COMMERCIAL BUILDING
ENERGY AUDIT PROGRAM

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ENERGY AUDIT FOR:

PROJECT NO:
ORC001

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Oregon State University

U.S. DEPARTMENT OF ENERGY

Lane Community College

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Abbreviations

AFUE	Annual Fuel Utilization Efficiency
AHU	Air Handling Unit
BTU	British Thermal Unit
CFM	Cubic Feet (per) Minute
CMU	Concrete Masonry Unit
CV	Constant Volume
DAT	Discharge Air Temperature
DDC	Direct Digital Control(s)
DegF	Degrees Fahrenheit
DOE	Department of Energy
DHW	Domestic Hot Water
dP	Discharge Pressure
dT	Delta T (Temperature difference)
DX	Direct Expansion
EEM	Energy Efficiency Measure
EFLH	Estimated Full Load Hours
ETO	Energy Trust of Oregon
EUI	Energy Use Index
HC	Heating Coil
HP	Horsepower
hr	Hour
HVAC	Heating Ventilating & Air Conditioning
HW	Heating Water
HWP	Heating Water Pump
IAC	Industrial Assessment Center
kBtu	1,000 Btus
kW	Kilowatt
kWh	Kilowatt-hours
lbs	Pounds
LPD	Lighting Power Density
MBH	kBtu/hr (1,000 BTU/hr)
MAT	Mixed Air Temperature
OAT	Outside Air Temperature
RAT	Return Air Temperature
RF	Return Fan
SAT	Supply Air Temperature
sf	Square Feet
SF	Supply Fan
SOO	Sequence of Operations
SP	Static Pressure
TMY3	Typical Meteorological Year
TU	Terminal Unit
VAV	Variable Air Volume
VFD	Variable Frequency Drive
W	Watts
Yr	Year

Disclaimer

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

The intent of this energy analysis is to estimate energy savings associated with the recommended energy efficiency upgrades. This report is not intended to serve as a detailed engineering design document. Any description of proposed improvements that may be diagrammatic in nature are for the purpose of documenting the basis of cost and savings estimates for potential energy efficiency measures only. Detailed design efforts may be required by the participant to implement measures recommended as part of this energy analysis. While the recommendations in this study have been reviewed for technical accuracy and are believed to be reasonably accurate, all findings listed are estimates only. Actual savings and incentives may vary based on final installed measures and costs, actual operating hours, energy rates and usage.

Preface

The Commercial Building Energy Audit (CBEA) program is funded by the DOE and structured within the framework of its predecessor and parent program, the Industrial Assessment Center (IAC). The purpose of the CBEA is to provide customers with free energy assessments of commercial buildings, thereby increasing energy efficiency while simultaneously expanding the workforce of building efficiency professionals through the application of student participation from partnered colleges and universities. The scope of such audits is limited in nature, for the express purpose of identifying no-cost and low-cost energy savings opportunities, and a general view of potential capital improvements. This is accomplished by means of utility usage and billing evaluation, along with observation and analysis of energy using systems. The findings and recommendations within this report represent the conditions observed at the time of this site survey. Conditions and equipment usage are subject to change, and therefore the conclusions expressed within this report may not be evident in the future. The CBEA audit team has endeavored to meet what it believes is the applicable standard of care ordinarily exercised by others in conducting this energy audit. No other warranty, express or implied, is made regarding the information contained in this report.

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2 Energy Efficiency Measure (EEM) Summary

The energy efficiency measures (EEM)s are suggested for the facility. Cost savings are based on average utility rates for electricity and natural gas. Actual rates and cost savings will differ. Non-energy cost benefits are related to cost savings due to as-avoided maintenance. Simple payback is estimated using current utility rates and estimated project costs, which may vary over time.

Measure Number	Measure Description	Annual Energy and Cost Savings				Measure Cost and Simple Payback		
		Electrical Savings		Gas Fuel Savings Therms	Total Cost Savings	Measure Cost	Simple Payback Year	Eligible for Utility Incentive
		kWh	kW					
EEM 1	Upgrade Lighting	183049	32	-	$ 9,146	$ 29,612	3	Yes
EEM 2	Occupancy Sensors	9277		-	$ 455	$ 1,200	3	-
EEM 3	Demand Control Ventilation	40813		1056	$ 3,194	$ 300	0	-
EEM 4	Economizers on Packaged Units	29374		-	$ 1,439	$ 6,750	5	-
Totals (Recommended Measures)		262513		1056	$ 14,233	$ 37,862	3	

