

ALASKA HOUSING FINANCE CORPORATION

RETROFIT ENERGY ASSESSMENT FOR LOANS (REAL)



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PART I INTRODUCTION

SECTION 1000 ALASKA ENERGY EFFICIENCY REVOLVING LOAN FUND (AEERLF)

The Alaska Housing Finance Corporation (AHFC) Alaska Energy Efficiency Revolving Loan Fund (AEERLF) is a State of Alaska program enacted by the Alaska Sustainable Energy Act ([Senate Bill 220, A.S. 18.56.855](#), “Energy Efficiency Revolving Loan Fund”). The AEERLF will provide loans for energy efficiency retrofits to public facilities via the Retrofit Energy Assessment for Loan System (REAL). As defined in [15 AAC 155.605](#), the program may finance energy efficiency improvements to buildings owned by:

- regional educational attendance areas;
- municipal governments, including political subdivisions of municipal governments;
- the University of Alaska;
- political subdivisions of the State of Alaska or,
- the state.

Native corporations, tribal entities, and subsidiaries of the federal government are **not** eligible for loans under this program.

SECTION 1001 RETROFIT ENERGY ASSESSMENT FOR LOAN (REAL) SYSTEM

AEERLF loans are intended specifically to fund energy efficiency improvements. The Retrofit Energy Assessment for Loan (REAL) system establishes two methods for potential projects to achieve energy efficiency. Loans may be used to finance energy efficiency measures (EEMs) via:

- Energy Performance Contracts (EPCs) (see PART XII), or,
- Non-EPC construction (see 0) contracts approved by AHFC.

Both of the loan instruments (EPC and Non-EPC) allow Facility Owners to finance the implementation of energy efficiency measures without up-front capital investment or specific appropriations.

An EPC combines engineering, design, construction, and financing with guaranteed savings. With an EPC, the cost of implementing energy efficiency measures (EEMs) is funded by the measureable energy and maintenance savings generated by the improvements. AHFC provides financing to pay the implementation costs, and the loan is repaid from the energy savings.

Energy Services Companies (ESCOs) specialize in the engineering, design, implementation, and guaranteed performance of EEMs. EPCs differ from the standard design-build approach since the ESCO guarantees the energy savings for the duration of the performance guaranty, as part of the Energy Performance Contract. All EPCs shall be implemented by qualified ESCOs.

AHFC recognizes that the EPC may not be a viable mechanism to implement energy efficiency measures to all public facilities. Therefore, projects funded by AHFC for \$250,000 or less may be implemented utilizing non-EPC construction contracts (see 0) approved by AHFC.

SECTION 1002 PROCESS OVERVIEW

The overall process for REAL projects is:

- Step 1 – Complete and submit the [REAL Application & Preliminary Benchmark Data Form](#) (see SECTION 6000)
- Step 2 – AHFC reviews the REAL Application & Preliminary Benchmark Data Form, including the required utility bill data, for eligibility (see SECTION 6001)
- Step 3 – (Optional, on a case-by-case basis determined by AHFC) Certified Energy Auditor (CEA) or Certified Energy Manager (CEM) performs initial assessment used by AHFC to benchmark facility and prioritize projects (see PART VIII)
- Step 4 - Certified energy auditor (CEA/CEM) prepares Investment Grade Audit (IGA) (see SECTION 10000 and SECTION 10001)
- Step 5 – Submit IGA and Loan Application to AHFC (see SECTION 6004)

Details are discussed in the topic-specific sections of the manual.

PART II DEFINITIONS

AkWarm-C©: AHFC-approved data collection software for energy audits.

Alaska Retrofit Information System (ARIS): data collection, management, and information access resource for all AkWarm-C© files.

Baseline Conditions: the baseline energy consumption and operating conditions for a facility, including the equipment inventory and conditions, occupancy, energy consumption rate, control strategies, etc. in place prior to implementation of EEMs.

Baseline Energy Consumption: for any billing period, the Energy Consumption that would have been incurred by the Facility if the ESCO Services and ESCO Equipment had not been implemented, as calculated by utilizing the data, methodology and variables set forth in the Energy Performance Contract.

Benchmarking: An initial assessment of energy use for a facility to collect data that may be used for a variety of purposes, including prioritizing projects for funding, assessing the building's energy use against available end use indexes (EUI), and developing an Alaska-specific EUI.

Billing Period: the time period as set forth in the Energy Services Proposal (e.g. month, quarter, year) used to calculate Energy Savings for the Facility.

Change Order: a modification to the final scope of work after the loan documents are signed by AHFC.

Conditioned Square Footage: the gross square footage within the thermal envelope of a building where the space is:

- directly or indirectly heated to maintain a pre-determined temperature above the outside air temperature during periods when the outside air temperature is less than indoor temperatures, excluding spaces that are intentionally cooled, such as walk in freezers etc), or,
- directly cooled to maintain indoor temperatures below 72°F, excluding spaces that are directly or indirectly warmed, such as a mechanical room, solarium, etc.).

NOTE: Do not use the “rentable square footage” for the conditioned square footage, as it does not quantify conditioned square footage because it excludes common areas (restrooms, foyers, etc.).

Commissioning: (From ASHRAE Guidance, “The Commissioning Process”) a quality-oriented process for achieving, verifying, and documenting that the operation and performance of facilities, systems, and assemblies meets defined objectives and criteria.

Contracting Agency: the state agency, institution, municipality or its authorized representative with the authority to enter into, administer, and/or terminate the work in accordance with the conditions of the Energy Performance Contracts or Non-EPC contracts, and make related determinations and findings.

Eligible facilities: public buildings owned by regional educational attendance areas, municipal governments, including political subdivisions of municipal governments, the University of Alaska, or the state, including political subdivisions of the State of Alaska, as described in [15 AAC 155.605](#).

Energy Consumption: the amount of energy and power, in the form of electricity, natural gas, oil, propane, or other energy source, consumed in the Facility in any Billing Period, as calculated by utilizing the data, methodology and variables set forth in the Energy Performance Contract. Energy consumption may also include other utilities such as water and wastewater.

Energy Cost Index: the total annual energy cost for all energy sources to operate a building, reported in \$/ft².

Energy Cost Savings: savings in units of consumption (e.g. kWh, kW demand, therms, CCF, gallons, etc.) in a Billing Period times the cost per unit of consumption for the Billing Period, as established in the Energy Performance Contract.

Energy Conservation Measures (ECMs): Policies and procedures intended to reduce a building's energy consumption by modifying human behavior. ECMs are administrative controls, such as training employees to turn lights off in un-used areas, disconnect appliances that are not in use, lower room temperature thermostat set-points, etc.

Energy Efficiency Measure (EEMs): Per [10 CFR 420.2](#), any capital improvement that reduces energy costs in an amount sufficient to recover the total cost of purchasing and installing such measure over an appropriate period of time and maintains or reduces energy consumption from non-renewable sources. EEMs include ESCO Equipment that meets this definition.

Energy End Use: The energy consumed to support a specific function (space conditioning, refrigeration, lighting, hot water, plug load, water use, wastewater treatment, etc.).

Energy Equipment: equipment or structural components that influence energy consumption in the Facility.

Energy Escalation Rate: the average escalation rate over a period of time for fuel prices based on energy price forecasts determined by an AHFC-approved institution or method.

Energy Performance Contract (EPC): the contracting mechanism between the Facility Owner and the Energy Services Company that implements energy efficiency measures to achieve guaranteed energy savings, without up-front capital costs or capital appropriations.

Energy Savings: for each form of energy for each Billing Period, the difference between the Baseline Energy Consumption for that Billing Period and the Energy Consumption actually incurred in that Billing Period as set forth in the Energy Performance Contract.

Energy Services Company (ESCO): a contractor that meets AHFC qualifications that performs the energy audit, design, implementation, and measurement and verification of savings for energy efficiency retrofit projects.

Energy Service Company (ESCO)-installed Equipment: the equipment installed or caused to be installed by the ESCO, as set forth in the Energy Services Proposal.

Energy Use Intensity or Energy Use Index (EUI): a unit of measurement that describes a building's energy use in units of energy consumed by the building per unit area of square footage (BTU/ft²), or BTU/ft²/year. The EUI is used to compare a building's energy use to others of similar size and end use.

Existing Equipment and Operating Conditions: the energy equipment and operating conditions that are identified in the Energy Performance Contract as existing at the time of the Energy Services Proposal.

Facility: the building(s) or facility(s) included in the Energy Performance Contract and described in the Energy Services Proposal.

Facility Maintenance Checklist: method to record and track the maintenance procedures performed by facility personnel, that includes the tasks and schedules for prescribed procedures.

Facility Owner: Entity responsible for an individual facility or group of facilities, including operations, maintenance, financial, legal, and management.

Financial Guaranty: A financial instrument that commits funds for payment to the Facility Owner in the event that the projected savings in the performance guarantee are not met.

Fuel Escalation Factor: see "energy escalation rate"

Gross Square Footage: Per ASHRAE's 2009 95% Peer-reviewed "Draft Performance Measurement Protocols for Commercial Buildings," the total square footage of a building based on exterior dimensions, including exterior walls, and including occupied and minor unoccupied spaces, but excluding major unoccupied or un-conditioned spaces.

Investment Grade Audit: an energy analysis of a facility to identify cost effective EEMs. The Investment Grade Audit provides detailed engineering investigation and report of a facility's current baseline energy and water consumption, equipment condition, operation, performance, maintenance, potential energy and water efficiency upgrades, life cycle costs, and risks for future performance.

Maintenance Service Plan: details the operations and maintenance requirements necessary to meet the performance guaranty, and the parties responsible for fulfilling those requirements.

Measurement and Verification (M&V) Plan: (From the [Efficiency Valuation Organization](#) "Energy Savings Measurement Guide") the process of using measurement to reliably determine actual savings created within an individual facility by an energy management, energy conservation or energy efficiency project or program. As savings cannot be directly measured, the savings can be determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions."

Municipality: every city, county, town, district (including school districts), or other public agency thereof which is authorized by law to execute public work.

Non-energy Cost Savings: Operations & maintenance, water use, wastewater, and/or solid waste reduction, and other non-energy cost savings. The non-energy savings must be real

savings that will be realized through qualified and quantifiable analysis (i.e. calculated savings with task measurement, budget comparison and/or stipulated baseline).

Non-EPC Project: A project that is implemented directly by the Facility Owner or Facility Owner contractor(s) and that does not include a performance guaranty.

Notice of Commencement of Energy Savings: written notice from the ESCO to the Facility Owner that the ESCO has substantially completed installation of ESCO Equipment and/or that it has provided ESCO services and that such equipment or services are now providing Energy Savings sufficient for the Facility Owner to begin making payments as set forth in the performance guaranty.

Performance Guaranty: The ESCO's contractual assurance that a specific level of operational performance and energy savings will be accomplished from the installed and maintained EEMs.

Performance Period: the term of the guaranteed level of performance and energy savings from installed EEMs as defined in an Energy Performance Contract. For AHFC projects funded through REAL, the performance period shall be three (3) years and commence when the installation of all EEMs has been completed and accepted by the Facility Owner and the ESCO issues the Notice of Commencement of Energy Savings.

Public Facilities: any building owned by a regional educational attendance areas; municipal governments, including political subdivisions of municipal governments; the University of Alaska; political subdivisions of the State of Alaska or the state.

Qualified Contractors: contractors that are licensed and bonded in the State of Alaska to perform the work. AHFC may require cold climate building science or other training to ensure high performance retrofits.

