IMPROVING HOMES AND LIVES

Great Bear Initiative's Energy Efficiency in Existing Homes

GBI Community Energy Facilitator

Work to implement the Clean Energy Action Plan

Community goals include:

- Reduce fossil fuel use is communities
- Reduce energy use in communities
- Support renewable energy
- Reduce energy costs
- Improve reliability
- Improve health
- Support local economic development in energy

Community Energy Facilitator

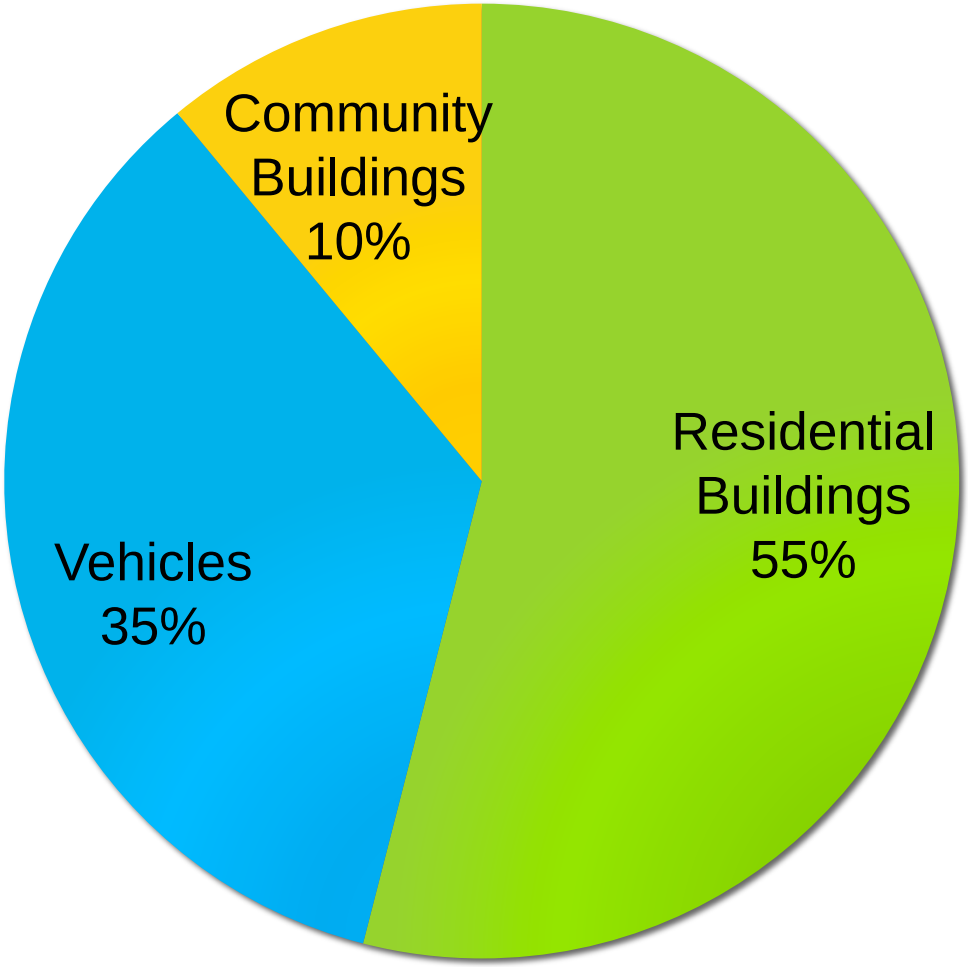
- Manages peer-to-peer network
- Support communities to reach own energy goals
- Build relationships with partners
- Offers guidance, finds funding, removes barriers