Capital Improvement	Description	Annual Energy and Cost Savings			Measure Cost and Simple Payback		
		Electricity Savings kWh	Gas Fuel Savings Therms	Total Cost Savings	Measure Cost	Simple Payback Year	Eligible for Utility Incentive
Solar PV	236 KW PV Electric Solar System	328711		$ 18,375	$ 219,853	12	Yes - See Appendix

3 Building Description

The retail store is located in Springfield, OR. It encompasses roughly 64,000 sf and is attached to a mall shopping center. The building was constructed in 1990 and has changed hands three times, most recently coming under the ownership of the current occupant in 2011. This transition was accompanied by significant modifications to the lighting, HVAC, building exterior and interior. The building's current envelope consists of a flat metal roof covered with thermal insulation, coverboard, and a white membrane; two glass double-door entryways for primary ingress and egress, both enclosed within large glass windows, with another two doors for employee and warehouse access. The interior of the building contains a large sales floor space with a 30 ft ceiling, two warehouse spaces, storage rooms, public restrooms, private offices, along with a mezzanine level accessed via stairway or elevator consisting of employee lounge, bathrooms, conference room, private offices, and server room.

The building is open every day, with operating hours for staff from 6AM to 10PM, and customer access between 9AM and 9PM; 10AM – 7pm Sundays. The building staff averages approximately 100 employees per day. The annual building energy consumption averages approximately 4,000 MMBtu as measured across three years from 2019 and 2021.

4 Best Practices

This audit is per ASHRAE Level 1 requirement. The building's energy cost and efficiency were assessed by analyzing 3 years utility data.

Utility analysis was used to produce reports on the monthly consumption of both electricity and natural gas. The output from these reports was used to benchmark this building against the median EUI for buildings of its size and type in the local vicinity.

The mechanical and lighting schedules were used to generate outlines of energy usage in terms of demand and energy consumption.

A site visit conducted on April 28th, 2022 provided a walk-through survey of the facility including its construction, operation and maintenance, and major energy consuming equipment. Feedback from the customer related to facility performance and comfort was used to inform the survey and the resulting recommendations within this report.

The data was then used to identify no-cost and low-cost measures for improving energy efficiency. Because calculations at this level are minimal, savings and costs are approximate.

5 Energy Cost Analysis

Table 1: Year 2021 Utility Data

2021 Electrical Data					
Month	**kWh**	**kWh Charge**	**Fees**	**kW**	**kW Charge**
Jan	95,040	$5,136.58	$100.80	175.36	$944.62
Feb	83,840	$4,553.06	$100.80	160.32	$843.40
Mar	81,280	$4,419.69	$100.80	171.04	$915.55
Apr	95,200	$5,144.92	$114.44	202.72	$1,128.76
May	89,600	$3,917.52	$142.73	212.96	$1,197.67
Jun	97,920	$4,260.30	$143.47	223.84	$1,270.89
Jul	119,840	$5,163.41	$128.40	242.72	$1,397.96
Aug	111,040	$4,800.85	$144.39	237.60	$1,363.50
Sep	113,600	$4,906.32	$143.26	220.80	$1,250.43
Oct	89,280	$4,900.98	$142.71	212.64	$1,195.52
Nov	88,320	$4,850.30	$128.40	194.72	$1,074.92
Dec	88,640	$4,867.19	$128.40	179.68	$973.70
TOTALS	1,153,600	$56,921.12	$1,518.60	2,434.40	$13,556.92

2021 Natural Gas Data				
Month	**Therms**	**Cost/Therm**	**Other Charges**	**Total**
Jan	235.0	$217.75	$30.25	$248.00
Feb	221.0	$183.28	$26.58	$209.86
Mar	148.4	$111.68	$23.30	$134.98
Apr	61.3	$57.44	$19.75	$77.19
May	1.2	$0.96	$16.05	$17.01
Jun	1.2	$0.96	$16.05	$17.01
Jul	0.0	$0.00	$15.99	$15.99
Aug	1.2	$0.96	$16.05	$17.01
Sep	2.4	$1.93	$16.11	$18.04
Oct	3.5	$2.81	$16.17	$18.98
Nov	77.2	$71.17	$20.65	$91.82
Dec	261.1	$282.74	$34.50	$317.24
TOTALS	1,013.5	$931.68	$251.45	$1,183.13

