

## **How to Save The Planet March 2020**

The two largest contributors to climate change are fossil fueled vehicles and heating equipment.

Most people think going to an electric vehicle and a heat pump is too expensive. This may be true for the up-front capital cost but it is not true for the life cycle cost.

Here are a couple of ways to put money in your pocket and save the planet.

### **Example 1. Hybrids**

The Browns think they will have to wait until their relatively new gas furnace, air conditioner and water heater die before buying heat pumps to replace them. They will have to save up for the higher cost. Their gasoline car is eight years old and they plan to drive it into the ground while saving money for an electric car.

This means they could be producing about 5 tonnes of carbon a year from their furnace and water heater and about 3 tonnes from their vehicle. If they have a gas dryer and stove/BBQ, it could add another tonne or so.

The Burlington Climate Action Plan asks for a 50% reduction in emissions by 2030. This does not mean everyone has to wait until then to switch. It will be a gradual transition where older cars and appliances are replaced first.

But if you can save money over the next ten years, and the planet, why not start now?

Enter hybrid cars and appliances. Both use a combination of fossil fuel and clean Ontario grid electricity and are cheaper than the fossil fuel alternatives.

#### Vehicle

Their current sedan is worth about \$10,000 and they think it will last until 2030. They found a used plug-in hybrid for \$24,000 + HST. They have only one car and don't want to go all electric because they make long trips to see relatives every few months. There are not many charging stations along the way and they don't want the hassle of planning every trip based on charging. With the hybrid, they can charge it up at home with a 120 Volt outlet and don't need to spend money on a fast charger. Around town, they may not need to charge it up for a few days in a row. An overnight charge costs about a dollar. On long trips, the system switches from full electric to hybrid when the battery gets low and they can travel continuously as long as they can find a gas station. They figure they would be on electric power 75% of the time.

They compared keeping the current car to replacing it. The savings in fuel, insurance, maintenance and depreciation are about \$1,000 a year, mostly due to fuel savings. The yearly finance costs for a 5 year lease on the value after trade-in would be \$2663. At the end of ten years, they have a vehicle with a good resale value and longer life because the gasoline motor runs only a portion of the distance travelled and will have less hours of use on it compared to a gasoline engine running all the time.



## Example 2. All Electric

### Vehicle

OK so you are ready for a new car. Your first thought is a Honda Civic. Let's compare that to a Chevy Bolt EV. The new car price is \$50,000 and it is eligible for the \$5,000 federal rebate. The Civic is \$35,000.

You figure your driving habits will accommodate an electric car with a range of about 400 km on a charge. You have a second gasoline car if you need a long trip with few charging stations along the way.

The savings in fuel for 20,000 km a year is \$1,500. And maintenance is about \$800 a year less. 5 year financing is less because the EV does not depreciate as quickly as the gasoline car. This leaves \$240 in your pocket every month. And over ten years they add up \$23,000.

Carbon savings would be about 3 tonnes a year.

### Furnace, Water Heater and Air Conditioner

They are all toast. Replacing with similar more efficient gas appliances would cost \$10,000 for an energy savings of \$500. Financing would cost \$1000 a year. The emissions savings would be minor. Their net cost would be \$500 a year and still produce 4 tonnes a year in carbon.

Switching to a heat pump and electric water heater would cost \$12,000 and cost \$1200 a year in financing and save \$325 a year in energy. The net cost would be \$370 a year and the carbon savings would be 4 tonnes a year. With government rebates and lower maintenance costs, they could be spending less than with the natural gas alternatives.

But when the savings on the car are factored in, they are up \$19,000 over ten years. And they have saved 71 tonnes of carbon.

Example 2.	Current			Replacement				Savings	
	Age	Carbon	Cost	Age	Carbon	Oper. Cost	Finance Cost	Carbon	Cost
Vehicle	0 yr Civic	4 t	\$4500/yr oper. \$4,936 fin	0 yr Bolt	1 t	\$2200/yr	\$4370/yrx 5 yr	3	\$2866
5 yrs	5 yr	20 t	\$47,180	5	5 t	\$11000	\$21,848	15 t	\$14,332
10 yrs	10 yr	40 t	\$76,618	10	10 t	\$22,000	\$32,072	30 t	\$22,546
Furnace-A/C	0 yr Gas/electric	4.0 t	\$1500 oper. \$400 fin.	0 Heat Pump	0.4 t	\$1675	\$550	3.6 t	(\$325)
Water heater	0 yr Gas	0.6 t	\$120 op. \$100 fin.	0 electric	0.1 t	\$215	\$50	0.5 t	(\$45)
10 yrs	10	46 t	\$21,200	10	5 t	\$18,900	\$6,000	41 t	(\$3700)
<b>Combined</b>								<b>71 t</b>	<b>\$19,300</b>

