Version 2024.2

Existing Buildings Program

ALLIED TECHNICAL ASSISTANCE CONTRACTOR (ATAC) GUIDE

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1 Introduction

This document provides guidelines for Allied Technical Assistance Contractors (ATAC) that participate in Energy Trust of Oregon's Existing Buildings Program (Program). TRC Companies, Inc. (TRC) serves as the Program Management Contractor (PMC) for the program.

Please note that this guide may be updated periodically in accordance with program requirements and will be shared with participating ATACs, as necessary. Please refer to resources available for ATACs here: https://www.energytrust.org/allied-technical-assistance-contract-atac-materials-for-existing-buildings-program/

1.1 About the Existing Buildings Program

Energy Trust of Oregon (Energy Trust) launched the Existing Buildings program in 2003. The program provides financial and service incentives to program participants to improve the energy efficiency of eligible existing buildings and facilities located within the territories of Portland General Electric (PGE) and Pacific Power (PAC) for electric incentives and/or NW Natural Gas (NWN), Cascade Natural Gas (CNG), and Avista (AVI) for gas incentives.

To qualify for program incentives, the participant site must be located in Energy Trust's service territory. Please reference the Service Territory Map:

https://www.energytrust.org/wp-content/uploads/2016/11/GEN_ServiceTerritoryMap.pdf.

Eligible commercial facilities include all types such as office, educational, retail, foodservice, lodging, hospital, and government facilities as well as all multifamily properties of two or more attached units, assisted living facilities, campus living, and individually owned condos and townhomes.

1.2 Energy Trust Programs

Energy Trust offers multiple programs to deliver energy-efficiency measures to all market sectors. A complete list of Energy Trust programs can be found here: https://www.energytrust.org/.

Energy Trust aims to ensure that program participants receive program services and support most appropriate to their project. To assist with project sorting, Energy Trust has established specific project sorting criteria to help send projects to the appropriate Energy Trust program.

The list of Energy Trust programs and their sorting criteria are described in the table below. Please contact a program representative for any clarification on sorting rules for your participant project(s).

Energy Trust Program	Sorting Rules
Industry and Agriculture (Production Efficiency)	A site where the existing facility or business processes, treats, assembles, mines, produces, repackages, bottles for outside distribution, grows something or has a cold storage distribution center.
New Buildings and New Multifamily	New construction, major renovation, tenant improvement and additions for commercial, industrial, and multifamily structures.
EPS New construction	New residential single family and side by side home construction, prior to occupancy.
Home Retrofit	Existing single-family homes that are stand-alone structures. Includes manufactured/mobile homes.
Existing Buildings	Established commercial properties that are not residential or industrial use. Includes commercial measures or retail projects for mixed use commercial properties.
Existing Multifamily	Established multifamily properties, assisted living and campus living properties with two or more dwelling units inclusive of townhomes and condominiums along with any community spaces that are not undergoing major renovation. Includes in-unit upgrades for mixed used commercial properties. This is now part of the Existing Buildings Program
Products	Includes residential appliances and lighting, and new manufactured homes, purchased at retail for single family homes.
Renewables	All renewable installations (such as Solar) go through the Renewables Program, regardless of building type.
Business Lighting	Includes lighting measures only for existing Commercial, Industrial and Multifamily properties

Figure 1: Overview of Energy Trust of Oregon Energy Efficiency Programs

2 Existing Buildings Program Roles

The goal of the program is to achieve electric and natural gas energy savings and help transform energy use in commercial and multifamily markets by providing financial and service incentives to qualifying participants. The program provides technical assistance and financial incentives to promote the installation of these energy-efficiency measures in existing commercial and multifamily buildings.

2.1 Energy Trust of Oregon

Energy Trust oversees the implementation, strategic direction, and budget for the program as it strives to meet its energy-savings and other goals. Energy Trust coordinates activities among its portfolio of programs and conducts quality assurance and evaluations of program activities.

2.2 TRC Companies, Inc.

Energy Trust selected TRC as the Program Management Contractor (PMC) for the Existing Buildings program beginning January 1, 2021. TRC contracts and manages the ATAC network for the program, which includes both the Existing Buildings and Existing Multifamily ATAC networks. TRC will help participants through the lifecycle of a project and with the program requirements to receive incentives and make the necessary information and resources available to the participants per program guidelines. TRC will work with Energy Trust, participants and ATACs to identify the level of assistance appropriate for each participant.

TRC (referred to as PMC) is responsible for establishing ATAC subcontractor agreements, communicating program information to the ATACs, assigning work orders for technical studies to ATACs, reviewing study submittals and processing service incentive payments to ATACs.

2.3 Allied Technical Assistance Contractor (ATAC)

The ATAC network maintained by the PMC is a group of energy engineering companies in the region. ATACs are selected for participation in the program based on geographic location, industry & technical expertise, strategic relationship, or the amount of savings they anticipate bringing to the program.

The program leverages the experience and expertise of the participating ATACs to examine a participant's facility and equipment energy usage to identify energy saving opportunities. The ATAC coordinates and works with the PMC and delivers a high-quality technical study, that meets Existing Buildings program standards, to the participant.

In the first quarter of each year, the PMC will evaluate ATAC participation and performance. More information on this is included in Section 4 below.

3 Program Offerings and Incentives

The program provides four main types of financial incentives: standard, custom, service, and bonus/enhanced. Program requirements, including offerings and incentives, are subject to change without notice and are subject to incentive budget availability and caps in effect. There can be site and project incentive caps for standard, lighting, and custom track projects in Oregon and Washington. For the most current information on offerings and incentives, please see Energy Trust's website:

- For more information on Commercial Standard Equipment upgrades incentives: https://www.energytrust.org/programs/equipment-upgrades-retrofits/
- For information on Commercial Lighting Incentives: https://www.energytrust.org/incentives/existing-buildings-lighting/#tab-two
- For more information on Commercial Custom incentives: https://www.energytrust.org/incentives/existing-buildings-custom-incentives/#tab-two

If a site has been certified as eligible to self-direct, Energy Trust refers to the Oregon Department of Energy's site definition when determining Existing Building program eligibility and services. Please reference Section 5.2 Self Direction for more information.

3.1 Standard Incentives

Standard or prescriptive (referred to as Standard in this document) measures and incentives are pre-determined savings and financial incentives offered for specific Energy Efficiency Measures (EEMs). Standard incentives are available for a wide variety of measures including but not limited to insulation, water heaters, HVAC equipment, heat pumps and appliances. Savings and incentives are pre-determined for standard EEMs and approved by Energy Trust Planning and Evaluation Department.

Standard incentives do not require a Technical Analysis Study (TAS) or Site Assessment although they may be identified or recommended in a TAS or site assessment. PMC Energy Advisors, ATACs, Equipment dealers or Trade Allies may help a participant understand which equipment may qualify for Energy Trust standard incentives prior to ordering equipment. The PMC will examine invoices and equipment specification sheets to determine if equipment detailed in the invoice qualifies for incentives. Some Standard EEMs might require a post-installation verification by the PMC.

ATACs should familiarize themselves with the standard incentive offerings to help participants. If the ATACs identify opportunities for standard measures and incentives during the site visit (in addition to custom measures), they can recommend the standard measures in the TAS.

The list of standard incentives including application forms for Existing Buildings and Multifamily offerings are available through the links below:

Existing Buildings (non-lighting commercial retrofits):

https://www.energytrust.org/commercial/existing-buildings-oregon-cash-incentives/

Existing Multifamily (non-lighting multifamily retrofits):

https://www.energytrust.org/commercial/multifamily-cash-incentives/

ATACs should check the website on an ongoing basis for updated versions of the incentives.

3.2 Custom Incentives

The Existing Building program offers custom incentives for non-lighting measures. Custom financial incentives are provided on a case-by-case basis and are determined based on the estimated annual energy savings, measure cost-effectiveness, and the simple payback from the energy savings. The eligibility criteria and incentives for custom measures are listed below:

3.2.1 Eligibility Criteria

To qualify for custom incentives, a measure must satisfy the following criteria:

- Should be serviced by one or more of the participating utilities under the Existing Buildings programs and on an eligible rate schedule.
- Be cost-effective in both the Utility Cost Test (UCT) and the Total Resource Cost (TRC) test with a benefit cost ratio (BCR) of greater than 1.0 unless otherwise pre-approved by the Oregon Public Utilities Commission. Each measure must be tested individually.
- Have a simple payback of greater than 12 months.
- Retrocommissioning (RCx) measures can have a payback less than 12 months

The ATAC or participant must work with the PMC team to confirm if the project site is under the per year incentive cap and is eligible to receive incentives.

3.2.2 Custom Incentive Structure

The incentive structure for non-lighting measures for Existing Buildings program is detailed in the table below:

Existing Buildings Custom Incentives		
Projects with qualifying electric savings	$0.45/annual kWh saved	Incentive cap: 90% of eligible measure cost (small business may be eligible up to 100%)
Projects with qualifying gas savings	$5/annual therm saved	

Figure 2: Custom incentive rates

Please note:

- Measure equipment or services purchased or contracted prior to the program having a signed incentive offer are done at risk. Associated costs will not be included for purposes of Energy Trust incentives if purchased more than 1 year before receiving the signed incentive offer.
- A participant's self-direct status may impact the amount of incentive funding that the program can provide towards a project. See Section 0 below.

ATACs should regularly check the link https://www.energytrust.org/incentives/existing-buildings-custom-incentives/ for current custom incentive information or contact the program with any questions at EBCustom@trccompanies.com. PMC will notify the ATACs of any critical updates to the custom track and incentives via emails and/or webinars.

Lighting incentives will be offered under the Business Lighting program currently managed by CLEAResult. For more details on lighting measures and incentives, please refer to the following link:

https://www.energytrust.org/incentives/existing-buildings-lighting/

3.3 Program Services and Service Incentives

In addition to incentives for installation of energy efficiency measures (EEMs), the program offers certain no-cost services to help participants identify potential EEMs.

PMC staff can conduct a site assessment at the participant site to help them identify measures for a more detailed study by the ATAC, at no cost to the participant.