Table 2: Historical Energy Use

Month	Electrical Use (kWh)				Natural Gas Use (MMBtu)			
	2021	2020	2019	3-year Average	2021	2020	2019	3-year Average
January	95,040	94,080	92,640	93,920	37	28	24	30
February	83,840	97,760	93,760	91,787	95	47	22	55
March	81,280	85,920	85,920	84,373	81	36	15	44
April	95,200	84,320	98,240	92,587	27	4	6	12
May	89,600	64,320	93,760	82,560	4	0	0	1
June	97,920	75,040	104,480	92,480	1	0	0	0
July	119,840	103,200	114,880	112,640	0	0	0	0
August	111,040	100,000	105,280	105,440	0	0	0	0
September	113,600	109,600	106,720	109,973	0	0	0	0
October	89,280	92,800	94,880	92,320	12	1	0	5
November	88,320	82,720	100,800	90,613	38	9	8	18
December	88,640	84,160	88,480	87,093	70	25	26	40
Annual Energy Usage								
Annual Energy Usage (MMBtu)	3,936	3,664	4,026	3,875	364	151	101	206
Rolling Energy Usage	Month 24-36	Month 12-24	Month 0-12		Month 24-36	Month 12-24	Month 0-12	
Annual Energy Usage (kBtu)	3,936,083	3,664,215	4,025,614	3,875,304	364,420	150,850	101,350	205,540
Energy Performance of the Facility								
Conditioned Space Area (sqft)				63,724				
Total Energy Use (kBtu per year, based on 3-year average)				4,080,844				
Energy Use Intensity, EUI (kBtu/sqft/year)				64.0				
***Median EUI for Facility Type in the US**				55.8				

