CHIEFS OF ONTARIO

# FIRST NATIONS ENERGY TOOLKIT

**Toolkit 3: Case studies and best practices for First Nations energy projects**

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## Toolkit 3: Case studies and best practices for First Nations energy projects

### Purpose and overview

Toolkit 3 is designed to inspire and guide First Nations communities by showcasing real-world examples of successful energy projects. It highlights case studies, proven strategies, and best practices that combine environmental stewardship, energy independence, and economic resilience. This toolkit empowers communities to replicate or adapt innovative energy solutions while addressing their unique cultural, geographic, and energy needs.

### Key insights

- **Proven pathways to success**: Case studies of impactful projects, such as the Oneida Energy Storage Facility and Wataynikaneyap Power Project, demonstrating solutions to challenges like energy sovereignty, economic development, and emissions reduction.
- **Practical applications**: Examples of how communities have implemented solar, wind, and bioenergy projects, showcasing actionable steps and lessons learned.
- **Knowledge transfer and decision-making**: Insights into overcoming barriers, building partnerships, and enhancing community-driven energy initiatives.
- **Community engagement**: Strategies to foster collaboration, inspire action, and build leadership capacity.

### How to use this toolkit

Toolkit 3 is a resource for community leaders, energy champions, and decision-makers to:

1. **Explore regional context**: Explore regional energy opportunities and challenges in **Northern and Southern Ontario**, considering geographic, economic, and social factors to inform your approach.
2. **Examine case studies**: Learn from detailed examples of First Nations-led renewable energy projects. Each case study highlights successes, challenges, and solutions, offering actionable insights.
3. **Apply best practices**: Use lessons from other communities to overcome barriers like funding or infrastructure limitations, engage stakeholders effectively, and build leadership and capacity within your community.
4. **Integrate with other toolkits**: *Toolkit 1*: Foundational energy knowledge and advocacy skills and *Toolkit 2*: Practical community-based energy solutions.

## 1. Why case studies and best practices matter for First Nations

First Nations in Canada are at the forefront of adopting renewable energy solutions that align with their cultural values, economic aspirations, and commitment to environmental stewardship. These communities exemplify how innovative energy approaches can harmonize sustainability with local economic development, driving transformative change at the community level[1]. Examining case studies allows First Nations to gain insights into how others have successfully turned ambitious energy goals into practical, impactful outcomes. These success stories provide inspiration and actionable blueprints for addressing common challenges and maximizing the potential of renewable energy projects.

**Importance of case studies and best practices for First Nations**

Case studies and best practices are crucial for First Nations, particularly in the context of renewable energy projects. They provide valuable insights into successful governance models and community engagement strategies. For instance, the case studies of the Ojibway Pic River First Nation and the NaiKun Offshore Wind Project highlight the importance of participatory governance and community control in renewable energy projects. These examples demonstrate how inclusive planning and community ownership can lead to sustainable energy futures that align with the long-term visions of First Nations[2]. Additionally, the case study of Poplar Hill First Nation illustrates the complexities of energy transitions in remote communities, emphasizing the need for community engagement and understanding of local contexts to achieve self-sufficiency and sustainable development[3].

**Importance of case studies and best practices for energy planning**

In the realm of energy planning, case studies and best practices serve as essential tools for understanding the diverse challenges and opportunities associated with transitioning to renewable energy systems. For example, the National Renewable Energy Laboratory (NREL) has identified best practices for community energy planning, which include data-driven approaches and equitable planning processes. These practices are informed by extensive experience and literature reviews, providing a framework for communities to effectively manage their energy transitions[4]. Furthermore, the analysis of local energy initiatives in Saerbeck, Germany, and Lochem, the Netherlands, underscores the significance of strategic leadership and community involvement in successful energy transitions. These best

[1] Government of Canada. (2023). Indigenous energy projects and initiatives. Retrieved from https://www.canada.ca/en/natural-resources-canada/news/2023/11/government-of-canada-announces-10-indigenous-communities-advancing-clean-energy-solutions.html

[2] Krupa, J., Galbraith, L., & Burch, S. (2015). Participatory and multi-level governance: applications to Aboriginal renewable energy projects. Local Environment, 20, 101 - 81. https://doi.org/10.1080/13549839.2013.818956

[3] Rakshit, R., Shahi, C., Smith, M., & Cornwell, A. (2019). Energy transition complexities in rural and remote Indigenous communities: a case study of Poplar Hill First Nation in northern Ontario*. Local Environment, 24, 809 - 824. https://doi.org/10.1080/13549839.2019.1648400

[4] Ross, L., & Day, M. (2022). Community Energy Planning: Best Practices and Lessons Learned in NREL's Work with Communities. https://doi.org/10.2172/1883201

practices highlight the importance of building networks, managing expectations, and facilitating learning to support local energy initiatives[5].

## 2. Regional energy context

The energy landscapes of Northern and Southern Ontario not only present distinct opportunities and challenges for First Nations but also align closely with Canada's broader energy strategy. Projects like the Wataynikaneyap Power Project, Oneida Energy Storage, and the Henvey Inlet Wind Farm exemplify how First Nations leadership is driving progress toward achieving the objectives of Canada's 2030 Emissions Reduction Plan, the Clean Energy for Indigenous Communities Program, and the National Net-Zero Emissions by 2050 Commitment.

These projects support federal and provincial energy policies by:

- ✓ Reducing reliance on diesel and fossil fuels, contributing to significant greenhouse gas emissions reductions.
- ✓ Strengthening Indigenous participation in renewable energy, advancing reconciliation and self-determination.
- ✓ Creating local jobs and fostering green economic development in both remote and urban settings.

By emphasizing cultural preservation, environmental stewardship, and economic resilience, these First Nations-led initiatives are not only transforming local energy systems but also setting benchmarks for meeting Canada's clean energy and net-zero goals.

### 2.1 Northern Ontario: Advancing energy sovereignty in remote communities

Northern Ontario is characterized by vast, sparsely populated territories and remote First Nations. These geographic realities create significant energy generation and distribution challenges, such as reliance on costly and environmentally harmful diesel generators. Despite these obstacles, Northern Ontario offers opportunities for transformative renewable energy projects that reduce emissions, enhance energy reliability, and strengthen local governance.

