

## FIRST NATION



## COMMUNITY ENERGY PLAN SAMPLE

Please note that all community energy plans are unique from our office. We provide this as a sample start. If you require additional information, please schedule a Zoom meeting with Shayne Hill from our office.

<https://www.indigenousaware.com/shayne-hill>



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assistance of CIPS Inc.

## EXECUTIVE SUMMARY

This is an executive summary of our Community Energy Plan (CEP). It contains specific topics and points of interest. Additional details relating to all information presented in this summary can be found in the main CEP document.

Our community has developed this CEP to focus on various aspects of energy within our community and focuses on energy education, energy conservation, and energy generation. Our CEP includes:

- An overview of our community;
- The past and present energy initiatives that our community is involved in;
- Community engagement;
- Development of an energy vision and energy goals;
- An energy baseline analysis;
- A forecast of our future energy needs;
- Identification of various opportunities and priorities related to energy; and
- The development of an Implementation Plan.

### Overview of Our Community

Sample First Nation (SFN) is located in southwestern Province and is situated about 30 km to the south-west of the City, Province. As of 2015, our on reserve registered population is 931 and we have about 255 residential units in our community. We also have 24 Nation-owned facilities and assets and a thriving commercial sector.

### Past and Present Energy Initiatives

Several initiatives, including past, current, and planned activities relating to both energy conservation and energy generation have been identified.

SFN is currently participating in the *First Nations Conservation Program (FNCP)*, offered by Hydro One. This program is designed to help increase energy efficiency within First Nations homes. Our Nation is also involved in a number of renewable energy projects through partnerships with various developers.

## Community Engagement

Engaging our community was critical in the development of our CEP. Engagement activities completed as part of the CEP development process included:

- A CEP project kickoff event;
- The hiring of a *Local Energy Liaison*;
- Completion of a *Community Energy Survey*;
- Participation in the *First Nation Conservation Program* Kickoff Event;
- Meetings with various administrative departments; and
- Presentations at the SFN Monthly Gathering.

Feedback and information gathered from these community engagement events was incorporated into our CEP to the best extent possible.

## Energy Vision and Energy Goals

Our energy vision provides the direction that we will strive towards as a community in relation to energy.

Through consultation and engagement, we have defined our energy vision to be:

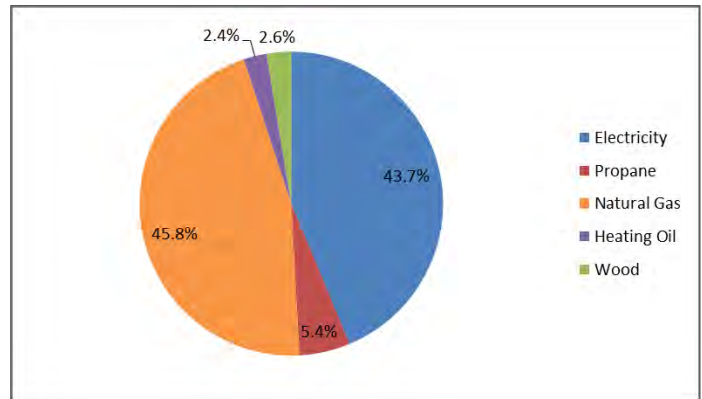
*We are a community that wishes to gain energy independence while reducing the cost and environmental impacts of energy in our community.*

We also developed energy goals to help move us towards our energy vision. Our energy goals are to:

- Increase knowledge of energy conservation and generation amongst our community members;
- Reduce energy consumption within our residential and Nation-owned sectors;
- Successfully demonstrate and achieve some level of energy independence within our community; and
- Provide resources to our community members to enable them to reduce energy costs through available programs.

## Baseline Energy Use

We have completed a baseline energy use assessment of our community for the years 2014, 2015, and 2016. This assessment allows us to gain an understanding of how energy is used within our community. For the purposes of our CEP, we have converted all energy use into a unit called a gigajoule (GJ). In 2016, our total community energy consumption was about 39,100 GJ. Energy used for transportation is not a part of this analysis.