**Median EUI Source: https://www.energystar.gov/buildings/benchmark/understand_metrics/what_eui*

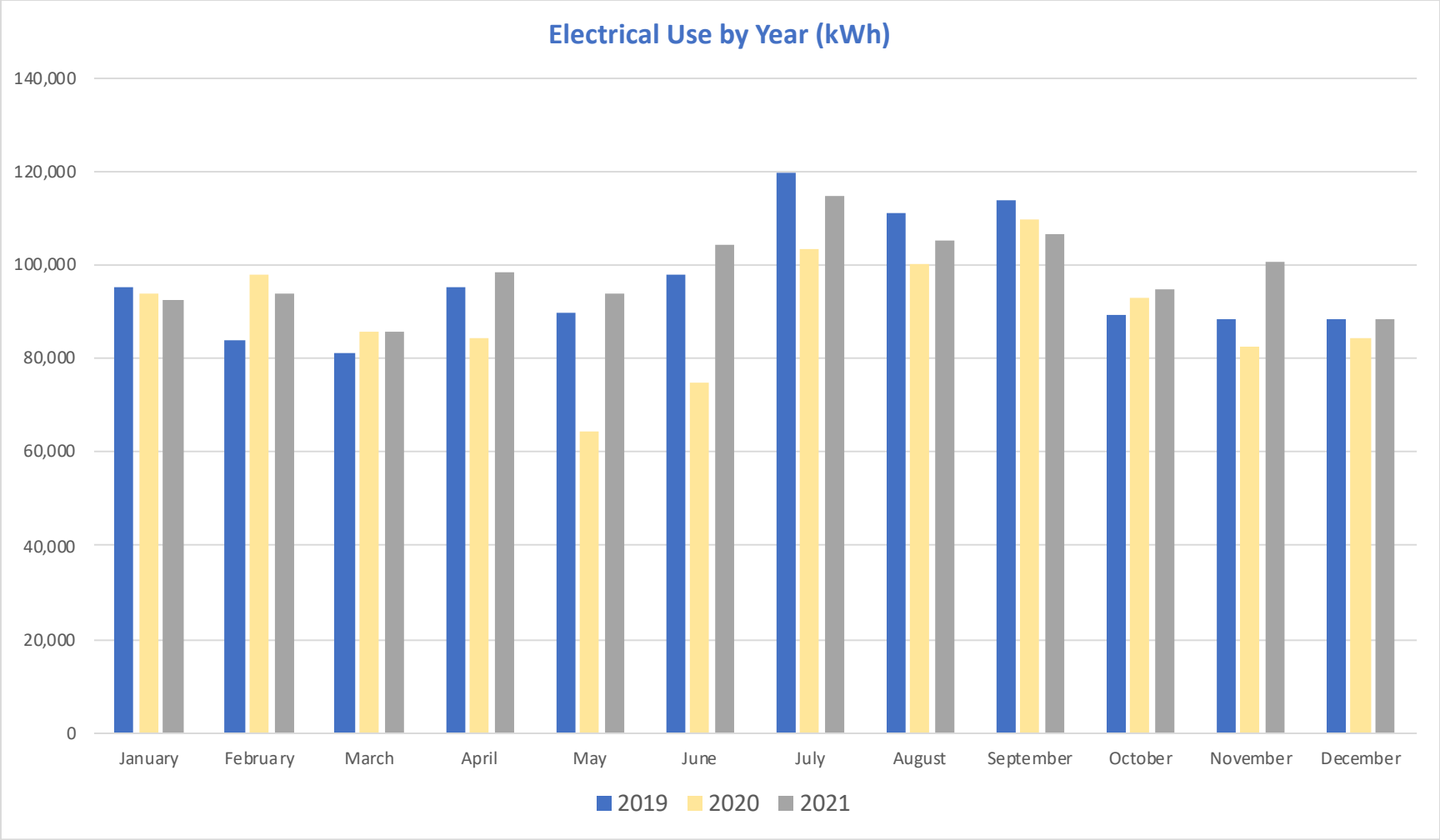


Figure 1: Electrical Use by Year (in kWh)

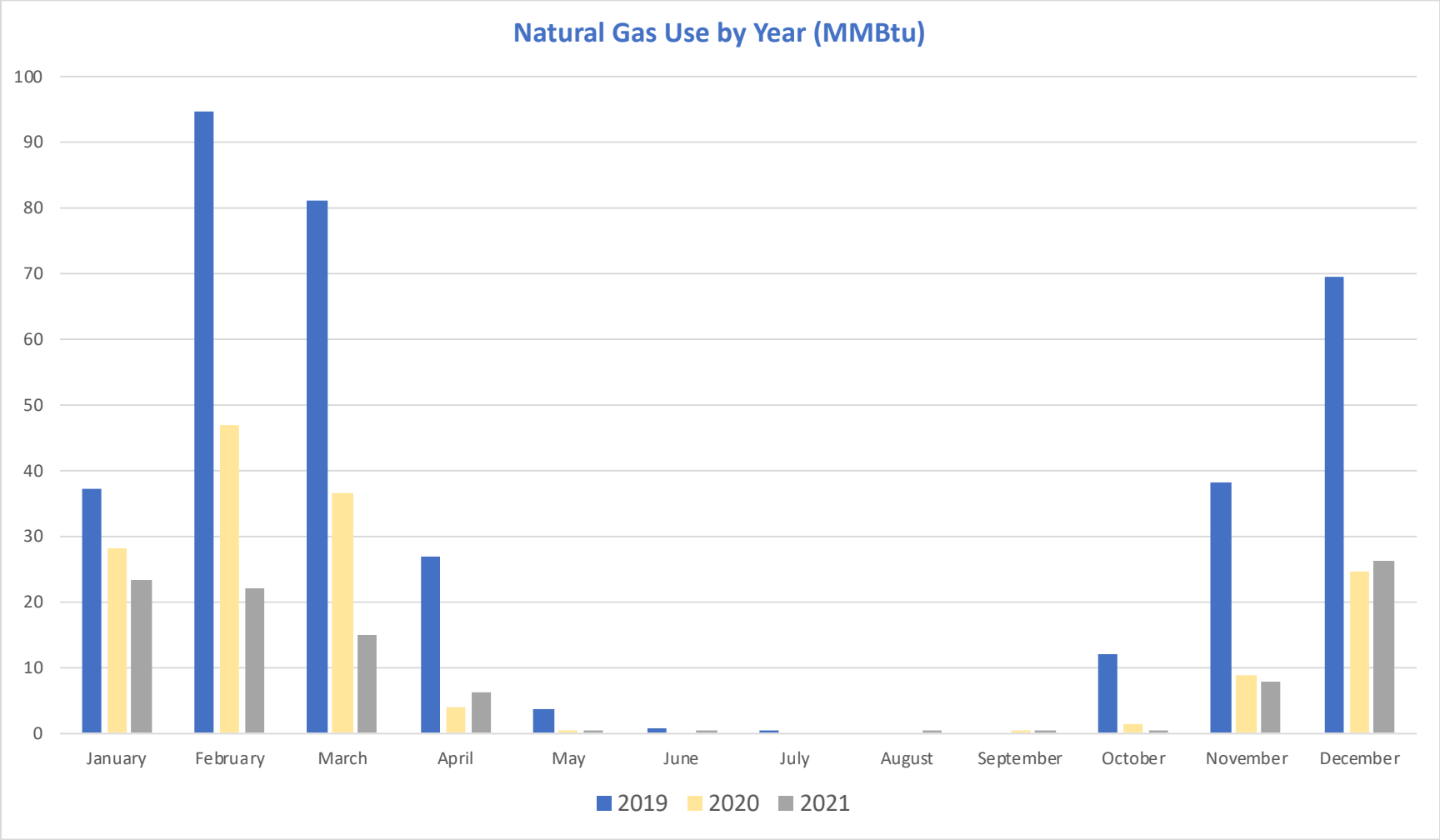


Figure 2: Natural Gas Use by Year (in MMBtu)

