

**EB-2012-0458**

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

**AND IN THE MATTER OF** an Application by K2 Wind Ontario, LP for an order under section 92 and subsection 96(2) of the *Ontario Energy Board Act, 1998*, granting leave to construct an electricity transmission line and related transmission facilities;

**SUBMISSION OF THE RESIDENTS GROUP**

**July 3, 2013**

## TABLE OF CONTENTS

<b>1. INTRODUCTION .....</b>	<b>4</b>
1.1 RESIDENTS GROUP – WHO WE ARE .....	4
1.2 COMMUNITY SUPPORT.....	4
1.3 K2 WIND APPLICATION .....	5
<b>2. PUBLIC INTEREST &amp; THE ONTARIO ENERGY BOARD.....</b>	<b>5</b>
2.1 DEFINITION OF PUBLIC INTEREST .....	5
2.2 THE CHANGING CURRENT IN PUBLIC POLICY .....	9
2.3 ONTARIO ENERGY BOARD JURISDICTION .....	10
<b>3. IMPACT OF RENEWABLE ENERGY POLICY ON ONTARIO’S ELECTRICAL CONSUMERS .....</b>	<b>10</b>
3.1 ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS .....	11
3.2 INDEPENDENT ELECTRICITY SYSTEM OPERATOR (IESO).....	13
3.3 ONTARIO AUDITOR GENERAL REPORT .....	15
3.4 FRASER INSTITUTE STUDY – AUTHORED BY PROFESSOR ROSS MCKITRICK – 2013 .....	18
3.5 K2 WIND .....	19
<b>4. K2 WIND PROJECT ANALYSIS – PART 1: ENERGY PRODUCTION &amp; COST IMPLICATIONS.....</b>	<b>20</b>
4.1 PROJECTED POWER PRODUCTION .....	20
4.2 CONSUMER COST IMPLICATIONS .....	26
4.3 SIA & CIA REPORTS .....	28
4.4 HYDRO ONE NETWORKS INCORPORATED (HONI).....	30
<b>5. K2 WIND PROJECT ANALYSIS – PART 11: DESIGN PARAMETERS - SAFETY ISSUES – UNDERGROUND 230 KV TRANSMISSION LINE.....</b>	<b>31</b>
5.1 SCOPE OF OEB MANDATE .....	31
5.2 SAFETY CONSIDERATIONS .....	34
a) <i>Design Inadequacies/Lack of Information</i> .....	34
b) <i>Mechanical Protection</i> .....	35
c) <i>Erosion/Farm Equipment Disturbance</i> .....	35
d) <i>Warning Tape</i> .....	36
e) <i>Municipal Drains</i> .....	36
f) <i>Cables</i> .....	36
g) <i>Ontario Standards of Construction</i> .....	36
h) <i>Line Location on Road Allowance</i> .....	38
i) <i>Township Review</i> .....	39
j) <i>Emergency Response Plans</i> .....	39
k) <i>Easement Agreement for Transmission Line</i> .....	40
<b>6. RELIABILITY/IMPACT ON GRID.....</b>	<b>42</b>
6.1 TURBINE FIRE .....	43
6.2 STRAY VOLTAGE .....	44
6.3 GODERICH TORNADO – EMERGENCY RESPONSE PROCEDURES.....	45
<b>7. SUMMARY.....</b>	<b>45</b>
7.1 RESIDENTS GROUP POSITION .....	45
7.2 RECOMMENDATIONS .....	48
a) <i>Safety Recommendations</i> .....	48
b) <i>Stray Voltage Recommendations</i> .....	49
c) <i>Cost Recommendations</i> .....	50

7.3 CONCLUSION ..... 50

**8. SIGNATURES..... 52**

**9. REFERENCES..... 53**

**10. APPENDICES ..... 55**

## **ONTARIO ENERGY BOARD – SUBMISSION of the RESIDENTS GROUP**

**July 3, 2013**

**EB-2012-0458**

### **1. INTRODUCTION**

#### **1.1 Residents Group – Who We Are**

The ratepayers that present this submission are a group of ordinary citizens and residents of Ashfield Colborne Wawanosh (ACW). We have lived, worked, raised families and been part of this community for many years, some of us for our entire lives. We have a deep love and commitment to this land and this community. For some of us these ties extend back for generations.

Wind turbines on a commercial scale have been present in our Township since 2006. The proposed 140 turbine K2 Wind development is a massive expansion of the existing wind generation in this Township. We are concerned with the scale of this development and the lack of answers to questions raised by residents regarding the reliability of the project and the various risks associated with the project. There are long term implications for Ontario citizens with respect to price and reliability of the energy system that are not being adequately addressed. There are safety issues surrounding the specific proposal by K2 Wind that have not been adequately addressed. Our decision to request intervener status was based on these concerns.

#### **1.2 Community Support**

We are not alone in our concerns regarding this project. Many residents of the Township have submitted comments as part of this hearing. The K2 Wind project does not have extensive community support in Ashfield Colborne Wawanosh. Over 800 residents and citizens have signed a petition that opposes the further development of wind energy, as it is currently being proposed, in this Township and they stand with us in our concerns. The original petition has been submitted to the Ministry of the Environment as part of the public input for the REA process. The electrical customers in ACW are well aware of the impact that unnecessary electrical generation has had to date on their electric bills. They do not want Ontario to have the electrical poverty seen by ratepayers of Europe. On a broader scale, the 2011 provincial election results in Ontario showed a changing tide in rural Ontario with little public support for the provincial green energy policies.



### **1.3 K2 Wind Application**

In its application to the Board, K2 Wind has justified the approval of the Kingsbridge wind project on the following basis:

The construction of the Proposed Facilities are in the overall public interest within the meaning of subsection 96(2) of the OEB Act because:

(i) the Proposed Facilities will facilitate the transfer of 270 MW of clean, renewable energy to Ontario's electricity grid and will further Ontario's objective of significantly increasing the amount of renewable electricity generated in the province;

(ii) the cost of the construction of the Proposed Facilities will be borne entirely by the Applicant and not by electricity ratepayers; and

(iii) the SIA (and the Addendum) and CIA Reports filed as part of this application support the conclusion that the interconnection of the Proposed Facilities with the IESO-controlled grid will not adversely affect the reliability and quality of electricity service in Ontario.<sup>1</sup>

In its Argument-in-Chief, K2 Wind has submitted that it meets these criteria specified in section 96(2) of the *Ontario Energy Board Act* ("*OEB Act*"). It is the position of the Residents Group that K2 Wind's application does not in fact meet the intent of the criteria set out in the *OEB Act*. It is the position of the Residents Group that the K2 Wind application cannot be justified as being in the overall public interest at this time. The subsequent sections of this submission speak to our reasons for taking this position.

## **2. PUBLIC INTEREST & THE ONTARIO ENERGY BOARD**

### **2.1 Definition of Public Interest**

The OEB has stated that the definition of "public interest" is ever fluid and flowing, changing with each and every new project. In a speech to the Ontario Energy Network in 2008, the chair of the OEB, Howard Wetston outlined the following comments on public interest:

It has been said that the public interest must necessarily represent a working compromise and be subject to continuous definition, as the need arises, in the process of achieving an often delicate balance among conflicting interests. While consistency and predictability are important regulatory goals, there is little, if any consensus on what exactly constitutes the public interest other than recognizing that it must be elastic and permitted to evolve.<sup>2</sup>

And:

---

<sup>1</sup> EB-2012-0458, K2 Wind Application Filed Dec. 21, 2012, Exhibit B, Tab 1, Schedule 1, pgs. 8-9

<sup>2</sup> Wetston, Howard. *Text of Speech to Ontario Energy Network*, April 17, 2008, pg. 1 published on <http://www.ontarioenergyboard.ca/OEB/Documents/speech>

Of course, regulating in the public interest is also understanding that the public interest continually evolves.<sup>3</sup>

In the OEB decision, File #EB-2008-0050 (Canadian Renewable Hydro Developers) the Board stated in respect to the public interest:

This Board has previously considered the phrase “the public interest”. In one decision the Board noted: Clearly there are no firm criteria for determining the public interest which would hold good in every situation. Like ‘just and reasonable’ and ‘public convenience and necessity’, the criteria of public interest in any given situation are understood rather than defined, and it may well not serve any purpose to attempt to define these terms too precisely. Rather, it must be left to those who have to arrive at a conclusion to strike the balance of puts and takes, pluses and minuses, that at the particular point in time are considered appropriate.

The public interest is dynamic, varying from one situation to another, if only because the values ascribed to the conflicting interests alter. It follows that the criteria by which the public interest is served may also change according to the circumstances.

In another decision, the Board made the following observations regarding the definition of “the public interest”:

In the opinion of the Board, the public interest can only be more particularly defined by examining the facts and nature of the situation in which the test is to be used. The public interest will consistently take the form of the facts to which it is applied, moulding itself to the specific use to which it is to be put.

Having determined that the public interest is not generally definable, the Board would add that in spite of its elusiveness, when it is applied to a specific set of facts the reasonable man of the common law has no trouble determining if a particular act meets the test...Lord Coke put it succinctly when he wrote: ‘The law prefers the public good to the private good, and if it has to choose between prejudice to the many and mischief particular to the individuals, the individuals must suffer.’

In *Union Gas Ltd. v. Township of Dawn*, the Divisional Court dealt with an appeal of a Board decision made in the public interest, and in its reasons stated: “The words ‘in the public interest’ ... would seem to leave no room for doubt that it is the broad public interest that must be served”<sup>4</sup>.

We, as a group of citizens of ACW, feel that the definition of “public interest” is clear in this particular case. It is our assertion that K2 Wind is the private interest and the citizens of ACW, and thus, by extension, the residents of the province of Ontario, are the public interest. When past decisions are taken into consideration, the public interest as defined by the Board makes clear that we the residents and by extension the taxpayers of Ontario must be considered the public interest in this hearing. The task before the OEB is to determine what is best for the broad public interest.

---

<sup>3</sup> Ibid, pg. 6

<sup>4</sup> EB-2008-0050, Decision and Order dated July 18, 2008, pgs. 8-9



In the Honourable Ms. Kathleen Wynne's recent Throne Speech, she stated that our economy can benefit from developments like wind plants, but only if we have willing hosts. ACW Council and ninety other municipalities have called for a moratorium on wind turbines in the province of Ontario. These municipalities are acting on behalf of their residents, the public interest, and are not willing hosts

1. Adelaide-Metcalf Township (Middlesex County)
2. Ajax, Town of (Durham County)
3. Amaranth Township (Dufferin County)
4. Arran-Elderslie, Township of (Bruce County)
5. Ashfield-Colborne-Wawanosh, Township of (Huron County)
6. Asphodel-Norwood, Township of (Peterborough County)
7. Aundeck Omni Kaning First Nations Band Council
8. Blue Mountains, Town of (Grey County)
9. Bluewater, Municipality of (Huron County)
10. Bonnechere Valley, Township of (Renfrew County)
11. Bruce County
12. Caledon, Town of (Peel Region)
13. Carling, Township of (District of Parry Sound)
14. Cavan-Monaghan, Township of (Peterborough County)
15. Central Huron Council (Huron County)
16. Centre Wellington, Township of (Wellington County)
17. Chatsworth, Township of (Grey County)
18. Clarington, Municipality of (Durham Region)
19. Clearview, Township of (Simcoe County)
20. Dawn Euphemia Township (Lambton County)
21. Dufferin County
22. Durham, Regional Municipality of
23. East Garafraxa, Township of (Dufferin County)
24. East Luther-Grand Valley, Township of (Dufferin County)
25. East-Zorra Tavistock, Township of (Oxford County)
26. Edwardsburgh-Cardinal (Leeds and Grenville)
27. Essex County Council
28. Georgian Bluffs, Township of (Grey County)
29. Greater Napanee, Town of (Prince Edward County)
30. Grey Highlands (Grey County)
31. Haldimand County
32. Hamilton Township (Northumberland County)
33. Hamilton, City of
34. Huron County
35. Huron East, Municipality of (Huron County)
36. Huron-Kincloss Township
37. Kawartha Lakes, City of
38. Killaloe, Hagarty & Richards Township (Renfrew County)
39. Kincardine, Municipality of (Bruce County)
40. Kingsville – offshore (Essex County)

- 41.Lambton, County of
- 42.Lambton Shores (Lambton County)
- 43.Lanark, County of
- 44.Leamington – offshore (Essex County)
- 45.Lennox-Addington, County of
- 46.Loyalist Township (Lennox and Addington County)
- 47.Lyndoch, Brudenell and Raglan, Township of (Renfrew County)
- 48.Madawaska Valley Council (Renfrew County)
- 49.Mapleton, Township of (Wellington County)
- 50.Meaford, Municipality of (Grey County)
- 51.Melancthon, Township of (Dufferin County)
- 52.Middlesex, County
- 53.Montague, Township of (Lanark County)
- 54.Mulmur, Township of (Dufferin County)
- 55.Newbury, Village of (Middlesex county)
- 56.Norfolk, County of
- 57.North Bruce, Municipality of (Bruce County)
- 58.North Kawartha, Township of (Peterborough County)
- 59.North Middlesex Township (Middlesex County)
- 60.North Perth (Perth County)
- 61.North Dundas (Counties of Stormont, Dundas and Glengarry)
- 62.Northeastern Manitoulin & the Islands (NEMI)
- 63.Norwich Township (Oxford County)
- 64.Oxford County
- 65.Perth East (Perth County)
- 66.Pickering, City of (Durham Region)
- 67.Plympton-Wyoming, Town of (Lambton County)
- 68.Powassan, Municipality of (Parry Sound District)
- 69.Prescott-Russell, United Counties of
- 70.Prince Edward County
- 71.Prince Township (Algoma District)
- 72.Ramara, Township of (Simcoe County)
- 73.Saugeen Shores, Town of (Bruce County)
- 74.Sheguiandah First Nation
- 75.Smith Falls (Lanark County)
- 76.South Algonquin Township (Renfrew County)
- 77.South Bruce, Municipality of (Bruce County)
- 78.South Bruce, Town of (Bruce County)
- 79.St. Clair Township (Lambton County)
- 80.Strathroy-Caradoc (Middlesex)
- 81.The Archipelago, Township of (Parry Sound District)
- 82.Thessalon Township (Algoma District)
- 83.Tiny Township (Simcoe County)
- 84.Toronto Regional Conservation Authority (TRCA)
- 85.Uxbridge, Township of (Region of Durham)
- 86.Wainfleet, Township of (Niagara District)



- 87. Warwick, Township of (Lambton County)
- 88. Wellington County
- 89. Wellington North, Township of (Wellington County)
- 90. West Grey, Municipality of (Grey County)
- 91. West Lincoln, Municipality of (Niagara District)

## **2.2 The Changing Current in Public Policy**

In considering the public interest the Board must have regard to the public policies of the current government in formulating its decisions. As with the public interest, public policy is a fluid, ever changing animal. It changes with every government, every decision made by an arm of the government and every action taken by an employee of that government. The stated goals of public policy are often contradictory. The *Planning Act* is a prime example of that. Those tasked with the job of implementing “public policy” are frequently asked to weigh and assign merit to competing aspects of the public interest.