These services help the participant identify equipment that could be eligible for prescriptive and custom incentives. Based on the stage their project is at and the equipment type the participant wishes to analyze, the PMC may additionally offer incentive-funded technical assistance to a participant in the form of Technical Analysis Study (TAS). Subject to certain self-direct policy requirements, TAS are typically provided at no cost to the participant.

The PMC utilizes service incentive funding to pay ATACs for assigned/accepted TAS, in connection with the program, in accordance with the terms and conditions of the ATAC agreement. It is important to note that to qualify for service incentive funding, work orders must be generated and signed by the PMC and ATAC before any TAS work can begin.

3.3.1 Technical Analysis Study (TAS)

A TAS is a detailed study of EEMs that may be eligible for custom incentives under the program. ATACs will conduct a site visit to study specific measures with potential for custom incentives and will develop a TAS report based on the site visit. A TAS requires greater expertise to complete and may involve more complex energy analysis methodologies, including bin analysis and/or building energy modeling software such as eQUEST or TRACE.

A TAS report will include estimated measure savings, costs, simple payback, savings methodology, back-up calculations and supporting documentation for the project site studied by the ATAC. The ATAC must use the TAS template that will be provided by the PMC or coordinate with the PMC for approval of alternate formats prior to their use.

The ATACs will submit the TAS, energy models, and supporting documents to the PMC for review. Once reviewed and approved by the PMC Engineering team, the TAS will be presented to the participants for them to make informed decisions about custom EEMs they may implement at their facility.

The participant can select EEMs for implementation and will procure bids from contractors to implement the selected EEMs.

3.3.2 Technical Analysis Study (TAS) Site and Study Caps

TAS reports are subject to cost caps which currently are $20,000 per TAS or $20,000 in TAS fees per site per calendar year. Consideration for fees above these thresholds will be taken on a case-by-case basis. These thresholds may change throughout the year or from year to year; information will be communicated with any significant changes. As a reminder, the TAS fee cannot exceed the incentive potential for the customer.

3.4 Strategic Energy Management (SEM)

The program also offers commercial Strategic Energy Management (SEM) as a subset of the Existing Buildings program. The SEM offering incentivizes energy management strategies that address energy-saving opportunities in participant's buildings through no- and low-cost operations and maintenance improvements, continuous technical support and training, and energy efficient occupant behaviors. This guide will focus on the standard, custom and service incentives offerings only. Please reach out to the PMC for more information on the SEM program.

3.5 Bonus and Enhanced Incentives

During specific times of the year, Energy Trust may approve certain enhanced incentives or incentive bonuses for custom projects or specific measures that meet the eligibility criteria. These incentives will have special rules, bonus incentive caps and deadlines that participants must follow to receive the incentive. PMC will inform the ATACs about these promotions via email and on the program website when they are in effect.

4 ATAC Participation and Program Eligibility

The program leverages a network of ATACs to support the identification and study of custom EEMs for qualifying participants. ATACs examine how a participant's facility and equipment use energy and identify potential ways to save energy. The PMC utilizes Energy Trust service incentive funds to pay the ATAC for the completed studies based on size and complexity of the project.

4.1 ATAC Program Participation

Firms can initiate potential participation in the program as an ATAC by responding to the PMC's Request for Qualifications (RFQ). Note that the PMC will issue an RFQ for ATAC enrollment on an as needed basis. Additionally, a potential ATAC can engage with the program to go through an application process proactively or when there is a potential project. The PMC will review the RFQ responses for qualifications, reference(s), sample work (if requested, typically 3 prior energy studies and supporting calculations), and insurance requirements. If the RFQ response meets the requirements and has potential to support the program objectives, the ATAC receives an Allied Technical Assistance Contractor Application. Once the application is executed and returned to the PMC, an Approval Notice is sent to the ATAC, thus enrolling them into the ATAC network.

Once enrolled, the ATAC receives the Technical Analysis Studies (TAS) report templates, and an Existing Buildings ATAC Onboarding training is scheduled. The ATACs are expected to coordinate and support the PMC to deliver quality TAS reports to the participant and join the Energy Advisor staff when presenting a study, if requested.

To participate and remain under 'Active' status with the program, ATACs must:

- Remain in compliance with the ATAC agreement, including providing high-quality TAS for program participants consistent with the requirements set forth in this ATAC Guide
- Demonstrate commitment to the program by responding to PMC's request to bid on studies and/or timely communication related to review of studies
- Ensure strict compliance with the Utility Customer Information (UCI) confidentiality agreement
- Represent its business in an ethical, professional manner and as an independent contractor and at no time will it represent its business as an agent or representative of Energy Trust.
- ATACs must (a) comply with all applicable federal, state, and local laws regarding non-discrimination, and (b) not discriminate in any case against any ATAC employee, Energy Trust employee, member of the Energy Trust Board of Directors, or member of the public based on race, color, religion, creed, national origin, sex, age, familial status, sexual orientation, gender identity, disability, or status as a veteran.

If the above criteria are not met, ATACs will be notified of improvements they must make to remain active in the program. The PMC is committed to work with and support the ATACs via one-on-one meetings, webinars, emails, and phone calls to provide support and updates on program information throughout the year.

If the ATAC continues to underperform, the PMC can change the ATAC's status to *Inactive*, and a letter will be sent to terminate the agreement between the PMC and the ATAC.

4.2 Provisional ATACs

Firms can initiate potential participation in the program as a provisional ATAC by engaging with the PMC and expressing interest in enrolling. Provisional ATAC designation is reserved for firms and individuals who meet the qualification, reference, and insurance requirements but do not have sample work and calculations to share.

The provisional ATAC program differs from the traditional ATAC program in the following ways:

- Requires additional pre-acceptance meetings to discuss qualifications, experience, areas of practice/expertise, and expectations.
- Process will involve additional interaction between the provisional ATAC and PMC; additional touchpoints to include:
  - ATAC Coordinator and Engineering Lead will have discussions with the provisional ATAC to ensure suitability for the provisional ATAC pathway.
  - PMC to conduct site visit with provisional ATAC.
  - PMC to conduct call with provisional ATAC after site visit but prior to beginning the TAS, intent to discuss calculation methodology and ensure everyone is on the same page.

Provisional ATAC designation is a pathway towards acceptance as a traditional ATAC. Depending on performance the following outcomes are possible:

- Traditional/Full ATAC
  - Provisional ATAC is deemed capable of performing studies on their own, and provisional designation removed.
- Provisional ATAC
  - Provisional ATAC remains provisional with additional program support for an additional duration, with the continued goal to remove the designation when they've proven capable.
- Not Suited for Provisional or ATAC status
  - In the unlikely event that the performance of the provisional ATAC does not meet program expectations, they will be removed from participation as a provisional ATAC.

4.3 ATAC Performance

At the PMC's discretion, ATACs may be scored based on quality of deliverables, timeliness of responses and submissions, and other qualitative factors. These may take the form of periodic meetings to cover changes since the last meeting, performance relative to peers, etc. Specific information about performance will be used internally and shared with the ATAC directly. Anonymized (without identifiable) information on all ATACs may be published to the ATAC pool for reference. For instance, ATAC 1's detailed information would not be shared with any of the other ATACs, but information on all ATACs may be shared with numeric, letter, or other naming to ensure that anonymity is maintained.

Announcements and coordination will be made if/when these go into effect to ensure all parties are aware.

5 Program Policies and Objectives

This section includes key program policies and objectives that ATACs should be aware of:

5.1 Cost Effectiveness of Energy-Efficiency Measures

The Oregon Public Utility Commission (OPUC) has directed Energy Trust to incorporate cost-effectiveness requirements to ensure that Energy Trust is responsibly investing ratepayer funds. To meet this directive, Energy Trust offers incentives through its programs for measures that meet the cost-effectiveness requirements.

The cost effectiveness analysis is comprised of two tests: the Total Resource Cost Test benefit-cost ratio (TRC BCR) and Utility Cost Test benefit-cost ratio (Utility BCR). Each individual energy efficiency measure must pass with a benefit-cost ratio (BCR) of at least 1.0 on each test. Combining (or bundling) of measures is not allowed as a mechanism to approve a non-cost-effective measure by pairing it with a cost-effective measure.

If the project provides non-energy benefits (NEBs), such as reduced operations and maintenance, these can be included in the TRC BCR calculation. To include NEBs, the benefits must be quantifiable. Examples of quantifiable NEBs may include water and sewer savings, other fuel costs (oil, propane, wood), and operations and maintenance savings. Comfort, space savings, health, and participant interest are not quantifiable.

An explanation and supporting documentation regarding any non-energy benefits being claimed must be included in the TAS. The total NEBs should be presented as an average annual value, in dollars.

You can find additional resources on cost effectiveness and NEBs in the links below:

https://energytrust.org/wp-content/uploads/2016/11/GEN_FS_CostEffectiveness.pdf

https://www.energytrust.org/wp-content/uploads/2016/11/4.06.000.pdf

5.2 Eligible Costs

Below is guidance provided on behalf of the program when it comes to measure costs regarding what can and cannot be included for purposes of incentive determination.

What costs are eligible?

- Equipment and labor costs associated with the measure are the only eligible costs.
    - Equipment costs include any permanent equipment required for the measure to be properly installed (for an HVAC system, the controls, wiring, and ducting would all be considered equipment). A crane or yearly subscription to a software would not be considered equipment because they are not permanently installed with the energy saving system.
    - Labor costs are the labor associated with physically installing the equipment when on site. For example, the labor cost of two HVAC technicians installing an HVAC unit would be eligible, but the engineering work to design the system would not be included.
        - Note that when using an incremental cost, the equipment and labor costs of both the measure case/efficient equipment and baseline equipment need to be collected. However, if the labor cost is the same for both pieces of equipment, only the equipment costs are needed for the equipment (typically the labor cost is assumed the same for both cases, but it is not guaranteed they will be the same).

What costs do we typically exclude? Engineering, shipping, etc.

- Any cost not included in the equipment and labor definition above should not be included when applying for an incentive. This includes costs associated with designing/engineering a project, shipping it to the site, renting a crane, purchasing a warranty or permit, etc.

