

# Multi Municipal Wind Turbine Working Group

## AGENDA

MMWTWG-2023-02

Thursday, March 9, 2023, 7:00 p.m.

Virtually via Microsoft Teams

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### Pages

#### 1. Meeting Details

Microsoft Teams meeting

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#### 2. Call to Order

#### 3. Adoption of Agenda

#### 4. Disclosures of Pecuniary Interest and General Nature Thereof

#### 5. Minutes of Previous Meetings

##### 5.1 January 12, 2023 MMWTWG Minutes

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#### 6. Business Arising from the Minutes

##### 6.1 Revisions to the Terms of Reference

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At the January 12 meeting, the Working Group discussed revising the Terms of Reference to broaden the mandate of the group and address other energy generation facilities. A revised copy is included for review by the Working Group which will be forwarded to each Member Municipality for final approval following resolution of approval by the Working Group members.

6.2	Minister of Finance - Response to Wind Turbine Taxation Correspondence	17
6.3	Wind Turbine Failures Letter	19
	The Recording Secretary has reviewed the correspondence received and confirms that no response has been received regarding the correspondence sent December 14, 2021, as copy of which is included in the agenda package for the benefit of new Members.	
6.4	FOI Requests	
	No further information has been received on these requests to date.	
6.5	Bill Palmer - Technical Issues related to Energy Storage	31
7.	Delegations/Presentations	
7.1	Ruby Mekker - Wind Turbines defined as a Health Hazard	46
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8.1.3	2023 Membership Fee	
	The fee is currently set at \$400.00 per Member Municipality.	
8.1.4	Approval of Recording Secretary Invoice	104
8.2	For Information	
9.	Members Updates	
	Members may provide updates on recent activities and findings relevant to the purpose of the MMWTWG.	
10.	New Business	

11. Closed Session (if required)  
Not Required.
12. Resolution to Reconvene in Open Session
13. Adoption of Recommendations Arising from Closed Session (If Any)
14. Adoption of Closed Session Minutes
15. Confirmation of Next Meeting  
Thursday, May 11, 2023 - 7pm via Teams
16. Adjournment

## **Multi Municipal Wind Turbine Working Group MINUTES**

**MMWTWG-2023-01  
Thursday, January 12, 2023, 7:00 p.m.  
Virtually via Microsoft Teams**

Members Present: Mark Davis - Municipality of Arran-Elderslie - Citizen  
Appointee  
Ryan Nickason - Municipality of Arran-Elderslie  
Scott Mackey - Township of Chatsworth  
Paul McQueen - Municipality of Grey Highlands  
Tom Allwood - Municipality of Grey Highlands  
Dan Wickens - Municipality of Grey Highlands  
Don Murray - Township of Huron Kinloss  
Jim Hanna - Township of Huron Kinloss  
Mike Hentz - Municipality of Dutton-Dunwich  
Todd Dowd - Municipality of Northern Bruce Peninsula  
Bill Palmer - Consultant

Others Present: Julie Hamilton - Recording Secretary

### **1. Call to Order**

The Chair called the meeting to order at 7:00 pm. A quorum was present.

### **2. Adoption of Agenda**

The Working Group passed the following resolution:

#### **MMWTWG-2023-01**

**Moved by:** Scott Mackey - Township of  
Chatsworth

**Seconded by:** Dan Wickens - Municipality  
of Grey Highlands

Be It Resolved that the Multi-Municipal Wind Turbine Working Group hereby adopts the agenda of the Thursday, January 12, 2023 as distributed by the Recording Secretary.



**Carried**

### **3. MMWTWG Membership Update**

The Recording Secretary provided an update on the membership of the Working Group.

#### **Returning Municipal Members and Appointees**

##### **Municipality of Arran-Elderslie**

Ryan Nickason

Brian Dudgeon

Mark Davis - Citizen Appointee

##### **Township of Chatsworth**

Scott Mackey

Terry McKay

##### **Municipality of Grey Highlands**

Paul McQueen

Tom Allwood

Dan Wickens

##### **Township of Huron Kinloss**

Don Murray

Jim Hanna

##### **Municipality of Dutton-Dunwich**

Mike Hentz

##### **Municipality of Northern Bruce Peninsula**

Rod Anderson

Todd Dowd

##### **Unconfirmed Membership**

Municipality of Kincardine

Municipality of Central Huron

##### **Non-Returning Members**

Town of Grand Valley

Municipality of Brockton

Township of Melancthon

Township of West Lincoln

#### **4. Annual Election of Chair and Vice-Chair**

As per the Terms of Reference for the Multi-Municipal Wind Turbine Working Group, the Chair and Vice-Chair shall be elected annually at the first meeting of the year.

The Recording Secretary opened the floor to nominations for Chair of the Working Group for 2023.

Member Mackey nominated Member Allwood.

Member Allwood accepted the nomination.

The Recording Secondary called a second and third time for nominations. No further nominations were heard.

Nominations were subsequently closed and Tom Allwood was elected Chair for 2023.

The Recording Secretary opened the floor to nominations for Vice-Chair of the Working Group for 2023.

Member Murray, Member Davis and Member McQueen and Member Hanna declined nomination.

No other nominations were made. Member Hanna agreed to accept the nomination in the absence of further nominations.

Nominations were subsequently closed and Jim Hanna was elected Vice-Chair for 2023.

Tom Allwood resumed the Chair for the remainder of the meeting.

#### **5. Disclosures of Pecuniary Interest and General Nature Thereof**

None.

#### **6. Minutes of Previous Meetings**

##### **6.1 MMWTWG November 10, 2023 Minutes**

##### **MMWTWG-2023-02**

**Moved by:** Mark Davis - Municipality  
of Arran-Elderslie - Citizen  
Appointee

**Seconded by:** Scott Mackey - Township of  
Chatsworth

Be It Resolved that the Multi-Municipal Wind Turbine Working Group hereby approves the minutes of the Thursday, January 12, 2023 meeting as presented by the Recording Secretary.

**Carried**

## **7. Business Arising from the Minutes**

### **7.1 Letter Re: Wind Turbine Taxation**

There has been no response to the letter sent to the Minister of Finance regarding the Wind Turbine Taxation letter.

It was also noted that no response from the Minister of Environment had been received regarding the letter sent in December 2021 regarding wind turbine failures. The Recording Secretary will look into this further to confirm.

Members of the Working Group feel that it would be beneficial to invite MPP Rick Byers, who is also the Parliamentary Assistant to the Minister of Finance, to the next meeting to introduce him to the Working Group and follow up on the letter.

Subsequent to further discussion, the Working Group passed the following resolution:

#### **MMWTWG-2023-03**

**Moved by:** Scott Mackey - Township of  
Chatsworth

**Seconded by:** Dan Wickens - Municipality  
of Grey Highlands

Be It Resolved that the Multi Municipal Wind Turbine Working Group hereby invite MPP Rick Byers to the next meeting of the Working Group to discuss the letter sent to the Minister of Finance regarding Wind Turbine Taxation.

**Carried**

## **7.2 Response to November 10, 2022 letter requesting quarterly reports from the MECP.**

The Working Group believes that the complaints would not be considered confidential. The request is for information regarding the complaints themselves and is not to obtain the names of who the complaint is regarding. It was decided that a follow up letter should be sent challenging the response that was sent to the Working Group.

Subsequent to further discussion, the Working Group passed the following resolution:

### **MMWTWG-2023-04**

**Moved by:** Jim Hanna - Township of Huron Kinloss

**Seconded by:** Todd Dowd - Municipality of Northern Bruce Peninsula

Be It Resolved that the Multi Municipal Wind Turbine Working Group hereby,

1. Directs that a follow up letter be sent to the Minister of Environment, Conservation and Parks requesting that the data regarding the complaints be sent to the Working Group, with any confidential information redacted; and
2. That the letter be copied to MPP Rick Byers and MPP Lisa Thompson as well.

**Carried**

## **7.3 Ruby Mekker - Wind Turbines defined as a Health Hazard**

Ms. Mekker is unable to attend and this item is being deferred to a future meeting.

Chair Allwood provided some information that he had an opportunity to speak with Dr. Arra, the local Medical Officer of Health in Grey-Bruce regarding this issues. Dr. Arra indicated that he was aware of the MMWTWG and its mandates and although he finds the issues interesting, there is not the money and resources available to properly investigate the health affects.

Ms. Mekker is seeking an amendment to the original motion passed by the Working Group that indicated that a letter be sent to the local Medical Officer's of Health.

The Working Group will discuss this matter further and provide direction at a future meeting.

#### **7.4 MECP FOI Requests**

The Recording Secretary reported that the fee estimate has been paid however, no further information has been received.

### **8. Delegations/Presentations**

#### **8.1 IESO Update - Warren Howard**

Mr. Howard provided an update on the IESO.

The IESO is seeking additional capacity and has issued an RFP to obtain proposals for achieving this.

There has been some differing views on the requirement for municipal support of the proposed projects between the government and IESO. On December 23, the RFP was changed which made the municipal support requirement mandatory to the application.

There have been a number of proposals presented to Council's all over the province. Some of the questions being raised relate to location, aboriginal support and zoning. Online public consultations have also been allowed. Mr. Howard suggested that if proposals do come to local Council tables, it is important that Council asks a number of questions.

He also provided some information on the plan for decarbonization. Minister Smith requested a plan to decarbonize electricity production in Ontario. Consultations were held with more than 70 organizations. A plan was developed with 2 scenarios and there has been a positive response from the environmental sector. Mr. Howard feels that a response from both the MMWTWG and individual municipalities would be appropriate.

The plan projects that wind capacity will double which would allow them to phase out natural gas. There is no backup supply discussed for intermittent wind and solar sources. The plan also highlights a need to address decommissioning. There is the possibility that the IESO's view of needing 17,760 MW of wind

capacity by 2050 could be out of step with the government's view on the matter.

It was noted that the IESO decarbonation plan also includes a significant contribution of 15,000 MW of hydrogen generation which should also be included in any response drafted from the Working Group.

Mr. Howard also provided a brief update on the North Kent well water issues, indicating that a study was completed showing that the water contamination was linked to wind turbines. There is a local campaign to raise funds to complete further in depth testing in the area. The contamination is the result of the vibrations coming from the turbines.

Members raised questions regarding the various storage technologies that will be seen as a result of the IESO RFP, two of the main sources being lithium ion battery storage and hydrogen. The carbon footprint could be made much larger from the mining required for the production of all these batteries.

There is a storage facility proposed for Chesley. It consists of sea container type buildings full of batteries that fill up with power during the off peak times and send it back out during the peak times.

The IESO requires that the projects have the power be available on demand with 4-6 hours of continuous power so a wind turbine without storage would be able to support this demand.

It was also noted that oftentimes the benefits are examined but not always are the consequences associated with alternative energy solutions are considered.

There have been issues raised regarding fire suppression measures related to the battery storage facilities and the large quantities of water that would be required to combat a fire if it occurred.

Member Palmer offered to bring forward a presentation on battery storage facilities for the benefit of members at the next meeting in March.

Subsequent to further discussion, the Working Group passed the following resolution:

**MMWTWG-2023-05**

**Moved by:** Todd Dowd - Municipality  
of Northern Bruce  
Peninsula

**Seconded by:** Jim Hanna - Township of  
Huron Kinloss

Be It Resolved that the Multi-Municipal Wind Turbine Working Group hereby receives agenda item 8.1 IESO Update from Warren Howard, for information purposes.

**Carried**

## **9. Correspondence**

### **9.1 Requiring Action**

#### **9.1.1 Approval of Recording Secretary Invoice**

The Working Group passed the following resolution:

#### **MMWTWG-2023-06**

**Moved by:** Scott Mackey - Township of  
Chatsworth

**Seconded by:** Don Murray - Township of  
Huron Kinloss

Be It Resolved that the Multi Municipal Wind Turbine Working Group hereby approve the invoice for the Recording Secretary for November and December 2022.

**Carried**

### **9.2 For Information**

#### **9.2.1 MOE Response to Letter Re: IESO Handling Municipal Support for Energy Projects**

A response to the letter sent to the Minister of Energy dated September 28, 2022 has been received.

The letter confirms that municipal support will be a requirement of the RFP process associated with the IESO additional storage requirements.

The Working Group passed the following resolution:

#### **MMWTWG-2023-06**

**Moved by:** Jim Hanna - Township of Huron Kinloss

**Seconded by:** Mark Davis - Municipality of Arran-Elderslie - Citizen Appointee

Be It Resolved that the Multi-Municipal Wind Turbine Working Group hereby receives agenda item, 9.2.1 MOE Response to Letter Re: IESO Handling Municipal Support for Energy Projects, for information.

**Carried**

## **10. Members Updates**

The Recording Secretary formally introduced the new Member Municipality, Northern Bruce Peninsula, along with each returning and newly appointed member.

Members introduced themselves and provided some background for the benefit of the Working Group.

A general discussion took place regarding the various projects and issues that have arose from those projects in the member municipalities that currently have wind turbines.

## **11. New Business**

Member Murray raised the point that the group was originally formed to combat wind turbine issues, however, other issues are coming forward regarding storage facilities and other alternative energy solution.

The Working Group agreed that it would warrant revisiting the Terms of Reference to make amendments to allow for the group to address concerns with other alternative generation facilities.

The Working Group passed the following resolution:

### **MMWTWG-2023-07**

**Moved by:** Don Murray - Township of Huron Kinloss

**Seconded by:** Mark Davis - Municipality of Arran-Elderslie - Citizen Appointee



Be It Resolved that the Multi Municipal Wind Turbine Working Group hereby agrees to review the Terms of Reference and revise them to reevaluate the MMWTWG mandate and address other alternative energy sources.

**Carried**

**12. Closed Session (if required)**

**13. Resolution to Reconvene in Open Session**

**14. Adoption of Recommendations Arising from Closed Session (If Any)**

**15. Adoption of Closed Session Minutes**

**16. Confirmation of Next Meeting**

The next meeting was confirmed for Thursday, March 9, 2023 at 7:00 pm virtually via Teams.

**17. Adjournment**

The Working Group passed the following resolution:

**MMWTWG-2023-08**

**Moved by:** Mark Davis - Municipality  
of Arran-Elderslie - Citizen  
Appointee

**Seconded by:** Don Murray - Township of  
Huron Kinloss

Be it Resolved that the meeting of the Multi-Municipal Wind Turbine Working Group is hereby adjourned at 8:27 p.m.

**Carried**

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Tom Allwood, Chair

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Julie Reid, Recording  
Secretary

## Terms of Reference

### Multi-Municipal ~~Wind Turbine~~Energy Working Group MMEWG

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#### Name:

The committee shall be known as the Multi-Municipal ~~Wind Turbine~~Energy Working Group (the "Committee"). The Committee may be cited by it's short title MMEWG, when appropriate to do so.

#### Purpose:

The purpose of the Committee is to draw together representatives from ~~\_area~~ municipalities to share and discuss and advocate "best practices" and other means to address mutual concerns regarding ~~proposals to locate and install industrial/commercial windenergy~~ generation facilities and storage infrastructure to all the relevant Government Ministries and Agencies.

#### Activities:

The Committee will meet on a regular basis to discuss ongoing matters and, where applicable, make recommendations to the Councils of the member municipalities for support and/or action as applicable.

The Committee will also undertake research into various related topics and liaise with other similar working groups as appropriate to share information and ideas.

The Committee may form sub-committees to concentrate on specific matters, which sub-committees will report back to the Committee on an ongoing basis.

#### Delegated Authority:

The Committee is a working group and has no delegated authority except for the advocacy of best practices.

The Committee has no authority to direct staff from any of the member municipalities, and any recommendations requiring implementation, reports, staff action, or a commitment to expend money must first be approved by the respective Council or Councils as the case may be, depending on the municipality(ies) impacted, before any action by staff may be taken.



### Committee Composition:

The membership of the Committee will be comprised of representatives appointed by Council resolution or by-law from participating municipalities as follows:

- Two members of council from each participating municipality appointed as regular members of the Committee
- One member of council from each participating municipality appointed as an alternate to attend in the absence of one or both of the regular member representatives from that municipality (appointment of alternate is at the discretion of each member municipality)
- One citizen member may be appointed by each member municipality for the purpose of bringing additional expertise to the discussion

Should any participating municipality wish to opt out of the Committee, a resolution from the participating municipality shall be received by the Committee by December 31<sup>st</sup> of the year they wish to cease membership. There will be no refund of the annual fee to the municipality wishing to opt out.

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### Term of Office:

All members of the Committee shall be appointed for the term of the Council of the member municipality that appointed them.

Each appointing Council reserves the ability to replace its appointees at its sole discretion and may do so at any time by notifying the Recording Secretary by way of resolution or by-law.

### Administration of the Committee:

The Committee will elect a Chair and Vice-Chair from amongst its members on an annual basis, at the beginning of each calendar year.

The Committee will be governed by the Procedural By-law of the Municipality of Arran-Elderslie, except as set out in these Terms of Reference.

Meetings of the Committee shall be open to the public, subject to the exceptions set out in Section 239 of the *Municipal Act, 2001*, as amended.

A maximum of three (3) delegations will be permitted to be placed on the

agenda for any Committee meeting, or at the discretion of the Committee. The request to be added to the agenda and the nature of the delegation must be provided to the Recording Secretary not less than five (5) business days prior to the meeting. Each delegation will be allotted ten (10) minutes for their presentation, at the discretion of the Committee.

Notwithstanding the limit to the number of delegations to be placed on the agenda, with the approval of a majority of the Committee members present, up to an additional three (3) 5-minute delegations may be permitted to address the Committee at any given meeting on short notice.

Delegations will not be permitted to appear before the Committee to present the same information on more than one occasion, nor shall multiple delegations be permitted to repeat the same information as previous delegations, and the ruling of the Chair of the Committee with respect to this matter shall be final.

Staff attending meetings of the Committee are not members of the Committee.

All members of the Committee agree to provide financial support for the secretarial support for the Committee by forwarding, to the Municipality of Arran-Elderslie an amount as established by the Committee, and approved by consensus of the Councils of the participating municipalities. The Committee will review and levy this amount on an annual basis, at the beginning of the calendar year and this levy must be paid by June 1<sup>st</sup> in each year. In case of any participating municipality discontinuing their participating in Committee, the said municipality shall remain liable for payment of their support for that calendar year.

If the Committee is disbanded, the members of the Committee at the time of disbandment shall agree how the remaining funds shall be distributed, and approved by consensus of the Councils of the remaining participating municipalities.

The Committee shall provide an annual fee structure which shall be approved by Councils of the participating municipalities. A year-end financial statement will be forwarded to the Clerks of the participating municipalities by April 1<sup>st</sup> of the following year.

Minutes from Committee meetings will be presented for adoption by the Committee at its next regular meeting and once adopted, forwarded to the member municipalities for information and disposition of recommendations as necessary.

### Membership:

A yearly record of membership will be established by the Recording Secretary and the agendas and minutes will reflect the name of the appointed member's municipality represented. This record of membership shall be updated from time to time as required, and be provided to all participating municipalities.

### Quorum:

Quorum shall be a representation of appointed officials from a majority of the participating municipalities, either by one, two or three of the appointed members or the alternate appointee (where such appointee exists). Quorum shall be 50% of the participating municipalities plus one (1).

If there is no quorum within thirty minutes after the time appointed for the meeting, the Recording Secretary shall call the roll and record the names of the members present the meeting shall stand adjourned until the next regular meeting or until a special meeting is called.