Scope of Work: details the specific EEMs identified in the Investment Grade Audit that will be implemented and the buildings to be retrofitted under the AHFC-funded project. The scope of work must segregate EEMs from capital improvements required to support the EEMs.

Termination Value: the amount that the Facility Owner will pay to the ESCO in any year to terminate the Energy Performance Contract.

PART III APPLICABILITY

The REAL Program Manual (the manual) is intended to provide detailed information on program requirements and shall be incorporated by reference into all AEERLF contracts (Facility Owner-ESCO, Facility Owner – Auditor, Facility Owner – AHFC, etc.) and the AHFC loan documents. The requirements in the manual shall be imposed on REAL projects funded by AHFC, even if other funding sources pay for portions of the project.

PART IV PROGRAM OVERVIEW, GOALS, AND OBJECTIVES

SECTION 4000 PROGRAM OVERVIEW

The Alaska Housing Finance Corporation (AHFC) Retrofit Energy Assessment for Loan Systems (REAL) provides loans to eligible borrowers to implement energy efficiency measures (EEMs) in a public facility owned by an eligible borrower. Loan proceeds will be used to implement energy efficiency measures (EEMs) to an existing building owned by an eligible borrower as described in [15 AAC 155.600](#) and SECTION 1000 . The REAL program uses AHFC funds and Energy Performance Contracts (EPC) as the primary vehicle to finance the implementation of projects. An EPC allows Facility Owners to implement EEMs and realize energy savings without up-front capital investment or specific appropriations. The Energy Performance Contract concept is further discussed in PART XII .

Alternatively, projects may be funded without an EPC, as described in 0.

SECTION 4001 PROGRAM GOALS

The goals of the REAL program are to:

- Reduce energy costs for public facilities by providing funding for comprehensive energy efficiency retrofits that go beyond lighting and heating system upgrades,
- Establish energy use intensity (EUI) data, specific to Alaska, that describe the size-related energy consumption for buildings with specific energy end uses,
- Successfully implement comprehensive and effective energy efficiency retrofits that lead to measureable short-term and long-term energy savings and improved building performance,
- Identify effective energy efficiency measures specific to Alaskan public buildings (office buildings, warehouses, water plants, schools, etc.),
- Establish qualifications for and CEA/CEM who may prepare investment grade audits for AHFC-funded projects, and,
- Establish qualifications for ESCOs in order to assure long-term energy efficiency and building performance.

SECTION 4002 PROGRAM OBJECTIVES

The objectives of the REAL program may include:

- Provide technical assistance to Facility Owners, such as oversight of:
 - Project development,
 - Project implementation, and,

- measurement and verification of savings.
- Create a standardized process for use by any public entity state-wide that establishes criteria to:
 - develop, implement, and measure and verify EPC projects;
 - formalize process steps, measurement and verification requirements, and other documentation; and,
 - establish qualifications and training process for eligible Energy Services Companies (ESCOs) and Certified Energy Auditors (CEA)/Certified Energy Managers (CEM) that provide services under the program requirements.
- Assist ESCO and Facility Owner with contract language for participation in the Program.

PART V ELIGIBLE PROJECTS

SECTION 5000 PROJECTS SHALL YIELD ENERGY SAVINGS

Loans shall be used to fund energy efficiency measures (EEMs) to eligible facilities to reduce the facility's energy use. For some projects, as described further in this program manual, funds may be used to implement health and safety, code compliance, and other capital improvements required to support the implementation of the EEMs.

SECTION 5001 CODE COMPLIANCE

All work and services performed on REAL projects shall be completed in compliance with:

- the International Energy Conservation Code (IECC) 2009,
- the Alaska-specific Amendments to IECC 2009, and,
- all applicable codes, laws, regulations or other governing authority.

Where no superseding code, law, regulation, or other governing authority exists, IECC 2009 and the Alaska-specific Amendments to IECC 2009 shall apply.

SECTION 5002 HISTORIC PRESERVATION

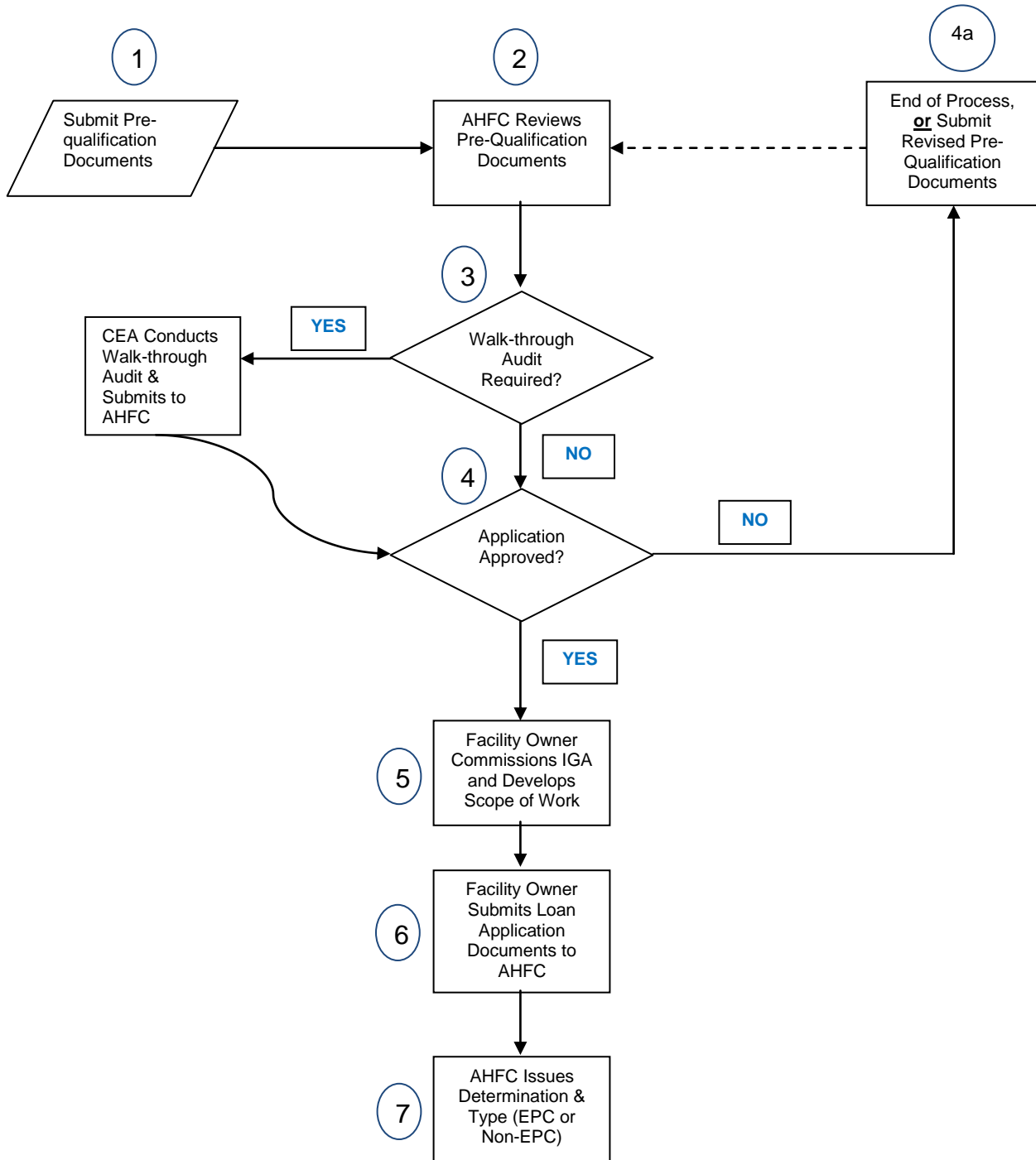
All projects that utilize REAL funds shall comply with the requirements of Section 106 of the [National Historic Preservation Act](#) (NHPA). The Alaska [State Historic Preservation Office](#) (SHPO) is the regulatory authority for projects in Alaska. Facility Owners are responsible for identifying if the project includes or is within an:

- Historic Property,
- Historic District, and/or,
- Archaeological District.

REAL applicants must include this information in the loan application. Work performed on facilities that are any of the above may be prohibited or limited from implementing EEMs.

PART VI APPLICATION PROCESS

The following flow diagram shows an overview of the REAL application process.



SECTION 6000 PRE-QUALIFICATION DOCUMENTS

The pre-qualification process provides baseline information about the facility and its energy consumption, and shows that the facility is owned by an eligible entity. Facility Owners may apply to finance an energy efficiency retrofit to one or more public facilities as defined in SECTION 1000 .

Native corporations and tribal entities are **not** eligible for loans under the REAL program.

Facility Owners must submit a completed [REAL Application & Preliminary Benchmark Data Form](#) to have their project considered. A separate REAL Application & Preliminary Benchmark Data Form must be completed for each building proposed for retrofit through the REAL program. The Facility Owner or designee must complete all fields of the form, including two years of the most recent utility data specific to the facility for all electricity, fuel, wood, propane, natural gas, or other energy sources used to support the facility. The applicant may attach 24 months of utility bills for all energy types used in lieu of entering the data into the [REAL Application & Preliminary Benchmark Data Form](#). If sub-metering is not available for the individual building(s), [contact AHFC](#).

SECTION 6001 REVIEW OF PRE-QUALIFICATION DOCUMENTS

Upon receipt of the complete [REAL Application & Preliminary Benchmark Data Form](#), AHFC will review the application for eligibility. AHFC may request a walk-through assessment as described in APPENDIX D if benchmarking data are insufficient to determine project eligibility, or if the CEA/CEM or ESCO is willing to defer payment for the IGA until loan disbursement (see SECTION 6002).

SECTION 6002 INVESTMENT GRADE AUDIT

If the [REAL Application & Preliminary Benchmark Data Form](#) indicates the facility has the potential to reduce energy consumption from an energy efficiency retrofit, AHFC will notify the Facility Owner to commission an investment grade audit (IGA). IGAs are discussed in detail in SECTION 10000 . The Facility Owner is responsible for the up-front cost of the IGA. Some CEAs, CEMs, and/or ESCOs may agree to accept payment at a later date based on AHFC loan funds. If AHFC funds the project, the Facility Owner can use the loan funds to pay for the IGA.

SECTION 6003 PROJECT MUST YIELD ENERGY SAVINGS

Energy **cost** savings are used primarily for loan sizing purposes only and will be based on the effective energy rates at the time the IGA was prepared. Energy cost savings will be used to show that the projected energy savings based on the final scope of work will meet or exceed the loan payments through the term of the loan.

All post-construction energy savings will be based on the reduction in **energy** consumption (BTU, kWh, CCF, therms, etc.), not the monetary reduction in energy bills. Whenever energy cost savings are cited, the savings will be based on the energy rates in effect on the date the IGA was prepared. Energy escalation rates may be applied per a written agreement between the Facility Owner and the ESCO, and subject to approval by AHFC. The maximum energy

escalation rates shall be determined based upon the United States Department of Energy (US DOE) [Energy Escalation Rate Calculator](#) (EERC) or other AHFC-approved source; the contractual energy escalation rate will be negotiated to a rate between zero and the maximum energy escalation rate.

Projects funded by AHFC may use the funds to implement health and safety, code compliance, and other capital improvements **required to support the implementation of the EEMs** as long as the annual energy savings anticipated in the IGA and final scope of work will meet or exceed the annual loan payments.

.01 PROJECTS UTILIZING ENERGY PERFORMANCE CONTRACTS

The IGA and proposed scope of work must demonstrate that the annual energy **cost** savings generated by the implemented EEMs funded by the loan will meet or exceed the annual loan payments.