5.3 Self-Direction

Under the Oregon Public Utility Commission (OPUC) grant agreement, Energy Trust receives and invests a portion of the funds generated by the Public Purpose Charge (PPC) collected from the customers of PGE and PAC. Although payment of the PPC is generally mandatory, Oregon law recognizes that large electric energy users (those using one average megawatt (≥1aMW) or more at a certified site per year) may choose to manage their own electric energy efficiency and renewable energy PPC investments at a site via a self-direct option.

Oregon Department of Energy (ODOE) is responsible for administering the self-direct option of the PPC. Participant sites using ≥1aMW (8,760,000 kWh or more) of electricity annually in the previous year and metered through a single meter or having a contiguous site (including campus sites where multiple buildings may be grouped together) could qualify to be certified by ODOE as eligible to self-direct their PPC. Typically, in the EB program, these customers are universities, hospitals, and other types of campuses. If a self-direct participant is submitting a project to the ODOE to receive self-direct credits for it, then that project is not eligible for any Energy Trust incentives.

Energy Trust has developed a policy, approved by its Board of Directors, regarding self-direction which can impact the amount of incentive funding the participant is eligible to receive from Energy Trust. Self-directing participants are generally eligible for up to 50% of the incentive amount that a non-self-directing entity would be eligible to receive, or they can receive the full amount if the site stops self-directing for a period of at least 36 months.

ATACs should contact the program to inquire about participant eligibility if they believe a participant site may be a large electricity user (≥1aMW, equal to or greater than 8,760,000 kWh). PMC will support ATACs in making the determination of whether a participant is eligible for or has elected to self-direct, and if they are eligible for the technical study incentives. The PMC may also request additional information about a participant's self-direct status when reviewing application submittals.

The board-approved policy is available for review at: https://energytrust.org/wp-content/uploads/2016/11/4.10.000.pdf.

Frequently Asked Questions regarding Self-Direction are available at: https://energytrust.org/faqs/.

5.4 Additional Program Objectives

The primary goal of the program is to achieve electric and natural gas energy savings and help transform energy use in commercial markets by providing financial and service incentives to qualifying participants. In addition, the program has the following objectives:

- Achieve Diversity, Equity, and Inclusion goals as laid out by Energy Trust (https://www.energytrust.org/about/explore-energy-trust/diversity-equity-and-inclusion/)
- Avoid paying incentives in situations where the customers would have installed energy efficiency measures (EEMs) without assistance (commonly called free ridership) from Energy Trust.
- Assure that savings occur in significant quantities in areas beyond the Portland metropolitan area.
- Encourage increased installation of efficient equipment and controls.
- Demonstrate and evaluate selected technologies and services that are mature and significant enough to warrant demonstration in the field.
- Leverage other funding sources including green loans, private sector capital and participant investment.
- Reduce operating hours of equipment as a form of efficiency if there is no adverse impact on service quality and occupant comfort.
- Avoid recommending solutions that push a participant to switch from one type of fuel source to another.
- Work together with Energy Trust's other programs to find the right course of action for each participant.

6 Utility Customer Information (UCI) Confidentiality

Energy Trust requires ATACs to keep all participant information confidential and to comply with the Utility Customer Information (UCI) confidentiality agreement that the ATACs enter into as part of the ATAC agreement with the PMC. ATACs are required to use the following procedures to protect transfers of participant information. A participant is any company or individual involved with an Energy Trust service or incentive offering, past, present, or future. Participant information includes, but is not limited to, name, site location, address, utility information and project or study information.

Each ATAC must complete both a contractor version of the UCI agreement and an individual version of the UCI agreement for each team member within the organization (including subcontractors) that will have access to any UCI data. The individual agreement must be signed by all full time, temporary or contract staff that will access or handle the sensitive UCI data. If a new team member from the ATACs team will work on the program, the ATAC must inform the PMC immediately and submit a signed UCI agreement for that individual. ATACs must ensure that they adhere to the terms included in the UCI agreement while performing any work under the program.

6.1 Requirements for Transfer of Participant Information

- Verify recipient status: Make sure the recipient, and the company they work for, has a contract with Energy Trust or the PMC, which also subjects them to confidentiality obligations. Disclosing any participant information to a person who is not subject to such confidentiality obligations is prohibited.
- Secure devices: Ensure that you have security protocols and procedures in place to avoid unauthorized access to electronic devices used to transmit participant information. For example, devices should be password protected and subject to remote locking.
- Need to know: Share participant information only with those authorized people (authorized by Energy Trust) who have an actual need for the information.
- Confidentiality notice: Alert the recipient that the transferred information is confidential.
- Alert: Notify Energy Trust within 24 hours if you become aware of any transmittal security issue. Send an email to Debbie Menashe, Energy Trust's General Counsel, at debbie.goldbergmenashe@energytrust.org and copy EBcustom@trccompanies.com.
- Training: All ATACs with access to customer utility data must watch the Energy Trust's Sensitive Data Training video before they can have access to said utility data. This short 12-minute video can be found here.

6.2 Encryption Requirements for Transfer of Certain Participant Information

When transmitting participant information via email, either internally or externally, regarding more than five participants or projects at a time you must use the following additional precautions:

- Confirm the recipient is authorized to receive the data (has signed the UCI Confidentiality Agreement)
- Ensure that the recipient will use Participation Information and/or UCI data for Energy Trust purposes only
- Mark the information as “confidential”
- Encrypt email: Electronic transfer must be secured by a minimum of 128-bit encryption with password protection (SFTP, WinZip, PDF, MS Office 2007 or later). Password protects the document and notify the recipient that the email contains confidential information.
- Separate password notice: Send the password in a follow-up email
- Copy gcnotice@energytrust.org on emails where UCI data files are transmitted.
- Whenever possible, avoid transmitting any UCI data via email.

6.3 Storage of Sensitive Data

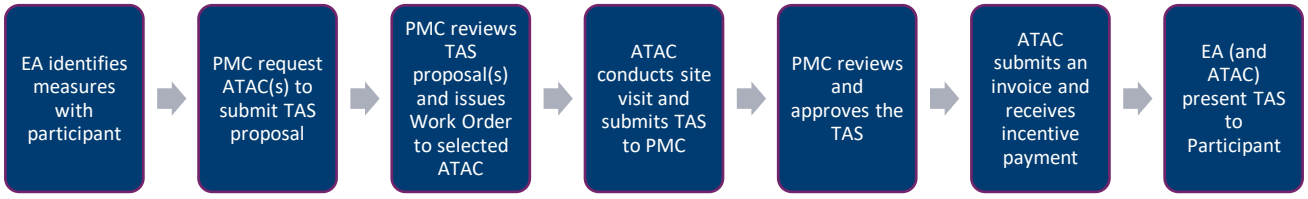
- Store sensitive data on file servers and databases
- Avoid storage on mobile devices such as laptops, smartphones, tablets, etc.
- **Prohibited:** Storage of sensitive data on USB flash drives, CDs, DVDs, and external hard drives.

7 Technical Analysis Study Overview

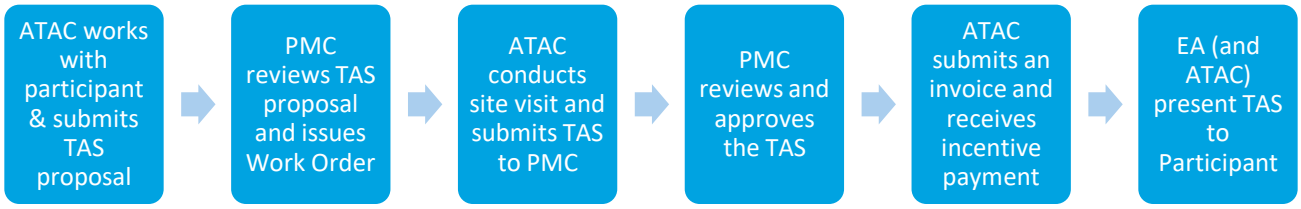
This section provides an overview of the process of initiating and performing a Technical Analysis Study including custom project initiation, participant enrollment, Technical Analysis Study (TAS) initiation and completion, and incentives processing and payment for the TAS.

Please note that the overall custom project lifecycle goes beyond the TAS to include project installation, post-install verification and custom measures incentive processing and payment. However, for the purpose of the ATAC guide, this section will focus on the role of TAS in the custom project lifecycle.

Scenario 1: Energy Advisor (EA) Manages Participant Relationship



Scenario 2: ATAC Manages Participant Relationship



7.1 Custom Project Cycle

Sections 7.1.1 through 7.1.8 describe the process of custom project initiation through the approval of the Technical Analysis Study. Section 7.3 provide an overview of the steps after TAS approval for the participant.

7.1.1 Custom Project Initiation

There are four approaches through which a custom project can be initiated under the program:

- **Option A**: When PMC Energy Advisors identify EEMs with potential for the custom incentives through a site assessment or participant interactions.
- **Option B:** When a potential participant directly approaches the PMC team to express their interest to study EEMs with custom incentive potential and requests the PMC to assign an ATAC for the study.
- **Option C**: When a potential participant (along with a preferred ATAC) or an ATAC (on behalf of a potential participant) approach the PMC with a custom project lead or proposal to study EEMs with custom incentive potential.
- **Option D**: When a potential participant directly approaches the PMC with EEMs already identified through their own study (conducted by them or their contractor).

Under Options A-C mentioned above, a detailed study of the EEMs is required. The study and the EEMs could be eligible for both service and custom incentives if they meet the requirements of the custom process outlined below.

Under Option D, if the study was already completed prior to the PMC issuing a work order for the study, then the study will not be eligible for incentives from Energy Trust but the EEMs could still qualify for custom incentives.

EEMs Identified Through a Site Assessment or by a Participant for a TAS (Option A & B)

If a PMC Energy Advisor identifies a participant site with potential for a technical study (Option A) or is requested by a potential participant to conduct a technical study (Option B), PMC engineering will do a preliminary assessment to verify that the equipment has the potential to qualify for service incentives through a technical analysis study. To qualify for a study, the equipment should have energy savings potential (electric or gas) and potential to meet Energy Trust cost-effectiveness tests. This is determined based on a high-level cost-effectiveness check, past program data and engineering expertise.

