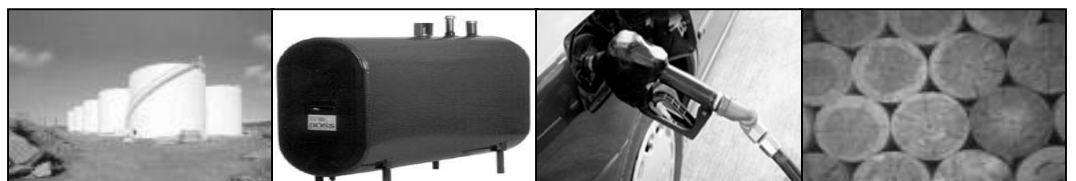


# Community Energy Plan



# Introduction and Acknowledgements

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## Our community

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

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

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

**ENERGY HELP**  
For your home. For your business. For your community.

TOLL FREE 877 755 5855  
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ARCTIC ENERGY  
ALLIANCE

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

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# What is a community energy plan?

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An energy plan shows what a community decides to do, over a certain period of time, to change how we use energy – to find better ways to make and use energy. We decide to do things today because we have a vision of a better, cleaner energy future.

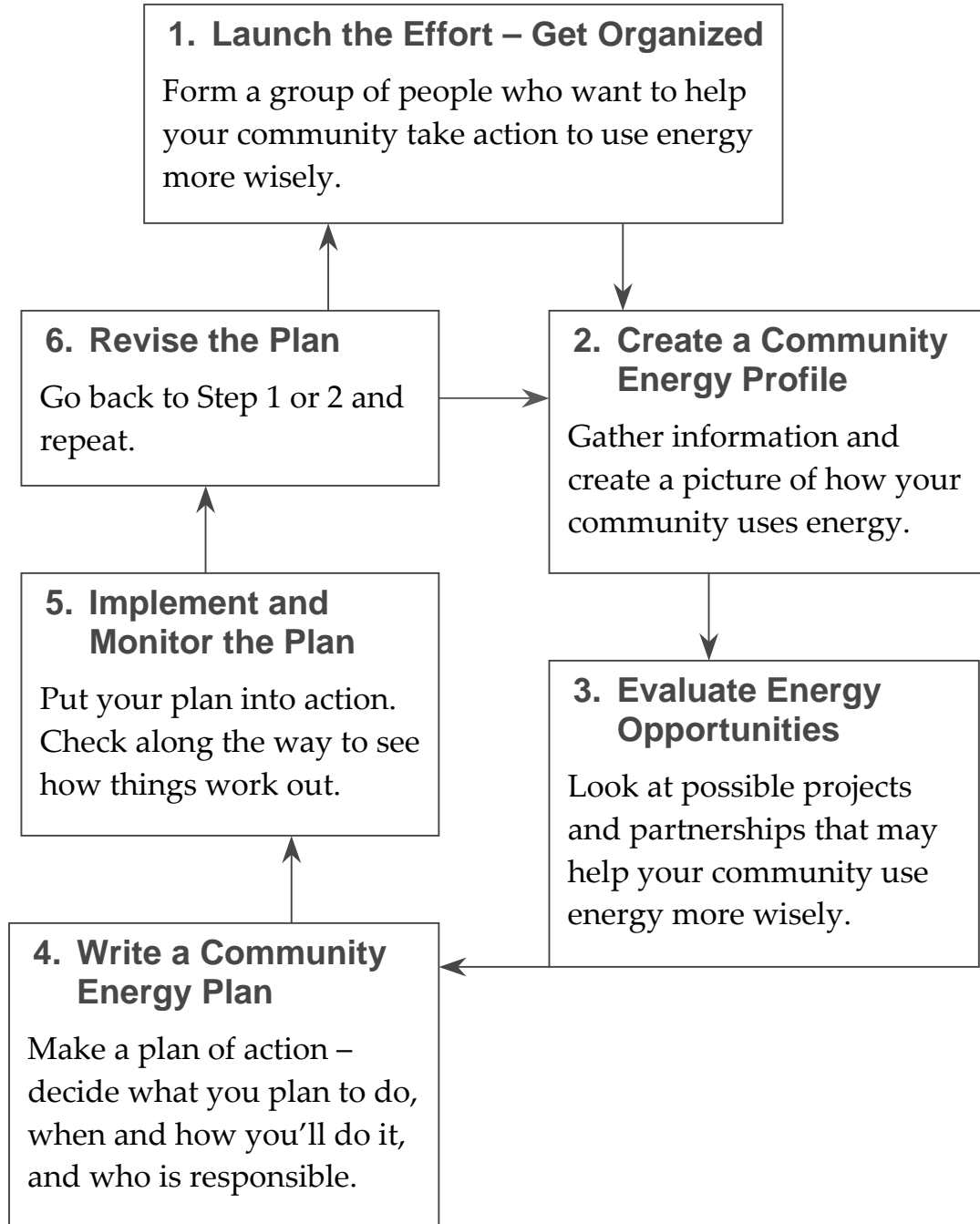
The diagram on the next page shows a 6-step process a community can use to develop an energy plan. This Community Energy Plan includes some general and community-specific information for each step.

