

Energy Savings Performance Contracting

Guidelines for Public Agencies in Washington State

March 2012

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Enterprise Services
Facilities Division – Energy Program**



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Appendix 1 List of Acronyms used

Appendix 2 Guidance for agencies that do not use energy savings performance contracting

1. Energy Savings Performance Contracting

Energy Savings Performance Contracting (ESPC) means contracts for which payment is conditional on achieving contractually specified savings (Chapter 39.35C.010 RCW). ESPC is a method of identifying, implementing and financing energy and utility efficiency projects at public facilities. By leveraging utility savings along with grants, utility rebates and capital dollars, projects can typically be funded within existing operating budgets. ESPC in Washington State relies on a working partnership, contractually established between the client agency, the Department of Enterprise Services (DES) Energy Program and an energy services company (ESCO).

ESPC shares many similarities with conventional public works design and construction practices. However, there are some distinct differences between ESPC and the design, bid, build (DBB) process. ESPC can provide many opportunities to a client agency installing energy efficiency equipment, which are not otherwise available when using the DBB process. The ESCO assumes the construction and performance risk for the project.

Some advantages to ESPC over traditional DBB for procuring energy efficiency equipment include:

- The ESCO provides a guaranteed maximum construction cost.
- Third-party financing is available, which allows the client agency to construct projects sooner. Some public works projects can take as long as six years to complete: identifying the project and requesting funding in the first biennium; designing in the second biennium; and, constructing in the third biennium. Using ESPC, a similar project can be completed in 18 months or less.
- By using the State Treasurer or third-party financing for procuring energy efficiency equipment, the client agency preserves scarce capital dollars for more pressing building improvements. Combining such financing with capital dollars allows the client agency to leverage capital appropriations or bonds, essentially doing “more with less.”
- ESPC maximizes utility financial participation in the project.
- ESCO selection is based on qualifications. Since the ESCO also provides general contracting services, the client agency is also selecting the highest qualified general contractor, rather than the low-bid contractor.
- Building audit findings must meet the client agency’s cost effectiveness criteria or there is no cost for the ESCO’s audit services.
- The ESCO is the single point of accountability from audit through design, construction and commissioning. This reduces the uncertainty of identifying a responsible party when design or construction issues arise.
- Commissioning is an integral component of ESPC since the ESCO is required to guarantee equipment performance.
- The ESCO provides a guarantee of energy savings and reimburses the client agency for any savings shortfalls.
- ESCO’s measurement and verification (M&V) services provide the client agency with assurance that equipment will perform for the life of the agreement.

2. Energy Services Companies Selection

a) Energy Services Company Definition

An ESCO is an energy consultant who engages in performance-based contracting with a client agency to develop and install measures that reduce energy and water consumption and/or costs in a technically and financially viable manner. ESCOs provide a range of professional services, including energy auditing, determination of client baseline energy consumption, multi-discipline engineering design, project construction management, financial and risk analysis and management, measurement of energy savings and analysis of impact, commissioning of installed project elements, facilitation of financing, seeking other available funding sources (utility rebates, grants), and maintenance and operations training for new or renovated systems. ESCOs provide a guaranteed maximum project cost, guaranteed minimum quantity energy savings and guaranteed equipment performance for the projects they design and cause to be installed. Guaranteed savings and performance are based upon detailed, site specific information collected in an investment-grade audit (see Section 6). ESCOs must have the financial capability to fund the acquisition and installation of projects and be willing to be reimbursed out of the energy savings over the term of the investment. ESCO companies must hold a valid general contractor's license in the state of Washington.

b) Enterprise Services ESPC Program

ESCO Qualifications: Every two years the DES Energy Program establishes a pre-qualified list of ESCOs capable of providing energy services to public facilities in the state for the upcoming biennium. To qualify, ESCOs respond to a Request for Qualifications (RFQ), which is advertised in the Daily Journal of Commerce in Seattle, Portland and the Spokesman Review in Spokane. The DES Energy Program evaluates the companies' qualifications and experience and offers an agreement to those that are deemed qualified. ESCOs that execute this agreement become eligible to develop energy-related projects on behalf of Washington public facilities under DES's ESPC Program. The process satisfies public works selection requirements and enables public-sector clients to avoid having to conduct duplicative, individual public works selection processes.

DES's Contracting Process: Public-sector agencies choosing to participate in energy savings performance contracting work through DES's ESPC program first establish an interlocal agreement with DES pursuant to Chapter 39.34.080 RCW. This agreement sets up a contractual relationship between the two public agencies that, once authorized by the governing bodies of each party, allows each agency to perform any governmental service, activity or undertaking that the law authorizes.