[5] Hoppe, T., Graf, A., Warbroek, B., Lammers, I., & Lepping, I. (2015). Local Governments Supporting Local Energy Initiatives: Lessons from the Best Practices of Saerbeck (Germany) and Lochem (The Netherlands). Sustainability, 7, 1900-1931. https://doi.org/10.3390/SU7021900

## KEY CHALLENGES

1. **Reliance on diesel generators**: Many remote First Nations depend on diesel for electricity, incurring high costs and environmental impacts. For instance, Fort Severn First Nation spent a significant portion of its annual budget on diesel transportation before transitioning to solar energy[6]. Diesel reliance also increases greenhouse gas emissions, making energy alternatives critical[7].
2. **Geographical isolation**: Seasonal transportation routes, like ice roads and airstrips, limit the delivery of materials and technical expertise. The Fort Severn Solar Project overcame logistical challenges by strategically transporting solar components during accessible seasons[8]. Geographic barriers further exacerbate energy access issues, particularly in northern and remote Ontario communities.
3. **Infrastructure gaps**: Limited access to Ontario's main electricity grid has driven the adoption of localized energy solutions, such as the Wataynikaneyap Power Project, which connects remote communities to reliable energy sources[9]. Infrastructure gaps are further highlighted in reports by the Ontario Energy Board[10] and the IESO's Indigenous Energy Support Program[11].

## OPPORTUNITIES AND FIRST NATIONS-LED SOLUTIONS

1. **Solar microgrids**: First Nations are demonstrating leadership in adopting solar microgrids to reduce diesel reliance and enhance energy sovereignty. Projects like the **Gull Bay Microgrid** have achieved a 25% reduction in diesel use, lowered greenhouse gas emissions, and provided consistent energy access, serving as a replicable model for other communities[12][13].

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[6] International Energy Agency. (2023). *Clean Energy for Rural and Remote Communities Program*. Retrieved from https://www.iea.org/policies/17863-canadas-clean-energy-for-rural-and-remote-communities

[7] Hedgehog Technologies. *Fort Severn Solar Project*. Retrieved from https://www.canadianconsultingengineer.com/awards/pdfs/2020/G-04_Hedgehog_FortSevernSolarProject_Entry.pdf

[8] Hedgehog Technologies. *Fort Severn Solar Project*. Retrieved from https://www.canadianconsultingengineer.com/awards/pdfs/2020/G-04_Hedgehog_FortSevernSolarProject_Entry.pdf

[9] Wataynikaneyap Power. (2024). *Wataynikaneyap Power Completes Construction of "the Line that Brings Light".* Retrieved from https://www.wataypower.ca/updates/wataynikaneyap-power-completes-construction-of-the-line-that-brings-light

[10] Ontario Energy Board. (2022). *Electricity Grid Access for Remote Communities*. Retrieved from https://www.bing.com/ck/a?!&&p=e063722a6bb14e7fbfb42494f362ed13148f37f77481330c2e092a5c39445240JmltdHM9MTczNTM0NDAwMA&ptn=3&ver=2&hsh=4&fclid=00f8b1e7-447f-6c6e-076a-a52a45d56d3d&psq=Ontario+Energy+Board.+(2022).+Electricity+Grid+Access+for+Remote+Communities&u=a1aHR0cHM6Ly93d3cucmRzLm9lYi5jYS9DTVdlYkRyYXdlci9SZWNvcmQvNzQzOTU0L0ZpbGUvZG9jdW1lbnQ&ntb=1

[11] Independent Electricity System Operator (IESO). (2023). *Indigenous Energy Support Program*. Retrieved from https://www.ieso.ca/en/Get-Involved/Indigenous-Relations/Indigenous-Energy-Support-Program/IESP-Overview

[12] International Brotherhood of Electrical Workers. (2019). *First remote energy storage microgrid in Gull Bay Indigenous community*. Retrieved from https://ibewcco.org/news/first-remote-energy-storage-micro-grid-gull-bay-indigenous-community/

[13] Government of Canada. (2019). Government of Canada supports renewable energy alternatives in Indigenous and northern communities. Retrieved from https://www.canada.ca/en/crown-indigenous-relations-northern-affairs/news/2019/05/government-of-canada-supports-renewable-energy-alternatives-in-indigenous-and-northern-communities.html

2. **Hydropower projects**: First Nations-led hydropower projects showcase the potential of renewable energy to create long-term economic and environmental benefits:
    - **The Wataynikaneyap Power Project**: 51% owned by First Nations, connects 24 communities to Ontario's power grid, reducing diesel use by 6.6 million liters annually and creating economic opportunities through equity stakes and employment[14][15].
    - **The Smoky Falls Generating Station Redevelopment**: Modernized aging infrastructure, increasing capacity to 267.9 MW while ensuring revenue-sharing and employment opportunities for the Moose Cree First Nation[16].
3. **Community governance and ownership**: First Nations are setting national benchmarks for self-determination in energy planning through equity ownership and decision-making roles. Projects like **Wataynikaneyap Power** not only provide long-term revenue but also strengthen Indigenous governance, ensuring that energy development aligns with traditional land and economic priorities[17][18].
4. **Emerging technologies**:
    - **Small Modular Reactors (SMRs)**: Highlighted in Canada's SMR Action Plan, SMRs offer a low-carbon energy solution for remote communities. First Nations involvement is critical in shaping the future of this technology to ensure it aligns with community needs and values[19][20].
    - **Hydrogen energy**: Hydrogen is emerging as a sustainable energy carrier with the potential to complement renewable systems like solar and hydropower. Pilot projects in Northern Ontario are showcasing its feasibility for remote communities[21].

