# Save Georgian Bay from *Ontario's Worst Energy Mistake*

| Proposed Pump Storage Project | Save Georgian Bay |
|---|---|
| TC Energy is proposing to develop an energy storage facility that would provide 1,000 megawatts of flexible, clean energy to Ontario's electricity system using a process known as pumped storage. | Save Georgian Bay, a Meaford-based citizen's group with supporters across the region, opposes TC Energy's proposed pumped storage project co-located at the existing 4th Canadian Division Training Centre on Department of National Defence (DND) lands in Meaford (on the Niagara Escarpment and in Georgian Bay). |

# Save Georgian Bay from *Ontario's Worst Energy Mistake*

## Environmental Impact

TC Energy's proposed pumped storage project is <u>not</u> an environmentally responsible solution for Ontario.
The location of the facility on the Niagara Escarpment and in Georgian Bay will result in significant environmental harm to both Georgian Bay as well as to the Niagara Escarpment (a UNESCO World Biosphere Reserve). This harm will be caused both during the construction of the facility as well as during the operation of the facility.

## Alternate More Environmentally Responsible Solutions

Increasing power demand, a desire to phase out natural gas-fired generation, and an expected decommissioning of nuclear plants are realities facing Ontarians. Storage is an important part of the solution.

However, **there are alternative more environmentally responsible solutions.**

**<u>Closed loop</u> pump storage:** <u>Closed loop</u> projects pose less environmental impacts than TC Energy's proposed <u>open loop</u> pump storage project.

**Battery storage facilities:** Battery projects (such as the Oneida Battery Storage project) pose less environmental impacts than TC Energy's proposed pump storage project.

## Alternate More Economically Responsible Solutions

**TC Energy's proposed pump storage project does not provide value to Ontario ratepayers or taxpayers**.

The IESO (Independent Electricity System Operator) concluded that "*TCE's proposal did not provide sufficient value to Ontario's electricity consumers."* Savings are estimated to approximately $11/person/year, less than what an individual would save by changing a single incandescent bulb to an LED.

The estimated $4.3 billion dollar cost of TC Energy's proposed pump storage project poses a significant burden on Ontario taxpayers who will bear the cost of the project in their taxes.

**There are alternative more economic solutions.**

Buying from Hydro Quebec: The Ontario Clean Air Alliance notes that twice the amount of energy can be acquired from Hydro Quebec for $80m. That's 98% lower than the $4.3 billion cost of TCE's proposed Ontario Pumped Storage plant.

Battery Storage: The IESO has recently entered into a 10-year energy contract for the Oneida Battery Storage project. IESO advanced the Oneida project to Gate 3 at the same time that it rejected TC Energy's proposal at Gate 1. This demonstrates the economic and technological viability of battery storage.

## Community Impact

The jobs that TC Energy will create are temporary in nature, not adding long term value to the local economy.

Worker unavailability as well as a lack of technical skills and capacity will likely result in the required labor force and associated goods and services not being fully supplied locally.

A large influx of temporary workers (and potentially their families) to a region can lead to adverse social and environmental impacts on local communities, especially if the communities are rural, remote or small. Such adverse impacts are usually amplified by local-level low capacity to manage and absorb the incoming labor force.

## Public Health & Safety

The reservoir will be located above a residential neighbourhood. Even the smallest risk of a reservoir breach is not worth the catastrophic consequences to lives and property that would occur if the reservoir fails.

TC Energy has a history of low environmental intelligence.

TC Energy has a poor environmental track record.

TC Energy lacks experience with pumped storage projects. In fact this would be their first.

## Ethical Concerns

TC Energy's proposed pump storage project would be co-located at the existing 4th Canadian Division Training Centre on Department of National Defence (DND) lands in Meaford (on the Niagara Escarpment and in Georgian Bay). This land was appropriated from home and farm owners on July 21, 1942 in support of the war effort. It is unethical for this land to be used for commercial profit.