ESCO selection process: DES's client agencies are permitted to select any company from the pre-qualified list as long as they agree to participate in DES's program. These clients may use whatever selection process that complies with their own policies and procedures.

DES energy engineers are assigned to work with client agencies based either on their locality or client organization. As part of the selection process, the client agency may choose to obtain from DES's assigned energy engineer the following background information:

- (1) Executive summaries from each ESCO's statement of qualifications, which provide key information on how each firm approaches projects, their specific experience and the scope of projects completed in recent years; and
- (2) The full statement of qualifications and sample energy audits submitted by the ESCOS for evaluation by DES's pre-qualification selection committee.

If the client agency chooses to interview firms as part of the selection process, the energy engineer may sit in on ESCO interviews but does not participate in the final decision-making process. The client agency makes the final ESCO selection.

c) Public Agency RFP Process

Chapter 39.35A RCW provides the authority for public work of performance-based contracts for water conservation, solid waste reduction, and energy equipment. RCW 39.35A.010 states:

“Therefore, the legislature declares that it is the policy that a municipality may, after a competitive selection process, negotiate a performance-based energy contract with a firm that offers the best proposal.”

Chapter 39.35A.30 RCW provides guidance for municipalities to select their own ESCO for a performance based contract:

(1) Each municipality shall publish in advance its requirements to procure water conservation services, solid waste reduction services, or energy equipment and services under a performance-based contract. The announcement shall state concisely the scope and nature of the equipment and services for which a performance-based contract is required, and shall encourage firms to submit proposals to meet these requirements.

(2) The municipality may negotiate a fair and reasonable performance-based contract with the firm that is identified, based on the criteria that is established by the municipality, to be the firm that submits the best proposal.

(3) If the municipality is unable to negotiate a satisfactory contract with the firm that submits the best proposal, negotiations with that firm shall be formally terminated and the municipality may select another firm in accordance with this section and continue negotiation until a performance-based contract is reached or the selection process is terminated.

RCW 39.04.010, the definitions section of the public works statute, defines a municipality as follows:

"Municipality" means every city, county, town, port district, district, or other public agency authorized by law to require the execution of public work, except drainage districts, diking districts, diking and drainage improvement districts, drainage improvement districts, diking improvement districts, consolidated diking and drainage improvement districts, consolidated drainage improvement districts, consolidated diking improvement districts, irrigation districts, or other districts authorized by law for the reclamation or development of waste or undeveloped lands.

Within this context, the public works statutes apply to all cities, counties, towns, port districts or other public agencies.

Contracts for performance-based energy work may be executed by public agencies after advertisement and competitive selection. DES uses the Request for Qualifications document for advertising and conducting the competitive selection process. Municipalities that choose not to go through DES's ESPC Program will need to follow the requirements set forth in RCW 39.35A.30.

3. Cost-effectiveness Criteria

Chapter 39.35C.010 RCW provides one definition for cost-effectiveness. It states:

"Cost-effective" means that the present value to a state agency or school district of the energy reasonably expected to be saved or produced by a facility, activity, measure, or piece of equipment over its useful life, including any compensation received from a utility or the Bonneville Power Administration, is greater than the net present value of the costs of implementing, maintaining, and operating such facility, activity, measure, or piece of equipment over its useful life, when discounted at the cost of public borrowing.

This means that projects may be considered cost-effective if they result in a net positive present value over their economic lifetime. For purposes of determining economic lifetime, ESCOs rely on generally accepted engineering practices established by entities such as the American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE), or other national or international standard setting bodies.

Based on this definition, DES's ESPC Program directs the client agency to set the cost-effectiveness criteria that will be used for their projects. The client agency also may establish supplementary cost-effectiveness criteria, including but not limited to: simple payback, budget neutrality, or maximum financing term.

The following factors should be considered in developing cost-effectiveness criteria:

- The client agency may use a combination of funding and payment options to discharge its obligations under the contract for ESCO services, such as:
 - ESCO financing;
 - ESCO arranged Municipal Lease financing;
 - State Treasurer's lease/purchase or LOCAL Program^[1];
 - Other third-party financing (banks, etc.);
 - Energy cost savings, utility cost savings, and approved O&M savings to pay off any of the above debt structures;
 - Grants, loans and/or incentives from utilities or other funding sources; and

^[1] Chapter 39.94 RCW authorizes the State Treasurer to enter into financing contracts for the state or on behalf of another agency for the use and acquisition for public purposes of real and personal property. The State Treasurer's state agency lease/purchase program details can be found at <http://www.tre.wa.gov/government/leasePurchaseProgram.shtml>

