**Technical Analysis Study**

**<Insert Participant’s Site Name>**

**<Insert Site Address>**

Project Number: **<Insert Reference ID and PT ID from Form 104 Work Order>**

**<Insert facility photo below>**

![C:\Users\e297021\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\91VRRKBV\MC900240161[1].wmf]()

*Study sponsored by:*

**Energy Trust of Oregon - Existing Buildings Program**

*Submitted by:*

**<Insert ATAC Company name>**

*Submitted on:* **<Insert Report date>**

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**Disclaimer**

*This energy analysis is funded by Energy Trust of Oregon to help the participant (customer) identify energy savings potential at their facility. TRC is the Program Management Contractor for the Existing Buildings Program. TRC will work with the Allied Technical Assistance Contractor (ATAC) to review the accuracy of this study. If the energy efficiency upgrades (measures) recommended in this report may be eligible for Energy Trust incentives and if the participant wishes to implement the eligible measures, TRC will support and provide guidance to the participant on Energy Trust’s incentive application process and requirements throughout the life of the project.*

*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.*

*In no event will Energy Trust of Oregon, TRC or the ATAC be liable for (i) the inability of the participant to achieve the estimated energy savings or any other estimated benefits included herein, or (ii) for any damages to participant’s site, including but not limited to any incidental or consequential damages of any kind, in connection with this report or the installation of any identified energy efficiency measures.*

# Key Contact Information

|  |
| --- |
| **Participant (Customer) Contact** |
| **Contact Name** |  |
| **Title** |  |
| **Phone** |  |
| **Email** |  |
| **Allied Technical Assistance Contractor (ATAC) Contact**  |
| **Contact Name** |  |
| **Title** |  |
| **Phone** |  |
| **Email** |  |
| **Energy Advisor Contact**  |
| **Contact Name** |  |
| **Phone** |  |
| **Email** |  |

# Project and Measure Summary

This section includes a summary of the facility, its energy usage, list of recommended energy efficiency measures, and an estimate of energy savings if the recommended measures are implemented.

*To prevent confusion, clarify if % Savings are on-bill or incremental (if using incremental savings or a modified baseline).*

## Energy Use and Savings Summary

|  |
| --- |
| **Facility Description** |
| **Site Name**  |   |
| **Facility Type (e.g., office, grocery etc.)** |   |
| **Year Built** |   |
| **Number of Floors** |   |
| **Total Building Area (sq.ft.)** |   |
| **Area Affected by Proposed Measure(s) (sq.ft.)** |   |
| **Energy Usage** |
| **Average Annual Electricity Usage (kWh)** |   |
| **Average Annual Gas Usage (therms)** |   |
| **Energy Use Intensity (EUI) (kBtu/sq.ft.)** |   |
| **Electric Utility Provider** |   |
| **Gas Utility Provider** |   |
| **Estimated Savings (%)** |
| **Baseline Type (Modified or Existing)** |  |
| **Estimated Electricity Savings (%)** |  X% (On-Bill or Incremental) |
| **Estimated Gas Savings (%)** |  X% (On-Bill or Incremental) |

## Energy Efficiency Measure (EEM) Summary – Custom Track

The following energy efficiency measure(s) (EEMs) are recommended for the participant’s site and are potentially eligible for custom incentives under the Existing Buildings program:

* EEM 1 - [Title]

*Provide brief measure description.*

* EEM 2 - [Title]

*Provide brief measure description.*

The table below includes a list of recommended EEMs that may be eligible for Custom Incentives:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Custom Measures** | **Measure Descriptions** | **Energy Savings** | **Cost Savings** | **Estimated Program Eligibility Cost3** **($)**  | **Estimated Project Cost - Without Incentive4 ($)** | **Simple Payback5 - Without Incentive (years)** |
| **Estimated Annual Electric Savings (kWh)** | **Estimated Annual Gas Savings (therms)** | **Estimated Annual Energy Cost Savings1 ($)** | **Estimated Annual Non-Energy Benefits2 ($)** |
| **EEM 1** |  | 0 | 0 | $0 | $0 | $0 | $0 | #DIV/0! |
| **EEM 2** |  | 0 | 0 | $0 | $0 | $0 | $0 | #DIV/0! |
| **EEM 3** |  | 0 | 0 | $0 | $0 | $0 | $0 | #DIV/0! |
| **Total** | **0** | **0** | **0** | **0** | **0** | **0** | **#DIV/0!** |