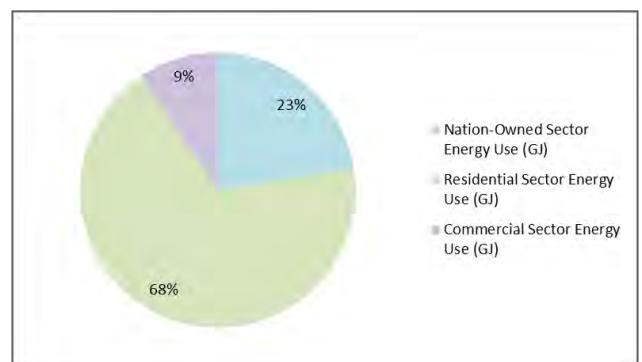
**Figure I - Energy Breakdown by Type, 2016**

Within our community, we have identified the use of the following types of energy:

- Natural Gas;
- Electricity;
- Propane;
- Wood; and
- Heating Oil.

A breakdown of our energy use in 2016 is shown in Figure I. Natural gas and Electricity are the most used energy types in our community.

Within our CEP, we split energy users within our community into one of 3 sectors; Nation-owned, residential, and commercial. The breakdown of the total amount of energy used in each of these sectors (in 2016) is shown in Figure II. Our residential sector is responsible for the majority of energy use in our community.



**Figure II – Energy Breakdown by Sector, 2016**

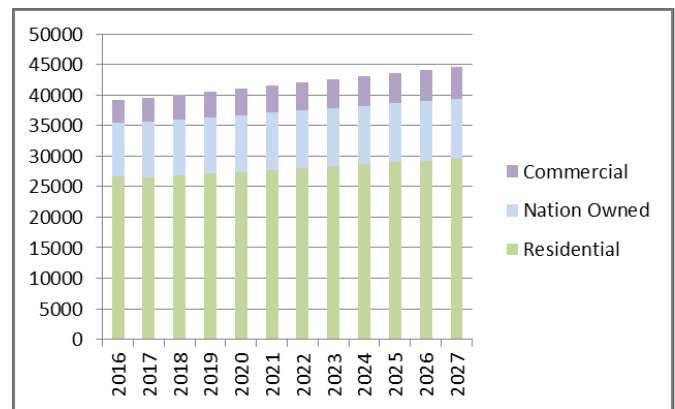
In Canada, the typical household uses an average of 105 GJ per year. Based on our analysis, the average household in our community uses approximately 103 GJ, slightly under the Canadian average. In a typical Canadian household, about 64% of energy is used for space heating applications. Water heating, appliances, and lighting make up approximately 19%, 12%, and 4%, respectively.

From our baseline analysis, we have concluded that although energy conservation in all aspects are important and should be included as part of our CEP, reducing natural gas and electricity use in our residential and Nation-owned sectors (particularly related to space and water heating) should be our primary focus in regards to energy conservation.

### Future Energy Needs

As part of our CEP, we have projected the future energy needs of our community for the year 2027. This projection assumes a “business as usual” scenario, meaning that energy consumption will remain constant over the next 10 years, impacted mainly by growth within the sectors themselves.

Overall, we estimate that energy consumption in all sectors of our community will increase to various degrees over the coming years. Our total energy consumption (including all sectors) will grow to about 44,700 GJ by 2027, as shown in Figure III. Calculations for our current and anticipated future electrical demand were also completed.



**Figure III - Projected Future Energy Use**

### Opportunities and Priorities

During the development of our CEP, various opportunities and priorities were identified which represent areas that we can make a positive impact in relation to energy. Each of these opportunities has been categorized under energy conservation, energy education, or energy generation, which are listed below.

#### *Energy Education*

- Residential Energy Education Program
- Residential Energy Support Program
- Renewable Education Program

#### *Energy Conservation*

- Efficiency in New Builds
- Upgrades to Existing Homes

- Nation-owned Green Procurement Strategy
- Nation-owned Building Efficiency Improvements

#### *Energy Generation*

- Net-Metering Demonstration Project
- Geothermal and Solar Thermal Demonstration Projects
- Long-Term Energy Independence – Micro-Grid

Details on the opportunities listed above are provided within the CEP document, including information on potential education topics and an in-depth analysis of renewable energy opportunities available within our community.

