Community Energy Plan

Sambaa K'e Dene Band 2010

Sambaa K'e

Trout Lake, NT

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 Sambaa K'e Dene Band:

- Community members, who took the time and energy to participate
- Staff at the Sambaa K'e Dene Band
- 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

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

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Executive Summary

The community of Sambaa K'e is committed to maintain their culture and traditions. Community residents respect their language, traditional knowledge and history of sustainable living in harmony with the land.

In keeping with these values, community representatives have worked with Arctic Energy Alliance over the last 4 years to develop a Community Energy Plan that reflects Sambaa K'e traditions of sustainable living and respect for the land.

The initial Community Energy Planning groundwork was incorporated into the Integrated Community Sustainability Plan (ICSP) process. Community representatives and Arctic Energy Alliance representatives participated in the regional ICSP meeting that included the Community Energy Plan (CEP) as one part of the 4-part ICSP.

The CEP process will continue after March 31, 2010 to further develop and implement the goals and strategies that were identified at community meetings in Sambaa K'e and at the Deh Cho regional ICSP workshop.

Overall Community Energy Planning Goal:

The Sambaa K'e Dene Band wants to manage and use energy in ways that respect the land and honor future generations.

The community is rooted in its traditions and cultural practices and wants to maintain them while introducing new and basic energy strategies.

Strategies to Achieve the Overall Community Energy Planning Goal:

Strategy 1: Reducing the community's Energy Consumption with respect to business, municipal and individual's homes

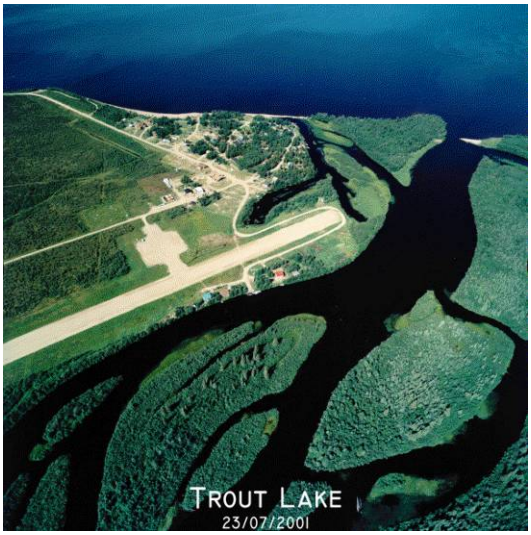
Strategy 2: Complete a Yardstick audit on municipal buildings

Strategy 3: Encourage New Buildings to meet minimum energy efficiency standards

Strategy 4: Hire or Share with another community an Energy Coordinator to research energy efficiency projects that may be possible in Trout Lake

The recommended strategies describe the direction to focus future actions.

Introduction



The community of Sambaa K'e (Trout Lake) is one of 10 communities in the Deh Cho Region of the Northwest Territories. The Sambaa K'e Band consists of just over 95 residents. There are 116 Band Members, some living for a time away from the community.

The community is self-governing, having established independence from the Fort Liard Band around 1975.

Sambaa K'e is located on the south shore of Trout Lake, 161 air km south of Fort Simpson and 442 km southwest of Yellowknife. Access to the community is limited and is available through Fort Simpson, Hay River, and Fort Liard. There is an airport and no regularly scheduled flights into the community. A winter road links Trout Lake with the Mackenzie Highway. The community is mainly resupplied by the winter road access. Trout Lake relies on a diesel generator for electricity.

There is one governing body in the community: Sambaa K'e Dene Band. Sambaa K'e is part of the Deh Cho Territory.

The Community Energy Planning (CEP) process developed by Arctic Energy Alliance was somewhat modified in order to meet the March 31, 2010 deadline for gas tax funding.

In addition to previous CEP work done with the community by Arctic Energy Alliance (AEA), community and AEA representatives

participated in an Integrated Community Sustainability Plan (ICSP) process that incorporated the Community Energy Plan (CEP) as one part of the 4-part ICSP.

The CEP process will continue after March 31, 2010 to further develop and implement the goals and strategies that were identified at community meetings in Sambaa K'e and at the Deh Cho regional ICSP workshop.

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 Sambaa K'e 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, describes how energy is currently used, and outlines recommendations 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.