.02 NON-EPC PROJECTS

Non-EPC projects are projects that are not implemented under an Energy Performance Contract and do not include a performance guaranty. Non-EPC projects will utilize the IGA and final scope of work to demonstrate that the proposed EEMS will yield energy **cost** savings sufficient to meet or exceed the loan payments through the term of the loan, based on the energy rates in effect at the time the IGA was prepared.

SECTION 6004 LOAN APPLICATION

After the IGA is complete, the Facility Owner must submit to AHFC:

- loan application,
- the IGA, completed no more than one year prior to the date the loan application is submitted to AHFC, except as described in SECTION 10000 .02I, and,
- the proposed scope of work.

The loan application must be complete prior to AHFC making a loan determination. The IGA and scope of work, as approved by AHFC, will demonstrate that:

- the project will achieve energy savings, and,
- the energy savings can meet or exceed the annual loan payments through the term of the loan.

AHFC will review the loan, IGA, proposed scope of work, and contract documents and notify the Facility Owner if AHFC will finance the project.

.01 LOAN AMOUNT

There is no maximum loan amount on an AHFC loan for REAL energy efficiency retrofit projects. However:

- Loans for Non-EPC projects will not exceed \$250,000, and,
- The maximum loan amount for EPC projects will be dependent upon AHFC funding, in conjunction with the Investment Grade Audit and the scope of work, and,
- Loans for EPC projects in excess of \$1,500,000 require approval by AHFC's Board of Directors. This is an AHFC administrative requirement and should not be viewed as a limitation on the loan amount.

.02 LOAN APPROVAL

If the loan for the proposed project is approved, the Facility Owner must provide to AHFC:

- For EPC projects: the Facility Owner shall provide the signed EPC between the ESCO and the Facility Owner to AHFC within 90 days of signing the EPC.
- For Non-EPC projects: the Facility Owner shall provide the final scope of work to AHFC within 90 days of whichever date is earliest:
 - signing an implementation contract with an implementation contractor, or,
 - the date the loan was approved.

Modifications to the scope of work in the EPC or, for Non-EPC projects, the final scope of work that was submitted with the loan application, will be managed as described in PART XV .

AHFC will respond to loan applications with a written notice:

- approving the loan,
- declining the loan, with stated reasons for the decline, or,
- a request for additional information.

.03 APPEAL

If an applicant chooses to appeal AHFC's decision to decline to fund a project, the applicant may appeal the decision as described in [15 AAC 150.210](#), "Appeal for Reconsideration."

SECTION 6005 PROJECT QUEUE - RESERVED

PART VII PROGRAM ELEMENTS

The REAL program establishes the following elements for successful implementation of energy efficiency retrofits that yield guaranteed performance and energy savings:

- Benchmarking
- Project Feasibility
- Qualifications
- Financial Elements
- Energy Performance Contracts (EPC)
- Non-EPC Projects
- Monitoring and Verification
- Modifications

Each element is described in detail in the following sections.

PART VIII BENCHMARKING

Benchmarking helps identify inefficient facilities without the in-depth evaluation and modeling required for an investment-grade audit, by comparing a facility's energy performance to another benchmark datum. REAL benchmarking will develop facility-specific data sets to:

- Assess the initial feasibility of a project,
- Prioritize projects based on feasibility, logistics, scope, or other elements,
- Identify projects that would benefit from an aggregated project approach, and,
- Establish Alaska-specific energy use intensity (EUI) data set for public facilities.

SECTION 8000 PRELIMINARY BENCHMARK DATA COLLECTION

The first step is to collect basic information about the building(s), the facility use schedule, and a minimum of two years of building energy consumption data, for all energy sources used by the facility (electricity, heating oil/diesel, wood, propane, coal, natural gas, etc.). This information will be used to identify energy use patterns and energy savings opportunities. The Facility Owner will complete and submit the [REAL Application & Preliminary Benchmark Data Form](#) for each building to be considered for the REAL program. AHFC will evaluate the completed [Application & Preliminary Benchmark Data Form](#) to assess interest in the program, evaluate project potential, and prioritize projects. Information from the [REAL Application & Preliminary Benchmark Data Form](#) will be input into AkWarm-C© or other AHFC-approved [ARIS](#)-compatible data system.

SECTION 8001 WALK-THROUGH ASSESSMENT

AHFC may require walk-through assessment(s), on a case-by-case basis, for projects where the initial benchmark data are insufficient to determine project eligibility, or if the ESCO is willing to defer payment for the IGA. Walk-through assessments will be performed in accordance with APPENDIX D or as approved by AHFC.

SECTION 8002 DATA ANALYSIS - RESERVED

PART IX PROJECT FEASIBILITY

SECTION 9000 AHFC EVALUATION

AHFC will evaluate the facility benchmarking data and loan application documents described in PART VI to assess the following project information:

- evaluate if energy savings (\$/ft²/year), based on energy prices in effect on the date that the IGA was prepared, will support the cost-effectiveness of the project,
- develop a regional data map of proposed projects that may be grouped together for more efficient implementation and/or procurement logistics,
- identify projects with lower potential energy savings that may be offset by implementation with other higher energy savings projects in the vicinity, and,
- prioritize projects, if a wait list develops.

Project energy savings for the REAL program are based on the facility's reduced energy consumption (kWh, BTUs, therms, CCF, kGals, etc.), whereas energy **cost** savings are evaluated in the AEERLF Loan Application process (see SECTION 6003). Energy **cost** savings may also be considered as part of the Initial Feasibility Report (see SECTION 9001). Energy **cost** savings are not considered for the post-construction, measurement and verification purposes for AHFC-funded projects.

A small percentage of facilities may consume the largest amount of energy, and these facilities may warrant priority for retrofit.

SECTION 9001 INITIAL FEASIBILITY REPORT (IFR)

Based on AHFC's determination, the Facility Owner may choose to engage an ESCO to develop an Initial Feasibility Report (IFR). The IFR is a survey of facilities and is a tool for the Facility Owner that provides a preliminary assessment of the project potential. It reviews the existing conditions, potential Energy Efficiency Measures (EEMs) recommended for further evaluation, budget estimates of implementation costs and energy savings, and other metrics to determine if the ESCO can develop a project that meets the Energy Performance Contract (EPC) requirements and meet the performance guaranty as described in SECTION 12002 .02G. The IFR should provide sufficient information to allow the Facility Owner to determine if the project is technically and financially viable enough to warrant proceeding with an Investment Grade Audit as described in SECTION 10000 . If at any time during the IFR process the Facility Owner and ESCO determine that a project is not viable under an EPC, analysis and further development can be terminated. The Facility Owner may choose to pursue AHFC loan funds for a Non-EPC project as described in 0.

If the project will be implemented under an EPC, the ESCO should prepare the IFR, so that the implementing ESCO is familiar with the facility. The Facility Owner should provide any previous studies or surveys to the ESCO, so the ESCO can confirm the recommendations of any prior energy audits and/or reports.

The Facility Owner shall provide the contractor completing the IFR reasonable access to facility staff to evaluate the existing systems and opportunities. The contractor preparing the IFR agrees to work diligently to assess validity of information provided and to confirm or correct the information as needed.

PART X QUALIFICATIONS

Energy efficiency retrofits funded by AHFC will meet AHFC's qualifications for:

- Investment Grade Audits (IGA),
- Certified Energy Auditors (CEA)/Certified Energy managers (CEM),
- Energy Service Companies (ESCO), and,
- Final Scope of Work.

SECTION 10000 INVESTMENT GRADE AUDIT (IGA)

Once a potential project facility has been benchmarked and a feasible project identified, the Facility Owner must commission an Investment Grade Audit (IGA). The IGA is an engineering-based, ASHRAE-guided energy audit to assess as accurately as possible the facility's existing energy use, cost-effective EEMs, and potential energy savings for the facility.

The IGA is the foundation for both Energy Performance Contract and Non-EPC projects. It includes a detailed investigation of the facility's current energy and water consuming equipment inventory, condition, operation, maintenance and performance. The IGA examines potential energy and water efficiency upgrades, develops implementation costs, and calculates energy and/or water savings. Life cycle costs, operation and maintenance requirements, and risks for future performance are also assessed.

One of the most important components of the IGA is development of the baseline energy consumption for the facility. The performance guaranty and project financing are developed based on the proposed energy savings, and are calculated in relation to the baseline energy consumption. If the project will be implemented under an EPC, it is critical that **the Facility Owner and the ESCO work together to develop and agree upon the baseline energy consumption** so that both parties understand the methods that will be used to measure energy savings.

Facility Owners will be actively involved in the IGA process and project development process.

IGAs shall be completed by a qualified CEA/CEM, as described in SECTION 10001 .

.01 REQUIRED COMPONENTS OF THE IGA

The IGA will consist of the following elements of the ASHRAE, "Procedures for Commercial Building Energy Audits," RP-669/SP-56, as updated (if applicable) by [ASHRAE](#), and as modified by AHFC.

- Preliminary Energy Use Analysis,
- (Optional, on a case-by-case basis, as determined by AHFC) Level I – Walk-through Assessment,

- Level II – Energy Survey & Engineering Analysis, and,
- On a case-by-case basis, AHFC may also require ASHRAE Level III – Detailed Analysis of Capital-intensive Modifications

Elements of the Preliminary Energy Use Analysis and, if performed, the Level I Walk-through Assessment, will be captured in the benchmarking process.

.02 REQUIRED COMPONENTS OF THE IGA REPORT

A. Energy Consumption History

Review a minimum of 24-months of utility bills or other source data and calculate the facility's consumption, in BTU/year and kWh/year, for all energy sources applicable to the facility. Whenever available, billing meter data shall be provided to corroborate consumption calculations. Be sure to include the type of resource and units (e.g., 2 cords of spruce, 11000 gallons of diesel #1, etc.).

- Utility Bills: Electricity, natural gas, heating oil, water, wastewater, or other utilities, including all elements of the utility rates (including rates for energy use, demand, ratchet, fuel surcharges, and any other rates or charges)
- Delivery Bills: Wood, propane, heating oil, coal, water, wastewater
- Purchase data: Wood, propane, heating oil, coal, water, wastewater

Identify the energy rates for each metered or non-metered energy source supplied to the facility. Produce facility-specific daily and annual load profiles to chart peak and low electricity demand. Load profile data will be used to evaluate load distribution planning for future/potential peak pricing electricity rates.

Utility and/or energy source data can show opportunities for potential savings, including:

- Load shifting (demand),
- Time of use (demand),
- Intermittent vs. constant operation (demand and energy use),
- Opportunities to negotiate rates with the utility, and,
- Other cost-saving administrative or operational measures.

B. Facility Use

Characterize the building usage and occupancy profiles, facility size, construction features including an assessment of the building envelope (windows, doors, insulation, etc.) and equipment description and operations. Include text, facility diagrams with typical floor plans, and schematics to describe all proposed facility changes.

C. Equipment List

Develop a detailed inventory of equipment, which contains pertinent information for all energy-consuming equipment including estimates of equipment efficiency and remaining useful life.

D. Equipment Logs

Evaluate available equipment logs for run-time or other information that may present opportunities to reduce energy consumption.

E. Existing Conditions

Discuss existing operating and/or design conditions that waste energy and identify cause.