### 2.2 Southern Ontario: Innovation for urban and semi-urban contexts

Southern Ontario, with its dense population centers and developed energy infrastructure, presents a unique opportunity for scaling renewable energy initiatives led by First Nations. These projects not only address high urban energy demands but also serve as examples of how renewable energy systems can be integrated into existing urban and semi-urban contexts. Leveraging cutting-edge technologies,

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[14] Wataynikaneyap Power. (2022). *Wataynikaneyap Power Reaches Major Milestone!*. Retrieved from https://www.wataypower.ca/updates/wataynikaneyap-power-reaches-major-milestone

[15] The Narwhal. (2022). *How Indigenous-led Wataynikaneyap Power is bringing renewable energy to remote Ontario communities*. Retrieved from https://thenarwhal.ca/ontario-indigenous-energy-watay-power/

[16] Ontario Power Generation. (2015). *Lower Mattagami Project Complete*. Retrieved from https://archive.opg.com/pdf_archive/Media%20Releases/H150_20150119LowerMattagamiProjectComplete.pdf

[17] Wataynikaneyap Power. (2024). *The Partnership*. Retrieved from https://www.wataypower.ca/ownership/partnership

[18] Independent Electricity System Operator. (2023). *Indigenous Energy Support Programs Funding Increase and 2023 Recipients Announced*. Retrieved from https://www.ieso.ca/en/Sector-Participants/IESO-News/2023/11/Indigenous-Energy-Support-Programs-Funding-Increase-and-2023-Recipients-Announced

[19] Natural Resources Canada. (2021). *Canada's Small Modular Reactor Action Plan*. Retrieved from https://smractionplan.ca/

[20] First Nations Power Authority. (2021). *FNPA on Canada's SMR Action Plan*. Retrieved from https://fnpa.ca/2021/12/09/national-smr-forum-with-indigenous-communities-2/

[21] Ontario Ministry of Energy. (2023). Ontario Investing in Hydrogen to Fuel Province's Growing Economy. Retrieved from https://news.ontario.ca/en/release/1003639/ontario-investing-in-hydrogen-to-fuel-provinces-growing-economy

strategic partnerships, and innovative approaches, these initiatives balance economic development, cultural preservation, and environmental sustainability.

## KEY CHALLENGES

1. **Urban energy demand:** Cities in Southern Ontario consume significant electricity, necessitating scalable renewable energy solutions to meet long-term urban needs. The Henvey Inlet Wind Project exemplifies how large-scale wind energy can supply power to approximately 100,000 homes annually while reducing fossil fuel dependency[22].
2. **Transitioning from fossil fuels:** Many First Nations face challenges in converting legacy fossil fuel infrastructure into renewable energy systems. For example, the Nanticoke Solar Facility was built on the site of North America's largest coal-fired power plant, transforming it into a 44 MW solar hub, significantly reducing greenhouse gas emissions[23].
3. **Equitable partnerships:** Ensuring fair revenue-sharing agreements and collaborative decision-making processes in partnerships with non-Indigenous entities remains a priority. The Oneida Energy Storage Project, for instance, demonstrates how public-private partnerships can align economic benefits with First Nations ownership and decision-making[24].
4. **Integration of emerging technologies:** Incorporating emerging energy technologies, such as Small Modular Reactors (SMRs) and hydrogen energy, requires substantial investment and technical expertise. SMRs offer reliable and low-carbon energy solutions, while hydrogen energy is increasingly viewed as a clean alternative for energy storage and transportation[25].

## OPPORTUNITIES AND FIRST NATIONS-LED SOLUTIONS

1. **Large-scale wind energy:** The Henvey Inlet Wind Project is Canada's largest First Nations-owned wind energy initiative, featuring 87 Vestas turbines that generate 300 MW of clean electricity annually. This project exemplifies First Nations leadership in large-scale renewable energy, providing significant revenue and employment opportunities while addressing urban electricity needs[26].
2. **Repurposing infrastructure:** The Nanticoke Solar Facility, developed collaboratively by the Six Nations of the Grand River Development Corporation and the Mississaugas of the Credit First Nation, produces 44 MW of solar energy. This capacity powers

[22] Pattern Energy. (2023). *Henvey Inlet Wind Project Overview*. Retrieved from https://patternenergy.com/projects/henvey-inlet-wind/
[23] Ontario Power Generation. (2019). *Nanticoke Solar Now Generating Renewable Power for Ontario*. Retrieved from https://www.opg.com/stories/nanticoke-solar-now-generating-renewable-power-for-ontario/
[24] NRStor. (2023). *Oneida Energy Storage Project Overview*. Retrieved from https://nrstore.ca/projects/oneida-energy-storage-project/
[25] Natural Resources Canada. (2024). *Canada's Small Modular Reactor Action Plan*. Retrieved from https://smractionplan.ca/
[26] Pattern Energy. (2023). *Henvey Inlet Wind Project Overview*. Retrieved from https://patternenergy.com/projects/henvey-inlet-wind/

approximately 13,000 homes annually and significantly reduces greenhouse gas emissions. The project demonstrates the feasibility of transforming outdated fossil fuel infrastructure into renewable energy hubs[27].

3. **Energy storage solutions:** The Oneida Energy Storage Project is one of North America's largest battery storage initiatives, with a capacity of 250 MW. It plays a critical role in reducing greenhouse gas emissions by an estimated 2.2 to 4.1 million tonnes over its lifespan, equivalent to taking up to 40,000 cars off the road annually. Additionally, it enhances grid stability and creates sustainable economic benefits for the Six Nations of the Grand River[28].
4. **Community-scale solar projects:** The Aamjiwnaang First Nation has been involved in various renewable energy projects, including partnerships in wind energy initiatives like the Grand Bend Wind Project. These projects integrate renewable energy into community facilities, providing clean electricity and reducing reliance on non-renewable energy sources. They also offer training opportunities for local members in renewable energy technologies, empowering communities with technical expertise[29].