Act on BEHALF of Nations

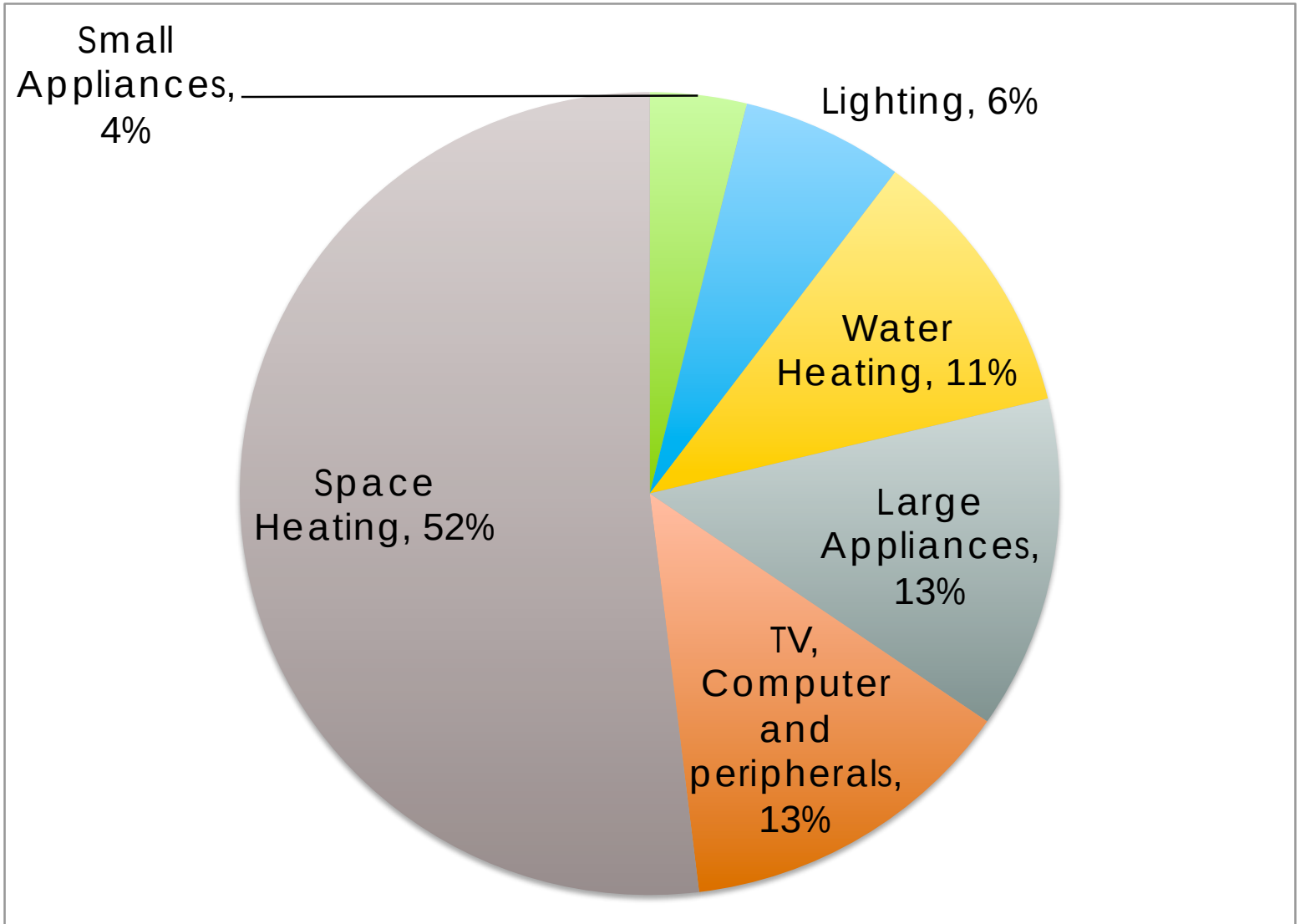
Typical Community Energy Use

Based on Coastal First Nations Communities

Community Energy Use

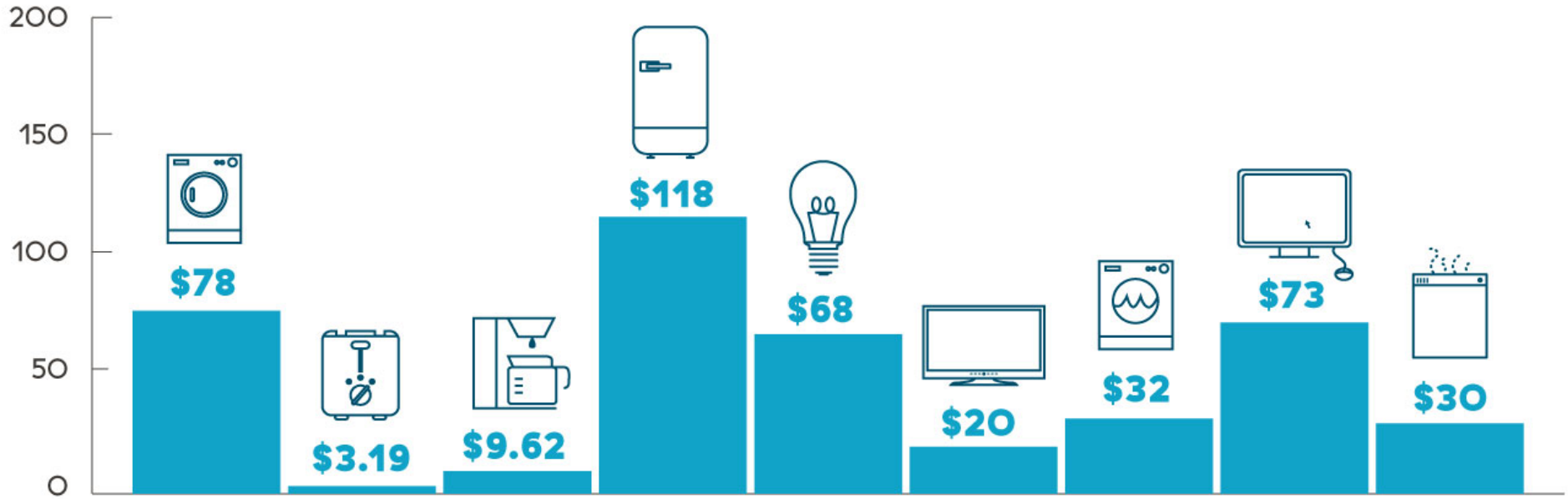


Home Energy Use



Household devices annual costs

Here's a look at the approximate electricity costs at the Step 1 rate of 8.29 cents per kilowatt hour.



Clothes dryer	Toaster	Coffee maker	Old refrigerator	15 incandescent light bulbs	TV	Clothes washer	Computer/ monitor	Dishwasher
6,200 Watts 8 cycles a week	1,100 Watts 5 minutes a day	1,500 Watts 10 minutes of brewing and 1 hour of warming a day	380 Watts 24 hours a day	10 Incandescent lamps 600 Watts 3 hours a day	132 Watts 5 hours a day	700 Watts 35 loads a month	Always on	1,200 Watts 20 hours a month

Use	Energy Source - Connected	Energy Source - Remote
Space Heating	Electric Natural gas Oil Propane Wood	Largely oil Some propane Some electric Wood
Water Heating	Electric Natural gas Oil Propane	Electric Oil Propane Natural gas
Electricity	Hydro	Diesel Small hydro*

Saving Energy

Energy Efficiency in Existing Homes

Benefits of Energy Efficiency

- **Save money**– energy bills are often reduced
- **Greater comfort** – homes are less drafty, and maintain a constant temperature better than an inefficient home
- **More mold resistant** – a well-insulated, well-ventilated home controls moisture issues
- **Improved pride** – in your home, and sense of well-being
- **Local economic development** – including the development of skilled workers
- **Preserves the natural environment** – less oil spills, cleaner air, and reduced contributions to climate change

