

Energy Conservation in Oak Bay

Oak Bay Council

Presenter - Ken Olson

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Quick history of Energy conservation in Oak Bay

- 1985 Solar Heating System
- 1994 Natural Gas Conversion
- 1996 First Major Energy Upgrade
- 2002 to 2006 Various Ice Rink Upgrades
- 2010 Second Major Energy Upgrade
- 2011 Electric Zamboni
- 2011 and 2013 Tennis Bubble Insulation
- 2016 REALice
- 2016 to 2019 LED Street Lighting
- 2018 Tennis Bubble LED Lighting
- 2019 Energy Recovery Loop
- 44 Energy Saving Projects to Date



Our Success Over the Years

In Oak Bay we have been involved in energy conservation for a very long time and the savings have been really adding up.

Actual and avoided costs from conservation measures are now over \$5.5 Million and yearly savings are now almost to \$675,000.

GHG Emission reduced to date (2020): **17,268** Tonnes

We are now saving 1167 Tonnes Per Year over historical levels. (Early 90's)

Yearly that's equivalent to the annual greenhouse gas emissions from;

- 358 Average passenger cars.
- 15 Tanker trucks worth of gasoline.
- 497,149 Litres of gasoline consumed

And is also equivalent to CO2 emissions from;

- 6.4 Rail cars worth of coal burned
- 273 Homes for one year
- 2,637 Barrels of oil consumed

You would need 1,373 acres of forest to sequester this amount of carbon each year.

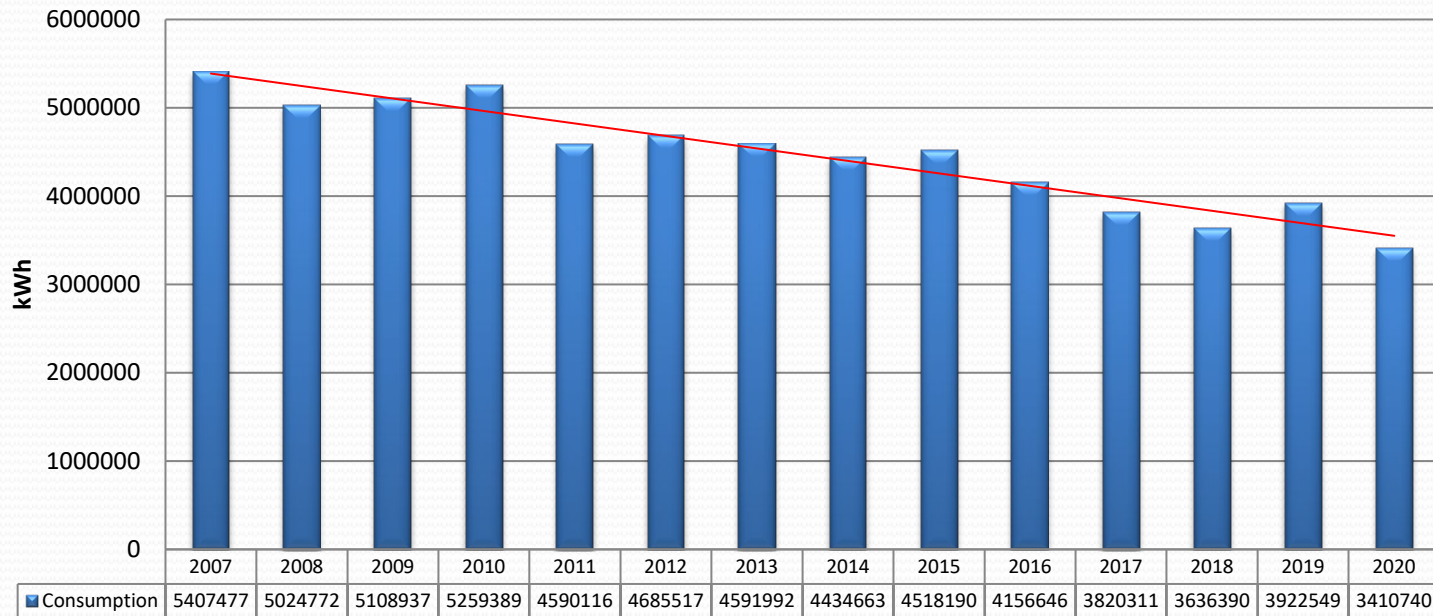


Our Success Story

In 2007 Oak Bay signed on to the BC Climate Action Charter and adopted an aspirational goal of reducing Green House Gasses (GHG) by 33% by 2020 over our 2007 levels.

