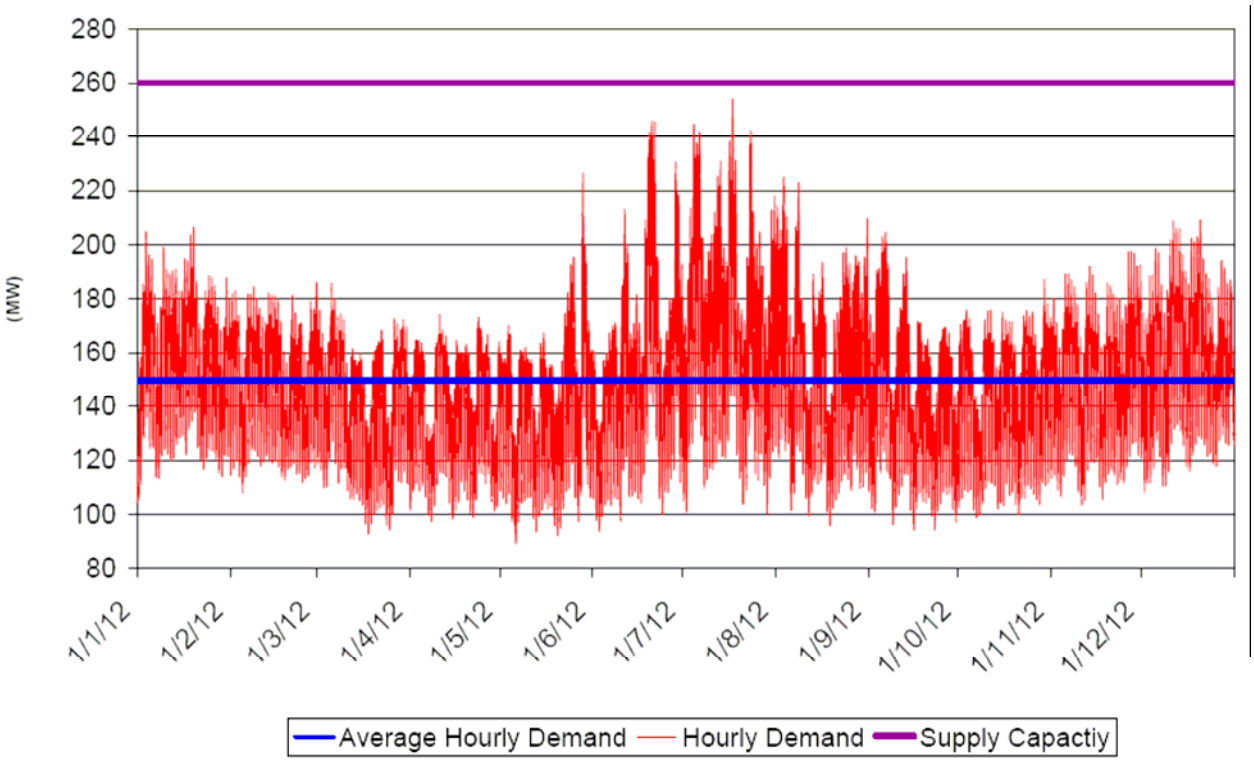
70. For the reasons noted above with respect to the KWCG area as a whole, Environmental Defence submits the supply capacity needs in the Kitchener-Guelph and Cambridge subsystems can likely also be met through a combination of CDM and DG. As detailed

[48] OPA KWCG Report, p. 13 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]
[49] Email from Matt Weninger, Director of Metering and Conservation, Guelph Hydro to Jack Gibbons, November 5, 2012 [Compendium, tab 24]
[50] According to the OPA, the average demand reduction of a *peaksaver* customer is 0.57 kW. See Response to ED Interrogatory No. 10 (Ex. I, Tab 2, Schedule 10) [Compendium, tab 11]
[51] Response to ED Interrogatory No. 21 (Ex. I, Tab 2, Schedule 21) [Compendium, tab 19]

below, the demand in these areas is currently below the supply capacity limits. The demand in these subsystems is also subject to extreme summer peaks in demand that are amenable to cost-effective demand reduction measures, as is the case for the KWCG area as a whole.