- The owner's capital budget or any other funds at the owner's discretion.
- The financing term may not exceed the economic life of the energy efficiency measures (EEM), unless otherwise approved by the client agency^[2].
- Not more than 90% of the energy cost savings should be used to repay the financing, unless otherwise approved by the client agency.
- Up to 100% of utility grants may be used to defray project costs or to repay the financing agreement.
- Labor or maintenance cost savings should not be included in energy cost savings for the purpose of determining cost-effectiveness, unless specifically approved by the client agency. These cost savings typically represent costs for purchased parts and service contracts, rather than internal labor cost savings.
- The total cost of implementing the EEMs will include the cost of the investment-grade audit, preparation of the energy services proposal, project design, construction, administration, DES's management fee (if applicable), commissioning, subcontractor bidding, bonding, insurance, overhead and profit, permits, taxes, client agency training, cost and saving guarantees, and other costs that may be agreed to by the ESCO and the client agency.
- The client agency's future period cash flow including utility bill savings, utility incentive contributions, cost of measurement and verification services, cost of EEMs, and financing should be neutral or positive with respect to the client agency's "before project" cash flow. Future utility bill savings are based on the ESCO's guarantee of savings.
- Current utility rates should be used to calculate energy and utility cost savings. Energy and utility cost inflation factors should not be used without the client agency's expressed approval.
- Identify whether proposed measures must be cost-effective on a stand-alone basis or whether they will be considered as a bundled total. Under the bundling consideration, measures are considered to meet the economic criteria even though some individual measures with high paybacks are supported by other measures with low paybacks.

Occasionally a client agency will have additional criteria that must be met, such as shortened facility life-time due to planned replacement, limitations on borrowing capacity, and special conditions associated with federal or state grants used to pay for a project.

4. Preliminary Audit

The preliminary audit, conducted by the ESCO in consultation with the client's facility expert, evaluates the facility to determine the likelihood that further investigation and analysis will yield a project of cost-effective EEMs. The ESCO, DES (if applicable) and the client agency use the

^[2] The State Treasurer's Office requires that the finance term of any loan does not exceed the useful life of the equipment financed. The Office of Financial Management's useful life table (Chapter 30.50 of the State Administrative & Accounting Manual) can be found at <http://www.ofm.wa.gov/policy/30.50.htm>

preliminary audit and subsequent proposal process to ensure the project meets the owner's cost-effectiveness criteria and addresses most or all of the facility's needs.

For projects that are managed under DES's ESPC Program, this is the point where the ESCO and the DES energy engineer begin working together and continue to work together throughout the remainder of the project. The benefits of this relationship for the ESCO are reduced costs for preliminary audit development, another technical expert to help develop energy efficiency measure ideas, and streamlining of the project development so it will move through the client agency's approval process faster. DES can likewise assist the client agency to present the project to internal decision makers, explain contracting and invoicing requirements to accounting staff, or guide the client agency to develop applications for grant fund that may be available from state or federal sources.

Audit Preparation/Development: Prior to conducting the preliminary audit, the client agency provides the following information about the facility to the ESCO:

- ***Utility billing information*** (at least for the most current 12-month period, but preferably for the past two years). Utility data may include electricity, natural gas (i.e., all heating fuels routinely purchased including propane, diesel, or other petroleum products, biomass, etc.), water and waste billing records as appropriate.
- ***Facility operations/capacity*** (e.g., operating schedules, square footage and average facility occupancy)

These data are analyzed to establish the energy utilization index (EUI) of the facility. This represents a measure of building energy efficiency and is calculated as total energy consumed per year (in Btus) divided by building square footage (Btu/sq ft/yr).

During development of the preliminary audit, methods for establishing energy baseline data measurement and verification (M&V) will be proposed by the ESCO and reviewed and agreed upon by DES (if applicable) and the client agency.

Audit Report: The preliminary audit report forms the basis for the ESCO's investment-grade audit proposal where a scope of work is identified and an audit cost is negotiated. It includes:

- Systems, facilities and/or measures to be analyzed and evaluated in the more detailed investment-grade audit. These measures may be identified as:
 - (1) fully cost-effective in that the energy savings will repay the investment within the measure's useful lifetime;
 - (2) cost-effective if the client agency has additional capital to invest other than the borrowed funds; and
 - (3) necessary for safe and comfortable operation of the facility but probably not meeting basic cost-effectiveness criteria for simple payback.
- Equipment data-logging opportunities when time-appropriate. (It is difficult, for instance, to get a good representation of cooling equipment operation in the winter or true occupancy patterns of a school over the summer.) To establish the project, data collection on parameters such as equipment run hours, space and system temperatures, air flow

rates, and facility occupancy may ultimately be used to create building energy use models or support other analyses by the ESCO.