When the *Green Energy and Economy Act* was implemented in 2009 the province was in a very different situation financially from where it is today. It is clear that the economic landscape of the province has radically changed since 2009 and one of the foremost goals of the current government is to be fiscally responsible to the Ontario taxpayers. A prime example of the push towards fiscal responsibility is recent changes to the contracts of Ontario teachers. The new contracts mandated by the government show how drastically and quickly the public priorities can shift in response to an altered reality. Clearly the overriding shift of the focus of policy in the province today is toward fiscal responsibility. Given the mountain of debt Ontario taxpayers are shouldering, that is an understandable and laudable move.

The fiscal situation in our province is forcing a revisiting of our costly renewable energy policies. On June 20<sup>th</sup>, 2013, the government announced that it was reducing the Korean Consortium’s (which includes Samsung) total commitment for renewable energy projects under the Green Energy Investment Agreement (GEIA) from 2,500 megawatts (MW) to 1,369 MW. It estimated that this would save almost \$3.7 billion in contract costs.<sup>5</sup> This is a clear sign of how the policy direction has now changed. Increasing the amount of renewable electricity generated in the province is no longer top priority.

There is also a changing direction in the Ontario Government’s renewable energy policy with respect to the need to address local issues. On May 30<sup>th</sup>, 2013, the Minister of Energy announced the cancellation of the Feed-in-Tariff (FIT) program for large-scale renewable energy projects over 500 kilowatts. The new process that is being established is intended to better meet the needs of communities. In announcing this change, the Minister of Energy noted that it was clear that changes needed to be made in the process

---

<sup>5</sup> Ontario Ministry of Energy, 2013. *Energy Agreement Secures Jobs and Clean Energy*. News Release June 20, 2013 on <http://www.energy.gov.on.ca/en/news>

to increase local control over the siting of renewable energy projects.<sup>6</sup> This change is, in effect, an acknowledgement that the original policy was seriously flawed and that many of the projects proposed under it were inappropriately sited without sufficient regard for local concerns. This change of direction has taken place in a policy that is only a few years old.

Any decision of the OEB that contradicts these new realities is clearly undermining the public policy direction in which the province is heading. Fiscal responsibility is driving the other competing aspects of public policy. Local interests have been given greater prominence in energy policy. With these goals in mind, the OEB decisions must perform reflect this new policy environment.

### **2.3 Ontario Energy Board Jurisdiction**

The OEB's jurisdiction is limited under section 96(2) of the *Ontario Energy Board Act*. The Board shall consider the public interest and shall only consider the following two issues when deciding if the proposed project is in the public interest:

- 1) The interests of consumers with respect to prices and the reliability and quality of electricity service; and
- 2) Where applicable and in a manner consistent with the policies of the Government of Ontario, the promotion of the use of renewable energy sources.

Although this directive narrows the issues that the Board can consider, it still poses a conundrum for the Board. What happens when the two goals are in conflict? How then does the Board weigh the competing goals? Which goal is given priority?

It is our contention that the two aims are now in conflict. The province has reached a point where implementation of its renewable energy policy, as it was originally conceived, is causing problems for consumers with respect to prices and the reliability and quality of electricity service. In support of this position, the next section references various experts who have assessed the long-term impact of Ontario's renewable energy policies on both pricing and the reliability and stability of the electrical grid.

### **3. IMPACT OF RENEWABLE ENERGY POLICY ON ONTARIO'S ELECTRICAL CONSUMERS**

The provincial Long Term Energy Plan (LTEP) projects that over the next 20 years, consumer electricity rates will increase by about 3.5% annually. However, over the next 5 years, residential electricity rates are expected to rise by around 7.9% annually (46% over 5 years). Investments in new renewable energy generation are projected to account

---

<sup>6</sup> Ontario Ministry of Energy, 2013. *Ontario Working With Communities to Secure Clean Energy Future*. News Release May 30, 2013 on <http://www.energy.gov.on.ca/en/news>



for 56% of this increase.<sup>7</sup> If the Ontario consumer was faced with a situation of power shortages and usage limitations resulting from those shortages, an argument could be made for supporting any efforts to expand supply regardless of the cost implications. Clearly that would be in the broader public interest. However, as the next sections of this submission show, that argument does not stand up to scrutiny.

### **3.1 Ontario Society of Professional Engineers**

The Ontario Society of Professional Engineers (OSPE) conducted an extensive review of wind energy in 2011 and authored a report entitled “*Wind and the Electrical Grid: Mitigating the Rise in Electricity Rates and Greenhouse Gas Emissions.*”<sup>8</sup>

The following is taken from the executive summary of that report.

The Ontario Society of Professional Engineers (OSPE) has undertaken an independent engineering review of wind generation and its impact on Ontario’s electrical grid because of growing amounts of hydraulic spill, nuclear shutdowns and periods of negative wholesale electricity prices during severe base load generation periods. This situation is expected to get much worse over the next several years as significant amounts of wind, hydraulic and nuclear generation will be coming into service while expected electrical demand will continue to be stagnant even with the introduction of electric plug-in vehicles.<sup>9</sup>

One of the important points to note in this report is the growing divergence between the demand and supply sides of the electrical system. The Ontario situation with surplus base load generation was of particular concern:

Ontario was planning for a small annual growth in energy demand over the past several years. This growth did not materialize. In fact the peak customer demand over the past 5 years has actually dropped by almost 6% or 1,600 MW and the total annual energy demand has dropped by 6% or 9 TWh (R10). The off-peak customer demand has dropped by over 7% or 800 MW... This drop in demand has created a divergence between planned generation additions and required generation. It has also undermined the government’s plans to significantly increase wind generation in the energy mix...wind turbines produce their maximum output at night. Consequently, wind generation competes directly with nuclear and must-run hydraulic generation for the reduced customer demand.

The surplus base load generation problem will get worse and more costly as more wind, hydraulic and nuclear base load generation capacity is added over the next 6 years unless we dispatch down our wind turbines or take other measures to reduce surplus base load generation.<sup>10</sup>

---

<sup>7</sup> Ontario Ministry of Energy, 2013. *Ontario’s Long-Term Energy Plan* published on <http://www.energy.gov.on.ca/en/itep/electricity-prices>

<sup>8</sup> OSPE, 2012. *Wind and the Electrical Grid: Mitigating the Rise in Electricity Rates and Greenhouse Gas Emissions.*

<sup>9</sup> Ibid at pg. 1.

<sup>10</sup> Ibid at pgs. 8 and 14

The OSPE estimated that by 2030 with an additional 8,000 MW of base load generation, Ontario could reach over 11,000 MW of surplus base load generation in a low electrical demand scenario. One of the key recommendations from the OSPE review was that the Minister of Energy should modify market rules so that all significant generation resources including wind will be subject to IESO dispatching.

In a presentation at the Energy Mini-Conference Series on March 22, 2012 in Toronto, the chair of the OSPE Energy Task Force, Paul Acchione, outlined the following problems with wind and the current Ontario electrical grid <sup>11</sup>:

- Ontario's electrical demand is flat;
- Wind generation is intermittent so it needs a dependable backup supply;
- Storage of electricity is very expensive;
- Ontario is not geographically large enough to eliminate hourly fluctuations in wind generation among wind farms;
- Wind production is out of step with actual electrical demand; and
- Wind generation is not grid friendly in that
  - a) It competes with base load plants for electrical demand
  - b) If it is given priority access to the grid in periods of insufficient demand then water is spilled at hydraulic plants, power is sold at negative electricity prices and nuclear plants that cannot maneuver sufficiently need to be shutdown; and
  - c) Giving wind priority forces nuclear off-line.

Wind is already forcing nuclear off-line. In a letter from Duncan Hawthorne, President and CEO of Bruce Power to Paul Murphy, President and CEO of the IESO, Mr. Hawthorne indicates that the Bruce Nuclear plant maneuvered over 700 times during the past 3 years in response to surplus conditions. He also notes that the Bruce operators are "acutely aware of the challenges facing the province to balance supply and demand on a daily basis, given the reduction in baseload requirements overall in the market, [and] the changing supply mix".<sup>12</sup>

The implications of nuclear shutdowns are much more significant. As Mr. Acchione noted, nuclear plants have limited maneuvering capability. Wind must be dispatched during low demand periods (spring and fall) or we will have nuclear shutdowns and hydraulic spill. A shutdown lasts 2-3 days minimum and causes higher fuel costs and higher GHG emissions for gas fired replacement power. For 2014 he noted that the IESO estimated that shutdowns will result in \$180 Million in additional CO2 emissions if wind is not dispatched. Mr. Acchione's summary conclusions are a stark warning for the powers governing the electrical grid:

- The current design of the Ontario electrical grid is not compatible with a large increase in wind generation;

---

<sup>11</sup> Acchione, 2012. *Wind and the Ontario Electrical Grid – The Good, the Bad and the Ugly*. Presentation to the Energy Mini-Conference Series 2012, Toronto, (March 22, 2012) by Paul Acchione, Chair of OSPE Energy Task Force.

<sup>12</sup> Duncan Hawthorne. EB-2013-0029, *Letter to Paul Murphy*, IESO, August 16, 2012.



- The reduced customer demand for electricity is making the surplus base load generation problem worse;
- The large increase in wind generation will place upward pressure on electricity rates and will drive GHG emissions higher unless:
  - wind and solar are dispatched;
  - demand is shifted from day to night;
  - surplus energy is sold on a firm basis to neighboring grids;
  - nuclear plants are modified to improve their maneuverability;
  - more daily and seasonal storage is added.
- There was inadequate professional engineering input into the development of Ontario's electrical energy policies, directives and implementation plan;
- Ontario's long term energy plan is not optimum with respect to cost and environmental performance;
- Ontario's Ministry of Energy needs to include more power engineering expertise specific to Ontario's grid design in the development of electrical energy policies, directives and implementation plans in order to achieve optimum cost and environmental performance.<sup>13</sup>

### **3.2 Independent Electricity System Operator (IESO)**

Ontario currently sits in an enviable situation. It no longer faces a shortfall of energy. The IESO website posts the statistics for total annual Ontario energy demand. It shows that provincial demand peaked in 2005 at 157 TWh. In contrast, demand in 2010 had dropped to 142 TWh and by 2012 had further declined to 141.3 TWh.<sup>14</sup> The most recent 18-Month Outlook (from June 2013 to November 2014) published by the IESO indicates that energy demand is forecast to continue the downward trend by decreasing 0.4% in 2013.<sup>15</sup>

In the words of the IESO regarding electrical demand in Ontario:

...it now has the luxury of sufficient and even excess supply...The supply-side challenge now is therefore not driven by the need to procure new generation capacity, but to manage supply to meet the needs of electricity customers.<sup>16</sup>

The IESO specifically notes that “deferring or avoiding new supply until it is needed to meet electricity system requirements is not a change in government policy.”<sup>17</sup> The IESO further states that “it is only prudent to consider the relative benefits of acquiring or deferring additional supply capacity in light of reduced demand...The benefit of avoiding

---

<sup>13</sup> Acchione, 2012. *Wind and the Ontario Electrical Grid – The Good, the Bad and the Ugly*. Presentation to the Energy Mini-Conference Series 2012, Toronto, (March 22, 2012) by Paul Acchione, Chair of OSPE Energy Task Force. pgs. 22-23.

<sup>14</sup> IESO, 2013. *Total Ontario Energy Demand*, [http://www.ieso.ca/imoweb/media/md\\_demand.a](http://www.ieso.ca/imoweb/media/md_demand.a)

<sup>15</sup> IESO, May 24, 2013. *Power Outlook: Spring 2013, 18-Month Outlook*, pg. iii, [http://www.ieso.ca/imoweb.pubs/marketReports/18MonthOutlook\\_2013may.pdf](http://www.ieso.ca/imoweb.pubs/marketReports/18MonthOutlook_2013may.pdf)

<sup>16</sup> IESO, 2011. *Reconnecting Supply and Demand*, pg. 3, <http://www.ieso.ca/imoweb.pub>

<sup>17</sup> Ibid at pg. 5

or deferring additional capacity is the avoided costs of new generation that is no longer required to meet peak demand requirements.”<sup>18</sup>

Some of the short-term (to 2014) options for managing the surplus power situation that have been identified by the IESO are to “increase the use of IESO control actions e.g. manual dispatch, nuclear maneuvers, **curtailing renewable resources**”<sup>19</sup> (emphasis added). Dispatch of renewable resources is also recommended for managing SBG situations.

Recently, the IESO established new market rules which would allow it to restrict the flow of wind power into the electricity grid when the demand for power is out of sync with wind production. The wind companies filed an application with the OEB (EB-2013-0029) asking it to force the IESO to review its new rules. It should be noted that if the IESO was acting in the best interests of consumers in dispatching wind generation, the appeal of the wind producers was contrary to this position. They could only be acting in their own individual interest to maintain lucrative contracts.

This is the fundamental problem with wind production. It does not fit easily into the electrical demand profile for the province. If the wind power cannot be curtailed in periods of low energy demand, how can this contribute to green policy objectives? As well, and ironically, the more reliant we become on intermittent wind power, the more reliant we become on gas-fired generation – wind’s fossil fuel back-up. The reasonable individual can clearly see that conservation efforts must be at the heart of any truly successful provincial green energy policy. The current provincial policy is obviously contrary to this goal.

In the IESO’s submissions to the OEB in EB-2013-0029 it noted that if it cannot control the flow of wind and solar power onto the Ontario grid, then “reliable and economic operation of the power system is, at best, highly compromised and likely not feasible”. Bruce Campbell, Vice President of Resource Integration for the IESO (now President and CEO of the IESO effective May 1, 2013), filed an affidavit in the case in which he stated that:

The changing supply mix across the Province, in particular as a result of the growing investment in variable generation, is challenging the IESO’s ability to efficiently dispatch power system resources, and at times to maintain reliability...The need for the MR-00381 rule amendments is based entirely on (1) managing surplus baseload generation (SBG) at the provincial level; (2) managing SBG at the regional level; and (3) addressing operational needs such as ramping and load following requirements, and efficient co-ordination with other generation...The IESO’s analysis focused on the environmental benefits, cost savings, and system operational efficiencies that could be gained through the amendments.<sup>20</sup>

---

<sup>18</sup> Ibid at pg. 5

<sup>19</sup> Ibid at pg. 13

<sup>20</sup> Campbell, Bruce. EB-2013-0029. IESO Response to RES Generators, Submission dated Jan. 16, 2013, pg. 2



The IESO estimated that surplus power would cost Ontarians \$200 million a year. In addition to the economic implications, excessive generation is a well-known threat to the overall stability of the grid and can lead to failures. It is interesting to note that in EB-2013-0029 the Ministry of Energy claimed confidentiality over a document entitled *Managing Surplus Generation* dated May 14, 2012 and one of the reasons cited for this was that “fundamental decisions relating to how government will effectively manage the issues relating to surplus baseload generation involve key policy decision-making processes which are still ongoing”<sup>21</sup>. Clearly the issue of surplus power is an ongoing problem.

However, the new rules for curtailment of wind generation only apply to the existing RESOP RES 1 and RES 2 wind contracts. This would include the KI project of 22 turbines (now 21 subsequent to the fire on April 2, 2013). The proposed 140 turbine K2 project will not be affected. If additional wind power generation on the scale of K2 is approved in this province, ratepayers will be faced with the ludicrous situation of compensating existing wind producers for power that has not been produced while continuing to destabilize the grid with additional surplus power that cannot be curtailed. Only in the bizarre universe of wind generation would this scenario even be considered. Fortunately, the wider world does not operate in this way.