6 Major Energy Consuming Equipment

6.1 Mechanical Systems

The retail space, warehouse, mezzanine and offices are conditioned by gas heat, electric cooling roof mounted packaged units. The units were installed in 2011 when the facility was remodeled for the current store. The units are single zone, constant volume, ranging from 5 to 20 tons nominal cooling capacity. The Equipment Schedules indicate all units to be equipped with economizer and CO2 sensors for varying outside air.

The electrical rooms and server room are conditioned with split system air conditioning units with roof mounted condensing units.

Electric unit heaters provide heating to portions of the warehouse and entrance vestibules. Gas fired unit heaters provide heating at the loading doors in the Warehouse.

Roof mounted exhaust fans provide general exhaust for restrooms, warehouse and archery range.
The Equipment Schedules for the major mechanical systems are shown in Tables.

Table 2: Rooftop Unit Schedule

Rooftop Unit Schedule (Gas Heating / Electric Cooling)												
Tag	Area Served	Manufacturer	Model	Air Flow (CFM)	Min OA (CFM)	Heating Capacity (MBH)	Heating Efficeincy	Cooling Capacity (MBH)	Cooling Effiency (EER)	Econ	Supply Fan HP	SF VFD
RTU-1	Warehouse	AAON	RN008	3000	1200	120	80%	81.1	11.5	Yes	3	No
RTU-2	Employee East	AAON	RN010	3400	655	120	80%	100.9	11.7	Yes	3	No
RTU-3	Gun Sales	AAON	RQ005	2000	440	81	80%	56.7	12.5	Yes	2	No
RTU-4	Employee West	AAON	RN010	4000	940	120	80%	110.9	12.1	Yes	5	No
RTU-5	NE Sales	AAON	RN020	7500	2310	220	80%	209.1	12	Yes	7.5	No
RTU-6	SE Sales	AAON	RN020	7500	2310	220	80%	209.1	12	Yes	7.5	No
RTU-7	NW Sales	AAON	RN020	7500	2310	220	80%	209.1	12	Yes	7.5	No
RTU-8	SW Sales	AAON	RN020	7500	2310	220	80%	209.1	12	Yes	7.5	No
RTU-9	Cash/Office	AAON	RQ003	1320	150	49	80%	31.1	13.4	Yes	1	No

Table 3: Cabinet Unit Heater Schedule

Cabinet Unit Heater Schedule (Electric)						
Tag	Area Served	Manufacturer	Model	Air Flow (CFM)	Heatinc Capacity (MBH)	Output (kW)
CUH-1	Main Entrance	INDEECO	CU1	500	41	12
CUH-2	Main Entrance	INDEECO	CU1	500	41	12
CUH-3	North Entrance	INDEECO	CU1	500	41	12
CUH-4	Emp Entrance	INDEECO	WCI	160	6.8	2
CUH-5	East Entrance	INDEECO	WCI	320	27.3	8
CUH-6	SouthE Entrance	INDEECO	WCI	160	13.7	4

Table 4: Electric Unit Heater Schedule

Unit Heater Schedule (Electric)						
Tag	Area Served	Manufacturer	Model	Air Flow (CFM)	Heatinc Capacity (MBH)	Output (kW)
CEH-1	Women Toilet	INDEECO	CCI	160	6.8	2
CEH-2	Men Toilet	INDEECO	CCI	160	6.8	2

Table 5: Gas Unit Heater Schedule

Unit Heater Schedule (Natural Gas)							
Tag	Area Served	Manufacturer	Model	Air Flow (CFM)	Heating Capacity (MBH)	Heating Efficeincy	Fan HP
GUH-1	Warehouse	REZNOR	UDAP100	1361	87	80%	1/30
GUH-2	Warehouse	REZNOR	UDAP100	1361	87	80%	1/30

Table 6: Exhaust Fan Schedule

Exhaust Fan Schedule						
Tag	Area Served	Manufacturer	Model	Air Flow (CFM)	Exhaust Fan HP	Fan RPM
EF-1	Emp Toilets	GREENHECK	GB	750	0.25	1270
EF-2	Server Room	GREENHECK	GB	800	0.25	1307
EF-3	Archery	GREENHECK	GB	300	0.25	1155
EF-4	Public Toilets	GREENHECK	GB	700	0.25	1334
EF-5	Warehouse	GREENHECK	GB	1200	0.25	1262

6.2 Lighting

The main lighting in the open main floor retail consists of ceiling suspended 16” diameter pendant fixtures with compact fluorescent lamps. Flood task lighting is used to highlight special retail features primarily around the perimeter. The lighting in the offices consists of 2 ft x 4 ft T8 recessed troffers. The warehouse lighting consists of 2ft x 4 ft T5 suspended high bay fluorescent fixtures. The Storage area, electrical rooms and server room lighting consists of T8 4 ft suspended linear fixtures.

