



FIRST NATIONS HOME ENERGYSAVE



THE FINANCIAL CASE FOR ENERGY MANAGEMENT

BIG IDEA | TOTAL COST

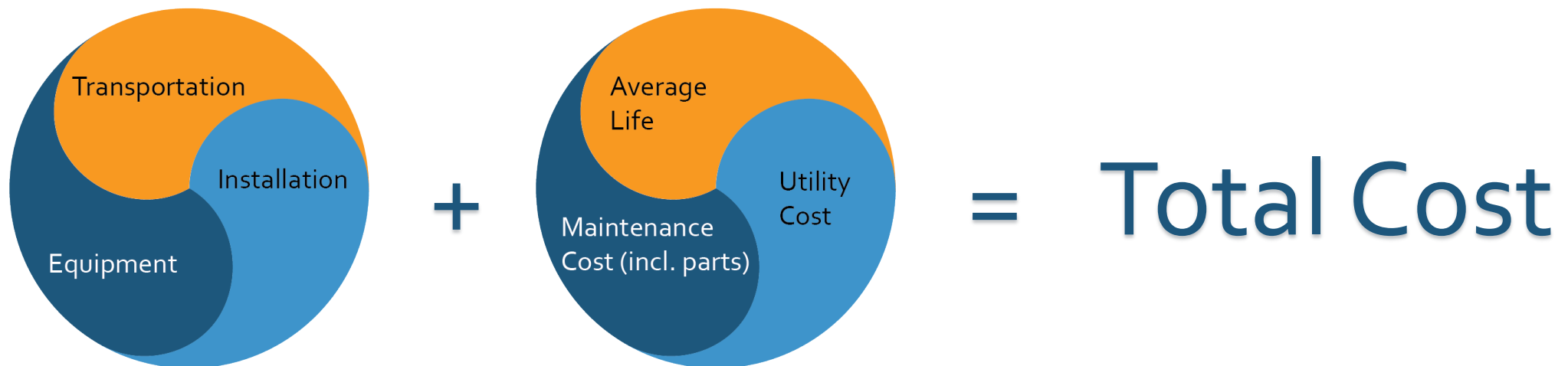


For any project that consumes energy, you have two price tags.

The UPFRONT COST (initial capital cost) includes equipment, installation, transportation minus any incentives.

The ONGOING COST includes energy costs, plus maintenance and repairs over the life of the equipment. When comparing between equipment, we also need to consider the average life of the equipment (how long it will last). This is an important part of AFFORDABILITY for residents.

TOTAL COST includes all the upfront costs plus ongoing costs.



TOTAL COST EXAMPLE: LIGHTING



Option	Upfront Cost	Annual Ongoing Cost (8hrs / day, 365 days / yr @ 9¢ / kWh)	Average Life	Total Cost
CFL Bulb	\$3.50 / bulb	14 W/h = \$3.68/yr	9 yrs	Lifetime Cost $\$3.50 + (\$3.68 \times 9) = \$36.62$ Compared to LED $\$36.62 \times 2.4 = \mathbf{\$87.89}$
LED Bulb	\$5.25 / bulb	9.5 W/h = \$2.50/yr	22 yrs (2.4 x longer)	Lifetime Cost $5.25 + (\$2.50/\text{yr} \times 22) = \mathbf{\$60.25}$

For simplicity, we left out transportation, installation, and maintenance. The bulbs provide the same amount of light and we have assumed that the colour quality is equal as well.

UTILITY BILLS | ELECTRICITY



Whether you're with BC Hydro for FortisBC Electric, you'll see the same charges on your bill.

BASIC CHARGE: per day charge to cover the costs of infrastructure.

ENERGY CHARGE: also called a consumption charge. This is displayed in kilowatt hours (kWh) and is the amount of electricity used during the billing period. This bill shows a step rate, meaning if you use more than a basic amount, you will be charged at a higher rate. Make sure you're using the correct step rate for calculating electricity savings.

You may also see GST and municipal or regional levies depending on where you are in the province.

Bill details

May 16, 2020 to Jul 16, 2020

PREVIOUS BILLING PERIOD

Previous bill..... \$90.11

BALANCE FORWARD

\$90.11

ELECTRICITY CHARGES

Based on Residential Conservation Rate 1101

May 16, 2020 to Jul 16, 2020

Basic Charge 62 days @ \$0.2069 /day..... \$12.83*

ENERGY CHARGES

Step 1: 720 kWh @ \$0.0935 /kWh..... \$67.32*

Step 2: 0 kWh @ \$0.1403 /kWh..... \$0.00

Customer Crisis Fund charge: 62 days @ \$0.0043 /day..... \$0.27*

Regional transit levy: 62 days @ \$0.0624 /day..... \$3.87*

TAXES ON ELECTRICITY CHARGES

* GST 5% on \$84.29..... \$4.21

ELECTRICITY CHARGES SUBTOTAL

\$88.50

TOTAL DUE

\$178.61

ACCESSING MY HYDRO ACCOUNT



Both BC Hydro and FortisBC Electric have on-line portals. To set up on-line access you first have to create a profile, and then link your account to your profile. In addition to managing your bill payments, you can see the consumption history for that electricity meter and access tools to help reduce your consumption.