Once the potential for service and custom incentives can be verified at a high-level based on the available information, the PMC may issue a bid to a shortlist of ATACs within the ATAC network to select an ATAC to perform the TAS.

Criteria for PMC engineering or program partner involvement:

- Properties or facilities 20,000 SF or less.
- Study of simple measures (e.g., motor or pump replacement; RTU replacement) at a larger site.
- In cases where the program cannot support a TAS fee as a result of limited opportunity.

- In cases where there is no ATAC able to serve the customer.

For studies on properties or facilities over 20,000 SF or more, or complex equipment, an ATAC, provided one is available, will be selected to perform the study. See section below on TAS bid and ATAC Selection process.

ATAC Generated Custom Study Leads (Option C)

ATACs are encouraged to bring potential TAS opportunities to the program (Option C). When ATACs bring TAS opportunities to the program, they must provide a TAS proposal to the PMC for review. If they wish to seek service incentives for the study, they may only proceed with the study if the PMC approves and issues a work order to perform the study. ATACs should not imply to any potential program participant that they will be eligible for or receive Energy Trust service incentives for their study *unless* the PMC has approved incentives for that participant's study via a work order. See Section 7.1.5 for more details on work order issuance.

Regardless of the way a custom project is initiated (Option A, B or C), ATACs are required to follow the work order process to qualify for any study incentives.

7.1.2 Enrollment Agreement (Form 100E)

Once a custom project is initiated (via Option A-D described above), the participant is required to submit a signed Enrollment Agreement (100E for Existing Buildings Oregon, 100E-WA for SW WA projects) to the PMC. By signing this form, the participant declares their commitment and interest in service and/or custom incentives for EEMs with energy savings potential. Upon receiving the signed enrollment form:

1. The PMC will verify that the participant site is eligible for Energy Trust incentives under the Existing Buildings program and obtain the participant's utility consumption data.
2. When deemed necessary or helpful, an Energy Advisor (EA) will reach out to the participant to provide information about the program and custom process and to evaluate their interest in pursuing the study and custom incentive opportunity.
3. Additional documentation may be required to confirm eligibility for Energy Trust incentives, including service incentive funding for the TAS.

7.1.3 TAS Bid and ATAC Selection Process

When the PMC identifies EEMs that require a detailed study by an ATAC (Option A & B), the PMC has the option to issue a bid to one or more ATACs. If interested, the ATAC(s) will have the opportunity to submit a TAS proposal in response to the PMC's bid. The PMC will review all ATAC proposals received and will select the ATAC best qualified to complete the study, in terms of technical expertise, past program experience, and study costs.

The PMC reserves the right to issue the bid to a select group of ATACs depending on the following criterion as it pertains to ATACs:

- Technical expertise in the scope of study (i.e., the market sector and technology to be studied).
- Past program performance and participation rate, for existing ATACs. For new ATACs, we will factor in past industry experience and expertise.

- Geographic proximity to the participant site.
- Participant preference (if specified by the participant).

The PMC also reserves the right to select and issue the work order to the ATAC that is determined to be best qualified for that study. In addition to the above criteria, the PMC will evaluate ATAC proposals based on the following criteria:

- Proposed fee structure
- Availability to meet participant's preferred timeline

The PMC's objective through this process will be to responsibly invest ratepayer funds, to serve Energy Trust customers well and to provide fair and equal opportunities to all participating ATACs.

The PMC reserves the right to directly assign TAS Work Orders to a specific ATAC in the following scenarios:

- In cases where the ATAC approaches the program with a TAS proposal on behalf of the participant, PMC will typically select the same ATAC to perform the study.
- If a participant has a preference to work with a specific ATAC.
- If an ATAC has previously provided services to the participant and is familiar with the participant site and/or building systems.
- If timeline or other conditions make direct selection the most appropriate option.

7.1.4 TAS Proposal Review

For Options A-C, the PMC will request that ATACs submit a TAS proposal for review. The PMC will review the TAS proposal submitted by the ATAC to evaluate:

- Measure(s) proposed and scope of work
- Equipment complexity and data collection approach
- Proposed savings analysis methodology
- Estimated energy savings potential and measure costs
- Potential to meet program cost-effectiveness
- Proposed savings relative to annual site usage
- Reasonableness of the proposal fee
- TAS proposal fee is less than maximum potential incentive

To assist the ATAC with high-level and early assessment of the cost-effectiveness of the measures, the PMC will annually provide a Cost Effectiveness Calculator (can be found on the ATAC portion of the website https://www.energytrust.org/allied-technical-assistance-contract-atac-materials-for-existing-buildings-program/). This tool is intended for the ATACs to review prospective projects before submitting a proposal for study with the intention of filtering out non-cost-effective measures and strengthening their proposal.

The PMC may work with the ATAC and/or participant to discuss the scope of work in the TAS proposal. Once a TAS proposal is reviewed and found satisfactory, the PMC may issue a work order to the ATAC.

Note: Proposals for measures where cost-effectiveness is not feasible, may be eligible for service incentives (e.g.: typically, window replacement in commercial buildings is found to be not cost-effective and proposals to study windows for replacement may not be eligible for service incentives) if there is likelihood that the information in the study will influence the participant to pursue and energy saving option and the participant will likely allow the program to claim savings. Projects in public K-12 schools in Oregon that are served by ODOE's PPC program (SB1149) will also still be eligible if not cost-effective.

ALL TAS PROPOSALS MUST BE SUBMITTEDD TO EBCUSTOM@TRCCOMPANIES.COM. THE EMAIL SUBJECT SHOULD BE FORMATTED AS: 'PROJECT NAME – TAS PROPOSAL'

7.1.5 Technical Analysis Study Work Order Issuance

The PMC issues a Technical Analysis Study Work Order (Form 104) to the ATAC in accordance with the terms and conditions of the ATAC agreement. If the ATAC signs and returns the work order, the ATAC can then begin to work with the participant to perform the study according to the scope of work and budget indicated. The work order will be issued and signed by the PMC and must be signed by the ATAC and returned to the PMC before beginning any TAS work.

7.1.6 Site Visit and TAS Submission

Once a work order is accepted (i.e., signed and returned to the PMC), the ATAC can conduct the site visit and submit the TAS to the PMC for review upon completion. The PMC will provide a TAS template that ATACs must use.

In the TAS, ATACs must provide information which will help the participant to determine if a proposed EEM would be a good investment for the facility (in terms of cost, energy savings and other benefits), and help the PMC to verify the measure energy savings and to determine if the measure meets cost-effectiveness tests.

The ATAC should use their expertise to determine the most appropriate approach to analysis which could vary by building and project complexity. The ATAC may request a meeting after the site visit to discuss calculation approach and methodologies with the PMC before completing the TAS. For all project studies, clear documentation of assumptions used for baseline and estimated equipment operations must be included within the study. Where practical, ATACs may use spreadsheet calculations or energy modeling software such as eQuest or Trace. Other specialized software tools may be used depending on the facility and the complexity of the recommendations. If the files are too large to be submitted via email, the files should be in zip format and via a file sharing platform.

Please ensure that the TAS document title and the supporting documentation title(s) reflect the appropriate version number for easy reference.

ALL TAS SUBMITTALS INCLUDING SUPPORTING DOCUMENTATION MUST BE SUBMITTED TO EBCUSTOM@TRCCOMPANIES.COM. EMAIL SUBJECT SHOULD BE FORMATTED AS: 'PROJECT ID – PROJECT NAME – TAS SUBMISSION_REV1'

7.1.7 TAS Review and Approval

Once the ATAC submits the TAS and supporting documentation, the PMC Engineering team will review the submitted documentation for accuracy of savings and costs estimates of the proposed EEMs. PMC engineering will use a standardized review checklist, section 13 of this document includes the contents of this checklist. PMC engineering staff members will verify the savings methodologies and run each of the proposed EEMs through a cost-effectiveness test to determine if the measures qualify for custom incentives. If PMC staff has any clarifying questions or finds any discrepancies, they will work with the ATAC to address them until the TAS is approved by the PMC Engineering team. The PMC Engineer will inform the ATAC when the TAS is approved.

If the identified discrepancies cannot be resolved between the ATAC and the PMC, the PMC will defer to the Energy Trust engineering and program management team for resolution and decision.

7.1.8 TAS Invoice Submission

Once the PMC Engineer approves the TAS, the ATAC can submit an invoice towards the approved service incentive stated in the Work Order. Please submit the invoices to the PMC within 30 days of receiving TAS approval notification.

Please ensure the following details are included in the invoice, for easy reference and processing by the PMC team:

- Project Name
- Project Tracker ID, PT ID (Typical format: P0000XXXXXXXX)
- Reference ID (Typical format: CU-1XXXXX)
- Invoice amount

ALL TAS INVOICES MUST BE SUBMITTED TO EBCUSTOM@TRCCOMPANIES.COM.
EMAIL SUBJECT SHOULD BE FORMATTED AS:
'PROJECT ID – PROJECT NAME – TAS INVOICE'

7.2 TAS Timeline

The typical timeline to complete and submit a TAS to the PMC is within 6-8 weeks from the date of issuance of the TAS Work Order. ATACs must include the anticipated study completion and submission date in the TAS proposal. ATACs should let the program and/or Energy Advisor should timelines on delivery change.

7.3 Steps after TAS Approval (for Participant)

After a TAS is approved by PMC engineering, the approved TAS is presented to the participant(s) by the PMC Energy Advisor. PMC may request the ATAC to join the Energy Advisor while presenting the TAS to the participant. The next steps for the participants are listed below:

Obtain Bids for EEM(s) the Participant Selects 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 PMC Energy Advisor.
- The PMC will review the contractor's proposed scope and costs to determine compliance with Existing Building's 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 subject to incentive budget availability, PMC may issue Form 120C - Incentive Offer 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 the PMC 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 measures could be required.
- Upon review of the completion documentation and post-installation verification (if required), the PMC will issue the Project Completion form to be signed and returned by the participant.
- All required documentation must be provided to the PMC and post-installation verifications (if required) must be completed before incentive payments can be issued.

