

Integrated Energy Resource Plan Consultation Response: Eden Energy Equipment Storage

Relevant documents referenced in this response

- [Ontario's Clean Energy Opportunity: report of the electrification and energy transition panel](#), EETP Dember 2023
- [LogisVert Efficient Homes Program](#), Hydro Quebec, Jan 2024
- [Dynamic Load Management Program](#), Long Island Power Authority, 2024
- [Swapping hot water tank with PCM thermal battery to cut gas consumption](#), NYSERDA house, NYSERDA
- [Thermal batteries reduce peak load in a New York office building](#), NYSERDA
- [Ontario's Affordable Energy Future: The Pressing Case for More Power](#), MOEE October 2024

Overarching Question:

- What policy options and actions should the government consider in the integrated energy resource plan to achieve Ontario's vision for meeting growing energy needs, keeping energy affordable and reliable, ensuring customer choice and positioning us to be an energy superpower?

The policy should be based upon the following pillars

1. Solutions with a short speed of deployment and policy that actually uses the existing, proven technology
2. Level playing field, don't try to choose winners
3. Solutions with the lowest whole system, lifetime cost
4. Solutions that can use our workforce with existing or easily transferable skills
5. Solutions that offer electric grid as well as decarbonization benefits

Thermal storage of heat is a proven method to reduce heating and cooling loads as well as grid peak reductions due to off peak charging of the thermal storage devices, electrical and natural gas supply reductions and electric system seasonal load balancing.

Thermal storage can be significantly improved in the performance and the physical size requirements by using Phase Change thermal storage. Traditional thermal storage devices use water or solid materials to store heat which only recovers sensible heat. This is the heat used to raise the temperature of the storage material. Phase Change thermal storage uses materials that change phase between solid and liquid. This is latent heat and is a very significant amount of extra heat that is stored due to this process.

Phase Change thermal storage devices are currently available in residential, commercial and industrial capacities. With no internal moving parts, they will have a long life with no maintenance requirements. They can be used for air or water heating and cooling as well as domestic water heating. Maximum benefits are in new applications but can also be used in retrofit situations.

Traditional skills are only needed for the installation of these devices. System life time costs are attractive compared to other traditional systems.

This type of product meets all of the pillars listed above.

Planning for Growth

- Building on the recommendations of the EETP's final report, what actions should be prioritized to enhance planning across natural gas, electricity, and other fuels?

In EETP's "Ontario's Clean Energy Opportunity" report they noted that "Participants across all streams of engagement shared their view that electrification of homes must be coupled with a reduction in energy demand to prevent overloading the grid. This requires pathways to make energy-efficient technologies affordable and accessible to the entire market. Participants saw a need to improve the effectiveness of such programs and allocate marketing budgets to engage with communities that can benefit the most." (page 52)

We support many EETP's recommendations such as:

"Recommendation 3: The provincial government should continue to seek alignment and coordination of clean energy economy objectives, standards and policies with other governments (within and outside Canada) whenever practical and consistent with the province's economic and policy interests." (page 126)

Other governments that have embraced programs that incentivise energy efficient, green solutions, two are listed below.

- Hydro Quebec LogisVert Efficient Homes Program where up to \$22,000 is available for systems that include thermal storage
- Long Island Power Authority Dynamic Load Management Program where up to \$250 per Kwh saved is available using thermal storage

"Recommendation 9: To ensure energy planning and policy development are supported by the best evidence available, the government should fund, on an ongoing basis, independent whole economy energy pathways studies, in a way that allows for iterative improvement of modelling and assumptions, transparency on costs, and with meaningful input from relevant stakeholders and Indigenous communities." (page 131)

We support using best evidence available and performing independent whole economy pathways studies and would like to participate if appropriate.

"Recommendation 10: To enable the effective evolution of innovative business models in line with clean energy economy goals and to help consumers benefit from electrification and the energy transition, the OEB and IESO should:

a. Continue encouraging experimentation by utilities, innovators, and new market entrants through platforms, such as the Grid Innovation Fund and the Innovation Sandbox program, and ensure appropriate resourcing of these programs

b. Regularly evaluate and build on these initiatives to advance successful projects beyond the pilot stage to broader adoption when appropriate, proactively identify any legislative and regulatory barriers to government, and ensure sustainable business models

c. Review opportunities to help consumers through electrification and the energy transition, including business model innovations that provide new products and services that enable consumers to finance the high up-front capital costs for building retrofits and fuel switching appliances in a fair and affordable manner” (page 132)

Attached are 2 field studies that would support this recommendation. The Latham NY office building report outlined load and peak load reductions possible with Phase Change thermal storage in an all electric domestic water heating application. The NY residential home report outlined natural gas load reductions as well as and peak load reduction possible with Phase Change thermal storage in a domestic water heating application.

- The government’s priority is to ensure Ontario has the energy resources it needs to support growth. Are there opportunities to enhance the province’s approach to procuring electricity generation supply to better serve this priority?

No additional comments

- What actions should government consider to promote greater access to electricity and accelerate grid-connections that will support economic growth, connecting new homes, and electrifying transportation and heating?

1. Increased skills training of existing contractors
2. Increased encouragement for people to enter into the contracting industry
3. Support on increasing productivity of the construction industry
4. Clear unbiased information to consumers on the direction of travel and what actions are going to be undertaken by LDC’s and utilities
5. Support the growth of manufacturing in Ontario for energy products

- As the need for new transmission infrastructure continues to grow, what steps can government take to ensure that transmitters have the certainty they require to move forward with development work as soon as possible, while also ensuring that competitive pressures keep costs as low as possible?