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.

## 6 Steps - Energy Planning Process

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Energy planning is a cycle. The cycle might last for one, three, or five years. During each cycle a 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 better, 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.

## **Why is a community energy plan important?**

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Do you want your community to:

- Save money and create local jobs?
- Have less pollution and produce less greenhouse gases?
- Build healthy ways of living and help people learn new and creative skills?

A community energy plan helps a community do all these things, and more. People will always need and use energy. We live in the north. We need heat and light for our homes and other buildings in winter. Our modern world depends on electricity for many things besides light - things like appliances, machines, computers, TVs, radios, music, etc.

We get most of our energy from fossil fuels and we know fossil fuels won't last forever. They get more and more expensive as time goes by and we know burning them causes climate change. We also know that in many ways our modern society encourages people to waste energy.

A community energy plan can help our community save money and reduce greenhouse gas emissions. It can bring economic, environmental, and social benefits to a community.

## **What are the economic benefits of community energy planning?**

---

The main economic benefits of community energy planning are to:

- Develop local jobs to increase energy efficiency and to produce and maintain more local sources of energy.
- Keep more of the money that we spend on energy in the community.
- Reduce energy costs and create economic development opportunities.
- Apply for and receive government funding for energy related projects. One example is Gas Tax funding.

### **Did you know?**

- ♦ 93% of NWT energy supply is imported fossil fuel - 400 million litres per year.
- ♦ The NWT spends \$230 million a year on energy – we spend more than half that outside the NWT.



In the NWT about 42,000 people live in 32 communities. We mostly use hydro and diesel generators to produce electricity. We pay a lot to bring fuel north to run the diesel generators, to heat our homes and other buildings, and to drive our cars and trucks. NWT energy costs can be up to 10 times higher than in other parts of Canada.

Energy efficiency and renewable energy projects provide local employment. Research shows that renewable energy projects create up to 12 jobs per million dollars spent, while energy efficiency improvement projects create even more

Projects that create local employment have a multiplier effect – they create more jobs than just the jobs related directly to the project. When people have jobs they spend money in their community and create jobs for other people.

### **Did you know?**

If a community replaces imported, non-renewable fuel with local, renewable sources of energy, more money stays in the community.

The community can use that money to provide other community services. And the community has a sustainable, more independent, secure energy supply.

Local energy efficiency and renewable energy projects help the economy in other ways too. If people in the community spend less money on their energy bills, they have more money to spend on other things. This potentially leaves more money in the community.

## What are the environmental benefits of community energy planning?

---

The main environmental benefits of community energy planning include:

- Use less diesel and gasoline fuel, and produce less toxic exhaust local air pollution.
- Have fewer fuel spills and reduce local pollution.
- Replace diesel power plants or use them less, and reduce noise pollution.
- Use less fossil fuel and produce less greenhouse gas emissions.