Since that time Oak Bay has reduced electrical consumption by 37%

Municipal Electrical Consumption

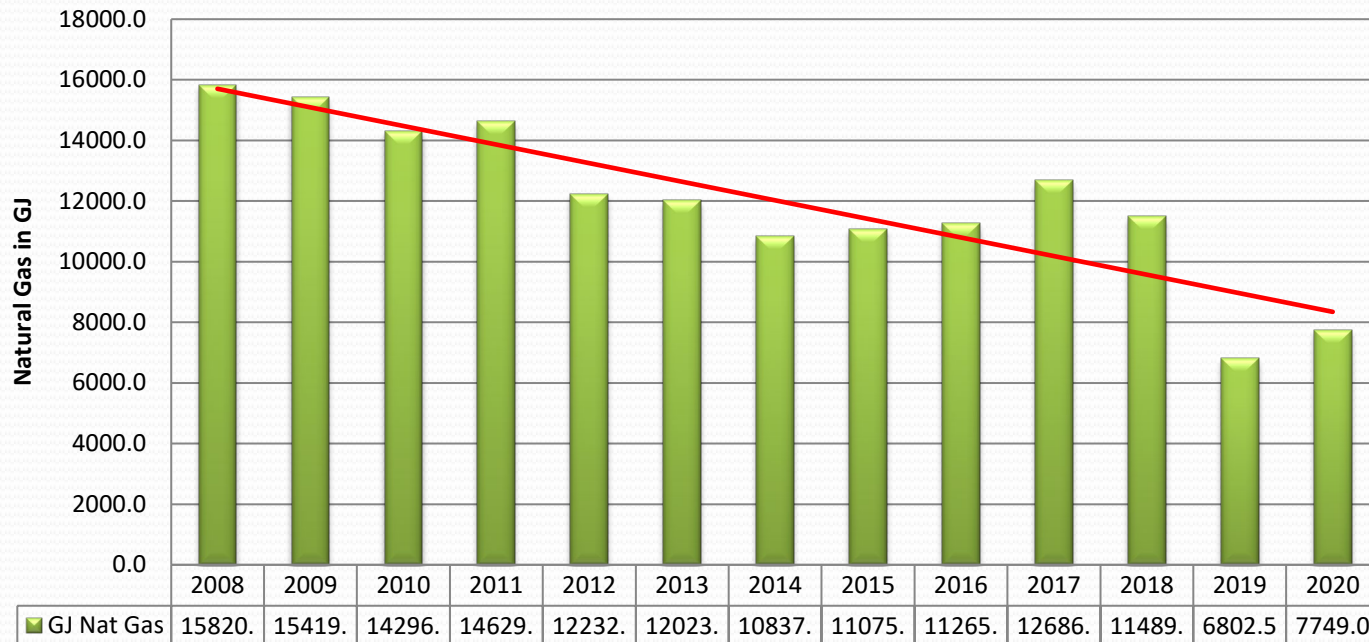


In 2020 Oak Bay's electrical consumption was down almost 2 million kWh over 2007 levels.

Our Success Story

Since 2007 Oak Bay's Natural Gas consumption has been reduced by **51 %**. This has been a huge help in lowering GHG emissions

Municipal Natural Gas Consumption

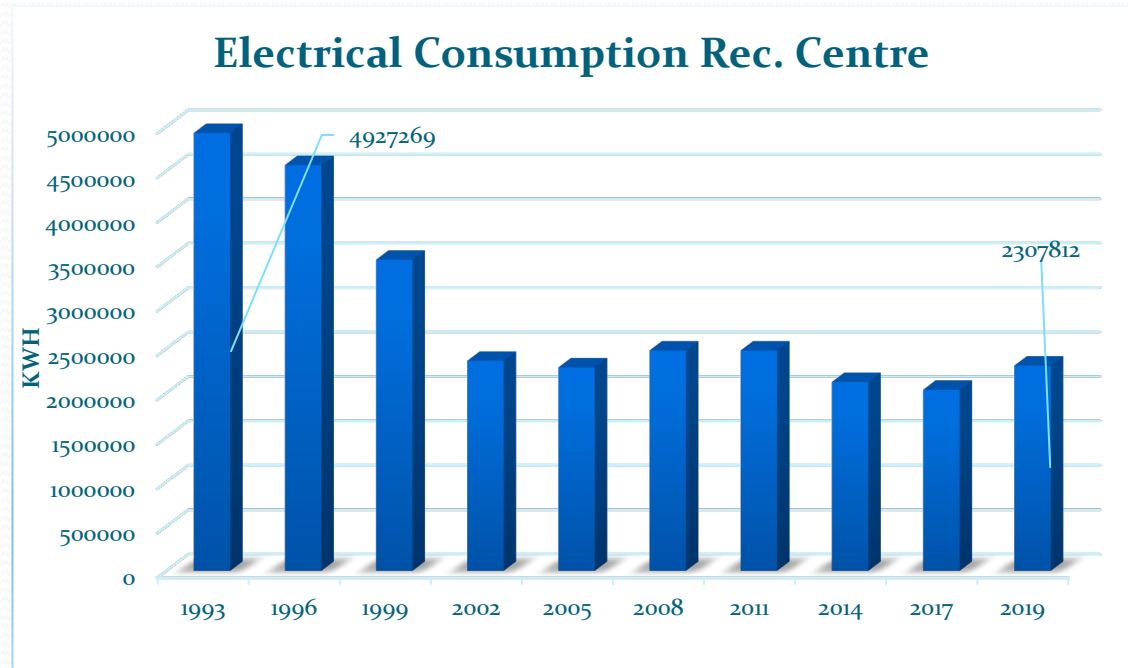


That's 406 tonnes of GHG from just this one area.

In 2020 Oak Bay's natural gas consumption was down to 7,749 GJ, a drop of 8,071 GJ from the 15,820 GJ that were used in 2008.

Our Success at the Rec Centre

In 1993 the Rec Centre's electrical consumption was 4,927,269 kWh. In 2019 it decreased to 2,307,812 kWh. A reduction of over 2.6 million kWh or 53%. That's enough to power 250 homes each year.

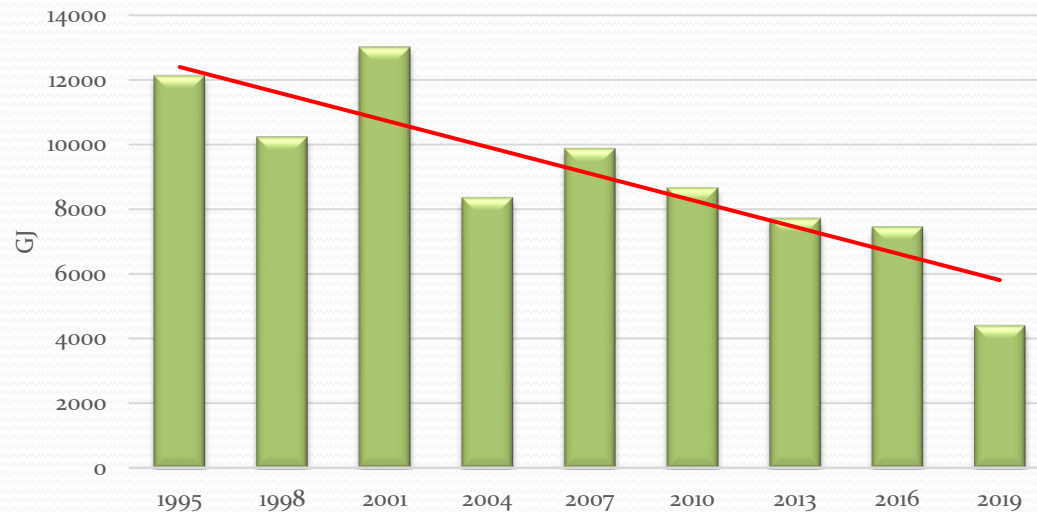


If we still used the same amount of electricity as in 1993 it would have cost \$542,000 last year. In 2019 we paid \$202,084. That is \$339,916 in avoided cost.

The entire municipality now uses 1.5 million kWh less electricity than what the Rec Centre alone used in 1993.

Our Success at the Rec Centre

Rec Centre Natural Gas Consumption



- Natural Gas consumption is reduced by 67% over historical levels. 1996 used 13,559 GJ that is now down to 4,422 GJ in 2019, a reduction of 9,137 GJ.
- In 2011 a \$10,000 per year propane bill was eliminated with the purchase of the new electric Zamboni.

Carbon Neutrality & the CARIP Program

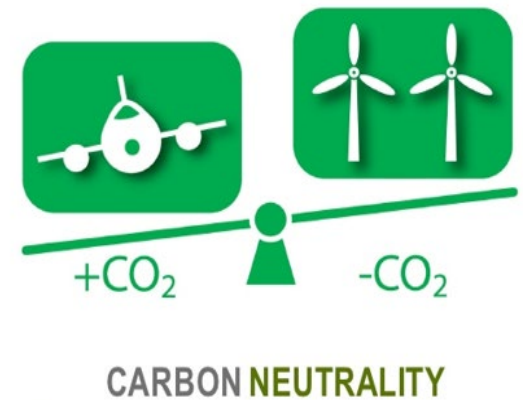
There are two parts to carbon neutrality.

- 1 – Do all we can to lower carbon emissions.
- 2 – Balance the remainder of corporate emissions by doing things that have a positive impact towards GHG and climate change. Alternatively carbon offsets can be purchased.



How Oak Bay gets to carbon neutral.

Source	Tonnes Claimed	Tonnes Diverted
GHG Produced	1104	
Yard Waste	-684	2252
Kitchen Organic	-286	719
Trenchless Tech	-193	
CRD Ind % Commercial	-192	
Total	-251	

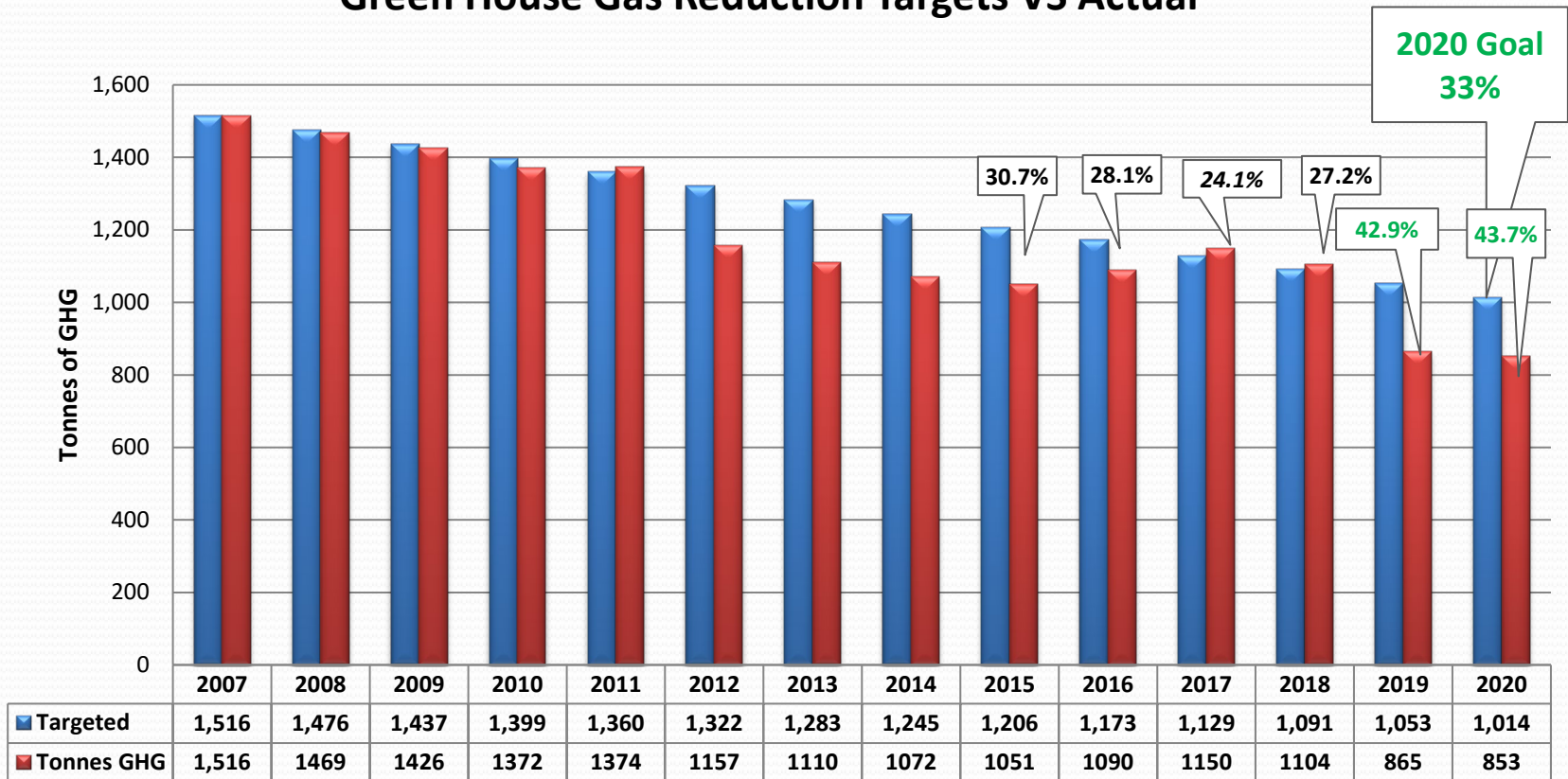


Congratulations Oak Bay has been carbon neutral since 2016.

Next step – Help our community get there too.

GHG Reduction Targets

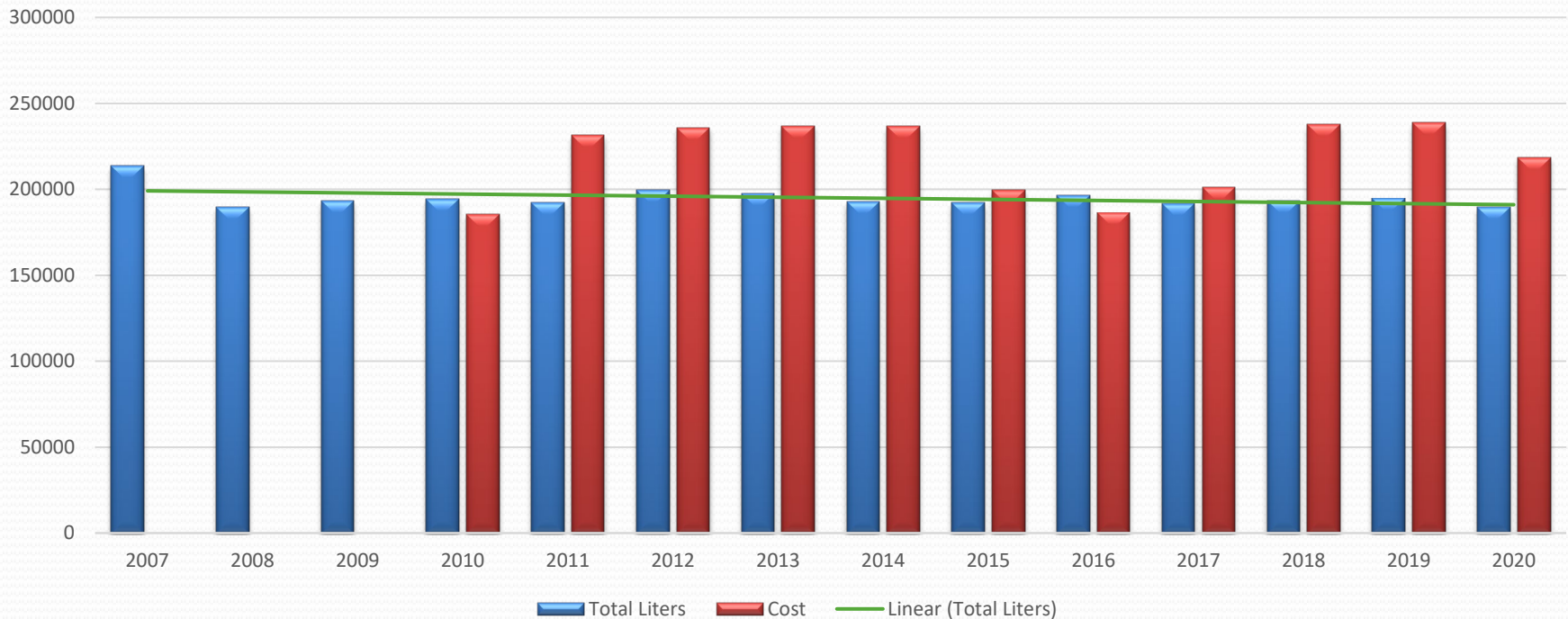
Green House Gas Reduction Targets VS Actual



In 2019 Oak Bay met and surpassed its GHG reduction goal.

Municipal Gas & Diesel

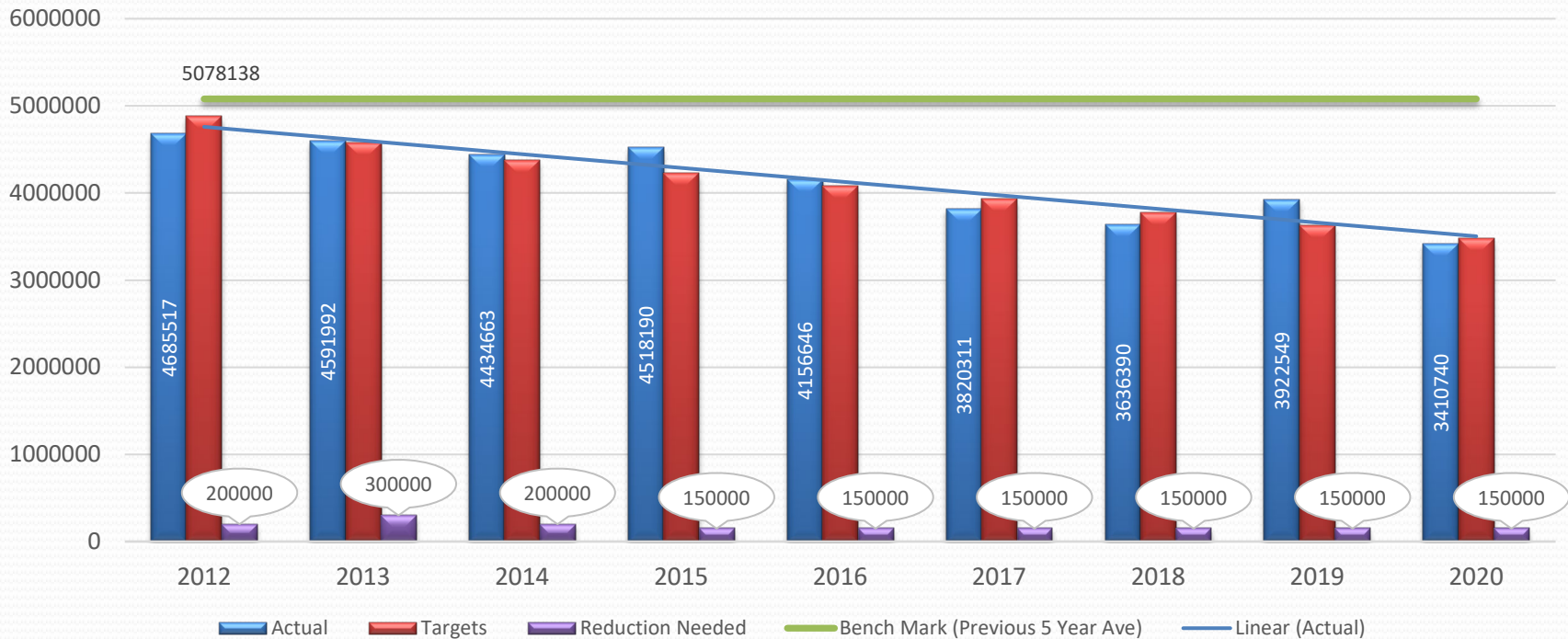
Gas & Diesel



More than half of all Oak Bay's corporate GHG emissions now come from the fleet. This area represents our best opportunity for future GHG reductions.

Electrical Targets

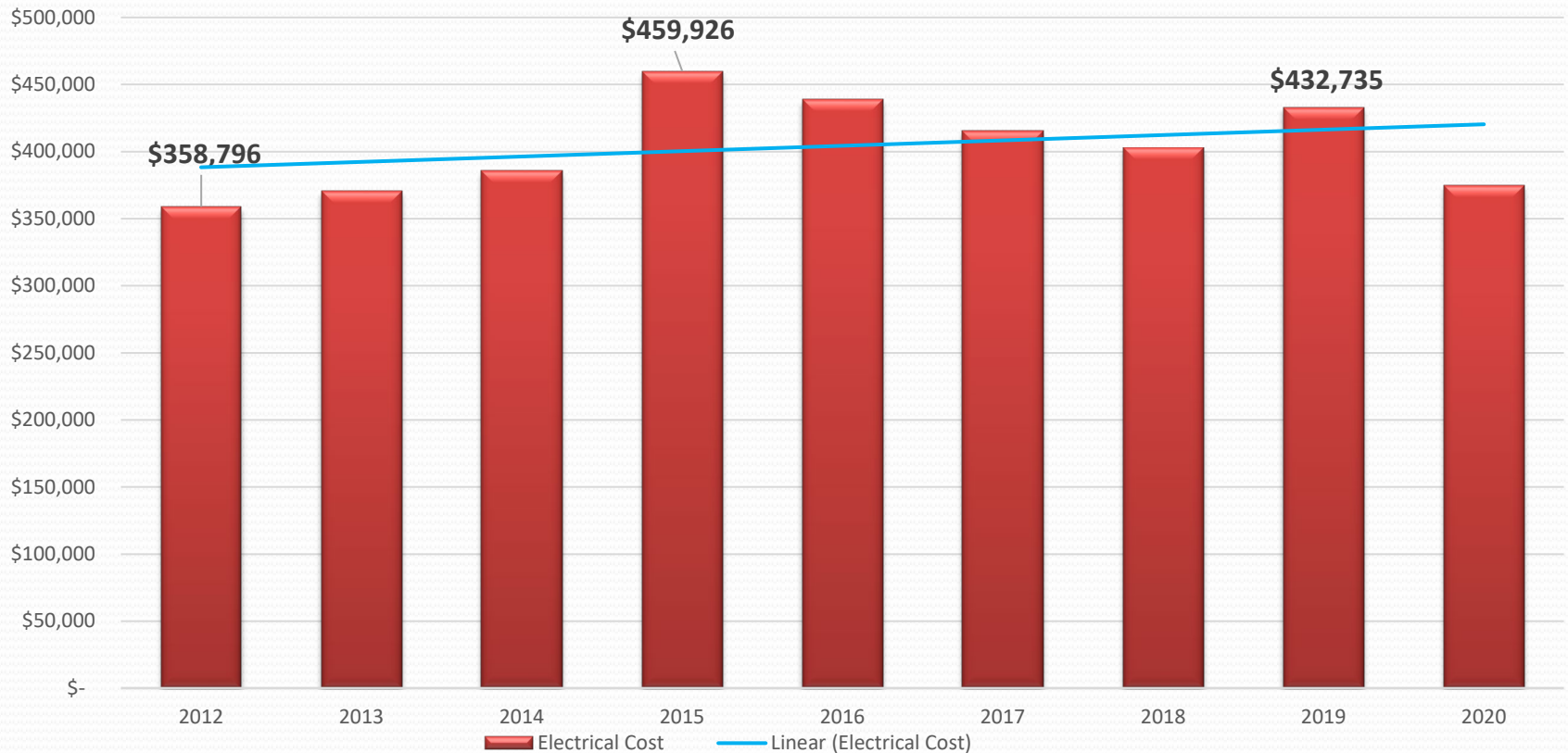
Electrical Reduction Targets VS Actual



The good news is we have lowered our consumption by 27% in the 8 years since we set these targets.

Electrical Cost

Municipal Electrical Cost

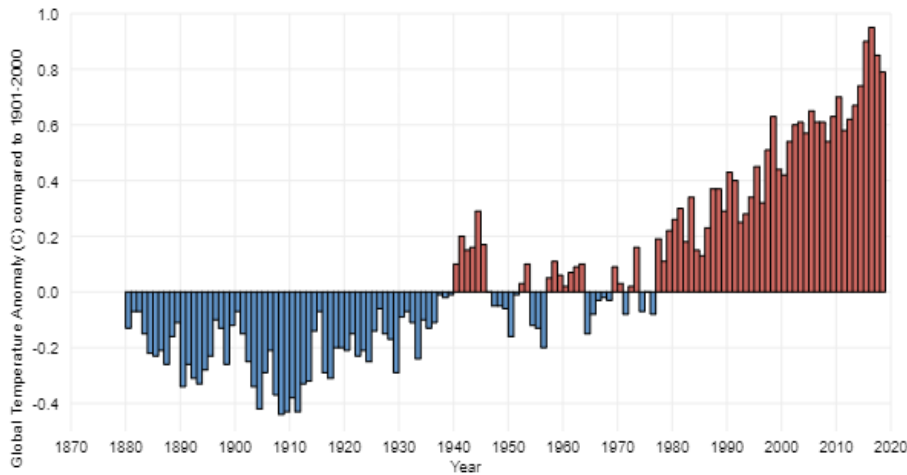


The bad news is that we are paying 17% more in 2019.

Why Conservation Is Important

Average Global Temperatures

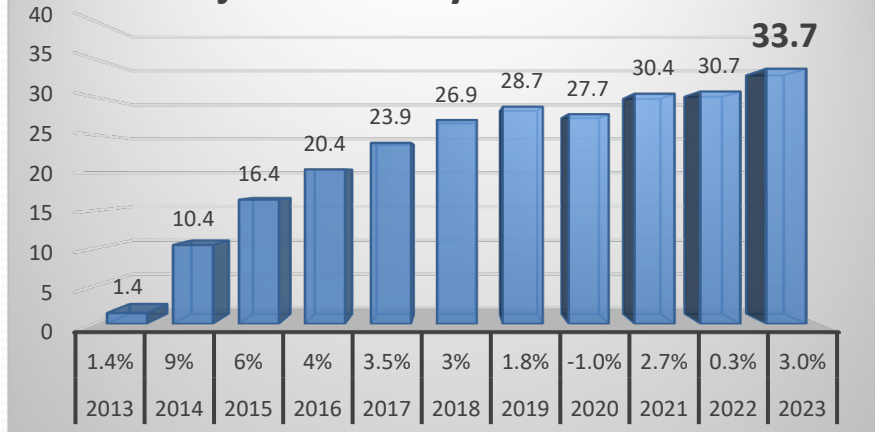
History of global surface temperature since 1880



Since the start of the twenty-first century, the annual global temperature record has been broken five times.

These increases would have cost Oak Bay close to 1 million additional dollars over this 10 year period if no action had been taken.

Projected BC Hydro Increases



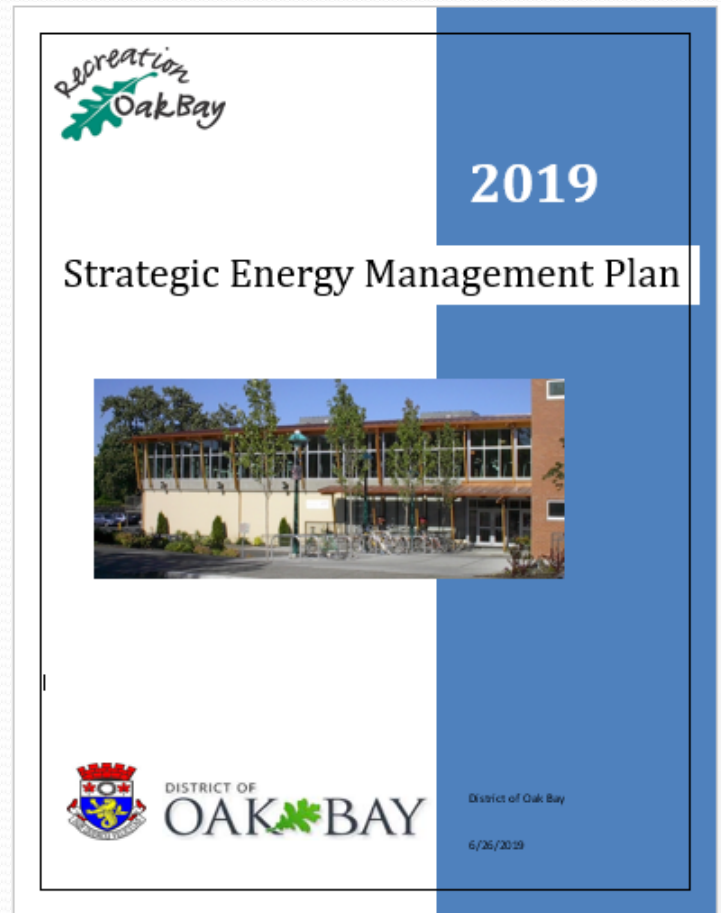
5 Previous years saw 29.1% for a 15 year total increase of 63%.

SEMP

Our Strategic Energy Management Plan is the backbone of our energy management program and includes our details on how we intend to move forward with conservation initiatives.

In it you will find our Energy Policy targets and goals, how we use energy, historical information and plans for the future.

On Line – Municipal Hall
Plans & Reports
Sustainability
For Staff - On Public Drive
SEMP
SEMP 2019 Final



Projects Done in 2018/19

Projects for 2018/19							
Projects for 2018/19				Annual Savings			
Item	Description	Cost	Payback	\$	GJ	kWh	GHG
Rec Centre	Pool Overhead LED Lights	\$6,927	4.4	\$1,578		14,349	0.1
2018	Tennis Bubble LED Lights	\$53,135	4.3	\$12,451		113,191	1.0
2019	Pool Change room Lights	\$1,355	1	\$1,300		14,454	0.1
2019	Energy Recovery Loop	\$763,135	20	\$37,320	3664	-33,153	184.0
Henderson	Gym Lighting	\$4,000	2.1	\$1,911		17,379	0.2
2019							
Municipal	Phase 3 LED Street Lights	\$110,000	4.4	\$25,190		229,000	2.5
2019							
	Incentives/Grant	-\$668,069					
	Total	\$270,483	3.4	\$79,750	3664	355,220	187.9

Our Milestones

By 2013 the Oak Bay Rec Centre had reduced it's overall energy consumption (electric and natural gas) by more than **50%** over it's historical levels.

In 2016 Oak Bay became carbon neutral and have stayed that way ever since.
One of just 50 municipalities in BC

In 2017 Oak Bay hit the 50% reduction mark on Electrical consumption.

In 2019 Oak Bay hit the 50% reduction mark on Natural Gas consumption.

In 2019 Oak Bay reached and surpassed their goal of reducing GHG emission by 33%

Future Projects

- Solar PV for the Rec Centre
- New energy study
- New SEMP
- Work on the project list items
- Heat pumps for Monterey
- New technologies
- Low carbon electrification



Things we need to *Remember*

- Every one of these projects has improved the quality of the lighting, helped to improve existing infrastructure and reduced maintenance.
- The more work we do now, the more we reduce our exposure to increases in the future.
- Carbon tax rose from \$40 to \$45 per tCO₂e in 2021 and will increase by \$5 per tonne until it reaches \$50 per tonne in 2022.
- We have to **make energy conservation business as usual**
- Can we do more to help the community with sustainability.
- What will our future goals be and are we willing to make sure we have the resources to achieve them.

A Big Thank You

- BC Hydro **over \$585,000**
- NRCan **\$711,969**
- Fortis BC **\$25,697**



Natural Resources
Canada

Ressources naturelles
Canada

Canada 



Thank You

Congratulations Oak Bay On Achieving Your Climate Action Goals



DISTRICT OF
OAK  BAY