As the Housing Manager, if residents are paying the electricity bills, you can ask them to link your profile to their account (so you can see their consumption history) OR you can ask them to download a report of their consumption history. This is valuable information for calculating the financial benefits of energy efficiency.

The screenshot shows the MyHydro website interface. At the top is a navigation bar with links: MyHydro, Billing & Payments, Moving, Electrical Connections, Electricity Rates & Energy Use, and Get Help. Below this is a breadcrumb trail: Home > Accounts > MyHydro. The main content area is divided into several sections. On the left, under 'Balance', it shows a current balance of \$135.14, with payment received of \$0.00 and a payment due date of Oct 13, 2020. Below this are buttons for 'Make a payment' and 'View my bill'. In the center, 'Consumption for the last 7 days' is shown as a bar chart with data for Sun 13 (25 kWh), Mon 14 (25 kWh), Tue 15 (22 kWh), Wed 16 (18 kWh), Thu 17 (23 kWh), Fri 18 (16 kWh), and Sat 19 (23 kWh). Below the chart are buttons for 'View detailed consumption' and a link to 'Learn when you're using the most electricity and find ways to save.' On the right, the 'Current billing period' is Sep 17 - Nov 17, 2020, with a cost to date of \$6* or 62kWh* and a projected cost of \$139*. A note states this is an estimate. At the bottom right, there is a section for 'Consumption alerts' with a 'Set up alerts' link.

MyHydro Billing & Payments Moving Electrical Connections Electricity Rates & Energy Use Get Help

Home > Accounts > MyHydro

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MANAGE ACCOUNT SHOW ALL

Move my service Account settings

Balance

\$135.14

Payment received: \$0.00
Payment due: Oct 13, 2020
My bill amount for Sep 18, 2020: \$135.14

Make a payment

View my bill

Learn more about your rate.

Consumption for the last 7 days

kilowatt hours (kWh)

Day	Consumption (kWh)
Sun 13	25
Mon 14	25
Tue 15	22
Wed 16	18
Thu 17	23
Fri 18	16
Sat 19	23

View detailed consumption

Learn when you're using the most electricity and find ways to save.

Current billing period
Sep 17 - Nov 17, 2020

Cost to date (3 days):
\$6* or 62kWh*

Projected cost: **\$139***

*This is an estimate. Consumption costs don't include taxes and other fees which appear on your bill.

Consumption alerts
Set up alerts to keep up to date on your electrical consumption.

Set up alerts

UTILITY BILLS | NATURAL GAS




There are two natural gas utilities in British Columbia: FortisBC and Pacific Northern Gas. Both natural gas utilities will have the same charges on their bills.

Delivery charges include a per day charge to cover the costs of infrastructure called the basic charge plus a **TRANSPORTATION CHARGE** to deliver the gas to your residence. The transportation charge is per Gigajoule (GJ) of natural gas used in the billing period.

Commodity charges include a per GH charge for **STORAGE AND TRANSPORT** plus a per GH **CONSUMPTION CHARGE** for natural gas used in the billing period.

Finally you'll see other charges and taxes, including a per GJ **CARBON TAX**. Add up all the per GJ charges to get an accurate rate.

		Name: Service address:	ANNIE CUSTOMER 12345 ANY STREET CRANBROOK	NATURAL GAS	
		Rate class: Billing date:	Residential October 1, 2020	7 Customer Service: 1-888-224-2710 7 am - 8 pm Mon - Fri fortisbc.com	
Account number		Due date	Amount due	Amount paid	
555555		October 22, 2020	\$86.05		
2 Previous bill 168.82					
Less payment - Thank you 168.82 CR					
Balance from previous bill 0.00					
3 Delivery charges					
Basic charge (30 days at 0.4261 per day) 12.78					
Delivery (6.4 GJ at 4.596 per GJ) 29.41					
42.19 **					
4 Commodity charges					
Storage and transport (6.4 GJ at 1.019 per GJ) 6.52					
Cost of gas (6.4 GJ at 2.844 per GJ) 18.20					
24.72 **					
5 Other charges and taxes					
Municipal operating fee (3.09% of * amounts) 2.07 **					
Carbon tax (6.4 GJ at 1.9864 per GJ) 12.71 *					
Clean Energy Levy (0.40% of * amounts) 0.28					
GST (5% of * amounts) 4.08					
Please pay 86.05					