### Did you know?

Diesel exhaust:

- Contains over 40 toxic air contaminants,
- Increases the risk of lung cancer, and
- Can cause coughs and aggravate asthma.

Human energy use affects the environment and human health. In the past, nature mostly absorbed these effects - the scale and intensity of human energy use did not overwhelm the natural balance. Today the global population keeps growing and people around the world use more and more fossil fuels such as diesel and gasoline, the main source of greenhouse gas emissions.

Burning fossil fuels the largest source of greenhouse gas emissions in the NWT. We produced 1,750,000 Tonnes of CO<sub>2</sub> in 2001.

Greenhouse gas emissions are the main cause of climate change. The effects of climate change are more severe in the north than in the southern parts of Canada. Right now most of the world depends on fossil fuels for energy, just as we do in the NWT. And although we have a small population, we're responsible to do our part.

### Did you know?

- NWT greenhouse gas emissions increased more than 60% between 1996 and 2001.
- The Arctic Climate Impact Assessment states that the Arctic is warming at twice the rate of the rest of the world.

Overall the NWT produces a relatively small amount of greenhouse gas emissions. But per person, we produce more than many other parts of the world. We need to take responsibility and do our part to help reduce greenhouse gas emissions.

### Sara Kuptana, Sachs Harbour, 1999

Sila (the weather and climate) has changed all right. It is a really late fall time now, and really fast and early springtime. Long ago the summer was short, but not anymore.

## What are the social benefits of community energy planning?

---

The main social benefits of community energy planning are to:

- Create warmer, more comfortable buildings that last longer.
- Use local sources of energy so we don't have to depend on outside sources of energy.
- Create opportunities for people to get training and develop new skills.
- Make the community more sustainable.
- Get the whole community involved in making decisions, and build community spirit and pride.

### Did you know?

An average northern house uses between 4 and 8 cords of wood per year for heat.

An efficient, well-insulated house uses only 2-3 cords per year and is more comfortable

## Our community's vision

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During Step 1 of the energy planning process, the community formed an energy planning committee. The committee developed a vision to guide the process.

A vision is a short statement of what the energy committee sees in the future – an ideal picture of how we'd like things to be. The vision helps the energy committee always see the big picture of what we're working for and what we care about, and encourages us to keep working, even when it's hard.

### Energy Committee Members

### Our Vision

## Our community's energy profile

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This section of the community energy plan gives a brief summary of our community's energy profile that we produced during Step 2 of the energy planning process. For more details, look at the separate community energy profile report. Contact the community energy committee to get a copy.

### What is a community energy profile?

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A community energy profile describes energy supply and energy use in our community, for a year. It shows:

- The different fuels a community uses to produce energy
- How much money a community spends on energy
- How much greenhouse gases each fuel produces
- How much energy a community uses in homes, other community buildings, and for transport within the community
- Some basic ideas a community can explore to use less energy, produce less greenhouse gases, and save money

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?

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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?

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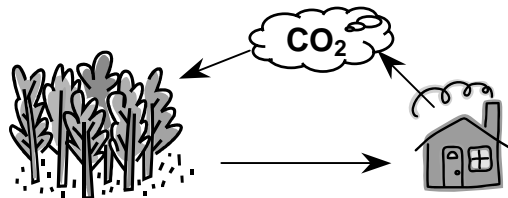
The community energy profile measures greenhouse gas emissions as carbon dioxide equivalent (CO<sub>2</sub> EQ). Carbon dioxide is the most common greenhouse gas and we use it to show overall greenhouse gas emissions.

Each fuel has a standard formula to calculate greenhouse gases as CO<sub>2</sub> 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.



Insert community energy profile poster



# Energy opportunities for our community

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This section of the community energy plan talks about Step 3 of the energy planning process – evaluate energy opportunities. To complete this step of the process we did three main things:

- Raise awareness and collect ideas
- Identify potential projects
- Evaluate potential projects

## Raise awareness and collect ideas

---

First we held different activities in the community to raise awareness about our community's energy use. During these activities we discussed the community's energy profile and learned about some different energy efficiency and renewable energy projects we might consider doing in our community.