6.3 Controls

According to the Regional Facilities Manager, the facilities have web-based direct digital control of the HVAC systems. All adjustments and monitoring of the controls are conducted through an outside independent agency. A contracted firm provides quarterly Preventive Maintenance (PM) on the units. The PM includes changing filters, performing functional testing on the units and calibration of sensors.

There are a total of 9 roof top units (RTUs) that serve the facility. All units are scheduled to operate from 6:00 am – 10:00 pm Monday – Saturday and 6:00 am – 8:00 pm Sunday. One unit is scheduled to operate continuously to provide minimum conditioning during off hours. During occupied periods the building controls in the sales, office and warehouse spaces are set to maintain 72 degF cooling and 67 degF heating. The IT room is set to always maintain 65 degF. The unoccupied temperatures are set for 76 degF cooling and 61 degF heating. Local area sensors maintain space temperature. Each unit has a CO2 sensor but it is not confirmed that the units are configured to provide demand control ventilation. Each unit has economizer function. It is not confirmed that the economizers are operational.

The lighting in the retail area, offices and warehouse are scheduled to be ON from 6 am – 10 pm Monday – Saturday and from 6 am – 8 pm Sunday. Track and accent lighting are scheduled On from 8:50 am – 9:15 pm Monday – Saturday and 9:50 am – 7:15 pm Sunday.

7 Detailed Energy Efficiency Measures

7.1 EEM 1 – Upgrade Lighting in Warehouse and Retail Space

EXISTING CONDITIONS

In the warehouse there are 44 lighting fixtures with 6 bulbs per fixture, and 54 watt per each lamp for a total of 324 watt per fixture.

The general lighting in the retail space consists of 282 fixtures suspended from the ceiling with compact fluorescent bulbs in each, with an estimated 168 watt per fixture.

PROPOSED MEASURE DESCRIPTION

Replace existing with LED lamps in each fixture.

SAVINGS METHODOLOY

Savings are estimated using a spreadsheet calculation.

ESTIMATED COST

The cost is estimated at $29,612.

EEM #1 Upgrade Lighting in Warehouse and Retail Space		
Annual Energy Usage & Savings Estimate	Baseline Electric Usage (kWh)	359931
	Proposed Electric Usage (kWh)	176882
	Electric Savings (kWh)	183049
	Demand Savings kW	32
	Electric kWhCost Savings ($)	$ 8,969
	Electric kW Cost Savings ($)	$ 176.50
	Total Elec Savings	$ 9,146
	Baseline Natural Gas Usage (Therms)	0
	Proposed Natural Gas Usage (Therms)	0
	Natural Gas Savings (Therms)	0
	Natural Gas Savings ($)	$ -
	Annual Energy Cost Savings	$ 9,146
Measure Cost & Simple Payback	Project Cost	$ 29,612
	Simple Payback (Cost/Savings)	3.2

7.2 EEM 2 – Provide Occupancy Sensors in Offices

EXISTING CONDITIONS

The Office lighting is controlled by manually operated wall switches.

PROPOSED MEASURE DESCRIPTION

Provide occupancy sensors in offices currently controlled by wall switches.

SAVINGS METHODOLOY

Savings are estimated using a spreadsheet calculation.

There are 8 separate office areas currently controlled by wall switches. The measure assumes lighting operation can be reduced from approximately 16 hours per day to 10 hours per day.

ESTIMATED COST

The estimated cost is estimated at $150 per sensor

EEM #3 Estimated Savings			
Annual Energy Usage & Savings Estimate	Baseline Electric Usage (kWh)		24738
	Proposed Electric Usage (kWh)		15461
	Electric Savings (kWh)		9277
	Electric Cost Savings ($)	$	455
	Baseline Natural Gas Usage (Therms)		0
	Proposed Natural Gas Usage (Therms)		0
	Natural Gas Savings (Therms)		0
	Natural Gas Savings ($)	$	-
	Annual Energy Cost Savings	$	455
Measure Cost & Simple Payback	Project Cost	$	1,200
	Simple Payback (Cost/Savings)		2.6

7.3 EEM 3 – Demand Control Ventilation on Roof Top Units

EXISTING CONDITIONS

There are nine packaged rooftop units that serve the facility. The units all have economizer dampers and CO2 sensors. There is not any evidence that the units vary the outside air based on occupancy. In the main store the patron occupancy varies throughout the day, with peak occupancy occurring from noon- 4:00 pm daily. The Contract Documents show that the design minimum outside air is based on ASHRAE 62.1. For the four 20 Ton (minimal) units that serve the main retail space this equates to 9,240 CFM, and a constant occupancy of 596 people.