Benefits of Energy Efficiency

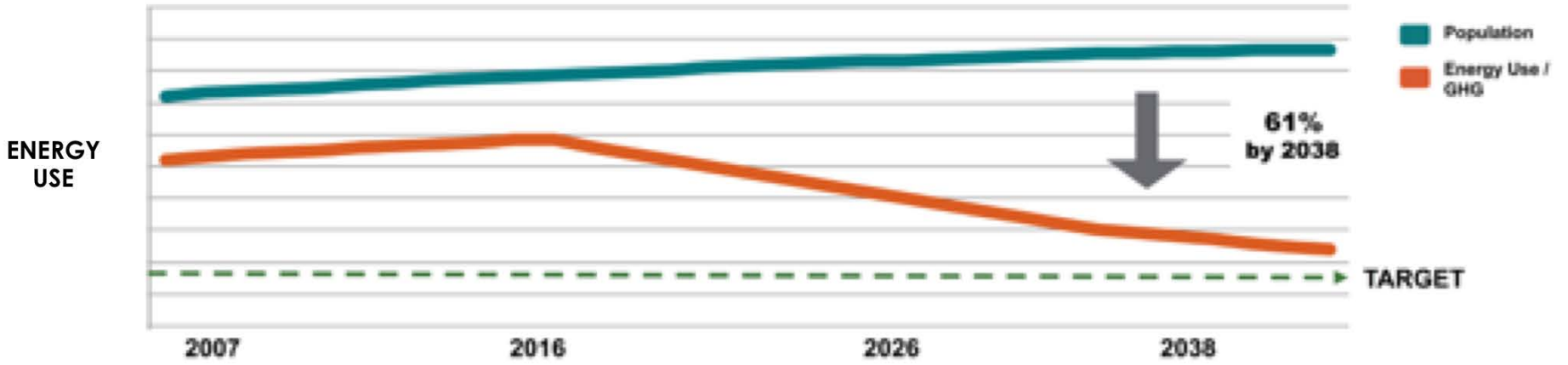
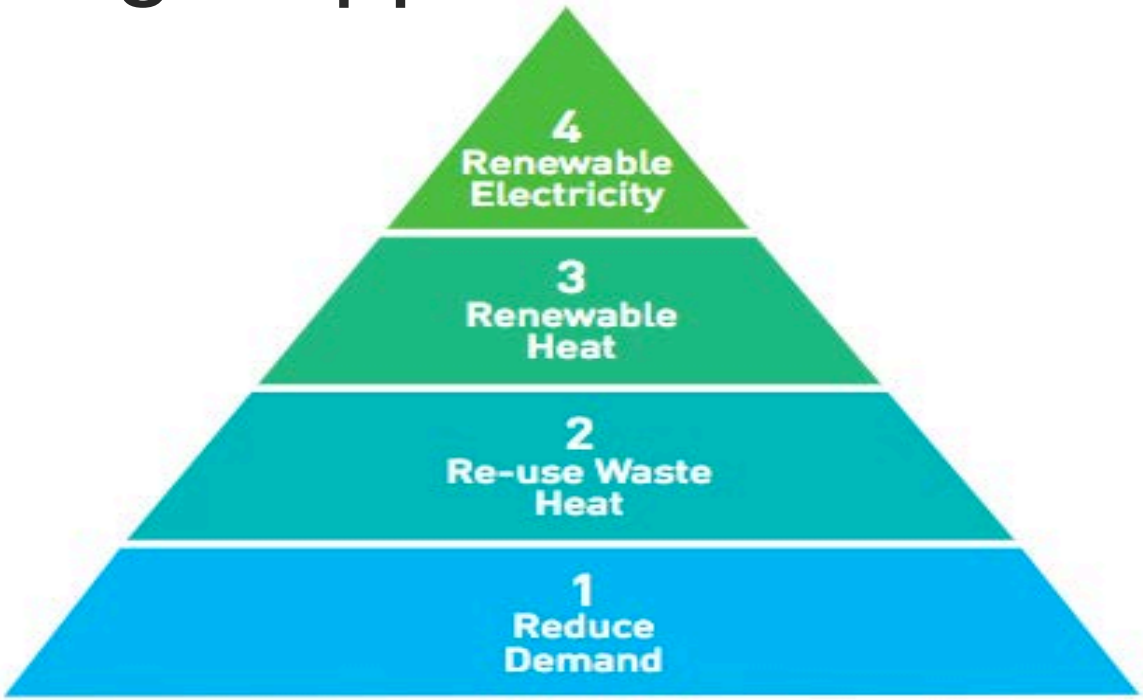