Please note that our participation in the *First Nations Conservation Program (FNCP)* is expected to have a very positive impact in terms of both energy education and energy conservation within our community, particularly the residential sector. The opportunities and priorities identified for our residential sector are meant to build upon and enhance the results of this program, where applicable.

#### Implementation Plan

As part of our CEP, we have developed an Implementation Plan. This Implementation Plan was formed through consultation as our CEP was developed, and is meant to be updated on an ongoing basis. Our Implementation Plan is intended to establish a realistic and obtainable course towards our energy goals. The Implementation Plan builds upon the opportunities identified, and provides further details related to the implementation of each, including subtasks, tentative scheduling, estimated costs, and possible sources of funding.

Actions relating to planning are also identified. Having the resources to manage our Implementation Plan is imperative to its success. It is suggested that the first action in implementing the CEP be to seek funding through the IESO's Education and Capacity Building (ECB) program. This funding can then be used to hire a *Community Energy Liaison* and establish a *Community Energy Committee* prior to starting any other part of our Implementation Plan. Periodic reviews of the entire CEP, including the Implementation Plan are also included.

An action inventory and *Implementation Table* have also been created. The *Actions Inventory* provides a summary of the actions that must be completed as part of our CEP. The *Implementation Table* provides a high level schedule and overview of the various tasks that need to be completed as part of the Implementation Plan. A *Cost Breakdown* is also provided. Please note that all costs are estimates, and further refinement should be

completed prior to beginning any action. Furthermore, the suggested timing of actions may vary based on various circumstances, and should be adjusted as necessary.

Finally, it is suggested that at the beginning of each year, we review our *Implementation Table* and *Actions Inventory* and create an annual actions plan. This will allow for the implementation actions for the year to be better planned and updated as necessary. It is also suggested that some of the larger components be broken into smaller stages that can be more readily managed throughout the year.

The Year One Annual Action Plan has been developed and is shown in the table below. Please note that this Action Plan includes the remainder of 2017 as well as the full year of 2018, since the actions required for the remainder of 2017 are limited.

**Table 1 - Year One Action Plan**

Component	Action	Timing	Estimated Costs
<b>Education and Capacity Building (ECB) Funding</b>	Apply for ECB Funding	Q3 2017	N/A
<b>Community Energy Liaison</b>	Hire a <i>Community Energy Liaison</i>	Q1 2018	N/A
	<i>Community Energy Liaison</i> Training	Q2 2018	\$5,000
	<i>Community Energy Liaison</i> Work Term	Ongoing	\$30,000 (\$40,000 per annum)
<b>Community Energy Committee</b>	Establish a <i>Community Energy Committee</i>	Q1 2018	N/A
	<i>Community Energy Committee</i> Meetings	Ongoing	\$1,500 (\$2,000 per annum)
<b>Residential Energy Education Program</b>	Develop Program	Q3 2018	\$3,500
	Deliver Program	Ongoing	\$750 (\$6,500 per annum)
<b>Residential Energy Support Program</b>	Develop Program	Q4 2018	N/A
		<b>Total:</b>	<b>\$40,750</b>

Note that funding requirements beyond those identified in the table above should be included in the initial application to the ECB funding program.





## TABLE OF CONTENTS

1.0	INTRODUCTION.....	5
	GLOSSARY OF TERMS.....	6



## **LIST OF INSERTED FIGURES**

NO TABLE OF FIGURES ENTRIES FOUND.

## **LIST OF INSERTED TABLES**

No table of figures entries found.