PROPOSED MEASURE DESCRIPTION

Configure the existing direct digital control system to vary the outside air based on CO2 sensor .

SAVINGS METHODOLOY

Savings are estimated using a spreadsheet calculation.

EEM is calculated for savings assuming the OSA varies based on CO2 readings and a varying occupancy of patrons. The current OSA values assume 596 occupants during the occupied periods. This is high and not realistic per site observations and discussions with facility personnel. The EEM savings estimates the actual occupancy is approximately 200 during non-peak hours of operation. OSA can be reduced from 9,240 CFM to 6,207 CFM during the hours between 6 am – 10 am and from 6 pm – 10 pm.

EEM savings based on bin data for Eugene, Oregon, and calculating savings for reducing the outside air heating and cooling energy use.

ESTIMATED COST

The estimated cost is $300 to modify existing control strategy. The units currently have CO2 sensors and DDC.

EEM #3 Estimated Savings		
Annual Energy Usage & Savings Estimate	Baseline Electric Usage (kWh)	64116
	Proposed Electric Usage (kWh)	23303
	Electric Savings (kWh)	40813
	Electric Cost Savings ($)	$ 2,000
	Baseline Natural Gas Usage (Therms)	3182
	Proposed Natural Gas Usage (Therms)	2125
	Natural Gas Savings (Therms)	1056
	Natural Gas Savings ($)	$ 1,194
	Annual Energy Cost Savings	$ 3,194
Measure Cost & Simple Payback	Project Cost	$ 300
	Simple Payback (Cost/Savings)	0.1

7.4 EEM 4 – Economizer Control of Roof Top Units (RTUs)

EXISTING CONDITIONS

There are nine packaged rooftop units that serve the facility. The units all have economizer dampers specified on the Mechanical Equipment Schedules. There is not any evidence that the economizer control is currently functioning.

PROPOSED MEASURE DESCRIPTION

Configure the existing direct digital control (DDC) system to provide economizer on all rooftop units. Provide fault detection on units to verify economizer operation and to send signal to the DDC system in case of economizer failure.

SAVINGS METHODOLOY

Savings are estimated using a spreadsheet calculation.

EEM is calculated for savings assuming 100% ambient outside air provides cooling during occupied periods when free cooling is available.

EEM savings based on bin data for Eugene, Oregon, and calculating savings for reducing compressor use when free cooling is available.

ESTIMATED COST

The estimated cost is estimated at $750 per unit to provide economizer fault detection. The units currently economizers and direct digital control.

EEM #4 Estimated Savings		
Annual Energy Usage & Savings Estimate	Baseline Electric Usage (kWh)	138617
	Proposed Electric Usage (kWh)	109243
	Electric Savings (kWh)	29374
	Electric Cost Savings ($)	$ 1,439
	Baseline Natural Gas Usage (Therms)	0
	Proposed Natural Gas Usage (Therms)	0
	Natural Gas Savings (Therms)	0
	Natural Gas Savings ($)	$ -
	Annual Energy Cost Savings	$ 1,439
Measure Cost & Simple Payback	Project Cost	$6,750
	Simple Payback (Cost/Savings)	4.7