Figure 1: Energy Use / Greenhouse Gas Emissions and Population over Time

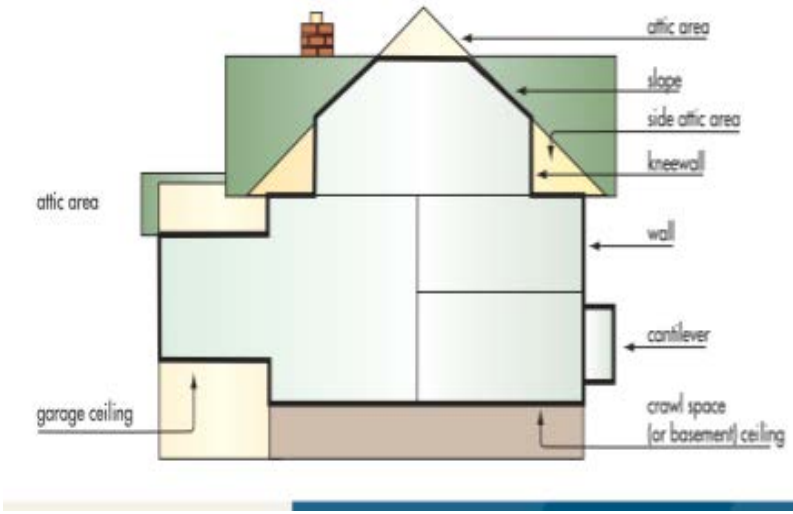
A Strategic Approach to Efficiency



1. REDUCE ENERGY DEMAND	through community design, green buildings, and efficient technologies.
2. RE-USE WASTE HEAT TO HEAT BUILDINGS AND HOT WATER	e.g., industrial or commercial waste heat, sewer and waste water heat recovery.
3. RENEWABLE HEAT SOURCES TO HEAT BUILDINGS AND HOT WATER	e.g., solar thermal and geo-exchange.
4. RENEWABLE ENERGY FOR ELECTRICITY	e.g., biomass/biogas combined heat and power, micro-hydro, wind, solar, tidal and geothermal.

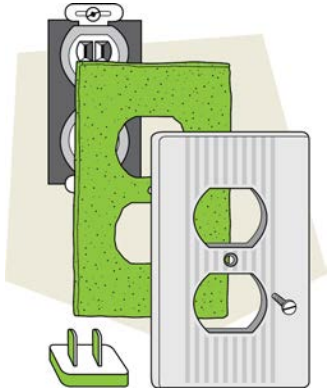
What is Demand Side Management?

- **Improve the building envelope** to keep more warm air in the home.
- **Reduce energy consumption** through a combination of changing the way occupants' use the building (e.g. turning off the television when not in the room), and;
- **Increasing the energy efficiency** of equipment and appliances used in the home.