Continuing to add intermittent and variable surplus power of the magnitude of the K2 Wind project undermines the aim of the IESO’s new dispatch rules. In addition to the cost implications for ratepayers, it magnifies the already existing SBG problem as noted by the IESO:

Ontario will continue to experience an increase in volume, frequency and duration of surplus baseload generation (SBG) conditions with declining wholesale demand for electricity and significant quantities of baseload generation on the system. A vast majority of SBG is being managed via IESO tools and processes such as managing exports and nuclear maneuvering. In the first three weeks of May, nuclear units were shut down on three occasions in response to surplus conditions. The IESO will gain another tool to help manage SBG in September 2013 as wind becomes a dispatchable resource, which will help manage this increase in SBG.<sup>22</sup>

### **3.3 Ontario Auditor General Report**

In 2011 the Auditor General issued a scathing report on the implementation of the province’s renewable energy policy. The following excerpts are taken from that report.

Given that demand growth for electricity is expected to remain modest at the same time as more renewable energy is being added to the system, electricity ratepayers may have to pay renewable energy generators under the FIT program between \$150 million and \$225 million a year not to generate electricity.

---

<sup>21</sup> Ontario Ministry of Energy. EB-2013-0029. Letter dated Feb.6, 2013, pg. 3

<sup>22</sup> IESO, May 24, 2013. *18-Month Outlook*, pg. iv,

[http://www.ieso.ca/imoweb.pubs/marketReports/18MonthOutlook\\_2013may.pdf](http://www.ieso.ca/imoweb.pubs/marketReports/18MonthOutlook_2013may.pdf)

Renewable energy sources such as wind and solar provide intermittent energy and require backup power from coal or gas-fired generators to maintain a steady, reliable output. According to the study used by the Ministry and the OPA, 10,000 MW of electricity from wind would require an additional 47% of non-wind power, typically produced by natural-gas-fired generation plants, to ensure continuous supply.<sup>23</sup>

And:

Our analysis of actual and projected data from the IESO and the OPA shows that from 2005 to 2025, installed and effective capacity will continue to exceed both average demand and peak demand... An OEB analysis completed in April 2010 also concluded that, by 2016, electricity supply will far exceed demand. Despite these anticipated surpluses, renewable energy generators who have contracts with the OPA will get paid even though Ontario does not need their electricity.<sup>24</sup>

Based on the Auditor General’s review of Ontario Power Authority data, it is expected that renewable energy contracts will contribute significantly to an increase in the Global Adjustment. The impact that this will have on the individual consumer is shown in the following figure excerpted from that review.<sup>25</sup>

**Figure 4: Monthly Electricity Charge Related to Renewable Energy in Different Sectors**

Source of data: Ministry of Energy

Economic Sector	Examples	Assumed Electricity Consumption (kWh/month)	Renewable Energy-related Electricity Charge (\$)	
			2010 (Actual)	2018 (Projected)
residential	n/a	800	2	31
small commercial	convenience store, small dry cleaner, restaurant, small retail store	12,000	38	500
large commercial	supermarket, shopping mall, large office building, hotel	130,000	385	5,000
industrial	paper and pulp, automobile, mining, cement, iron and steel manufacturing, chemical products, petroleum (i.e., refineries)	61,200,000	200,000	2,400,000

In reviewing this data, it is clear that the average consumer will face substantial increases in rates. The impact of rising energy prices that were projected in this 2011 analysis are already being felt in the province’s economy. As an example, a recent article in the May 14<sup>th</sup>, 2013, edition of *The London Free Press* outlined how a \$1 billion planned expansion of Nova Chemical in Sarnia is now in jeopardy and quoted Sarnia Mayor Mike

<sup>23</sup> Excerpt of the Report from the Auditor General, 2011 Annual Report of the Office of the Auditor General of Ontario. pg. 91

<sup>24</sup> Ibid at pg. 99

<sup>25</sup> Ibid, pg. 95



Bradley as stating “The key issue that was flagged by Nova – and it’s an issue with nearly every company we’re dealing with – is the cost of power”.<sup>26</sup>

The Auditor General analyzed the performance of all wind farms in Ontario in 2010 based on IESO data. The analysis showed that wind output was out of phase with electricity demand during certain times of the day. During the morning hours wind output usually decreased just as demand ramped up.

The OPA has recognized that the lack of correlation between electricity demand and intermittent renewable energy has created operational challenges, including power surpluses and the need for backup power generated from other energy sources.<sup>27</sup>

One of the threats to the reliability of the electrical system is the occurrence of surplus base-load generation (SBG), power oversupply when the amount of electricity from base-load generators exceeds demand. There were no SBG days in 2005-2007, but there were 4 in 2008, 115 in 2009 and 55 in 2010. In quoting the IESO, the Auditor General notes that “because most generators cannot ramp wind power up or down in response to demand, SBG hours will increase significantly over the next decade” which will create “operational challenges and costs that will ultimately be borne by electricity ratepayers.”<sup>28</sup>

One of the preferred means of dealing with SBG events is to export surplus power. The following excerpt from the Auditor General’s report outlines the cost implications of this action.

... the increase in renewable energy has led to an increase in exports and put downward pressure on export prices. We noted that:

- In 2010, 86% of wind power was produced on days when Ontario was already in a net export position.
- The price Ontarians pay for electricity and the price Ontario charges its export customers – which are determined by the interaction of supply and demand in the electricity market – have in recent years been moving in opposite directions. Although export customers paid only about 3¢/kWh to 4¢/kWh for Ontario power, electricity ratepayers of Ontario paid more than 8¢/kWh for this power to be generated...
- Based on our analysis of net exports and pricing data from the IESO, we estimated that from 2005 to the end of our audit in 2011, Ontario received \$1.8 billion less for its electricity exports than what it actually cost ratepayers of Ontario.<sup>29</sup>

The Auditor General goes on to note that Ontario spilled water to reduce electricity supply on 96 days in 2009 and 10 days in 2010, which is an expensive mitigation strategy to reduce surplus power, as the overall cost of production of hydroelectric power is often

---

<sup>26</sup> Morden, Paul. “\$1B project in jeopardy” in *The London Free Press*, May 14, 2013 edition, A8.

<sup>27</sup> Excerpt of the Report from the Auditor General, 2011 Annual Report of the Office of the Auditor General of Ontario, pg. 111

<sup>28</sup> Ibid at pg. 112

<sup>29</sup> Ibid at pg. 112

lower than all other types of power. Hydroelectric power is also considered to be green renewable energy.

### **3.4 Fraser Institute Study – Authored by Professor Ross McKittrick – 2013**

On April 11, 2013, the Fraser Institute released a report authored by Professor Ross McKittrick, entitled Environmental and Economic Consequences of Ontario's Green Energy Act. This report presents the results of an in-depth analysis of the impacts of the policy direction taken for renewable energy under the GEA. It speaks directly to the implications for Ontario ratepayers in terms of cost and reliability of supply that the next phase of additional wind generation (which includes K2 Wind's proposal) will create:

Not only does Ontario have surplus power, but it has surplus baseload power, and this creates a problem for maintaining grid reliability as wind power expands. The GEA requires the system to buy all available wind energy. Depending on wind conditions, there can be a surge in production that needs to be absorbed...wind power tends to peak when demand is at a minimum, so it either must displace baseload production or be dumped on the export market at a loss. Currently, the latter is the case, but if the next phase of expansion of the wind fleet is undertaken, the baseload capacity itself will have to be reduced, most likely by taking a nuclear generating unit offline. Calculations by the Ontario Society of Professional Engineers (Acchione, 2012) show that this not only inflates the cost of power generation unnecessarily, but since wind power must be nearly 50% matched by spinning gas-fired power as a backup in case of power drops in wind (AGO, 2011:91), shutting down nuclear facilities and replacing them with wind turbine installations will result in higher greenhouse gas and air pollution emissions. Consequently, further expansion of wind (or solar) power will work against the province's environmental goals.<sup>30</sup>

If the addition of further wind power into the grid in effect results in these scenarios, it cannot be seen to meet the test of consistency with the stated environmental goals of the Province. The Province could not have intended to burden consumers with costs associated with dumping electricity at a loss or actually creating higher greenhouse gas and air pollution emissions through impacts on the nuclear generators.

It is clear that the cost implications for electrical ratepayers are substantial in accommodating a project of the scale of the K2 Wind proposal. They extend well beyond basic construction costs for facilities. As Professor McKittrick notes:

Due to the fluctuating nature of wind generation, new wind-turbine capacity must be matched almost 50% by coal or gas-fired back-up generators. Since the coal plants are slated for closure, this requires new gas generators to be built...<sup>31</sup>

---

<sup>30</sup> McKittrick, Ross, 2013. *Environmental and Economic Consequences of Ontario's Green Energy Act*, pg.

8

<sup>31</sup> Ibid, pg. 11



The unreliability of wind generation means that facilities must be overbuilt to produce smaller amounts of power. Again, this adds to the total cost of incorporating wind power into the grid:

Because of the unreliability of output, 7MW of rated wind energy are needed to provide a year-round replacement of 1MW of conventional power generating capacity. Consequently, the cost of achieving the provincial targets for renewable energy in the coming years will be much higher than currently acknowledged.<sup>32</sup>

The Residents Group notes that Professor McKittrick has submitted comments to the Board for this hearing which summarize his research on the cost and reliability implications of the addition of the K2 Wind and other such projects to the grid. A copy of his report in its entirety is included as Appendix A with the author's permission.

### **3.5 K2 Wind**

The wind producers themselves have also acknowledged that Ontario is sitting in a surplus power situation. In the Interrogatory Responses submitted to the Board by K2 Wind, Appendix 4 contained copies of reply letters that were sent to ACW residents and other citizens that commented on the K2 Wind application. These letters were signed by Paul Wendelgass, the Project Lead for K2 Wind, and contained the following statement:

K2 Wind is responding to the Ontario government's policy to develop additional sources of renewable power in the province. The design, implementation and long-term planning of Ontario's electricity markets is at the ultimate direction of the Government of Ontario. The surplus base load generation in Ontario results from the large percentage of provincial electric generation from nuclear power plants that cannot be curtailed, combined with reduced electric consumption since the recession of 2007-08.<sup>33</sup>

This statement from the project manager Mr. Wendelgass is a direct contradiction to the justification for the project as advanced in the K2 Wind application. He clearly acknowledged that demand has dropped and the province doesn't need the additional power and that the province was continuing to build unnecessary generation. However, his contention is that the wind companies are not responsible; it's the nuclear plants that cause the problems.

This assertion is directly contradicted by the IESO's recent actions taken to curtail wind generation, by the position paper put forward by the Ontario Society of Professional Engineers on March 14, 2012, and by Mr. McKittrick's analysis. It is also contradicted by the former Minister of Energy, Chris Bentley, who paid a visit to the Bruce Nuclear Power plant in December 2012 where he praised the plant and stated, "It is enormously important to have that base load power available 24 hours a day, 365 days a year" because "whether it's winter, spring, summer or fall, wherever we are, family or business,

---

<sup>32</sup> Ibid, Executive Summary, pg. iv

<sup>33</sup> EB-2012-0458. K2 Wind Ontario, Interrogatory Responses to Board Staff and ACW Residents Group, Appendix 4. Submitted March 14, 2013.



everybody expects the energy to be there when we flip the switch.”<sup>34</sup> He noted that it was clean, green power and had been done without public financing. The Minister of Energy was well aware of the crucial role that nuclear energy plays in this province’s electrical grid.

Mr. Wendelgass’s comment is a statement that strikes to the heart of the public interest in this hearing and raises a basic question. If the proponent of a project is aware of, and acknowledges existing problems on the electrical grid related to surplus energy supply, but seeks to place blame for that situation on another entity, can the proponent be said to be acting in the public interest? The Residents Group submits to the Board that the proponent in this case can only be seen to be acting to promote an individual interest.

#### **4. K2 WIND PROJECT ANALYSIS – PART 1: ENERGY PRODUCTION & COST IMPLICATIONS**

##### **4.1 Projected Power Production**

The K2 Wind project was initiated at a very different point in the Province’s energy outlook. As shown in Section 3 of this submission, in 2006, when this project was in the initial stages, the Province was reacting to anticipated future energy demands. This demand did not materialize. As previously noted, demand dropped 15.7 TWH between 2005 and 2012 and the IESO is projecting a further 0.4% decrease in demand for 2013.<sup>35</sup> So where does that leave the K2 project? What impact will it have on consumers in a flat or declining demand scenario?

The applicant has taken the position that the K2 Wind project is in the public interest because “it will facilitate the transfer of 270 MW of clean, renewable energy to Ontario’s electricity grid”<sup>36</sup>. It is one of the largest wind projects being proposed for the province. The proponents have stated that this project has the potential to meet the average annual power needs of 75,000 Ontario homes (based on the average household energy use of 1000 kWh/month).<sup>37</sup> On the surface that sounds like a win for the electricity customers. It gives the illusion to the public that these hypothetical homes will be powered non-stop by 270 KV of clean wind power. But let’s take a more detailed look at that projection and see what it actually means. It is particularly important to note that this is 270 MW of *nameplate capacity* being referenced. The reality is different.

In the K2 Wind response to the Residents interrogatories, the applicant refused to provide meteorological data as it was considered to be confidential information. In the absence of this data, to get a feel for the actual impact of the K2 Wind project on the energy supply of the province, it is reasonable to look at the past history of the KI Wind project operated

---

<sup>34</sup> Chris Bentley, December 12, 2012. Interview with CKNX Radio FM 101.7

<sup>35</sup> IESO, 2013. Total Ontario Energy Demand, [http://www.ieso.ca/imoweb/media/md\\_demand.a](http://www.ieso.ca/imoweb/media/md_demand.a)

<sup>36</sup> EB-2012-0458. K2 Wind Application Filed Dec. 21, 2012, Exhibit B, Tab 1, Schedule 1, pg. 8-9

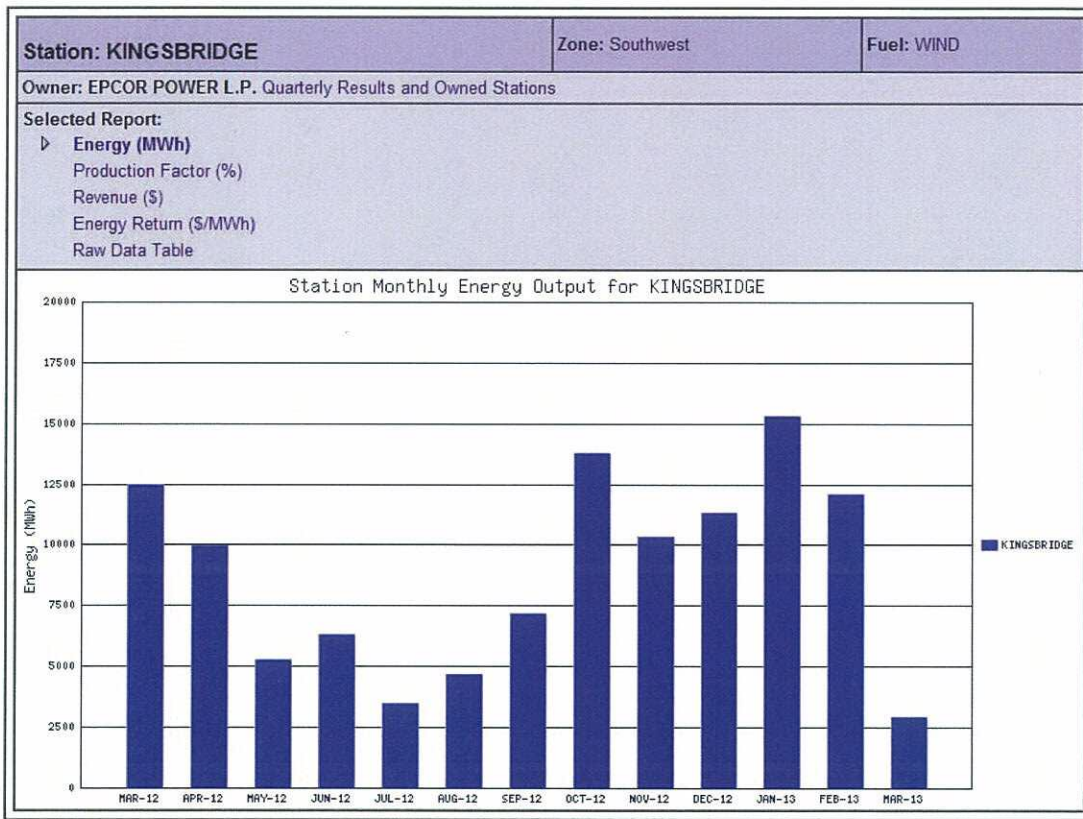
<sup>37</sup> K2 Wind Ontario, 2012. *K2 Wind – Moving forward. Community Update – Fall 2012.*



by one of the partners in the K2 project. KI Wind consists of 22 turbines with a nameplate capacity of 40 MW. The KI project has been in operation since 2006. It is also located in Ashfield Colborne Wawanosh and is affected by the same wind patterns as the K2 proposal. The energy output patterns for the two projects will therefore be comparable in terms of time of output and strength of the wind.