71. Figure 3 below plots the hourly electricity demand in the Kitchener-Guelph subsystem in 2012. In that year, Kitchener Guelph's peak hourly demand was 254 MW.[52] That is, the peak demand was 6 MW less than its supply capacity of 260 MW.[53] In Figure 3, the horizontal purple line at 260 MW represents the supply capacity, the horizontal blue line at 149 MW represents the average hourly demand, and the vertical red line plots the hourly electricity demand.

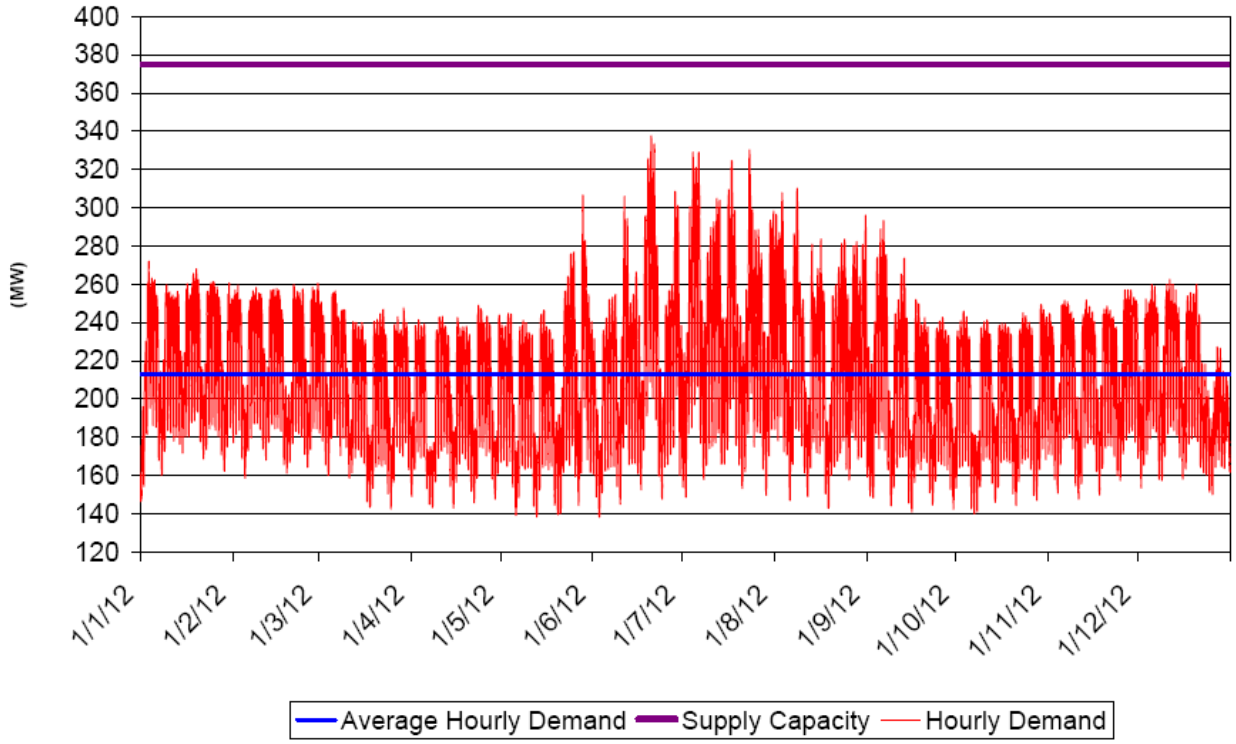
Figure 3: Hourly Electricity Demand in Kitchener-Guelph in 2012



[52] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]
[53] OPA KWCG Report, p. 13 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

72. Figure 4 below plots the hourly demand in the Cambridge subsystem in 2012. In that year, Cambridge's peak hourly demand was 325 MW.[54] That is, the demand was 50 MW less than its supply capacity of 375 MW.[55]

Figure 4: Hourly Electricity Demand in Cambridge in 2012



73. Figures 3 and 4 clearly indicate that the peak hourly demand in these two subsystems is below the supply capacity, the average hourly demand is *far* below the supply capacity, and the overall demand profile exhibits considerable peaks in the summer. For the reasons noted above with respect to the KWCG area as a whole, we submit that the peak day demands can likely be cost-effectively kept below the relevant supply limits in these two subsystems by an integrated combination of CDM and DG.