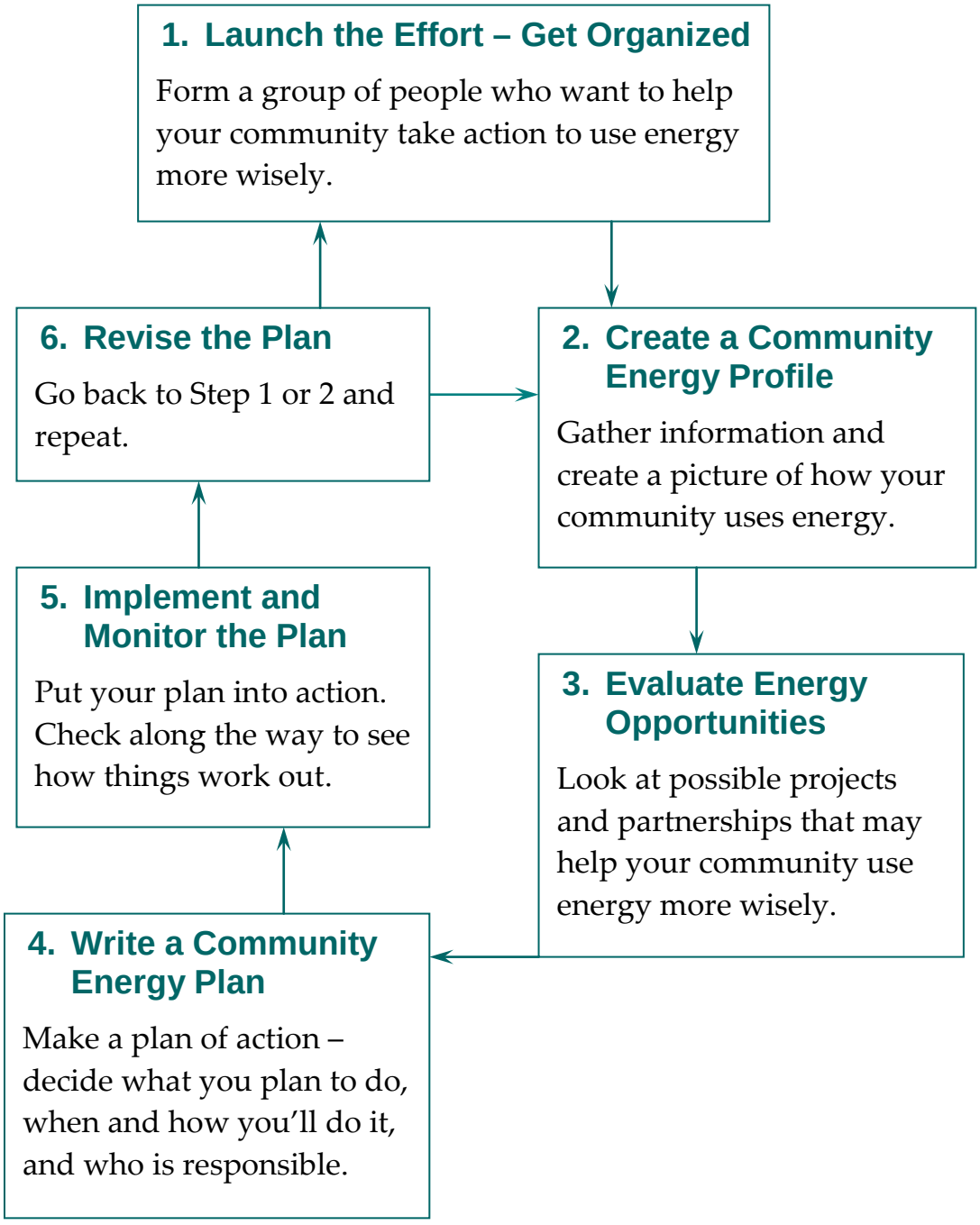
Energy planning is a cycle. The cycle might last for one, three, or five years. During each cycle, the community develops and carries out certain projects that make up the energy plan for that time period. At the end of the time period, a community reviews the energy plan, decides what other projects 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. The modified process that was followed in order to meet the ICSP deadline meant that there was not as much community involvement as is ideal in the steps leading up to the development of the CEP.

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

The Sambaa K'e Dene Band wants to manage and use energy in ways that respect the land and honor future generations.

The community is rooted in its traditions and cultural practices and wants to maintain them while introducing new and basic energy strategies.

Community Members who participated in discussions:

Ruby Jumbo
Dolphus Jumbo
John Deneron
Tony Jumbo
Thomas Kotchea
Norma Jumbo
Brenda Jumbo
Arthur Jumbo
Elder Edward Jumbo
Elder David Jumbo

Our community's energy profile

This section of the community energy plan gives a brief summary of our community's 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.