Graph 1 shows the energy output from KI Wind’s turbines over the past year (March 2012 to March 2013). The highest period of energy production is in the late fall and early winter period. Lowest energy production occurred during the summer months of July and August. The months of May, June and September also showed lower production levels than the winter months. The strongest winds in ACW occur in the late fall and winter months as the residents of ACW can verify.

**GRAPH 1: Monthly Energy Output for Kingsbridge KI Wind Project – March 2012 – March 2013.**<sup>38</sup>



This pattern is completely out of sync with the demand pattern for energy. This fits with the broader problems inherent in Ontario’s wind patterns that have been identified by the

<sup>38</sup> Sygration, 2013. <http://www.sygration.com/cgi-bin/statinfo?=KINGSBRIDGE&t=t>

IESO. During times of peak energy demand for summer air conditioning, wind energy output is substantially reduced. The K2 Wind project will also follow this pattern. The greatest production from K2 Wind will occur in non-peak load periods. These are already periods of surplus energy.

The Board directed the Residents Group towards the IESO data available on-line to assist us in preparing our submission. Table 1 on the following page was compiled from a simple analysis of over six years (March 1, 2006 – February 13, 2013) of recorded wind production data from the KI project as published by the IESO. It takes a closer look at the time periods when the wind was available in ACW. Table 1 shows the amount of power produced by KI on an hourly basis in the differing time periods established for the residential electricity market. The power production has been aggregated into periods comparable to the regulated Time-of-use (TOU) price periods.

A number of points can be taken from reviewing this data. Firstly, it is immediately obvious that most of K1 Wind's energy - 60% - is produced in the winter period (November – April) when there is less overall demand in the province for electricity. Only 40% of its power production occurs in the high summer demand period (May – October).

Secondly, it is clear that the bulk of KI's production, almost two thirds of the total power produced in its lifespan, occurs in off-peak load periods for both summer and winter. A whopping 67.42% of the summer production and 62.05% of winter production is off-peak (nights and weekends). Very little of the power output occurred at peak periods (17.05% in summer and 19.24% in winter) when it was most needed by consumers. The KI Wind project comes nowhere near meeting its nameplate capacity. Actual overall production efficiencies range from a low of 21.62% in summer to a slightly higher 34.19% in winter.

It is also worth noting the amount of total non-production from the KI project. In a 6.8 year period, the entire project produced no power for 548.3 days (over 1.5 years or 21.6% of the 6.8 year time period). Almost a year of that non-production occurred during the higher summer demand timeframe. This is in an area that is considered to have abundant wind.



**TABLE 1: Power Output KI Wind Project – March 1, 2006 - February 13, 2013.**<sup>39</sup>

<b>Combined Winter &amp; Summer Power Output</b>				
	Total MWH Generated		% of Total Production	
Off-peak	434,376		64.18%	
Mid-peak	118,068		17.44%	
On-peak	124,398		18.38%	
Total Power Output	676,842			
<b>Winter Power Output (November 1 – April 30)</b>				
			<b>Summer Power Output (May 1 to October 31)</b>	
	Total MWH Generated	% of Total Winter Production	Total MWH Generated	% of Total Summer Production
Off-peak	254,052	62.05%	180,324	67.42%
Mid-peak	76,574	18.70%	41,494	15.51%
On-peak	78,789	19.24%	45,609	17.05%
Total Power Output	409,415		267,427	
# of Zero generating hours	4502 hr = 187.5 days		8661 hr = 360.8 days	
	<b>Total Energy Production as % of nameplate capacity (40 MW) – Winter</b>		<b>Total Energy Production as % of nameplate capacity (40 MW) - Summer</b>	
	Potential Production MWH	Actual Production Efficiency	Potential Production MWH	Actual Production Efficiency
Off-peak	791,520	32.09%	809,760	22.26%
Mid-peak	202,800	37.75%	213,360	19.44%
On-peak	202,800	38.85%	213,360	21.37%
Total	1,197,120	34.19%	1,236,480	21.62%

Source: Data compiled from market data published by IESO, 2013 – Hourly Wind Farm Generation

<sup>39</sup> IESO, 2013. Hourly Wind Generator Output, <http://www.ieso.ca/iomweb/marketdata/marketData.asp>

NOTES:

1. Winter Times:      Off-peak      - 7:00 pm to 7:00 am  
                                 Mid-peak      - 11:00 am to 5:00 pm  
                                 On-peak      - 7:00 am to 11:00 am & 5:00 pm to 7:00 pm
- Summer Times:      Off-peak      - 7:00 pm to 7:00 am  
                                 Mid-peak      - 7:00 am to 11:00 am & 5:00 pm to 7:00 pm  
                                 On-peak      - 11:00 am to 5:00 pm

Weekends and holidays are off-peak periods for both summer and winter.

2. Total hours of production for KI Wind in this period = 60,840 (2535 days)

- Total hours of potential winter production = 29,928 (1247 days)

    Off-peak Hours = 19,788

    Mid-peak Hours = 5070

    On-peak Hours = 5070

- Total hours of potential summer production = 30,912 (1288 days)

    Off-peak Hours = 20,244

    Mid-peak Hours = 5334

    On-peak Hours = 5334

3. Maximum Potential Production KI Wind

- Nameplate capacity x Total hours = 40MW x 60,840 hours = 2,433,600 MWH.

- Potential Winter Production capacity = 40MW x 29,928 hours = 1,197,120 MWH

    - Off-peak capacity = 40 MW x 19,788 hours = 791,520 MWH

    - Mid-peak capacity = 40 MW x 5070 hours = 202,800 MWH

    - On-peak capacity = 40 MW x 5070 hours = 202,800 MWH

- Potential Summer Production capacity = 40MW x 30912 hours = 1,236,480 MWH

    - Off-peak capacity = 40 MW x 20,244 hours = 809,760 MWH

    - Mid-peak capacity = 40 MW x 5334 hours = 213,360 MWH

    - On-peak capacity = 40 MW x 5334 hours = 213,360 MWH

4. Future Data Review: Any analysis of future wind production from the KI project should take note of a turbine fire on April 2, 2013 which destroyed one turbine.

\*\*\*\*\*

The K2 Wind project has a stated nameplate production of 270 MW (6.75 x larger than KI). Using the production efficiencies determined in Table 1, if we project similar power



production levels going forward for K2, the power output will look something like Table 2. (For the ease of calculation we assumed a similar breakdown between percentages of off-peak, mid-peak and on-peak power production using a March 1 start. Projections could be refined if an actual start date was known for K2.)

**TABLE 2: Projected Power Output K2 Wind Project – 20-Year Timeframe**

	Twenty Year Winter Power Output (November 1 – April 30)		Twenty Year Summer Power Output (May 1 to October 31)	
	Potential Production based on Nameplate Capacity (MWH)	Estimated Actual Production based on KI Production Efficiency (MWH)	Potential Production based on Nameplate Capacity (MWH)	Estimated Actual Production based on KI Production Efficiency (MWH)
Off-peak	15,385,463	4,937,195*	15,740,009	3,503,726*
Mid-peak	3,942,000	1,488,105*	4,147,264	806,228*
On-peak	3,942,000	1,531,467*	4,147,264	886,270*
Total	23,269,463	7,955,829*	24,034,537	5,196,266*
	<b>Annual Estimated Winter Power Output (MWH)</b>		<b>Annual Estimated Summer Power Output (MWH)</b>	
Off-peak	246,859.75		175,186.30	
Mid-peak	74,405.25		40,311.40	
On-peak	76,573.35		44,313.50	
Total	397,791.45		259,813.30	

\*Note: Due to rounding differences, total will not match precisely

NOTES:

1. Total Potential Production over 20 years = 20 years x 365 days x 24 hours x 270 MW nameplate capacity = 47,304,000 MWH

2. K2 Wind Project = 6.75 x KI Wind nameplate capacity

3. Estimated Total Potential Winter Production capacity over 20 years using March 1 start date = (KI winter capacity MWH) x 6.75 x (20x365x24/# hours in KI analysis) hours = 1,197,120 MWH x 6.75 x (175200/60840) = 23,269,463 MWH

- Off-peak capacity = 15,385,463 MWH
- Mid-peak capacity = 3,942,000 MWH
- On-peak capacity = 3,942,000 MWH

4. Estimated Total Potential Summer Production capacity over 20 years using March 1 start date = (KI summer capacity MWH) x 6.75 x (20x365x24/# hours in KI analysis) hours = 1,236,480 MWH x 6.75 x (175200/60840) = 24,034,537 MWH

- Off-peak capacity = 15,740,009 MWH
- Mid-peak capacity = 4,147,264 MWH
- On-peak capacity = 4,147,264 MWH

5. Estimated Actual Production For One Year of Project = Estimated Total Production/Years of Project = 13,152,095 MWH/20 = 657,604.75 MWH

- Estimated annual winter production = 7,955,829 MWH/20 = 397,791.45 MWH
  - Off-peak production = 246,859.75 MWH
  - Mid-peak production = 74,405.25 MWH
  - On-peak production = 76,573.35 MWH
- Estimated annual summer production = 5,196,266 MWH/20 = 259,813.30 MWH
  - Off-peak production = 175,186.30 MWH
  - Mid-peak production = 40,311.40 MWH
  - On-peak production = 44,313.50 MWH

\*\*\*\*\*

What are the implications of this analysis for the hypothetical 75,000 homes using 1000 kwh/month that the K2 Wind project could potentially supply as asserted by the applicant? Let's just look at an estimate of one year of production using the observed efficiencies. Approximately 657,604 MWH per year will be produced. However, those mythical homes need 900,000 MWH over a year. There will be an annual deficit of 242,396 MWH. K2 Wind's projection of powering those mythical homes for a year is decidedly optimistic. The turbines will also sit idle for roughly 4.3 years of the 20-year life span based on the wind patterns seen in KI. There were many other periods when only small amounts of power were produced (less than 10 MWH). During these periods the power needs of consumers will need to be addressed by alternate sources.

In regards to K2 Wind's assertions that 270 MW of clean renewable power will be produced, it is clear that actual production will come nowhere near the nameplate capacity. It is also obvious from the analysis of the production from the existing KI project that the bulk of the power produced over the life of K2 will occur in off-peak periods and more power will be produced over the winter than the summer. Of the estimated 657,604 MWH produced/year, a substantial amount, 536,717 MWH, will be produced in non-peak demand periods of the year. This is precisely when it is not needed.

#### **4.2 Consumer Cost Implications**

As part of its justification for its application for these transmission facilities, K2 Wind states that the project is in the public interest because the cost of the construction of the proposed facility will be borne entirely by the applicant and not by electrical ratepayers.



This is only accurate if one takes an extremely blinkered and narrow view of the definition of public interest as it applies to costs. As an example, when someone travels to another place to attend a concert or sporting event, on paper the cost to attend is the price of the ticket. However, in reality, the actual cost to attend includes the transportation costs, parking, meals and possibly an overnight stay at a hotel. All of this is factored into the actual cost of the outing. Examples of direct uncounted costs in the K2 Wind application are Hydro One's costs of purchasing the land for the Switching Station from K2 Wind, the ongoing maintenance and operational costs of the Hydro One Switching Station and Yard and the maintenance costs of the 7 kilometer 27.6 KV transmission line to be built specifically to accommodate the K2 Wind project. The Residents Group notes that the issue of operational costs has also been raised by HONI in the ongoing Varna Wind hearing EB-2013-0442.<sup>40</sup> We support HONI's position that operational factors, both current and future, have consequences for electricity costs and must therefore be considered by the Board.

The real costs of the project to the public lie within the structural mismatch of the project versus the needs of the Ontario electrical consumers. As was shown in Section 5.1 of this submission, the K2 Wind project will produce an enormous amount of power during surplus periods. (It would also be reasonable to assume that given the decline in overall power demands since the 2005 peak, and taking into account the fact that the Bruce is now fully on-line, the entire production of the K2 Wind project will be surplus. However, our analysis only considered the off-peak production to be surplus.) In his response to the ratepayers of ACW and the province who commented on the issue of surplus energy, Mr. Wendelgass stated that surplus energy was an issue outside of the Board's jurisdiction.<sup>41</sup> However, the interests of consumers with respect to prices and the reliability and quality of electricity service are within the Board's jurisdiction and surplus energy has implications for both.

The costs that this production of surplus power in off peak times will have for the Ontario consumers are staggering. Effective May 1, 2013, Ontario residents are paying 6.7¢/kWh for off-peak power, 10.4¢/kWh for mid-peak power and 12.4¢/kWh for peak power. The K2 Wind generation is guaranteed 13.5¢/kWh or \$135/MWH. The province of Ontario has ample existing power supply to meet demands in off peak periods. Thus, if the K2 production during off-peak times is considered to be surplus, Ontario consumers will pay **\$56,976,216** for unneeded power in the first year of K2's operation alone. Think about that for a minute – almost \$57 million in one year only, for surplus power that the province does not need. In 10 years, the amount paid to this one wind project for unnecessary surplus power generated in off-peak periods will equal the total amount of the costly gas plant cancellation.

If inflation were not a factor, over the 20-year span of the project over **\$1,139,524,336** would be paid out for surplus power in off peak periods. However, Statistics Canada data indicates that the historical increase in the Consumer Price Index from 2006 to 2012 has

---

<sup>40</sup> EB-2013-0442. Submission filed April 19, 2013 by HONI

<sup>41</sup> EB-2012-0458. K2 Wind Ontario, Interrogatory Responses to Board Staff and ACW Residents Group, Appendix 4. Submitted March 14, 2013.



averaged a 1.85% increase over this period.<sup>42</sup> Assuming that a similar inflationary trend will prevail over the 20-year period of the K2 project and as K2 Wind's contract is indexed for inflationary increases, the amounts paid for surplus power will be staggering. This is money that could have been directed towards hospitals, schools and public infrastructure but will not be available. This surplus energy generated on the off peak periods will not only contribute to price increases but it will also create instability in the grid. Eventually, the IESO will undoubtedly be forced to dispatch these turbines in periods of surplus production.