No additional comments

- What policy guidance should the government provide to the Ontario Energy Board (OEB) with respect to the long-term role of natural gas in Ontario's economy and opportunities for low-carbon alternatives in the gas system?

The OEB should also promote to the Utilities and LDC's the adoption of hybrid heating/cooling systems. Including Phase Change thermal storage can reduce gas load and electrical peak demand.

- How can the government best support Indigenous leadership and participation in energy planning and projects?

Investing in green, energy efficient technologies can have many benefits. In MOEE's "Ontario Affordable Energy Future" report regarding Indigenous Leadership and Participation, it states "Those communities see immediate and lasting economic benefits that come from their participation in energy projects, including stable streams of revenue and knock-on benefits such as increased opportunities for indigenous businesses, job creation and skills development." (page 24)

One such example is what was reported in the Winnipeg Free Press article "More Peguis, Fisher River First Nations homes to get geothermal heating" more than 200 homes were retrofitted with ground source heat pumps. David Crate, the Fisher River Cree Nation Chief stated "this is an excellent first step to us becoming energy independent. Crate added the agreements mean work crews will add to their experience, allowing them to branch out and eventually work off-reserve in non-First Nations communities"

- How can provincial planning processes be enhanced to support high growth regions, ensure greater coordination between energy resources, and better integrate municipal, distributor and regional planning processes?

No additional comments

- What cooperation opportunities exist across other jurisdictions to support energy trade, construction of transmission infrastructure (ex. pipelines and interties), and transportation electrification?

No additional comments

- What types of technical information and forecasts would best support sector participants and energy consumers as the system is built out for growth and the economy increasingly electrifies?

The consumer needs to be informed of the actual space and water heating operating costs of all their energy options. That information should also include, system life expectancy and carbon footprint for all the options.

This is supported by statements in the MOEE “Ontario’s Affordable Energy Future” report (page 28)

“Priorities for Helping Ontarians Save through Energy Efficiency:

- There is an opportunity to expand energy efficiency to help consumers lower their energy costs and to help offset investments in new, more expensive electricity infrastructure.
- Households, businesses and institutions would benefit from easier-to-access information about their energy use to make informed decisions about their building’s energy performance, through streamlined processes that protect consumer information.
- Encouraging and supporting consumers who want to reduce their overall energy use to save money and lower emissions should be a continued priority over the long term.”

Affordable and Reliable Energy

- What further steps should the government take to enable households and businesses to manage and make informed decisions about their energy use?

Energy providers should use every opportunity available to communicate smart and affordable energy strategies to homeowners. An integrated public and private information campaign to teach Ontarians about technologies like Phase Change thermal storage would drive a more unified and informed approach to energy success.

- What actions could the government consider to ensure the electricity system supports customers who choose to switch to an electric vehicle?

No additional comments

- What actions should government consider that would empower customers to install innovative technologies to generate or store energy on-site to reduce costs and improve resiliency?

Improve or initiate incentive programs to empower customers to install innovative technologies to generate or store energy on-site to reduce costs and improve resiliency. These programs are delivered in Ontario by the IESO through the Save on Energy brand. Many of these programs are restricted to income-eligible residents, to certain geographic locations, existing fuel types and types of residences or business classifications. The programs should be open to all and have a stated multi-year duration. They also should be of a large enough significant to engage the customers.

- What specific actions could position the integrated energy resource plan to best leverage distributed energy resources (DER) that enhance local and province wide grids to support energy system needs reliably and at the lowest cost?

No additional comments

- What policy or regulatory changes should government consider to address financial risks and support adoption of DER in the long-term?

No additional comments

- With the energy sector evolving and distributors considering new roles in serving customers, what barriers exist that limit local distribution companies from taking on new duties that could enable more efficient grid operations, leverage new technologies and further the integration of DERs?

No additional comments

- What actions can the government take to enhance collaboration between the OEB, the IESO, local distribution companies, industry stakeholders, and local communities to support the investment and integration of DER?

No additional comments

- What further actions could the government take to maintain an affordable energy system for Ontarians throughout the energy transition?

System wide modelling including both thermal and electrical storage should be incorporated and up-dated yearly. The interplay between the thermal demand and the electricity demand should be included as storage in the form of thermal networks, thermal batteries and electrical batteries supporting thermal demand driven peaks on the electricity network are key to installing the most economical efficient generation.

Gas will continue to play an important part of ensuring that the glide to net zero by 20250 will be affordable and secure. However, new gas pipeline expansion should be thoroughly investigated as 5th generation ambient thermal networks installed would encourage and support a more prosumer interaction with the energy grid and network systems.

LDC's will become an important component to delivery. There needs to be the ability for their customers to compare their LDC against other LDC's in terms of price, customer service, carbon content of the kWh delivered either in electricity or thermal energy (i.e. heating or cooling).

LDC's can react and drive their policies at the speeds needed to achieve Ontario's vision for meeting growing energy needs, keeping energy affordable and reliable, ensuring customer choice and positioning us to be an energy superpower.

Becoming an Energy Superpower

- What opportunities exist to further capitalize on Ontario's leadership and expertise in nuclear technology and nuclear innovation?

No additional comments

- What opportunities should Ontario consider to leverage its position as a clean energy leader?

No additional comments