1. *Cost savings are based on Energy Trust average utility rates for electricity and gas. Actual rates and cost savings may differ.*
2. *Non-energy cost benefits are related to cost savings due to as avoided maintenance, reduced water costs etc.*
3. *Program Eligibility Cost is used to estimate cost-effectiveness under the Program. This could be the incremental cost for end-of-life replacement or full costs for early replacement measures. Program eligibility cost typically include equipment and labor costs. Costs such as permitting, shipping, crane use, painting, warranties, concrete pads, engineering, and design are ineligible to include in the program costs.*
4. *Project Cost includes all costs the participant would incur towards the EEM such as equipment, labor, permitting, shipping, and all other applicable costs.*
5. *Simple payback is estimated using current utility rates and project costs, which could vary over time.*

## Energy Efficiency Measure (EEM) Summary – Standard (Prescriptive) Track

The following energy efficiency measure(s) (EEMs) are recommended for the participant’s site and are potentially eligible for standard (prescriptive) incentives under the Existing Buildings program:

* EEM # - [Title]

*Provide brief measure description.*

* EEM # - [Title]

*Provide brief measure description.*

The table below includes a list of recommended EEMs that could be eligible for Standard (Prescriptive) incentives:

|  |  |  |  |
| --- | --- | --- | --- |
| **Prescriptive Measures** | **Measure Quantity** | **Incentive per unit ($)** | **Total Incentives ($)** |
| **EEM #** |   |   |   |
| **EEM #** |   |   |   |
| **EEM #** |   |   |   |
| **Total** | **-** | **-** | **0** |

The eligibility criteria for the prescriptive measures can be found here:

* Existing Buildings – Standard Measures Incentive Brochures & Forms: <https://www.energytrust.org/commercial/existing-buildings-forms/>
* Existing Multifamily - Standard Measures Incentive Brochures & Forms: <https://www.energytrust.org/commercial/multifamily-forms/>

# Historical Energy Usage

|  |  |  |
| --- | --- | --- |
| **Month** | **Electric Use (kWh)** | **Natural Gas Use (therms)** |
| **20xx** | **20xx** | **20xx** | **3-year Average** | **20xx** | **20xx** | **20xx** | **3-year Average** |
| **January** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **February** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **March** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **April** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **May** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **June** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **July** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **August** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **September** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **October** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **November** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **December** |   |   |   | #DIV/0! |   |   |   | #DIV/0! |
| **Annual Energy Usage** |
| **Annual energy usage** |  -  |  -  |  -  | #DIV/0! |  -  |  -  |  -  | #DIV/0! |
| **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)** |  -  |  -  |  -  | #DIV/0! |  -  |  -  |  -  | #DIV/0! |
| **Energy Performance of the facility** |
| **Conditioned space area (sqft)** |   |
| **Total Energy Use (kBtu per year, based on 3-year Average)** | #DIV/0! |
| **Energy Use Intensity, EUI (kBtu/sqft/year)** | #DIV/0! |
| **Median EUI for facility type in the US** |   |

*\*Median EUI source:* [*https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/what-energy*](https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/use-portfolio-manager/understand-metrics/what-energy)

# Facility & Equipment Description

*Please fill out this section as relevant to the proposed EEM(s) and the energy savings calculations. Feel free to delete section(s) which are not relevant to the proposed EEM(s) or add in new sections as relevant to your analysis and to the data collected as part of this study.*

*If you are performing energy modeling, please provide details of all building systems used to create the model to estimate energy savings. For major equipment (eg: HVAC systems), please include equipment age, capacity, efficiency, operating schedule, and other relevant or noteworthy details such as control type, setpoints, operations & maintenance issues etc. You can present the information in the form of bullets or as a narrative. We encourage you to include photographs that might be insightful.*

**Facility Operations**

* Facility description (various areas in the facility, usage etc.)
* Operating hours
* Total hours facility is occupied per year
* Total hours facility is unoccupied per year

**Building Envelope**

* Describe the building shell, wall assembly, windows, roof conditions as relevant