## **LIST OF APPENDICES**

Appendix A - Energy Efficiency Assessment

Appendix B - Community Energy Survey Results

Appendix C - Baseline Methodology and Future Energy Calculations

Appendix D - Energy Education Topics

Appendix E - Renewable Energy Education Topics

Appendix F - Energy Efficiency Guidelines

Appendix G - Hydro One Distribution Maps

Appendix H - Funding Options and Available Incentives

Appendix I - Implementation Table, Actions Inventory, and Estimated Costs

## 1.0 INTRODUCTION

Sample First Nation (SFN) is a First Nation community located in southwestern Province. Our community vision states that:

*As Sample First Nation, we look to our Anishinabe roots to guide our vision for the future as a strong, caring, connected community who respects the earth's gifts and protects the environment for future generations. Our identity includes our history, language, culture, beliefs and traditions which we strive to incorporate into the programs and services offered to our community*

*To view the entire document or to learn about how we can help you develop your own customized community energy plan, please contact us today!*

*[www.indigenouslyaware.com](http://www.indigenouslyaware.com)*

## GLOSSARY OF TERMS

- Annual Fuel Utilization Factor (AFUE):** Measurement of thermal energy generated compared to the total amount of energy that is supplied from a fuel.
- Ballasts:** An electrical ballast is a device which limits the amount of current in an electrical circuit and is typically used in fluorescent lamp fixtures.
- BioEnergy:** Energy created through the combustion of biological materials.
- Building Envelope:** The physical separator between the interior and exterior of a building.
- Business As Usual (BAU):** A projected forecast given current patterns; assuming no changes.
- Capital Cost:** Fixed, one-time expenses incurred to bring a project or installation to an operable state.
- Carbon emission factor:** A numerical conversion factor defined by the EPA which is used to express an electrical quantity as a mass of carbon dioxide (CO<sub>2</sub>).
- Climate:** Prevailing regional patterns in weather over a long period of time.
- Climate Change:** A long-term change in the statistical distribution of weather patterns.
- Commercial Sector:** All commercial buildings within the community, excluding those that are Nation-owned.
- Comprehensive Community Plan:** A process to create a plan that enables a community to build a roadmap to sustainability, self-sufficiency and improved governance capacity.
- Connection Impact Assessment (CIA):** A process through which Hydro One determines an electrical generator's effects on its' distribution and transmission system. A connection impact assessment is required to be completed prior to connection to the Hydro One's network.
- Cooling System:** A system used to cool a building, such as an air conditioning unit.
- Density Rating:** A Hydro One measurement used to distinguish the amount of customers in a given area. Density Rating affects the rates that a Hydro One customer pays.
- Diesel:** A fuel type typically used in transportation and electrical generators. It is used in diesel engines. Diesel is typically derived from petroleum, but may be derived from other sources as well.
- Economic Development:** The process and policies by which a community improves the economic and social well-being of its people.
- Energy:** The ability of a system to perform work. Includes the electrical energy and heat energy from the combustion of fuels.
- Energy Conservation:** The practice of using less energy, or using it more efficiently.
- Energy Consumption:** How much energy is used over a given period of time.
- Energy Education:** Information aimed to help a community understand energy, especially in regards to increasing energy conservation and efficiency within a community.
- Energy Efficiency:** The practice of managing energy use in an efficient manner.
- Energy-from-Waste (EFW):** Energy derived from solid waste. Refers to combustion and gasification processes.
- Energy Generation:** The act of creating usable energy in the form of electricity or heat.
- Energy Independence:** A community's ability to produce its own energy and rely less on major suppliers. There are varying degrees of energy independence.
- Energy Star Certification:** Products that are independently certified to save energy without sacrificing functionality.
- Energy Use Behavior:** The way in which a person, or group of people, typically use energy.
- Electrical Generator:** A technology which produces electrical energy.
- Electricity:** A type of energy consisting of charged particles flowing as a current. Electricity has many uses and is commonly used to power appliances, devices, and for heating purposes.
- Feed-in-Tariff (FIT):** an economic incentive for large-scale renewable energy projects.
- Feeder Line:** An electrical line within an electrical distribution system used to transport electricity.
- First Nation Conservation Program (FNCP):** An IESO program designed to assist First Nations to reduce energy demand and manage costs by increasing energy efficiency in homes.
- Forecasted Energy Needs:** An estimation of energy requirements needed in the future.
- Gasoline:** A refined petroleum fuel used in internal combustion engines.
- Geothermal Energy:** Energy obtained from the earth for heating or cooling purposes.
- Geothermal Heat Pump:** A system used to help adjust home heating and cooling by using the earth's temperature. Does not generate energy but can be used to offset heating and cooling requirements.
- Generation Capacity:** The amount of electricity that electrical infrastructure can safely accept from an electrical generator.
- Gigajoules (GJ):** A unit of energy, equivalent to the energy potential of just over two propane tanks.
- Green Procurement Strategy:** The practice of only purchasing certified "green" products.
- Greenhouse Gas Emissions:** The release of gases in the atmosphere which trap thermal energy.
- Grid-Tied:** Having access to an electrical grid system, especially in reference to electrical generation.
- Heating Degree Day (HDD):** The number of degrees that a day's average temperature is below 18 degrees Celsius, or the temperature below which a building needs to be heated
- Heating Oil:** A liquid petroleum fuel that is used in furnaces and boilers to produce heat. Also referred to as Furnace Oil or Fuel Oil.
- Heating System:** A system used to control the heat within a building or space.
- Hot Water System:** A system used to heat water for domestic use within a building.
- Hydroelectric:** Electrical energy derived from flowing water, typically from the use of hydroelectric dams.
- Hydro One:** The local distribution company and electricity service provider.
- Incandescent Light Bulb:** An electric light source that produces visible light by passing an electric current through a filament.
- Independent Electricity Systems Operator (IESO):** An organization responsible for the day-to-day operation of Province's electrical system as well as the safe and reliable operation of that system.
- Infrastructure:** The basic physical structures and facilities required for the operation of a society.