In addition to paying for surplus power, as noted in Section 5.1, there will be 4.3 years when the turbines will produce no power, and substantial periods when minimal amounts will be produced. If the province relies on the theoretical K2 Wind production as an integral part of the grid, these minimal and zero production hours will lead to deficits especially if they occur in on-peak or mid peak demand periods. These deficits will need to be made up by other fuel sources. The turbines will require constant backup from other sources due to the high variability of wind and the low observed efficiencies. These backup generators will need to be paid to remain on standby. Again, this cost is shouldered by the consumers.

All of these costs will affect transmission rate charges paid by the ratepayers over the long term. In looking at the issue of cost, therefore, the K2 Wind project should not be taken in isolation from all these associated hidden costs. While the OEB may have looked at cost in previous cases primarily through the lens of facility costs, this really does not address the impacts on the electrical ratepayers of the province over the long term. Simple construction cost is a more appropriate lens to apply to applications for upgrades to existing facilities, made by existing distributors and transmitters. Where a project purporting to be made in the public interest is proposed by a private entity and that project has much broader cost ramifications, it is appropriate to apply a wider lens. It is the position of the Residents Group that the public interest can only truly be served by taking a detailed look at a project of this magnitude and undertaking a cost benefit analysis to determine not only the short term costs but also the long term costs for electricity consumers.

### **4.3 SIA & CIA Reports**

The K2 Wind application purports to be in the overall public interest within the meaning of subsection 96(2) of the OEB Act because:

- (iii) the SIA (and the Addendum) and CIA Reports filed as part of this application support the conclusion that the interconnection of the Proposed Facilities with the IESO-controlled grid will not adversely affect the reliability and quality of electricity service in Ontario.<sup>43</sup>

---

<sup>42</sup> Statistics Canada, 2013. <http://www.statcan.ca/tables-tableaux/sum-som/101/cst01/econ46a-eng.htm>

<sup>43</sup> EB-2012-0458. K2 Wind Application, Exhibit B, Tab 1, Schedule 1, pg. 8-9



The position taken in the SIA and CIA reports is that this project can be designed with enough safeguards and measures employed to ensure that it can be integrated into the wider grid without negatively affecting the system. K2 Wind has used that as a rationale for concluding that this project is therefore in the public interest. However, it is a giant leap in logic to conclude that simply because a project can be technically designed to integrate with the grid, it is thus automatically beneficial to the broader public interest.

This is an extremely narrow interpretation of the meaning of the public interest in this case. There are much bigger issues at play in the electricity system of the province that demand a wider assessment of where the public interest actually lies.

For example, the SIA and CIA reports for the K2 Wind project are based on some underlying assumptions. We note that under the 2014 summer light load base case scenario these assumptions include minimum hydraulic generation and only 2 of 4 Darlington units and 5 of 8 Bruce units on line.<sup>44</sup> The K2 Wind project is incorporated into the system under this scenario while the cheaper 'green' hydraulic resources are minimized. It is also not clear under this scenario if the nuclear units are actually shut down or if they are simply maneuvering and wasting steam that could have produced electricity in order to accommodate the excess wind energy production. The report does not indicate what the scenario will be in winter conditions when the electrical demand is lower. As shown previously in Section 5.1, the bulk of K2 Wind's production, approximately 60%, will occur in the winter period when it is not needed due to lower demand.

The SIA and the CIA are extensive technical "how can we do this guides" but there is a fundamental gap in their rationale. At no point do they look at the actual need for the project from the consumer's perspective. The ultimate cost to the ratepayers of the province is the missing plank in these reports. Nowhere in the SIA and CIA does the analysis look at the cost implications to ratepayers of the substitution of higher priced wind power for cheaper hydraulic and nuclear power. Nowhere in their analysis do they look at the issue of cost associated with getting rid of the surplus power that will be generated though the addition of this project to the grid. Nowhere in the analysis does it address the additional costs paid to the nuclear generators for spilling steam that could have been used to produce power. Nowhere in the analysis does it consider the costs of exporting power at a loss. Nowhere in the analysis does it consider the cost of backing up the K2 project with standby generation for the 4.3 years that the turbines will be non-productive as seen in our analysis, or for all the other periods when they function at only a fraction of their rated potential.

It is the equivalent of saying that plugging an extra toaster into a wall outlet will be a good idea because the plug itself is designed to mesh with the outlet and you can plug it in. But if you already have a perfectly good toaster that does the job, and you can only eat so much toast, it is a pointless exercise. And sometimes if you have company and actually need extra toast the toaster just doesn't work that day so you have to go out and

---

<sup>44</sup> EB-2012-0458. Filed by K2 Wind, Exhibit G, Tab 2, Schedule 1, *System Impact Assessment Report*, Final Report dated Feb. 24, 2012



get the toast someplace else. And if that extra toaster is plugged into a system that is already strained and having difficulty coping with loads, while the connection itself might be safe and not impact the system, the results could still be failure and unreliability.

There are broader system wide issues with the grid that are becoming evident and not being addressed in the SIAs for wind projects. An example is the McLean's Mountain Wind project that received a REA on October 31, 2012. The proponents of this project have recently submitted an application for a REA amendment to allow changes that include a "larger substation transformer (a slightly larger unit required due to instability in the provincial grid)..."<sup>45</sup> (emphasis added).

The IESO's conclusions contained in the SIA analysis accompanying the K2 Wind application stand in direct opposition to the position that it took in EB-2013-0029. If the IESO (as it stated to the Board in EB-2013-0029) is:

- 1) Experiencing challenges in managing increasing numbers of SBG events due to existing variable generation; and
- 2) Having problems integrating the existing variable generation and at times maintaining reliability and cost-efficient operations; and
- 3) Concerned with reducing costs to Ontario ratepayers that are resulting from surplus energy created by variable generators; and
- 4) Initiating rules to dispatch those same existing generators,

a logical, reasonable person would conclude that adding additional variable wind generation of the magnitude of K2 Wind could only result in further unreliability for the grid and additional unwarranted costs to consumers. The IESO cannot take one position in a hearing in February and then take a different contradictory position in a separate hearing a few months later without putting their credibility into question.

#### **4.4 Hydro One Networks Incorporated (HONI)**

If there is any doubt that customer rates are impacted by approval of projects such as that proposed by K2 Wind, it should be noted that residential customers of HONI received an unpleasant surprise with their recent electric bills. The pamphlet accompanying their bill stated in bold red letters that "Delivery Rates are Increasing". It went on to inform customers that the OEB approved a delivery rate increase for 2013. The rationale for that increase was stated as follows: "A delivery rate increase is necessary to maintain a reliable distribution system and *also to accommodate more renewable energy*"<sup>46</sup> (emphasis added). The expected increase in the delivery portion of the bill was projected between 3.5% to 5.7% for residential users and up to 35.5% for streetlights and 40.4% for

---

<sup>45</sup> Northland Power, 2013.

[http://mcleansmountain.northlandpower.ca/site/northland\\_power\\_mclean\\_s\\_mountain/assets/pdf/mmwf\\_re\\_a\\_amend\\_notification\\_letter\\_apr24\\_2013.pdf](http://mcleansmountain.northlandpower.ca/site/northland_power_mclean_s_mountain/assets/pdf/mmwf_re_a_amend_notification_letter_apr24_2013.pdf), pg. 1

<sup>46</sup> HONI, 2013. Flyer included in March/April Residential Customer Bills. pg. 1



sentinel lights. It is impossible to maintain that approval of projects such as the K2 Wind project will not impact the costs to electric customers in Ontario when Hydro One is obtaining rate increases to accommodate those projects.

## **5. K2 WIND PROJECT ANALYSIS – PART 11: DESIGN PARAMETERS - SAFETY ISSUES – UNDERGROUND 230 KV TRANSMISSION LINE**

### **5.1 Scope of OEB Mandate**

(Note: The following paragraphs of Section 5.1 are excerpts from the Resident's Group Letter to the Board submitted on April 22, 2013. We have included them again because we feel they are important points that speak to the OEB's mandate.)

Throughout these proceedings K2 Wind has consistently taken the position that this is a project which is in a preliminary stage and details therefore do not need to be provided. They have put forward the argument that details are not required at this stage of the proceedings and that in any event provision of such detailed information falls outside the Board's mandate.

In response to that contention, the Residents Group submits the position that the scope of the Board's mandate is not limited in terms of the information which they may seek to obtain in reaching a decision in any given case. This is particularly true when the matter before the Board is for a project of such magnitude that the safety of the public is a primary factor. Chapter 4 of the OEB filing requirements for Electricity Transmission and Distribution Applications specifically notes that the discretion of the Board is not limited in terms of information and evidence that it may wish to see.

The Residents Group also submits that the substantive nature of the K2 Wind proposed facilities elevate the project in terms of the rigor with which it must be assessed. The OEB website defines the following terms:

Generators: Generators produce the electricity that we use. Generation is the first step in the process to provide electricity to consumers.

Transmitters: Once generated, electricity travels across Ontario from generating plants over high-voltage transmission lines to local transformers that then reduce the voltage level, making it suitable for local distribution.

Utilities (Distributors): After traveling over the high-voltage transmission lines and through transformers, electricity then travels over low-voltage distribution lines, which are owned by local utilities, to homes and offices.<sup>47</sup>

---

<sup>47</sup> OEB, 2013. <http://www.ontarioenergyboard.ca/OEB/Consumers>

K2 Wind, in response to the Board staff interrogatories, has indicated that it is planning to apply for a generation license. However, we note that the distinctions between generators, distributors and transmitters are not mutually exclusive as considered by the Board. In the case EB-2010-0253, the OEB determined the following:

The Board disagrees with Grey Highlands' submission that the defined terms "distribution system", "generation facility", "renewable energy generation facility" and "transmission system" are all mutually exclusive since there is nothing in the applicable legislation that would support such an interpretation.<sup>48</sup>

This interpretation was subsequently upheld in EB-2011-0053 when the Board ruled:

The Board finds, as did the panel in the original Decision, that there is nothing in the applicable legislation and regulation that would support such a restrictive, mutually exclusive interpretation of the definitions in the Electricity Act or indicate that a "strict construction" of section 41 of that Act is proper, or would yield the interpretation Grey Highlands argues for in its Notice of Motion.<sup>49</sup>

The Residents Group notes that throughout the application process K2 Wind has referred consistently to this application as a transmission project. The matter before the Board is described as a "Matter of an Application (the "Application") by K2 Wind Ontario Limited Partnership ("K2 Wind") for an order under section 92 and subsection 96(1) of the OEB Act granting leave to construct an electricity transmission line and related transmission facilities (the "Proposed Facilities")."

A review of the Board staff interrogatories would indicate that there is a definite concern regarding the scale and scope of the Proposed Facilities and the abilities of the applicant to develop and manage them. For example, Board staff posed the following questions to K2 Wind:

Interrogatory 2: Connecting Other Generation

- ii. As a privately owned transmission line, does K2 Wind see the possibility of accommodating additional connections?
- iv. Does K2 Wind intend to apply for a transmission license?

Interrogatory 4: General Organizational Capability

- i. What is the Applicant's experience in constructing and operating a transmission infrastructure in Ontario or in other jurisdictions in Canada?
- ii. Please indicate what corporate organizational capabilities exist to complete the applied for transmission facilities; Where applicable, please provide information on:
  - Project Management
  - Design and Construction
  - Operation and Maintenance; and
  - Examples of similar projects that have been undertaken.<sup>50</sup>

---

<sup>48</sup> EB-2010-0253. Decision and Order dated Jan 12, 2011, Paragraph 40, pg. 9

<sup>49</sup> EB-2011-0053. Decision and Order on Motion to Review dated April 21, 2011, pg. 6

<sup>50</sup> EB-2012-0458. Board Staff Interrogatories, February 28, 2013, pgs. 5-7



These are questions which echo the guidelines for transmission projects set out in Document G-2010-0059. These requirements are mandated by the Board for transmitters seeking designation to develop a transmission project in Ontario that has been identified by the OPA as required for connection of renewable generation sources.<sup>51</sup> While K2 Wind has indicated that it is not seeking a transmitting license, the project certainly has the elements of a transmission system.

In their response to the Board staff interrogatories, K2 Wind filed a copy of its Power Purchase Agreement (PPA) with the Ontario Power Authority (OPA). Section 2.1 of the PPA – Article 2 Development and Operation of the Facility reads as follows regarding the Supplier (K2 Wind):

The Supplier shall design and build the Contract Facility using Good Engineering and Operating Practices and meeting all relevant requirements of the IESO Market Rules, Transmission System Code, the Connection Agreement, in each case as applicable, and all other Laws and Regulations. The Supplier shall ensure that the Facility is designed, engineered and constructed to operate in accordance with the requirements of this Agreement.<sup>52</sup>

The standards which are referred to in section 2.1 are defined as follows:

Good Engineering and Operating Practices means any of the practices, methods and activities adopted by a significant portion of the North American electric utility industry as good practices applicable to the design, building, and operation of generating facilities of similar type, size and capacity as the Contract Facility or any of the practices, foresight and reasonable judgment by a prudent generator of Electricity in light of the facts known at the time the decision was made, could reasonably have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, expedition and Laws and Regulations. Good Engineering and Operating Practices are not intended to be limited to the optimum practices, methods or acts to the exclusion of all others, but rather are intended to delineate acceptable practices, methods, or acts generally accepted in the North American electric utility industry.<sup>53</sup>

The Residents Group respectfully submits the Application before the Board ought to be more properly considered as having the characteristics of a transmission project and thereby held to a higher standard of review than that proposed by K2 Wind. Clearly the PPA signed by the Applicant envisions an extremely high standard of design that is consistent with existing applicable utility standards in regards to safety and reliability. In that regard, it is well within the mandate of the Board to have regard to information that speaks to the applicant's abilities and design capabilities.

---

<sup>51</sup> OEB, Document G-2010-0059, *Filing Requirements: Transmission Project Development Plans*, Aug. 26, 2010, pg. 3

<sup>52</sup> EB-2012-0458. K2 Wind Response to Interrogatories of Board Staff, Appendix 1, Section 2.1 of PPA, pg. 5, filed March 14, 2013,

<sup>53</sup> EB-2012-0458. K2 Wind Response to Interrogatories of Board Staff - Appendix 1, Section 68 of Appendix 2 pg. 7 to PPA, filed March 14, 2013

## **5.2 Safety Considerations**

Safety is an integral aspect of the reliability and quality of electrical service which is one of the Board's main concerns. As it is currently being proposed, the Residents Group submits that the 5.1 km, 230 KV underground transmission line from the transformer station on Belgrave Road down Lanesville Line to the substation on Glens Hill Road is unsafe and is incapable of providing reliable electrical services. There are a number of issues identified by the ACW residents in reviewing this proposal. These are outlined as follows:

### **a) Design Inadequacies/Lack of Information**

Two of the members of our group constructed a deck on their property last year. In order to obtain a building permit for the deck they were required to submit incredibly detailed plans showing every aspect of the proposed construction. This was for a private deck a few feet off the ground.