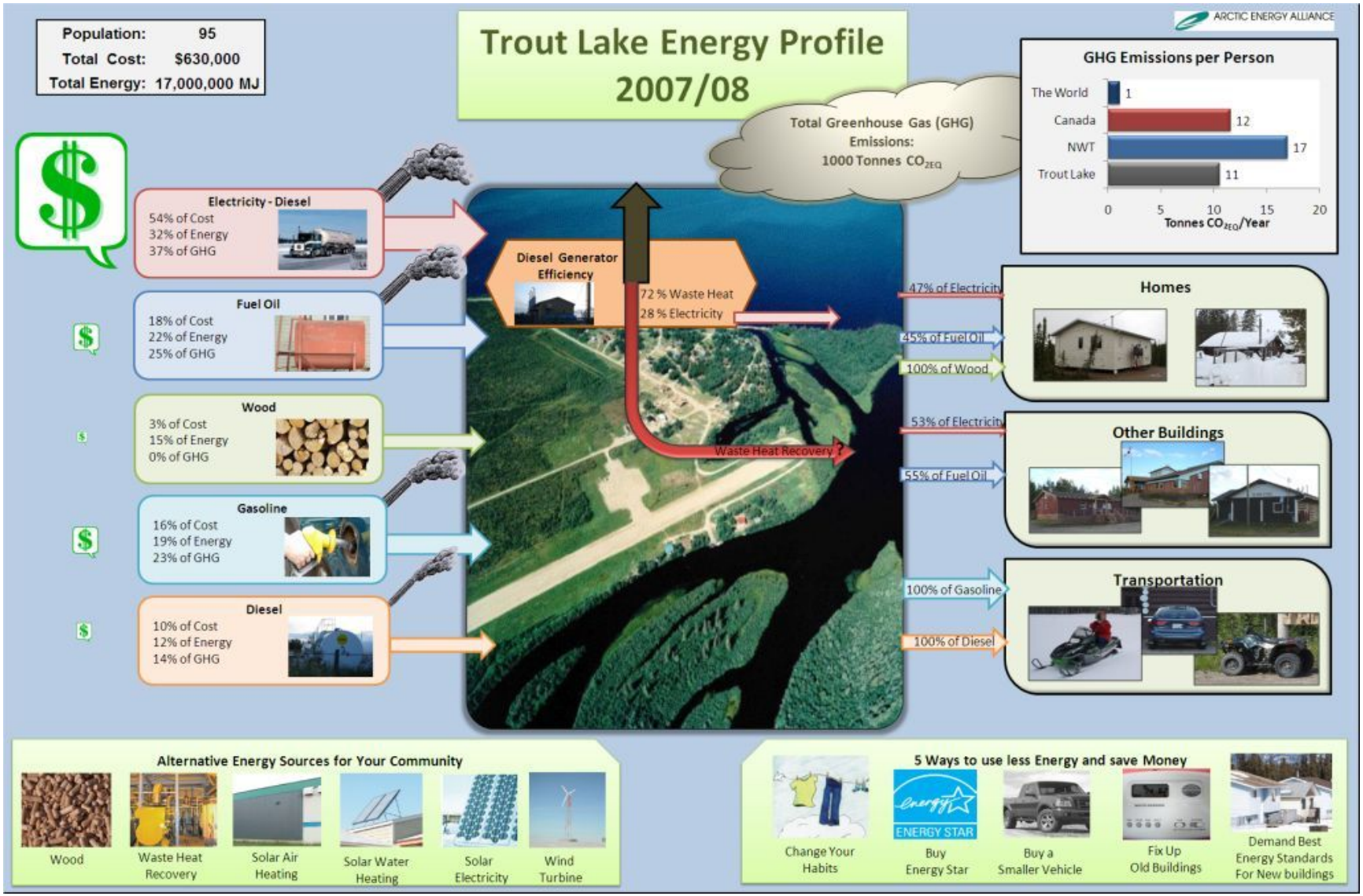
A community energy profile contains basic information that is easy to find and easy to find again in the future. We can update the profile and keep track of how our community's energy use changes over time, and if and how it improves.

Summary of our energy profile

The energy profile shows that electricity is produced by burning diesel fuel in a diesel generator. Electricity is used to power lights and appliances in our homes and buildings. Homes are heated by a combination of burning fuel oil and burning wood. Community buildings are heated from burning fuel oil, except for the garage that is heated from waste heat from the diesel generator. Gasoline and diesel are used for cars, trucks, snowmobiles, ATVs, and boats.

The diesel fuel for electricity, fuel oil for heating, and gasoline and diesel for vehicles are all brought into the community by truck on the winter road. When the fuel is burned it releases greenhouse gases, which have impacts on the land in the form of local pollution. Greenhouse gases are also related to larger effects on climate change.