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### Voting Strength:

Each ~~participating municipality~~ ~~appointed member~~ shall carry a voting strength of one (1) vote per participating municipality and a quorum shall be 50% over half of the participating municipalities. ~~plus one (1).~~

### Agendas and Minutes:

The Agendas will be prepared by the Recording Secretary and distributed to each participating municipality for posting in accordance with their standard practices.

The minutes, once adopted by the Committee, will be forwarded to each participating municipality and made public by each participating municipality in accordance with their standard practices.

### Meeting Schedule:

It is expected that the Committee will meet on an ~~an approximately bi-~~ monthly basis, or at the call of the Chair, as may be determined from time to time.

Meetings will be held virtually using Microsoft Teams or other suitable virtual platform in an effort to broaden the membership and participation area.

The platform in which meetings are held will be reviewed by the committee from time to time and altered to accommodate the needs of the committee by a general consensus of the committee members. **Add in for hybrid meeting**

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The Committee will establish a proposed meeting schedule on an annual basis at the beginning of the year to facilitate planning.

#### **Remuneration:**

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Committee members shall be compensated for meeting attendance by their respective member municipality in accordance with their municipalities remuneration policy and/or procedures.

#### **Staff Resources:**

Secretarial support including preparation of agendas and minutes of meetings will be provided by the Recording Secretary who is hired by the Committee.

The Committee may appoint a technical assistant at a rate to be determined, and approved by consensus of the Committee, but will not exceed the annual budget.

#### **Miscellaneous:**

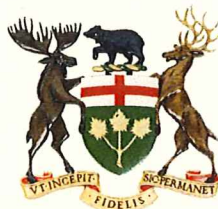
These Terms of Reference for the Multi-Municipal Wind Turbine Working Group are established by consensus of the Councils of the participating municipalities and can only be altered by consensus of those municipalities.

Date of Adoption of Terms of Reference: February 2011

Date of Amendment: September 2015

Date of Amendment: March 2023

Ministry of Finance  
Office of the Minister  
Frost Building S, 7th Floor  
7 Queen's Park Crescent  
Toronto ON M7A 1Y7  
Tel.: 416-325-0400



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Minister of Finance | Ministre des Finances  
**PETER BETHLENFALVY**

880-2022-1918

Mr. Tom Allwood  
Chair, Multi-Municipal Wind Turbine Working Group  
Councillor, Municipality of Grey Highlands  
[councillorallwood@greyhighlands.ca](mailto:councillorallwood@greyhighlands.ca)

c/o Julie Hamilton, Deputy Clerk, Municipality of Arran-Elderslie  
[deputyclerk@arran-elderslie.ca](mailto:deputyclerk@arran-elderslie.ca)

Dear Councillor Allwood:

Thank you for your letter regarding the property assessment and taxation of wind turbine towers. We appreciate the opportunity to respond to your group's concerns about the assessment methodology for these projects.

As you have noted, the assessment of wind turbine towers is determined by the Municipal Property Assessment Corporation (MPAC) based on a regulated amount per megawatt of the turbine attached to the tower.

It is important to note that wind turbine towers operated by corporate power producers are taxed at the industrial property tax rate. It is also important to emphasize that this regulated methodology applies only to the assessment of the tower itself. Land and any other associated buildings or structures are assessed using established methodologies and are also taxed at the industrial rate.

Machinery and equipment used in generating electricity, including the turbine and generator, are exempt from property taxation. The tax exemption for the equipment is not unique to wind projects, but rather, is consistent with the treatment of machinery and equipment used in all forms of electricity generation.

I appreciate you sharing your group's perspective regarding the assessment of wind turbine towers.

.../cont'd



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Thank you again for writing.

Sincerely,



Peter Bethlenfalvy  
Minister of Finance

c: The Honourable Rick Byers, Parliamentary Assistant to the Minister of Finance  
Lisa Thompson, MPP, Huron-Bruce  
Sylvia Jones, MPP, Dufferin-Caledon  
Sam Oosterhoff, MPP, Niagara West  
Rob Flack, MPP, Elgin-Middlesex-London

## Wind Turbine Failures

Based on the number of catastrophic wind turbine failures, the Multi Municipal Wind Turbine Working Group (MMWTWG)<sup>1</sup> is deeply concerned about the associated implications. While the wind power industry reports that each is an isolated incident, there are now too many incidents for this response to be credible. At least 10 known turbines failures have happened in Ontario since first industrial-scale wind turbines were installed in 2006. Each of these resulted in significant portions of blades or the tower hitting the ground at some distance from the turbine base.

At the same time, there has been no public response from the provincial government that indicates these potentially serious incidents are being investigated either in the context of public and/or workplace safety. To date, there has been no information shared with MMWTWG member municipalities.

As a result, we have been working with several people that have technical experience with industrial applications of power and rotating equipment. We have developed our own assessment of the failures based on statements from project operators, pictures and other available information. This assessment of the following events points to a number of different causes:

- **Bow River** – Pictures suggest that tower collapse was linked to a bolt failure of tower sections.
- **Skyway 8** – Rotor failure occurred shortly after the installation of an experimental device.
- **Raleigh Wind** – Published information from the project owner indicates that the tower collapse is related to a single blade failure. Marks on the tower suggest that the blade struck the tower.
- **Sumac Ridge** – Blade fractures, no explanation available.
- **Kingsbridge 1** – Fire in the nacelle spread to the blades resulting in wide debris scatter.
- **Huron Wind** – Blade failure with the location of the debris thrown by this failure highlighting the inadequacy of current setbacks from property lines.

Another recent incident in New Brunswick adds to our concerns:

- **Kent Hills, NB** – Project operator linked the collapse of tower to a foundation failure.

Collectively, the assessments of these situations increased our concern that action is required to formally investigate these incidents. We believe they clearly demonstrate that the current setback distances are inadequate to protect the public and they will increase as tower heights and blade lengths increase.

Faced with continued public inaction by the provincial government, the MMWTWG decided to prepare this summary of available information relative to these failures with a goal of sharing the information with other municipalities that host wind turbine projects to enable them to better protect their citizens.

The MMWTWG recommends that the provincial government needs to:

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<sup>1</sup> The MMWTWG formed in 2009 by member municipalities in Bruce, Grey and Huron Counties to share information on wind turbine projects being proposed or operating in our municipalities. The working group is a joint committee with elected and municipally-appointed citizen representatives from the member municipalities.

1. **Establish a formal public process for investigations of wind turbine failures** so that the cause can be firmly determined. These would involve third-party independent engineers starting with initial inspection procedures through to the public release of the final report;
2. **Complete comprehensive inspections of existing projects** to identify any project that shows signs of similar weaknesses;
3. **Establish requirements** for on-board predictive maintenance equipment for operating wind turbines to allow early identification of problems and establish protocols for information transfer to the MECP for review and sharing with the host municipality.
4. **Review the emergency response procedures** submitted by the proponents of wind turbine projects as part of the approval process to ensure that the plans are current and responsive to the types of failures being experienced; and
5. **Increase the setbacks** from property lines to a minimum of tower height plus blade length for new towers or repowering of existing sites to at least reflect the impact of a tower collapse while recognizing additional distances would be required to protect against ice throw and debris scatter like that seen in the Huron Wind failure where debris with the dimensions of a car were found 2.5 times the height of the tower plus blade length.

We suggest that Councils review these attached summaries to consider how they apply to the wind turbine project(s) in your municipality. It may be possible for the municipality to review the situations with the owner of each project to confirm that appropriate activities are underway to ensure public safety.

If you agree with the recommendations for action by the provincial government we ask that you communicate your support to David Piccini, Ontario Minister of Environment, Conservation and Parks.

When these projects were approved and built, provincial regulations limited municipal input into the projects and the supervision of their construction. This self-regulation process led to some serious problems for the municipalities. Now that further gaps in this process are becoming evident, the province needs to take responsibility for addressing the mistakes that were made.

## Attachment 1: Bow Lake, Algoma Region, Ontario

### Project Details:

#### Owners:

Batchewana First Nation – 50%

DIF Infrastructure V – 50%

BluEarth Renewables - operator

**Location:** Northwest of Sault Ste Marie

**Capacity:** 58.3 MW

#### Commissioned:

Phase 1: May 2015

Phase 2: April 2016

**Equipment** – GE Energy 1.6 MW

**Height** – 80 m tower; 50 metre blades

**Date of Failure:** August 28, 2021

### Assessment of Failure:

The pictures strongly suggest that the failure mechanism was fatigue of the bolts holding the tower together. There is no evidence of buckling, tearing of the steel plate or general deformation at the adjoining section flanges.

A portion of one blade was found located on the ground near the tower base. The other two blades appear to have remained attached to the rotor as it collapsed into the adjacent trees.

Even though the tower contained 60 gallons of flammable petrochemical lubricants, the MECP Environmental Officer did not visit the site until 3 days after the accident took place.



### Potential Learnings:

Tower bolt failures can have many potential causes; i.e. wrong bolts, excessive cyclical loading beyond design criteria, improper installation method regarding torque application, inadequate bolt maintenance checks during regular maintenance etc.

Fatigue damage cannot be seen until a crack develops. Since all aspects of the other towers seem to be identical, it would seem necessary to replace all their tower section bolts.



## Attachment 2: Skyway 8, Grey County, Ontario

### Project Details:

**Owner:** Capstone Infrastructure

**Location:** South west of Dundalk

**Capacity:** 9.5 MW

**Commissioned:** August 2014

### Equipment

3 - Vestas V100- 1.8 MW

2 - Vestas V100- 2.0 MW

**Height** – 80 m tower; 50 metre blades

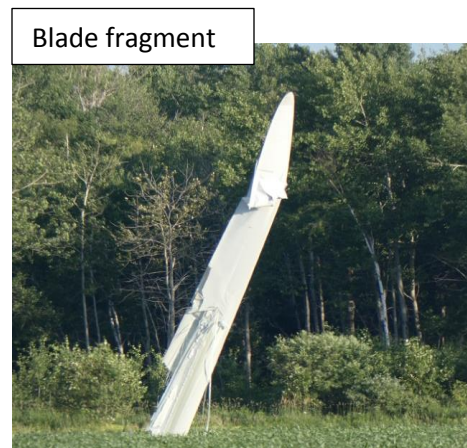
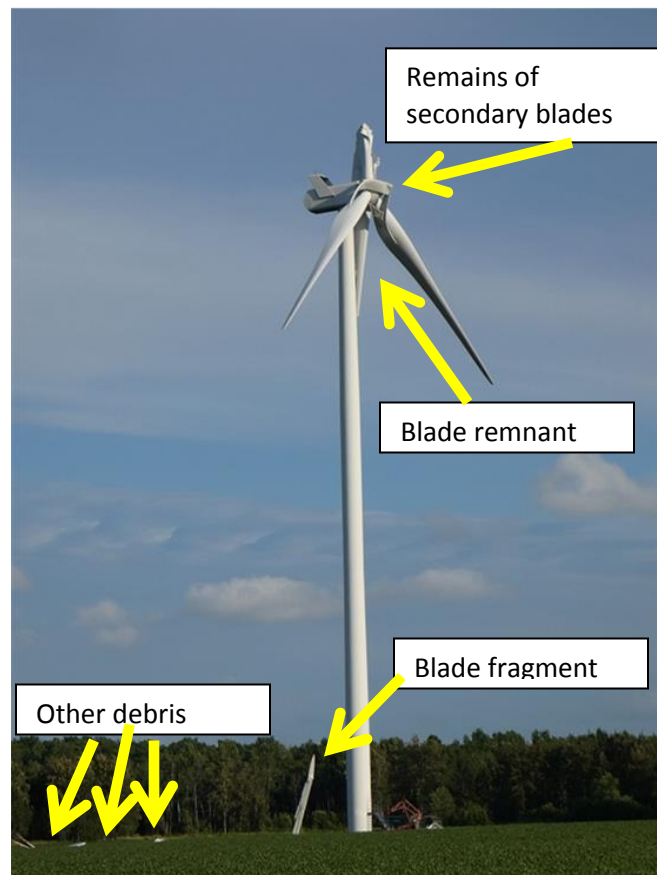
**Modification** – Biome Renewables secondary blades installed on this turbine in early 2021.

**Date of Failure:** June 30, 2021

### Assessment of Failure:

This turbine was retrofitted approximately 3 months prior to the failure with a secondary rotor of three curved blades that fastened to the hub between the existing blades. This experimental device was not part of the original design and was added to increase power output. The failure resulted in the separation of one of the secondary blades and one of the existing blades. Although the exact sequence of the failure is not known, the most likely scenario is that the experimental blade partly separated, impacting the main blade which then failed.

MECP approved the change but there is no public information confirming that the turbine could handle the additional static and dynamic loads imposed by the secondary rotor.



### Learnings:

This turbine was located only 195m from the road, Grey Rd. 8. The road closure that was immediately put in place for public safety confirms that existing setback requirements are insufficient. The failure raises many questions concerning how this project was executed and the engineering safety margins for the original wind turbine design.



### Attachment 3: Raleigh Wind, Chatham-Kent

#### Project Details:

##### Owner:

2018 – Terraform Power

2020 – Brookfield Renewables

**Location:** South of Chatham

**Capacity:** 78 MW

**Commissioned:** January, 2011

**Equipment:** 52 - GE 1.5 MW

**Height** – 80 m tower;

42 metre blades

**Date of Failure:** Jan. 19, 2018



#### Assessment of Failure:

The company reported that their investigations indicated that the failure was caused by a single faulty blade.

This tower at Chatham-Kent buckled at approximately its midpoint and fell toward the wind. It was found with one blade wrapped around the tower base and markings on the tower that were above the fold line.

Based on the evidence of publicly available pictures, it seems that the most likely scenario for this catastrophic failure was that the tower was struck by a blade which weakened it such that it collapsed.



#### Learnings:

If the failure was indeed caused by a blade strike on the tower, this raises questions as to how this occurred. This suggests that the clearance may not have been adequate for the conditions encountered during operation. Alternately the blade may have started to separate and this caused it to get so close to the tower that it made contact with it. There may be other possibilities and variations as well.

Chatham-Kent Ward 2 Councillor Frank Vercooterren told CBC News at the time that he believed that the setback from roads was insufficient to protect public safety.

## Attachment 4: Sumac Ridge, Kawartha Lakes

### Project Details:

**Owner:**

**2016:** wpd

**2021:** Capstone Infrastructure

**Location:** Southwest of Peterborough

**Capacity:** 10.5 MW

**Commissioned:** November, 2017

**Equipment:** 5 - Senvion MM92 2.05 MW

**Height** – 80 m tower;

46 metre blades

**Date of Failure:** April 20, 2019

### Assessment of Failure:

Residents reported hearing a grinding sound followed by a loud explosion at 9 a.m. on the morning of the incident.

It was found that one of the blades of the turbine had shattered. Parts of the blade fell to the ground while other pieces were still dangling off of the remaining sections of the blade. The nearby road was closed to ensure public safety.

Initial speculation was that the failure may have been related to the strong winds associated with the storm that moved through the area on the previous weekend.

The investigation and follow up on this incident was hampered as Senvion had filed for bankruptcy protection on April 9 – just before incident.

### Learnings:

The blade that failed was relatively new having been in operation for only 1.5 years. This highlights the fact that failures can occur at any time during the life of a wind turbine.

If the failure was related to the strong winds, it raises questions concerning the design safety margins.



## Attachment 5: Kingsbridge 1, Ashfield-Colborne-Wawanosh

### Project Details:

Owner: Capital Power

Location: North of Goderich

Capacity: 40 MW

Commissioned: 2006

Equipment: Initially 21 – Vestas V80 with the failed turbine being replaced with a Vestas V 90.

Height – 80 m tower; 45m blades

Date of Failure: April, 2013

### Assessment of Failure:

The fire started at about 1 am and burned for about two hours. Most of the nacelle was completely destroyed. The intensity of the fire also ignited the blades.

The fire department was called to the site but there was not much that they could do given the elevation of the fire and risks posed by burning pieces of the nacelle and the blades that were falling off of the towers.

Blades continued to rotate and could not be stopped due to the fire in control mechanisms.

A representative of the operator addressed ACW Council the following day and indicated that elements of the turbine were found over 200 metres from the tower.

As the fire occurred in early spring, the ground was wet and there were no crops to be set on fire when burning elements fell off of the tower.

### Learnings:

This failure highlights the need for fire identification and suppression systems to be installed within the nacelles of all wind turbines.

Had this fire occurred when dry crops were in the field below the turbine, the fire progression would have been more serious.





## Attachment 6: Huron Wind, Bruce County

### Project Details:

#### Owners:

TC Energy

OMERS

**Location:** North of Kincardine

**Capacity:** 9.0 MW

**Commissioned:** March 2008

**Equipment** – 5 Vestas V80 - 1.8 MW

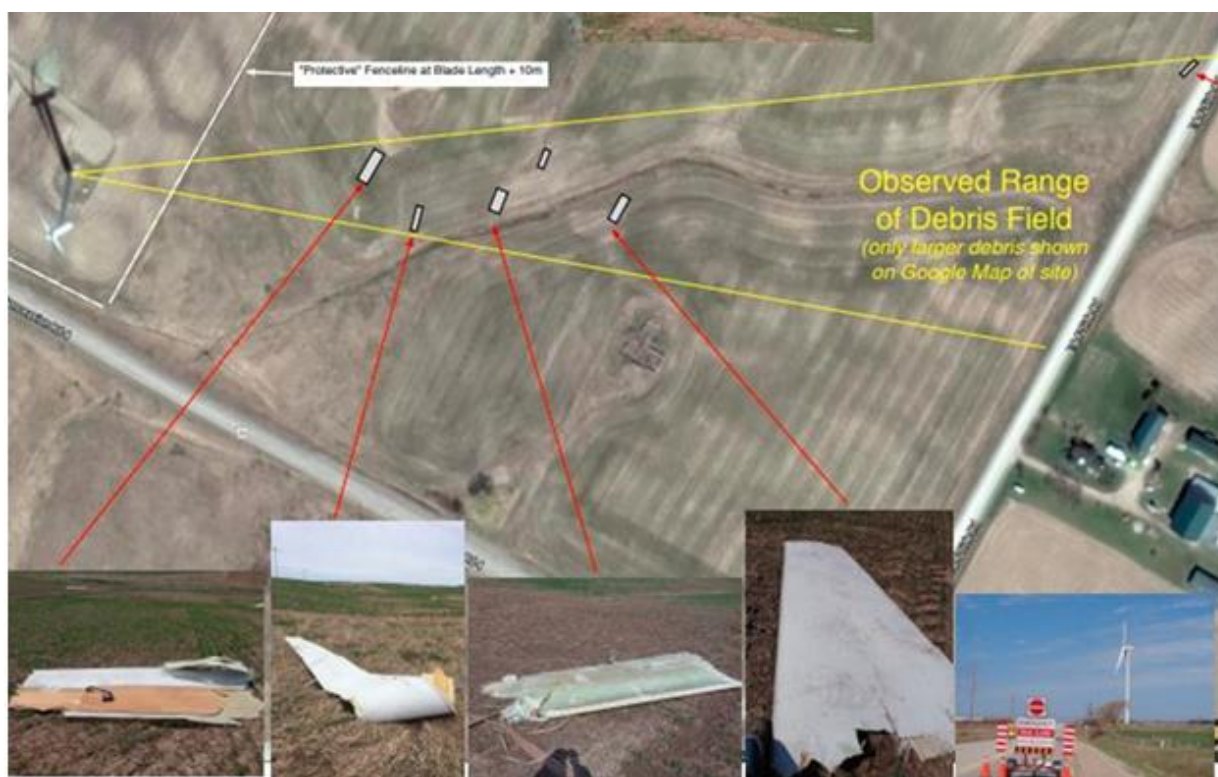
**Height** – 65 m tower; 40 metre blades

**Date of Failure:** May 4, 2018

### Assessment of Failure:

Immediate access to the site allowed full documentation of the debris created by this blade failure.