8 Special Requirements

8.1 Retro-Commissioning (RCx)

Retro-Commissioning (RCx) measures follow the same custom project pathway as capital improvement measures; however, RCx measures are defined and evaluated using the following metrics:

- Evaluated using a 5-year measure life
- RCx work must be complete within 180 days of receiving the incentive offer
- Incentives may be calculated at a specific RCx rate
  - See Section 3.2.2 Custom Incentive Structure for details

For RCx measures, ATAC must be approved for RCx to receive a service incentive for the TAS. ATACs can qualify for RCx by being a certified RCx firm (or a certified commissioning agent on staff), or by submitting three RCx or commissioning studies for review and approval. PMC engineering staff can provide guidance, training, and support to help ATACs complete RCx projects and qualify as an approved RCx ATAC.

RCx project workflow can vary depending on the parties involved. Generally, qualifying ATACs serve to identify RCx measures and quantify the associated savings as presented in a TAS. After the RCx measures have been identified and quantified with savings estimates, the measures can be implemented by a variety of parties depending on the preferences and capabilities of the participant:

- Certified Commissioning (Cx) or Retro-Commissioning (RCx) agent or firm
  - Certified by NEBB or similarly recognized association
- Controls or mechanical contractor familiar with equipment
- On-site facilities management staff
- Retro-Commissioning (RCx) approved ATAC

Overall, RCx can be a nuanced and complex process depending on the goals of the participant and the capabilities of the existing system. PMC staff will work with the parties involved to facilitate RCx projects and provide guidance as needed.

8.2 Trending Guidance for RCx

Trending is recommended for any measure where possible. Trends should be set on a minimum of the points that will be used to calculate energy savings for the suggested measures. 15-minute interval trends are preferred, although a longer time interval may be acceptable if the BAS cannot handle 15-minute intervals. When possible, at least 2 weeks of data should be included for calculation purposes to capture a variety of weather conditions.

When setting up trends for specific calculations, if seasonality or weather is a major factor, please take that into consideration. Gathering data on a cooling system makes more sense to do in the summer than the winter for example.

Below are some common points that are trended on each system. Please note that this list is not all inclusive nor are all of these points needed for each EEM. Relevant/recommended points will vary based on measure and point availability.

Air Handling Units:

Supply and Return Fan Status/VFD Speed	Supply Air Temperature and Setpoint
Cooling Percentage or Status	Heating Percentage or Status
Outside Air Temperature	Supply Air Temperature and Setpoint
Return Air Temperature	Mixed Air Temperature and Setpoint
Any other temps that are available to trend in unit	Outdoor Air Damper Position
Return Air Damper Position	Pressure Drop Across Filters and/or Coils
Humidity and Setpoint	CO2 and Setpoint
Duct Static Pressure and Setpoint	Zone Temp and Setpoint

Cooling Plant:

Chilled Water Supply/Return Temp and Setpoint	Condenser Supply/Return Temp and Setpoint
Water Flow Rate and Setpoint	Chiller Status and Percentage
Power Consumption of Chiller	Cooling Tower Fan Status/Speed
Current Tonnage of Chiller	kW/Ton
Chilled/Condenser Water Valve Positions	Chiller and Cooling Tower Valve Positions
Chilled/Condenser Water Pump Status/Speed	

Heating Plant:

Hot Water Supply/Return Water Temps/Setpoints	Boiler Status and Firing Rate
Water Flow Rate and Setpoint	Hot Water Valve Positions
Hot Water Pump Status/Speed	

8.3 Public Purpose Charge (PPC) K-12 Schools Program (also referred to as the SB1149 Schools Program)

Oregon Department of Energy's (ODOE) works with schools throughout Oregon and facilitates the administration of the Public Purpose Charge (PPC) Schools Program. The PPC Schools Program funds paid for by Portland General Electric and Pacific Power rate payers, provide eligible public K-12 schools funding for energy audits, fleet audits, energy efficiency projects, electric vehicles and charging infrastructure. To be eligible, facilities must be owned by a public school district, the building must be used for academic purposes, and it must be located within either PGE or Pacific Power territory. ODOE completes a review of eligible school districts and facilities each year. Link to full SB1149 Program Guidelines: https://www.oregon.gov/energy/energy-oregon/Pages/SB1149-Program-Guidelines.aspx

Existing Building program and ODOE will collaborate on schools' projects that are pursuing PPC Schools Program funding and Existing Buildings program participation. If a participant is eligible for PPC Schools Program and Existing Buildings program and would like to utilize PPC Schools Program funding, the Existing Buildings Program will engage an ATAC to conduct a technical analysis study (TAS) for the participant. The participant can also indicate their preferred ATAC for the study.

Under the Existing Buildings program, for school districts pursuing PPC Schools Program funding, the ATAC must be approved through both the Existing Buildings and PPC Schools Program. The selected ATAC will be awarded a Work Order to perform a TAS and must use the Schools TAS template, which is different from the Existing Buildings TAS template. The Existing Buildings PMC will provide the Schools TAS template to ATACs. This is also available on the ATAC portion of the Energy Trust website.

The TAS guidelines for PPC Schools Program eligible schools differ from the Existing Building TAS guidelines in the aspects listed below:

- Baseline guidelines:
  - Baseline conditions for Existing Buildings could be existing conditions, code compliant conditions and others. See Section 11B for baseline guidelines. The baseline conditions for ODOE / PPC Schools Program savings evaluation are the existing conditions.
  - For measures that add a system functionality component that was missing (such as ventilation air not meeting code, adding cooling capacity), the increased usage due to added functionality can be referenced in the measure description details or added to an O&M measure.
  - If the ATAC determines that for their project, the baseline guideline is different under ODOE and Existing Buildings, the ATAC must provide two separate analyses. Both analyses must be provided in the Schools TAS template.
  - It is recommended that an ATAC pursuing a school project that would be eligible for PPC Schools Program funding review the scope of work in advance to determine if a project may require two different baselines and outline any additional effort in the proposal scope of work and budget.
- In Schools TAS reports, ODOE uses a blended utility rate for each utility to estimate energy cost savings. The blended utility rates published by OPUC annually will be provided in the Schools TAS.

- ODOE estimates funding based on Measure Life and annual Energy Cost Savings. To assist with the funding calculation, a Measure Life table will be included as an exhibit within the Schools TAS template for ATAC reference.
  - For measures that have multiple components that each have a different Measure Life, the ODOE / PPC projects will need to use the Multi-Component Measure Life Calculator provided in the Schools TAS template.
- The energy efficiency measure (EEM) summary tables are slightly different in the Existing Buildings and the Schools TAS template.
  - The summary table includes a Commissioning (Cx) Required field for the ODOE / PPC projects. The notes below the summary table provide information for which measures require Cx.
- The Schools TAS template includes a more detailed cost estimate table than in the Existing Buildings TAS template. The ODOE / PPC projects estimated costs are to include the full cost to complete the project. The Existing Buildings eligible project costs may not be the same and if so, the ATAC will need to provide two-line items in the summary table and two cost estimates in the measure description.
  - For measures that require Cx, the ATAC may provide a Cx cost for the measure but it is not required. If the Cx cost is provided, then it is included at the bottom of the cost estimate table as a reference but is not included in the total measure cost.
- The Schools TAS will be reviewed by both Existing Building and ODOE engineering teams. However, for ease of coordination, the ATAC will receive any clarifying questions and comments from the Existing Building engineering team, which will also include ODOE's review comments.
- If the participant wishes to pursue PPC Schools Program funding and is found eligible, the Existing Buildings program may authorize and fund a Schools TAS that includes a study of measures that may or may not meet Energy Trust cost-effectiveness criteria such as window replacement or measures that use other fuel types such as propane or oil boilers.
- For schools projects that are not eligible for PPC Schools Program funding, the Existing Building custom process and TAS templates must be followed.

Please note the above guidelines are based on Energy Trust's understanding of the ODOE PPC Schools Program Guidelines currently in effect (as of the date of this ATAC Guide). ATACs must refer to ODOE PPC Schools Program Guidelines or reach out to ODOE for questions or clarifications on ODOE PPC Schools Program Guidelines.

9 Communication and Key Resources

9.1 Communication Guidelines

- TAS proposals, TAS submittals along with supporting documentation, TAS invoices, and queries should be submitted to EBcustom@trccompanies.com. We will do our best to respond within 2-4 business days. If you do not hear back, please follow-up via email.
- Email subject: Please ensure that you include the Project ID, Project Name, and submittal name/ request detail in the email subject. For example:
  - Project Name - TAS Proposal
  - Project ID - Project Name - TAS submission_V1
  - Project ID - Project Name - TAS submission_V2
  - Project ID - Project Name - TAS Invoice
- Similarly, please ensure that the document title reflects the Project ID, Project Name, and document type. For example:
  - Project Name - TAS Proposal
  - Project ID - Project Name - TAS submission_V1_MM.DD.YYYY
  - Project ID - Project Name - TAS submission_ V2_MM.DD.YYYY
  - Project ID - Project Name - TAS Invoice

9.2 Key Resources

Energy Trust's ATAC Materials page is updated with current copies of enrollment forms (100E), TAS templates, Cost effectiveness calculators, and a study proposal template. All resources can be found at this link: https://www.energytrust.org/allied-technical-assistance-contract-atac-materials-for-existing-buildings-program/

10 Key Program Personnel

10.1 Program Management and Engineering Team

Team Member	Role	Email
Jeff Cropp	Engineering Manager	Jcropp@trccompanies.com
Ron Ramey	Custom Engineering Lead	RRamey@trccompanies.com
Courtney Brown	Delivery Program Manager	Cbrown@trccompanies.com
Lisa Littleton	Energy Advisor Manager	Llittleton@trccompanies.com

Figure 3: Program Management and Engineering Team

11 TAS Requirements

A. Supporting Documentation Requirements

This section lists the requirements for supporting documentation to be provided, as necessary and relevant for the recommended EEMs. Supporting documentation can include:

- **Savings Calculations Back-Up**
  - See section 12
- **Specification Sheets**
  - Specification sheets for proposed equipment and if available also for baseline equipment.
- **Operating Load Profile**
  - Equipment hours of operations (operating schedule per day, week, year).
  - Where applicable, provide operating load profiles showing how the equipment load and operating parameters vary over time due to changes in occupancy, weather etc.
  - For major equipment loads, metering the energy usage is recommended to determine load profile when feasible.
- **Sequence of Operations**
  - Where applicable, provide a description of equipment operating sequences, set points, operating schedules and any other operating parameters used to estimate energy savings.
- **Useful Life**
  - End-of-life replacement measures claiming incremental costs and savings must provide documentation supporting that the existing equipment is at the end of its useful life such as proof of equipment installation date or maintenance records.
- **Site Visit & Equipment Photos**
  - Please provide photographs collected, with the participant's permission, during the site visit including relevant photographs of the facility, existing equipment, equipment nameplate, operating conditions / set-points, as applicable.
- **Measure Costs**
  - Supporting documentation for proposed measure costs such as quotations from vendors, cost estimates from RSMeans etc.
  - For projects that involve multiple technologies, please provide costs broken out by technology type.
  - Cost calculations that are incremental from a code baseline must also provide costing documentation (estimates are acceptable) on the code baseline equipment.
  - In-house labor for installation of EEMs may also be factored into the project costs.