The K2 Wind proposal is for 140 wind turbines with a buried 230 KV transmission line. Yet details that have been provided for the transmission line are incomplete. No details of bore construction are available. The cross-sectional design diagram of the proposed 230 KV transmission line clearly states that it is a preliminary design and details may change during final design.<sup>54</sup> The cross-sectional given is a distribution standard for voltages less than 69KV. It is the Residents Group's position that this is an inadequate standard to apply to a 230 KV line.

As noted in the evidence submitted by the Residents Group, important information that should be included in an application of this nature is missing. There is no mention of the following<sup>55</sup>:

- Induction studies to be conducted to verify there are no impacts on existing utility services and conformance to CSA C22.3 No. 3 and CSA C22.3 No. 6.
- Grounding design to address the electro-chemical corrosion of underground metallic structure as per CSA C22.3 No. 4
- Post-construction testing for stray voltage and conformance to CSA C22.3 No. 3 and CSA C22.3 No. 6.
- Testing for electromagnetic fields (EMFs).
- Design for marking underground cables for electronic locating. You do not simply hook an underground locator to these high voltage cables.

---

<sup>54</sup> EB-2012-0468. K2 Wind Exhibit E, Tab 5, Schedule 1

<sup>55</sup> EB-2012-0458. Evidence Submitted by Residents Group – Affidavit of M. Leitch, Submitted March 25, 2013, Section 9, pg. 4



- Final designs for the five splicing vaults and their locations. If splicing vaults are not used, then there is no design for the extra mechanical and electrical protection required since the metal mechanical protective sheath will be cut back to make splices.
- Addressing water issues at splicing vaults or splice locations. Cable splices do not have the same protection to water penetration as somewhere in the middle of the cable. Water ponding is a significant issue in the locations of the proposed splices.
- Final design for splices and splice protection, including design for bonding of sheaths and grounding of the shield and design for the cross bonding link boxes.
- The 7 km, three phase 27.6 KV line expansion required to provide service to the Hydro One Switchyard.
- Cross sectional design for multiple circuits of 34.5 KV cables.

#### **b) Mechanical Protection**

The applicants have indicated that the 230 KV transmission line will be laid in trenches 1.0m wide by 1.2m deep. The cables will be bedded in crushed limestone and the trench backfilled with excavated native soil. A warning tape will be installed approximately 0.3m above the cables and will run the length of the underground cables. This is virtually the same standard that K2 Wind has indicated they applied to the cables running from the turbines. Yet the lines running from the turbines are only carrying 34.5 KV, a fraction of the power in a 230 KV line. As noted in section 5.2 a) the cross sectional given is a distribution standard for voltages less than 69 KV.<sup>56</sup> No mechanical protection has been provided in K2's proposed design. This is a serious safety risk and raises serious concerns about the reliability of the proposed project.

If this line is to be allowed on road allowance or near property lines it must be deep enough to provide enough mechanical protection for possible future work to be done in a safe and economical manner without very costly and deadly side effects.

#### **c) Erosion/Farm Equipment Disturbance**

The 1.2 m proposed for the buried 230 KV line is woefully inadequate for safety purposes. Farm equipment will be disturbing the area above this line. A subsoiler for example, works at a depth of roughly 2 feet (.6 m). This is a common piece of farm equipment used to break up compacted soil and clay hardpan. There is no way of knowing who may own this land over the lifespan of the proposed project and what equipment they may use over the line.

There is also the issue of erosion to consider. Cropped land is subject to water and wind erosion. Tillage changes the soil profile over time. Over the life of this project there could be areas where the initial 1.2m depth becomes less over the 20-year span.

---

<sup>56</sup> Ibid, Section 4, pg. 4

#### **d) Warning Tape**

The inclusion of warning tape is also an issue with farm equipment. Warning tape is fine for hand digging or excavations where the operator is watching the excavation closely. However, farm machinery is dragged behind the operator and any warning tape may not be noticed before it is too late, particularly under night conditions. Farmers routinely work late during busy seasons and are often tired and stressed. In a recent situation in Ashfield Colborne Wawanosh a young farmer barely escaped with his life after a few moments of misjudgment resulted in a 44 KV line being brought into contact with his tractor. The tractor burned to the ground.<sup>57</sup> The results of a momentary lapse with a 230 KV line buried a few feet below the surface of the ground are frightening to think of. In the Residents Group's opinion a situation like this is a recipe for a tragedy.

#### **e) Municipal Drains**

The small portion of the proposed underground line to be located on private property at the corner of Glens Hill Road and Lanesville Line will intersect municipal drains crossing this field. Municipal drains frequently require cleanout and maintenance work. Despite the fact that there are 3 municipal drains in this field, K2 Wind has not provided any cross sectional drawings for areas of directional boring. It should be noted that as ducts are required in the boring location, there will be an effect on the heat dissipation of the 230 KV cables. K2 Wind has not provided any information regarding the type and size of the ducts to be used, what depth the boring will be at or how low the sections of ducting will be. They also have provided no information on how the cables will be pulled into the duct work given the size and weight of the 230 KV 1000mcm XLPE insulated cables.<sup>58</sup>

#### **f) Cables**

There are other variables that are of concern in respect to the cables. These other factors include but are not limited to: the trench profiles, trench materials, trench depths, protection systems, conduits, duct systems, distance, splicing vaults and the conductor itself. The conductor is described as having a 230 KV rating, 1000mcm, compressed A1 with XLPE insulation. The semiconductor shield type, shield grounding, metallic sheath type, external layer type, ground resistivity (ohms/meters), and cable construction are not provided by K2 Wind. These are important for the pulls, splices and cable protection.<sup>59</sup>

#### **g) Ontario Standards of Construction**

In K2 Wind's response to the Resident Group's interrogatories, two existing situations with buried 230 KV lines were identified in Halton Hills and Wolfe Island. The Halton Hills Generating Station incorporates a 230 KV transmission line comprising

---

<sup>57</sup> Ibid, Section 21, pg. 4 & Exhibit Q

<sup>58</sup> Ibid, Section 6, pg. 3

<sup>59</sup> Ibid, Section 8, pg. 3



approximately 2 km of direct buried 230 KV cables as well as a crossing under Highway 401. The line is installed on both private and public lands in a rural area. The Halton Hills Generating Station 230 KV line consists of six cables. The length of the cables is 1,480m. The installation consisted of six 8-inch ducts encased in concrete running along an existing regional road. The project also included crossing Highway 401 with eight separate parallel 8-inch diameter conduits. Additionally, it also included constructing four poured in place concrete splicing bays. The installed ducts are encased in concrete along the regional road.<sup>60</sup> The Residents Group expects that the same standards (that being the cables installed in ducts, encased in concrete) would be used along the public road allowance in ACW in respect of any proposed project in ACW.

The Wolfe Island Wind Project is the other project identified by K2 Wind. Before the Ontario Energy Board in respect of this project it was stated that:

The cable is buried at 1.2 meters below surface. The cable itself is buried in sand bedding to protect it from mechanical damage, and then above that there will be a 100-millimeter layer of concrete that is dyed red for identification in case someone digs in that area. Then above that, there will be a warning tape that is placed above the concrete, so if anybody digs down towards the cable, they will see the warning tape first, identifying to them that there is a buried cable below that portion. Then the concrete provides mechanical protection, so if it is a backhoe, they won't be able to come into contact with the cable if they are digging in that area.<sup>61</sup>

The Wolfe Island Wind Project, like K2 Wind, is a Samsung affiliated project. One would expect that as such, the company would be well versed in the design standards it previously employed for a project of this magnitude. As an example, red dyed concrete was considered a required mechanical safety barrier for heavy equipment working in the area.<sup>62</sup>

A third 230 KV transmission line is being proposed by Dufferin Wind in the Shelburne area. The design proposed for this line shows a 30mm concrete barrier for mechanical protection located below the marker tape in their typical 230 KV ductbank arrangement for direct burial. They also have a cross sectional for directional boring. It shows the ducts at 5000 mm.<sup>63</sup>

All of these lines have been designed to a significantly higher safety standard than that proposed by K2 Wind. It is the Residents Group's submission that the design being proposed by K2 Wind does not adhere to the accepted standards being employed in this province. It does not adhere to the standards employed in other wind energy projects in this province as evidenced by the Wolfe Island project and the proposal by Dufferin Wind. Even a "preliminary design" as K2 Wind has stated their proposal is, should be designed to meet existing provincial standards.

---

<sup>60</sup> Ibid, Sections 27 & 28, pg. 11

<sup>61</sup> EB-2007-0034. Transcript of Hearing dated Sept. 24,2007, pgs. 40-41

<sup>62</sup> EB-2012-0458. Evidence Submitted by Residents Group – Affidavit of M. Leitch, Submitted March 25, 2013, Section 29, pg. 11

<sup>63</sup> Ibid, Section 16, pg. 7



Hydro One lines of this extreme high voltage are not located on road allowances. They are placed away from the public on private property in a location where no one will ever be tilling the land, cleaning a ditch, rebuilding a road, installing a tile, installing fence posts and no other utility will be working on their underground cables. Hydro One lines of 230 KV would not be installed without mechanical protection.<sup>64</sup>

#### **h) Line Location on Road Allowance**

The portion of the 230Kv located on road allowance is planned for the south side of Glens Hill Road from Splice location 1 to Splice location 2, about 950 meters in length. The ditch along this south side of Glens Hill Road is 1.2 meters deep. The bottom of the ditch is 3.1 to 4 meters from property line with a steep incline to the traveled portion of the road located 6.4 meters from property line. K2 states that the K2 Transmission Line located within road allowance will be 3 to 3.5 m from residential property lines. K2 will make reasonable efforts to install the line (i) between the roadside drainage ditch and the boundary of road allowance; and (ii) at a depth that will avoid conflicts with other infrastructure. But the bottom of the ditch is already in this 3 to 3.5 meter location. There are many trees and at least one bell box along the property lines. If the K2 Transmission Line was installed between the ditch and road, it would be cutting into the 1.2m steep bank along the road. This would make the trench right next to the road and 2.4 meters or 8 feet deep if their design depth was used.<sup>65</sup>

Any trench in this location should really be 6 to 8 feet below final grade to protect against the effects of frost in roadbed areas, an issue which does not appear to have been considered in the preliminary design. This trench would have to remain totally open while the cables were installed. This installation would include the installation of the thermal back fill material, ducts (if used), cables and cement protective cover or cement encasement. If such a deep trench right along the road was open for days, road lane closures would be required. Plans for future ditch clean outs and deepening would also need to be taken into consideration for the design of cable depth of installation.<sup>66</sup>

The Residents Group would also like to advise the Board that page 21 of the K2 Wind Response to Interrogatories of Board Staff appears to contain an error. The response indicates that there is an existing overhead 27.6 KV line running along Glens Hill and Lanesville Roads. The transmission lines along the route of the proposed 230 KV line are 4.8 KV Hydro One distribution lines. The 27.6 KV line that they seem to be referring to is a K1 transmission line that does not actually intersect the proposed route of the 230 KV underground line.

---

<sup>64</sup> Ibid, Sections 13-15, pgs. 6-7

<sup>65</sup> Ibid, Section 25, pgs. 9-10

<sup>66</sup> Ibid, Section 25, pg. 10



### **i) Township Review**

At an ACW Council meeting on March 19, 2013, several residents raised the issue of safety regarding the proposed 230 KV transmission line and the need for the Township to retain an engineer to review the proposal. In response to this request, Paul Wendelgass, the Project Manager of K2 Wind stated the following:

My...my understanding of the road use agreement is that the Township will review drawings that we provide which are signed and stamped by a, the professional engineer who is qualified to design the electrical infrastructure, and the Township's review will be related to the compliance with the road use agreement. I don't believe your engineers are going to recapitulate our engineer's design of the electrical, the electrical lines themselves but rather look at whether they meet your standards and requirements for depth of burial, location within the road allowance and those kinds of issues, UM I could be mistaken about that but, but that was my understanding when we were working on that.<sup>67</sup>

This is an extremely troubling statement from the applicants. Surely a municipality's review of a proposal of this magnitude must include all aspects of the design which is presented to it including safety issues that are of primary concern to its residents. The Residents Group notes that while our public works department staff are highly regarded by the local residents, a proposal for a 230 KV transmission line is well beyond their expertise and qualifications. Ashfield-Colborne-Wawanosh is a small rural township with no expertise in the field of high voltage transmission. Going forward, the OEB cannot leave an issue of public safety to unqualified Township staff to determine what are the best designs to meet the installation requirements on road allowances.<sup>68</sup>

It should be noted that many residents have expressed these concerns repeatedly to the local Council and in various communications with K2 Wind and the OEB.

### **j) Emergency Response Plans**

K2 Wind has not developed any protocols for emergency response despite having worked on this project for over 6 years. In their response to the Board staff interrogatory 5.iii, K2 Wind indicated that these protocols would be developed. In light of the early morning April 2, 2013 turbine fire in the KI wind project in our Township, this is a safety issue of great concern for residents. (A more detailed discussion of the turbine fire is contained in Section 6.1 of this report.) There is no fire alarm system in the turbines as explained by the KI project manager to ACW Council. KI staff only became aware of the emergency public hazard situation after being contacted by the fire department and did not arrive on scene until after the fire department.

One of the most troubling aspects of this response is the fact that nearby residents who were downwind were not notified at any point during the emergency. Had this fire occurred during the summer months in a wheat field, the outcome could have been

---

<sup>67</sup> Paul Wendelgass. Excerpt from recording of ACW Council meeting March 19, 2013

<sup>68</sup> EB-2012-0458. Evidence Submitted by Residents Group – Affidavit of M. Leitch, Submitted March 25, 2013, Section 33, pg. 13



strikingly different and homes and lives would have been at risk. This is a clear inadequacy in the emergency response protocols.

**k) Easement Agreement for Transmission Line**

There are provisions contained in the proposed easement agreement filed by K2 Wind which raise serious issues of safety. Section 6.b) indicates that the landowner may, at its own risk, continue to farm portions of the Right-of-Way (ROW) not occupied by surface equipment.<sup>69</sup> The easement also makes note in Section 6.e) that K2 Wind shall not fence any portion of the ROW. However, it goes on to specifically mention the construction of fences across portions of the ROW by the landowner and the installation of gates. Not only is this not prohibited, but K2 Wind clarifies that it wants to get keys to any gates installed. It is a significant safety risk to be permitting the installation of any fencing, gates or any construction above an underground 230 KV line. The issue of safety should be of more importance than whether or not keys are available for the gates.

In reviewing the standards applied in other North American areas for easements related to underground high voltage lines, we note the following standard applied in Texas by Xcel Energy, an electricity company with extensive experience: “Underground transmission structures require a completely clear right-of-way (ROW) of approximately 60 feet (no farming activity within the 60-foot ROW).”<sup>70</sup> Cultivation activities are clearly considered a safety risk in proximity to underground high voltage lines and this is for lines that are installed in concrete encased duct banks. The K2 Wind proposal for its underground line has none of this protection, is only buried 4 feet underground, and yet the easement permits fencing to be installed and cultivation to take place over the line, thereby putting the safety of their leaseholders at risk which they openly acknowledge with the wording in the agreement.

\*\*\*\*\*

The K2 Wind response to these safety concerns that have been raised by the Residents Group and by other residents of the Township in this hearing and at other points in the public review process can be summarized as follows. They have chosen to take the position that safety issues related to an underground 230 KV transmission line are not part of the Board’s mandate. They have challenged anyone who raises issues related to the safety of that line and dismissed their input as irrelevant. They have put forward the argument that they have over 700 pages of supporting evidence which proves their project should be approved as presented. They have argued that someone else has responsibility for safety.