**HVAC System**

* **Cooling System:** Chillers, cooling tower, air handling units (AHUs), fan coil units (FCUs), rooftop units (RTUs), pumps, fans, heat exchangers
* **Heating System:** Boilers, pumps, heat exchangers, burners, steam systems
* **HVAC System type:** Single zone system, multi-zone system, terminal reheat system, dual duct system, variable air volume, induction system

**Domestic Hot Water System**

* Boiler(s), water heaters, heat exchangers, burners

**Controls (For Relevant Equipment)**

* Set points (winter/summer) of various areas, supply and return air temperatures (winter/summer), load based supply air temperature reset or supply air static pressure reset settings, variable frequency drives (VFDs), economizer and/or demand-controlled ventilation settings, HVAC equipment schedules, and age of existing controls system

**Internal Loads**

* Occupancy
* Lighting
* Equipment (any major equipment or equipment with 24-hour load, such as server closets)

**Previous Energy Efficiency Upgrades**

* Include details of any relevant energy efficiency upgrades that occurred at the facility

# Detailed EEM Description – Custom Track

## EEM 1 – [Title]

### Existing Equipment Description

*Please describe the existing condition pertaining to this measure only. Include equipment age, model number, current operating conditions, equipment performance, effective useful life and efficiency information, description of controls and sequence of operations, as relevant.*

### Proposed Measure Description

*Please describe the proposed measure. Include model numbers for basis-of-design equipment, proposed operating conditions, performance and efficiency details, description of controls and sequence of operations. Descriptions should contain sufficient information for a contractor to provide a bid.*

*When applicable, please summarize and compare the key performance and operating parameters of the baseline and proposed conditions in the table below. The parameters could include operating schedule, efficiency, equipment type, control type, set points etc. If an energy model is submitted which does not use parametric runs to calculate measure savings, please provide the model/reference pathways to the inputs being modified in the calculations (eg. Refer to Tab ‘title’>Column #>Row #).*

|  |  |  |  |
| --- | --- | --- | --- |
| **Performance or Operating Parameters of the Equipment** | **Model Input Pathway** | **Baseline Condition** | **Proposed Condition** |
|   |  |  |   |
|   |  |  |   |

### Savings Methodology

*Please provide a description of the methodology you used to estimate the energy savings (spreadsheet calculations or simulation model). Also provide a description of the baseline conditions (existing, code or market baseline) used to calculate savings. Refer to the Technical Guidelines section of the ATAC Guide for guidelines on baseline conditions and model calibration. Information included in Section 6 may be excluded to avoid redundancy.*

### Estimated Cost

*Please include a description of the estimated measure costs, including calculation of incremental or full costs that will be used to estimate the measure’s cost-effectiveness.*

### Non-Energy Savings Estimates

*Please include a description of any non-energy savings related to this measure. Please explain the benefits that are considered towards non-energy savings and how you arrived at the savings estimates.*

|  |
| --- |
| **EEM 1 - Estimated Savings, Cost & Incentive summary** |
| **Annual Energy Usage & Savings estimate** | Baseline Electric Usage (kWh) |   |
| Proposed Electric Usage (kWh) |   |
| Electric Savings (kWh) |  |
| Electric Cost Savings ($) |  |
| Baseline Natural Gas Usage (therms) |  |
| Proposed Natural Gas Usage (therms) |  |
| Natural Gas Savings (therms) |  |
| Natural Gas Cost Savings ($) |  |
| Annual Energy Cost Savings ($) |  |
| Annual Non-Energy Savings ($) |  |
| **Measure Cost & Incentives**  | Program Eligibility Cost1 |  |
| Project Cost without incentive2 |  |
| Estimated Energy Trust Incentives ($) |  |
| Project Cost with Incentive |  |

*1. Program Eligibility cost is used to estimate cost-effectiveness under the Program. For example, this could be the incremental cost for end-of-life replacement or full costs for early replacement measures. Program eligibility cost typically include equipment and labor costs. Costs such as permitting, shipping, crane use, painting, warranties, concrete pads, engineering, and design are ineligible to include in the program costs.*

*2*. Estimated Project Cost includes all costs the participant would incur towards the proposed measure such as equipment, labor, permitting, shipping, and all applicable costs.