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# Environmental Impact

| TCE's Message | SGB's Message |
|---|---|
| The project's zero emission footprint makes it an environmentally responsible energy solution for Ontario that will also help Canada reduce greenhouse gas emissions. | **TC Energy's proposed pumped storage project is <u>not</u> an environmentally responsible solution for Ontario.**<br><br>**1) The location of the facility on the Niagara Escarpment and in Georgian Bay will result in significant environmental harm** to both Georgian Bay as well as to the Niagara Escarpment (a UNESCO World Biosphere Reserve). This harm will be caused **both during the construction of the facility as well as during the operation of the facility.**<br><br>**I. Environmental harm caused by the construction would include:**<br>a. 500 acres of Niagara Escarpment land clearcut to build:<br>i. a 375 acre (equivalent to 284 football fields), 20m/67ft high (equivalent to a 5 storey building) above ground concrete reservoir;<br>ii. Water intake/outfall pipes;<br>iii. Underground powerhouse;<br>iv. High Voltage underwater transmission lines from Meaford to Wasaga Beach and above ground from Wasaga Beach to Staynor.<br>*(Source: https://www.ontariopumpedstorage.com/siteassets/about/design/map/images/reservoirrockfill.jpg)*<br><br>b. Trucks going to and from the construction site along 7th Line and GR 112 resulting in an estimated 300,000 tonne increase in C02 emissions and other airborne contaminants.<br><br>**II. Environmental harm caused by the operation of the facility would include:**<br>a. The daily pumping and flushing of 23 million cubic meters (23 billion litres) of Georgian Bay water will kill fish, disrupt the aquatic ecosystem and shoreline, and cause water turbidity. |

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## Alternate More Environmentally Responsible Solutions

| TCE's Message | SGB's Message |
|---|---|
| The project will reduce the need for reliance on natural-gas-fired power generation.<br><br>Pumped hydro storage is the most environmentally responsible and economic energy storage solution available. | Increasing power demand, a desire to phase out natural gas-fired generation, and an expected decommissioning of nuclear plants are realities facing Ontarians. Storage is an important part of the solution.<br>*(Source: https://www.ieso.ca/en/Powering-Tomorrow/2018/Whats-the-big-deal-about-energy-storage).*<br><br>However, **there are alternative more environmentally responsible solutions.**<br><br>**1) Closed loop pump storage:** Closed loop projects pose less environmental impacts than TC Energy's proposed open loop pump storage project. The other pumped storage project currently being considered by the IESO is the Marmora PSP. This project is a closed-loop system located at an abandoned mine site. This PSP will revitalize a brownfield site and enhance the environment.<br>*(Source: https://themeafordindependent.ca/georgian-bay-pumped-storage-plant-is-far-from-being-a-done-deal/)*<br><br>**2) Battery storage facilities:** Battery projects (such as the Oneida Battery Storage project) pose less environmental impacts than TC Energy's proposed pump storage project. Battery storage:<br>I. Can be built along existing transmission lines where it is most needed and doesn't require a long transmission corridor or underwater line<br>II. Won't destroy the lands and waters of the Niagara Escarpment and Georgian Bay<br>III. Won't kill fish<br>*(Source: https://themeafordindependent.ca/georgian-bay-pumped-storage-plant-is-far-from-being-a-done-deal/)* |

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# Alternate More Economically Responsible Solutions

| TCE's Message | SGB's Message |
|---|---|
| At 1,000 MW, the project will be Ontario's biggest battery, storing enough clean carbon-free electricity to power nearly a million homes. The project will ensure Ontario gets the most value from its power generation, storing excess energy at night, during periods of low demand, and providing an energy balance by delivering that stored energy during the day, at times of extreme weather, during periods of high demand, reliably and responsibly. The project will save Ontario ratepayers $250 million per year | **1) TC Energy's proposed pump storage project does not provide value to Ontario ratepayers or taxpayers.**<br><br>**I. The IESO (Independent Electricity System Operator) concluded that "*TCE's proposal did not provide sufficient value to Ontario's electricity consumers.*" Savings are estimated to approximately $11/person/year, less than what an individual would save by changing a single incandescent bulb to an LED.**<br>*(Source: https://themeafordindependent.ca/georgian-bay-pumped-storage-plant-is-far-from-being-a-done-deal/)*<br><br>**II. The estimated $4.3 billion dollar cost of TC Energy's proposed pump storage project poses a significant burden on Ontario taxpayers and ratepayers who will bear the cost of the project.**<br><br>**2) There are alternative more economic solutions.**<br><br>**I. Buying from Hydro Quebec:** The Ontario Clean Air Alliance notes that twice the amount of energy can be acquired from Hydro Quebec for $80m. That's 98% lower than the $4.3 billion cost of TCE's proposed Ontario Pumped Storage plant.<br>*(Source: The Clean Air Alliance https://www.cleanairalliance.org*<br><br>**II. Battery Storage:** The IESO has recently entered into a 10-year energy contract for the Oneida Battery Storage project. IESO advanced the Oneida project to Gate 3 at the same time that it rejected TC Energy's proposal at Gate 1. This demonstrates the economic and technological viability of battery storage. The capital cost for the Oneida project is approximately $500,000/MWh, in comparison with a capital cost for TC Energy's PSP which is closer to $600,000/MWh. Oneida is also 95% to 98% efficient, while the Georgian Bay PSP is only 70% efficient (it uses 30% more energy than it generates).<br>*(Source: https://themeafordindependent.ca/georgian-bay-pumped-storage-plant-is-far-from-being-a-done-deal/)* |