The energy profile shows that as a community, Trout Lake spent a total of approximately $630 000.00 on energy from April 1, 2007 to March 31, 2008. Electricity (produced from the diesel generators) is the biggest expense and the biggest source of greenhouse gases compared to the other energy sources.


Population: 95
Total Cost: $630,000
Total Energy: 17,000,000 MJ
Trout Lake Energy Profile
2007/08
ARCTIC ENERGY ALLIANCE
Total Greenhouse Gas (GHG) Emissions:
1000 Tonnes CO_{2EQ}
GHG Emissions per Person
The World 1
Canada 12
NWT 17
Trout Lake 11
0 5 10 15 20
Tonnes CO_{2EQ}/Year
Electricity - Diesel
54% of Cost
32% of Energy
37% of GHG
Fuel Oil
18% of Cost
22% of Energy
25% of GHG
Wood
3% of Cost
15% of Energy
0% of GHG
Gasoline
16% of Cost
19% of Energy
23% of GHG
Diesel
10% of Cost
12% of Energy
14% of GHG
Diesel Generator Efficiency
72 % Waste Heat
28 % Electricity
Waste Heat Recovery ?
47% of Electricity
45% of Fuel Oil
100% of Wood
Homes
53% of Electricity
55% of Fuel Oil
Other Buildings
100% of Gasoline
100% of Diesel
Transportation
Alternative Energy Sources for Your Community
Wood
Waste Heat Recovery
Solar Air Heating
Solar Water Heating
Solar Electricity
Wind Turbine
5 Ways to use less Energy and save Money
Change Your Habits
ENERGY STAR
Buy Energy Star
Buy a Smaller Vehicle
Fix Up Old Buildings
Demand Best Energy Standards For New buildings

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.

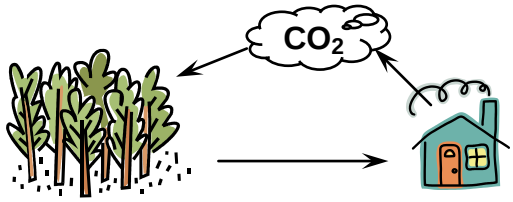
- One MJ equals the amount of energy it takes to boil 2 ½ litres of water.
- 1000 MJ = 1 GJ

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 Sambaa K'e as a Community Energy Plan.

These recommendations are based on three sources:

- information about Sambaa K'e energy use in the Community Energy Profile;
- participation from community members; and
- participation on the Community Energy Plan during the ICSP regional workshop

The recommended strategies relate to:

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

The recommended strategies describe the direction to focus future actions.

List of Recommended Strategies in our community energy plan

Strategy 1: Reducing the community's Energy Consumption with respect to business, municipal and individual's homes

As described in the community energy profile, there are different sources of energy. There are different strategies to reduce energy consumption for different energy sources. For example, reducing electricity consumption can be done by using energy efficient appliances and turning off appliances when they are not being used. Reducing fuel oil consumption can be done by renovating buildings to be more efficient so that they require less heat and by using more wood or wood pellets for heating and. Reducing consumption of gasoline and diesel can be done by using vehicles less, especially reducing the time that vehicles are left to idle.

Strategy 2: Complete a Yardstick audit on municipal buildings

An energy audit can provide baseline information about energy related deficiencies in existing buildings. 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.

An energy yardstick audit can be done free of charge. 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 helps identify how energy efficient the building is.

Ongoing monitoring of electricity and heating bills in existing buildings can help our community make informed decisions in the future about which buildings need to be renovated.

Strategy 3: Encourage New Buildings to meet minimum energy efficiency standards

An excellent new standard to set for new residential buildings being built in Sambaa K'e would be EGNH 80 (Energuide for New Houses 80). An average home has a rating of around EGNH 65, which uses about twice as much energy as a building with an EGNH 80 rating.

An excellent new standard for commercial buildings would be MNECB+25 (Model National Energy Code for Buildings plus 25%). The MNECB+25 standard is a building built 25% more efficient than the national standard.

Strategy 4: Hire or Share with another community an Energy Coordinator to research energy efficiency projects that may be possible in Trout Lake

An energy coordinator can investigate energy efficiency projects and alternative energy sources, and work to educate fellow community members about energy. The benefit of hiring an energy coordinator is that the knowledge that they will learn about energy will stay in the community. Community involvement and awareness is key to implementing successful projects. Knowing how to maintain and use new infrastructure and equipment is also important.

Next steps

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

It is helpful to keep track of what happens to see how 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

The following are 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.

Yardstick Energy audit

A yardstick 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.