Community Energy Plan

Katlodeeche 2010

ARCTIC ENERGY ALLIANCE

Introduction and Acknowledgements

This Community Energy Plan explains what we did so far during the energy planning process, and outlines a work plan for what we need to do next.

We thank the following people who helped create this community energy plan for Katlodeeche:

- Chief and Council of Katlodeeche First Nation and Staff members of Katlodeeche First Nation office who took the time and energy to participate
- Northlands Utilities Ltd, the Petroleum Products Division of the GNWT, and Environment and Natural Resources, who shared their data
- The Arctic Energy Alliance who facilitated the process

To learn more about energy planning in our community please contact:

Katlodeeche First Nation
BOX 3060
Hay River NT X0E 1G4
Phone: 867-874-6701
Fax: 867-874-3229

The Arctic Energy Alliance developed the template for the community energy plan, with help from Mary McCreadie, NWT Literacy Council.

Table of Contents

Executive Summary

The Katlodeeche First Nation is committed to doing its best to maintain a clean, safe and healthy community. The mission of the Katlodeeche First Nation Council is to deliver responsible, effective leadership and decision making through public accountability, sound fiscal management, and the delivery of quality programs and services for all its community residents.

Chief and Council, as well as Katlodeeche First Nation staff worked with a representative of Arctic Energy Alliance (AEA) and MACA staff to develop a Community Energy Plan (CEP) that reflects the energy sources, energy needs and the principles of living within our means and respect for the land that are held by Katlodeeche.

The initial CEP groundwork was incorporated into the Katlodeeche Integrated Community Sustainability Plan (ICSP).

The CEP process will continue after March 31, 2010 to further develop and implement the goals and strategies that were identified at the meeting held in Katlodeeche February 16 – 17, 2010.

Community Energy Planning Goal:

- To use energy in ways that are within our community means and are in harmony and respect the land.

The Community Energy Planning goal reflects the values expressed by Katlodeeche Council and staff. Some of these values are to use things in the right way so there is no waste and to learn about and respect the land.

Strategies to Achieve the Community Energy Planning Goals:

- Incorporate Energy Standards into all new building contracts
- Assess the energy efficiency of municipal buildings and equipment.
- Upgrade existing buildings
- Find ways to use less diesel fuel for heating.
- Research alternative sources of energy such as solar, ground source heat pumps, etc. and their potential use in Katlodeeche.

Katlodeeche Council wants to take good care of its buildings and make sure future buildings are energy efficient. The Council wants to reduce their reliance on diesel fuel and look at alternative ways to heat buildings and generate electrical power.

These strategies describe the direction to focus future actions. From here, we can move forward.

Introduction

Katlodeeche is located on the south shore of the Hay River where it flows into Great Slave Lake across the river from the community of Hay River.

A secondary road connecting with an all weather highway provides year round access. There is an airport across the river at Hay River with scheduled air service to points north and south. The community is sometimes subject to flooding during spring breakup depending on ice conditions.

Katlodeeche is a hydro community.

There is one governing body in the community – the Katl'odeeche First Nation. The community has Reserve status.

Council Members and staff respect their traditional Dene language, spirituality and traditional beliefs, values, knowledge and skills.

What is a community energy plan?

An energy plan shows what a community decides to do, over a certain period of time, to change how energy is used – to find better ways to make and use energy.

The community of Katlodeeche decided to create an energy plan to gather information about how energy use can be improved. This Community Energy Plan (CEP) report explains the energy planning process up till now, describes how energy is currently used, and outlines strategies for next steps.

Most NWT communities use energy planning to find ways to:

- Replace imported, non-renewable sources of energy such as fossil fuels with more local, renewable sources of energy such as wind, water, or sunlight.
- Reduce negative environmental impacts from energy use, such as greenhouse gas emissions, noise, or fuel spills.
- Keep money related to energy use in the community, rather than spending this money outside the community.
- Use energy more efficiently.