After the posters, look for a summary of what we did during Step 3 of the energy planning process, to evaluate energy opportunities for our community.

## **Summary of what we did to evaluate energy opportunities for our community**

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This is a summary of the energy opportunities we looked at, how we evaluated energy opportunities, and the projects we decided to focus on.

## Scenarios of future energy use

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This section of the community energy plan shows a picture of what is possible if our community implements certain energy efficiency and renewable energy projects.

We compare total energy costs and greenhouse gas emissions under these scenarios:

- No energy saving projects – Our community keeps using energy the way we do right now.
- Energy efficiency scenario – Our community takes action on energy efficiency projects.
- Renewable energy scenario – Our community takes action on renewable energy projects.
- Energy efficiency and renewable energy scenarios combined.

We look at each scenario for four time periods: at five, 10, 15, and 20 years in the future.

We assume certain things for all the scenarios:

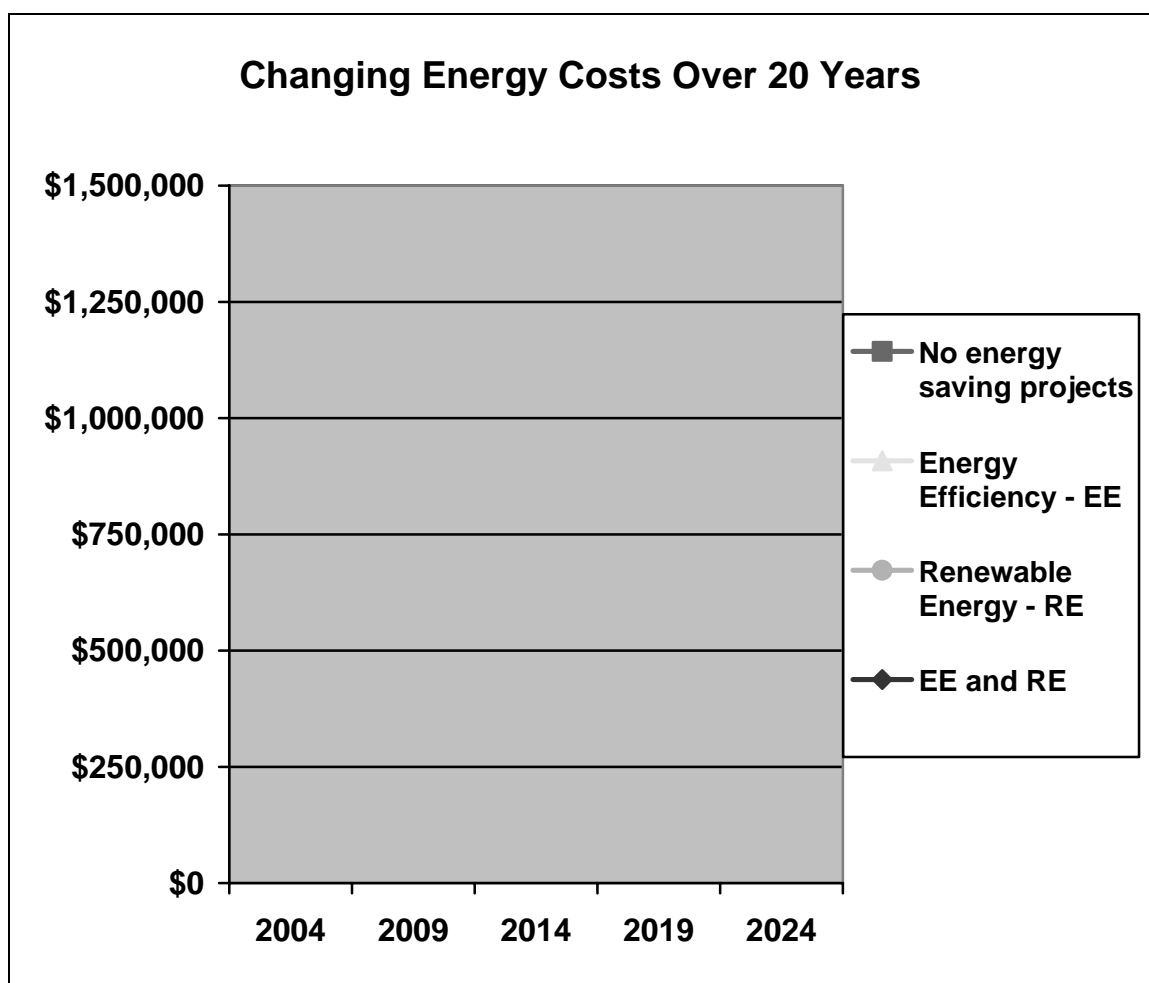
- Each scenario accounts for population changes over 20 years, as defined by the NWT Bureau of Statistics.
- Fuel prices stay the same over time. Most people believe the prices will keep rising, so there may be more savings than we show.
- In the energy efficiency scenario, ‘energy costs’ is the amount people spend every year on energy bills. This does not include things such as the money a person pays to fix up an older building or the money they save when they buy a small vehicle instead of a big one.