F. Energy Efficiency Measures (EEMs)

Provide a detailed analysis of each EEM recommended for each area of the building, including manufacturer, make, model, rating, or other unit-specific information. Include the calculated energy savings and energy cost savings per room. Provide detailed information on existing and proposed environmental conditions that will be altered by the proposed scope, such as lighting levels and comfort conditioning (relative humidity, heating/cooling setbacks, etc.).

Provide the following financial analysis for each recommended EEM:

- Description of the EEM,
- Any additions or repairs that will be required in order for EEMs to be effective,
- Installation cost and source of cost estimate, with contractor price quotes, where applicable,
- Cost estimate contingencies,
- Potential impact on occupant health, safety, and comfort,
- Projected energy savings (BTU/year, BTU/ft²/year, kWh/year, kWh/ft²/year),
- If demand rates are in effect: annual demand savings (kW/year, kW/ft²/year),
- Expected budget accuracy,
- Estimated annual energy cost savings (\$/year and \$/ft²/year),

- The following, based on the energy prices in effect on the date that the IGA was prepared:
 - All assumptions regarding future energy costs and life of the EEM, noting that post-construction measurement and verification are based on energy savings, not energy cost savings,
 - Estimated annual operating cost savings,
 - Estimated lifetime energy cost savings,
- Life-cycle cost of EEMs,
- Savings-to-Investment Ratio (SIR),
- Simple Payback (SP), and,
- Estimated Return on Investment (ROI).

In addition, provide estimates for any applicable rebates, tax incentives, or other financial incentives that may be available to reduce or offset the project cost.

G. Method(s) of Analysis

Provide a description of and documentation for the tools used to perform energy use, energy savings estimates, benchmarking, modeling, and financial analyses, including calculations and/or software used. Provide supporting data for all assumptions and estimates used in the analysis, including sample calculations.

The final report will be reviewed by the CEA/CEM and the Facility Owner to address discrepancies, modifications or other elements prior to developing the implementation plan. The Facility Owner will provide a copy of the audit to AHFC. The loan application will not be processed until AHFC receives the IGA report. AHFC may monitor the audit process during any phase of the IGA. CEA/CEM and facility operators will be required to provide documentation as requested by AHFC or its designee.

H. Data Collection

All data collected for benchmarking, walk-through assessments, and IGAs shall be input into [AkWarm-C©](#). AHFC may consider an alternative data collection system but any approved alternative must be compatible with the [Alaska Retrofit Information System](#) (ARIS) database.

IGAs are the property of the state and may be incorporated into AkWarm-C©, the ARIS, [Alaska Energy Data Inventory](#), or other state and/or public information system.

I. Life of an IGA

The life of an IGA is one year. The life of the IGA may be extended on a case-by-case basis, at the discretion of AHFC.

SECTION 10001 CERTIFIED ENERGY AUDITOR QUALIFICATIONS

Preliminary Energy Use Analysis, Level I Walk-through Assessment, and Investment Grade Audits will be completed by [Certified Energy Auditors](#) (CEA) or [Certified Energy Managers](#) (CEM), certified by the [Association of Energy Engineers](#) (AEE) or other AHFC- approved equivalent certification body. In addition, the CEA or CEM must provide proof of completion of the following:

- Alaska Professional Engineer (P.E.) stamp, **or**,
- [Board-approved Arctic Engineering Courses](#) for the Alaska P.E. stamp, **or**,
- AHFC-approved Cold Climate Building Science course(s).

SECTION 10002 ENERGY SERVICE COMPANY (ESCO) QUALIFICATIONS

.01 QUALIFICATIONS

AHFC has established the qualifications required for ESCOs to implement AHFC-funded projects, to ensure that the ESCO meets the program standards. Establishing the qualifications for an ESCO should provide a high level of confidence for Facility Owners that their project can achieve the performance guaranty (see SECTION 12002 .02G). Although AHFC has established the qualifications for ESCOs, and AHFC may pre-qualify ESCOs for AHFC-funded projects, AHFC does not endorse or ensure the performance of ESCOs that meet these qualifications. ESCO qualifications include:

- Licensure or other permit to do business in the State of Alaska, including proof and documentation of all required insurance and bonds;
- Proven performance on EPCs, including sample project list;
- Ability to dedicate a CEA/CEM to the project from project implementation through the measurement and verification phase;
- Use of qualified subcontractors and delegates, who are qualified, licensed and bonded in the State of Alaska to perform the work (AHFC may require cold climate building science or other training to ensure high-performance retrofits);
- Proof of financial solvency, ability to pay its debts as they mature, and possession of sufficient working capital to install EEMs and perform its obligations through the term of the EPC;
- Ability to obtain and pay a financial guaranty in the event that the performance guaranty is not met; and,

- Possession of all requisite authority to license the use of proprietary property, both tangible and intangible, contemplated by the EPC.
- Proven development or knowledge in procedures to control energy and water consumption through services provided and equipment installed and maintained at facilities similar in scope and scale of Facility Owner.

Or,

- Accreditation by the National Association of Energy Service Companies ([NAESCO](#))

Any ESCO may market its services directly to Facility Owners. However, the ESCO must meet the qualifications listed in this section to perform services and/or execute EPCs for AHFC-funded projects.

SECTION 10003 FINAL SCOPE OF WORK

The final scope of work for the project shall be prepared from and include Energy Efficiency Measures (EEMs) identified in the Investment Grade Audit (IGA). The final scope of work should include the EEMs that will yield the most energy savings.

The final scope of work shall be incorporated into the EPC by reference and will detail the specific EEMs to be implemented, including:

- A description of facility and pre-existing equipment inventory (may be referenced from the current IGA),
- The final list of buildings included in the EPC,
- A schedule of each EEM task and measure, selected from the EEMs identified in the IGA and, if applicable, other capital improvements, to be implemented by the ESCO,
- Cost per EEM, and,
- Total project cost.

EEMs in the final scope of work should be selected from those that will achieve the highest energy savings.

Proposed EEMs that were not identified in the IGA, and/or equipment makes/models that were not specified in the IGA, will be evaluated by the same criteria for the IGA (see SECTION 10000) and the IGA will be revised accordingly.

The scope of work will segregate EEMs from capital improvements required to support the EEMs. For example, if electrical wiring must be brought up to code requirements to support the

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installation of energy efficient lighting, the scope of work must identify the EEM and capital improvement tasks separately.

PART XI FINANCIAL ELEMENTS

SECTION 11000 FINANCIAL GUARANTY

.01 ENERGY PERFORMANCE CONTRACT (EPC) PROJECTS

The ESCO shall retain an AHFC-approved form of financial guaranty to pay the Facility Owner, in the event that the annual energy savings fail to exceed the annual loan payments. A financial guaranty may consist of a performance bond or other AHFC-approved instrument or method. AHFC will take an assignment of the financial guaranty for collateral purposes in the event an AHFC loan is approved for the facility.

The amount of the financial guaranty is negotiable but should equal the anticipated energy savings or otherwise meet AHFC approval.

.02 NON- ENERGY PERFORMANCE CONTRACT (EPC) PROJECTS

For projects implemented without an EPC, AHFC reserves the right to approve or decline the scope of work as it relates to the proposed loan amount. Non-EPC projects will also be subject to AHFC approval regarding the contractor chosen by the Facility Owner to complete the work.

In addition, AHFC reserves the right to require a financial guaranty.

SECTION 11001 ADDITIONAL SAVINGS

Savings in excess of those projected for the installed EEMs shall be retained by the Facility Owner.

PART XII ENERGY PERFORMANCE CONTRACTS (EPC)

SECTION 12000 OVERVIEW OF AN ENERGY PERFORMANCE CONTRACT (EPC)

An EPC provides ESCO expertise to the project from development through completion. The EPC includes a performance period to assure success in the areas of:

- energy efficiency measure design and engineering,
- operation and maintenance of buildings,
- project cost assessment,
- financing,
- construction management,
- training for facility staff, and,
- on-going project monitoring and trouble-shooting to ensure sustained savings.

The EPC guarantees the implementation of specific EEMs and corresponding energy savings for the duration of the performance period, based on successful implementation and maintenance of those measures. The EEMs are identified and energy savings calculated as part of an Investment Grade Audit (IGA) for the facility. The performance period begins when the ESCO issues a Notice of Commencement of Energy Savings for the project (see SECTION 12002 .02J).

Once the EPC is implemented, the ESCO serves as the single point-of contact and is responsible for coordinating and executing the design, construction, and post-construction measurement and verification activities. The EPC defines not only the final scope of work and all its associated costs, but also mutual responsibilities between the ESCO and the Facility Owner. The EPC details the exact EEMs, equipment and labor costs associated with them, the performance period, guaranteed energy and maintenance cost savings, and how the savings and performance will be measured and verified.

SECTION 12001 FUNDING REQUIREMENTS

All projects funded by AHFC in excess \$250,000 must be executed under an EPC. EPC may also be used to fund projects less than \$250,000.

SECTION 12002 ELEMENTS OF AN EPC

.01 COMPLIANCE REQUIREMENTS

The EPC must comply with all elements of the REAL program manual. The program manual and all requirements therein shall be incorporated by reference into the EPC.

.02 CONTRACT DOCUMENTS

The EPC is a legally binding document that must contain the minimum requirements to ensure successful project implementation, performance, and energy savings outlined in SECTION 12002 .02. Some examples of Energy Performance Contracts are available on the web:

[Energy Services Coalition](#)

[Idaho Department of Administration](#)

A. Investment Grade Audit

1. The IGA will meet the qualifications in Investment Grade Audit (IGA) (see SECTION 10000) and must be signed and approved by both the Facility Owner and the ESCO. The IGA will establish or provide the basis for:

- Baseline Energy Consumption,
- Description of Facility and Pre-Existing Equipment Inventory,
- Notice of Acceptance of Investment Grade Audit Report,
- Projected energy savings and energy cost savings,
- Measurement and verification, and,
- Project eligibility.

The signed Notice of Acceptance of IGA shall be incorporated into the EPC.

2. Payment

The Facility Owner is responsible for the cost of the Investment Grade Audit if:

- The Facility owner accepts the IGA and enters into an Energy Performance Contract with the ESCO to implement the scope of work, or,
- The Facility Owner accepts the IGA but fails to enter into an EPC with the the ESCO within a period to be defined between the Facility and the Facility Owner prior to conducting the IGA.

Unless otherwise negotiated between the ESCO and the Facility Owner, the Facility Owner shall have no payment obligations for the IGA if the ESCO does not provide a scope of work for EEMs that, if implemented, will achieve energy savings sufficient to pay the costs and fees associated with the loan.

B. Standards of Comfort

Energy and water conservation measures installed by the ESCO shall provide the standards of heating, cooling, ventilation, hot water supply, lighting quality and levels, etc. described and agreed to between the ESCO and the Facility Owner. The ESCO will be responsible for maintaining the levels of comfort for each building as specified in this EPC. During the term of the EPC the ESCO and Facility Owner will maintain and operate the EEMs in a manner that will provide the standards of comfort and levels of operation defined in the EPC.

C. Final Scope of Work

The final scope of work shall be incorporated into the EPC by reference and will meet the qualifications described in SECTION 10003 . EEMs included in the scope of work shall be selected from the EEMs in the IGA, and should consist of the EEMs that will yield the most energy savings.