[27] Ontario Power Generation. (2019). *Nanticoke Solar Now Generating Renewable Power for Ontario*. Retrieved from https://www.opg.com/stories/nanticoke-solar-now-generating-renewable-power-for-ontario/

[28] Todo Canada. (2023). *Largest Electricity Battery Storage Project in Canada Coming to Ontario*. Retrieved from https://www.todocanada.ca/largest-electricity-battery-storage-project-in-canada-capable-of-meeting-peak-demand-in-oshawa-sized-city-coming-to-ontario/

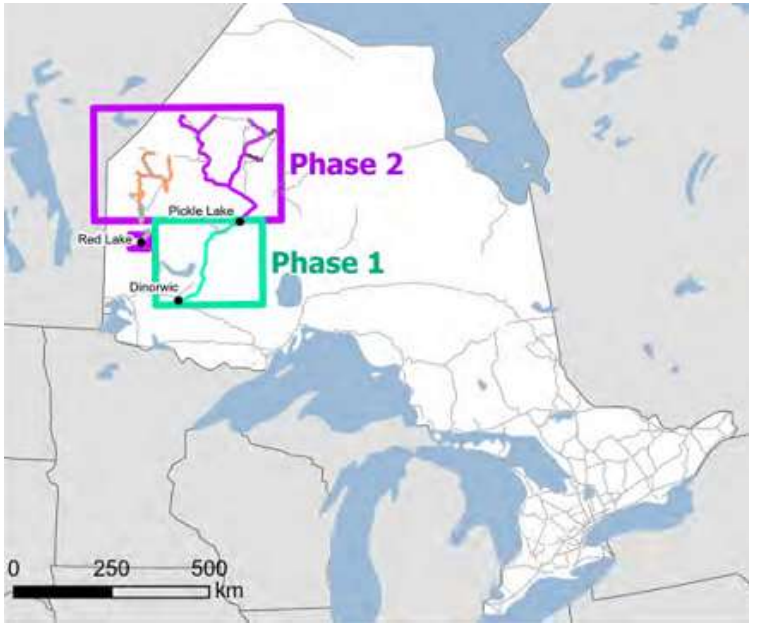
[29] Anishinabek News. (2015). *Giiwedin Noodin and Northland Power Inc. Close Funding Deal for Grand Bend Wind Project*. Retrieved from https://anishinabeknews.ca/2015/04/15/giiwedin-noodin-northland-power-inc-close-funding-deal-for-grand-bend-wind-project/

# 3. Case Studies: First Nations renewable energy projects

## 3.1 Northern Ontario

### 3.1.1 WATAYNIKANEYAP POWER PROJECT

| | |
|---|---|
| **Energy type** | Hydroelectric and other renewable sources via grid connection |
| **First Nation** | 24 First Nations, including those under Treaty 9, Treaty 3, and Treaty 5 |
| **Location** | Northwestern Ontario |
| **Project purpose** | To connect 24 remote First Nations communities across Ontario to the provincial power grid. This initiative aims to reduce reliance on diesel generators, which are costly and environmentally harmful, while providing clean, reliable, and sustainable energy to underserved areas. |
| **Capacity** | 1,800 km of transmission lines connecting 24 communities |
| **Partners** | Wataynikaneyap Power LP, Ontario Power Authority, Government of Canada |
| **Key features** | -Largest Indigenous-led infrastructure project in Canada with 51% First Nations ownership.<br>-Eliminates reliance on diesel generators, significantly reducing greenhouse gas emissions.<br>-Designed to withstand rugged terrain and extreme weather conditions. |
| **Challenges** | -Geographical remoteness of the communities and the difficult terrain, which required innovative engineering solutions<br>-High costs and stringent environmental protection requirements added complexity to the development process |
| **Solutions** | -Federal and provincial funding were crucial in financing the project, which included environmental assessments and community consultations to respect the environment and First Nations cultural priorities. |
| **Economic impact** | -More than 5000 workers contributed to the transmission project, including nearly a thousand individuals from First Nation communities across the north. The project also ensures long-term employment opportunities in the operation and maintenance of the energy infrastructure |
| **Environmental benefits** | -By eliminating the reliance on diesel generators, the project reduces diesel consumption by 6.6 million liters annually. This translates to a greenhouse gas emissions reduction equivalent to removing approximately 14,000 cars from the road each year |
| **Social benefits** | -Access to reliable electricity has enabled significant improvements in healthcare, education, and local businesses. Communities now benefit from uninterrupted power supporting the operation of schools, clinics, and essential services |
| **First Nation involvement** | 51% ownership by 24 First Nations communities ensures long-term revenue sharing. |
| **Completion year** | 2021 |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### 3.1.2 GULL BAY FIRST NATION MICROGRID

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|---|---|
| **Energy type** | Solar power with battery storage |
| **First Nation** | Kiashke Zaaging Anishinaabek (Treaty 3) |
| **Location** | Northwestern Ontario |
| **Project purpose** | To reduce reliance on diesel by creating a sustainable and environmentally friendly microgrid solution, while improving energy security and reliability for the community |
| **Capacity** | 300 kW of solar energy combined with a 2.2 MWh lithium-ion battery system capable of storing and managing excess energy |
| **Partners** | Hydro One Remotes, Government of Canada |
| **Key features** | -Canada's first fully integrated solar-battery microgrid<br>-Reduces diesel use by 25% annually, serving as a National model for clean energy in remote First Nations communities |
| **Challenges** | -High initial costs of microgrid infrastructure implementation<br>-Technical challenges in seamlessly integrating the solar-battery system with existing diesel generators |
| **Solutions** | -Collaborated with industry experts to design and implement the microgrid<br>-Developed community training programs to empower local members to operate and maintain the system independently |
| **Economic impact** | -Created local jobs during construction and ongoing maintenance, including roles such as solar technicians and battery system operators<br>-Diesel cost savings reinvested into community infrastructure and programs |
| **Environmental benefits** | -Offset approximately 130,000 liters of diesel annually, reducing CO2 emissions by 345 tons per year<br>-Improved air quality and reduced noise pollution by minimizing diesel generator use |
| **Social benefits** | -Enhanced energy reliability supports schools, health clinics, housing developments, and community facilities<br>-Fostered community pride and recognition as a leader in renewable energy innovation |
| **First Nation involvement** | -Local training programs developed community expertise in solar and battery system management, empowering residents to maintain and operate the microgrid independently<br>-Community leadership guided the project to ensure alignment with local values and priorities |
| **Completion year** | 2019 |