[54] Response to ED Interrogatory No. 1 (Ex. I, Tab 2, Schedule 1, Attachment 1) [Compendium, tab 6]
[55] OPA KWCG Report, p. 13 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

Waterloo-Guelph and Kitchener and Cambridge Subsystems: Reliability Needs can be met by CDM and DG

74. The second purpose for the proposed project is to improve reliability in the Waterloo-Guelph and Kitchener and Cambridge subsystems. These subsystems currently fail to comply with the ORTAC service interruption criteria that load lost in excess of 250 MW must be restored within a half hour. These subsystems have failed to meet this criteria since it was adopted in 2007. Environmental Defence submits that a combination of CDM and DG can likely provide more reliability for these subsystems in a shorter time frame as compared to the proposed transmission project.

75. The first key problem with the proposed transmission option is that it will not come into effect until the second quarter of 2016.[56] In other words, the transmission system will fail to meet ORTAC criteria in these two subsystems for at least approximately three years. The OPA and Hydro One have failed to address these serious reliability issues for far too long already. The KWCG area needs a solution that will start to address this serious issue now, not in three years from now.

76. In contrast, unlike the OPA's proposed transmission option, incremental CDM and DG can start to bring these two subsystems into compliance with the IESO's reliability criteria this year. Furthermore, the aggressive pursuit of CDM and DG has the potential to bring these two subsystems into full compliance with the IESO's reliability criteria before the transmission option would (i.e. the second quarter of 2016).

77. The second key problem with the proposed transmission option is that it will not completely address the ORTAC standards. For example, for the Kitchener and Cambridge subsystem, the proposed project will only ensure that 100 MW of load can be restored in a half hour, which would still leave a 300 MW load loss at the 2012 peak of 401 MW.[57] The OPA simply states in this regard that "further improvements to minimize

[56] IESO, *18-Month Outlook* <http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlook_2013may.pdf> [Compendium, tab 18]
[57] OPA KWCG Report, p. 31 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

the impact of major outages to customers in the Kitchener and Cambridge area will be investigated."[58]

78. Third, as we have noted above in paragraphs 37 to 38 and 41 to 47, CDM and DG can meet the KWCG area's electricity needs at a lower cost than the OPA's proposed transmission and generation option.

79. Fourth, CDM and DG can provide the Waterloo-Guelph and Kitchener and Cambridge subsystems with a higher level of reliability than the OPA/Hydro One transmission option. As discussed above in paragraphs 56 to 61, the proposed transmission upgrades only mitigate local risks whereas CDM and DG mitigate local, regional, and province-wide risks to supply.

80. It may be the case that certain small transmission upgrades would help improve reliability in these subsystems in conjunction with CDM and DG (e.g. additional circuit breakers). Although Environmental Defence is challenging the transmission line, which is the most expensive portion of the proposed project, it does not oppose small and low cost transmission upgrades which might improve reliability in conjunction with CDM and DG.

81. In sum, an integrated combination of CDM and DG is a superior strategy to increase the security of supply in these two subsystems because:

a. CDM and DG can significantly increase the security of supply before the second quarter of 2016;

b. The aggressive pursuit of CDM and DG has the potential to bring these two subsystems into full compliance with the IESO's reliability criteria before the transmission option would (i.e., the second quarter of 2016);

c. CDM and DG can provide these subsystems with a higher level of reliability than the OPA/Hydro One transmission option, which will not keep the lights on in the event of severe generation and/or transmission failures in the rest of Ontario; and

[58] *Ibid.*

d. CDM and local DG can meet these subsystems needs for reliable electricity supply at a lower cost than the OPA's proposed transmission and generation option.

Real and Practical CDM and DG Solutions are Available in the KWCG area

82. CDM and DG are not merely technical or hypothetical solutions. There are actual programs that could be ramped up quickly in the KWCG area to produce significant results. Environmental Defence submits that the OPA and the LDCs should pursue the KWCG area's cost-effective CDM and DG opportunities as soon as possible to provide the region with a more reliable electricity supply *before* the second quarter of 2016.