Improving the envelope

- Air Sealing



- Insulation
- Windows
- Doors

Reducing Consumption

Reasons to engage community members

- Share the intent of efficiency project
- Assess community values and vision
- Learn about housing conditions
- Share insights into community energy use
- Educate on energy efficient practices
- Share information on home maintenance
- Access capital (EDC)
- Gain access to homes for upgrades

Reducing Consumption

Efficient Equipment

- Lighting
- Appliances
- Heating Systems
- Programmable Thermostats
- Low flow features
- Appliances

Skidegate Heat Pump Program

- 360 homes to replace diesel heat with electric heat pumps
- Bill reductions from $250/ month → $80/ month

Rough Costs

	Measure	Materials
Air Sealing	Basic sealing	$100
Insulation & Venting	Attic insulation	$600
	Floor insulation	$1,000
	DHW tank wrap	$45
	Improved Ventilation	$2,000
Windows	Low-e windows	$300
Water	Water saving	$44
Lighting	Lights	$160
Control Systems	Programmable t'stat	$40
	Smart learning t'stat	$250
Appliances	Hi-eff fridge	$800
	Hi-eff freezer	$600
	Hi-eff washer	$900

Payback Periods

Payback = Time it takes to save the amount of money you spend on upgrades

Measure	Payback (Y)
Air sealing	2.9
Windows	9.5
Insulation	5
LED Lights	3.7
Water Faucets	0.8
Control Systems (Thermostats)	2.6
Appliances	>20

Steps to take

- Engage community
  - Gain support for program
  - Teach about energy use to enable efficiency
- Conduct home audits
  - Gather information on what is needed, and where
  - Read meters!!

- Create an upgrade plan
  - Define priorities
  - Develop a business case
  - Secure budget
- Complete improvements
  - Train local folks, education, see benefits!

CHECKED	AREA OF HOME	NOTES
AIR SEALING		
☐	DOORS	
☐	WINDOWS	
☐	WALLS	
☐	FIREPLACE	
☐	ELECTRICAL OUTLET/SWITCH	
☐	HEATING VENTS	
☐	PIPE ENTRIES	
☐	ATTIC	
☐	BASEMENT	
☐	CRAWLSPACE	
INSULATION & HEATING		
☐	HOT WATER TANK	
☐		
☐	FURNACE	
☐		
☐		
WATER FIXTURES		
☐	BATHROOM	
☐		
☐		
☐	KITCHEN	
LIGHTING		
☐	ALL	

Ideal Home Upgrade

- **Seal leaks** with caulking, backer rod, or expanding foam as required
- Add **weather-stripping** to doors and windows
- In winter, cover all **single pane windows with plastic film** to reduce drafts until there is adequate budget to new EnergyStar windows rated for your climate zone
- Install a **programmable thermostat** and set daytime temperature to a maximum of 20°C and night time temperature to 15°C.
- Set the **hot water tank to 60°C** and insulate the hot water pipes.
- Change high use lighting to **LED bulbs**.

These measures cost roughly **$350** and could save **10-15%** of energy in winter months.

Energy Efficiency for First Nation Housing Managers

Vancouver Island University

UNDERSTAND HOW ENERGY IS USED IN YOUR COMMUNITY

First Nations Housing Managers are finding new opportunities to save money and improve living conditions through energy management. This course will provide a greater understanding of how energy is used in your community and help participants identify, prioritize and implement measures to optimize energy use in existing and new homes.

WHO IS THIS COURSE FOR?

First Nation housing managers, capital managers, asset managers, and others responsible for on-reserve housing.

DETAILS

This online course consists of seven modules. Each module contains a case study, an assignment and additional resources. It is estimated that the course will take approximately 20 hours to complete, including assignments.

KEY LEARNING OUTCOMES

- The benefits of energy efficient housing
- Principles for advancing energy efficiency
- How to develop energy efficiency policy
- How to collect and analyze energy data
- How to improve energy efficiency of existing homes
- Considerations for energy efficiency in new homes
- Approaches to engage community members on energy efficiency, and
- How to build a business case for energy efficient projects

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VANCOUVER ISLAND UNIVERSITY

THANK YOU

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Pinna
Sustainability