hydro one


remote renewable
energy-storage
micro grid
BUILD ON
THE NORTH

### 3.1.3 FORT SEVERN SOLAR PROJECT

| | |
|---|---|
| **Energy type** | Solar power |
| **First Nation** | Fort Severn First Nation (Treaty 9) |
| **Location** | Northern Ontario |
| **Project purpose** | To reduce diesel reliance and promote environmental sustainability through the adoption of solar energy. The project aimed to address the high financial and environmental costs of diesel generators, which had long been the community's primary energy source. |
| **Capacity** | A 300 kW solar power system was installed, providing a substantial renewable energy source to supplement existing diesel generation. |
| **Partners** | The project was supported by the Independent Electricity System Operator (IESO) and the Government of Canada. |
| **Key features** | -Offset diesel consumption by 25%<br>-Designed for operation in extreme weather conditions, including cold climates and low sunlight periods |
| **Challenges** | -Harsh weather conditions, including heavy snowfall and limited daylight hours.<br>-Transportation challenges in accessing the remote community, relying on ice roads and seasonal air travel. |
| **Solutions** | -Utilized durable solar technology specifically designed for extreme cold weather.<br>-Scheduled strategic delivery of materials during accessible seasons, leveraging community knowledge for efficient transportation. |
| **Economic impact** | -Created local jobs during installation and maintenance phases.<br>-Training programs for youth developed technical expertise in renewable energy systems, fostering long-term employment opportunities. |
| **Environmental benefits** | -Reduced diesel consumption by 100,000 liters annually.<br>-Prevented 250 tons of CO2 emissions per year, significantly lowering the community’s carbon footprint. |
| **Social benefits** | -Reliable electricity improved access to essential services such as healthcare, education, and housing.<br>-Enhanced community self-sufficiency and resilience against energy disruptions. |
| **First Nation involvement** | -Community members played a key role in material transportation and installation<br>-Leadership worked with partners to ensure cultural, economic, and environmental priorities were respected<br>-Training programs empowered residents to manage and maintain the solar system, fostering a sense of ownership |
| **Completion year** | 2018 |


NORTH WEST REGION
CENTRAL REGION
NORTH EAST REGION
HEADQUARTERS


Keewaytinook

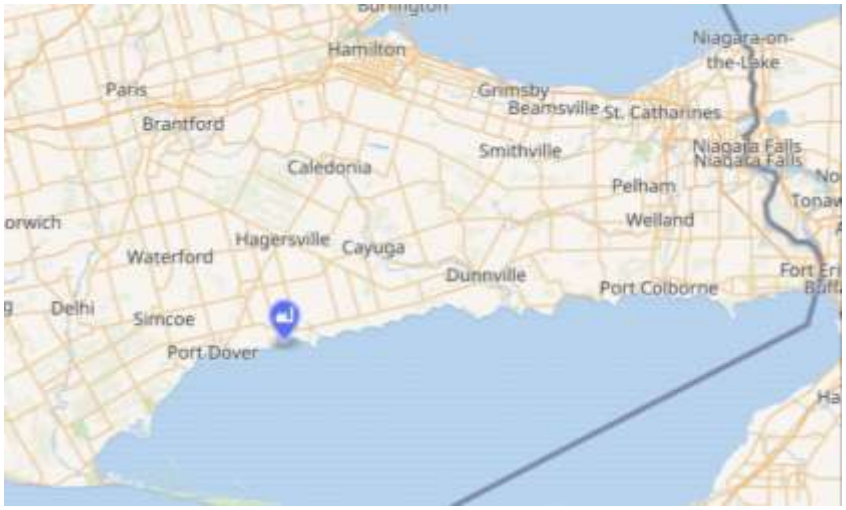
### 3.1.4 SMOKY FALLS GENERATING STATION REDEVELOPMENT

| | |
|---|---|
| **Energy type** | Hydroelectric Power |
| **First Nation** | Moose Cree First Nation (Treaty 9) |
| **Location** | Approximately 85 km northeast of Kapuskasing, Ontario |
| **Project purpose** | To modernize aging infrastructure, increase clean energy capacity, and provide economic and social benefits to the Moose Cree First Nation. |
| **Capacity** | Upgraded from 54 MW (commissioned in 1931) to 267.9 MW (redeveloped in 2014) |
| **Partners** | Ontario Power Generation (OPG) and Moose Cree First Nation |
| **Key features** | -Redeveloped as part of the $2.6 billion Lower Mattagami Project, upgrading four hydro stations on the Mattagami River.<br>-Replaced the original Smoky Falls station with a new three-unit station to significantly enhance capacity. |
| **Challenges** | -Addressing environmental impacts of redevelopment in a sensitive ecosystem.<br>-Balancing infrastructure upgrades with preserving cultural and natural heritage. |
| **Solutions** | -Conducted comprehensive environmental assessments to mitigate ecological disruption.<br>-Engaged stakeholders to ensure cultural and environmental priorities were addressed. |
| **Economic impact** | -Created 1,800 construction jobs at peak, including over 250 First Nation and Métis workers.<br>-Revenue-sharing agreements provided ongoing financial support for community programs, such as education and healthcare initiatives. |
| **Environmental benefits** | -Increased clean energy capacity, reducing reliance on fossil fuels and avoiding emissions equivalent to powering 215,000 homes annually.<br>-Habitat restoration efforts ensured minimal long-term ecological disruption. |
| **Social benefits** | -Strengthened community capacity through training and employment opportunities in hydroelectric operations.<br>-Empowered the Moose Cree First Nation to take a leadership role in Ontario's renewable energy initiatives. |
| **First Nation involvement** | - Holds a 25% equity stake through the Amisk-oo-Skow Comprehensive Agreement, ensuring long-term revenue streams.<br>- Community members received training and employment to develop local expertise in energy operations. |
| **Completion year** | 2014 |