D. Implementation Plan

The ESCO will develop a detailed implementation plan for the EPC project, including:

- project management, coordination, and use of subcontractors,
- The ESCO's organization plan for implementing and managing the EPC project, including an organization chart indicating individuals assigned to the project, the responsibilities of each individual shown and the lines of authority within the overall organization, selection and management of subcontractors performing work on the EPC project, and construction management, including:
 - how the ESCO will work with facility management and maintenance personnel in order to avoid conflicts with the facility's operation and use,
 - coordination and/or potential conflicts with other Facility Owners' activities such as management of additional energy and water projects and integration of other identified capital needs with other projects, which may or may not contain energy and water saving opportunities, should be included, and,
 - planned utility interruptions, including the time (date, day of week, time of day, etc.), duration and justification, and,
- O&M plan for EEM operations, maintenance, repair, and replacement requirements, including the responsible parties (Facility Owner or ESCO/sub-contractor) tasked with:
 - the operations and maintenance of ESCO-installed EEMs,
 - reporting requirements, and,

- the parties responsible for operations, maintenance, repair, replacements, and reporting during the performance period.

E. Project Implementation Schedule

The Implementation Schedule for the specific EEMs will show the order in which the ESCO proposes to perform the work. The schedule will be in the form of a progress chart. The schedule will include milestones and timelines, including:

- equipment and materials procurement,
- permitting,
- ESCO construction and installation period, including planned utility interruptions,
- system start-up and commissioning,
- construction completion, and,
- start- and end-dates for measurement and verification.

F. Financial Schedules

Financial Schedules shall include the following schedules at a minimum:

- implementation cost by energy efficiency measure (EEM),
- proposed first year annual cost savings,
- performance period cash flow,
- guaranteed annual cost savings and annual payments, and,
- termination value.

G. Performance Guaranty

There are two elements to the Performance Guaranty:

- System Performance
- Energy Savings

The ESCO guarantees the Facility Owner a specific level of systems performance and energy savings from the installed EEMs, for a defined period of time, known as the performance period. Energy savings during the performance period shall be based on the facility's reduced energy consumption, not the monetary reduction in energy bills. The ESCO guarantees the energy savings (BTUs) for each year of the performance period. The savings in the performance guaranty must exceed or be equal to the annual

payments the Facility Owner makes to re-pay the loan. Commissioning (see SECTION 12002 .02I) the project and implementing a Measurement & Verification Plan (see SECTION 12002 .02K) improve the potential for the project to meet or exceed the projected energy savings.

If the annual savings are not met through the term of the EPC, the performance guaranty requires the ESCO to pay directly to the Facility Owner the amount of the annual savings shortfall. In this way, the ESCO retains responsibility for the project's performance and the Facility Owner assumes limited financial risk in its ability to make its annual payments in the event of a savings shortfall. The term of the performance guaranty shall be a minimum of three (3) years for AHFC-funded projects. The performance guaranty shall include:

- Proof that the annual energy savings will be sufficient to meet the annual loan payments
- Guaranteed annual energy savings, in BTU/year, for the duration of the performance period,
- Savings measurements & calculations, and,
- If applicable, calculations and methodology for adjusting the baseline energy consumption, if necessary.

Measureable savings from operations and maintenance efficiencies may be a legitimate source of savings for AHFC-funded projects. If O&M savings are included in the performance guaranty, they must include operational data to support the projected savings. Any savings related to maintenance and operation of the facilities will be limited to only those that can be thoroughly documented.

All energy savings in excess of those stated in the performance guaranty are additional savings to the Facility Owner and shall be retained by the Facility Owner.

H. Risk Assessment Matrix

The Risk Assessment Matrix (matrix) is intended to outline the potential risks to the Facility Owner and ESCO by participating in the EPC. There are financial, operational, and performance risk aspects to any EPC and both parties must be aware of risk. The matrix is typically developed by the ESCO and discussed in APPENDIX C .

I. Commissioning

All equipment and systems installed as part of an EPC shall be commissioned. Commissioning ensures that systems are designed, installed, functionally tested in all modes of operation, and capable of being operated and maintained in conformity with the design intent regardless of the impact on the Facility's energy system. Commissioning is typically completed by the ESCO and witnessed by the Facility Owner. In some cases, however, it may be contracted out to a third party.

Commissioning is a start-to-finish process, from planning and delivery through measurement and verification, that ensures that the installed EEMs meet the performance objectives and criteria. Commissioned projects typically yield improved overall performance and energy savings, as opposed to non-commissioned projects. More information on commissioning is available from the [National Institute of Building Sciences](#) (NIBS) [Whole Building Design Guide, "Building Commissioning."](#)

J. Notice of Commencement of Energy Savings

Within 10 calendar days of completion of construction of all EEMs defined in the final scope of work, and system start-up and commissioning activities are completed, the ESCO will issue a Notice of Commencement of Energy Savings (Notice) to the Facility Owner. The Facility Owner shall provide the Notice to AHFC within 10 calendar days of receipt from the ESCO.

K. Measurement and Verification Plan (M&VP)

The M&VP (see PART XIV) is the tool that will be used to verify the performance guaranty. It is a measurement-based process used to reliably determine the actual savings from the EEMs installed for the EPC. Savings are determined by comparing the measured energy consumption before and after implementation of the EPC, and adjusting for changes in conditions.

The M&VP outlines the instrumentation, methodology, and calculations used to measure and verify the performance and energy savings attained by the installed EEMs. A well-designed M&VP will:

- establish the baseline for the facility's energy use prior to and post-retrofit,
- accurately assess energy savings for a project,
- allocate risks to the appropriate parties,
- reduce uncertainties to reasonable levels,
- monitor equipment performance,
- identify additional savings,
- improve operations and maintenance,
- verify the performance guaranty is met,
- allow for future adjustments as needed, and,
- normalize for weather conditions.

M&VP are required for all AHFC-funded projects implemented with a performance guaranty.

L. Maintenance Service Plan

The EPC must specify the operations and maintenance requirements to meet the performance guaranty, the parties responsible for fulfilling those requirements, and the party responsible for completing the Facility Maintenance Checklist.

- **ESCO's Maintenance Responsibilities:** A complete description of the ESCO's specific operations and maintenance responsibilities shall be included along with the time intervals for their performance of the stated O&M activities.
- **Facility Owner's Maintenance Responsibilities:** This describes the operations and maintenance responsibilities that may be assigned to facility staff as agreed to by both parties. In some instances it will contain no more than a description of routine O&M currently being performed on existing energy consuming equipment in the facility. In other cases, facility staff may be used to provide some maintenance on the new equipment installed under the performance contract, with the ESCO providing any specialized services as needed.
- **Facility Maintenance Checklist:** The checklist is a method by which the ESCO may record and track the Institution's compliance with any of the maintenance procedures being performed by facility personnel. The checklist is typically a list of tasks and the corresponding schedules for the performance of the prescribed procedures. Facility staff will complete the checklist and forward it to the ESCO, usually on a monthly basis. The checklist is a tool for both the ESCO and the Facility Owner to verify that the required maintenance activities are performed at the scheduled intervals.

M. Operations and Maintenance Training

The EPC will include a detailed description of all required and recommended operations and maintenance (O&M) training, including the duration and the frequency of the specified training that the ESCO will provide to the Facility Owner personnel for each EEM. ESCO will also identify any additional recommended and/or required training as appropriate for each EEM that will **not** be provided by the ESCO. If applicable, include provisions for on-going training, commitments to train newly hired facility personnel, and training with respect to possible future equipment or software upgrades, as well as a fee schedule for any training defined in the EPC and requested by the Facility Owner.

Training should be customized to reflect the level of operations and maintenance responsibility to be assumed by Facility Owner personnel. The training plan will define training responsibilities (ESCO, Facility Owner), and ensure that Facility personnel are fully trained on the operating parameters and maintenance and repair requirements for all installed EEMs.

SECTION 12003 RESPONSIBILITIES

.01 FACILITY OWNER

The Facility Owner must:

- have the authority to enter into a contract for all EPC services, including:
 - construction/improvements,
 - project contingencies,
 - reimbursable expenses,
 - miscellaneous expenses, and,
 - for the purchase and installation of EEMs and other capital improvements;
- provide the ESCO with all records relating to energy and water usage and energy-related maintenance of the facility;
- not engage in or develop energy or capital projects other than those in the EPC that may affect the energy installations, maintenance and operations, measurement and verification, and/or energy savings related to the EPC without:
 - an AHFC-approved engineering analysis to ensure that the EEMs installed under the EPC will continue to meet performance and energy savings defined in the EPC,
 - reviewing the proposed project with the ESCO, and,
 - written notification to AHFC of the proposed project, 30-days prior to implementation.
- within 10-days of written request by AHFC, present documents relating to execution of the work under the EPC, including contracts and subcontracts it has entered into.

.02 ESCO

ESCOs shall:

- Meet AHFC qualifications outlined in SECTION 10002 ,
- use subcontractors and delegates that are qualified, licensed and bonded in the State of Alaska (AHFC may require proof of completion of cold climate building science or other training to ensure high-performance retrofits),

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- complete or have access to a current (per SECTION 10000 .02I) Facility Owner-approved Investment Grade Audit Report,
- provide Facility Owner with a scope of work containing a package of acceptable Energy Efficiency Measures (EEMs),
- ensure that loan funds will be used to install only EEMs that are compatible with all other Facility mechanical and electrical systems, subsystems, or components with which the EEMs interact, and that, as installed, neither the EEMs nor such other systems, subsystems, or components will materially adversely affect each other as a direct or indirect result of equipment installation or operation,
- Use capital from non-AHFC sources to implement improvements that are not identified in the IGA, and negotiate these improvements between the ESCO and the Facility Owner to ensure that the proposed improvements are compatible with all other Facility mechanical and electrical systems, subsystems, or components with which the proposed improvements interact, and that, as installed, the proposed improvements will not materially adversely affect the EEMs as a direct or indirect result of equipment installation or operation, and,
- Within 10 days of written request by AHFC or Facility Owner, present documents relating to ESCO execution of the work under the EPC, including contracts and subcontracts it has entered into.

PART XIII NON-ENERGY PERFORMANCE CONTRACT PROJECTS

SECTION 13000 OVERVIEW

Many public facilities are located in remote areas of Alaska where energy costs and consumption are high. The basis for an Energy Performance Contract (EPC) is a performance guaranty that the annual energy savings will exceed the annual loan payments. However, the additional cost and logistics issues required to implement projects in remote locations may not support an EPC.

Many elements of the Energy Performance Contract apply to the Non-EPC model. The primary differences are:

- The project may or may not be implemented by an ESCO. The implementation contractor may be the Facility Owner and staff, an ESCO, or another non-ESCO contractor selected by the Facility Owner.
- There is no performance guaranty to assure a specific level of performance and/or energy savings.
- Since there is no performance guaranty, a risk assessment matrix is not required.
- Loans in excess of \$250,000 will not be issued for Non-EPC projects.

SECTION 13001 FUNDING REQUIREMENTS

Only projects using less than \$250,000 of AHFC funding may utilize the Non-EPC option. Projects using AHFC funding in excess must be executed under an EPC, as described in PART XII .

SECTION 13002 REQUIRED ELEMENTS

The following elements common to the Energy Performance Contract apply to and are required for projects implemented under the Non-EPC model.

.01 MUST ACHIEVE ENERGY SAVINGS

The project must implement EEMs that yield energy savings.

.02 INVESTMENT GRADE AUDIT

An Investment Grade Audit (IGA) must be completed for all AHFC-funded projects, as described in SECTION 10000 .

.03 STANDARDS OF COMFORT

EEMs installed shall provide the standards of heating, cooling, ventilation, hot water supply, lighting quality and levels, etc. described by the Facility Owner.