*Please use the above (or equivalent) format to provide details for all the EEMs you are recommending in this report in the sections below. Feel free to create more sections as needed.*

## EEM 2 – [Title]

## EEM 3 – [Title]

# Calculation Methodology Description

## Calculation Software

*Describe the software used to calculate EEM savings – custom spreadsheet, energy model, etc. If savings are measure dependent, name the weather file used.*

## Energy Model Calibration

*If EEMs were calculated using a whole building energy model, include the energy model calibration table.*

|  |  |  |
| --- | --- | --- |
| **Month** | **Electric Use (kWh)** | **Natural Gas Use (therms)** |
| **Baseline/ Billed**  | **Model** | **% Deviation** | **Baseline/ Billed**  | **Model** | **% Deviation** |
| **January** |   |   |  |   |   |  |
| **February** |   |   |  |   |   |  |
| **March** |   |   |  |   |   |  |
| **April** |   |   |  |   |   |  |
| **May** |   |   |  |   |   |  |
| **June** |   |   |  |   |   |  |
| **July** |   |   |  |   |   |  |
| **August** |   |   |  |   |   |  |
| **September** |   |   |  |   |   |  |
| **October** |   |   |  |   |   |  |
| **November** |   |   |  |   |   |  |
| **December** |   |   |  |   |   |  |
| **Total** | **0** | **0** | **%** | **0** | **0** | **%** |

# Lighting and Solar Opportunities

*Please include brief details of lighting and solar opportunities you may have identified during the study. For lighting include brief details of existing lighting systems. For solar include brief details about the solar potential such as available area, orientation, shading details etc. TRC’s Energy Advisor will work with the participant and the ATAC to discuss these opportunities and/or connect the participant with Energy Trust’s lighting and solar program representatives.*

# Next Steps for the Participant

## Apply for Energy Trust Incentives for Recommended EEMs

#### Obtain bids for EEM(s) you wish to implement and Sign the Incentive Application

* The participant will evaluate the recommended EEMs contained in the TAS and estimated incentives in the accompanying 110C and select the EEMs they wish to implement.
* The participant must obtain bids from contractors for the EEM(s) they wish to implement and send a copy of the final bid to the Energy Advisor.
* The PMC will review the contractor’s proposed scope and costs to determine compliance with Existing Building program requirements, alignment with the EEMs as described in this TAS and to ensure that the EEMs still meet the cost-effectiveness criteria.
* If the bids are found satisfactory and subject to Existing Buildings program requirements in effect at that time and incentive budget availability, PMC may issue Form 120C (or 320C) - Incentive Offer form for participant review and signature. This offer to reserve incentives will detail the approved measures and estimated incentives that the participant is applying to receive, as well as Energy Trust’s terms and conditions for Existing Buildings program incentives, including any per-site, per-year limits.
* To apply for a reservation of Energy Trust custom incentives, the customer must return the signed Incentive Offer to the PMC by the submittal deadline listed in the Incentive Offer application and **BEFORE** issuing purchase orders or beginning the project work. If the participant moves forward with purchase orders or installation before signing and returning the Incentive Offer application, the measures will no longer be eligible for Energy Trust incentives.

**Notify TRC upon Installation of EEM(s) and Submit Completion Documentation**

* The participant must notify the PMC once the installation of EEMs is completed along with final invoices before the project’s incentive reservation expiration date which will be included in the Incentive Offer.
* A post-installation verification of the installed EEMs could be required.
* All required documentation must be provided to the PMC and post installation verifications (if required) must be completed before incentive payments can be issued.

## Apply for Energy Trust Solar Incentives

Please review details of any solar opportunities, if included in this report. If you wish to find out more, please fill out Energy Trust’s solar interest form included here - <https://energytrust.org/solar-request-analysis-bid/>. Energy Trust will match you with qualified solar Trade Ally contractors in your area. The solar Trade Allies will help you assess your rooftop or property potential for solar power, provide a bid with estimates incentives, tax credits, annual solar power generation and utility cost savings information, and answer any questions you may have.

# Appendix A – EUL Reference

*SB 1149 Appendix A is the default reference used for technology EULs. If a technology is more accurately captured by a different EUL source, the alternative source may be cited.*


*\*SB1149 Measure Life Table References available on page 27 of* [2022 Program Guidelines (oregon.gov)](https://www.oregon.gov/energy/energy-oregon/Documents/2022-09-SB-1149-Schools-Program-Guidelines.pdf)