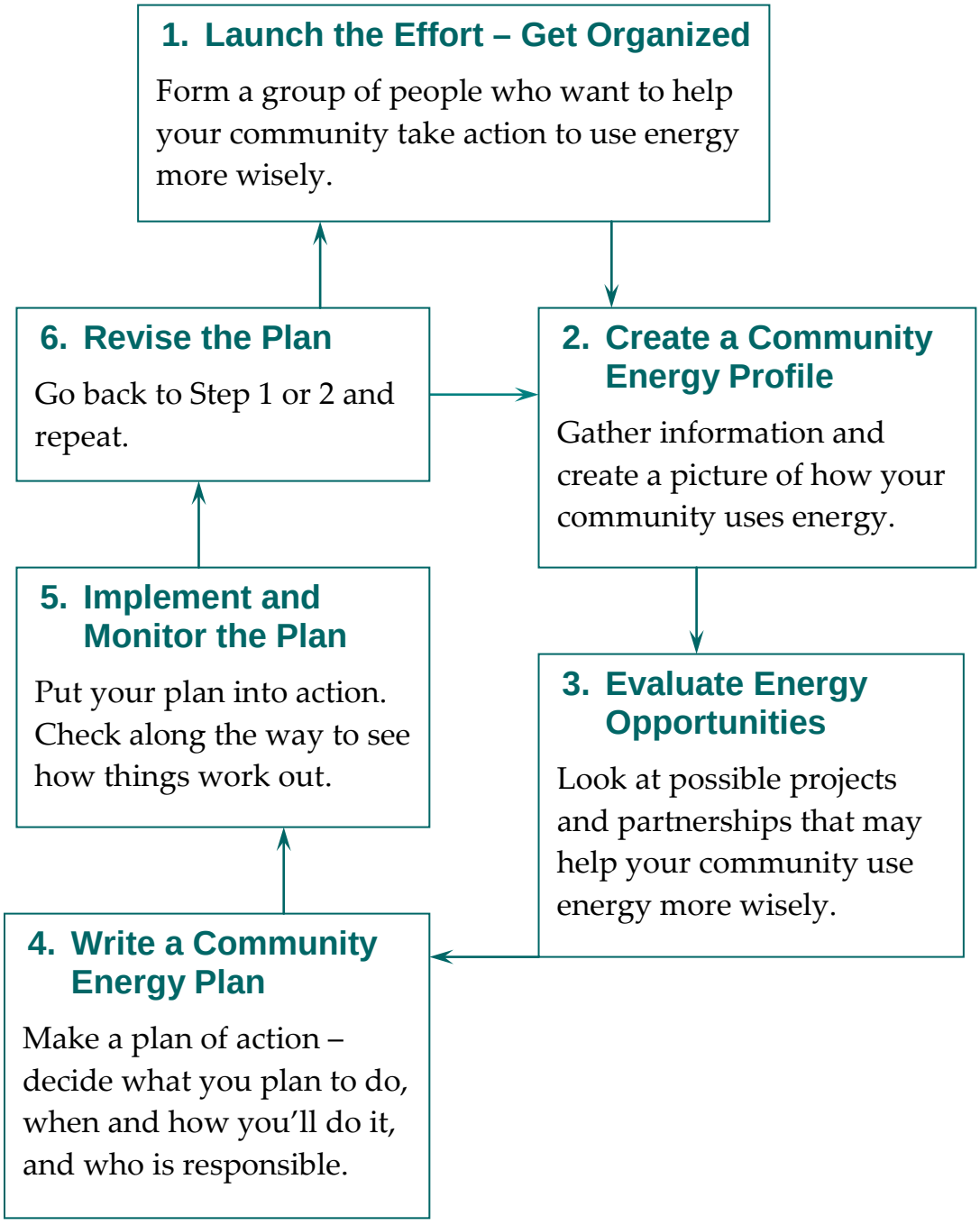
Energy planning is a cycle. The cycle might last for one, three, or five years. During each cycle, the community develops and carries out certain projects that make up the energy plan for that time period. At the end of the time period, a community reviews the energy plan, decides what other projects they can do, and continues to work towards their vision of a healthier, cleaner energy future.

Many people dream that things could be different – that we can use less energy, save money, produce less greenhouse gases, use more renewable sources of energy, and live with respect for the land.

A community energy plan helps to realize this dream. A community energy plan helps you take more responsibility and have more control over what energy you use and how you use it.

The diagram shown on the next page is a 6-step Community Energy Planning process a community can use to develop an energy plan. A modified process was followed in order to meet the ICSP deadline.

6 Steps - Energy Planning Process



Our community's Energy Goal

A goal is a short statement which describes where you want to get to and how you want things to be. It is realistic and achievable.

Our Energy Goal

- To use energy in ways that are within our community means and are in harmony and respect the land.

Our community's energy profile

This section of the community energy plan gives a visual summary of our community energy profile.

What is a community energy profile?

A community energy profile describes energy sources and energy use in our community, for a year.

The energy profile does **not** usually include energy related to air and truck transport that bring goods into the community.

A community energy profile contains basic information that is easy to find and easy to find again in the future. We can update the profile and keep track of how our community's energy use changes over time, and if and how it improves.

How does an energy profile measure energy?

The community energy profile measures energy with units called mega joules or MJ and giga joules or GJ.

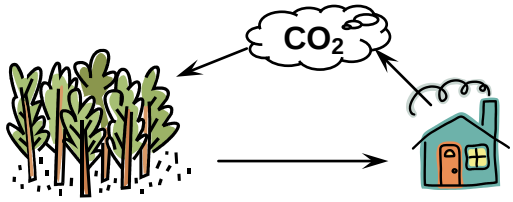
- One MJ equals the amount of energy it takes to boil 2 ½ litres of water.
- 1000 MJ = 1 GJ

To create an energy profile, we convert all units of energy into MJ so we can add up all the sources of energy and compare them. Other examples of units of energy supply include things such as litres for gasoline or diesel, cords for firewood, and kilowatt hours for electricity.