## 3.2 Southern Ontario

### 3.2.1 NANTICOKE SOLAR FACILITY

| | |
|---|---|
| **Energy type** | Solar power |
| **First Nation** | Six Nations of the Grand River Development Corporation and the Mississaugas of the Credit First Nation |
| **Location** | Shores of Lake Erie, Haldimand County, Southern Ontario |
| **Project purpose** | To repurpose the site of the decommissioned Nanticoke Generating Station, formerly North America's largest coal-fired power plant, into a renewable energy source, fostering economic development within the involved First Nations communities. |
| **Capacity** | 44 MW (approximately 192,431 solar panels) |
| **Partners** | Ontario Power Generation (80% ownership), Six Nations of the Grand River Development Corporation (15%), and Mississaugas of the Credit First Nation (5%) |
| **Key features** | -Repurposed the former Nanticoke coal plant site into a solar energy facility<br>-Generates clean electricity for approximately 13,000 homes annually |
| **Challenges** | -Transitioning from coal-based energy infrastructure to a renewable energy facility<br>Ensuring equitable partnerships and revenue-sharing agreements among stakeholders |
| **Solutions** | -Established a collaborative partnership model, ensuring significant equity stakes and decision-making roles for the First Nations partners<br>-Implemented comprehensive community engagement and consultation processes to address concerns and incorporate First Nations knowledge |
| **Economic impact** | -Created job opportunities during the construction and operational phases<br>-Provided ongoing revenue streams for the First Nations communities through their equity stakes |
| **Environmental benefits** | -Significantly reduced greenhouse gas emissions by replacing coal-fired energy production with clean solar power. |
| **Social benefits** | -Strengthened relationships between First Nations communities and industry partners, fostering a model for future cooperative ventures in renewable energy |
| **First Nation involvement** | -Active equity partnership (SNGRDC's 15% equity ownership) and revenue-sharing ensured First Nations' long-term economic benefits and decision-making roles in the project |
| **Completion year** | 2019 |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St. Catharines
Brantford
Smithville
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Caledonia
Pelham
Welland
Hagersville
Cayuga
Waterford
Dunnville
Port Colborne
Delhi
Simcoe
Port Dover

### 3.2.2 HENVEY INLET WIND PROJECT

| | |
|---|---|
| **Energy type** | Wind power |
| **First Nation** | Henvey Inlet First Nation |
| **Location** | Northeastern shore of Georgian Bay, Southern Ontario |
| **Project purpose** | To harness wind energy potential within the Henvey Inlet First Nation's territory, providing clean energy and generating economic benefits for the community. |
| **Capacity** | 300 MW (87 Vestas wind turbines) |
| **Partners** | Nigig Power Corporation (51% owned by Henvey Inlet First Nation) and Pattern Energy (49% ownership) |
| **Key features** | -Largest First Nation-owned wind energy project in Canada.<br>-Designed to generate clean electricity to power approximately 100,000 homes annually. |
| **Challenges** | -Navigating complex regulatory approvals and environmental assessments.<br>-Ensuring the protection of traditional lands and wildlife habitats during construction and operation. |
| **Solutions** | -Conducted thorough environmental assessments and implemented mitigation strategies to minimize ecological impacts.<br>-Engaged in continuous consultation with community members to incorporate First Nations knowledge and address cultural concerns. |
| **Economic impact** | -Created significant employment opportunities for community members during construction and operation.<br>-Established a sustainable revenue source for Henvey Inlet First Nation, supporting local infrastructure and social programs. |
| **Environmental benefits** | -Generates enough clean electricity to power approximately 100,000 homes annually, significantly reducing reliance on fossil fuels. |
| **Social benefits** | -Enhanced community pride and capacity in managing large-scale renewable energy projects. |
| **First Nation involvement** | -Henvey Inlet First Nation holds a 51% ownership stake through its subsidiary, Nigig Power Corporation, ensuring long-term economic benefits and decision-making power. |
| **Completion year** | 2019 |


KILLARNEY
Henvey
Project Area
GEORGIAN BAY
LAKE HURON
TORONTO
LAKE ONTARIO

### 3.2.3 AAMJIWNAANG FIRST NATION SOLAR PROJECT

| | |
|---|---|
| **Energy type** | Solar power |
| **First Nation** | Aamjiwnaang First Nation |
| **Location** | Southern Ontario |
| **Project purpose** | To develop renewable energy resources within the community, reduce environmental impact, and create economic opportunities for the Aamjiwnaang First Nation. |
| **Capacity** | 1 MW |
| **Partners** | Renewable energy developers, Ontario's Feed-In Tariff (FIT) program |
| **Key features** | -Solar panels installed on community buildings and designated lands.<br>-Excess power sold back to the grid under the FIT program. |
| **Challenges** | -Securing financing and navigating the FIT application process.<br>-Building technical capacity within the community to manage and maintain solar installations. |
| **Solutions** | -Partnered with renewable energy developers to gain expertise and secure funding.<br>-Implemented training programs for community members to develop skills in solar technology installation and maintenance. |
| **Economic impact** | -Revenue generated from electricity sales supports community programs and fosters local economic growth.<br>-Created jobs in installation and maintenance of solar panels. |
| **Environmental benefits** | -Reduced greenhouse gas emissions by generating clean electricity and decreasing reliance on non-renewable energy sources. |
| **Social benefits** | -Increased environmental awareness within the community and empowered members through skill development and participation in sustainable energy projects. |
| **First Nation involvement** | -Community leadership ensured alignment with local values and priorities.<br>-Training programs empowered community members to manage and maintain the solar installations. |
| **Completion year** | 2014 |