- In the renewable energy scenario, total energy costs do not include the money a community pays to set up a hydro project or to buy efficient wood stoves.

It is not easy to predict the future and the scenarios are an educated guess, not a promise. To truly create a clean energy future we need to take action, gather good information along the way, and apply our knowledge and experience to create more effective projects.

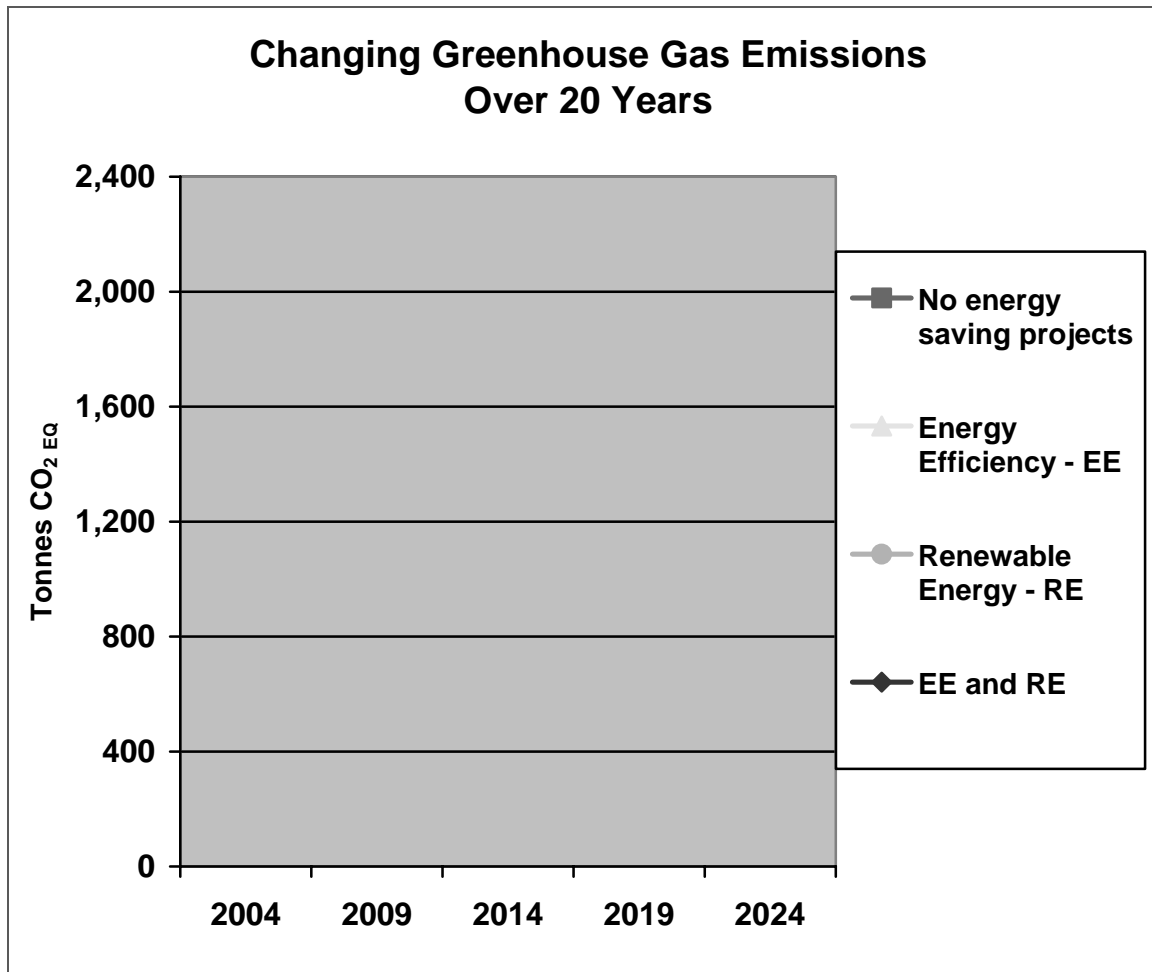
### **Our community's energy efficiency scenario**

