Multi Municipal Energy Working Group

Battery Energy Storage Systems

Overview for Arran-Elderslie Council

December 11, 2023

New Capacity Sought by IESO

Program	Capacity	Type	Timing
Expedited	**930 MW**	**Electricity Storage Projects**	Awarded
	570 MW	Other Expansions	Awarded
Upgrades	300 MW	Improve facility; amend contract	Awarded
LT1 RFP	**1600 MW**	**Electricity Storage Projects**	Due Dec 12
	918 MW	Non Storage Projects	Due Dec 12

Specific Requirements

- Provide electricity on demand.
- Duration - up to 4 (storage) or 8 (non-storage) hours.
- Length of Contracts
  - Storage – end in 2047
  - Natural Gas - end in 2040
- 35 active BESS proposals identified with 6,200 MW.

IESO's RFP Process

- Proponent proposes to build and operate a facility
  - Specifies size in MW, location
  - Hydro One confirms grid capacity available
- Proposal includes fixed cost for facility
- Points used to reduce cost in evaluation process
  - Municipal Support – if yes, points awarded
    - If no, municipal support must be obtained later
  - Indigenous support – if yes, points awarded
- Contracts go to lowest bidder based on adjusted price
- Hydro One uses facility as required to fill gaps in supply
  - No usage fees – just a fixed monthly cost

Battery Energy Storage Systems

Operating Experience Suggests Caution

- Contain flammable electrolytes, can create unique hazards if the battery cell enters thermal runaway
- During thermal runaway, large amounts of flammable and potentially toxic battery gas generated
- Major toxic gases emitted can include CO, HF, NO2, HCL, - can pose very large threat to human health, a greater threat than the heat of the fire
- Tracking shows 32 destructive failures in 3 years since Dec. 2020. Some resulted in fatalities or serious injury of fire fighters

Emergency Response Required

- The response to a fire situation is often to let the affected battery section burn out - can take a day or multiple days.
- Fire crews need special training as some burning batteries can explode if water is used on the fire.
- Adjacent battery sections must be cooled with copious water. Dry sprinkler systems can used to direct cooling water.
- Need to consider handling of effluent fire protection water to prevent contamination of adjacent land and water courses.
- Need to ensure safety setbacks to residences, roads, etc. to protect against heat and toxic gases,
- Need to assess the ability of emergency services to provide this type of extended response.

Regulations Related to BESS

- BESS technology is new and evolving rapidly.
- Unlike wind projects, Regulation 359-09 provides no standards or guidelines for BESS projects.
- US standards available for reference
  - Fire Code – NFPA 855; UL Testing – 9540A
- Hydro One identified a substantial fire risk to its infrastructure and published standards that proponents need to meet to connect to grid.
- Ontario Fire Marshall reviewing fire safety requirements – decision expected in 6 months

Municipal Role in Process

- Requirement to provide support for projects includes responsibilities to evaluate projects
  - Need to fully understand BESS risks
  - Impact on municipal services
  - Decommissioning requirements
- Risk Management - joint/several liability
- Municipalities should complete a full evaluation of project before approving support resolution, site plans or building permits

Hydro One Required Assessments

- For approval, proponents must have completed:
  - Hazard Mitigation Analysis
  - Fire Risk Assessment
    - Community Risk Assessment
    - Air/Gas Dispersion Study
  - Fire Protection Design Documentation
    - Passive Fire Protection System
    - Active Fire Protection System
  - Emergency Response Plan
- Applies only to Hydro One infrastructure
- At a minimum, municipalities should be requesting similar studies.

Hydro One BESS Separation Distances

Hydro One Facilities	Setback Distance
Hydro One – 500 kV Right of Way	150 metres
Hydro One – 230 kV Right of Way	100 metres
Hydro One – 115 kV Right of Way	60 metres
Hydro One – 500 kV Substation	300 metres
Hydro One – 230 kV Switching Station	200 metres
Hydro One – 115 kV Switching Station	100 metres

- Hydro One rules focused on fire risk and apply only to its infrastructure
- Municipal setbacks also need to consider toxic gases
  - eg. – Southern California fire in Sept 2023 – evacuation zone of 400 metres; shelter indoors – 800 metres.
- Municipal zoning by-laws could include 800 metre setbacks

Prime Agricultural Land

- Siting of BESS projects on Prime Agricultural Land is concerning local communities and councils.
- Current Provincial Policy Statement places a high priority on protecting prime land.
- The draft PPS posted for comment in June allowed BESS projects as a secondary “Diversified Use” on prime agricultural land.
  - No definition in the PPS on how large BESS project can be before it is no longer a diversified use.
  - The new PPS will not be finalized until early 2024.

Inputs to Municipal Decision

- IESO requires proponents to provide minimal information to proponents – mainly size and location of project.
- IESO indicates that municipalities can request additional information from proponents.
- IESO sets out minimal notice requirements for public consultation.
  - Communities frequently learn of project after single consultation meeting has taken place.
- Municipality can request additional public meetings with proper notice to obtain input.

Municipal Considerations

- **Define Setbacks to Protect Adjacent Users**
  - Include other activities, property lines
- **Define Emergency Response Requirements**
  - Role of municipal services in responding to emergencies needs to be full documented. Annual training plan required.
- **Source of Water Supply for Emergencies**
  - If municipal water supply is not at site, the source of water to used for cooling in an emergency needs to be defined.
  - Some US sites maintain water on site.
- **Limits on Noise Emissions**
  - Project will contain equipment used 24/7 to cool modules
  - Impact on neighbouring properties needs to be established
- **Decommissioning Requirements**
- **Process for Change in Ownership**

Summary

- BESS technology is new and rapidly evolving.
- Limited direction from provincial level.
- Limited information provided to municipality.
- In supporting projects/issuing building permits, municipalities are making substantive decisions.

- Bottom Line: Municipalities have the right to decline support for the projects

Questions or Discussion