.04 SCOPE OF WORK

The Facility Owner or Facility Owner contractor must prepare a final scope of work prior to loan approval that details the specific EEMs to be implemented, including:

- The final list of buildings to be retrofitted under the AHFC-funded project,
- A description of each building to be retrofitted and its pre-existing equipment inventory (may be referenced from the current IGA),
- Cost per measure for each EEM,
- Total project cost,
- A schedule of each EEM task and measure, selected from the EEMs identified in the IGA and, if applicable, other capital improvements, to be implemented (Selected EEMs should be those that yield the highest energy savings.), and,
- All projects should be commissioned upon completion of construction, to ensure the performance of the EEMs meets the performance objectives and criteria.

The scope of work will segregate EEMs from capital improvements required to support the EEMs. For example, if electrical wiring must be brought up to code requirements to support the installation of energy efficient lighting, the scope of work must identify the EEM and capital improvement tasks separately.

.05 IMPLEMENTATION PLAN

The Facility Owner will develop a detailed implementation plan for the project, including:

- project management, coordination, use of subcontractors and/or facility staff to implement the project,
- how the project will coordinate and avoid potential conflicts with the facility's operation and use, and,
- how the Facility Owner will manage planned utility interruptions, including the time, duration and justification.

.06 PROJECT IMPLEMENTATION SCHEDULE

The Implementation Schedule for the specific EEMs will detail the order that the work will be performed, including milestones and timelines for:

- permitting,
- equipment and materials procurement,
- construction and installation period,

- planned utility interruptions,
- system start-up,
- construction completion, and,
- start- and end schedules for commissioning (if implemented), and,
- start- and end schedules for measurement and verification.

.07 NOTICE OF COMMENCEMENT OF ENERGY SAVINGS

Within 10 calendar days of completion of construction of all EEMs defined in the final scope of work, the Facility Owner shall notify AHFC in writing that the construction is complete and energy savings have commenced.

.08 MEASUREMENT AND VERIFICATION

The measurement and verification plan (M&VP) is a necessary component to ensure that anticipated energy savings are realized. Non-EPC projects, which do not include a performance guaranty, may require a modified M&VP, or no M&VP, depending upon the project and as determined on a case-by-case basis as determined by AHFC, depending upon the final scope of work, anticipated energy savings, or other factors.

M&V plans will be prepared as describe in PART XIV , or as approved by AHFC. If no M&VP will be implemented, AHFC may require the Facility Owner to provide to AHFC utility data for all energy sources for the retrofitted building(s), for two years from the Notice of Commencement.

.09 MAINTENANCE SERVICE PLAN

The Facility Owner or Facility Owner contractor shall develop a Maintenance Service Plan (MSP) that describes the operations and maintenance requirements necessary to maintain the performance and energy savings objectives of the installed EEMs. The MSP should include a Facility Maintenance Checklist (FMC) and identify the facility staff or contractor responsible for completing the FMC.

The MSP is intended to insure that EEMs that require hours-of-operation or calendar-based preventive maintenance are maintained. Depending upon the installed EEMs, the MSP may be basic, detailed, or not required. For example, if the scope of work consists only of a roof replacement, no MSP is required, whereas a boiler replacement may require a detailed MSP. If the Facility Owner retains a maintenance contract for the installed EEM, the Facility Owner shall retain a copy of the maintenance contractor's MSP.

The MSP shall identify the Facility staff or contractor tasked with:

- the operations and maintenance of installed EEMs, and,
- repair and/or replacement of installed EEMs and support systems.

.10 OPERATIONS AND MAINTENANCE TRAINING

The Facility Owner shall ensure that Facility personnel are fully trained on the operating parameters and maintenance and repair requirements for all installed EEMs. The responsible personnel shall complete the training required by the EEM manufacturer and/or installation contractor to insure the EEMs meet the performance and energy savings objectives. If the EEM will be maintained under a maintenance contract, training may not be necessary for Facility personnel.

SECTION 13003 QUALIFICATIONS

Facility Owners may choose to:

- manage and implement the EEMs with facility staff,
- Use a combination of facility staff and contractor(s) to manage and implement the EEMs, or,
- Use a contractor(s) to manage and implement the EEMs.

Facility Owners, and/or construction crews contracted by the Facility Owner, implementing the EEMs on REAL projects must meet the following basic qualifications:

- Licensure or other permit to do business in the State of Alaska, including proof and documentation of all required insurance and bonds,
- Access to a CEA/CEM from project implementation through the completion of construction or, if applicable, the measurement and verification phase; and,
- Use of qualified subcontractors and delegates, who are qualified, licensed and bonded in the State of Alaska to perform the work,
- Proven ability to implement and manage project, including but not limited to construction management, crew management, project implementation, managing change orders, and,
- Proof of staff capacity (qualified plumbers, electricians, etc.) to complete the project.

Properly trained construction, installation and maintenance crews, knowledgeable in cold climate construction and building science techniques, combustion safety, ventilation, and other elements of energy efficiency retrofits are an important part of the success of the project. In order to achieve high-performance retrofits, AHFC may require training for Facility Owner(s) and/or construction implementation crew(s), and may provide training at the sole discretion of AHFC.

SECTION 13004 RESPONSIBILITIES

The Facility Owner must:

- have the authority to enter into a loan contract with AHFC,
- have the authority to engage a CEA/CEM to conduct an IGA,
- provide the CEA/CEM performing the IGA with all records relating to energy and water usage and energy-related maintenance of the facility,
- notify AHFC 30-days prior to implementing changes in scope,
- notify AHFC within 90 days of discovery of, or projecting, cost over-runs,
- within 10 days of written request by AHFC, present documents relating to execution of the work under the EPC, including contracts and subcontracts it has entered into.

PART XIV MEASUREMENT AND VERIFICATION

SECTION 14000 APPLICABILITY

Measurement and Verification Plans (M&VP) will typically be required for EPC. AHFC may reduce M&VP requirements on a case-by-case basis. M&VP may not be viable for some EPC and Non-EPC projects. M&VP requirements will be established by AHFC based on the loan application documents.

SECTION 14001 ACCESS TO UTILITY DATA

AHFC reserves the right to inspect utility records for all energy sources used by the facility during the performance period or, for non-EPC projects for up to two years following project completion.

SECTION 14002 OVERVIEW

The most important element of the EPC is the final M&V plan, as mutually agreed upon between the Facility Owner and ESCO. It defines exactly how the guaranteed savings will be verified for each year of the performance period. The performance period for all AHFC-funded projects is a minimum of three years, even if AHFC funding was used only for a portion of the installed EEM. Measurement and verification of savings must be agreed upon by the Facility Owner and the ESCO, as the M&V plan will be incorporated into the Energy Performance Contract.

The [Efficiency Valuation Organization \(EVO\)](#) has developed the [International Performance Measurement and Verification Protocol \(IPMVP\)](#), which is a widely-referenced M&V guidance for EPC projects. In addition, the United States Department of Energy (USDOE) has developed the [Introduction to Measurement & Verification for DOE Super ESPC Projects](#). M&VP for AHFC-funded EPC shall meet the IPMVP, USDOE, or other AHFC-approved protocol. The M&VP evaluates each EEM and the overall installation of EEMs by:

- Accurately establishing baseline energy consumption and baseline condition data quality,
- Documenting data sources and assumptions,
- Outlining the scope, schedule, and responsible parties to conduct all M&V activities,
- Defining the engineering analysis parameters,
- Establishing the energy savings calculations,
- Calculating O&M cost savings realized,
- Defining O&M and M&V reporting requirements and responsible parties,
- Establishing causes for and methods to adjust baseline data, and,

- Establishing utility rates and how they are applied in energy cost savings calculations.

Note: Post-construction measurement and verification of AHFC-FUNDED projects are not based on energy cost, and utility rates are not pertinent to the performance guaranty. Facility Owner and ESCO may choose to include energy cost savings in their M&VP but energy cost savings data will not factor into the EPC.

At least annually, the ESCO and the Facility Owner shall verify that the installed EEMs have been properly maintained, continue to operate correctly, and continue to have the potential to generate the predicted savings.

SECTION 14003 REQUIRED ELEMENTS OF THE M&VP

.01 PRIOR TO PROJECT IMPLEMENTATION

A. Establish Baseline Conditions

In order to establish the basis of the energy savings, the baseline conditions must be established for the facility. The equipment inventory and conditions, occupancy, nameplate data, energy consumption rate, control strategies, etc. are developed as part of the benchmarking process, or, if the benchmarking data are not sufficient, the Investment Grade Audit (IGA). Baseline conditions are established for the purpose of estimating savings by comparing the baseline energy consumption to the post-installation energy consumption. Accuracy in determining the baseline conditions is critical to accurate energy savings predictions and calculations.

B. Develop M&VP

The Facility Owner and the ESCO must agree on the general methods and procedures to meet measurement and verification requirements prior to conducting the Investment Grade Audit (IGA), so that sufficient data and data collection parameters are established during the IGA. The M&V method(s) will dictate how the baseline energy consumption and baseline conditions are defined and what activities are conducted during the IGA. The M&V plan must be *project-specific* and include project-wide items as well as details for each EEM:

- details of baseline conditions and data collected,
- documentation of all assumptions and sources of data, including details of engineering analysis performed,
- inventory and schedule of all systems that will be verified and M&V activities,
- parties responsible for completing the M&V activities,
- specify the methods used to calculate energy savings,
- detail any operations & maintenance (O&M) cost savings claimed,

- assign O&M reporting responsibilities,
- define content and format of all M&V reports for the duration of the M&V period, and,
- if applicable, any adjustments to baseline energy consumption and energy savings and justification.

.02 AFTER PROJECT IMPLEMENTATION

A. Commissioning

Commissioning of installed equipment and systems for EPC projects is required by AHFC, and recommended for Non-EPC projects. The results of the commissioning activities are presented in a Commissioning Report, which tells the Facility Owner that the measure or project is ready for acceptance. Commissioning guidance resources are available from the [Lawrence Berkeley Lab Library](#) and the [National Institute of Building Sciences Whole Building Design Guide](#).

B. Post-installation Verification

Post-Implementation verification is conducted by both the ESCO and the Facility Owner to ensure that proper equipment/systems were installed, are operating correctly, and have the potential to generate the predicted savings. The verification is accomplished through commissioning and M&V activities.

Post-installation verification ensures that the equipment/systems continue to operate correctly and have the potential to generate the predicted savings.

After system start-up and commissioning activities are completed, the acceptance testing and M&V activities specified in the contract are implemented. Verification methods may include surveys, inspections, spot measurements, and short-term metering.

C. Periodic Verification

At least annually, the ESCO and the Facility Owner shall verify that the installed equipment/systems:

- are properly maintained,
- operate correctly, and,
- continue to have the potential to generate the predicted savings.

The results of the periodic verification are documented for the duration of the performance period.

D. Reporting

Commissioning Report: The Commissioning Report shall include commissioning results and documentation.

Post-implementation Report: The post-implementation report will include at a minimum:

- project description,
- installation verification and list of installed equipment,
- details of any changes between the EPC and as-built conditions, including energy impacts,
- documentation of all post-installation verification activities and performance measurements conducted,
- performance verification, including a description of how performance criteria were met, and,
- the expected energy savings for the first year.

Periodic Monitoring Report: The ESCO shall submit an annual report documenting the savings actually achieved for the duration of the performance period, including itemized savings for each EEM, and showing that the performance guaranty has been met on a cumulative basis for all EEMs. Inspections shall confirm that the installed equipment/systems have been properly maintained, continue to operate correctly, and continue to have the potential to generate the predicted savings.