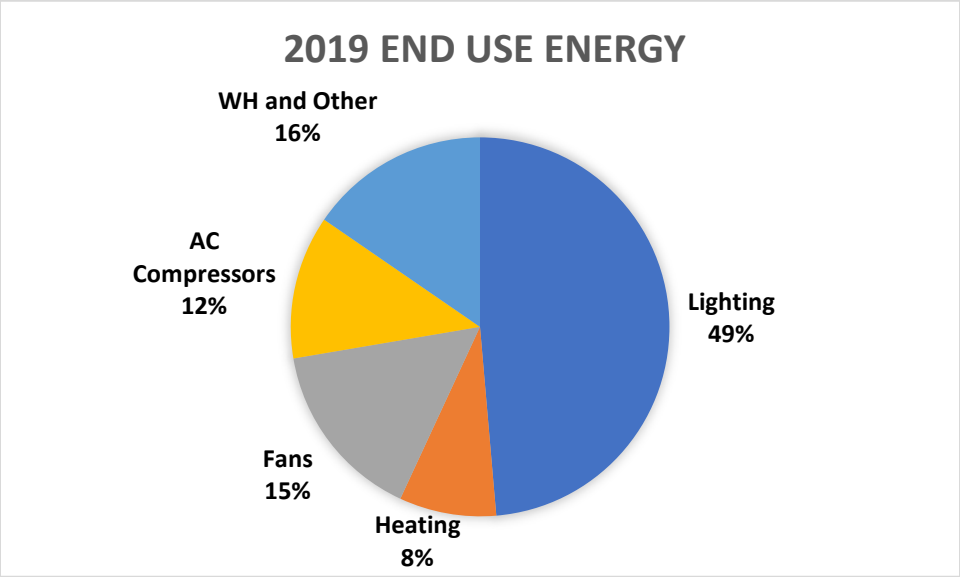
8 Capital Improvements – Solar Opportunity

8.1 PV Solar System

Analysis and cost estimate for a 236 kW PV (photovoltaic) solar system including roof mounted solar array is included in the Appendix.

9 Appendices

9.1 End Use Summary for 2019 *(last full year prior to Covid restrictions)*



9.2 Site Photos

Figure A: Rooftop Exhaust Fan (Greenheck GB)

Figure B: Rooftop Surface Area

Figure C: Typical Roof Top Unit

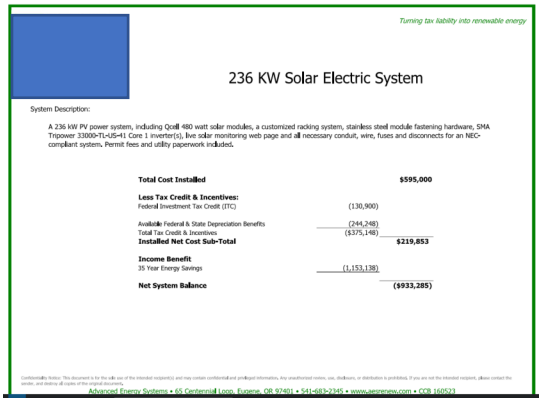

Figure D: Typical Split System Condensing Unit

Figure E: Server Room

Figure F: Primary Sales Floor Lighting


Figure G: Warehouse Highbay Lighting

9.3 PV Solar System Summary



Turning tax liability into renewable energy

236 KW Solar Electric System

System Description:

A 236 kW PV power system, including Qcell 480 watt solar modules, a customized racking system, stainless steel module fastening hardware, SMA Tripower 33000-TL-US+41 Core 1 inverter(s), live solar monitoring web page and all necessary conduit, wire, fuses and disconnects for an NEC-compliant system. Permit fees and utility paperwork included.

Total Cost Installed		**$595,000**
Less Tax Credit & Incentives:		
Federal Investment Tax Credit (ITC)	(130,900)	
Available Federal & State Depreciation Benefits	(244,248)	
Total Tax Credit & Incentives	($375,148)	
Installed Net Cost Sub-Total		**$219,853**
Income Benefit		
35 Year Energy Savings	(1,153,138)	
Net System Balance		**($933,285)**

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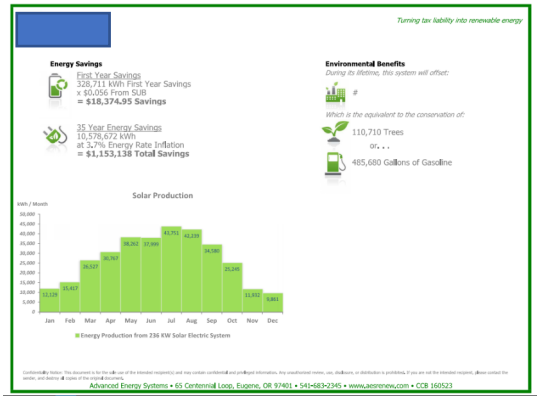

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Energy Savings

First Year Savings
328,711 kWh First Year Savings
x $0.056 From SUB
= **$18,374.95 Savings**

35 Year Energy Savings
10,578,672 kWh
at 3.7% Energy Rate Inflation
= **$1,153,138 Total Savings**

Environmental Benefits

During its lifetime, this system will offset:

#

Which is the equivalent to the conservation of:

110,710 Trees
or. . .
485,680 Gallons of Gasoline

Solar Production

Energy Production from 236 KW Solar Electric System

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