The PMC reserves the right to request any other documentation if deemed necessary. Please clearly label all supporting documentation. If supporting documentation is provided separately for EEMs, please clearly label the files to indicate the EEM name in the file title.

B. Guidelines on Baseline Selection

This section provides guidelines on selection of baseline for the recommended EEMs. Please use best engineering judgment and your analysis of the equipment to determine the baseline conditions. Where uncertain, ATACs are encouraged to reach out to the program to collaborate on a best approach.

Replacement Type	Definition	Recommended Baseline condition to estimate savings	Eligible Costs to estimate cost-effectiveness
Early Replacement	Replacement of equipment before it reaches its Effective Useful Life (EUL)	Existing conditions	Full cost
End of life replacement	Replacement of equipment that has reached or passed the end of its Effective Useful Life (EUL)	Minimally code compliant or market baseline or standard practices (Incremental savings) Controls projects will use existing conditions	Incremental costs Controls projects will use full costs
Retrofit add on	If a component is added to an existing system to improve its efficiency (e.g., VSD/VFD)	Existing conditions	Full cost
New Functionality (or end use)	Example Scenarios: • Adding more ventilation to meet code requirements • Addition (or reduction) of building occupancy • Adding functions (e.g., adding a new laboratory to a university) or loads to the building (e.g., additional cooling), as necessary to maintain the level and quality of service	Minimally code compliant or market baseline or standard practices (incremental savings)	Incremental costs

Figure 4: Guidelines on Baseline Selection

C. Key Definitions

Baseline type

- **Existing Conditions Baseline:** An existing condition baseline, as the name implies, is a baseline that represents the condition of the building prior to the implementation of energy efficiency measures.
- **Code Baseline:** A code baseline is a subset of a market baseline. A code baseline represents a building or piece of equipment which meets current local and state building code requirements, or an appliance that meets local or federal standard specifications. Note that if minimally code compliant is not typical, a market baseline is a better choice.
- **Market Baseline:** A market baseline is a baseline that represents the purchase or actions that we expect a customer to make in the absence of our programs, also sometimes called current practice.

Savings

- **Full savings** is defined as the difference between the annual energy use of the existing equipment in place and the annual energy use of the proposed high efficiency equipment.
- **Incremental savings** is defined as the difference between annual energy use of equipment that is minimally code compliant or represents the market baseline and the annual energy use of the proposed high efficiency equipment. This will be used whenever incremental savings are used.

Costs

- **Full cost** is simply the cost (including installation) of the proposed high efficiency equipment.
- **Incremental cost** is defined as the difference between the full cost of proposed high efficiency equipment and the cost of the equipment that is minimally code compliant or represents the market baseline.
  - If it is challenging to procure equipment cost for minimally code compliant equipment after making reasonable efforts, equipment cost for the next available product above code or equipment that represents market baseline can be used.
  - Market baseline cost may be calculated. Acceptable references are quotes, construction cost catalogues, and previous project costs.

D. Special Circumstances

Fuel Switch

- Existing Building program does not encourage fuel switching.
- Projects involving fuel switching will still be evaluated by the program.
- If equipment replacement results in fuel switching, the equivalent fueled, code compliant or market baseline equipment will be used as the baseline.

Measure Bundling guidelines:

Different measures should be analyzed separately, should not be bundled into one measure, and each individual measure proposed should pass the cost effectiveness test. Bundling of measures as a mechanism to approve a non-cost-effective measure is not allowed.

There could be some situations where it is challenging to separate one measure from another. In those situations, measures can be evaluated as one EEM. In these situations, see guidelines below on Effective Useful Life (EUL) weighting of bundled measures.

Effective Useful Life (EUL) weighting:

When multiple opportunities cannot be separated, and have different EULs, then a weighted average EUL is assigned to the EEM.

- If the measures have single fuel savings (i.e., have gas only or electric only savings) with the same load profile, then the EUL should be weighted by savings.
- If the measures have dual fuel savings, then ATACs should include the EUL of individual measures in the TAS report, and the PMC engineering team will support with the estimation of the weighted averaged EUL.

Note for ODOE schools projects: This guideline applies to the Energy Trust Existing Building savings methodology and not to ODOE savings methodology.

Capturing interactive effects of multiple measures:

For studies that involve multiple measures:

a. If it is not certain that the participant will select and install all measures, interactive effects should not be factored into analyses.

b. If measures with significant interactive effects are proposed in the TAS and the participant provides clear direction that they are certain they will move forward with all of them, then the savings calculations should factor in these interactive effects. This is only necessary when interactive effects can have a significant impact on savings because the chance of rework and project delay cause by the program is high.

Note for ODOE schools projects: This guideline applies to the Energy Trust Existing Building savings methodology and not to ODOE savings methodology.

COVID Guidance for Utility usage in baseline

Some commercial and government buildings may have been impacted by COVID and may have different operating patterns since March 2020. See guidance on selection of utility usage history for savings analysis below:

- In 2024, the presumption is that the operation over the past several years represents expected operation going forward. As a default approach, this data should be used for calculations and calibration purposes.
- In the uncommon scenario where the facility anticipates going back to pre-COVID operations, the program encourages the ATAC to engage with the program prior to developing any analysis to ensure there is sufficient basis for this deviation. In these cases, pre-COVID utility data should be used to represent business as usual operating conditions.

E. Blended Utility Rates

Please use the Energy Trust-provided utility rates below to estimate cost savings for the proposed EEMs. Please note that the actual utility rates and cost savings may differ. For Multifamily sites, typically individual apartments are on electric residential rates and common areas are on commercial rates.

Blended Utility Rates				
Sector type	Electric ($ per kWh)	Gas ($ per therm)	NWN-WA Gas ($ per therm)	Last update date
Residential	$0.1624	$1.2752	$1.705	1/5/2024
Commercial	$0.1458	$1.0870	$1.658	1/5/2024
Industrial	$0.0869	$1.0198	$1.595	1/5/2024

Figure 5: Blended Utility Rates

F. Water and Wastewater rates

Please use the Energy Trust provided utility rates below to estimate non-energy benefits from water and wastewater savings.

Water and Wastewater Cost & Energy Intensity				
Rate	**Units**	**Blended rates for water and sewer**	**Date Updated**	**When to use**
Combined Water Rate	$/1000 gal	$20.92	12/8/2023	Oregon
Combined Water Rate	$/1000 gal	$14.10	12/8/2023	Washington
Embedded Energy Savings	kWh/1000 gal	3.68	12/8/2023	Oregon & Washington

Figure 6: Water and Wastewater Costs: Oregon and Washington

G. Other heating fuels rates

Propane and Fuel rates for Non-Energy Benefits (NEB)			
Fuel type	**Rate per therm equivalent**	**Date Updated**	**When to use**
Propane	$2.80	1/8/2024	Calculating non-energy benefits for Propane and Fuel Oil savings
Fuel Oil	$3.10	1/8/2024	

Figure 7: Propane and Fuel Oil rates for non-energy benefits (NEB)

H. Expected Useful Life (EUL) Table

The SB 1149 Program table below 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.

SB 1149 Schools Measure Life [d]			
Equipment/Measure	**(Years)**	**Equipment/Measure**	**(Years)**
Building Envelope		**HVAC Controls**	
Double glazed windows (complete units)	30	DDC systems	15
Retrofit double glazing	20	Local controls: timers, prog. thermostats	15
Triple glazed windows (complete units)	30	CO_2, auto faucet or other sensors	10
Adding storm windows	15	**Pumps, Motors & Drives**	
Solar shade films	12	Pumps, base mounted	25
Insulated metal doors	20	Pumps, inline	20
Cavity insulation (wall, floor or ceiling)	30	Premium efficiency motors	25
Reduction of window or door area	30	Variable frequency drives	20
Rigid roof deck insulation	25	**Domestic Hot Water**	
Caulking, weather stripping & sealing	10	Heat pump water heaters	15
Exterior door self closers	5	Gas or propane water heaters	20
HVAC Components		Solar water heaters	15
Boilers	30	Faucet flow restrictors, aerators	10
Boiler burners	20	**Lighting**	
Boiler tune-up optimization	5	Lighting fixtures, non-LED	25
Replacement steam traps	6	LED lighting fixtures (integrated)	20
Ground source heat pump systems	25	Lighting fixture rebuild kits [a]	20
Rooftop gas/oil pkgd units	15	T-LED lamps and retrofits [c]	15
Fans, central	25	Exterior LEDs	18
Air conditioner, rooftop/split	15	Field/Stadium LEDs	25
Air-to-air packaged heat pumps	15	Electronic ballasts	15
Water-to-air packaged heat pumps	15	Dimming systems	12
Variable Refrigerant Flow / Ductless Heat Pump	15	Occupancy sensors	10
Coils, DX, water or steam	25	Lighting control systems (electronic)	15
Radiant/unit heaters, all types	20	Linear fluorescent fixture de-lamping [b]	9
Thermostatic valve	15	Reduced wattage linear fluorescent lamps [c]	9
Furnaces, gas/oil	20	Screw-in replacement CFL lamps	5
Chillers, reciprocating	25	Screw-in replacement LED lamps	12
Chillers, centrifugal & absorption	30	**Kitchen Equipment**	
Cooling towers	25	Refrigeration system upgrades	15
Heat Recovery Systems	20	Walk-in fan EC motors	15
Heat Exchangers	25	Reach-in refrigerators/freezers	18
Damper systems & VAV conversions	20	Dishwashers (Energy Star Commercial)	15
Low leak dampers	15	Ice machines	10
Air economizers	15	Walk-in door self-closers	10
Automatic boiler flue dampers	15	Kitchen cooking equipment	25
Ductwork & Piping (new)	30	Kitchen hood fan VFD and control	18
Duct and pipe insulation/sealing	15	**Other Measures**	
Valve and damper actuators, Valves	15	Pool covers	10
		Solar PV systems	25
		Retro-commissioning	5
		Vending machine controls	10
		Computer power management controls	5