The map below compares the limits of the protected area of 50 m with the actual locations of debris from the blade failure. Large pieces of debris found 280 m from the tower.



Debris at 150m  
from tower -  
1.3m X 3.6m

Debris at  
170m from  
tower

Debris at 210 m  
from tower  
1.2m X 3.0m

Debris at  
280m from  
tower  
1.2m X 3.0m

Concession 4  
closed to danger

## Attachment 7: Kent Hills, New Brunswick

### Project Details:

**Owner:** Trans Alta Renewables

**Location:** Southwest of Moncton, NB  
Site shared with ATV/snowmobile trails

**Capacity:** 167 MW

### Commissioned in Phases:

Dec 2008 – 25 turbines; Nov 2010 – 24 turbines; Oct 2018 – 5 turbines

**Equipment** – Vestas V90 3 MW

**Height** – 80 m tower; 45 metre blades

**Date of Failure:** October 14, 2021

### Assessment of Failure:

As confirmed by the operator, this tower collapse was linked to a foundation failure (sub-surface crack propagation). The tower itself seems to have all the sections intact and bolted together. Basically, the pictures indicate that the top part of the foundation directly below the tower base was no longer adequately supporting the tower.

A close-up picture of the foundation shows the failed surfaces consists of concrete rubble and rebar. There does not seem to be evidence of the long primary anchor bolts that should fasten to the flange at the base of the tower and then be embedded deep into the concrete foundation.

Earlier pictures taken of wind turbines in this project indicate that numerous anchor bolts had been installed in the concrete bases. This is highly unusual and suggests that they were added when problems with the foundations became evident.

### Potential Learnings:

The foundation problem(s) that caused the failure are very likely not an isolated case. Foundation failures can result from many factors i.e., faulty design, quality control, construction techniques, procedures etc.

This failure raises many questions that relate to how likely it is that the other foundations have the same problems. As well, it raises the question of public safety and the need for safe separation distances.



## Attachment 8: History of Turbine Failures in Ontario

The following table documents the known equipment failures at Ontario wind turbine projects. that resulted in wind turbine blades hitting the ground so that members of the public may have been harmed if present in locations outside any protective exclusion zone. While the industry response to each failure is that the situation is unique and an exception, the table confirms that this is not the case.

#	Date	Project	Type	Equipment	Age at Failure
1	April 2007	Port Burwell	Blade Failure	GE 1.5	11 months
2	January 2008	Prince Wind	Blade Failure	GE 1.5	2.1 years
3	April 2013	Kingsbridge 1	Fire	Vestas V80	7 years
4	August 2015	Goshen	Blade Failure	GE 1.62	6 months
5	April 2017	Bornish	Blade Failure	GE 1.62	3 years
6	January 2018	Raleigh	Tower Collapse	GE 1.62	7 years
7	May 2018	Huron Wind	Blade Failure	Vestas V80	15.4 years
8	April 2019	Sumac Ridge	Blade Failure	Senvion MM92	1.3 years
9	June 2021	Skyway 8	Blade Failure	Vestas V100	6.9 years*
10	August 2021	Bow Lake	Tower Collapse	GE 1.62	6 years

\*100 days after secondary blades installed.

These situations are similar to the operating experience with wind turbines in other jurisdictions. It suggests that the positioning of wind turbines relative to other adjacent activities needs to anticipate the potential for failure either the blades or the tower and other dangers such as ice throws or fires. Analysis of these failures indicates that the current Ontario setback of blade length plus 10 metres is not sufficient to protect the wider public.

The failures also indicate that there needs to be a program of ongoing monitoring of operation of these wind turbines with public reporting of the results of inspections and remedial actions ordered to address faults identified.

December 14, 2021

Mayor and Council  
Municipality of XXXXXXXX  
Address line  
City Province Postal Code  
By e-mail –

Dear Mayor and Council:

**RE: Wind Turbine Failures**

I am writing to share information compiled by the Multi-Municipal Wind Turbine Group (MMWTWG) on some recent catastrophic failures of wind turbines. Because you are a municipality with an operating wind turbine project, we expect this information will be of interest to you.

The MMWTWG was initially created in 2009 by municipalities in Bruce, Grey and Huron Counties to share information on wind turbine projects being proposed or operating in our municipalities. The organization is a joint committee with elected and citizen representatives from the member municipalities. Since its formation, we have been monitoring the operation of wind turbines and advocating on behalf of our residents adversely affected by the wind turbines.

The group has seen the number of catastrophic wind turbine failures increase, and is deeply concerned about the associated implications. While the wind power industry reports that each is an isolated incident, there are now too many incidents for this response to be credible. A total of 10 turbines failures have happened in Ontario since first industrial-scale wind turbines were installed in 2006.

At the same time, there has been no public response from the provincial government that indicates these serious workplace accidents are being investigated. To date, there has been no information shared with MMWTWG member municipalities.

As a result, we have been working with several people that have technical experience with industrial applications of power and rotating equipment. We have developed our own assessment of the failures based on statements from project operators, pictures and other available information. This assessment of the following events points to different causes in these situations:

- **Bow River** – Pictures suggest that tower collapse was linked to a bolt failure of tower sections.
- **Skyway 8** – Rotor failure occurred shortly after the installation of an experimental device.
- **Raleigh Wind** – Published information from the project owner indicates that the tower collapse is related to a single blade failure. Marks on the tower suggest that the blade struck the tower.
- **Huron Wind** – Blade failure with the location of the debris thrown by this failure highlighting the inadequacy of current setbacks from property lines.

Another recent incident in New Brunswick adds to our concerns:

- **Kent Hills, NB** – Project operator linked the collapse of tower to a foundation failure.

Collectively, the assessments of these situations increased our concern that action is required to formally investigate these incidents. We believe they demonstrate that the current setback distances are inadequate to protect the public and the magnitude of these risks will increase as wind turbines have gotten larger.

Faced with continued public inaction by the provincial government, the MMWTWG decided to share the following summary of their findings relative to these failures along with other summary information with other municipalities that host wind turbine projects.

The MMWTWG recommends that the provincial government needs to:

1. **Establish a formal public process for investigations of wind turbine failures** so that the cause can be firmly determined. These would involve third-party independent engineers starting with initial inspection procedures through to the public release of the final report;
2. **Complete comprehensive inspections of existing projects** to identify any project that shows signs of similar weaknesses<sup>1</sup>;
3. **Establish requirements** for on-board predictive maintenance equipment for operating wind turbines to allow early identification of problems and establish protocols for information transfer to the MECP for review and sharing with the host municipality.
4. **Review the emergency response procedures** submitted by the proponents of wind turbine projects as part of the approval process to ensure that the plans are current and responsive to the types of failures being experienced; and
5. **Increase the setbacks** from property lines to a minimum of tower height plus blade length for new towers or repowering of existing sites to at least reflect the impact of a complete tower collapse with additional distances required to protect against ice throw and debris scatter like that seen in the Huron Wind failure.

We suggest that Council review these attached summaries to see if any apply to the wind turbine project(s) in your municipality. It may be possible for the municipality to review the situations with each project that appropriate activities are underway to ensure public safety.

If you agree with the recommendations for action by the provincial government we ask that you communicate your support to David Piccini, Ontario Minister of Environment, Conservation and Parks.

When these projects were approved and built, provincial regulations limited municipal input into the projects and the supervision of their construction. This self-regulation process led to some serious problems for the municipalities. Now that further gaps in this process are becoming evident, the province needs to take responsibility for addressing the mistakes that were made.

Yours truly,

Tom Allwood,  
Chair, Multi-Municipal Wind Turbine Working Group  
Councillor, Municipality of Grey Highlands  
c.c.

Honourable David Piccini, Minister of Environment, Conservation and Parks, [minister.mecp@ontario.ca](mailto:minister.mecp@ontario.ca)  
Honourable Monte McNaughton, Minister of Labour, Training and Skills Development,  
[minister.mltsd@ontario.ca](mailto:minister.mltsd@ontario.ca)  
Local MPP

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<sup>1</sup> This request parallels the October 2017 call from Lisa Thompson, then the PC Environment Critic for safety audits in response to reports of parts being shed by wind turbines. See <https://www.cbc.ca/news/canada/windsor/pcs-demand-ontario-liberals-conduct-safety-audits-on-all-industrial-wind-turbines-1.3282315>



# Battery Energy Supply Systems

## Impact on Host Municipalities

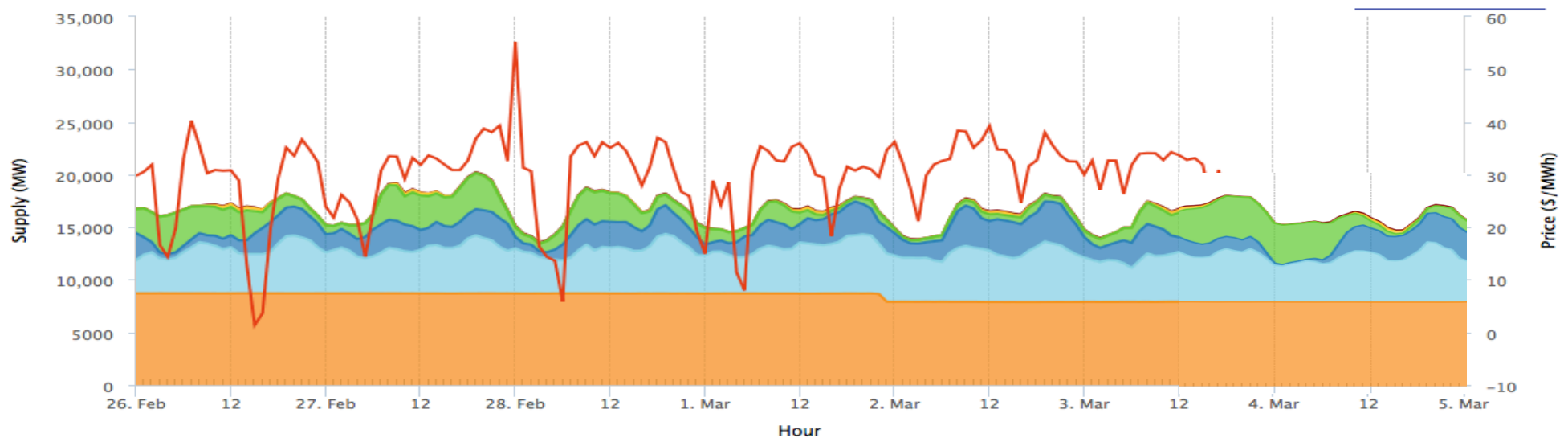
**Presentation to Multi Municipal Wind Turbine Working Group**

**March 9, 2023**

**Bill (William K.G.) Palmer P. Eng.**

# What's the Issue?

Supply does not match Demand – Here's Last Week



Today    2-4 Mar    26 Feb-4 Mar

● Generation By Fuel Type - Hourly  
 Nuclear    Hydro    Gas  
 Wind    Solar    Biofuel

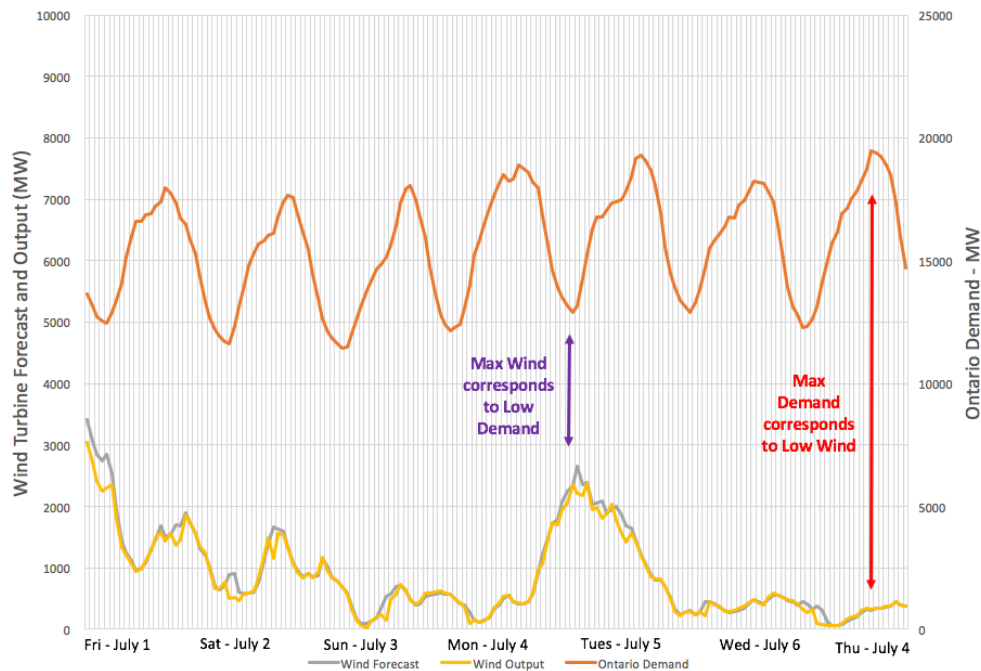
○ Imports Hourly    —  
 Exports Hourly    - - -  
 ○ Net Import/Export - Hourly    —

**Compare With**

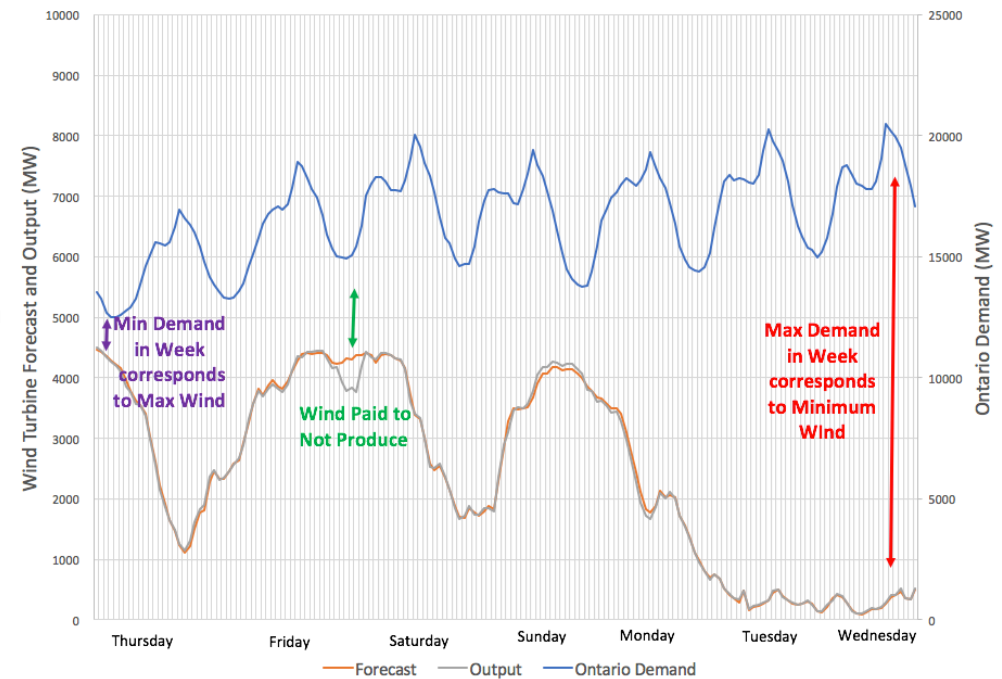
○ None  
 ● HOEP    —

# Two more examples of why adding more wind will make the need for storage more apparent

Ontario Demand and Wind - July 1 to 7, 2022

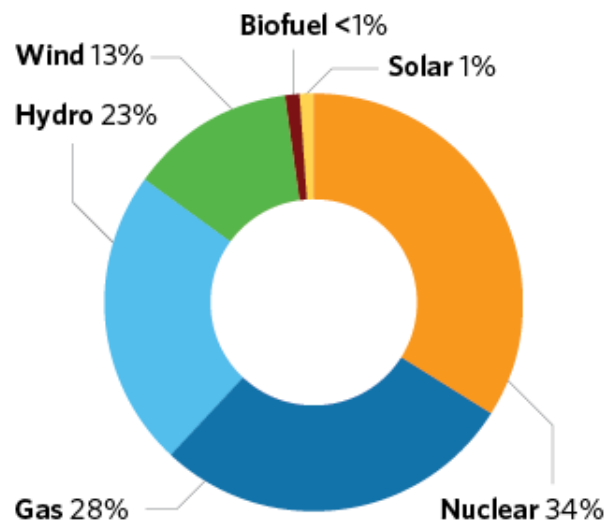


Ontario Demand and Wind - Dec 1-7, 2022

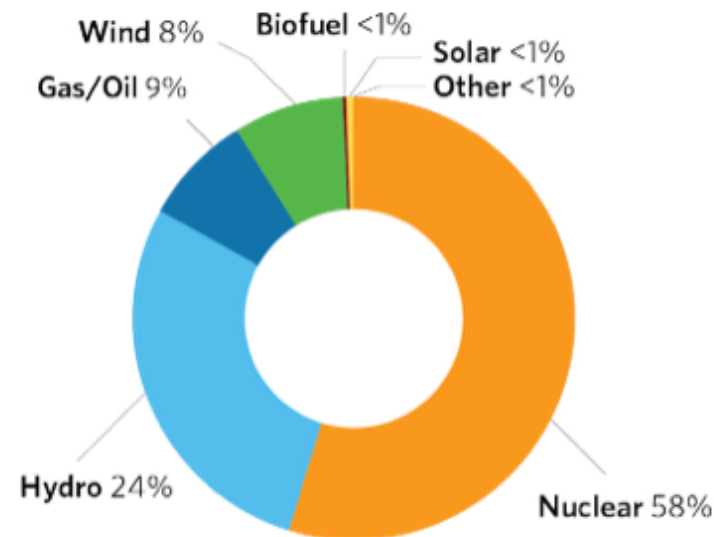




# The Supply – Demand Mismatch is Growing



Nuclear	13,089 MW
Gas/Oil	10,482 MW
Hydro	8,868 MW
Wind	4,883 MW
Biofuel	296 MW
Solar	478 MW



Nuclear	83.0 TWh
Hydro	34.2 TWh
Gas/Oil	12.2 TWh
Wind	12 TWh
Biofuel	0.4 TWh
Solar	0.75 TWh
Other	0.01 TWh