## **Our community's renewable energy scenario**



This chart shows changes in energy operating costs every five years, for a total of 20 years, for four scenarios.

- No energy saving projects – Our community keeps using energy the way you use it right now.
- Energy Efficiency – EE – Our community applies the energy efficiency scenario described above.
- Renewable Energy – RE – Our community applies the renewable energy scenario.
- EE and RE – Our community applies both the energy efficiency and renewable energy scenarios.



This chart shows changes in total greenhouse gas emissions, every five years, for a total of 20 years, for four scenarios.

- No energy saving projects – Our community keeps using energy the way you use it right now.
- Energy Efficiency – EE – Our community applies the energy efficiency scenario described above.
- Renewable Energy – RE – Our community applies the renewable energy scenario.
- EE and RE – Our community applies both the energy efficiency and renewable energy scenarios.

## **Our community's energy plan**

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This section of the community energy plan lists the projects we plan to do. For each project we also provide a brief summary for each project that shows:

- Energy efficiency or renewable energy project
- Project name and description
- Outline of how we plan to carry out the project

### **List of projects in our community energy plan**

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## Worksheet 4-2: Project work plan

Project name:

☐ Renewable energy project

☐ Energy efficiency project

Project description / results:

Tasks	Person responsible	Schedule	Budget

## Worksheet 4-2: Project work plan

Project name:

☐ Renewable energy project

☐ Energy efficiency project

Project description / results:

Tasks	Person responsible	Schedule	Budget

## Worksheet 4-2: Project work plan

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## Worksheet 4-2: Project work plan

Project name:

☐ Renewable energy project

☐ Energy efficiency project

Project description / results:

Tasks	Person responsible	Schedule	Budget

## Next steps

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Now we have a community energy plan we're ready for Step 5 of the planning process. During Step 5, our community takes action to carry out the plan. This happens over the period of time for this energy plan.

As we take action, we keep track of what happens to see how things work. We answer questions such as:

- 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 we complete this energy plan, we start the cycle again. During Step 6 of the planning process, our community does another energy profile, identifies new projects, and writes a new energy plan. We apply what we learned during the planning cycle and start the cycle again, to keep working toward our vision of a clean energy future.

The energy committee recommends that:

- Our community adopt this energy plan for the time period \_\_\_\_\_ to \_\_\_\_\_, and do the next energy profile in \_\_\_\_\_ years.
- Our community form an implementation committee to oversee Step 5 of the planning process, to help carry out the plan.

## Key words

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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<sub>2</sub> EQ - Carbon dioxide equivalent**

CO<sub>2</sub> 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<sub>2</sub> 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.