In many cases, equipment performance measurements should be used to substantiate savings. More frequent verification activities may be appropriate to ensure the M&V monitoring and reporting systems are working properly and allow fine-tuning of measures throughout the year based on operational feedback. The periodic monitoring reports will include:

- results/documentation of performance measurements and inspections,
- realized energy savings for the year (reduced energy consumption, O&M savings, other),
- comparison of actual savings to that projected in the performance guaranty,
- details of all analysis and savings calculations including, if applicable, adjustments made to the baseline energy consumption and justification for the adjustments,
- summary of operations and maintenance activities conducted, and,
- details of any performance or O&M issues that require attention.

E. Documentation

Measurement and verification data shall be entered into AkWarm-C©.

.03 ADDITIONAL RESOURCES

The United States Department of Energy (USDOE) Measurement and Verification (M&V) Resources web page contains guidance on M&V planning, savings calculations methods, sample reports, and other useful documents to develop M&V plans and programs. Information is available from [USDOE M&VP Resources](#).

PART XV MODIFICATIONS

SECTION 15000 CHANGE ORDERS

REAL projects are evaluated for eligibility based on the information contained in the loan application: the investment grade audit and the scope of work. Once a loan is issued, the work must be performed as described in the loan documents.

The Facility Owner shall notify AHFC in writing within 30-days of any modification to the information contained in the loan documents, including change orders, that:

- may affect the assumptions, models, calculations, and/or findings of the IGA,
- may affect the projected energy and/or performance savings,
- may affect the performance guaranty,
- may affect the project implementation schedule,
- may result in cost over-runs,
- adds or deletes proposed EEMs, and,
- alter the type (make/model), rating, or quantity of the proposed EEMs.

AHFC approval of the modifications to the scope of work may be required prior to implementing the modification.

Modifications to the loan documents and/or major project modifications may:

- require review and/or modification of the IGA by the CEA/CEM,
- result in work delays while AHFC reviews the modification,
- delay payment from AHFC, and/or,
- result in work stoppage if the modification results in ineligible activities or facilities, or otherwise violates contract agreements.

SECTION 15001 MODIFICATION APPROVAL

The ESCO or contractor shall submit a modification or Change Order (CO) to the Facility Owner that includes:

- justification for the change, and,
- the estimated increase/decrease in project cost.

The Facility Owner shall notify the CEA/CEM that performed the IGA of all modifications, and the CEA/CEM shall assess if the modifications will require a change to the IGA.

If the modifications will require a change to the IGA, the Facility Owner shall:

- notify AHFC in writing prior to implementing the modifications, and,
- shall authorize the CEA/CEM to update the IGA as needed.

If the Facility Owner approves the modifications, the Facility Owner shall provide AHFC with the updated IGA.

Work under the modified IGA shall not proceed until the Facility Owner receives written approval from AHFC.

SECTION 15002 FAILURE TO MODIFY

If the Facility Owner rejects the modifications, and the IGA and/or the scope of work will not be modified, no notification to AHFC is required.

SECTION 15003 BUDGET OVER-RUNS

Budget over-runs may occur without modifications to the scope of work. For example, weather or other elements may alter the construction schedule and lead to increased construction costs. ESCOs and Facility Owner contractors shall notify the Facility Owner immediately of potential budget over-runs. For EPC projects, Facility Owners will notify AHFC in writing of budget over-runs may affect complete implementation of the final scope of work. For Non-EPC projects, Facility Owners will notify AHFC as described in SECTION 13004 .

PART XVI TECHNICAL ASSISTANCE

Support from AHFC is integral to the success of the REAL program. AHFC or an AHFC-designated Technical Assistance Contractor (TAC) may assist Facility Owners with potential projects. Facility Owners are encouraged to engage the TAC as early in the process as possible to maximize the benefits of the program.

Support from the TAC **may** include:

- Helping Facility Owners complete the [Preliminary Benchmark Data Form](#),
- Assisting with the Benchmarking and/or Investment Grade Audit process,
- Training data users/managers on using AkWarm-C©
- Helping Facility Owner and ESCO or Facility Owner contractor develop comprehensive, deep retrofits that incorporate as many EEMs as are financially viable,
- Assistance with contract negotiations, including the ESCO selection process and attending meetings between Facility Owner and ESCO as needed,
- Providing technical, feasibility, and contracting assistance,
- Recommendations for construction administration to insure project viability,
- Assisting with oversight and monitoring various phases of the project, from inception through the performance period,
- Reviewing audits, project cost alignment, proposals, calculations, contracts, and reports,
- Reviewing measurement and verification of savings,
- Mediating any conflicts that may arise as needed,
- Assisting Facility Owner in implementing Energy Conservation Measures, to realize additional energy savings, and,
- Additionally, for Non-ESCO Projects:
 - Assisting Facility Owner developing project scope from IGA,
 - Helping Facility Owners with projects where EPC are not viable to develop alternative implementation methods, and establish qualifications for Facility Owner contractors that are not ESCO,
 - Assisting Facility Owner in grouping projects and/or facilities to make project more cost-effective or amenable to EPC,

RETROFIT ENERGY ASSESSMENT FOR LOANS (REAL)

SECTION 15003

- Assisting Facility Owner with self-monitoring to verify projected energy savings are realized,
- Identifying and integrate additional funding sources when applicable to communities with eligibility/access to these funds, and,
- Evaluating bulk procurement opportunities for EEM equipment and materials, to obtain bulk pricing or shipping discounts for multiple non-EPC facilities.

PART XVII PROGRAM MONITORING

AHFC may monitor various elements of AHFC-funded projects from time to time. Facility Owners, ESCOs, and Facility Owner contractors shall provide access to the project site and project documentation within 10-days of written request from AHFC. AHFC-funded project monitoring may be conducted in the field or from the desktop, and may include but is not limited to:

- verifying benchmark and/or investment grade audit data,
- reviewing project implementation
- reviewing implementation and documentation of change orders,
- verifying EEMs implemented under the project,
- evaluating measurement and verification process and parameters,
- reviewing implementation contracts and/or EPC,
- other monitoring elements to ensure program goals and objectives are met and maintained, and,
- reviewing operations & maintenance costs and utility costs.

APPENDIX A URL DEFINITIONS

- 12 AAC 36.110 - <http://touchngo.com/lglcntr/akstats/aac/title12/chapter036/section110.htm>
- 15 AAC 150.210 - http://www.ahfc.state.ak.us/regulations/150_200.cfm
- 15 AAC 155.600, 15 AAC 155.605 - <http://www.ahfc.state.ak.us/regulations/regulations.cfm>
- AkWarm-C© - <http://www.ahfc.state.ak.us/reference/akwarm.cfm>
- Alaska Energy Data Inventory - <http://akenergyinventory.org/>
- Alaska Retrofit Information System (ARIS) - <http://www.cchrc.org/aris-development>
- ASHRAE - <http://www.ashrae.org/publications/page/784>
- Association of Energy Engineers (AEE) - <http://www.aeecenter.org/i4a/pages/index.cfm?pageid=1>
- Board-approved Arctic Engineering Courses - <http://www.commerce.state.ak.us/occ/pub/baac.pdf>
- Certified Energy Auditors (CEA) - <http://www.aeecenter.org/i4a/pages/index.cfm?pageid=3365>
- Certified Energy Managers (CEM) - <http://www.aeecenter.org/i4a/pages/index.cfm?pageid=3330>
- Commercial Buildings Energy Consumption Survey (CBECS) - http://www.eia.doe.gov/emeu/efficiency/cbecstrends/cbecs_tables_list.htm
- Contact AHFC - http://www.ahfc.state.ak.us/loans/akeerlf_loan.cfm
- Efficiency Valuation Organization (EVO) - <http://www.evo-world.org/>
- Energy Escalation Rate Calculator - http://www1.eere.energy.gov/femp/information/download_blcc.html#eerc
- Energy Services Coalition - http://www.energyservicescoalition.org/resources/model/AttachG-Energy_Performance_Contract.pdf
- Idaho Department of Administration - <http://adm.idaho.gov/pubworks/perfcontracting/>
- International Performance Measurement and Verification Protocol (IPMVP) - http://www.evo-world.org/index.php?option=com_content&view=article&id=272&Itemid=397&lang=en
- Introduction to Measurement & Verification for DOE Super ESPC Projects - http://www1.eere.energy.gov/femp/pdfs/intro_mv.pdf

Lawrence Berkeley Lab Library - <http://mnv.lbl.gov/support/cx>.

National Association of Energy Service Companies (NAESCO) -
<http://www.naesco.org/accreditation/criteria.htm>

National Historic Preservation Act - <http://www.achp.gov/nhpa.html>

National Institute of Building Sciences - <http://www.nibs.org/>

REAL Application & Preliminary Benchmark Data Form -
http://www.ahfc.state.ak.us/iceimages/manuals/REAL_initial_benchmark_data.doc

Senate Bill 220, A.S. 18.56.855 -
http://www.legis.state.ak.us/basis/get_bill_text.asp?hsid=SB0220Z&session=26

State Historic Preservation Office - <http://dnr.alaska.gov/parks/oha/shpo/shpo.htm>

USDOE M&VP Resources -
http://www1.eere.energy.gov/femp/financing/superespics_mvresources.html

Whole Building Design Guide - <http://www.wbdg.org/>

Whole Building Design Guide, "Building Commissioning -
<http://www.wbdg.org/project/buildingcomm.php>

Wyoming Energy Conservation Improvement Program (WYECIP) -
<http://www.wyomingbusiness.org/pdf/energy/Appx%20J%20-%20WYECIP%20Contract%20Attach%20E%20RA%20Matrix%20upd2-1-09P.pdf>

APPENDIX B LESSONS LEARNED FROM EPC PROJECTS

The United States Department of Energy (USDOE) Technical Assistance Center (TAC) provided a list of issues to consider for successful performance contracts. The list is not exhaustive or all-inclusive but shall be considered when evaluating the EPC model for a given project.

ECONOMY OF SCALE

The transaction costs in pursuing any EPC bid – developing the audit, assembling the bid, making the desired margin on a given project, etc. – may make small projects or those expected to have hidden costs less attractive to an ESCO. One strategy is to bundle the assets a Facility Owner wants to retrofit into a single EPC. As the size of the project increases:

- the proportion in transaction costs is reduced,
- risk is spread out over the asset base, and,
- shorter-payback EEMs or buildings may help enable improvements on longer payback EEMs or buildings.

ESCO NEGOTIATIONS

If multiple ESCOs are competing for the Facility Owner's business, the Facility Owner is in a better position to negotiate for competitive pricing and decreased margins, and the amount of savings stated in the performance guaranty may be less conservative. However, the sooner a single ESCO is selected to move forward with the project:

- the sooner an investment grade audit can be produced,
- the more the firm can invest into developing the project, and,
- the sooner the savings can be achieved.

ALLOW TIME FOR EPC PROCESS

EPC is a process that requires time to develop a project that will accomplish the Facility Owner's and the ESCO's project goals and objectives. The goals and objectives for the Facility Owner and the ESCO may not always be aligned, and it's important to identify this and adjust the elements of the EPC accordingly before entering into the EPC. The Facility Owner and the ESCO will work closely for the term of the project – from design and implementation through operations and maintenance and measurement and verification. Positive relationships and trust among all parties are critical to project success.

MAXIMIZE FUNDING OPPORTUNITIES

Seed money, such as grants, can be used to pay down the principal, to extend the scope of the project for a given loan term, or to buy down risk. Other capital improvements, funded by non-AHFC sources, may be coupled with the energy efficiency retrofits to reduce implementation costs, engineering/design, project management, and other costs.