How does an energy profile measure greenhouse gases?

The community energy profile measures greenhouse gas emissions as carbon dioxide equivalent ($CO_{2\ EQ}$). Carbon dioxide is the most common greenhouse gas and we use it to show overall greenhouse gas emissions.

Each fuel has a standard formula to calculate greenhouse gases as $CO_{2\ EQ}$. We use this formula to calculate greenhouse gases for each fuel or energy.



The energy profile shows that wood has no greenhouse gas emissions. We count no greenhouse gases from wood because trees absorb carbon dioxide when they grow. This balances the greenhouse gases that wood produces when it burns.

Our community's energy plan

This section of the community energy plan lists recommended strategies that can be adopted by Katlodeeche First Nation as a Community Energy Plan. A list of potential future strategies is also included.

These strategies are based on two sources:

- information about Katlodeeche energy use in the Community Energy Profile;
- participation in the Community Energy Plan during the ICSP workshop February 16-17, 2010.

The Community Energy Plan is a part of the ICSP process because energy planning has implications for community infrastructure planning, strategic planning and human resource planning.

The strategies relate to:

- Energy efficiency recommendations *(how to use energy differently)*
- Renewable energy project recommendations *(how to get energy from a different source)*

The strategies are grouped under:

- Recommended strategies (doable in the next little while)
- Potential future strategies (for future consideration)

List of Recommended Strategies in our Community Energy Plan

Community Energy Planning Goal:

- To use energy in ways that are within our community means and are in harmony and respect the land.

Recommended Strategies

- **Incorporate Energy Standards into all new building contracts**

- **Assess the energy efficiency of Community buildings and equipment**

Chief and Council want to take good care of community buildings and make sure future buildings are energy efficient. Adopting this strategy will mean that energy efficiencies are designed and implemented into all new community infrastructure projects.

Arctic Energy Alliance has a ***Toolkit for Building Standards*** which can be used as a reference. The toolkit sets out building standards that can be included in a Request for Proposal and would require a contractor to build according to current energy efficiency standards.

An energy audit yardstick can provide baseline information about energy related deficiencies in existing buildings. The first step is to collect fuel and electricity bills for the last two years. These are compared against fuel and electricity costs for an average, equivalent size building in the NWT.

This information helps identify how energy efficient the building is and points out what can be done to improve the energy efficiency of the building. Using this information, it is possible to make informed decisions about whether to upgrade or replace existing structures. Capital or O&M activities may need to be identified to implement these decisions.

- **Upgrade Existing Buildings**

Upgrading existing buildings makes sense where the cost of upgrading is less than the cost of replacing a structure. This can be determined by monitoring energy use and doing a yardstick energy audit on the structure. There may be government rebate funding for some upgrading and equipment replacement.

- **Find ways to use less diesel fuel for heating.**

A number of practical, individual actions were identified. These include using wood and/or pellet heat, turning the thermostat down, replacing older wood stoves with newer energy efficient models and dressing warmly.

- **Research alternative sources of energy such as solar, ground source heat pumps, etc. and their potential use in Katlodeeche**.

Chief and Council and staff want to move away from their reliance on diesel fuel to heat community buildings and also find other ways to generate electrical power.

AEA has done research on what kinds of alternative sources of energy might work for different communities. This is based on computer modeling and certain assumptions. The choice of what you look into is up to community decision making process and priorities.

Katlodeeche wants to explore two alternative energy sources:

- Solar collecting farm; and
- Ground Source Heat Pumps.

Potential Future Strategies

- **Investigate the use of Wood Pellet boilers for community buildings**

There are a number of NWT community buildings that are using wood pellet boilers to heat the building. Katlodeeche is in a good location to consider using this heating source for large buildings because it is a road community and relatively close to a large wood pellet source in northern Alberta.

- **Set up an Energy Committee**

An energy committee could review the Community Energy Plan in more detail and provide get-up-and-go, ideas and continuity for ongoing energy awareness and conservation activities.

Any plan of action has a greater chance for success if community members, leaders and groups are behind it. Energy sources, their use and costs affect everyone in the community. Having community support generates enthusiasm.

- **Monitor Energy Use**

Keeping track of energy use does a number of things. Unexpected surges or drops will give an early warning sign when there are problems. It also helps identify possible future plans for upgrading structures and is the information required to do a yardstick audit. This will direct where upgrades can be made.