However, at no point in the proceedings have they actually answered the fundamental safety related questions before the Board that have been put forward by the Residents Group and residents of ACW. These questions still stand unanswered:

---

<sup>69</sup> EB-2012-0458. Exhibit F, Tab 3, Schedule 2 filed by K2 Wind December 5, 2012

<sup>70</sup> Appendix B to this Submission. Xcel Energy. 2013. Website <http://www.powerfortheplains.com/resources/fact-sheets/index.asp>, pg. 2



If the proponent's consultation program has engaged local stakeholders at every step of the way, as stated in the Argument-in-Chief, then why have the concerns of those local stakeholders been ignored? When safety and reliability issues are repeatedly raised, as they have been throughout the public review, why would a proponent not make every effort to accommodate and address those safety issues at an early stage of development of a project rather than wait until they are forced to at a final approval stage?

Why would a proponent of a project that has been 6 years in the making not have reached the point where all the physical parameters of a site are well known and thus be able to produce a design for a transmission line that accounts for these parameters?

Why would K2 Wind propose a design for an underground 230 KV transmission line that does not incorporate mechanical protection when all other examples within the province have been built to a standard of safety that includes mechanical protection?

Why would the K2 Wind engineer, who has apparently been involved in designing these other transmission lines, put forward a proposal for a line that does not meet the standards of his previous designs?

What justification can be used for not meeting the standards of similar facilities within the province? Would the citizens of ACW not merit the same level of protection as other residents in Ontario?

The K2 Wind position implies that the safety and reliability issues raised by residents are simple engineering questions that can be easily answered and we should give them approval and they will engineer it to work. However, there are a multitude of examples of engineered projects that have failed with catastrophic consequences for public safety.

With regard to the submission made by K2 Wind on March 22, 2013 in response to the Residents Group evidence, a reference is made to over 700 pages of K2's evidence. It should be noted that of the 700 pages of supporting evidence which K2 Wind refers to, the bulk of this material does not deal with the underground 230 KV line. There are only a few paragraphs that actually discuss the design of the 230 KV line and one diagram that shows a preliminary design. We also note that in the diagram of the preliminary design the initials of the designer of the line are identified as K.B. In Mr. Nicholson's C.V. that was provided by K2 Wind in response to the Residents Group submission, it should be noted that with regard to wind generating facilities and the K2 project his involvement is stated as follows:

Capital Power Corporation (EPCOR), Canada (2002 – 2010)...

Detailed design of the Kingsbridge II 34.5-500 kV substation, 34.5 kV collector system, and 500 kV transmission system connection for 160 MW wind generation facility; project postponed after 70% of the detailed engineering was completed.<sup>71</sup>

There is no mention of any involvement in the design of the underground 230 kV transmission line and the project that he was involved in designing appears to have a different nameplate capacity and was suspended after it was 70% completed.

One of the OEB's primary goals in determining the reliability of the proposal should be the safety and well being of the public. When a public agency gives its approval to a project, it is, in effect, saying that it has confidence that the project, as presented to it, is in the public interest. However, the public interest is not served if serious issues are ignored and arguments that it is too early in the process to deal with those issues, or that someone else will deal with them, are accepted. When safety and reliability issues are raised, they must be adequately addressed by the reviewing agency. When an applicant applies to an approval agency, these issues should be addressed before any approval is given. The public expects that private projects that are submitted for approval are not vague or "preliminary" concepts, but rather are substantially complete final designs and already designed to meet applicable safety and reliability standards. Historical practices of imposing conditions on projects should not prevent the Board from taking a more rigorous look at an application and should not be used by applicants as a means of ignoring safety issues.

The issues raised by the Residents Group and addressed in the Leitch affidavit are not minor technical construction details. These are fundamental issues of safety and reliability of the electrical service. If the applicant cannot conclusively show that these issues are resolved and has not addressed them throughout the public consultation phase, the Board must ask itself this question – Is this a project which is in the public interest? Approving an undertaking of the magnitude of the K2 Wind proposal without having complete design details would be irresponsible and not in the public interest

## **6. RELIABILITY/IMPACT ON GRID**

In response to the OEB questions about ownership, K2 Wind indicates that "K2 Wind is a limited partnership among affiliates of Samsung renewable Energy, Pattern Energy and Capital Power" and "While Capital Power is not a party to the GEIA, it made its Kingsbridge II project, including land rights and engineering and environmental studies, available to Samsung and Pattern for purposes of the GEIA in consideration of a one-third interest in K2 Wind."<sup>72</sup>

The OEB interrogatory specifically asked about examples of similar projects that have been undertaken and about what human resources will be pooled from any of the three participating partners.

---

<sup>71</sup> EB-2012-0458. K2 Wind, C.V. of Byron Nicholson, pg. 3 of 8, Filed April 22, 2013

<sup>72</sup> EB-2012-0458. K2 Wind, pg. 4 of 39, Filed March 14, 2013



In response, K2 Wind states “K2 Wind, through Capital Power (formerly EPCOR), has construction and operational experience with several relevant facilities, a selection of which are outlined in the table on the following page” and this table specifically lists the Kingsbridge I Wind Operation.<sup>73</sup>

The OEB’s mandate is to consider the “interests of consumers with respect to prices and the *reliability and quality* of electricity service”. A fundamental facet of reliability is the operator’s experience and capacity. In assessing the issue of reliability and quality of service, it is therefore worth looking at the experience of ratepayers in ACW with the Capital Power project that K2 Wind has cited as part of its operational experience. Twenty-two turbines were constructed in ACW as part of the Kingsbridge I Wind Project.

At an Ashfield-Colborne-Wawanosh Council meeting on August 21, 2012 the project manager of Capital Power stated that KI is a model wind farm, and an example of how to develop a good wind project. However, this “model wind farm” has had significant operational problems. There are serious gaps that have been exposed in their ability to respond to emergency situations. The turbines and associated transmission lines have also resulted in significant electrical problems on the grid that have never been adequately addressed or resolved.

### **6.1 Turbine Fire**

On April 2, 2013 a turbine in the KI Wind project suffered a major failure and burnt to a cinder.<sup>74</sup> The fire reportedly occurred early in the morning and was reported by various residents and passersby between 1-2 a.m. The Goderich volunteer fire department responded. A KI Wind representative did not arrive on site until approximately an hour after the fire started and the fire department was already on site. Residents living in the vicinity were not notified of the fire or contacted by KI representatives despite reports from residents of being able to smell toxic smoke from the burning turbine inside their homes. The Township was not officially notified of the fire by any KI staff and did not find out until the Township clerk contacted Paul Wendelgass who returned his call at 2:05 p.m. on April 2 and advised him of what was happening. The clerk did this in response to multiple calls from concerned residents. In conversations with Paul Wendelgass, residents of ACW have repeatedly been told by him that he has no knowledge of the KI project so it is a mystery to the Residents Group why he would be speaking to the turbine fire on behalf of KI.

Mr. Wendelgass also attended the Council meeting that evening in the company of Dan Hayden, project manager for KI Wind, who addressed Council regarding the fire. Mr. Hayden indicated that the debris field from the turbine had spread from 100 to 200 meters

---

<sup>73</sup> EB-2012-0458. K2 Wind, pgs. 13-14 of 39, Filed March 14, 2013

<sup>74</sup> Creces, Gerard - Huron County Focus - Photos and article relating to April 2, 2013 turbine fire attached as Appendix C to this Submission.

from the turbine itself. Subsequent reports in the newspaper indicated that the debris field extended further than 400 meters from the turbine. In his report Mr. Hayden also stated that he had driven around the neighbourhood in the dark with the window down smelling for smoke. Not smelling any, he then sent the fire department home.

The Residents Group understands that the Ministry of the Environment (MOE) was not immediately contacted by any representatives of KI Wind regarding the fire despite there being in excess of 750 liters of oil in the turbine itself. The MOE office in Owen Sound was contacted on April 2, 2013 by a resident of the Township and staff subsequently made a field visit to investigate. The MOE office in Toronto was eventually contacted on April 3, again by Paul Wendelgass who we have been told is not connected with KI Wind. Residents have been advised by MOE staff from Owen Sound that the Toronto office has nothing to do with turbines in ACW. This haphazard response speaks to a lack of capability to respond in a timely fashion to an emergency situation and represents a disorganized, chaotic approach to dealing with a crisis. At the time of writing, this turbine still stands as a charred, inoperable eyesore in the Township.

While these matters concern the KI Wind project, which is owned and operated by a K2 Wind affiliate, it is of grave concern that the current proposal submitted by K2 Wind lacks any substantive detail which would provide any confidence that the same issues would not be faced by this project and seriously calls into question the reliability of the electrical services and is of great concern to public safety.

## **6.2 Stray Voltage**

A review of Township records from 2006 to 2011 indicates that once the K1 Wind project became operational, it created stray voltage problems for residents in the Colborne ward of ACW.<sup>75</sup> The records indicate that residents approached Council on various occasions seeking assistance in resolving the problem. The ongoing presentations made by residents during this time period indicate that they experienced challenges in getting these problems resolved.

Reliability of electrical service entails more than just the ability to hire someone to construct electrical facilities. A fundamental aspect of reliability is the capacity to properly maintain and manage those facilities. This also means that the operator must have the capability and knowledge and will to respond to problems and issues affecting customers and to resolve them in a timely manner. Residents of ACW should not have to approach their local Council in order to find help to resolve such issues.

---

<sup>75</sup> Township of Ashfield-Colborne-Wawanosh, Minutes of Council Meetings 2006-2011.



### **6.3 Goderich Tornado – Emergency Response Procedures**

In 2011 the Town of Goderich and surrounding area was hit with an F3 tornado that caused extensive damage and one death. Hydro distribution lines were downed throughout the area including the private transmission lines that are owned by and exclusively service the KI Wind project. The Residents Group notes that a Hydro One Networks crew was diverted in response to a request from KI Wind, a private entity, to restore these private lines. This occurred while the residents of the town were still without power. In emergency situations, Hydro One usually advises residents and businesses that restoration of privately owned lines and services is their personal responsibility and they should contact an electrician. A Hydro One crew should not have been reallocated during an emergency to deal with a private line when the broader public did not have electrical service. As with the recent turbine fire, this speaks to a lack of preparedness and ability on the part of KI Wind to deal with emergency situations and raises questions about the potential for similar situations to arise with K2 Wind. It shows that there is no clear set of procedures for dealing with major events. If K2 Wind is relying on the experience and abilities of its affiliates, this raises serious issues of public safety and reliability for the grid.

## **7. SUMMARY**

### **7.1 Residents Group Position**

Throughout the process of this hearing it has become apparent to the residents of this Township that there is a fundamental problem in the way that these applications are being considered. Projects are not being assessed from a system wide perspective. Each project is being reviewed within the context of a very narrow box of short-term costs and connection/stability issues. Within that already narrow box, there is also an effort being made to further shrink the scope of the issues that may be considered by the Board. Arguments are put forward that seek to label information that is presented as either being irrelevant or as falling outside the scope of the Board's mandate. We see it in this hearing in the positions put forward by K2 Wind. We see it also occurring in the Varna Wind hearing EB-2013-0442 currently before the Board. If a review board allows itself to be maneuvered into this position, it gives the applicants of a project the power to determine the public interest. It allows them to inappropriately sweep issues of public safety and quality and reliability of electrical service outside the box and in so doing, undermines the overall intent of public laws and policies.

The Residents Group has reviewed the proposed K2 Wind project in great depth from the parameters of a larger box of public interest as it relates to public safety and quality and reliability of electrical service. We have approached it from both a short-term and a long-term perspective and looked at what the impacts will be in that context. When looked at from this perspective, it is our contention that this project cannot be considered to be in

the overall public interest within the meaning of subsection 96(2) of the *Ontario Energy Board Act* as suggested by K2 Wind for the following reasons:

1. The Proposed Facilities will not facilitate the transfer of 270 MW of clean, renewable energy to Ontario's electricity grid. Data from the existing KI Wind project operated by an affiliate of K2 Wind, located in the same geographic location and subject to the same wind patterns, shows that the efficiencies will be substantially less than projected and will range between 21% and 34% of nameplate capacity.
2. Data from the K1 Wind project noted above shows that the highest period of energy production - 60% - for the K2 Wind project, would be in the winter period. Lowest energy production would occur during the summer months of July and August when it is most needed.
3. Analysis of the same data as noted above, shows that the bulk of the power that will be produced by the K2 project will occur during periods of off-peak demand. These are already periods of surplus power. In just one year of production this surplus energy will cost the province almost \$57 Million for unnecessary power. During the 20 year life of the project over \$1.1 Billion will be paid out for surplus power production in off-peak periods. Production of additional power during these periods of surplus will not further provincial policies with respect to significantly increasing the amount of renewable electricity as the bulk of this surplus power will need to be dumped or exported to maintain stability on the grid.
4. The provincial electrical grid is already operating under strain as a result of the growing investment in variable generation which is, at times, challenging the ability of the IESO to maintain reliability. This is shown in statements made by the IESO to the OEB in EB-2013-0029.
5. The addition of this project to the provincial grid will add to the problems of surplus generation and will adversely affect the reliability and quality of electricity service in Ontario.
6. Long term hidden costs to electricity ratepayers will be incurred through the requirements for this project to be backed up by natural gas generation.
7. The costs to electricity ratepayers will include additional costs which have not been clearly identified including the purchase of land for the switching station, the ongoing operation and maintenance costs of a switchyard, and the maintenance of a 7 kilometer 27.6 KV transmission line designed solely to incorporate the proposed facilities. These costs will be borne by the ratepayers and not by the applicants.



8. No cost benefit analysis has been done to identify the extent of these long-term costs to electrical ratepayers.
9. There are significant gaps in the information provided for the design of the proposed 230 KV transmission line which have ramifications for public safety.
10. The preliminary design for the proposed 230 KV transmission line, part of which will be constructed on a public road, does not meet the current Ontario standards of construction for a line of this high voltage.
11. Residents of ACW have advised the Board of their strong concerns regarding the safety of the proposed facilities, particularly the 230 KV transmission line. The information provided by K2 Wind does not adequately address these concerns.
12. The ACW experience with the KI Wind project, operated by Capital Power, an affiliate and partner in the proposed K2 Wind project, includes a catastrophic turbine failure and unresolved stray voltage problems. Despite these problems, K2 Wind uses this as an example of their corporate abilities.
13. The emergency response for the recent turbine fire and the 2011 tornado highlighted serious gaps in the response protocols and ability of a K2 Wind affiliate and partner to deal with emergency situations. In the case of the recent fire, neighbouring residents and the Township were not notified. Residents reported smelling smoke from the fire after the fire department had been sent home. The MOE was not immediately contacted by KI Wind and only arrived on site in response to a resident's call. For a large commercial industrial operator, this is an inadequate emergency response.
14. The KI Wind response to the 2011 tornado exposed a reliance on Hydro One crews to respond to emergency situations involving a private corporation's transmission facilities and resulted in crews being diverted from work on public facilities. As noted in Point 13, for a large commercial industrial operator, this is an inadequate emergency response.
15. Ontario's provincial policy focus has shifted to fiscal responsibility. Contracted renewable generation amounts have recently been slashed in a cost saving effort. Addition of unnecessary generation capabilities of the magnitude of the K2 Wind project contradicts this shift in provincial policy.
16. Deferral of new renewable energy supply until it is required does not contradict government policy.
17. Recent changes in provincial renewable energy policy recognize that the original FIT process was flawed and local concerns must be given greater emphasis in the siting of large-scale projects. The K2 Wind project has not addressed the

reliability and safety concerns raised by local residents throughout the review process.