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**Community Impact**

| TCE's Message | SGB's Message |
|---|---|
| The project will create 1,000 jobs during development and construction. Once in operation, it is anticipated the facility will employ approximately 20 permanent positions.<br><br>The project is also expected to have a significant positive impact on local community economies during operation through the creation of skilled jobs, purchasing of local goods and services (e.g. equipment parts, fabrication, consulting, construction services, labour, materials such as gravel, etc.) and the associated indirect and induced financial benefits. | 1) The jobs that TC Energy will create are temporary in nature, not adding long term value to the local economy.<br><br>2) Worker unavailability as well as a lack of technical skills and capacity will likely result in the required labor force and associated goods and services not being fully supplied locally.<br><br>3) A large influx of temporary workers (and potentially their families) to a region can lead to adverse social and environmental impacts on local communities, especially if the communities are rural, remote or small (such as the Municipality of Meaford). Such adverse impacts are usually amplified by local-level low capacity to manage and absorb the incoming labor force. Such impacts may include:<br>I. increased demand and competition for local social and health services<br>II. Increased demand and competition for goods and services, which can lead to price hikes and crowding out of local consumers<br>III. increased volume of traffic and higher risk of accidents<br>IV. increased demands on the ecosystem and natural resources<br>V. social conflicts within and between communities<br>VI. increased risk of spread of communicable diseases<br>VII. increased rates of illicit behavior and crime.<br><br>Source: https://thedocs.worldbank.org/en/doc/497851495202591233-0290022017/original/ManagingRiskofAdverseimpactfromprojectlaborinflux.pdf |

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**Public Health & Safety**

| TCE's Message | SGB's Message |
|---|---|
| "We will do no harm," stated by John Mikkelsen, TCE Project Director | 1. The project requires construction on the escarpment habitat of many species. It will require using hazardous drilling chemicals which would likely leak into Georgian Bay waters and using equipment adding CO2 to the atmosphere.<br><br>2. TC Energy has a history of low environmental intelligence. TC Energy has a poor environmental track record, "*"According to the National Energy Board, 17 of the 39 major pipeline accidents in Canada (from 1992 to 2014) were on pipelines owned by TransCanada or its subsidiary NGTL."*<br>*(Source: Unplugging the Dirty Energy Economy, Polaris Institute, June 2015)*<br><br>2. The reservoir will be located above a residential neighbourhood. Even the smallest risk of a reservoir breach is not worth the catastrophic consequences to lives and property that would occur if the reservoir fails.<br>(Source: **Safety of Quebec dams in spotlight again after forced evacuations** In 2015, Quebec's auditor general report found only 10 per cent of the province's 5,900 dams fulfilled security obligations. **René Bruemmer** • Montreal Gazette<br>Apr 27, 2019)<br><br>3. TC Energy lacks experience with pumped storage projects, this would be their first. |
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**Ethical Considerations**

| TCE's Message | SGB's Message |
|---|---|
| | 1) TC Energy's proposed pump storage project would be co-located at the existing 4th Canadian Division Training Centre on Department of National Defence (DND) lands in Meaford (on the Niagara Escarpment and in Georgian Bay). This land was appropriated from home and farm owners on July 21, 1942 in support of the war effort. It is unethical for this land to be used for commercial profit.<br>*(Source: https://greyroots.com/story/home-range-meaford-tank-range-story)* |