Total 142.6 TWh

Here's today's Ontario Supply  
Wind capacity > 38% of Nuclear

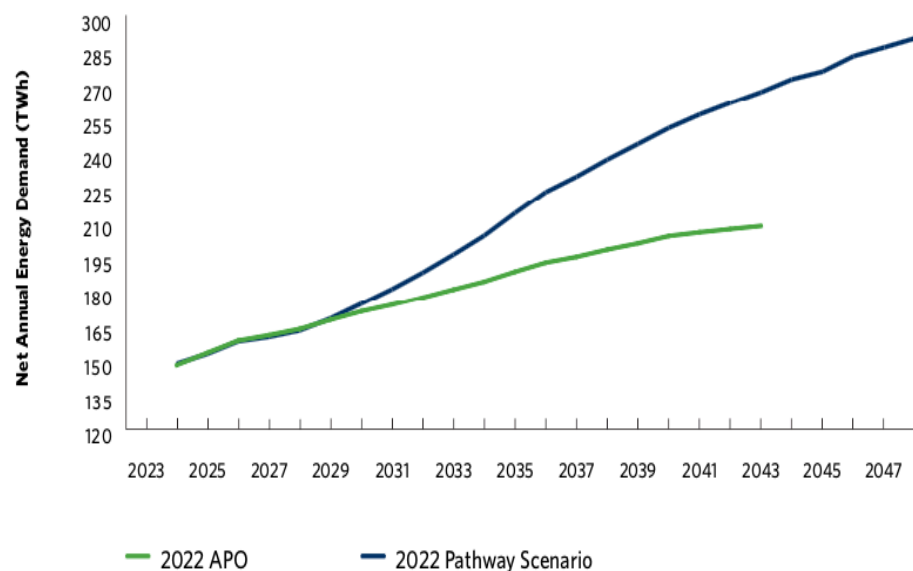
Here's What they Generated in 2021  
Wind Generated < 15% of Nuclear

## As the Proportion of Unreliable Generation Grows – There will be a Need for Batteries to Smooth the Valleys

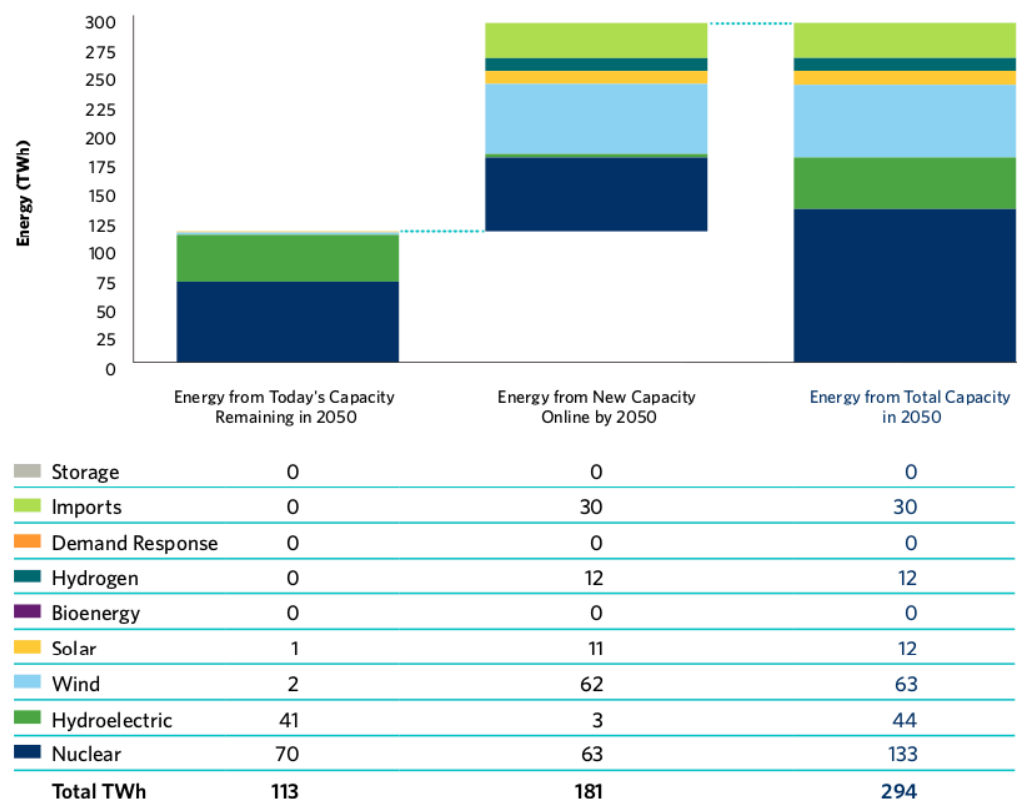
- IESO “Pathways to Decarbonization” foresees the need by 2050 as:
  - 2,500 MW of battery storage – (by 2027- in 4 years!) \ (Perhaps not enough)
  - 6,000 MW of new solar (compared to 488 MW grid connected today)
  - **17,600 MW of new wind** (compared to 4,883 MW grid connected today)
  - 657 MW new hydro
  - 17,800 MW of new nuclear (with only 300 MW committed today)
  - 15,000 MW of hydrogen equivalent (from ... somewhere else ??? )
- BUT – the “Pathways” Document only *mentions* the transportation shift from petroleum to electricity in passing – sourced from who knows where?

# Here's What IESO Expects by 2050

**Figure 7 | Energy Demand**



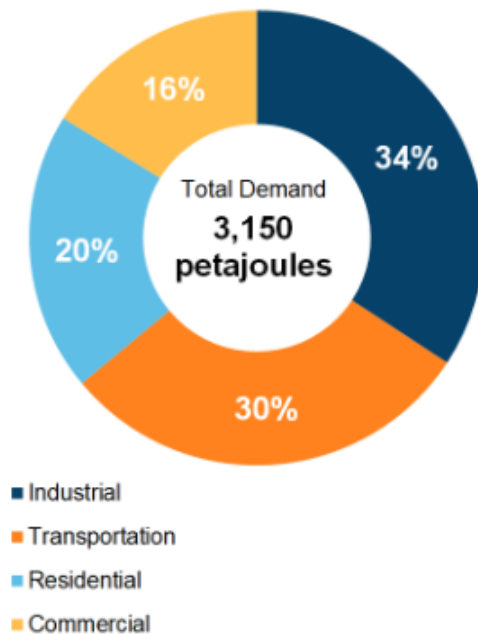
**Figure 13 | Pathway Scenario - Energy in 2050**



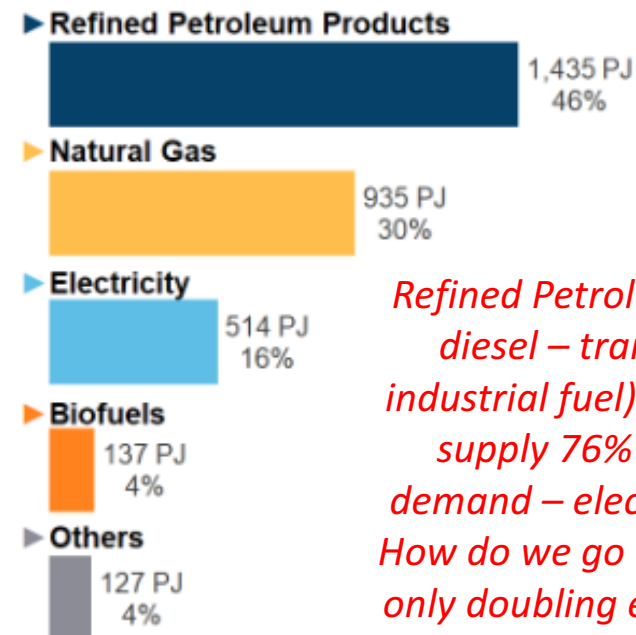
IESO expects demand to double, and the increase in wind turbines to supply 22% of energy by 2050.

# What was Ontario's Energy Demand (in 2019)

**Figure 5: End-Use Demand by Sector (2019)**



**Figure 6: End-Use Demand by Fuel (2019)**



*Refined Petroleum (gasoline & diesel – transportation & industrial fuel) plus natural gas supply 76% of the energy demand – electricity only 16%. How do we go off oil and gas by only doubling electrical supply?*

# Battery Options

- Lithium Ion is the present champion (some 90% of industrial/electrical supply storage batteries)
  - has mostly replaced lead – acid as storage battery of choice except for motor vehicle starting duty
- Li-ion generally good for fast response, up to 4 hour discharge time. Barely adequate for shifting night supply to daytime usage of energy, a poor choice for storage needing days or weeks, vs, hours of storage, due to Li-ion self-discharge over time. Expensive ~ 135 to 250 US\$ per MWh, lithium scarce, fire hazard.
- Alternatives under development
  - Flow Batteries (charge stored in liquid electrolyte tanks, outside battery cell) e.g.
    - “Primus” zinc-bromide battery, said to be non-toxic, long term storage, good for 100 hour discharge
    - “ESS” iron-flow battery, said to be non-toxic, reduced need for fire protection than Li-ion.
  - Metal/Air Batteries
    - “Form Energy” iron-air batteries, cheaper than Li-Ion, said good for 100 hour discharge
    - “Zinc8” zinc-air battery, a Canadian start-up, designing for 8 hour + discharge cycle, cheaper than Li-Ion
    - “Aluminum-Air” battery, still in development, perhaps for long range motor vehicles. Replaceable not rechargeable.
  - Gravity storage
    - Pumped hydro (as at Meaford)
    - Energy-vault (crane storing blocks in tower, recover energy lowering blocks) aka “Gravity Storage”
  - Thermal storage, “thermo photo voltaic” cells sensitive to heat energy stored in carbon blocks for days
  - “HydroStor” compressed air storage - pilot plant now at Goderich, ON
  - Hydrogen extraction from water by electricity (electrolysis) – Later generation of electricity from fuel cells or as a heating fuel – BUT, mind the expense, as each step costs \$\$\$.

# Li-Ion Grid Backup (BESS) Risks (1<sup>st</sup> example)

## **Lithium ion battery energy storage systems (BESS) hazards (published Feb, 2023)**

- Over 30 large-scale (1 MW +) Li-Ion BESS experienced failures resulting in destructive fires in the past 4 years
- contain flammable electrolytes, can create unique hazards when the battery cell enters thermal runaway.
- paper focusses primarily on small containerized BESS are often installed in standard shipping containers ranging from 8 feet to 53 feet in length, with a width and height of approximately 8 feet each.
- typically equipped with smoke detection, fire alarm panel, and some form of fire control and suppression system
- initiating event frequently a short circuit which may be a result of overcharging, overheating, or mechanical abuse. During thermal runaway, large amounts of flammable and potentially toxic battery gas will be generated.
- Journal of Loss Prevention in the Process Industries, Vol 81, Feb. 2023, 104932
- <https://doi.org/10.1016/j.jlp.2022.104932>

# Li-Ion Grid Backup (BESS) Risks (2<sup>nd</sup> example)

## Battery Hazards for Large Energy Storage Systems (Published 2022)

- Li-ion batteries have become popular in new grid-level installations due to rapidly decreasing prices and wide availability
- variety chemistries, from lithium iron phosphate (LFP) cathode to those with a nickel manganese cobalt oxide (NMC) cathode and with graphite, silicon composite, or lithium titanate (LTO) anodes. (Different Chemical Risks – Must Know the Specifics)
- The reactive and hazardous nature of Li-ion batteries under off-nominal conditions can lead to safety incidents and may cause extensive damage to the BESS. 42 reported failure incidents from 2011 to 2021.
- Li-ion batteries are prone to overheating, swelling, electrolyte leakage venting, fires, smoke, and explosions.
- gases produced as a result of a fire, smoke, and/or thermal runaway can accumulate to a combustible level and cause explosion.
- High and low temperatures lead to different unsafe conditions. High temperatures lead to ... violent venting, fire, and thermal runaway. Low temperatures increase the viscosity of the electrolyte ... leads to increased internal cell temperatures ... thermal runaway and fire. *Heaters installed, to heat batteries before charging, but if heaters fail “off” – or “on” can lead to same destructive result.*
- combustible gases such as hydrogen, carbon monoxide, methane, ethylene, and propylene can be produced in concentrations above the TLV.
- [doi: 10.1021/acsenergylett.2c01400](https://doi.org/10.1021/acsenergylett.2c01400)

# Li-Ion Grid Backup (BESS) Risks (3<sup>rd</sup> example)

## **What are the fire safety risks of lithium-ion batteries?** (Published Aug 2022)

- Dr Amer Magrabi, principal fire engineer at Lote Consulting, gave a talk on battery fire safety at the [Australasian Fire and Emergency Services Council \(AFAC\) conference](#) in Adelaide.
- “It’s an emerging risk, we’re still coming to grips with it.”
- “Once alight, lithium-ion battery fires are very hard to extinguish. Common fire suppressants don’t work and the fire can burn very fiercely. In some circumstances, the battery can explode.”
- “If you have a problem with one cell, it’s going to start spreading.” This unstoppable fire is called “thermal runaway.”
- Water may assist with absorbing heat from some small fires, but it reacts dramatically with lithium – making it a bad decision to go directly on fires.
- Lithium-ion fires don’t burn cleanly: batteries can vent toxic gases. It’s not always clear what these gases will be, as battery chemistry is a closely guarded commercial secret.”
- Some fire services have a code of not intervening in lithium-ion battery fires: they’re unlikely to suppress them because the risk to firefighters is too high.
- Instead, they wait for the reaction to finish, and protect the surrounding environment.
- 26 August 2022 / COSMOS Magazine



## Li-Ion Grid Backup (BESS) Risks (4<sup>th</sup> example)

- **A comprehensive investigation on the thermal and toxic hazards of large format lithium-ion batteries with LiFePO<sub>4</sub> cathode** (Published 2020)
- Toxic gases released from lithium-ion battery fires pose a **very large threat** to human health.
- Li-Ion Batteries with higher state of charge (SOC) are found to have greater fire risks in terms of their burning behavior, normalized heat release rate, and fire radiation, as well as the concentration of toxic gases.
- The major toxic gases detected from the online analysis are [CO](#), [HF](#), SO<sub>2</sub>, [NO<sub>2</sub>](#), [NO](#) and [HCl](#).
- Results show that the effects of irritant gases are much more significant than those of asphyxiant gases. [HF](#) and SO<sub>2</sub> have much greater toxicity than the other fire gases. The maximum [FEC value](#) (*fractional effective concentration – a measure of toxicity impact*) is approaching the critical threshold in such fire scenarios.
- <https://doi.org/10.1016/j.jhazmat.2019.120916>.

## Li-Ion Grid Backup (BESS) Risks (5<sup>th</sup> example)

- **Toxic fluoride gas emissions from lithium-ion battery fires** (published 2017)
  - Lithium-ion battery fires generate intense heat and considerable amounts of gas and smoke.
  - the emission of toxic gases can be a larger threat than the heat.
  - large amounts of hydrogen fluoride (HF) may be generated - HF can pose a serious toxic threat
  - The amounts of HF released from a large burning Li-ion battery packs could be 200 kg for a 1 MWh battery. The immediate dangerous to life or health (IDLH) level for HF is 0.025 g/m<sup>3</sup> (30 ppm) and the lethal 10 minutes HF toxicity value is 0.0139 g/m<sup>3</sup> (170 ppm). The release of hydrogen fluoride from a Li-ion battery fire can therefore be a severe risk and an even greater risk in confined or semi-confined spaces.
  - 15–22 mg/Wh of another potentially toxic gas, phosphoryl fluoride (POF<sub>3</sub>), was measured in some of the fire tests
  - Using water mist resulted in a temporarily **increased** production rate of HF but the application of water mist had no significant effect on the total amount of released HF.
  - <https://doi.org/10.1038/s41598-017-09784-z>

# Now – You Have the “Big Picture”

## - so what can you do? (Other than reject BESS?)

- **6 practical steps to improve community safety near lithium-ion energy storage systems** (Published Sept. 2021)
  - By Steve Kerber *Vice President of Research at UL Firefighter Safety Research Institute.*
  - most first responders have limited experience with Li-Ion battery fires - behave differently than typical fires
    - Lithium-ion batteries have flammable chemical electrolytes and are susceptible to thermal runaway
    - lithium-ion batteries can spontaneously reignite hours or even days later after a fire event
    - safety requirements for ESS sites are still evolving as more information about the technology becomes available
  - what can be done right now to improve safety?
    - Lithium-ion battery ESS should incorporate gas monitoring that can be accessed remotely.
    - Lithium-ion battery ESS should incorporate robust communications systems to help ensure remote access to the battery management system, sensors and fire alarm control panel remains uninterrupted.
    - Owners and operators of ESS should develop an emergency operations plan in conjunction with local fire service personnel and the authority having jurisdiction and hold a comprehensive understanding of the hazards associated with lithium-ion battery technology.
    - Signage that identifies the contents of an ESS should be required on all ESS installations to alert first responders to the potential hazards associated with the installation.
    - Lithium-ion battery ESS should incorporate adequate explosion prevention protection as required in National Fire Protection Association (NFPA) 855 or International Fire Code Chapter 12, where applicable, in coordination with the emergency operations plan.
    - New lithium-ion battery ESS should be built in accordance with NFPA 855, the most current standards available for safety, and we are calling on local governments to mandate adoption within their cities and municipalities.
  - <https://www.utilitydive.com/news/6-practical-steps-to-improve-community-safety-near-lithium-ion-energy-storage/585938/>

# The “Other” Current Hype - Hydrogen

- Invest 20 minutes to watch, “The Trouble With Hydrogen” It’s easy watching, and very informative.
- <https://www.youtube.com/watch?v=Zklo4Z1SqkE>
- Briefly:
  - Most (>90%) hydrogen produced today is from fossil fuels. To produce “green hydrogen” from renewable electricity (solar or wind) will be “cost prohibitive” (3 or 4 times greater)
  - Hydrogen for vehicle fuel cells is stored under very high pressure of about 10,000 PSI
    - Needs heavy cylinders, with carbon fibre reinforced barriers
    - Hydrogen under pressure tends to react with metal, forming brittle hydrides, degrading the storage vessel.
  - Fuel cells to make electricity from hydrogen for vehicle propulsion need platinum or irridium – neither are cheap nor plentiful.
- Not mentioned in video:
  - Adding hydrogen above about 7% in concentration to natural gas supply network requires modifying ALL combustion equipment (furnaces, etc.) connected to the gas line for safety reasons, so that’s not an easy option.
  - Batteries can typically reuse between 80–90% of the chemical energy stored, but fuel cells generally transform only 40% to 60% of their energy to produce electrical power. (There are more losses, hence less efficiency.)
  - Overall, “Green Hydrogen” supply/usage efficiency is about 30%. 70% of the energy is wasted. That’s economically undesirable.
  - However, there are Big government subsidies for Green Hydrogen (big-hype) Too Good to be True ... usually is.
- An internet search for “Green Hydrogen Hype” returns over 6,000 results.

**From:** [Ruby Mekker](#)  
**To:** [Julie Hamilton](#)  
**Subject:** Re: Call for Agenda Items - MMWTWG Meeting - March 9, 2023 7pm  
**Date:** March 2, 2023 8:18:43 PM

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Hi Julie,

Please provide this to the Group members in preparation for my presentation at the March 9 meeting. Given that the compilation of the Group members have changed since the last meeting, please ensure that all members have the materials which were included with my presentation on November 3, 2022.

When you have time can you please reply to my March 1, 2023 email below.

Thanks.

Ruby

### ***My presentation to the MMWTWG November 3, 2022***

I had asked to present at the November 3, 2022 MMWTWG meeting. As I stated in my request and as it appeared on the Agenda and subsequently in the Minutes, the purpose of my presentation was:

*“To have MMWTWG seek clarification/confirmation from the Government of Ontario whether industrial wind turbines are or should be considered to be a “health hazard” as defined by the Health Protection and Promotion Act of Ontario.”*

The request could have been more precise as the focus of my presentation is, in particular, the *audible wind turbine noise* at the levels permitted by the Government of Ontario, and how it should be regarded as a “health hazard” in accordance with the definition that is provided in the Health Protection and Promotion Act of Ontario (HPPA).

I provided to the Group documents showing my inquiries trying to understand why the Duty that is imposed by Section 11 of the HPPA has not been fulfilled insofar as there are no statements available confirming that a determination has been made that a health hazard exists or does not exist as is required by the Duty.