- **Adopt a Low/No idle policy for community vehicles**

Some communities in the NWT have chosen this as a way to reduce greenhouse gas emissions from idling vehicles and to take a leadership role in changing community attitudes and beliefs.

- **Hold Winterization and Home Maintenance workshops**

This strategy is a very practical and hands on way to start. The goal of a Winterization Workshop is to provide basic knowledge and skills to winterize a house – weather stripping, stopping leaks, covering windows with plastic, etc. and have the participants practice these skills. AEA offers a short term workshop for high school students. As part of their training, the students assist community Elders by winterizing their homes. The students earn school credit for their work and the Elders homes are winterized.

Home Maintenance Workshops have a similar goal – to provide basic knowledge and skills to maintain a home in good condition and identify ways to increase energy efficiency. This could include cleaning and/or replacing furnace filters, lightbulbs, caulking, etc. and learning about ways to increase energy efficiency.

- **Replace Appliances**

Continue to promote replacing appliances with energy efficient, energy star appliances. Provide people with information about the brands and models that qualify for rebates and the forms used to apply for the rebates.

- **Community Evaluation and Decision Making for Large Scale Alternative Energy Projects**

Make a plan for evaluating future large scale energy projects – develop criteria for evaluating projects and outline the community decision making process.

Develop a protocol and process to work with community members and technical advisors to evaluate large scale alternative energy projects such as solar and hydro.

Next steps

Now that a list of strategies has been identified, the next step is to develop an implementation plan for each strategy. An implementation plan describes how each strategy will be carried out.

It is helpful to keep track of what happens to see you things work.

The following questions can be asked:

- Did we complete all our projects?
- How do we know the projects are done?
- What things went well as we did our work?
- What things do we need to change in the future?

When the energy plan is complete, the cycle starts again. A new community energy profile can be created and new projects can be identified. The learning from one cycle is applied to the next.

Key words

We encourage you to understand and learn to use some key words about energy planning.

Capacity

Capacity is the knowledge, skills, people power, time, energy, money, and other resources that a person, group, or community has. We can increase capacity any time we increase any of these resources.

$CO_{2\ EQ}$ - Carbon dioxide equivalent

$CO_{2\ EQ}$ measures greenhouse gas emissions. Carbon dioxide is the most common greenhouse gas and we use it to show overall greenhouse gas emissions.

We measure greenhouse gas emissions as Tonnes $CO_{2\ EQ.}$

One Tonne = 1000 kilograms.

Cogeneration

Cogeneration is a system and technology that takes waste heat from a diesel generator and pipes it to a nearby building, to heat that building.

Community energy plan

A community energy plan shows how a community changes how they use energy today, to meet their vision of how they want to use energy more wisely in the future. It shows the process and information the community uses to decide what they want to do, how they want to do it, and who will do the work.

Energy audit

An energy audit measures how a building uses energy and what you can change in the building, to save energy.

Energy efficiency

Energy efficiency means to use less energy and still do the same amount of work. An energy efficient vehicle uses less gas to go the same distance. An energy efficient refrigerator uses less electricity to keep things cold. Energy efficient habits are things people do that use less energy – such as turning off lights when you don't use them, walking instead of driving, using a clothesline instead of a dryer.

Demonstration project

A demonstration project is something we decide to do once, to show that it works. For example, to do a demonstration project for solar water heating we could install a system in a building like the nursing station. We'd keep track of things like how much money we save over one year, compared with when we didn't have the solar water heating system.

Feasibility / Pre-feasibility study

A feasibility study is when we learn things to find out if something is possible. For example, to do a feasibility study for a run-of-river hydro project, we'd pick one or more sites we think might be good. We'd measure things such as water flow and the height of a waterfall over a year or more.

A pre-feasibility study is when we learn things to help decide if we want to do a feasibility study. In the example above, we'd learn general things about run-of-river hydro and we'd decide which sites might be good to look at more closely.

Fossil fuels

Fossil fuels include things like gasoline, diesel oil, and natural gas. Fossil fuels come from deep in the ground and they are a nonrenewable resource. Once we use them up, they are all gone.

Greenhouse gases and climate change

Greenhouse gases are part of the earth's atmosphere - gases such as carbon dioxide, methane, nitrous oxide, and others. Sunlight comes through the atmosphere and hits the earth's surface. Some light energy bounces back into the atmosphere as heat energy. Greenhouse gases trap the heat and keep it in the atmosphere.

Many greenhouse gases come from nature. Human activity also creates lots of greenhouse gases – especially burning fossil fuels.

Over time, the earth's temperature should stay about the same if amount of energy coming in from the sun is the same as the energy going back into space. Right now we burn too much fossil fuels and produce much greenhouse gases – we've upset the balance. This causes climate change.

Renewable energy

Renewable energy is energy that comes from things that can last forever. Renewable energy is never all gone. Examples of renewable energy sources include the sun, wind, moving water, and wood.