For more information and a calculator tool, visit

<https://www.jadeenvironmentalservices.com/resources/How%20to%20Choose%20a%20Hybrid%2C%20PHEV%20or%20BEV%20Feb%2028%202019.pdf>

<https://www.jadeenvironmentalservices.com/resources/Green%20Home%20and%20Car%20Upgrade%20Program%20February%202019%20R1.pdf>

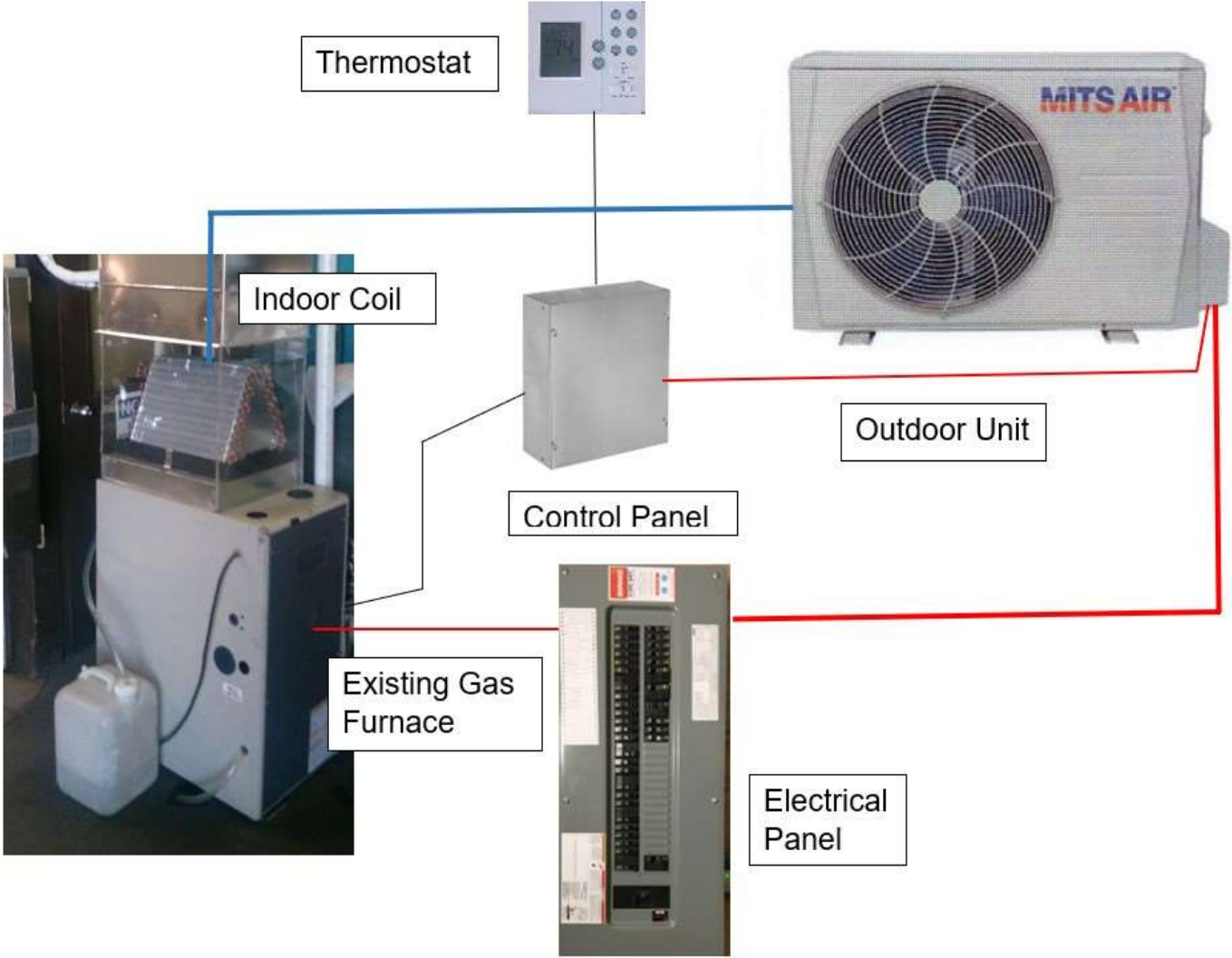
Appendix Slide Deck



Gen 2 Volt in Heather Gray

	Current			Replacement				Savings	
Example 1.	Age	Carbon	Oper. Cost	Age	Carbon	Oper. Cost	Finance	Carbon	Cost
Vehicle	8 yr Gas	3 tonnes	\$3700/yr	3 yr PHEV	1 tonne	\$2700/yr	\$2663/yrx5 yr	2 t	(\$1663)
10 yrs	18 yr	30 t	\$37000	13	10 t	\$27000	\$19,392	20 t	(\$9,392)
Resale	\$0			\$7,728					(\$1,644)