**Kilowatt (kW):** A unit of power that is generally used to describe the rate at which electrical energy is produced or used.

**Kilowatt-Hours (kWh):** A unit of energy typically used to measure electricity.

**Local Distribution Company (LDC):** Responsible for delivering electricity from transmission lines to customers. Hydro One is a LDC.

**microFIT:** An economic incentive for small-scale renewable energy production.

**Micro-Grid:** An energy system with energy sources and loads that is capable of operating both in parallel with and independently from the main power grid.

**Megawatts (MW):** A unit of power that is generally used to describe the rate at which electrical energy is produced or used. A Megawatt (MW) is equal to 1000 Kilowatts (kW).

**Natural Gas:** A type of fuel consisting largely of methane and other hydrocarbons found naturally underground.

**Net-Metering:** Sending surplus electricity generated from a renewable energy source to the grid to offset energy costs.

**Off-Grid:** Having no access to an electrical grid system, especially in reference to electrical generation.

**Payback Period:** The length of time required for an investment to recover its initial cost (or capital cost).

**Phantom Load:** Devices in the home that consume energy when 'off'.

**Propane:** A common fuel type derived from petroleum. Is a gas at standard temperature and pressure but can be compressed to a liquid for storage and transportation.

**Renewable Energy:** Energy that is collected from resources which are naturally replenished on a human timescale.

**Residential Sector:** All houses and residential buildings within the community.

**Seasonal Residential:** A Hydro One residential customer that does not live in the residence year-round.

**Smart Meter:** An electronic device that records consumption of electric energy in short intervals and communicates that information to a utility company.

**Solar Photovoltaic:** Electrical energy that is derived from the sun using semiconductor materials.

**Solar Thermal:** Thermal energy derived from the sun.

**Time-of-Use (TOU):** A pricing schedule introduced to reflect the costs of producing electricity at different times of the day. Was introduced to help reduce provincial electrical demand.

**Upstream Feeder:** The distribution or transmission station that supplies electricity to a specified point within an electrical grid.

**Weather:** The state of the atmosphere at a specific time or place.

**Wind Energy:** Energy derived from wind, typically from the use of wind turbines.

**Winter Preparation:** The act of reducing heat loss in order to conserve energy during the winter months.