Gas usage calculation (Meter RCT673584)

Present reading	-	Previous reading	x	Conversion factor	=	Gas used in gigajoules (GJ)
Oct 1 '20		Sept 2, '20				
2,614		2,562 Est		0.1237279		6.4

Point of delivery: 1010157

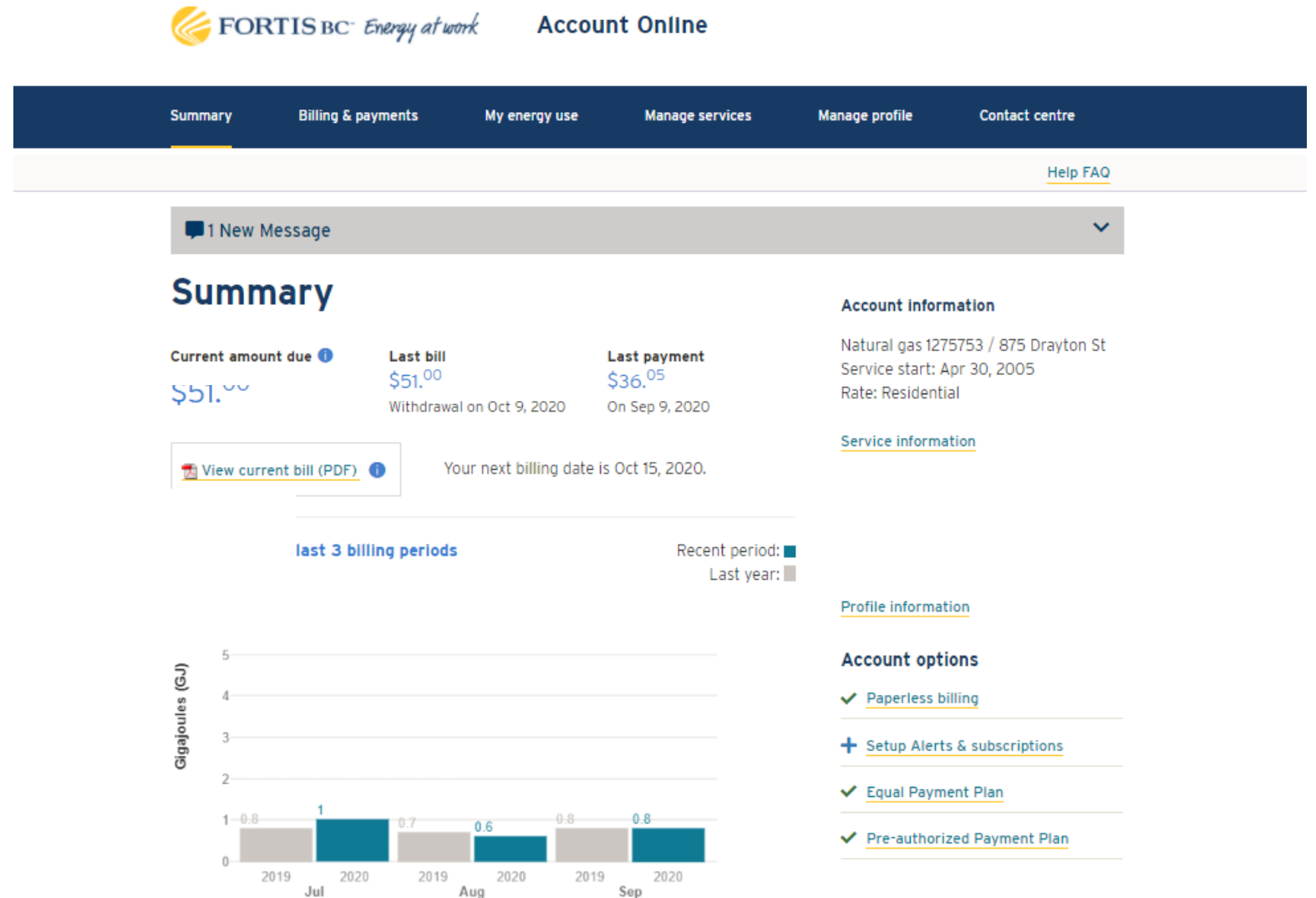
Comparison to previous year

Billing period	Number of days billed	Average daily temp.	Average daily usage GJ	Total billing period usage GJ
Oct '20	30	10°C	0.21	6.4
Oct '19	30	9°C	0.24	7.2

ACCESSING YOUR GAS ACCOUNT



FortisBC also has on-line account services where you can see your consumption history and access reports. Housing Manager's can also link to these accounts.