I also provided to the Group documents published by the Government of Ontario and the Government of Canada which support the conclusion that the noise exposures are known to have an adverse effect on the health of some people. Thus we conclude that the audible wind turbine noise at the levels permitted by the Government of Ontario is a “health hazard”.

“Health hazard” is defined in the Health Protection and Promotion Act of Ontario as:

- (a) a condition of a premises,*
- (b) a substance, thing, plant or animal other than man, or*
- (c) a solid, liquid, gas or combination of any of them,*

*that has or that is likely to have an adverse effect on the health of any person.*

Section 11 of the Health Protection and Promotion Act of Ontario imposes a Duty on the local Medical Officer of Health to investigate complaints relating to occupational or environmental health hazards, “to determine whether the health hazard exists or does not exist”.

*Complaint re health hazard related to occupational or environmental health*

*11 (1) Where a complaint is made to a board of health or a medical officer of health that a health hazard related to occupational or environmental health exists in the health unit served by the board of health or the medical officer of health, the medical officer of health shall notify the ministry of the Government of Ontario that has primary responsibility in the matter and, in consultation with the ministry, the medical officer of health shall investigate the complaint to determine whether the health hazard exists or does not exist. R.S.O. 1990, c. H.7, s. 11 (1).*

***The evidence supports the conclusion that a “health hazard” exists***

The *Transitive Property* in mathematics states that if  $A=B$  and  $B=C$ , then  $A=C$ .

I provided evidence to the Group that was produced by the Ministry of the Environment, Government of Ontario that states that the noise levels permitted by the Government are expected to result in a significant portion of the exposed people being “highly annoyed”.

I also provided a reference from Health Canada that states that community noise annoyance “is considered to be an adverse health effect by the World Health Organization”.

I am also providing to the Group another reference from Health Canada in which Health Canada advised that introducing a noise source into a community which is expected to cause people to be highly annoyed, is regarded as the causation of adverse health effects.

*Health Canada’s approach to noise assessment is to consider a variety of internationally recognized standards for acoustics (i.e. United States Environmental Protection Agency (U.S. EPA 1974), CAN/CSA ISO standards). Health Canada considers the following noise-induced endpoints as health effects: noise-induced hearing loss, sleep disturbance, interference with speech comprehension, complaints, and change in percent highly annoyed (%HA).*

[https://publications.gc.ca/collections/collection\\_2015/sc-hc/H128-1-10-599-eng.pdf](https://publications.gc.ca/collections/collection_2015/sc-hc/H128-1-10-599-eng.pdf)

Therefore, since annoyance is expected, and being that annoyance is an “adverse health effect”, it may be concluded that the permitted noise levels are expected to have “an adverse effect on the health of some people”, thus it should be regarded as a “health hazard”.

My request to the MMWTWG was somewhat misunderstood, and discussion at the Meeting digressed into debate where some Group members attempted to trivialize the term “annoyance” and what it represents, and argued that it was not an “adverse health effect”. Again I encouraged the Group members to read and understand the Health Canada document and accept the authority of Health Canada and the World Health Organization who consider annoyance from community noise exposure to be an “adverse health effect”.

Subsequent to the Meeting there was email exchange in which some group members contended that the Health Protection and Promotion Act of Ontario does not apply to the noise from wind turbines, and that noise from wind turbines could not meet the (a), (b), or (c) types of exposures contained in the “health hazard” definition.

In response to these contentions I observe that several Health Units in the Province have, in response to the complaints about wind turbine noise they have received, acknowledged the Duty that is imposed by Section 11 of the HPPA and have undertaken some steps toward fulfilling this Duty. Unfortunately, it appears they have not completed the Duty by issuing statements confirming that a health hazard exists, NOR have they have issued statements stating that a health hazard DOES NOT EXIST.

Furthermore, there are no statements that I am aware of from any government authority declaring that the Section 11 Duty of the HPPA does not apply to complaints about wind turbine noise.

I replied through email on November 17, 2022 and expressed my deep concern about the seriousness and risk of MMWTWG Group members contending that a Duty imposed by law does not apply and I urge these group members to retract those statements.

In response to the allegation that wind turbine noise does not classify as one of the (a), (b), or (c) types of exposures that may cause a “health hazard”, I point out that noise is a thing [clause (b)], and that the noise emissions that are permitted to blanket a property are a “condition of a premises” [clause (a)].

***Proposed action plan for the MMWTWG***

Enclosed is a draft letter that I am recommending the MMWTWG send to the Minister of Health of Ontario, asking for a reply.

Respectfully

Ruby Mekker

**DRAFT LETTER**

The Honourable Sylvia Jones  
Minister of Health  
777 Bay Street, 5th Floor  
Toronto, ON M7A 2J3

Subject: Wind Turbine Noise levels permitted by the Ontario Government & “Health Hazards” as defined by the Health Protection and Promotion Act of Ontario

Dear Honourable Minister,

We are writing to inquire about whether the Government of Ontario considers that wind turbine noise levels that are permitted to affect neighboring residents should be regarded as a “health hazard” as it is defined by the Health Protection and Promotion Act of Ontario.

We have enclosed documents published by the Governments of Ontario and Canada that indicate that the noise levels permitted will cause adverse health effects for some of the neighboring residents. Therefore we believe this constitutes a “health hazard”.

We are aware that some Medical Officers of Health in Health Units across the Province have acknowledged that the Duty that is imposed upon them by Section 11 of the Health Protection and Promotion Act of Ontario mandates their response to complaints about wind turbine noise, and that they have undertaken some steps towards fulfilling that duty.

Unfortunately we are not aware of any statements confirming that the wind turbine noise at the levels permitted by the Government constitutes a “health hazard”, nor statements that confirm that the exposures are not a “health hazard”.

We are troubled about the apparent failure to carry out this important public health duty to determine when a “health hazard” exists or to provide assurance that a “health hazard” does not exist.

Nonetheless we are ultimately seeking to understand whether the Government of Ontario, in light of the evidence that is available, acknowledges that the wind turbine noise levels that are permitted in the province constitute a “health hazard” as it is defined by the Health Protection and Promotion Act of Ontario.

Conversely if the Government of Ontario will not state that these noise levels should be regarded as a “health hazard” then we ask the Government of Ontario and/or its relevant agencies to state that with respect to the noise levels that are permitted, “a health hazard does not exist”.

Respectfully,

The Multi Municipal Wind Turbine Working Group of Ontario

On Wed, Mar 1, 2023 at 2:41 PM Ruby Mekker <[rjmekker@gmail.com](mailto:rjmekker@gmail.com)> wrote:

Hi Julie,

Thanks for the reminder. I have been away with our five young grandchildren and it makes it very easy to lose track of time.

Please explain what "Teams" is. I will not be able to attend in person. Also, it would be helpful if you could send me a copy of the group's Terms of Reference so that I can present most effectively.

Ruby Mekker  
Finch, ON

On Tue, Feb 28, 2023 at 9:07 AM Julie Hamilton <[JHamilton@arran-elderslie.ca](mailto:JHamilton@arran-elderslie.ca)> wrote:



Good Morning,

The next meeting of the MMWTWG will be held on Thursday, March 9, 2023 at 7pm virtually via Teams.

Please provide any agenda items to me by Friday, March 3<sup>rd</sup> for inclusion in the agenda.

\*\*There are members of the public BCC on this email at their request. If you no longer wish to receive these emails, please reply to this email.

Please note that my email has changed to [jhamilton@arran-elderslie.ca](mailto:jhamilton@arran-elderslie.ca)

Please update your records to reflect this change.

Warm Regards,

*Julie Hamilton*

**Deputy Clerk**

Municipality of Arran-Elderslie

1925 Bruce Road, PO Box 70

Chesley, ON N0G 1L0

Office 519-363-3039 ext 105

Cell 226-668-8323

**From:** [Ruby Mekker](#)  
**To:** [Julie Hamilton](#)  
**Subject:** MMWTWG Agenda Item  
**Date:** November 3, 2022 8:55:10 PM  
**Attachments:** [EOHU Board of Health 18 August 2022.pdf](#)  
[Sept 15 to Nov 3 2022 Robert Lerch correspondence.pdf](#)  
[Aug 19 to Oct 22 2022 Jane Wilson WCO President correspondence.pdf](#)

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MMWTWG, **Agenda Item from Ruby Mekker**

**To have MMWTWG seek clarification/confirmation from the Government of Ontario about whether industrial wind turbines are (or should be considered) a “health hazard” as defined by the Health Protection and Promotion Act of Ontario, something "that has or that is likely to have an adverse effect on the health of any person."**

Three examples of Ruby Mekker's efforts to clarify whether industrial wind turbines are recognized as a “health hazard”:

1. Ruby Mekker and another local resident presented to the Eastern Ontario Health Unit Board of Health on August 18, 2022. In the presentation, evidence was provided that supports the conclusion that the noise from industrial wind turbines should be considered a health hazard. (a PDF copy of the Powerpoint is attached).

After the meeting the presentation was recorded, and made available at this youtube link:

[https://youtu.be/E\\_a5xMH9RF0](https://youtu.be/E_a5xMH9RF0)

2. Robert Lerch, Director, Health Protection and Surveillance Policy and Programs Branch, Ministry of Health, was contacted and asked whether the Government of Ontario considers that industrial wind turbine projects are "health hazards" or not, or has the Government neglected to see that this determination has been made? The series of emails is attached, and is ongoing.

3. Ruby Mekker contacted Jane Wilson, President of Wind Concerns Ontario and asked her to work collaboratively to have industrial wind turbine projects recognized as health hazards. See attached the series of emails.

**Presentation  
to  
Eastern Ontario Health Unit, Board of Health  
Eastern Ontario Health Unit**

**Chairperson:** Syd Gardiner

**Directors:** Paula Assaly, Gary Barton, Gerry Boyce, Gilles Fournier, Kirsten Gardner, Glen Grant, Stéphane Sarrazin, Carma Williams

**Chief Executive Officer and Medical Officer of Health:** Dr. Paul Roumeliotis

**August 18, 2022**

Ruby Mekker

Finch, ON

Email: [rjmekker@gmail.com](mailto:rjmekker@gmail.com)

Cell phone: 613 360-0000

Tammy McRae

Crysler, ON

Email: [tammcrae@gmail.com](mailto:tammcrae@gmail.com)

Cell phone: 613 662-6684

On behalf of the people effected by industrial wind turbines, we thank you for your attention.

We ask that you review this information and the information provided in your packages.

This presentation is public and can be shared.

## HEALTH PROTECTION AND PROMOTION ACT OF ONTARIO

### **Purpose**

2 The purpose of this Act is to provide for the organization and delivery of public health programs and services, the prevention of the spread of disease and the promotion and protection of the health of the people of Ontario. R.S.O. 1990, c. H.7, s. 2.

### **“Health Hazard” is defined in the HPPA as:**

- (a) A condition of a premises,
  - (b) substance, thing, plant or animal other than man, or
  - (c) A solid, liquid, gas or combination of any of them,
- that has or that is likely to have an adverse effect on the health of any person

### **“Wind Turbines Can Harm Humans”**

“This case has successfully shown that the debate should not be simplified to one about whether wind turbines can cause harm to humans. The evidence presented to the Tribunal demonstrates that they can, if facilities are placed too close to residents. The debate has now evolved to one of degree.”

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p 20, 2011

### **Environmental Review Tribunal Decision, 2011**

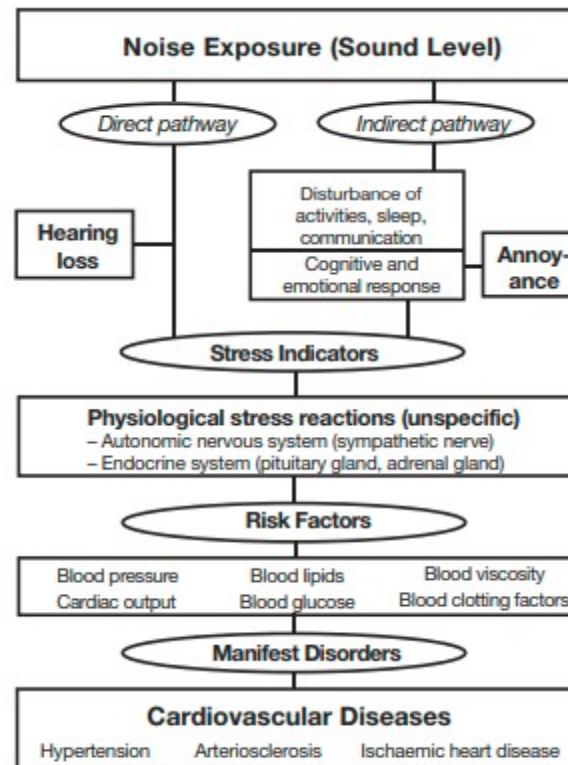
“... The Tribunal has found above that “serious harm to human health” includes both direct impacts (e.g., a passer-by being injured by a falling turbine blade or a person losing hearing) or indirect impacts (e.g., a person being exposed to noise and then exhibiting stress and developing other related symptoms). This approach is consistent with both the WHO definition of health and Canadian jurisprudence on the topic.”

Case Nos.: 10-121/10-122 Erickson v. Director, Ministry of the Environment Environmental Review Tribunal, Decision, p190, 2011

**Annoyance is an adverse health effect that occurs via the “indirect causal pathway”:**

2009	World Health Organization, Night Noise Guidelines	Noise can harm humans via the direct and indirect pathways
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## 62 EFFECTS ON HEALTH



**Fig. 4.3**  
**Noise effects**  
**reaction scheme**

Source:  
Babisch, 2002.

## Annoyance

Health Canada describes noise annoyance as an adverse health effect.


5.4 INDICATORS OF POTENTIAL HUMAN HEALTH EFFECTS Health Canada holds the view that certain community reactions to project-related noise represent potential indicators of adverse health; that is, if the noise is experienced over a long period of time, it could potentially increase one's risk of developing health effects. In the context of noise exposure, two of the most common community reactions are **complaints and annoyance**.

[Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE](#)




## Annoyance is acknowledged to be an adverse health effect.

“The most common effect of community noise is annoyance, which is considered an adverse health effect by the World Health Organization”

 Health Canada Santé Canada

**It's Your Health**



### COMMUNITY NOISE ANNOYANCE

#### The Issue

There is concern about excessive community noise because people can find it highly annoying. Over a period of time, such high annoyance can affect one's quality of life.

#### Background

As communities become more crowded, environmental noise levels increase. Health Canada commissioned two recent cross-country telephone surveys to find out how annoyed people were by different types of community noise. Randomly selected Canadians, who were at least 15 years old, answered the survey questions. Eight percent indicated that they were highly annoyed by noise outside their homes. Two main types of noise were clearly identified as being highly annoying:

- Road traffic noise
- Noises from other people and animals outside or in another dwelling

Other reports indicate that the following noise sources may also make Canadians highly annoyed:

- Aircraft and trains
- Construction equipment
- Power landscaping equipment

Scientists measure the levels of different sounds with a unit called the A-weighted decibel (dBA). The A-weighting reflects how people respond to sound. In a typical community, noise starts to make people highly annoyed when the sound level outside their home is around 55dBA. In comparison, the sound level on the shoulder of a major highway is between 80 and 90dBA.

#### Health Risks of Community Noise


The most common effect of community noise is annoyance, which is considered an adverse health effect by the World Health Organization. But noise may also affect your ability to have an ordinary conversation, enjoy some leisurely activities, get a good night's sleep, or do work that needs thought and concentration.

#### Minimizing Your Risk

Everyone has a responsibility to minimize noise in the community. Most municipalities have noise by-laws. Check with your municipality to find out what might apply in your neighborhood.

- Check your own noise sources. Your TV, radio or stereo could be a source of annoyance for your neighbor if you have to shout to be understood above your usual volume setting.
- Mowing your lawn when most people are normally trying to sleep could be a source of annoyance for your neighbor.
- When noise interferes with sleep, wearing ear plugs can help reduce noise levels, provided they do not cause discomfort.

**Canada**

 Health Canada Santé Canada

**It's Your Health**

### Government of Canada's Role

Health Canada conducts research to assess the potential health risks of community noise. This research is used to assess the need for regulations under the Radiation Emitting Devices Act for noisy outdoor machinery and equipment. It is also used to help advise Federal, Provincial, Territorial and Municipal authorities on community noise. As well, the research is used to inform the public and, where needed, recommend protective measures.

Under the Canadian Environmental Assessment Act, Health Canada provides advice to other Federal departments, public review panels and mediators on the potential health impacts of noise from a number of different projects. These have included expansions of airport runways, highways and railways as well as the building of wind turbines. To help with this work, the Department is developing Health Canada's Noise Impact Assessment Guidance for Environmental Assessments. In addition, Health Canada contributes to the development of U.S., Canadian and international standards on the description, measurement and assessment of environmental noise.

### Need More Info?

For more information on noise issues, please go to:

Aircraft noise  
[www.hc-sc.gc.ca/fyh-vsv/viron/noise-bruit\\_e.html](http://www.hc-sc.gc.ca/fyh-vsv/viron/noise-bruit_e.html)

Hearing Loss and Leisure noise  
[www.hc-sc.gc.ca/fyh-vsv/viron/leisure-loisirs\\_e.html](http://www.hc-sc.gc.ca/fyh-vsv/viron/leisure-loisirs_e.html)

D.S. Michaud et al. (2005) Noise Annoyance in Canada. Noise & Health at:  
[www.ingentaconnect.com/search?title=Noise+annoyance+in+Canada&database=1](http://www.ingentaconnect.com/search?title=Noise+annoyance+in+Canada&database=1)

The Canadian Centre for Occupational Health and Safety noise fact sheet at:  
[www.ccohs.ca/oshanswers/phys\\_agents/noise\\_basics.html](http://www.ccohs.ca/oshanswers/phys_agents/noise_basics.html)

The World Health Organization, Occupational and Community Noise fact sheet at:  
[www.who.int/mediacentre/factsheets/fs258/en/](http://www.who.int/mediacentre/factsheets/fs258/en/)

If you are noticing problems with your hearing please contact your family doctor or audiologist.