83. For example, the OPA and the LDCs should hire students to go door-to-door to sign up participants for the *peaksaver* program. At the present only 6,542 of the local utilities' 240,017 residential and small business customers have signed up for *peaksaver*.[59] If all of these customers were to sign up, the KWCG area's peak day demand could be reduced by up to 133 MW.[60]

84. The OPA should enhance its demand response programs for large volume commercial, institutional and industrial customers (DR1, DR2 and DR3) to provide them with a financial incentive to switch their diesel emergency back-up generators to natural gas. This will simultaneously reduce peak day demand and provide the KWCG area with a reliable, continuous, and clean back-up electricity supply in the event of a Hydro One transmission failure or a generation failure in the rest of Ontario. In 2008 the OPA estimated that there is between 100 and 200 MW of diesel emergency back-up generators in the KWCG area.[61]

85. The OPA should immediately sign up all of the proposed combined heat and power (CHP) projects in the KWCG area that meet the terms of its Combined Heat and Power Standard Offer Program. According to a City of Guelph report, the OPA has received

[59] Ontario Energy Board, 2011 Yearbook of Electricity Distributors, pages 56, 59, 61 and 66 [Compendium, tab 25]; Response to ED Interrogatory No. 10 (Ex. I, Tab 2, Schedule 10) [Compendium, tab 10]Response to ED
[60] *Ibid.*
[61] OPA Interrogatory Responses re KWCG Diesel Back-up Generators (EB-2007-0707, Ex. I, Tab 31, Schedule 60) [Compendium, tab 26]

applications for CHP projects with a total capacity of 30 MW in the City of Guelph alone.[62]

86. The OPA should enhance its CHP Standard Offer Program to ensure that it provides fair and reasonable terms and conditions, including price, for all the potential and cost-effective CHP projects in the KWCG area.

87. Hydro One and the local LDCs should establish Double Return programs which would increase the financial incentives for their customers' to reduce their peak day demands. According to Hydro One, a Double Returns program can have a Total Resource Cost Test Benefit-Cost Ratio of 11.3 to 1.[63]

88. These are just some of the specific initiatives that could be implemented as part of a combined CDM/DG alternative to the proposed project.

KWCG Working Group's Analysis is not a Reason to Support this Project

89. Hydro One has pointed to the support of the KWCG Working Group as a reason to approve its proposed project. However, Environmental Defence disputes this assertion, as the working group appears to have stated its support prior to conducting any significant analysis of the options or alternatives.

90. By way of background, the KWCG Working Group was established "to assess the reliability needs of the KWCG area, and to develop an integrated plan to address these needs."[64] The members of the KWCG Working Group are the OPA, the IESO, Hydro One, Cambridge and North Dumfries Hydro, Guelph Hydro, Kitchener-Wilmot Hydro and Waterloo North Hydro.[65]

91. On March 12, 2012 Amir Shalaby, Vice President of the OPA, wrote to Mike Penstone, Vice President of Hydro One recommending that Hydro One proceed with the Guelph

[62] Response to ED Interrogatory No. 21 (Ex. I, Tab 2, Schedule 21) [Compendium, tab 19]
[63] Supplementary Response to ED Interrogatory No. 26 (Ex. I, Tab 2, Schedule 26-S, Attachment 3, Page 24) [Compendium, tab 28]
[64] KWCG Working Group Report, p. 4 (Ex. I, Tab 2, Schedule 30, Attachment 1) [Compendium, tab 5]
[65] *Ibid.*

Area Refurbishment Project. According to Mr. Shalaby, his recommendation has the support of the KWCG Working Group.[66]

92. However, the KWCG Working Group endorsed the OPA's recommendation to proceed with the Guelph Area Refurbishment Project at least 14 months *before* it had completed its *draft* integrated plan to meet the KWCG area's electricity needs. As of May 16, 2013, the KWCG Working Group's *Integrated Regional Resource Planning Report* had still not been finalized.[67]

93. Second, none of the KWCG Working Group members requested the OPA to implement additional CDM programs or to procure more DG to meet the KWCG area's electricity needs.[68] In particular, Guelph Hydro failed to request the OPA to do so despite the fact that the City of Guelph's *Community Energy Plan's* goals include that:

a. Guelph will reduce the magnitude of the summer peak electrical grid by at least 40% by 2031 to avoid the need for investment in new electrical infrastructure to serve the growth of the city;

b. Within fifteen years, at least a quarter of Guelph's total energy requirement will be competitively sourced from locally created renewable sources; and

c. At least 30% of Guelph's anticipated electricity requirements will be associated with combined heat and power (cogeneration) by 2031.[69]

94. KWCG working group's support is not a reason to approve this project.

Hydro One and the LDCs Have Incentives Against CDM Alternatives

95. Environmental Defence submits that the Board should give Hydro One's application particular scrutiny because Hydro One and the LDCs have strong financial incentives to

[66] Letter from the Vice President of the OPA, March 12, 2012 (Ex. B Tab 1, Schedule 4, Attachment 1) [Compendium, tab 27]
[67] KWCG Working Group Report, p. 1 (Ex. I, Tab 2, Schedule 30, Attachment 1) [Compendium, tab 5]
[68] Response to ED Interrogatory No. 29 (Ex. I, Tab 2, Schedule 29) [Compendium, tab 29]
[69] City of Guelph, *Community Energy Plan*, (April 3, 2007), Executive Summary [Compendium, tab30]

reject CDM and DG alternatives in favour of building new transmission and distribution infrastructure.

96. Specifically, as detailed in Table 1 below, the OPA will provide the LDCs and Hydro One very generous profit bonuses if they *under spend* their CDM budgets. Unfortunately, the utilities can receive these profit bonuses even if they fail to achieve their minimum OEB-established CDM targets.[70] This is an obvious disincentive to spend on CDM and to meet CDM targets.

Table 1: Maximum Profit Bonuses for Under Spending CDM Budgets

	Maximum Profit Bonus for Under Spending CDM Budget
Cambridge and North Dumfries Hydro	$481,500
Guelph Hydro	$465,000
Kitchener-Wilmot Hydro	$660,000
Waterloo-North Hydro	$459,000
Hydro One	$7,891,500

97. In contrast, approval of the Guelph transmission project will increase Hydro One's after-tax profits by $72 million between 2016 and 2035.[71]

98. Similarly, increased DG will potentially reduce the LDCs profits by reducing their electricity sales.

99. Hydro One and the LDCs have strong incentives to reject CDM and DG alternatives and to favour building new transmission and distribution infrastructure.

Hydro One has Unreasonably Delayed in Assessing the KWCG Area's Needs

100. Environmental Defence requests that the Board indicate to Hydro One and the OPA that they should be comprehensively assessing CDM and DG as alternatives to supply-side transmission upgrades early in the planning process such that CDM and DG alternatives can be identified and adopted wherever they are the most cost-effective option. In this case, Hydro One was unreasonably delayed in assessing the KWCG area's needs.

[70] Response to ED Interrogatory No. 33 (Ex. I, Tab 2, Schedule 33) [Compendium, tab 31]
[71] Response to ED Interrogatory No. 34 (Ex. I, Tab 2, Schedule 34) [Compendium, tab 32]

101. Hydro One's KWCG system has failed to comply with ORTAC since at least 2004 due to supply capacity issues in South-Central Guelph and since 2007 due to supply interruption issues in two other subsystems.[72] Yet, in those *nine years*, Hydro One failed to conduct a thorough assessment of a combined CDM/DG option. Had Hydro One proactively addressed these problems, they could have been avoided through cost-effective CDM and DG measures years ago. The OPA and Hydro One have provided no justification as to why they waited until 2012 to propose a solution to this important reliability issue.

102. Hydro One's delay has also potentially led to avoidable power outages. As the OPA noted in its evidence, a major outage occurred in February 2012 when a forced outage on one of the D6V/D7V circuits "resulted in the interruption of electricity supply for roughly three hours to approximately 350 MW of customers in parts of the cities of Waterloo, Kitchener and Guelph."[73] It appears that this outage would not have occurred, or would have been resolved sooner, had the service interruption reliability criteria been addressed earlier.