CASE STUDY | SQUAMISH HOME



A 40-year old, 1,800 square foot home has a gas-fired forced air furnace original to the house that needs to be replaced. They pay \$9.46 per gigajoule (GJ) of natural gas and \$9.35 per kilowatt hour (kWh) of electricity.

Option 1: Repair & Replace Later

- \$2,000/yr for repairs
- -
- 75% AFUE
- 61 GJ/yr of gas
- 7,500 kWh/yr of electricity

Option 2: Replace with Efficient Gas Model

- \$5,000 installed
- \$800 incentive*
- 95% AFUE
- 21% reduction in gas
- No change in electricity

Option 3: Replace with Heat Pump

- \$15,000 installed
- \$10,000 incentive**
- -
- 100% reduction in gas
- 50% increase in electricity

AFUE is annual fuel utilization efficiency

** \$1,000 incentive is available for greater than or equal to 97% AFUE*

*** for eligible Indigenous communities and fuel switching projects only; smaller incentives available province-wide*

COMPARISON | UP FRONT COST



Option	Equipment Cost - Installed	Incentive	Total Up Front Cost	Incremental (Additional) Cost
Maintenance (Minimum Option)	\$2,000	\$0	\$2,000	-
Energy Efficient Renovation	\$5,000	-\$800*	\$4,200	\$2,200
HP Renovation	\$15,000	-\$10,000	\$5,000	\$3,000

At a minimum, the furnace needs to be repaired, so the homeowner must spend at least \$2,000. The INCREMENTAL COST is the additional cost to the homeowner compared to their minimum viable option.

COMPARISON | ONGOING COST



Option	Electricity (kWh)	Electricity (@\$0.0935 / kWh)	Natural Gas (GJ)	Natural Gas (@\$9.46 / GJ)	Ongoing Cost / year
Maintenance (Minimum Option)	7,500 kWh / yr	\$701.25	61GJ / yr	\$577.06	\$1,278.31
Energy Efficient Renovation	7,500 kWh / yr	\$701.25	40 GJ / yr	\$378.40	\$1,079.65
HP Renovation	11,250 kWh/yr (50% increase)	\$1,051.88	0 GJ	\$0	\$1,051.88

Assumption for simplicity is that maintenance costs are relatively equal.
Of note: energy costs are total consumption charges only – not basic charges.

BIG IDEA | SIMPLE PAYBACK



SIMPLE PAYBACK is the calculation of how many years it will take the energy savings to pay back the incremental (additional) cost of the energy efficient option. If the simple payback is shorter than the average life, you'll save money over the life of the equipment.

$$\text{Simple Payback} = \frac{\text{Total Cost}}{\text{Annual Ongoing Savings}}$$

Option	Incremental (Additonal) Cost	Ongoing Cost /Yr (Utilities)	Annual Savings	Simple Payback
Maintenance (Minimum Option)	-	\$1,278.31	-	-
Energy Efficient Renovation	\$2,200	\$1,079.65	\$198.66	11 years
HP Renovation	\$3,000	\$1,051.88	\$226.43	13.2 years

BIG IDEA | GHG EMISSIONS



NON-MONETARY COSTS AND BENEFITS are the impacts of your decisions that are difficult to put a dollar figure on, but may still influence your decision. Greenhouse gas emissions (GHG's) are an example of a non-monetary cost. Increase GHG emissions contribute to climate change which has a negative impact on the environment and our communities.

GHG EMISSION FACTORS

	Electricity	Natural Gas	Light Fuel Oil	Propane	Diesel	Wood
GHG Intensity / GJ of Energy (kg of CO²e)	0.11	49.87	67.68	67.68	69.95	23.48

COMPARISON | GHG EMISSIONS



Option	Electricity (kWh)	Electricity Savings (kWh)	GHG Savings from Electricity (0.396 g of CO ₂ e/W)	Natural Gas (GJ)	NG Savings (GJ)	GHG Savings from NG (49.87 kg of CO ₂ e /GJ)	Total GHG Savings
Do Nothing	7,500 kWh / yr	0	0	61GJ / yr	0	0	0
Energy Efficient Renovation	7,500 kWh / yr	0	0	40 GJ / yr	21 GJ	1,047 kg	1,047 kg
HP Renovation	11,250 kWh/yr	-3,750 kWh	-1.48 kg	0 GJ	61 GJ	3,042 kg	3,041 kg



This training series was developed by



For the Fraser Basin Council's First Nations Home EnergySave program,



With financial support from:

