

# Energy Usage and Emission Assessment- Council Presentation

For all City-Owned Buildings and Fleet

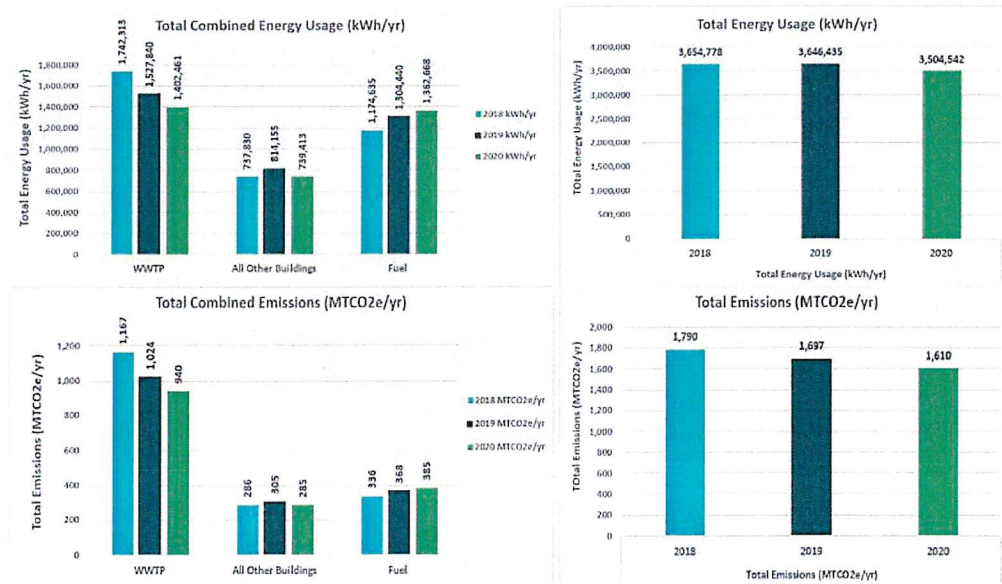
Hood River Public Works      July 16, 2020

## Energy Use and Emissions Assessment Project

### Scope:

This project falls under the Council Work Plan Goal of creating a more environmentally sustainable community. The purpose of this assessment is to evaluate energy use and emissions for city-owned buildings and fleet. During this assessment a 2018 baseline for energy use and emissions was calculated and will be used to assess energy and emissions savings resulting from future equipment upgrades and projects.

### Data Analysis Totals



Energy Usage Totals were calculated using Energy Source Bill Data (therm (NWN) and gallon (Fuel) were converted to kWh for direct yearly comparison). Emission Totals were calculated using source specific Energy Usage Totals and the below emission factors.

Energy Source	Emission Factor	Emission Factor Units
Pacific Power	0.00067	MTCO2e/ kWh
NWN	0.0053	MTCO2e/ Therm
Fuel- Premium	0.0100	MTCO2e/ gal
Fuel- Gasoline	0.0100	MTCO2e/ gal
Fuel- Diesel	0.0100	MTCO2e/ gal

2018		2019		2020	
Building	% of Total	Building	% of Total	Building	% of Total
WWTP	47.67%	WWTP	41.90%	WWTP	40.02%
Fuel	32.14%	Fuel	35.77%	Fuel	38.88%
Fire& EMS	8.91%	Fire& EMS	9.19%	Fire& EMS	8.76%
Public Works	5.59%	Public Works	6.55%	Public Works	6.11%
City Hall	3.60%	City Hall	3.95%	City Hall	3.75%
All Other	2.09%	All Other	2.62%	All Other	2.49%
<b>Energy Usage (kWh/year)</b>					
"All Other" Buildings: Chlorine Station, Wilson Resv, Riverdale Resv, Fire Storage					

2018		2019		2020	
Building	% of Total	Building	% of Total	Building	% of Total
WWTP	65.22%	WWTP	60.31%	WWTP	58.37%
Fuel	18.78%	Fuel	21.70%	Fuel	23.90%
Fire& EMS	6.89%	Fire& EMS	7.23%	Fire& EMS	7.16%
Public Works	3.48%	Public Works	4.48%	Public Works	4.22%
City Hall	3.33%	City Hall	3.56%	City Hall	3.49%
All Other	2.30%	All Other	2.72%	All Other	2.86%
<b>Emissions (MTCO2e/year)</b>					
"All Other" Buildings: Chlorine Station, Wilson Resv, Riverdale Resv, Fire Storage					

The % of Energy Usage and Emissions by location remained relatively steady for the 3 years analyzed. Combined, the WWTP and Fleet accounted for over 75% of the total energy used and 80% of the total emissions produced each year.

**Potential Factors Contributing to Yearly Energy Use:**

Energy Usage and Emissions increased in some locations compared to the 2018 baseline. These locations include Public Works, City Hall, and Fire & EMS along with Diesel Fuel.

- **Yearly Weather-** heating and cooling of buildings
- **Building Design/ Use-** orientation, level of weatherization, and crew size
- **Building Equipment-** efficiency of equipment (including hot water heaters and thermostats) and the amount of office equipment and lighting on site and in use
- **Fleet Equipment and Usage-** fuel economy, vehicle miles traveled, and idling hours
- **Operation and Maintenance of Buildings and Fleet-** when not optimized

**Review of Completed and In- Process Projects**

Annual Energy Use and Emissions are expected to decrease with the implementation of the below projects. The reduction in yearly energy use will also decrease the yearly energy cost owed by the City.

Location	Project Name	Completed?	Basic Project Information
WWTP	Solar Panel Installation	Completed	Panel installation is expected to supply about 5% of the WWTP annual power needs. To date- installation has provided about 3.4% payback on WWTP Electrical Costs/ Month.
	Boiler Upgrade	Completed	Upgrading the boiler system has enhanced boiler operation and biosolid processing by reducing shut downs and alarms and increasing temperature control. In addition, biogas production is expected to increase by 20-30% when the off-line digester is brought on-line. Amount of Natural Gas needed will decrease with increased biogas production.
	Dissolved Oxygen Probe Upgrade	Completed	Enhanced Dissolved Oxygen Probe control has reduced the runtime on the aeration basin blowers. This reduction equates to savings of about 232,214 kWh (\$4,664) per year.
City Hall	HVAC Installation on Rooftop	Completed	Replacement of an old, failing unit. Modern HVAC unit is expected to increase energy efficiency
General	Fleet Hybrid Electric Vehicle Purchase	Completed	Purchase of first generation hybrid-electric police interceptors
	Solar Panel Installation	Completed	Solar Panels were installed on the roof of the Public Works and Fire&EMS Buildings (Installation on much smaller scale than WWTP)



Location	Project Name	Completed?	Basic Project Information
WWTP	UV System Upgrade	In Process	System upgrade is expected to reduce system power cost by 75-80% by enhancing power control and monitoring systems. Cost savings are expected to be seen due to reduced costs for parts and repairs.
	Biogas Cogeneration Feasibility	In Process	If feasible- the Energy and Natural Gas usage at the plant is expected to decrease due to the cogeneration system producing both heat and power. Additional energy efficiency projects may also be considered as cogeneration project progresses.
Fire & EMS	Microgrid Feasibility	In Process	If feasible- Microgrid is expected to increase clean energy generation and offset emissions created by using purchased electricity. Microgrid also offers additional Solar + Storage Opportunities to enhance community resilience during extended power outages.
General	Forth Electric Vehicles Ride Share Program	In Process	Partnership with Forth to provide a small number of electric vehicles to the Hood River Community. At least one of these vehicles and a charging station will be located at Hood River City Hall. The City and any community member may check out these vehicles.
	In- Line Hydro Feasibility	Potential	Project has significant potential to reduce City Energy Usage by generating hydroelectric power. Hydroelectric power would be generated by adding an in-line turbine parallel to the existing Pressure Reducing Station.

## Next Steps

- Work with Outside Agencies to identify and recommend potential options for equipment upgrades and projects that can assist the City in meeting energy use and emission reduction goals

Outside Agency	Assistance Offered
Energy Trust of Oregon	Complete a free walk-through assessment of City- Owned Buildings Review building equipment and energy use Offer recommendations for potential equipment upgrades, projects, and energy savings
Clean Cities Coalition	Complete a low- cost (max \$300) evaluation of City- Owned Fleet Identify potential alternative fuel options and alternative vehicles Offer recommendations for potential upgrades and energy savings
Energy Council- Energy Coordinator	Offer recommendations for potential equipment upgrades, projects and energy savings Review options for procuring renewable energy to help offset emissions

- Bring potential options for reducing energy use and emissions before Council for consideration
- Continue progress of the WWTP Assessment on Biogas Cogeneration Feasibility

**Biogas Cogeneration**

Biogas Cogeneration- the process of using biogas to generate both heat and power

An increase in the amount of Fats, Oil, Grease (FOG) received at the WWTP can increase the amount of methane gas produced

Methane gas production generates electricity that can be used at the plant

**Biogas Cogeneration Feasibility**

Send out Request for Information + Survey (to determine availability of FOG in the market) → Collect and Analyze Data → Determine if performing a Feasibility Study is reasonable (YES/NO)

If YES: Use a Feasibility Study to examine the technical and financial viability of Biogas Cogeneration at the WWTP

If NO: Review feasibility of other energy upgrades at the WWTP such as Renewable Natural Gas generation

**Future:**

Along with the steady reduction of energy use the long-term goal for city- owned buildings and fleet is to be at net zero greenhouse gas emissions by 2035.

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