For more information on audiologists go to the Canadian Association of Speech-Language Pathologists and Audiologists at:  
[www.caspa.ca/](http://www.caspa.ca/)

For information on preventing noise induced hearing loss go to the Wise Ears Web site at:  
[www.nidcd.nih.gov/health/wise/index.asp](http://www.nidcd.nih.gov/health/wise/index.asp)

For additional articles on health and safety issues go to the It's Your Health Web site at:  
[www.healthcanada.ca/fyh](http://www.healthcanada.ca/fyh)  
 You can also call toll free at 1-866-225-0709 or TTY at 1-800-267-1245\*

**Canada**

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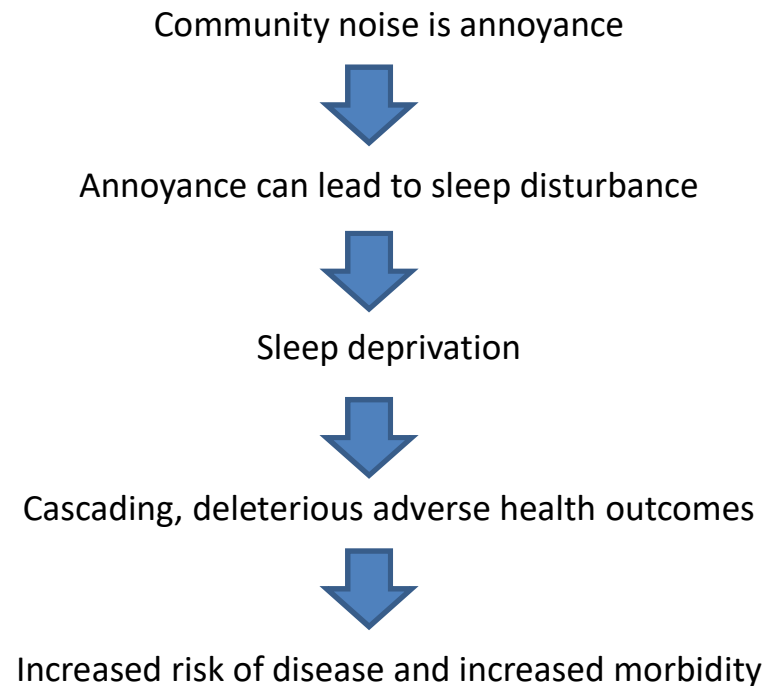
Original: September 2005

© Her Majesty the Queen in Right of Canada, represented by the Minister of Health, 2005

**Canada**

**“The result confirms the thesis that for chronically strong annoyance a causal chain exists between the three steps: health – strong annoyance – increased morbidity.”**

Reference: Niemann Dr Hildegard, Maschke Dr Christian, LARES Final Report Noise Effects and Morbidity, World Health Organization, (2004)



## Health Canada Wind Turbine Noise and Health Study, 2014



“Visual and auditory perception of wind turbines as reported by respondents increased significantly with increasing WTN levels as did high annoyance toward several wind turbine features, including the following: noise, blinking lights, shadow flicker, visual impacts, and vibrations.”

Peer Reviewed: Michaud DS, Feder K, Keith, SE and Voicescu SA. Exposure to wind turbine noise: The Journal of the Acoustical Society of America 139, 1443 (2016);  
<https://doi.org/10.1121/1.4942391>

## Chief Medical Officer of Health, Arlene King

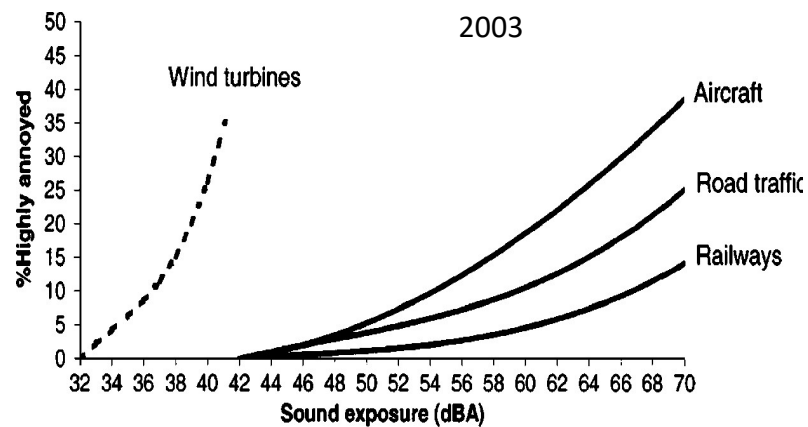
2010 - “The sound level from wind turbines at common residential setbacks is not sufficient to cause hearing impairment or other direct adverse health effects, but it may annoy some people”

[https://www.health.gov.on.ca/en/common/ministry/publications/reports/wind\\_turbine/wind\\_turbine.aspx](https://www.health.gov.on.ca/en/common/ministry/publications/reports/wind_turbine/wind_turbine.aspx)

to:

2015 – “Some people might find sound of WT annoying; it has been suggested that annoyance may be a reaction to the characteristic “swishing” or fluctuating nature of WT sound (2010 CMOH Report) For a given sound pressure level, wind turbines do produce more annoyance than other community noise sources.”

<https://slideplayer.com/slide/6356973/>



Sound exposure is for wind turbines calculated A-weighted  $L_{eq}$  for a hypothetical time period and for transportation DNL.

## Health Protection and Promotion Act of Ontario

### Duty of board of health

**61** Every board of health shall superintend and ensure the carrying out of Parts II, III and IV and the regulations relating to those Parts in the health unit served by the board of health. R.S.O. 1990, c.H.7, s. 61.

### In Part III Community Health Protection *of the HPPA is Section 11:*

Complaint re health hazard related to occupational or environmental health

**11** (1) Where a complaint is made to a board of health or a medical officer of health that a health hazard related to occupational or environmental health exists in the health unit served by the board of health or the medical officer of health, the medical officer of health shall notify the ministry of the Government of Ontario that has primary responsibility in the matter and, in consultation with the ministry, the medical officer of health shall investigate the complaint to determine whether the health hazard exists or does not exist. R.S.O. 1990, c. H.7, s. 11(1)

### “Health Hazard” is defined in the HPPA as:

- (a) A condition of a premises,
  - (b) A substance, thing, plant or animal other than man, or
  - (c) A solid, liquid, gas or combination of any of them,
- that has or that is likely to have an adverse effect on the health of any person

## Health Protection and Promotion Act of Ontario

### Medical Officer of Health

**67** (1) The medical officer of health of a board of health reports directly to the board of health on issues relating to public health concerns and to public health programs and services under this or any other Act. 1997, c. 30, Sched. D, s. 7(1).

**The EOHU Medical Officer of Health acknowledges he is undertaking his HPPA, Section 11 Duty to “investigate the complaint to determine whether the health hazard exists or does not exist.”:**

March 10, 2022	Letter from MOH to Chief Administrative Officer, Township of North Stormont	<i>“...the EOHU initiated a public health hazard investigation in the fall of 2021. The investigation consists of: a review of recent scientific information...; noise level assessments in the field conducted by the MECP which are ongoing”</i>
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**Ministry of Environment’s noise monitoring activities are  
focused only on determining compliance with Ontario’s noise regulations  
and not on evaluating human health impacts:**

1	April 12, 2022 MECP to Twnp of North Stormont Resident	“The <u>MECP does not have authority over matters of health</u> and I encourage you to see a professional health practitioner ”
2	June 6, 2022 MECP to Twnp of North Stormont Resident	“Health issues must be addressed through the appropriate ministry or agency. I know that you have shared your observations and concerns with <b>the <u>EOHU.</u></b> ”
3	June 13, 2022 MECP to Twnp of North Stormont	“To reiterate... <u>the District is responsible for ensuring compliance</u> with issued approvals and/or applicable legislation. The ministry is awaiting noise monitoring audits...”



**Compliance with Ontario's wind turbine noise regulations is expected to result in some people suffering adverse health effects.**

**The Government of Ontario's Ministry of the Environment commissioned engineering experts who advised them in 2010 that:**

Dec 10, 2010	Low Frequency Noise and Infrasound Associated With Wind Turbine Generator Systems: A Literature Review, Howe Gastmeier Chapnik Limited for Ontario Ministry of Environment	<b><u>"The audible sound from wind turbines is nonetheless expected to result in a non- trivial percentage of persons being highly annoyed."</u></b>
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**Medical Officer of Health, acknowledges that exposure to wind turbine noise results in nuisance and/or annoyance.**

June 10, 2022	Email from Eastern Ontario Health Unit to Twnp of North Stormont resident	"...The articles refer to the noise nuisance/annoyance factor, ....As part of the EOHU investigation, the <b>Public Health Ontario report</b> /literature review did also find that there was <u>a noise annoyance factor related to wind turbine proximity.</u> "
March 10, 2022	Medical Officer of Health to Chief Administrative Officer, Township of North Stormont	"Based on the <b>PHO report</b> , <u>there is evidence for annoyance</u> associated with exposure to wind turbine noise."
Nov 22, 2021	Public Health Report, 07/26/2020	Key Findings: <u>Annoyance</u> from audible wind turbine noise has been <u>documented consistently</u> in the literature.
Oct 2019	Medical Officer of Health to local physician	"To date, all of the scientifically rigorous, evidence-based studies/position statements, seem to conclude that although wind turbine noise is a "nuisance" ...."

**Medical Officer of Health, has been asked to reconcile the knowledge that adverse health effects are expected to result from exposure to wind turbine noise via the indirect causal pathway, with the definition of a “health hazard”:**

1	Aug 18, 2021 to Mar 20, 2022	Chain of emails between Twnp of North Stormont resident and Medical Officer of Health	Twnp of North Stormont resident asks for the 7 <sup>th</sup> time” ...explain to me how the knowledge that exposure to noise emissions from industrial wind turbine projects in the province of Ontario that result in adverse health effects being suffered by some people via the indirect causal pathway, reconciles with your duty under the Health Protection and Promotion Act of Ontario, Section 11 that you purport to be carrying out to investigate “to determine whether a health hazard exists or does not exist?”
2	Nov 6, 2021	Email to Board Director from Twnp of North Stormont resident	Twnp of North Stormont informs, “...he has asked the Medical Officer of Health in writing four (4) times....” and asks, “Is there anything you can do to help us understand what is going on?”
3	Nov 8, 2021	Email to resident from Twnp of North Stormont resident from Board Director	“I’m sorry, I do not have a response.”

The information that is available proves a health hazard exists relating to industrial wind turbines.

We request the EOHU Board of Health acknowledges that the health hazard exists.

We request the EOHU Board of Health approves the proposed resolution:

## RESOLUTION

WHEREAS the Health Protection and Promotion Act of Ontario defines “Health Hazard”:

- (a) a condition of a premises,
  - (b) a substance, thing, plant or animal other than man, or
  - (c) a solid, liquid, gas or combination of any of them,
- that has or that is likely to have an adverse effect on the health of any person (“risque pour la santé), and

WHEREAS the Health Protection and Promotion Act of Ontario imposes a duty on a local Medical Officer of Health under Section 11 in Part III Community Health Protection:

Complaint re: health hazard related to occupational or environmental health

11(1) Where a complaint is made to a board of health or a medical officer of health that a health hazard related to occupational or environmental health exists in the health unit served by the board of health or the medical officer of health, the medical officer of health shall notify the ministry of the Government of Ontario that has primary responsibility in the matter and, in consultation with the ministry, the medical officer of health shall investigate the complaint to determine whether the health hazard exists or does not exist. R.S.O. 1990, c. H.7, s. 11 (1)., and

WHEREAS the Health Protection and Promotion Act of Ontario imposes a duty on a local Board of Health under Section 61  
Duty of board of health

61 Every board of health shall superintend and ensure the carrying out of Parts II, III and IV and the regulations relating to those Parts in the health unit served by the board of health. R.S.O. 1990, c. H.7, s. 61, and

WHEREAS the Eastern Ontario Health Unit Board of Health believes there is sufficient evidence to determine that industrial wind turbines permitted to operate within our region constitute a health hazard

THEREFORE BE IT RESOLVED the Board of Health of the Eastern Ontario Health Unit acknowledges that industrial wind turbines in our region constitute a “health hazard”.

**Emails between Ruby Mekker and Jane Wilson, President, Wind Concerns Ontario  
August 19, 2022 to October 22, 2022**

**From:** Ruby Mekker  
**To:** WCO President  
**Date:** Aug 19, 2022  
**Subject:** Working collaboratively

Hi Jane,

I have read your report, Report to Wind Turbine Noise Complaints, Fourth Report, 2018 April 2021 which I found at:

<https://www.windconcernsontario.ca/wp-content/uploads/2021/04/Report-on-Noise-Complaint-Response-2018-FINAL.pdf>

In the report you state,

*"The MECP has responsibility for any adverse health effects caused by wind turbine noise pollution as any responsibility for health/public health was wrested from the Ministry of Health by the Green Energy Act. Local public health units are powerless to do anything, despite receiving calls."*

I bring this to your attention in the hopes of cooperation in our efforts to protect the people living in and around industrial wind turbines.

Yesterday, Tammy McRae and myself presented a powerpoint to the Eastern Ontario Health Unit Board of Health with the Medical Officer of Health, Dr. Roumeliotis, in attendance.

The main thrust of our presentation is that Ontario has the Health Protection and Promotion Act in which the duties of the Board of Health and the Medical Officer of Health are listed. These include under Section 11, their duty when complaints are filed to investigate and determine if a health hazard exists or does not exist. This is Ontario law and I believe, is totally separate to the Green Energy Act. It was not impacted by the Green Energy Economy Act or the Green Energy Act.

Our presentation has already been reported in the Standard Freeholder, Cornwall which you can find at: <https://www.standard-freeholder.com/news/local-news/nation-rise-wind-farm-opponents-address-roumeliotis-eohu-board>

It is likely you are aware that the Haldimand-Norfolk Health Unit and the Wellington-Dufferin-Guelph Public Health, in 2013. Health Hazard Investigation of a Transformer Station. Fergus, ON.

I am writing today to ask that WCO support our efforts collaboratively that we are taking to protect the health of the people from the harm inducing noise and emissions that are emitted from industrial wind turbines and their associated infrastructure.

The Health Protection and Promotion Act states at: <https://www.ontario.ca/laws/statute/90h07>  
 "health hazard" means,

- (a) a condition of a premises,
- (b) a substance, thing, plant or animal other than man, or

(c) a solid, liquid, gas or combination of any of them,  
that has or that is likely to have an adverse effect on the health of any person; (“risque pour la santé”)

### **Complaint re health hazard related to occupational or environmental health**

**11** (1) Where a complaint is made to a board of health or a medical officer of health that a health hazard related to occupational or environmental health exists in the health unit served by the board of health or the medical officer of health, the medical officer of health shall notify the ministry of the Government of Ontario that has primary responsibility in the matter and, in consultation with the ministry, the medical officer of health shall investigate the complaint to determine whether the health hazard exists or does not exist. R.S.O. 1990, c. H.7, s. 11 (1).

This letter is not deemed confidential and may be shared or in the public domain. Any errors or omissions are not intentional.

Ruby Mekker  
Finch, ON

**From: WCO President**

**To: Ruby Mekker**

**Date: Aug 21, 2022**

**Subject: Re: Working collaboratively**

Thank you for your email.

As it happens we have already developed our communications strategy for the fall, which is based on two extremely important events:

1. the IESO Request for Proposals (Long Term RFP)
- and
2. the Ontario municipal election.

We are very busy commenting formally to the IESO as a registered stakeholder on an ongoing basis about the need for change to the approvals and contracting process, and to the Ford government about the need for new setbacks and noise regulations, as well as the need to enforce existing regulations.

The municipal election is absolutely critical because with the IESO LT-RFP and the trend toward Distributed Energy Resources or DER, municipal councils will have input to future wind power developments.

We feel it is absolutely essential at this time to advocate for substantial change that will affect existing wind power facilities, and the projects that will almost certainly be proposed.

We continue to work toward acknowledgement of and action on the health impacts of wind turbine noise emissions, and have already begun new plans for further communication with the Ministry of Environment, Conservation and Parks.

I note with regret in the news story that the chair of the EOHU felt your delegation was attacking the health unit leadership. We know the limitations of the health units from working closely several years ago with the Huron County Health Unit on an important study of wind turbine noise and health effects. (The results of that study were significant and showed a link between wind turbine noise and adverse health effects. Unfortunately, a poorly thought out campaign by people with another agenda meant that too few people participated in that study for the government to recognize its findings.)

To conclude, **we have a comprehensive communications strategy built as a foundation for all our activities this fall**, all of which are aimed at protecting the health of Ontario residents, and ensuring appropriate government actions.

Thank you

Jane Wilson  
Ottawa

**From: Ruby Mekker**  
**To: WCO President**  
**Date: Sun, Sep 18, 2022 at 9:25 AM**  
**Subject: Re: Working collaboratively**

Thank you, Jane. for your August 21, 2022 reply.

I agree with you that we should be advocating for substantial change that will affect existing wind power facilities, and the projects that may be proposed.

This is why we are eager to see the Health Protection and Promotion Act of Ontario carried out, in particular the duties it imposes to determine that a "health hazard" exists.

Your comment, "*We know the limitations of the health units...*" was intriguing. What are the "limitations" of a health unit that you are referring to? Ontario's Health Protection and Promotion Act is clear that a medical officer of health is supposed to investigate complaints with the purpose of determining "whether the health hazard exists or does not exist."

Your comment about the failure of the Huron County Health Unit "study" was disappointing. Based on my conversations with some of the complainants and other people, some felt that the study--which was a spin off of the HPPA Section 11 Duty--was not designed in a way that would most expeditiously answer the question that was the purpose of the whole exercise, "to determine whether the health hazard exists or does not exist." Instead it looked like an exercise in studying the suffering of the victims who were being exposed to a known toxin without their consent.

At our presentation to the Eastern Ontario Health Unit on August 18, 2022 we presented evidence of the known adverse health effects of exposure to wind turbine noise in Ontario, which we conclude confirms the existence of a "health hazard" as defined in the Health Protection and Promotion Act of Ontario. Attached are the slides we relied on in our presentation. As you can see the references that we rely on were available back when the Huron County Health Unit were taking up their HPPA Section 11 duty, including the Ministry's engineers admitting the noise levels permitted by the Government will



result in annoyance, and Health Canada and the World Health Organization acknowledging that annoyance from exposure to industrial noise is considered to be an adverse health effect.

With your background and experience, do you agree this is enough evidence to determine that a health hazard exists with respect to wind turbine noise in Ontario?

Ruby Mekker  
Finch, ON

**From: Ruby Mekker**  
**To: WCO President**  
**Date: Oct 22, 2022 8:23 AM**  
**Subject: Working collaboratively**

Hi Jane,  
I haven't received your reply to the September 18, 2022 email I sent to you.

There have been some funny things going on with my emails so I don't know if you received my email or not.

I am just hoping to confirm with you that you agree that there is enough evidence to determine that a health hazard exists with respect to wind turbine noise in Ontario.

I look forward to your reply.

Ruby

**From: WCO President**  
**To: Ruby Mekker**  
**Date: Oct 22, 2022 9:59 AM**  
**Subject: Re: Working collaboratively**

I did reply to your email sent weeks ago.

In it I explained that we have established our communications program for the rest of the year and it is--and has been---very busy.

The IESO has launched a new procurement initiative in stages that may include wind power proposals, and the municipal election has required us to help our members across Ontario work hard to get wind power into the conversation.

We have been providing comments at every opportunity to the government, sending letters to MPPs and other stakeholders, and working on the noise complaint file without ceasing, as we have done for years.

I saw the news reports on your presentation to the EOHU and was disturbed to see comments that the delegation was perceived as disrespectful to the Board.

Jane Wilson

President  
WIND CONCERNS ONTARIO

**From: Ruby Mekker**  
**To: WCO President**  
**Date: Oct 22, 2022 10:18 AM**  
**Subject: Re: Working collaboratively**

Jane, with all the wind turbine development that may be proposed in the province, it would seem that it is all the more important to hurry up and acknowledge that the siting criteria that the province permits results in a "health hazard" being created for the residents who live under the blades.

I was asking you simply to confirm whether you personally agree that there is sufficient evidence to conclude that wind turbine noise levels permitted by the Government constitute a "health hazard."

Your reply does not address this question. Am I missing something??

Ruby

September 15, 2022 to November 3, 2022 Email Chain:

Ruby Mekker and Robert Lerch, Director, Health Protection and Surveillance Policy and Programs  
Branch, Ministry of Health

Statement by MPP Sylvia Jones, Ontario Legislature, April 18, 2013

**From: Lerch, Robert**

**To: Ruby Mekker**

**CC: Asha Riyaz**

**Date: Sep 15, 2022**

**Subject: RE: 4<sup>th</sup> Letter - New information and ongoing harm**

Dear Ruby Mekker,

Thank you for taking the time to contact us, we have received your emails dated May 2<sup>nd</sup>, 24<sup>th</sup> and 27<sup>th</sup> 2022, May 12<sup>th</sup> and September 2<sup>nd</sup> 2022 regarding wind turbines in your community.

There have been a growing number of reviews and consultations on the human and environmental health impacts of wind farms in the literature. Most recently, our partners at Public Health Ontario have conducted a further review of the scientific data to date. There is still no evidence, from any of the examined studies to propose a direct causal link between the placement of wind turbine farms and any subsequent adverse human health effects to neighbouring populations.

The Ministry of Health will continue to regularly review all new scientific evidence to ensure that the measures in place are protective of the environment and of human health, including sharing the concerns raised in your correspondence to our Public Health Ontario partners.

We will also continue to liaise with the Ministry of Environment, Conservation and Parks (MECP). The MECP has authority on this project and are responsible for policies, protocols, laws and regulation pertaining to wind farms and wind turbines. We will review all information presented in the upcoming MECP report and, in partnership, will continue our engagement in this issue. Again, it will be with the primary focus of safeguarding public health.

Thank you again for taking the time to share your concerns with the Ministry.

With regards,

Robert Lerch

A. Director

**From: Ruby Mekker**

**To: Robert Lerch**

**Date: Oct 8, 2022**

**Subject: Response to Fwd: 4<sup>th</sup> Letter - New information and ongoing harm**

Mr. Lerch,

I received your letter of September 15, 2022.

I had written to you on September 2, 2022 and had enquired about the fact it appears that the Health Protection and Promotion Act of Ontario, Section 11 Duty that is imposed on local Medical Officers of Health to investigate complaints to determine whether a health hazard exists or does not exist, has not been carried out in any health unit in the Province with respect to complaints about the adverse health effects of industrial wind turbines that have been built in residential communities.

In your reply letter you failed to acknowledge or address this concern.

Mr. Lerch, please will you confirm whether the Province of Ontario considers that health hazards exist pertaining to these industrial wind turbine projects that have been built in our residential communities? Please ensure your response includes the term "health hazard" as it is defined in the Health Protection and Promotion Act of Ontario.

I await your reply.

Ruby Mekker  
Finch, ON

**From:** Ruby Mekker **Date:** Wed, Oct 19, 2022 at 8:57 AM  
**Subject:** Re: Response to Fwd: 4th Letter - New information and ongoing harm  
**To:** Lerch, Robert (MOH) <[Robert.Lerch@ontario.ca](mailto:Robert.Lerch@ontario.ca)>  
**Cc:** Asha Riyaz

I wrote to you on October 8, 2022 and noted that in your letter of September 15, 2022 you did not address my concern that I had written to you about so I asked you to "confirm whether the Province of Ontario considers that health hazards exist pertaining to these industrial wind turbine projects that have been built in our residential communities? Please ensure your response includes the term "health hazard" as it is defined in the Health Protection and Promotion Act of Ontario."

I have not received your reply. When may I expect your reply?

Ruby Mekker  
Finch, ON

**From:** Ruby Mekker  
**To:** Robert Lerch  
**CC:** Asha Riyaz  
**Date:** Nov 3, 2022  
**Subject:** Robert Lerch: Health hazards and wind turbines

Robert Lerch  
Director, Health Protection and Surveillance Policy and Programs Branch  
Ontario Ministry of Health

Mr. Lerch,  
I wrote to you on October 8, 2022 and October 19, 2022 noting that in your reply letter of September 15, 2022 you did not address my question about whether the Ministry of Health considers the industrial wind turbine projects in Ontario that are the subject of numerous complaints about noise and adverse

health effects to be "health hazards". As you are aware, "health hazard" is a term that is defined in the Health Protection and Promotion Act of Ontario.

I have not received your reply. Please confirm, does the Province of Ontario consider that these industrial wind turbine projects are "health hazards" or not, or is the Province neglecting to make this determination?

I await your reply.

Ruby Mekker  
Finch, ON

# WCO | WIND CONCERNS ONTARIO

February 22, 2023

IESO Engagement

*Via email*

Attached is a report that summarizes information gathered from across Ontario about the process used to develop Battery Energy Storage Systems proposals for submission to the IESO's E-LT1 RFP that closed February 16. The situations reported are raising concerns across rural Ontario with the program and they should provide the basis for concern within the IESO.

Key observations:

- **Standards needed for emergencies** – As BESS technology is relatively new, standards are rapidly changing in response to emergency situations encountered. Even projects developed by companies with extensive battery experience have experienced serious emergency situations.
- **Not enough information** – The requirements for submissions to the IESO and to municipalities when requesting support for the project include few, if any, details on the actual project. The process appears to assume that once a company is awarded an IESO contract based largely on price, it will then proceed to develop the real proposal which will be submitted into an undefined permitting process or processes. Based on information submitted, it is not clear how the IESO will be able to distinguish between proposals with higher prices because they meet high standards for development and those with lower prices because the proposal includes the minimal safety standards.
- **Renewable energy or not?** – BESS systems are neither defined as a Renewable Energy project by Regulation 359/09, nor are they included in the list of excluded projects. The intention may be to omit further provincial review of these projects and to proceed directly to the municipal permitting process but this would be a recipe for substantial delay as the building officials in each host municipality (many of which are small rural municipalities) individually develop the expertise needed to assess and approve these projects.
- **Safety regulations?** – While Ontario Hydro has defined setbacks from BESS installations to protect their infrastructure, there are no setbacks for BESS installations established in Regulation 359/09 to protect other buildings and activities. Similarly, there are no noise standards for these systems which could create a new enforcement challenge for Ministry of Environment, Conservation and Parks field staff.
- **Potential for support to be withdrawn** – As the submissions to municipalities have included minimal information, there is potential for municipalities to rescind their support resolution once they learn the risks associated with these projects and the municipal resources that will be potentially required to deal with emergency situations.

The Wind Concerns Ontario paper proposes that more structure be imposed on the approval of these projects. They should be brought within Regulation 359/09 and one central group be established to complete a technical review of the project ensuring that they meet safety standards and established provincial setbacks. Their assessment would be passed to the host municipality who needs to review the support requirements that they will need to provide. That package would then be presented to municipal Council for final approval after which it would proceed into the permitting process.

While this proposed process provides a more structured, multi-leveled approval process, it will likely streamline approvals as the required technical expertise is developed in one location rather than in each municipality while municipalities would be in a position to consider the actual needs that the projects will apply.

Yours truly,

Jane Wilson,  
President, Wind Concerns Ontario  
[president@windconcernsontario.ca](mailto:president@windconcernsontario.ca)

cc  
Minister of Energy  
Minister of Environment, Conservation and Parks  
Association of Municipalities of Ontario  
Multi-Municipal Wind Turbine Working Group

## Battery Energy Storage Systems (BESS)

### Assessment of Community Risks

#### Introduction

Ontario has placed emphasis on grid-scale Battery Energy Storage Systems (BESS) to address shortfalls in electrical generation capacity that may occur due to the shutdown of the Pickering nuclear station and increasing demand for electricity. Proponents see this technology as key to addressing the intermittent nature of renewable power generation. BESS is a relatively new technology; however, installations around the world provide significant information on design requirements and actual operating benefits. Learning from the operating experience of other facilities reveals risks associated with the technology and highlights the need for changes in the industry standards that govern development of BESS facilities. The overarching goal of the Government of Ontario should be to ensure that projects using this technology will not harm residents of Ontario or result in adverse environmental impacts.

#### Incidents Reported at BESS Facilities

The 2021 fire in the Tesla's 300 megawatt (450 megawatt hours) Megapack in Geelong, Victoria, Australia received considerable media coverage. This situation highlights the potential risks from BESS facilities:

*The fire started on the morning of Friday July 30 and was not brought under control until the afternoon of Monday August 2. More than **30 fire trucks** and support vehicles and about **150 fire fighters** from the County Fire Authority and local Fire Rescue Victoria responded, containing the flames so they only affected two Megapacks of the approximately 210 that make up the system.<sup>1</sup>*

This incident is of particular note as it occurred in a facility designed and built by a company with extensive expertise in lithium battery technology. The duration of the fire and the scale of the response raise concerns. While Australian states have infrastructure to fight forest fires that can respond to this emergency, most municipalities, particularly in rural Ontario, do not

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<sup>1</sup> CNBC News, Tesla Megapack fire highlights issues to be solved for utility 'big batteries', August 5, 2021.



have easy access to 150 firefighters that could be dedicated to an incident for 3 days, as was the case with this situation.

It is not an isolated incident: other similar situations have been documented in the United States. A fire at a BESS facility in Chandler, Arizona received wide coverage<sup>2</sup> and other incidents were assessed by authorities responsible for setting fire standards for the United States.<sup>3 4</sup> This suggests that Ontario should be moving with caution on new BESS projects.

The potential for issues with BESS technologies should be viewed in the context of the experiences of rural Ontario communities with wind turbines. Even though they have since proven inadequate, at least the government set out some basic requirements for wind turbines such as separation from people's homes. These and other limitations governing the basic parameters for the approval of these projects were put in place before approvals were accelerated. A comprehensive set of reports that were made widely available before any community consultation or request for municipal support could move forward. While there are serious gaps in this process, it is robust compared to the review and consultation process that is currently underway for BESS in Ontario.

As we saw with the approvals for wind power, it could be left to "host" communities to deal with any negative impacts of these projects.

### **Key considerations**

There are several key issues to consider related to BESS technology. These issues are developed based on reviews of proposals published as part of the current RFP process; responses to questions from residents that will be affected; and a review of published reports on incidents involving BESS technology.

It is not intended to be a comprehensive study but rather, an overview of the rapidly evolving situation while identifying current work in this area that is relevant to the problem and providing some preliminary suggestions on potential content for an Ontario regulation related to this technology. Even these preliminary findings indicate that a need for the IESO and Ontario government ministries **to put a more rigorous regulatory framework in place before BESS projects are approved and implemented.**

This view that more regulations are required is shared with the Canadian Renewable Energy Association or CanREA which notes the need for these requirements in their January 2022

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<sup>2</sup> News 10 Phoenix, Fire at Lithium Battery Storage Facility prompts Evacuations, April 22, 2022.

<sup>3</sup> North American Electrical Reliability Corporation, Battery Energy Storage Cascading Thermal Runway, Lesson Learned, 21010301, March 29 2021, pp.1-4.

<sup>4</sup> National Fire Protection Association, Battery Energy Storage Hazards and Failure Modes, December 3, 2021.

white paper, “Laying the Foundation.”<sup>5</sup> In particular, CanREA recognizes the need sufficient expertise in regulatory bodies to fairly evaluate proposed energy-storage installations.<sup>6</sup>

Based on the findings outlined here, it is clear that work is required on the Ontario process for approving BESS projects so that the errors of the Green Energy program are not repeated.

### Underwriters Laboratory (UL) Standards for BESS Systems

Canadian regulators generally point to two standards in terms of the requirements for BESS. For example, the Canadian Electrical Safety Association document published in May 2022<sup>7</sup> references a UL standard, **ANSI/CA/UL9540**.<sup>8</sup> This is safety standard for an energy storage system and equipment intended for connection to a local utility grid or stand-alone application. It designates key issues associated with these systems including safety of the battery system, functional safety, fire detection/ suppression/ containment and environmental performance. The standard was adopted in February 27, 2020 and updated on April 9, 2021.

The second standard, **UL9540A**<sup>9</sup> is related to the base UL9540 standard. It outlines a test methodology to evaluate the fire safety characteristics of a storage system at each of the cell, module, unit and installation levels. The focus is the ability of the BESS installation to handle thermal runaway propagation. Performance criteria are specified for each level within the installation. Meeting the criteria for each level is required before moving to the next level. Any installation that does not meet the applicable performance criteria is considered non-compliant and would need to be revised and re-tested.<sup>10</sup> These tests are designed to be undertaken in specialized fire testing facilities.

The UL9540 covers storage capacities up to 50 kWh. Installations larger than this need to comply with UL 9540A fire test performance criteria. These standards have been developed for the United States but have also been adopted for use in Canada.

### National Fire Protection Association (NFPA) Standard 855

The US-based NFPA views BESS installations as systems that can provide clean, low-cost sources of energy but it notes that they also present significant life safety hazards. NFPA 855<sup>11</sup>, a “Standard for the Installation of Stationary Energy Storage Systems”, was originally published in 2020 to address the dangers of toxic and flammable gases, stranded energy, and increased fire intensity associated with using lithium metal or lithium-ion batteries. Based on learning since 2020, this standard has already been updated in 2023 requirements for fire detection and suppression, explosion control, exhaust

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<sup>5</sup> Canadian Renewable Energy Association, Laying the Foundation, January 2022.

<sup>6</sup> IBID, page 14.

<sup>7</sup> Ontario Electrical Safety Code, Bulletin 64-7-1, Installation and Approval of Energy Storage Systems, May 2022.

<sup>8</sup> UL Solutions, Energy Storage Systems and Equipment, UL Standard 9540, 2<sup>nd</sup> Edition, February 27, 2020.

<sup>9</sup> UL Solutions, Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems, UL Standard 9540 A, November 12, 2019.

<sup>10</sup> UL Solutions, Webinar - Canadian Codes and Standards for Energy Storage Systems, May 13, 2021.

<sup>11</sup> National Fire Protection Association, NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2020.

ventilation, gas detection, and thermal runaway have been added or revised.<sup>12</sup> In a technology environment that is rapidly changing, this more recent standard may include important new information. Even though this is a US standard, it can also be used for BESS projects in Canada.

### Fire Suppression Systems

As there is no IESO requirement to address fire safety issues as part of the community meetings or requests for municipal support required in the RFP process, there is limited published information on how the proponents of BESS projects intend to comply with appropriate standards.

For example, Solar Flow-Through Funds, the company proposing a BESS system in Chesley (Arran-Elderslie), did not include this information in its presentation to the Arran-Elderslie Council when the municipal support resolution was requested nor is reflected in its community presentation. Limited information was provided to a local resident in response to a specific question about fire safety. The company responded that the system proposed for Chesley would include a comprehensive Fire Suppression System consisting of at least seven layers of protection. Below is the company description of each layer:

- First, the batteries are isolated from each other to prevent any current from flowing between them.
- Second, there are gas and fire monitoring and controls for each battery, rack and cabinet that provide immediate isolation, suppression, and mitigation in the experience of a thermal event.
- Third, each battery module can be isolated from the overall system, shut down and thermal management applied to suppress propagation.
- Fourth, deflagration systems are built into the containers that are designed to release gases in case of a build-up. The deflagration systems are designed to allow the container doors or roof to blow off if the gas detectors detect a rise in gas concentration beyond prescribed limits. When gases are released, the probability of a fire is significantly reduced as it is the combination of pressure, concentration, and heat that can cause a fire/explosion.
- Fifth, the fire suppression is planned to be accomplished with a potassium nitrate aerosol-based generator. Potassium Nitrate is a benign ionic salt.
- Sixth, in the event of a fire, a dry pipe sprinkler system is triggered to eliminate all thermal events within the cabinet.
- Finally, each system has 24/7 monitoring requirements and annual preventative maintenance plus training for the operators.

Other safety measures described include 24/7 remote monitoring to ensure normal system functioning. This system is monitored for performance and safety continuously and integrated with the IESO command center to perform the dispatch functions required by the system operator.

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<sup>12</sup> IBID,2023.

This layered system generally aligns with the requirements of UL9540, but the response did not provide a commitment that the system would meet the performance standards for 9540A testing. The statement that training would be provided for operators conflicts with the statement at the municipal council that the proponent would have no local operators but would contract with local electrical suppliers to undertake required repairs and maintenance. These contract arrangements will not ensure the availability of trained resources in the event of an emergency.

The discussions at the Prince Edward County Municipal Council<sup>13</sup> meeting regarding a municipal support resolution for a BESS project included a lengthy assessment of these provisions. Inadequate provisions to address fire safety issues were a key reason why the proposal did not receive support.

Safety measures were also a concerns raised residents living near the RES project proposed for Enniskillen Township.<sup>14</sup> Enniskillen Mayor Marriott said township officials tried to gather information on battery storage projects from provincial agencies and officials while attending a recent Rural Ontario Municipal Association conference in Toronto, “but the information is fairly sparse.”<sup>15</sup>

## Hydro One Setback Standards

The standards discussed above are primarily focused internally on the design of the battery structure but Hydro One has a set of additional standards that defines how BESS systems will be positioned relative to Hydro One infrastructure. As part of its Transmission Generation Interconnection Requirements, Hydro One includes a specific section on Setback Considerations for BESS facilities.

Hydro One explains that these requirements are necessary because:

*Lithium battery storage facility fires can generate intense heat and smoke for prolonged periods of time and are difficult to extinguish. If these facilities are located in close proximity to Hydro One transmission facilities, there is an increased risk to the system. Of more concern is the risk associated with a fire in the BESS that can damage the Hydro One facilities and/or cause line or station equipment flashovers due to the ionization of the air. This can cause Hydro One facilities to be taken out of service and pose a risk to safe, secure and reliable operation of the transmission system.*<sup>16</sup>

Hydro One has established minimum set-back distances for BESS systems from Hydro One facilities as outlined in the following table.<sup>17</sup>

<sup>13</sup> Municipality of Prince Edward County, Municipal Council, January 31, 2023.

<sup>14</sup> Sarnia Observer, Oil City Battery Storage Proposal Dead in the Water, February 16, 2023.

<sup>15</sup> Sarnia Observer, Battery Storage Project Proposed, January 25, 2023.

<sup>16</sup> [Hydro One, Transmission General Interconnection Requirements](#), December 8, 2020, pg.22

<sup>17</sup> IBID.

Item #	Hydro One Facilities	Setback Distance
1	500 kV Right of Way	500 m
2	230 kV Right of Way	350 m
3	230 kV or 115 kV Right of Way with 2 or more double circuit 230 kV or 115 kV lines	250 m
4	115 kV Right of way with single circuit 115 kV line	150 m
5	550kV station	500 m
6	230 kV switching station	350 m
7	115 kV Switching station or a 230 kV or 115 kV step down station	250 m

*Source: Hydro One, General Transmission Interconnection Requirements, 2021*

As Hydro One is involved in confirming circuit capacity availability, it is assumed that these setbacks will be implemented as part of that process. Enbridge advised residents that setbacks used in the petroleum industry were reflected in the design of the project proposed for St. Clair Township.

If Hydro One and Enbridge are concerned about the impacts of BESS facilities on neighbouring activities that it requires setbacks from rights of way and facilities, **should similar setbacks not be incorporated into a provincial standard that would also apply to municipal road allowances and/or other improvements on adjacent land?**

### Requirements for Local Emergency Resources

The emergency response capabilities and resources available to respond need to be aligned with the types of emergency situations that can be encountered at each BESS location. As shown in the 2021 Tesla fire noted above, significant fire resources can be required for an extended duration to deal with emergency situations at these facilities.

This situation and emergency events at other BESS facilities provide some key learning for the emergency response plans for the BESS facilities being approved for Ontario:

- Rapid emergency responses are required suggesting that automated calls sent directly to the emergency call system for the community when an emergency situation is detected.
- Local emergency crews who respond need to be trained to handle lithium fires.
- While water will not put out a fire in a lithium battery, large volumes of water are required to cool all adjacent modules to stop an expansion of the fire. As a result, hydrants connected to a municipal water system are recommended on site.<sup>18</sup> The dry pipe system proposed as part of the BESS facility in Chesley assumes that this water source is available.
- The facility needs to be designed to allow emergency personnel to reach the problem module and to introduce water into the container at a safe distance.