AAMJIWNAANG
ENJIMAAJTAANG
"Where Opportunity Begins"
Resource Centre


Aamjiwnaang First Nation
Chicago
Ottawa

### 3.2.4 ONEIDA ENERGY STORAGE - SIX NATIONS OF THE GRAND RIVER

| | |
|---|---|
| **Energy type** | Battery energy storage |
| **First Nation** | Six Nations of the Grand River |
| **Location** | Southern Ontario |
| **Project purpose** | To enhance grid stability and reduce greenhouse gas emissions by storing surplus electricity during off-peak hours and returning it to the grid during peak demand. |
| **Capacity** | 250 MW |
| **Partners** | NRStor Inc., Northland Power, Aecon Group Inc., Six Nations of the Grand River Development Corporation |
| **Key features** | -One of the largest battery energy storage projects in North America<br>-Provides up to $760M net savings to ratepayers over 20 years<br>-Reduces CO2 emissions by 4.1 million tonnes over the project's lifespan<br>-Creates over 900,000 hours of local employment |
| **Challenges** | -Securing financing for a large-scale energy storage project<br>-Addressing regulatory and grid integration challenges |
| **Solutions** | -Established a public-private partnership model to share costs and risks<br>-Worked closely with the Independent Electricity System Operator (IESO) to integrate the project into Ontario's grid system |
| **Economic impact** | -Provides not less than $1M annually for the Six Nations community over the 20+ year lifespan of the project.<br>-Created up to 15 full-time employment opportunities during the operations phase<br>-Over 900,000 hours of local employment over the 20-year life of the asset<br>-Established subcontracting and internship opportunities for Six Nations members during construction and operation |
| **Environmental benefits** | -Red- Reduces reliance on natural gas peaker plants, significantly cutting greenhouse gas emissions<br>-Prevents 2.2-4.1 million tonnes of CO2 emissions over the project's lifetime |
| **Social benefits** | -Strengthened relationships between First Nations and industry partners, fostering future cooperative ventures<br>-Showcases First Nations leadership in adopting cutting-edge renewable energy technology |
| **First Nation involvement** | -Six Nations of the Grand River Development Corporation holds equity ownership, ensuring long-term economic benefits and decision-making roles<br>-Community members contribute through subcontracting opportunities and site maintenance |
| **Completion year** | 2023 |


Toronto
Kitchener
Hamilton
Brantford
Caledonia
The Haldimand Tract
Six Nations Settlement

## 4. Best practices and lessons learned

To achieve energy sovereignty and sustainability, First Nations in Ontario can adopt a range of best practices based on successful renewable energy initiatives, strategic partnerships, and government support programs. This section outlines key strategies to overcome barriers, foster community engagement, build partnerships, and strengthen leadership capacity for First Nations renewable energy initiatives. These strategies are informed by real-world case studies and align with national and provincial climate goals.

One exemplary initiative is the Wataynikaneyap Power Project, an Indigenous-led partnership that has successfully connected 17 remote First Nations communities in Northwestern Ontario to the provincial electricity grid. This initiative significantly reduces reliance on diesel-generated electricity, improves energy affordability, and promotes Indigenous leadership in renewable energy planning and operations[30]. The success of this project underscores the importance of Indigenous ownership and governance in addressing critical challenges such as infrastructure gaps, funding barriers, and energy security concerns.

Federal programs such as Canada's Clean Energy for Indigenous Communities Program, which allocates $300 million over five years, play a crucial role in supporting similar initiatives. This program funds clean energy projects in Indigenous, rural, and remote communities, with a target to transition away from diesel power by 2030[31]. Additionally, the federal 2030 Emissions Reduction Plan provides a comprehensive framework for achieving a 40-45% reduction in greenhouse gas emissions by 2030 and achieving net-zero emissions by 2050. This plan prioritizes investments in clean energy infrastructure and promotes Indigenous participation in climate action[32].

Another valuable initiative is the Indigenous Leadership Fund, which offers up to $180 million for community-driven, low-carbon energy projects. This funding empowers First Nations to develop renewable energy projects that align with their cultural and environmental values while addressing local economic priorities[33]. These programs not only provide financial support but also emphasize capacity building, technical training, and collaboration between First Nations, government bodies, and private sector partners.

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[30] Net News Ledger. (2024). Wataynikaneyap Power completes the line that brings light to Northwestern Ontario First Nations. Retrieved from https://www.netnewsledger.com/2024/12/13/wataynikaneyap-power-completes-the-line-that-brings-light-to-northwestern-ontario-first-nations/

[31] Natural Resources Canada. (2022). *Government of Canada investing $300 million in clean energy projects in Indigenous, rural, and remote communities*. Retrieved from https://www.canada.ca/en/natural-resources-canada/news/2022/04/government-of-canada-investing-300-million-in-clean-energy-projects-in-indigenous-rural-and-remote-communities.html

[32] Government of Canada. (2022). *2030 Emissions Reduction Plan*. Retrieved from https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030.html

[33] Environment and Climate Change Canada. (2023). Indigenous Leadership Fund. Retrieved from https://www.canada.ca/en/environment-climate-change/services/climate-change/low-carbon-economy-fund/indigenous-leadership.html

## 4.1 Key Insights and pathways forward: Advancing renewable energy sovereignty

The renewable energy projects highlighted in this toolkit underscore the transformative leadership of First Nations in their pursuit of energy sovereignty. These initiatives serve as a blueprint for overcoming persistent challenges, fostering meaningful community engagement, building sustainable partnerships, and leveraging innovative clean energy solutions. By integrating First Nations knowledge with modern energy practices, First Nations are forging a path toward self-determined, resilient, and sustainable energy futures.

The key insights and strategies identified from these case studies can serve as guiding principles for other communities looking to embark on similar clean energy journeys. These insights include:

## 1. Overcoming barriers

### Funding access

Securing initial capital and ensuring operational sustainability are critical challenges. Successful strategies include:

- **Public funding:** Programs like the Clean Energy for Rural and Remote Communities (CERRC) supported the Fort Severn Solar Project, transitioning from diesel dependence to renewable energy and reducing costs[34].
- **Equity sharing models:** Projects such as the Oneida Energy Storage Facility adopted public-private partnerships, with the Six Nations of the Grand River holding a 15% equity stake, ensuring shared risks and long-term economic resilience[35].

### Regulatory navigation

Navigating complex regulatory frameworks requires early and transparent engagement.