Figure 8: SB1149 Measure Life Table

**SB1149 Measure Life Table References available on page 27 of* 2022 Program Guidelines (oregon.gov)

12 Calculation Guidelines

12.1 Introduction

This section is designed to provide PMC engineers and ATACs performing calculation and reviews with guidance on accurate energy calculations for Technical Assistance Study (TAS) projects. TRC has created these guidelines incorporating industry best practices so that energy savings are properly identified, calculated, and realized. This document is not intended to be a step-by-step guide to performing energy savings calculations but is meant to provide recommendations and generally acceptable values that can be used as calculations are performed. Use of this document is also intended to reduce time spent in review and the back-and-forth communication during the review process. It is strongly recommended that energy saving calculations use this guidance whenever possible.

12.2 Calculation Guidance

When applicable, an Existing Conditions Baseline shall be established by calculating the current energy consumption of the affected equipment or system. If possible, trended or measured data should be used to calculate this baseline. When trended or measured data is not available, screenshots are an acceptable alternative (multiple screenshots through a range of outside air temperatures are preferred to ensure a complete understanding of system operation).

A Code Baseline may also be used to establish a baseline. A code baseline represents a building or piece of equipment installed to meet current local and state building code requirements. An example of when code baseline may be used is if a building is replacing a piece of equipment that has failed or is past is useful life expectancy with an efficient piece of new equipment. More information on how to select baselines can be found in section 12.B.

Energy Savings Calculations shall be performed in unlocked spreadsheets (PDFs or locked versions are not acceptable). All calculations (equations, parameters, and assumption values) must be clear and transparent, utilizing standard engineering methodologies and must list data sources, where relevant. Hard-coded values without a source are NOT acceptable. All values in the spreadsheet must be linked back to their source. That source must be an engineering calculation or hard-coded value with a comment noting its source.

When using whole building modeling, the engineer will fill out the model summary table below and include it within the TAS report.

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						

Model Calibration Guidelines

- Energy model calculations must use DOE2-hosted weather files (https://doe2.com/Download/Weather/) or recorded onsite data.

- Generally, the energy models must be calibrated so that each month's usage is within 20% and the annual usage is within 10% of the site's historical utility data usage, or with the actual weather data from the year that the calibration is run for. If there is a significant deviation from this, please provide reasons for the deviation.
- The default billed energy consumption is equal to the average of the most recent three years of consumption. If the most recent three years are not used, provide an explanation.
- Fractional models should only show calibration when appropriate (i.e. when submeter or metered data is available for the portion needed).
- If trending data is used in calculations, appropriate duration and sampling quantity should be used. This should be in accordance with IPMVP protocol or appropriate duration of data logging using sample size of n, where n = (N * 0.75^2 + 1), N = total equipment quantity, and 0.75 = 75% confidence level.
- Changes made to energy model inputs between measures should be transparent, in a parametric run section or documented in the proposed conditions in each EEM table.
- In general, backup documentation is very helpful when putting together and reviewing energy savings calculations. With all energy saving measures, please include as much of the following as possible: pictures of nameplates, equipment schedules, specification sheets, and existing sequence of operations all contain details that will assist with the calculations.

Energy Model Back-up Files

- If the ATAC developed an eQuest model for the study, submission of .pd2, .inp, and .prd (if run in detailed mode with parametric run) files is required. (eQuest files: provide files for baseline and files for each EEM in separate folders.)
- For TRANE Trace 700, include the .taf file, as well as input and output summaries of baseline and all EEMs
- For Trace 3D include the .mdfz file, as well as input and output summaries of baseline and all EEMs.
- For models utilizing Energy Plus, include .idf file and any interface files (eg: .osm).
- For models utilizing IESVE, include the .cab file that contains the .asp files for each EEM. When possible, include .aps files in addition to the .asp files.
- If the files are too large to submit via email, the files should be shared through a document sharing platform. If you need assistance with file transfer, please contact the PMC.

12.3 Trending Guidance

Trending is recommended for any measure where possible. Trends should be set on a minimum of the points that will be used to calculate energy savings for the suggested measures. 15-minute interval trends are preferred, although a longer time interval may be acceptable if the BAS cannot handle 15-minute intervals. When possible, at least 2 weeks of data should be included for calculation purposes to capture a variety of weather conditions. See section 8.2 for additional guidance on suggested trend data.

12.4 Equipment and System Common Variables

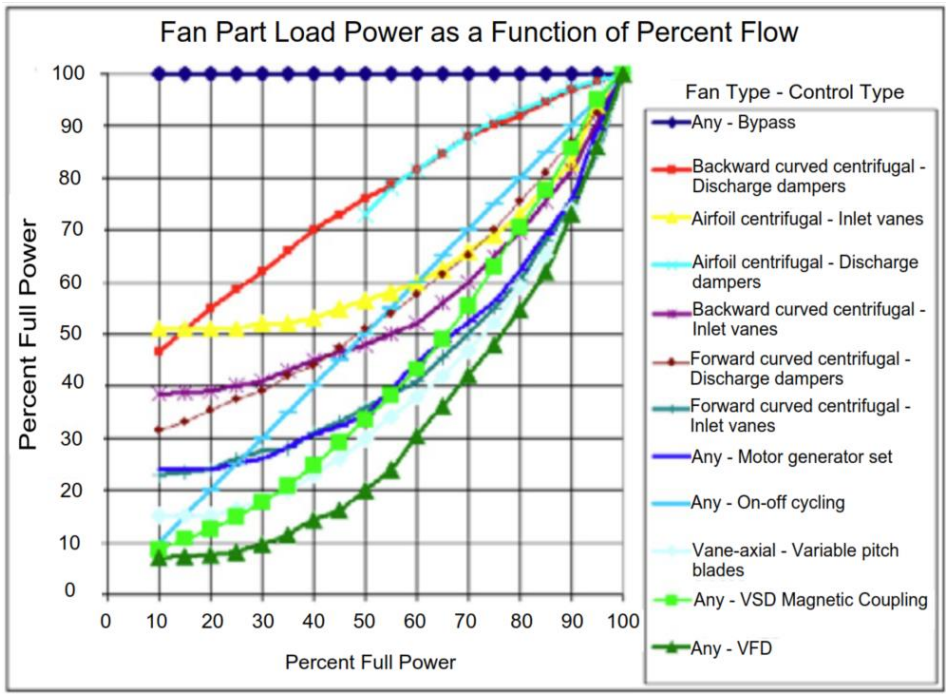
Equipment and System Efficiency Recommendations

When putting together calculations, it is not always practical to gather exact data on all variables. ATACs should refer to the following recommendations in the absence of hard data gathered onsite.

VFD Turndown and Efficiency:

When utilizing a VFD to control the flow and pressure, the allowable operating range is determined by the motor manufacturer as well as what is happening in the system and the other minimum flow requirements of connected equipment. Because of these manufacturer, application, and system differences, there is no standard which sets universal minimum speeds for VFDs. However, ANSI/HI 9.6.3 does provide "Preferred Operating Region" which sets that the **minimum speed that should be assumed is 25%** unless the manufacturer states otherwise. This is due to the potential of harming the equipment by operating it too slow, as well as that equipment can lose effectiveness and efficiency at such low speeds. In addition, a VFD will introduce an efficiency loss into the system. While the actual loses to the VFD vary based on manufacturer, use, and speed, NREL (National Renewable Energy Laboratory) recommends that a **97% efficiency** should be used in calculations when the actual efficiency loss is unknown (Romberger, Jeff: NREL Chapter 18: Variable Frequency Drive Evaluation Protocol).

Pump/Fan Curves and Equations:



(How to Avoid Overestimating Variable Speed Drive Savings (emacx.com) Figure 1)

If the above ASHRAE Fan Curves are not applicable, the below equations should be used when calculating savings in a pressure dependent system. Examples of this would include implementing duct pressure reset on a VAV system or decreasing PSI setpoint of a chilled water system.

Fan Bhp

$$Bhp = \frac{Flow(cfm) * \Delta P(in.\ w.c.)}{6356 * \ Eff_{Fan}}$$

Pump Bhp

$$Bhp = \frac{Flow(gpm) * \Delta P(psi)}{1714 * \ Eff_{pump}}$$

Convert HP to kW_{Elec}:

Please use the following equations when converting horsepower to kW_{Elec}.

Bhp to kW_{Elec}

$$kW_{Elec} = \frac{Bhp * 0.746(\frac{kW}{hp})}{Eff_{Motor} * \ Eff_{VFD}}$$

Nameplate hp to kW_{Elec}

$$kW_{Elec} = \frac{HP * 0.746\left(\frac{kW}{hp}\right) * 70\%\ load\ factor}{Eff_{Motor} * \ Eff_{VFD}}$$

Motor Load Factor of 70% should be assumed in absence of actual load factor or other information (2008 ASHRAE Handbook: HVAC Systems and Equipment (pg. 20.4, Table 2)

Affinity Laws:

Affinity Laws for pumps and fans can also be used in calculations where the above fan and pump curves and equations cannot be used. When using the Affinity Laws, we must account for losses that take place in the system and cannot use their theoretical values because energy savings would be overstated. In most cases ATACs should use an exponent of 2.5 instead of 3 for power vs flow (pg 54 from PNNL-24130.pdf) and 1.3 for power vs pressure. The result of using these numbers will more closely align with real world results when assuming constant fan and pump impeller sizing.

Volume Flow Capacity

$$\frac{Q_1}{Q_2} = \left(\frac{N_1}{N_2}\right)$$

Head or Pressure

$$\frac{dp_1}{dp_2} = \left(\frac{N_1}{N_2}\right)^2$$

Power

$$\frac{P_1}{P_2} = \left(\frac{N_1}{N_2}\right)^{2.5}$$

$$\frac{P_1}{P_2} = \left(\frac{dp_1}{dp_2}\right)^{1.3}$$

N = Rotational Speed of Fan or Pump

Q = Airflow Rate or Water Flow Rate

dp = Total Pressure or Head

P = Power

Motor Power and Load Factors:

When available, actual power readings from a meter, VFD, or other means are preferred. However, if calculating power from equations instead of actual readings, a **Power Factor of 85%** should be assumed. In addition, a **Motor Load Factor of 70%** should be assumed as well (2008 ASHRAE Handbook: HVAC Systems and Equipment (pg. 20.4, Table 2).

Efficiency:

Motor nameplate data should be used in calculations involving motor efficiency. When nameplate data cannot be provided, please use the following table:

NEMA Threshold Full-Load Nominal Efficiency Values for Energy Efficient Motors

(From NEMA MG1 Table 12-10)

hp	3600	1800	1200	900
1	72.5	82.5	80.0	74.0
1.5	82.5	84.0	85.5	77.0
2	84.0	84.0	86.5	82.5
3	85.5	87.5	87.5	84.0
5	87.5	87.5	87.5	85.5
7.5	88.5	89.5	89.5	85.5
10	89.5	89.5	89.5	88.5
15	90.2	91.0	90.2	88.5
20	90.2	91.0	90.2	89.5
25	91.0	92.4	91.7	89.5
30	91.0	92.4	91.7	91.0
40	91.7	93.0	91.7	91.0
50	92.4	93.0	93.0	91.7
60	93.0	93.6	93.0	91.7
75	93.0	94.1	93.6	93.0
100	93.6	94.5	93.6	93.0
125	94.5	94.5	94.1	93.6
150	94.5	95.0	94.1	93.6
200	95.0	95.0	95.0	94.1
250	95.4	95.0	95.0	94.5
300	95.4	95.4	95.0	—
350	95.4	95.4	95.0	—
400	95.4	95.4	—	—
450	95.4	95.4	—	—
500	95.4	95.8	—	—

12.5 Common Measures

Scheduling: Optimize the schedule of an air-handler, chiller, boiler, pump, lighting, or other piece of equipment so that it aligns with the needs of the building. This schedule may be by time of day, day of week, outside air temperature, or some other variable.

Duct Static Pressure Reset: Duct static pressure reset is a strategy to adjust the static pressure within the ductwork based on the actual demand of the system. This approach ensures that the airflow is optimized for current conditions by modulating the fan speed in response to real-time requirements., The goal is to align the system's performance with the immediate demands, reducing unnecessary energy usage and is typically based on outside air temperatures or VAV damper position.

Chilled Water Reset: Chilled water reset involves adjusting the temperature of the chilled water circulated through the system based on the actual cooling load. By varying the chilled water temperature to meet the real-time requirements of the building, chilled water reset optimizes the efficiency of the chiller and reduces energy consumption during periods of lower cooling demand. This strategy ensures that the chiller operates at the most energy-efficient conditions, aligning its performance with the building's cooling needs and is typically based on OAT or chilled water valve positions in the system.

Condenser Water Reset: Condenser water reset involves adjusting the temperature of the condenser water based on the current cooling demand and outside air conditions. By varying the condenser water temperature to align with demand at OAT conditions, condenser water reset optimizes the efficiency of the chiller and reduces energy consumption during periods of lower cooling demand and lower temperatures. This strategy aims to ensure the chiller operates at the most energy-efficient conditions while balancing the energy usage of pumps and cooling towers. Typically, condenser water reset is based on factors such as outside air temperature and humidity and includes consideration of chilled water temperatures.

Improved Economizer Control: Improved economizer control is the enhancement of the economizer by utilizing outside air instead of return when the conditions are favorable, and more return air than outside air when conditions are not. This can be done through a dry-bulb economizer that only looks at outside air temperature, or enthalpy-based economizer that also takes outdoor air humidity into account.

Morning Warm-Up and Cool-Down: Morning warm-up and cool-down involves varying the start-time of the HVAC equipment based on OAT and inside conditions. This allows for equipment to be started closer to the time of occupancy when the building is close to setpoint anyway and outside conditions are favorable. Conversely, the HVAC equipment will start earlier if the building temp is far from setpoint, or outside conditions require it gradually increasing or decreasing the building's temperature before occupants arrive. Implementing these strategies typically involves automated building controls that adjust based on time-of-day schedules, outside air temperatures, and space sensors. This approach is especially beneficial in buildings with predictable occupancy patterns.

Installation of VFDs: Variable Frequency Drives are a way of controlling the flow of air or water through the system by slowing down and speeding up a pump. Although not all systems are suitable for installation of a VFD, there are many times when 100% flow may not be needed. In these cases, it may make sense to install a VFD and slow the equipment down. Energy savings can be realized both through the energy saved by the motor moving less air or water, and since less mechanical heating and cooling may be needed due to the reduced flow.

Demand Control Ventilation: Demand Control Ventilation is designed to ensure air quality while maximizing energy efficiency by adjusting ventilation based on occupancy levels. Utilizing CO2 sensors, the system gauges the number of occupants in a space and regulates the outside air intake accordingly. In areas with low occupancy, ventilation is reduced, lessening the load on heating and cooling systems, which leads to energy savings. Conversely, higher occupancy triggers an increase in ventilation, ensuring adequate air quality. Common application of this approach is found in spaces with fluctuating occupancy patterns like schools, conference rooms, or auditoriums.

13 TAS Review Checklist

Below is a summary of the PMC internal TAS review checklist. This list is not comprehensive but gives the points of emphasis the review team is looking at when reviewing a TAS and calculations.

Report

- Both ODOE school projects and other projects are required to use the current template.
    - The latest template can be found here: https://www.energytrust.org/allied-technical-assistance-contract-atac-materials-for-existing-buildings-program/
- School projects should include the most recent 2 years utility data and other projects should include the most recent 3 years utility data.
- Summary table values in report should match the detail EEMs table values.
- RCx measures naming should start with "RCx - " and the Effective Useful Life (EUL) should be determined by types of measures. For example, most control sequence upgrades will have a 5-year EUL.
- Energy model calibration is required for whole building modeling.
- Modeled monthly energy usage should be within 20% and the annual energy usage should be within 10% of the site's historical utility data usage. Clarification is required to explain the discrepancy if modeled energy usage is outside the 20% /10% range of historical utility data usage and acceptance of models outside this framework is subject to PMC approval.
    - Before a modified baseline is applied for whole building modeling, the model should be calibrated to existing usage/equipment first to validate the energy usage is within acceptable range of utility data
- If Commercial Buildings Energy Consumption Survey (CBECS) energy end use breakdown is provided, the modeled usage should represent the system/building type being modeled.
- All relevant existing equipment quantities should be documented.
- All relevant existing equipment parameters should be documented. Examples are as follows: capacity, cooling/heating efficiency, setpoint, constant/variable speed.
- All relevant existing equipment schedules should be documented. Non-standard schedules should have clarification (examples include: 24/7 operation of an office building or year-round operation for a school).
- For equipment replacement, the age of existing equipment should be defined. A modified code minimum baseline should be used If the equipment age is beyond the EUL, if there is fuel change, or if the existing equipment is inoperable.
    - If a code minimum baseline is used, the equipment should meet the requirements (efficiency, control strategies, VFD, energy recovery, etc.) outlined in Oregon Energy Efficiency Specialty Code (OEESC) or ASHRAE 90.1.
- A table focusing on discrepancies/improvements/adjustments between baseline and proposed conditions is required. This should be detailed enough to prevent needing to go to the model or calculation to understand existing and proposed conditions.
- If Non-Energy Benefits (NEBs) are claimed, supporting documents or explanations are required to detail the benefits.

    - The NEBs should not be relative to an existing baseline if a modified baseline is applied.
- Maintenance savings are encouraged to be claimed if equipment is replaced and has not been evaluated incrementally.
    - Supporting documents or explanations are required for baseline and post-condition measure cost.
- EUL table is required to be included at the end of the report, and the EUL used in measures should match that in the EUL table. Supporting information is required if a different value is used.
    - For non-ODOE projects, a savings weighted EUL should be provided if multiple technologies are combined into one measure. Note combining measures is only permitted where scope cannot be separated.
    - For ODOE projects, a cost-weighted EUL should be provided if multiple technologies are combined into one measure.
- A clear plan to stage and account for the implementation sequence should be provided if there is an interaction between measures. For example, EEM2 will not be implemented until EEM1 is implemented.
- A rolling baseline from the previous measure is recommended for one measure if those two measures are interactive. If a rolling baseline is not used, a note will be made on the 110C Form that the true max incentive is lower than what is displayed.
- Energy Trust blended utility rates should be used to estimate cost savings for the proposed EEMs.

<u>Calculations/Model</u>

- If the calculations are performed using spreadsheets, they should be unlocked.
- All calculations (equations, parameters, and assumption values) should be clear and transparent, utilizing standard engineering methodologies and listing data sources, where relevant.
- Hard-coded values without a source are NOT acceptable. All values in the spreadsheet must be linked back to their source. That source must be an engineering calculation or hard-coded value with a comment noting its source.
- Equipment and system common variables, such as load factor, affinity law exponent, are recommended to follow ATAC guidelines. Supporting information is required if a different value is used.
    - The measure inputs in the calculations should match those in report.
- Baseline and post condition equipment descriptions in calculations should match those in report.