<sup>18</sup> Brendan D. Miller, P.E. Westwood Professional Services, [4 Requirements you may be missing on your BESS project](#), July 28, 2021.

- Toxic fumes can be released when most of these facilities are experiencing an emergency situation. These emissions can contain hydrocarbons, carbon dioxide and carbon monoxide.<sup>19</sup> These can include flammable gases and designs include venting procedures to prevent an explosion within the unit. These situations need to be monitored remotely with warning provided to affected people.

The ability of the local community to supply these emergency resources needs to be confirmed as part of the approval process and in many cases may determine the locations where these facilities can be developed. An emergency plan should be developed in conjunction with the host municipality for each site that documents which services are expected from the municipality and which services the proponent will be providing or sourcing elsewhere. This plan should be reviewed and updated annually.

In response to questions from a local resident about the proposed St. Clair BESS, Enbridge stated that there were going to provide equipment and training to local fire departments as part of their implementation. Enbridge also stated that it is evaluating how it might integrate local Enbridge staff to work in conjunction with local fire departments in the event of a fire emergency. This confirms that Enbridge sees these risks are worth addressing and all projects should be providing similar support to local emergency services.

## Noise Emissions

The potential for noise emissions from BESS installation has been raised at a number of public meetings with the discussions largely centred on the equipment used to cool the batteries. In most of the discussions, it has been generally dismissed by proponents as “just noise from fans”.

More details on the noise emissions were provided in the discussion at the Arran-Elderslie Council meeting<sup>20</sup> in response to a specific question from a Councillor. The proponent indicated that current ventilation systems used for their type of small application generated noise levels of about 75 dBA at source. They expected that this noise level would decrease to a 40–45 dBA level over distance, but no support or engineering estimates for these statements was provided. The proponent also stated that the facility would be located in an area zoned for light industrial uses (i.e., not residential) where noise of this level could be expected.

Though not challenged at the Council meeting, there is a reasonable probability that these noise emissions of 75 dBA will violate the Arran-Elderslie noise by-law. Section 3.16<sup>21</sup> of this by-law prohibits commercial operations from discharging noise that is clearly audible 15.25 metres (50 feet) from the property line on which the structure is located. **The proponent was not correct** in stating that noise levels are determined by the zoning of the property on which the operation is located. In Chesley, it is assessed based on noise levels at nearby receptors. If the nearby site is seniors’ housing that is designated as a “Quiet Zone”, noise emissions are more restrictive.

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<sup>19</sup> UL Solutions, Webinar - Canadian Codes and Standards for Energy Storage Systems, May 13, 2021.

<sup>20</sup> Municipality of Arran-Elderslie, Video of Municipal Council Meeting, January 9, 2023.

<sup>21</sup> Municipality of Arran-Elderslie, By-law 61-09 (Noise Bylaw), November 9, 2009

The District Office of the Ministry of Environment Conservation and Parks will have a role in responding to any complaints that are logged with the Spills Action Centre or the local ministry offices. Addressing the noise levels early in the development process to ensure would reduce the need for local interventions after the project is built. In particular, noise barriers can be used to address these problems but a noise assessment of each location should be included in the application so that the need for any remedial sound abatement can be addressed before the project is approved. This would also allow the abatement to be designed before the construction phase is understood,

Transformer stations are another potential source of problem noise. Regulation 359/09 sets out noise mitigation measures for transformer stations linked to renewable energy projects.<sup>22</sup> It is assumed that these will also apply to any transformer station needed to link a BESS to the grid.

### IESO Requirements

The IESO's current submission requirements for applicants to respond to the RFP with a BESS project are fairly general except for those requirements that relate to the contractual relationship with the IESO.

The requirements in the contract are similarly general:

*The Supplier agrees to design and build the Facility using Good Engineering and Operating Practices and meeting all relevant requirements of the IESO Market Rules, Transmission System Code, Distribution 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>23</sup>*

Beyond “using Good Engineering and Operating Practices”, there are no further details in terms of the standards that need to be met. Similarly the “Municipal Support” form does not require the submission of any information on standards the proposed project will meet. The primary focus of the RFP and contract on matters of direct concern to the IESO: bid price, timing of completion, etc. With the limited information submitted, it is not clear how the IESO will distinguish between submissions in which bid price reflects an identified need to invest heavily in safety features and practices and one that has cut corners in the design to generate a lower bid price. Similarly, the value of a Municipal Support Resolution based on the minimal information required is questionable when municipal support may be withdrawn when the full details of the project are known. The legal implications in the event that a municipality withdraws its support resolution after a proponent has been awarded a contract are unknown. If a proponent has incurred costs for consultancy reports, deposits for equipment and infrastructure components, etc., is it possible the company could opt to initiate legal action against the municipality as a means of coercion if support is withdrawn?

The limited role of the IESO was less of an issue with wind turbine and solar projects when the IESO was only responsible for the approval of the contract. For those projects, there was a separate approval process operated by the environment ministry that had an application and municipal consultation process that required detailed submission documenting the details of the proposal including

<sup>22</sup> Ontario, Regulation 359/09 Renewable Energy Projects, Section 35, October 10, 2009.

<sup>23</sup> Ontario Independent Electricity System Operator, ET1 – Contract Consolidated – February 3, 2023, Section 2.1 a

equipment proposed for use, siting arrangements, operating procedures, estimates of noise emissions and decommissioning arrangements. It is not clear what additional approval steps the IESO or the government as a whole are anticipating being applied to these projects.

## Role of Ontario Regulation 359/09

Development of some renewable energy facilities is regulated by Regulation 359/09. As shown by this review, a BESS facility can generate emissions that can be considered as “Adverse Effects” as defined by the Environmental Protection Act.<sup>24</sup> A BESS can also require significant resources from the host municipality.

### **There are no specific regulations applicable to BESS projects.**

The field staff of the Ministry of the Environment, Conservation and Parks will be responsible for management of any complaints about their noise emissions. This creates the potential for regulations and enforcement procedures related to BESS facilities to be developed after construction through the enforcement process.

New BESS facilities can also be linked to wind and solar projects which are covered under the Regulation and it is expected that new wind and solar projects may incorporate BESS capabilities to maximize revenue generated by the projects.

Despite these relationships, BESS projects are neither included, nor excluded, from the list of activities covered by Regulation 390/09. This regulatory environment needs to be clarified before moving forward with the approval of BESS projects:

- The approval process set out by the IESO only deals with the contractual relationship related to the generation and sale of electricity.
- The information that proponents are providing to municipalities to request a support resolution is not sufficient to consider this endorsement as an “approval” to proceed with construction of the project.
- The technology and standards related to BESS facilities continue to evolve rapidly, meaning that it is inappropriate to leave the technical requirements in the hands of local municipal building officials.

## Cost/Benefit Assessments

The IESO requirements for presentations to community meetings or municipal councils did not include any requirement to present cost-benefit analysis for the specific BESS project; however, proponents in the meetings already reference did put forward benefits from the project being proposed.

In their presentations, Solar Flow Through Funds focus on preventing local brownouts. For example, in their presentation to Arran-Elderslie Council,<sup>25</sup> the company representative indicated that the area had

<sup>24</sup> Ontario, Environmental Protection Act, RSO 1990, July 1, 2020, Section 1 (1) Interpretation – Adverse effect.

<sup>25</sup> Municipality of Arran-Elderslie, Video of Municipal Council Meeting, January 9, 2023.



been identified by the IESO as needing this type of back-up capacity “to prevent potential brown-outs” in the Chesley/Paisley area. In a subsequent question, the Deputy Mayor reported on a community meeting where she learned confirmed that isolating the community from brown-outs was a key driver of the project.

This information presented to Arran-Elderslie conflicts with the priorities indicated in the IESO RFP which is focused on fixing capacity issues west of London and east of Pickering as the current problem areas. Four of the six sites being proposed by Solar Flow Through align with those criteria and it not clear why the IESO has specifically identified Chesley as a problem location or how at 4.99 MW project that is only capable of generating 19.96 megawatt hours for a period of four hours would provide a robust solution to this problem. It is also unlikely that Chesley would have a higher exposure to brownouts than other area communities without BESS facilities if the project did not proceed.

As no proponent has been willing to discuss costs for their proposed BESS projects, it is difficult to prove confirm that these BESS projects are providing real value to electricity users across Ontario. Given that the IESO reports that 70% of capacity shortfalls last for more than four hours<sup>26</sup>, the concern about the parallel community risk being created by increasing dependence on what is a very expensive supply with a very limited output.

## Conclusion

Residents of rural Ontario have extensive experience with energy projects that were approved without sufficient attention to the impact on people and communities. We are concerned that the current IESO RFP is repeating the mistakes of the past by launching a new RFP process that requires very few details on what is proposed or how its operation will integrate with existing municipal structures and services.

We do not want the situation with wind turbines to be repeated. The failure of the IESO or other agencies of the Ontario government to set out a comprehensive set of siting requirements for battery storage systems seems to be preparing rural Ontario for a repeat of the situation with wind turbines.

## Recommendations

It appears that the process for projects receiving an IESO contract is that following acceptance of a submission, the proponent would proceed to develop a more detailed proposal for implementation to be presented to local building officials for review and issuance of permits. Given the complexity of these projects and the rapidly changing technology, it is expected that this process could result in substantial delays in implementation of these projects as each small municipality involved gains an understanding of the detailed requirements required to issue the necessary permits. At the same time, these projects require detailed support from municipal partners meaning that the final approval must rest with local authorities.

On that basis, it is recommended that BESS systems be added to the list of renewable energy projects covered by Regulation 359/09.

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<sup>26</sup> IESO, LT1 RFP and Additional Mechanisms Engagement, June 9, 2022, Slide 14.

In addition, Regulation 359/09 needs to be amended to add setbacks from nearby activities. These setbacks would likely, at a minimum, mirror the setbacks established by Hydro One for setbacks from their facilities.

Proponents awarded contracts should be required to present detailed proposals for review by the Ministry of Environment, Conservation and Parks for technical completeness. These proposals should include the following:

- A design showing the proposed location of the facility in relationship to nearby activities that could be affected by an emergency at the facility.
- Confirmation that their technology provider(s) assembling the completed battery storage system has been certified by an accredited body that the BESS conforms to all requirements of ANSI/CAN/UL 9540A and NFPA 855.
- Confirmation that the design of the project includes fire monitoring and suppression system in the design of the project.
- A detailed construction and commissioning plan, including the on-site expertise required from start of construction to connection to the grid.
- The proponents must confirm that noise emission from all aspects of the proposed project will meet the requirements of the noise by-law of the host municipality or not exceed 40 dBA nighttime, and 45 dBA daytime, at the closest receptor to the project during times when the receptor is downwind of the project site whichever is more restrictive. Where noise barriers are required to meet these standards, they would be shown in the design of the facility.
- The proponent must confirm that it has established an emergency plan, in conjunction with the local municipalities and fire authorities, in the event of a battery fire. This would include details on the resources that it is expected that the host municipality would provide.
- The proponent must confirm that its emergency plan includes a communication plan with nearby residents and the local communities in the event of a battery fire.
- The proponent must confirm that its emergency plan includes an evacuation strategy for nearby residents, and livestock if necessary, in the event that evacuation is required.

Once the MECP has confirmed that the plan is technically complete, the package would be presented to the community for comment and the municipality Council for review and approval.

Only after the project has been reviewed by MECP and approved by the host municipal council would the formal requests for building permits be initiated.

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Contact@windconcernsontario.ca

# **Battery Energy Storage Systems**

## **Assessment of Community Risks**

Multi-Municipal Wind Turbine  
Working Group  
March 9, 2023

# IESO New Capacity Initiatives

## Ministerial Directive – January 27, 2022

- Oneida Energy Storage – 250 MW

## Ministerial Directive – October 6, 2022

Program	Capacity		Decision
Expedited	1500 MW	Expansions or new projects	Feb 2023
Upgrades	300 MW	Improve facility; amend contract	Q1 2023
LT1 RFP	2200 MW	Expansions or new projects	Oct 2023

## Specific Requirements – October 7, 2022

- Storage - 1500 MW – Contracts up to 2047
- Natural Gas – 1500 MW – Contracts end in 2040

# Battery Storage Incidents

- Press report of 2021 fire at Tesla's 300 MW battery storage project in Victoria, Australia:

*“The fire started on the morning of Friday July 30 and was not brought under control until the afternoon of Monday August 2. More than 30 **fire trucks** and support vehicles and about **150 fire fighters** from the County Fire Authority and local Fire Rescue Victoria responded, containing the flames so they only **affected two Megapacks** of the approximately 210 that make up the system”.*

- Incident is not isolated – other reports from US

# **IESO's RFP Requirements**

## **Proposal/Contract Requirements**

- Price, financial arrangements
- Municipal Support
- Indigenous Engagement/Participation
- Community Engagement
- Meet “good engineering and operating practices”

## **Municipal Support Submission**

- Technology
- Location
- Capacity

## **Approval Process?**

# Standards for BESS Projects

## National Fire Protection Association

- Standard 855 – 2020; Revised 2023
- Significant safety hazards – toxic/flammable gases; fire intensity and explosion control

## Underwriters Laboratory

- ANSI/CA/UL9540 – April 2021
  - Fire detection/suppression/containment
- ANSI/CA/UL9540A - November 2019
  - Test methods at cell, module, unit & installation levels
  - Must meet performance criteria at each level

# Setback Requirements

## Hydro One

- Intense heat and smoke for prolonged periods represent increased risk to their system
- Setbacks of 250 m to 500 m from stations
- Setbacks of 150 m to 500 m from rights of way

## Other Rules

- 359/09 applies to specified renewable energy projects while other types of projects excluded
- Battery storage projects are not in either list.
- No known provincial setbacks.

## Municipal Zoning Rules

- Technology is too new to be covered in municipal zoning



# Noise Emissions

## Noise Issues Discussed at Meetings

- Focused on air cooling systems
  - Small projects would be allowed within noise by-laws
  - Noise emissions in large projects?
  - Need to be confirmed
- Regulation 359/09 outlines requirements for transformer stations associated with other renewable projects
  - Apply to Battery Storage?
- Need to include acoustic barriers in project design if required.

# Issues to Consider

## **Design Considerations**

- Management of toxic and explosive gases
- Dry sprinkler systems
- Access to large quantities of water
- Separation of modules to allow fire equipment access
- Acoustic barriers

## **Local Emergency Support Requirements**

- Specialized training for unique hazards
- Scale and duration of emergency situations
- Ability to handle toxic fumes and run-off

# Status of Known Projects

## Projects with Municipal Support

- Sault Ste. Marie – at least one supported
- Guelph – one project supported
- Lambton Shores - 3 Enbridge projects supported.
- Arran-Elderslie – Solar Flow Through Project supported
- City of Ottawa – one project supported

## Projects Refused Municipal Support

- Sault Ste. Marie – at least one declined
- Prince Edward County – rejected Solar Flow Through Project plus one other project
- Enniskillen – rejected one project

# Recommendations

- Add Battery Storage to Regulation 359/09
- Establish minimum setbacks from all activities
- Require design certification by an accredited body (UL9540A) and meets all standards (i.e. UL9540, and NFPA 855)
- Monitoring and fire containment systems linked to local emergency services
- Assessment of all noise emissions with abatement as required
- Emergency plan agreed with local authorities including specifications on support required
- Final package presented to municipal council for approval before permits issued.

Regular Meeting  
If Needed

MMEGWG 2023 MEETING SCHEDULE

January

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

February

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

March

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

April

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

May

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

June

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

July

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

August

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

September

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

October

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

November

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

December

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Multi-Municipal Wind Turbine Working Group  
Statement of Operations  
As of December 31, 2022  
With Four Year History, 2018 to 2021

	2022	2021	2020	2019	2018
<b>Balance Forward, January 1,</b>	<b>6,890.86</b>	<b>9,669.21</b>	<b>8,887.94</b>	<b>11,632.04</b>	<b>13,478.84</b>
<b>Activity for the year</b>					
<b>Revenue</b>					
Municipality of Arran-Elderslie	400.00		400.00	400.00	400.00
Municipality of Bluewater					400.00
Municipality of Brockton	400.00		400.00	400.00	400.00
Municipality of Central Huron	400.00		400.00	400.00	400.00
Township of Chatsworth	400.00		400.00	400.00	400.00
Municipality of Dutton Dunwich	400.00				
Township of Georgian Bluffs			400.00	400.00	400.00
Town of Grand Valley	400.00				
Municipality of Grey Highlands	400.00		400.00	400.00	400.00
Township of Huron-Kinloss	400.00		400.00	400.00	400.00
Municipality of Kincardine	400.00		400.00	400.00	400.00
Township of Melancthon	400.00				
Municipality of Meaford					400.00
Municipality of Northern Bruce Peninsula			400.00	400.00	-
Township of West Lincoln	400.00		400.00	400.00	-
	<u>4,400.00</u>	<u>-</u>	<u>4,000.00</u>	<u>4,000.00</u>	<u>4,000.00</u>
<b>Expenditures</b>					
Monthly contract costs		1,486.56	2,718.73	5,794.10	4,893.97
Gifts - bereavement/retirement		230.99			
Municipality of Arran-Elderslie (Jan-Dec)	3,040.96	1,060.80			
Donation - Chesley Fire Department			500.00	500.00	500.00
Donation - Durham Cemetery				50.00	
Analogue-Digital - DVD's					452.83
Return of funds to Municipality of Bluewater				400.00	
Paypro mail merge	32.93				
FIPPA	10.00				
MOECP - FOI	423.75				
	<u>3,507.64</u>	<u>2,778.35</u>	<u>3,218.73</u>	<u>6,744.10</u>	<u>5,846.80</u>
<b>Balance, End of Year</b>	<b>7,783.22</b>	<b>6,890.86</b>	<b>9,669.21</b>	<b>8,887.94</b>	<b>11,632.04</b>
<b><i>Total Funds held by Municipality of Arran-Elderslie</i></b>					

**Note:**

The Committee passed a resolution to waive membership fees for 2021.

Date Prepared: March 7, 2023

# INVOICE

Municipality - Arran-Elderslie  
PO Box 70  
1925 Bruce Rd 10  
Chesley ON N0G 1L0

## Customer Number

00000101072

General Receivables

Invoice Number: 0101520

Billing Date: MAR 06,2023

Due Date: APR 05,2023

MUNICIPALITY OF ARRAN-ELDERSLIE  
PO BOX 70  
CHESLEY, ONTARIO N0G 1L0

Description	Unit Charge	Qty	Amount
Invoice: 0101520 Multi-Municipal Wind Turbine Group/Services			
Recording Secretary Serv January	35.3600	6.00000	212.16
Recording Secretary Serv February	35.3600	5.00000	176.80
		Billing Amount:	388.96

Prev. Balance	0.00
Invoice Charges	388.96
Balance Due	388.96

Tax Reg: 87242 7158

A finance charge of 2% per month is added to balances not paid after 30 days.

Municipality - Arran-Elderslie  
Telephone - (519) 363-3039

E. &amp; O.E.

.....  
Please detach and return this portion with your payment.

00000101072  
MUNICIPALITY OF ARRAN-ELDERSLIE  
PO BOX 70  
CHESLEY, ONTARIO N0G 1L0

## General Receivables

Invoice Number: 0101520

Billing Date: MAR 6,2023

Due Date: APR 5,2023

Amount Due: 388.96

Amount Enclosed \$ \_\_\_\_\_

\*00000101072\*