- The Henvey Inlet Wind Project achieved compliance through early environmental assessments and regular consultations with provincial authorities, balancing ecological and cultural priorities[3637].
- Advocacy for policy reforms has proven impactful, as demonstrated by the Wataynikaneyap Power Project, which benefited from Indigenous-led infrastructure policies[38].

## 2. Importance of community engagement

### Inclusive governance

Engaging communities throughout project development ensures alignment with local values, priorities, and knowledge systems.

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[34] Natural Resources Canada. (2024). *SMR Action Plan and Hydrogen Strategy*. Retrieved from https://natural-resources.canada.ca/reducingdiesel

[35] NRStor. (2023). *Oneida Energy Storage Project Overview*. Retrieved from https://nrstor.com/2023/02/09/nrstor-and-partners-execute-major-agreements-for-1000-mwh-oneida-energy-storage-project/

[36] Nigig Power Corporation. (2023). Henvey Inlet Wind Project Compliance and Environmental Reports. Retrieved from https://aecom.com/en-ca/projects/environmental-assessments-for-henvey-inlet-first-nation-wind-project/

[37] Ontario Ministry of Environment, Conservation and Parks. (2024). Environmental Compliance Approval. Retrieved from https://www.ontario.ca/page/environmental-compliance-approval

[38] Ross, I. (2023). *Indigenous Leaders: Mission accomplished, Wataу Power declares on northwestern Ont. power line project*. Northern Ontario Business. Retrieved from https://www.sudbury.com/local-business/indigenous-leaders-mission-accomplished-wataу-power-declares-on-northwestern-ont-power-line-project-9967771

- The Henvey Inlet Wind Project established advisory groups comprising elders and youth to integrate Aboriginal Traditional Knowledge (ATK) into planning[39].
- The Oneida Energy Storage Facility conducted community-led consultations through town halls, fostering trust and inclusivity[40].

**Capacity building**

Equipping community members with skills to manage renewable energy infrastructure fosters long-term sustainability.

- The Gull Bay Microgrid incorporated comprehensive training programs, enabling independent operation of solar and battery systems[41].
- Youth workshops, as seen in the Fort Severn Solar Project, encourage interest in renewable energy careers[42].

## 3. Building sustainable partnerships

**Shared ownership**

Collaborative models ensure financial benefits and governance opportunities for communities.

- The Nanticoke Solar Facility includes equity stakes held by the Six Nations and Mississaugas of the Credit First Nation, promoting revenue sharing and decision-making[43].
- Partnerships with NRStor and Northland Power in the Oneida Energy Storage Project delivered advanced technology and local job creation[44].

**Government and research collaboration**

Aligning with federal programs and involving academic institutions enhances project feasibility and funding access.

- Programs such as the Green Infrastructure Fund and Canada Infrastructure Bank provide essential resources.

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[39] Chiefs of Ontario. (2024). *Aboriginal Traditional Knowledge (ATK)*. Retrieved from https://chiefs-of-ontario.org/priorities/environment/

[40] NRStor. (2023). *Oneida Energy Storage Project Overview*. Retrieved from https://nrstor.com/2023/02/09/nrstor-and-partners-execute-major-agreements-for-1000-mwh-oneida-energy-storage-project/

[41] Gull Bay First Nation. (2018). *Mashkawiziiwin Energy - Gull Bay First Nation*. Retrieved from https://www.gullbayfirstnation.com/mashkawiziiwin-energy/

[42] Association of Consulting Engineering Companies (ACEC). (2022). *Fort Severn First Nation Solar Array*. Retrieved from https://www.acec.ca/awards/CCE_awards/2022awards/14.html

[43] Ontario Power Generation. (2019). Nanticoke Solar Now Generating Renewable Power for Ontario. Retrieved from https://www.opg.com/stories/nanticoke-solar-now-generating-renewable-power-for-ontario/

[44] NRStor. (2023). Oneida Energy Storage Project Overview. Retrieved from https://nrstore.ca/projects/oneida-energy-storage-project/

- Feasibility studies, like those conducted for the Henvey Inlet Wind Project, optimize design and efficiency[45].

### 4. Leveraging data-driven technologies

**Innovation in energy literacy and tracking**

- Tools like GridWatch provide communities with real-time energy consumption and emissions data to inform decision-making.

### 5. Planning for longevity

**Sustainability mechanisms**

Reinvesting project revenues and maintaining adaptability ensures lasting benefits.

- Revenue from projects like the Henvey Inlet Wind Project has been allocated to scholarships and community priorities, fostering leadership and development[46].
- Projects like Wataynikaneyap Power demonstrate the importance of flexibility and ongoing stakeholder engagement to address evolving needs[47].

[45] Pattern Energy. (2024). Henvey Inlet Wind Project. Retrieved from https://patternenergy.com/projects/henvey-inlet-wind/
[46] Pattern Energy. (2024). Henvey Inlet Wind Project. Retrieved from https://patternenergy.com/projects/henvey-inlet-wind/
[47] Wataynikaneyap Power. (2022). *Wataynikaneyap Power Reaches Major Milestone!*. Retrieved from https://www.wataypower.ca/updates/wataynikaneyap-power-reaches-major-milestone

## 4.2 Pathways forward

To build on these successes, First Nations and stakeholders should consider:

1. **Expanding knowledge sharing**

- ❑ Establish a network for sharing lessons learned and best practices among First Nations involved in renewable energy projects.
- ❑ Include platforms for peer-to-peer mentorship and technical assistance.

2. **Strengthening policy advocacy**

- ❑ Advocate for streamlined regulatory processes and increased funding for First Nations-led energy initiatives through federal and municipal programs like.

3. **Investing in community-centered solutions**

- ❑ Ensure that revenue generated from renewable energy projects is reinvested into local priorities, such as healthcare, education, economic development and infrastructure, fostering holistic community well-being.

4. **Focusing on monitoring and evaluation**

- ❑ Adopt tools like the GridWatch app to track energy consumption, emissions, and project performance, ensuring data-driven decision-making.

By embracing these strategies, First Nations can lead the charge toward a sustainable, culturally aligned energy future, while setting benchmarks for reconciliation and economic resilience.