Save Georgian Bay Analysis

**Comparison: PSP v. Oneida**

| Pumped Storage vs. Battery Storage Power Comparison | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Capital Cost | | Time to Online | | Community Footprint | | |
| Plant Type | Construction Cost ($M) | Operating Cost ($M/10 year) | Permit Time (Years) | Construction Time (Years) | Total Area Required (Acres) Land and Water | Bay Area Area Required (Acres) | Community Impact |
| TCE PSP Meaford DND | $4,300 | | 5 | 5 | 600 | 130 | Significant |
| Oneida Type Battery Plant | $500 | | 1 | 1.5 | 10 | 0 | Minimal |
| Eight Oneida Type Battery Plants | $4,000 | | 1 | 1.5 | 80 | 0 | Minimal |
| Eight Oneida w Synergy* | $3,000 | | 1 | 1.5 | 40 | 0 | Minimal |
| | *Reduced redundancies | | | | | | |


# Save Georgian Bay Analysis
## **Comparison: PSP v. Oneida**

| | Power and Efficiency | | | | | | |
|---|---|---|---|---|---|---|---|
| Plant Type | Location | Power Output (MegaWatt Hours/day) | Generation Efficiency (%) | Distance to Power Grid (Km) | Transmission Line Loss - both directions (%) | Net Efficiency (%) | Net Power Delivered to Grid (MegaWatts/Day) |
| TCE PSP Meaford DND | 80km from Grid | 8000 | 70 | 80 | 10 | 60 | 7600 |
| Oneida Type Battery Plant | At Grid | 1000 | 90 | 0 | 0 | 90 | 4000 |
| Eight Oneida Type Battery Plants | At Grid | 8000 | 90 | 0 | 0 | 90 | 8000 |
| Eight Oneida w Synergy* | At Grid | 8000 | 90 | 0 | 0 | 90 | 8000 |

Save Georgian Bay Analysis

**Comparison: PSP v. Oneida**

| | Cost to Ratepayers | | | | |
|---|---|---|---|---|---|
| Plant Type | Estimated Capital Cost ($Billion) | Cost with Risk Factors ($Billion)*** | Excess Ratepayer Cost for Power for PSP Option ($million per year) | Lost Power Savings to Ratepayers PSP v. Oneida | Best Option |
| TCE PSP Meaford DND | $4.30 | $8.26 | $288 | No Savings | X |
| Oneida Type Battery Plant | $0.50 | $0.50 | $0 | 4 to 1 over PSP | ✓ |
| Eight Oneida Type Battery Plants | $4 | $4 | $0 | 4 to 1 over PSP | ✓ |
| Eight Oneida w Synergy* | $3 | $3 | $0 | 4 to 1 over PSP | ✓ |
| | | ***Oxford University Study reports average hydro power project runs 92% over original estimated cost. Consider Muskrat Falls. | | | |

Save Georgian Bay Analysis

**Comparison: PSP v. Oneida**

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| TCE PSP Meaford DND | $4.30 | $8.26 | $288 | No Savings | X |
| Oneida Type Battery Plant | $0.50 | $0.50 | $0 | 4 to 1 over PSP | ✓ |
| Eight Oneida Type Battery Plants | $4 | $4 | $0 | 4 to 1 over PSP | ✓ |
| Eight Oneida w Synergy* | $3 | $3 | $0 | 4 to 1 over PSP | ✓ |
| | | ***Oxford University Study reports average hydro power project runs 92% over original estimated cost. Consider Muskrat Falls. | | | |

Save Georgian Bay Analysis

**Comparison: PSP v. Oneida**

***In Every Category the TCE PSP is Ontario's Worst Energy Mistake!***

| Plant Type | Capital Cost Best Option | Cost To Raterpayers Best Option | Environmental Impact Best Option | Power and Efficiency Best Option | Community Footprint Best Option | Time To Online Best Option |
|---|---|---|---|---|---|---|
| TCE PSP Meaford DND | X | X | X | X | X | X |
| Oneida Type Battery Plant | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Eight Oneida Type Battery Plants | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Eight Oneida w Synergy* | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**SaveGeorgianBay.ca**