18. Over 800 residents and landowners of ACW have expressed their opposition to this project in a petition submitted to the Ministry of the Environment as part of the REA process.
19. The premier has indicated in her throne speech that the direction of provincial policy regarding renewable generation is changing to acknowledge the need for partners who are willing hosts. ACW, by way of its request for a moratorium, has indicated it is not a willing host.

The K2 Wind Argument-in-Chief does not stand up in the light of a detailed review of the application. The proposed project will have long-term negative implications for consumers with respect to prices and the reliability and quality of electricity service. It is inconsistent with the new direction of provincial policy for fiscal responsibility. In this respect it cannot be seen to be in the broader public interest.

## **7.2 Recommendations**

It is the Residents Group's firm position that a granting of Leave to Construct to K2 Wind would not be in the public interest. However, should Leave to Construct be granted, the Residents Group have submitted the following recommendations for consideration by the Board.

### **a) Safety Recommendations**

Should this project be approved, the Residents Group strongly recommends that in the interests of safety:

1. The portion of the proposed 230 KV line located on public road allowance should be built to the standards used along the public roads elsewhere in the province, and encased in concrete and clearly identified with regular above ground markers.
2. The portion of the proposed 230 KV line located on private property should be given at a minimum, basic mechanical protection in the form of a red concrete lid or the entire line encased in concrete.
3. The depth of the proposed line should be increased by a minimum of two feet to ensure adequate protection from mechanical disturbance.
4. Electronic locators should be required for the 230 KV line where it is located along the public road allowance and where it intersects private fence lines.
5. Additional soil resistivity testing should be required along the entire route of the proposed line.



6. All designs submitted to the Township for review should be assessed by a professional qualified in this field of high voltage transmission lines, the cost of which should be borne by K2 Wind.
7. The area of the transmission line located on private land should be posted with permanent warning signage with non-conductive materials.
8. The easement area of the transmission line on private land should be restricted from tillage and the easement agreement with landowners should require that this land be maintained in permanent vegetative cover. K2 Wind should not be permitted to absolve itself from risk associated with the 230 KV transmission line through the inclusion of such wording in the easement agreement.
9. Complete emergency response protocols should be developed which include notification procedures for residents of the Township and the municipality. Identification of hazards should be made by properly trained personnel e.g. fire department and not left in the hands of the project manager.
10. During emergency situations and power outages, Hydro One's priority should be the broader public. Repairs to private transmission systems should be the responsibility of the owner whose emergency response procedures should clearly identify an on-call team capable of dealing with extreme situations.
11. Fault monitoring systems in all turbines should include a means of fire suppression as well as detection and immediate warning alert for emergency response personnel. Fire suppression plans should be developed in conjunction with the local fire department.

#### **b) Stray Voltage Recommendations**

Just because the cables are buried underground does not mean they will not create tingle or stray voltage. These cables have shielding that must be grounded. Sometimes burying the lines can create worse situations especially in cases of high amperages. Residents of ACW have already experienced stray voltage problems with the existing KI wind project that were not adequately resolved. If K2 is granted Leave to Construct, the ACW Residents Group believes that K2 Wind should be required to be responsible for resolving any problems created. To that end we recommend the following:

1. Full clarification of responsibilities of both K2 Wind and Hydro One Networks for resolving issues relating to stray voltage.
2. Testing for stray voltage (pre and post construction). Where requested, K2 Wind should undertake base line studies for existing voltage conditions, particularly for residents with animal operations.

3. Mitigation of any identified problem to the landowner's satisfaction.
4. K2 Wind be responsible for any and all required mitigation measures.
5. K2 Wind be held liable for any resulting business losses or other associated costs for residents.

### **c) Cost Recommendations**

1. The long term operational and maintenance costs of the Hydro One switchyard should be borne by the applicants, as this switchyard exists solely to allow the individual interest, K2 Wind, to access the Bruce to Longwood 500 KV transmission line.
2. Future SIA/CIA analyses should be broadened in scope to address the full cost ramifications of proposed projects for electrical ratepayers.

### **7.3 Conclusion**

Ontario's power needs have altered dramatically from the point when the *Green Energy and Economy Act* was introduced. The Ontario Society of Professional Engineers and the Auditor General have clearly identified the surplus power situation. The IESO has taken action to limit the surplus power and the resulting instability which renewable generators are introducing to the grid. Even Paul Wendelgass, project manager for K2 Wind, has acknowledged the surplus power situation existing in Ontario.

It makes no sense for the OEB to continue to approve additional wind generation facilities within the province of Ontario when the IESO has initiated new rules to allow it to dispatch the production from those same producers. Continuing to approve surplus power projects in this province puts an unnecessary financial burden on the residents of this province. It also leads to less stability in the grid. The electrical grid is not a storage facility for electricity. The load must equal the supply. Reliability and quality of electricity service are paramount if we are to meet the OEB goal of protecting the best interests of the consumer (the public interest).

Public policy cannot be applied by arms of the government acting in a vacuum. Agents acting on behalf of the public good must be cognizant of and responsive to the evolving shifts in the provincial policy landscape. They must not make their decisions isolated from the realities faced by the broader public. Public good must trump private good and this imperative must be determined within a broader time frame than that of the immediate short-term construction costs of any one application. The Residents Group would agree with the direction of Mr. Wetston's comments when he stressed the



importance of the Board taking a longer-term view in determining where the public interest lies.<sup>76</sup>

The overwhelming direction of public policy is now towards fiscal responsibility. The Ontario Government has slashed its renewable energy commitment in a cost saving effort. Decisions which are made now only on the basis of a narrow view of the construction cost implications of an application and which do not incorporate a broader and longer-term view of costs for consumers, are not in line with current provincial policy. We respectfully submit that, in the face of clear documentation from the authorities governing the power system and given the acknowledgement of the wind producers themselves that Ontario is in a surplus power situation, it would be irresponsible to approve additional wind generation of the scale of the proposed K2 project. Deferring this project at this time would in fact adhere more closely to government policy. The IESO acknowledges that deferring new supply until it is needed does not contradict government policy. If future energy demands increase, the wind will still be there and storage technology may have caught up with production capability.

The public interest and the greater public good in this instance is served by addressing the existing fiscal realities and power needs of the province and the safety concerns of the residents of Ashfield Colborne Wawanosh. We therefore request that in the interests of serving the public interest and the greater public good that Leave to Construct not be granted to K2 Wind.

---

<sup>76</sup> Wetston, Howard. <http://www.ontarioenergyboard.ca/OEB/Documents/speech>, Text of Speech to Ontario Energy Network, April 17, 2008

**8. SIGNATURES**

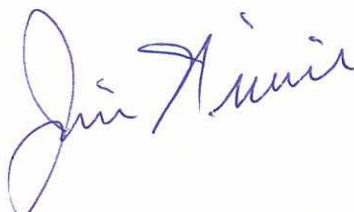
Michael Leitch  
36970 School Road  
R.R. 5, Goderich, Ont.  
N7A 3Y2  
Phone 519-524-5898  
Email – [mike.leitch@hurontel.on.ca](mailto:mike.leitch@hurontel.on.ca)



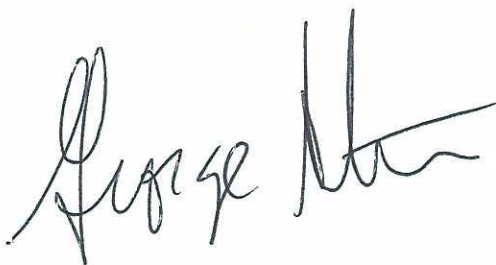
Marianne & Paul Bollinger  
37149 Belgrave Road  
Lucknow, Ont.  
NOG 2HO  
Phone 519-529-7807  
Email – [naturway@hurontel.on.ca](mailto:naturway@hurontel.on.ca)



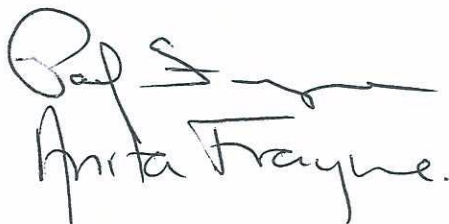
Jim & Sharon Nivins  
84956 Tower Line  
R.R. 7, Lucknow, Ont.  
NOG 2HO  
Phone 519-529-7740  
Email – [daramacafarms@hurontel.on.ca](mailto:daramacafarms@hurontel.on.ca)



George Alton  
85028 Tower Line  
R.R. 7, Lucknow, Ont.  
NOG 2HO  
Phone 519-529-7584



Anita & Paul Frayne  
84947 Bluewater Highway  
R.R. 3  
Goderich, Ont.  
N7A 3X9  
Phone 519-529-7711  
Email – [ninerubies@hurontel.on.ca](mailto:ninerubies@hurontel.on.ca)





## 9. REFERENCES

Acchione, Paul. 2012. *Wind and the Ontario Electrical Grid – The Good, the Bad and the Ugly*. Presentation to the Energy Mini-Conference Series 2012, Toronto, (March 22, 2012) by Paul Acchione, Chair of OSPE Energy Task Force. Available in PDF at <c.y.mcdn.com/sites/www.ospe.on.ca/resource/resmgr/doc\_advocacy/2012-pp\_22mar\_windelecgrid>

Bentley, Chris. December 12, 2012. Interview with CKNX Radio 101.7

Campbell, Bruce. Affidavit submitted in EB-2013-0029. IESO Response to RES Generators, Submission dated Jan. 16, 2013.

Creces, Gerard. 2013. “Turbine fire cause still undetermined” - (original article published in *The Goderich Signal-Star*). Article & related cover page photo, published in *Huron County Focus* on Friday, April 12, 2013.

Hawthorne, Duncan. 2012. Letter to Paul Murphy, President and CEO of IESO, dated August 16, 2012. Submitted as evidence to OEB by IESO in EB-2013-0029.

Hydro One Networks Inc (HONI). 2013. EB-2013-0442, Varna Wind Inc. Leave to Construct Application, Submission respecting Varna Wind’s Motion to Strike Hydro One Evidence

HONI. 2013. Flyer included in March/April Residential Customer Bills

Independent Electricity System Operator (IESO). 2013. *Hourly Wind Generator Output*. Website <<http://www.ieso.ca/iomweb/marketdata/marketData.asp> >

Independent Electricity System Operator (IESO). 2013. *Power Outlook: Spring 2013, 18-Month Outlook* published May 24, 2013. Website <[http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlook\\_2013may.pdf](http://www.ieso.ca/imoweb/pubs/marketReports/18MonthOutlook_2013may.pdf)>

Independent Electricity System Operator (IESO). 2013. *Total Ontario Energy Demand*. Website<[http://www.ieso.ca/imoweb/media/md\\_demand.a](http://www.ieso.ca/imoweb/media/md_demand.a)>

Independent Electricity System Operator (IESO). 2011. *Reconnecting Supply and Demand: How Improving Electricity Pricing Can Help Integrate A Changing Supply Mix, Increase Efficiency and Empower Customers*. Website<[http://www.ieso.ca/imoweb/pubs/consult/Market\\_Forum\\_Report.pdf](http://www.ieso.ca/imoweb/pubs/consult/Market_Forum_Report.pdf)>

K2 Wind Ontario. 2012. *K2 Wind – Moving forward. Community Update – Fall 2012*. Community newsletter circulated by K2 Wind Ontario.

McKittrick, Ross R. 2013. *Environmental and Economic Consequences of Ontario’s Green Energy Act*. Ontario Prosperity Initiative. Fraser Institute. Website<<http://www.fraserinstitute.org>>

Morden, Paul. 2013. "\$1B project in jeopardy", article published in *The London Free Press*, May 14, 2013 edition, A8.

Northland Power. 2013. REA Amendment Notification Letter.  
Website<[http://mcleansmountain.northlandpower.ca/site/northland\\_power\\_mclean\\_s\\_mountain/assets/pdf/mmwf\\_rea\\_amend\\_notification\\_letter\\_apr24\\_2013.pdf](http://mcleansmountain.northlandpower.ca/site/northland_power_mclean_s_mountain/assets/pdf/mmwf_rea_amend_notification_letter_apr24_2013.pdf)>, pg. 1

Office of the Auditor General of Ontario. 2011. *2011 Annual Report of the Office of the Auditor General of Ontario*. Queen's Printer.

Website<[http://www.auditor.on.ca/en/reports\\_2011\\_en.htm](http://www.auditor.on.ca/en/reports_2011_en.htm)>

Ontario Energy Board (OEB), 2013.

Website:<<http://www.ontarioenergyboard.ca/OEB/Consumers>>

Ontario Ministry of Energy, 2013. Letter dated Feb.6, 2013 submitted in EB-2013-0029

Ontario Ministry of Energy. 2013. Website < [www.energy.gov.on.ca/en/news](http://www.energy.gov.on.ca/en/news)>  
- *Energy Agreement Secures Jobs and Clean Energy*. News Release June 20, 2013  
- *Ontario Working With Communities to Secure Clean Energy Future*. News Release May 30, 2013

Ontario Ministry of Energy. 2013. *Ontario's Long-Term Energy Plan*. Website <<http://www.energy.gov.on.ca/en/itep/electricity-prices>>.

Ontario Society of Professional Engineers. 2012. *Wind and the Electrical Grid: Mitigating the Rise in Electricity Rates and Greenhouse Gas Emissions*. Report published March 14, 2012. Available in PDF at

Website<<http://c.yimcdn.com/sites/www.ospe.on.ca/resource/>>

Statistics Canada. 2013. Website<<http://www.statcan.ca/tables-tableaux/sum-som/101/cst01/econ46a-eng.htm>>

Sygration. 2013. Website<<http://www.sygration.com/cgi-bin/statinfo?=KINGSBRIDGE&t=t>>

Township of Ashfield-Colborne-Wawanosh. 2006-2011. Minutes of Council Meetings.

Wendelgass, Paul. 2013. Excerpt from recording of Ashfield-Colborne-Wawanosh Council meeting March 19, 2013

Wetston, Howard. Text of Speech to Ontario Energy Network, April 17, 2008.

Website<<http://www.ontarioenergyboard.ca/OEB/Documents/speechoenwetston20080417.pdf>>

Xcel Energy. 2013. *Underground Transmission Lines*. Factsheet published on

Website<<http://www.powerfortheplains.com/resources/fact-sheets/index.asp>>



## **10. APPENDICES**

### **APPENDIX A:**

McKittrick, Ross R. 2013.

*Environmental and Economic Consequences of Ontario's Green Energy Act*. Ontario Prosperity Initiative. Fraser Institute. <http://www.fraserinstitute.org> .

Included with permission of author.

### **APPENDIX B**

Xcel Energy. 2013.

*Underground Transmission Lines*, pg 2

Factsheet published on Website <[www.powerfortheplains.com/resources/factsheets/index.asp](http://www.powerfortheplains.com/resources/factsheets/index.asp)>

### **APPENDIX C**

Creces, Gerard. 2013.

Front page photo and article headlined "Turbine fire cause still undetermined"

Published in *Huron County Focus* – Community newspaper. Friday, April 12, 2013 issue.

Article also published in *Goderich Signal-Star* Wednesday, April 10, 2013