# HYBRID HEAT PUMP



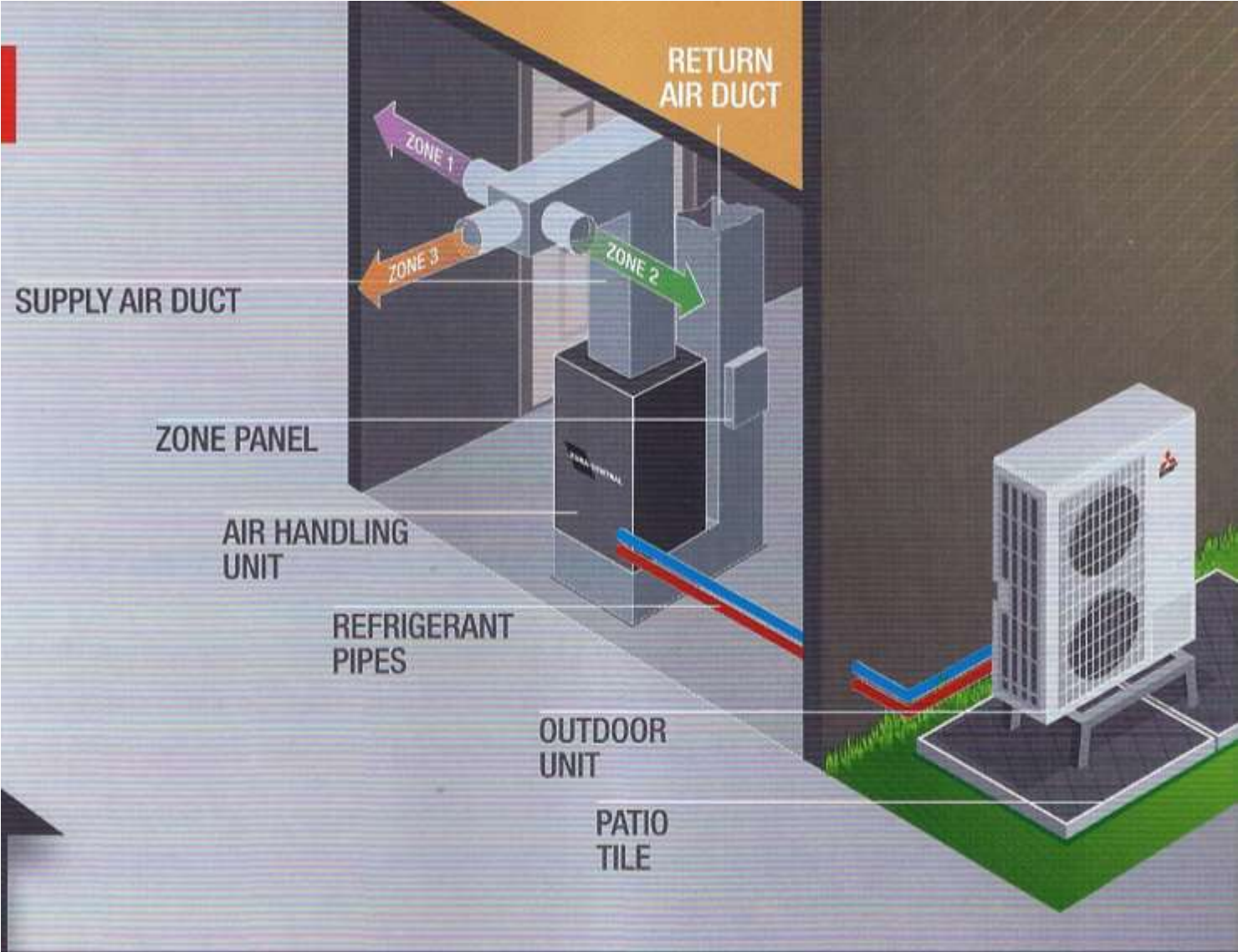






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# CENTRAL HEAT PUMP



**HIGH INSULATION ELECTRIC  
WATER HEATER  
NON-METALIC**



	Current			Replacement				Savings	
Example 2.	Age	Carbon	Cost	Age	Carbon	Oper. Cost	Finance Cost	Carbon	Cost
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Water heater	0 yr Gas	0.6 t	\$120 op. \$100 fin.	0 electric	0.1 t	\$215	\$50	0.5 t	(\$45)
10 yrs	10	46 t	\$21,200	10	5 t	\$18,900	\$6,000	41 t	(\$3700)
Combined Car and heating								71 t	\$19,300