LIMIT RISK WITH QUALITY DATA

The quality of the technical data – from the IGA to the measurement and verification data – can reduce the risk. The data are the backbone of the EPC and data collection protocols should be commensurate with the risk that may be incurred from the data.

Final DRAFT

APPENDIX C RISK ASSESSMENT

As with any contract, performance contracts involve potential risk. Facility Owners and ESCOs should consider potential risks before entering into an Energy Performance Contract (EPC). This section presents some, but not all, examples of risk that are typically considered

Typically, the Facility Owner and ESCO develop a Risk Assessment Matrix for Energy Performance Contracts. The Risk Assessment Matrix may be incorporated into the Energy Performance Contract. A sample risk assessment matrix is available from the [Wyoming Energy Conservation Improvement Program \(WYECIP\)](#).

The following sections include examples of some of the risk factors addressed in a Risk Assessment Matrix, but the examples are not all-inclusive. It is up to the Facility Owner and the ESCO to identify the risk factors that apply specifically to the project and to develop a comprehensive Risk Assessment Matrix.

FINANCIAL RISK FACTORS

Interest Rates

Neither the ESCO nor the Facility Owner has significant control over prevailing interest rates. AHFC loan interest rates will be locked in at the time the loan application is approved (IGA, Scope of Work, and approval by AHFC). However, if multiple funding sources are used, other interest rate conditions may apply. During all phases of the project, interest rates may change with market conditions. Higher interest rates can increase project cost, financing/project term, or both. The timing of the contract signing may impact the available interest rate and project cost. The risk assessment should clarify how fluctuating interest rates will be handled.

Energy Prices

For AHFC loans in the REAL program, energy prices are only considered in the loan application process. Post-construction energy savings are based on energy savings (BTU/year), not energy cost savings, so energy prices are not considered. However, energy prices may apply to agreements between the Facility Owner and the ESCO. Neither the ESCO nor the Facility Owner has control over the volatility of energy prices. The Risk Assessment Matrix should clarify how future energy costs will be treated.

Construction Costs

During the performance period, the ESCO is responsible for determining construction costs and defining a budget. In a fixed-price design/build contract, the Facility Owner assumes little responsibility for cost overruns. However, if construction estimates are significantly greater than originally assumed, the ESCO may find that the project or EEM is no longer viable and remove it before the contract is issued. The risk assessment should clarify how standards and the design approval process (including change orders) will be managed and how costs will be reviewed.

Measurement and Verification Costs

The Facility Owner assumes the financial responsibility for M & V costs directly or through the ESCO. If the Facility Owner wishes to reduce M & V costs, it may do so by accepting less rigorous M & V activities with more uncertainty in the energy savings estimates. The risk assessment should clarify how project savings will be verified (e.g., equipment performance, operational factors, energy use) and the impact on M&V costs.

Non-energy Savings

The Facility Owner and the ESCO may agree that the project will include savings from recurring and/or one-time efficiencies. This may include one-time savings from avoided expenditures for projects that were appropriated but will no longer be necessary. Including one-time efficiency savings before the money has been appropriated entails some risk to the Facility Owner. Recurring savings generally result from reduced O&M needs, reduced water consumption and wastewater treatment and disposal, and reduced solid and/or hazardous waste disposal. Recurring savings should:

- be based on actual measured reductions, and,
- define and itemize sources of non-energy savings and how they will be verified.

Delays

Both the ESCO and the Facility Owner can cause delays. Failure to implement a viable project in a timely manner may incur costs to the Facility Owner in the form of lost savings, and can add cost to the project (e.g. construction interest, re-mobilization, etc.). The Risk Assessment Matrix should define the schedule and clarify how delays will be managed, consistent with the EPC.

Major Changes to the Facility

The Facility Owner controls major changes in facility use, including closure. The risk assessment shall assign responsibilities in the event of a premature facility closure, loss of funding, or other major change.

Negotiable Items

The following are examples of items that may be negotiated in some Energy Performance Contracts:

- Facility Owner deferred maintenance cost,
- Interest rates (including other types of financing that are available and could be considered for this project),
- Outside incentive funds (utility incentives, grants, etc.), and,
- Customer equity cash contribution to the project.

The risk assessment should address any potential risks associated with incorporating negotiable items into the project.

OPERATIONAL RISK

Operating Hours

The Facility Owner generally has control over operating hours. Increases and decreases in operating hours can show up as increases or decreases in “savings” depending on the M&V method (e.g., operating hours multiplied by improved efficiency of equipment vs. whole-building/utility bill analysis). The risk assessment should address whether operating hours are to be measured or stipulated and what the impact will be if they change. If the operating hours are stipulated, the baseline energy consumption should be carefully documented and agreed to by both parties.

Load

Equipment loads can change over time. The Facility Owner generally has control over hours of operation, conditioned floor area, and intensity of use (e.g. changes in occupancy or level of automation). Changes in load can show up as increases or decreases in “savings” depending on the M & V method. Clarify whether equipment loads are to be measured or stipulated and what the impact will be if they change. If the equipment loads are stipulated, the baseline energy consumption should be carefully documented and agreed to by both parties.

Weather

A number of energy efficiency measures are affected by weather. Neither the ESCO nor the Facility Owner has control over the weather. Changes in weather can increase or decrease “savings” depending on the M&V method (e.g. equipment run hours multiplied by efficiency improvement vs. whole-building/utility bill analysis). If weather is “normalized,” actual savings could be less than payments for a given year, but will average out over the long run. Clearly specify how weather corrections will be performed.

User participation

The success of an EPC requires user participation to generate savings (e.g., control settings), especially if Energy **Conservation** Measures (ECMs), which rely on human behavior, are to be part of the project. Savings can be variable and, for this reason, the ESCO may be unwilling to invest in ECMs, or EEMs that require user participation, to meet savings objectives. The risk assessment should define the degree of user participation necessary and utilize monitoring and training to mitigate risk. If performance is stipulated, document and review assumptions carefully and consider M&V to confirm the capacity to save (e.g., confirm that the controls are functioning properly).

PERFORMANCE RISKS

Equipment Performance

Generally the Facility Owner has final approval over the selection of equipment and the ESCO is responsible for its proper installation, commissioning, and performance. It is the ESCO's responsibility to demonstrate that the new EEMs meet expected performance levels including specified equipment capacity, standards of service, and efficiency. The risk assessment defines who is responsible for initial and long-term performance, how it will be verified, and what will be done if performance does not meet expectations through the performance period, product warranty periods, or other applicable periods for which the ESCO is responsible, per the EPC.

Operations

During the performance period, responsibility for operations is negotiated between the ESCO and the Facility Owner, and can impact performance. Clarify responsibility for operations, the implications of equipment control, how changes in operating procedures will be handled, and how proper operations will be assured.

Preventative Maintenance

During the performance period, responsibility for maintenance is negotiated between the ESCO and the Facility Owner, and can impact performance. Clarify how long-term preventive maintenance will be assured, especially if the party responsible for long-term performance is not responsible for maintenance (e.g., ESCO provides maintenance checklist and reporting frequency, but Facility personnel perform maintenance). Clarify who is responsible for long-term preventive maintenance to maintain operational performance throughout the performance period. Clarify what will be done if inadequate preventive maintenance impacts performance.

APPENDIX D WALK-THROUGH ASSESSMENT

If the data provided in the [REAL Application & Preliminary Benchmark Data Form](#) are insufficient to ensure an eligible energy efficiency retrofit project, AHFC may request a walk-through assessment. Walk-through assessments will be performed by a qualified CEA/CEM (see SECTION 10001). Typically, the CEA/CEM will be contracted by the Facility Owner; however, AHFC may perform a limited number of walk-through assessments based on AHFC's best interest for the program. The Facility Owner shall provide mechanical, electrical, and architectural as-built drawings for all facilities in the project *prior* to the walk-through assessment. Due to the remote nature of many project sites, the Facility Owner or other designee may be required to field-confirm as-builts prior to the walk-through process.

The Walk-through Assessment includes elements of the ASHRAE Preliminary Energy Analysis and the ASHRAE Level I Walk-through Analysis.

PRELIMINARY ENERGY ANALYSIS

The preliminary analysis will evaluate system and structure as-built drawings, utility data, and facility operator knowledge to calculate the facilities:

- conditioned square footage (ft²),
- end use energy allocation (calculated as % of total BTU):
 - Heating,
 - Lighting,
 - Domestic hot water,
 - Cooling (if applicable),
 - Refrigeration(if applicable),
 - Kitchen/cooking (if applicable),
 - Laundry (if applicable),
 - Other processes (e.g., baling equipment, oil-water separation, sewage treatment.
- energy performance summary based on a minimum of 12-months of utility data:
 - calculate the energy utilization index (EUI), in BTU/ft²/year, based on conditioned square footage,
 - calculate the metered and/or delivered total water use, in kGal/year or ft³/year,

- calculate the metered and/or delivered minimum and maximum demand for each energy source in kGal/month, kWh/month, BTU/month **and** kGal/ft², kWh/ ft², BTU/ ft², and
- calculate the energy cost index (ECI) for each fuel source and water, per ASHRAE Energy Performance Comparison Standard 105, in $\$/(\text{ft}^2)_{\text{gross, conditioned}}$.

If data for comparison buildings are available, calculate target EUI and ECI per recommended ASHRAE methods, based on similar buildings. Calculate the anticipated energy and cost savings for each fuel type if the facility were retrofitted to meet the EUI/ECI targets.

Comparison data may be available from:

- CBECS – 1992-2003 [Commercial Buildings Energy Consumption Survey \(CBECS\)](#), and,
- Other Alaska Energy Utilization Index data, if available, from the Alaska Department of Transportation & Public Facilities (ADOT/PF), the Alaska Native Tribal Health Consortium (ANTHC), and/or the Alaska Energy Authority (AEA)..

LEVEL I WALK-THROUGH ANALYSIS

The Level I Walk-through Analysis audit refines system and structure assumptions that were based on as-built drawings and utility data, to develop a list of low-cost or no-cost EEMs for immediate savings. In addition to the preliminary energy use analysis, the walk-through assessment will:

- Further subdivide the facility into functional spaces, based on use, such as those described in ASHRAE 105-2007,
- Identify the specific HVAC & lighting systems that condition each functional area,
- Describe any O&M procedures in place to address building energy efficiency,
- Describe any known/reported maintenance problems, e.g. heating imbalances, etc.,
- Chart the occupancy (population and hours of peak use, maintenance/security-only use, etc.), including seasonal variations, if applicable,
- Provide detailed building envelope information, including:
 - Total exposed above-grade wall area (ft²), glazing area (ft² and % of exposed wall area), and roof area (ft²),
 - Total above-grade wall area common to other conditioned building(s), if applicable,

RETROFIT ENERGY ASSESSMENT FOR LOANS (REAL)

APPENDIX D

- Total floor area exposed to outside conditions (cantilevered floors, buildings on pilings),
- Inventory lighting systems and types; calculate fixture and ballast load (W/ ft², % of occupied space (ft²),
- Identify and inventory all HVAC system data for 1^o heating, 1^o cooling, air handling, exhaust, and other systems (e.g., energy recovery, on-site generation, energy monitoring & control, etc.),
- Identify HVAC systems unoccupied setbacks, by time schedule & outside air temperature,
- Identify any other loads that may not be standard for the building type (e.g., parking garage lighting, snow melting, etc.), and,
- Identify potential energy efficiency measures (EEMs), EEM costs, and projected savings from implementing the EEMs.