103. Similarly, the lack of a backup supply may have lead or contributed to the almost four-hour outage of over 250 MW that occurred in the City of Cambridge, the Township of North Dumfries, and the City of Kitchener in 2003.[74]

104. Had Hydro One and the OPA proactively pursued cost-effective CDM and DG earlier in time, these outages could have potentially been avoided or mitigated. We submit that Hydro One and the OPA should be assessing CDM and DG as alternatives to supply-side transmission upgrades far earlier in the planning process.

Hydro One has not Established that its Project is Preferable

105. It is the Applicant's burden to establish that its proposed project is the preferred alternative; Environmental Defence submits that this burden clearly has not been met.

---

[72] Supplementary Response to ED Interrogatory No. 5 (Ex. I, Tab 2, Schedule 5-S) [Compendium, tab 23]
[73] OPA KWCG Report, p. 14 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]
[74] OPA KWCG Report, pp. 14 & 15 (Ex. B, Tab 1, Schedule 5) [Compendium, tab 2]

106. Although there is a significant amount of evidence on the record to suggest that a combination of CDM and DG is a feasible and preferred alternative, Environmental Defence is not required to conclusively establish that this is the case. Instead, Environmental Defence simply must show that the Applicant has not provided an adequate cost-benefit analysis as between the proposed project and the CDM/DG alternative, as is required by the *Filing Requirements for Electricity Transmission and Distribution Applications* (the "*Filing Requirements*").[75]

107. The *Filing Requirements* clearly state that the project proponent – not the intervenor – bears the responsibility of establishing that its project is preferred to the alternatives. At page 8, the *Filing Requirements* state that "[t]he responsibility for the provision of all evidence for the entire case rests with the applicant." With respect to alternatives, the *Filing Requirements* state as follows:

> **The reasons that a project is necessary must be identified. The basic form for such evidence should be cost-benefit analyses**, if applicable, **of various options.** The Board expects that Applicants will present:
>
> - the preferred option (i.e. the proposed project); and
> - alternative options. (emphasis added)[76]

108. Again, Environmental Defence submits that Hydro One's cost-benefits analysis of the options, which is mandated by the *Filing Requirements*, is inadequate in this case.

109. The *Filing Requirements* do not require that an intervenor be able convince the board to select their preferred alternative. On the contrary, the *Filing Requirements* state that "the Board will either approve or not approve the proposed project … It will not choose a solution from among the alternative options."[77] Thus, the Board is not being asked in this proceeding to adopt the alternative option of CDM and DG, and it is not necessary that Environmental Defence conclusively establish that this CDM/DG option is superior. Again, the Board simply needs to decide whether Hydro One has fulfilled its legal obligation to establish that the project is preferred to other options.

---

[75] Ontario Energy Board, *Filing Requirements for Electricity Transmission and Distribution Applications*, last revised June 28, 2012, excerpts (EB-2006-0170) [Compendium, tab 33]
[76] *Ibid*., p. 10.
[77] *Ibid*., pp. 10-11.

110. Despite the considerable evidence suggesting that CDM and DG are a preferred alternative, Hydro One itself did *not* adequately assess the CDM/DG option as part of its decision-making process. As detailed in paragraph 31 above, the OPA did not even estimate the potential for CDM to cost-effectively reduce the demand for electricity in the KWCG area.[78] Seeing as the OPA did not even estimate the CDM potential, it cannot be said that it adequately considered this option.

111. Hydro One and the OPA explicitly acknowledged that they did not compare the cost-effectiveness of their project vis-à-vis a combined DG/CDM alternative. In response to Environmental Defence Interrogatory No. 28 Hydro One stated as follows:

> **Neither the OPA nor Hydro One has completed a system-wide comparison of the cost effectiveness of combinations of CDM/DG versus the recommended transmission reinforcements.[79]**

112. Furthermore, as a result of Environmental Defence's motion for better interrogatory responses, the OPA was forced to acknowledge that it conducted *no thorough analysis* of the CDM/DG alternative as part of its decision-making process. This supplementary interrogatory response reads as follows:

> The OPA did not commission any external reports nor prepare any internal reports on whether increased conservation and demand management ("CDM") and distributed generation ("DG") could avoid or defer the need for a new transmission line in the Kitchener-Waterloo-Cambridge-Guelph ("KWCG") area. The OPA also does not have any "thorough analysis" on this topic apart from what has already been filed. The OPA's evidence found in Exhibit B, Tab 1, Schedule 5, as well as the interrogatory responses …[80]

113. In other words, the OPA's only analysis of the CDM/DG alternative appears at Ex. B-1-5 and consists of a report prepared for this application. However, this report is dated March, 2013 (the month this application was filed) even though the decision on the transmission upgrades took place far earlier in time. In other words, the analysis of alternatives appears to have occured *long after* the actual decision was made, which is not the kind of integrated resource planning and cost-benefit analysis that the Board expects

---

[78] Response to ED Interrogatory No. 18 (Ex. I, Tab 2, Schedule 18) [Compendium, tab 9]
[79] Response to ED Interrogatory No. 28 (Ex. I, Tab 2, Schedule 28) [Compendium, tab 13]
[80] Supplementary Response to ED Interrogatory No. 26, p. 2 (Ex. I, Tab 2, Schedule 26-S, Attachment 3, Page 24) [Compendium, tab 28]

Applicants to conduct before seeking leave to construct $100 million transmission projects.

114. Even the after-the-fact analysis prepared by the OPA and submitted in this proceeding is flawed and incomplete. For example, as discussed in paragraphs 43 to 46 above, the analysis of the cost-effectiveness of CHP fails to account for the avoided capital cost of base load generation. More fundamentally, as detailed in paragraph 34 above, the OPA considers CDM and DG in isolation, rather than as a combined alternative. A combined option will of course provide a larger MW reduction in peak demand and would be more cost-effective because it would be possible to select only the best projects.

115. Hydro One has failed to fulfill the requirements for an application such as this as it has failed establish that the proposed transmission upgrades are preferred to the alternative of CDM and DG.

Conclusion

116. The OPA and Hydro One have been aware that the KWCG area's electricity system has been out of compliance with IESO criteria since 2004.[81] After letting approximately nine years pass, the OPA is now proposing a $100 million transmission solution that will not increase the KWCG area's security of supply for at least three years. It is Environmental Defence's submission that the proposed transmission project should not be approved by the Board since an integrated combination of CDM and small-scale, local DG can potentially meet the KWCG area's electricity needs *sooner, more reliably and at a lower cost.*

117. Even if the Board is not prepared to conclude that the CDM/DG option is feasible and preferable, we submit that the Application should still be rejected because the Applicant has not completed the kind of cost-benefit analysis required by the *Filing Guidelines*. In other words, Hydro One has not established that its $100 million project is preferred from the perspective of timing, reliability, and cost.

[81] Supplementary Response to ED Interrogatory No. 5 (Ex. I, Tab 2, Schedule 5-S) [Compendium, tab 23]

118. The Government of Ontario's *Conservation First* white paper is an indication of the future of energy planning in this province whereby cost-effective conservation must be considered *first*. The opposite occurred here. A combined CDM/DG option was not considered as part of the planning process even though it appears that this option could be implemented sooner and improve reliability more than proposed transmission upgrades, and all at a lower cost.

119. For the above reasons, Environmental Defence requests:

    a. An order denying leave to construct the proposed facilities pending the creation of a thorough cost-benefit comparison of the proposed project versus an integrated combination of CDM and DG; and

    b. A direction or statement that, in the future, Hydro One and the OPA should comprehensively assess CDM and DG as alternatives to supply-side transmission upgrades early in the planning process such that CDM and DG alternatives can be identified and adopted wherever they are the most cost-effective option.

Costs

120. Environmental Defence respectfully requests that it be awarded all of its reasonably incurred costs of participating in this proceeding. As the Board is aware, Environmental Defence is a registered charity and has no pecuniary interest in the outcome of this proceeding.

All of which is respectfully submitted this 26th day of July, 2013.

Kent Elson

KLIPPENSTEINS,
Barristers and Solicitors
160 John Street, Suite 300
Toronto, Ontario M5V 2E5