The ESCO, DES (if applicable) and the client agency use the preliminary audit and subsequent proposal process to verify that a project appears to meet the owner's cost-effectiveness criteria and addresses most or all of the facility's needs.

5. Proposal for the Investment-grade Audit and the Energy Services Proposal

A proposal for an investment-grade audit (IGA) and energy services proposal (ESP) are developed based upon the preliminary audit, which identifies potential cost-effective EEMs. The IGA proposal should include at least the following components:

- a) **Scope of the IGA:** Include: (1) a list of any facilities that will be investigated in the audit. Energy consuming systems in a given facility need to be clearly defined directly or by exclusion of systems not to be investigated; (2) the area, in square feet, of the facilities to be investigated; (3) any additional deliverables beyond the ESP, (e.g., Greenhouse Gas Inventory creation or Energy Star Benchmarking establishment).
- b) **Timeline for completing the IGA:** Identify major milestones, including client agency's decision points for individual EEMs and other identified information.
- c) **Cost of the IGA:** Methods to determine costs include: (1) dollar-per-square-foot basis. The \$/sq ft cost will typically be higher for smaller square footages or more complex systems; and (2) time and materials basis. Either of these methods should identify a not to exceed (NTE) cost.
- d) **Preliminary measurement & verification (M&V) plan:** Indicate the likely M&V method and timing that will be used. The plan should be based on the International Performance Measurement and Verification Protocol (IPMVP^[3]). For the M&V that will occur during the IGA phase, the proposal must indicate when in the timeline that will occur. To the degree possible, seasonal equipment energy use should be measured during the appropriate season. If measurement is conducted outside of the normally appropriate season (e.g. heating system measurement during the summer), the forced loading requirements needed to simulate normal seasonal operation should be clearly defined in the plan.
- e) **Other documentation or exclusions:** Identify any other information needed for the IGA, including (1) owner supplied documentation or assistance; and (2).exclusions or limitations to the range of systems being analyzed or the scope of technical analyses expected to be employed by the ESCO in the IGA. These must be clearly identified up front and agreed to by all parties.

^[3] <http://www.nrel.gov/docs/fy02osti/31505.pdf> Note that M&V plans can employ Options A, B, or C or a combination of the options as appropriate. Option A is typically used for lighting system improvements; Options B and C are used for other types of EEMs.

- f) **Energy services proposal:** Define what will be included in the energy services proposal that will be developed at the end of the IGA. All deliverables need to be clearly identified.

6. Investment-grade Audit

Professional Services Contract/Agreement: Once the ESCO, DES (if applicable) and the client agency agree on the energy savings potential in the facility, and an investment-grade audit proposal has been accepted, the next step is to negotiate a contract for the professional services necessary to complete the work. As described above, the cost of the IGA may be based on a value per square foot of audited facilities or by other means. The professional services contract should clearly specify the services to be provided, the not-to-exceed cost for these services, and the deadline for completion.

For projects where DES acts as the client agency's representative, the energy engineer reviews the IGA proposal and negotiates the cost of the audit prior to it being presented to the client agency. With the client agency's approval, DES then establishes a professional services agreement with the ESCO for the IGA.

Conducting the IGA: The ESCO then conducts a detailed investment-grade energy audit of the facility and submits an energy services report and an energy services proposal to the client and DES (where applicable) for review and approval.

The investment-grade energy audit is conducted to analyze all cost-effective EEMs for systems such as lighting, HVAC equipment, building envelope, steam, chilled water, domestic hot water and other water using systems, building controls, energy generation and distribution, and waste management systems. The audit is based upon detailed analysis of the existing systems, including instantaneous measurements of system performance parameters and, wherever possible, detailed data logging of system performance. The audit includes an evaluation of the economic performance and investment value of the EEMs.

The following are the potential outcomes of the investment-grade audit:

- a) If a facility does not have EEMs that meet the cost-effectiveness criteria established by the client agency there is no cost to the client for the audit. This is true unless the client agency, DES (if applicable) and the ESCO agree to other arrangements. In that case these special arrangements must be reflected in the contract documents.
- b) If the ESCO identifies cost-effective measures and the client agency decides not to proceed, then the ESCO will be reimbursed for the audit. If applicable, the DES Energy Program will also be paid a pre-determined termination fee.
- c) If the ESCO identifies cost-effective measures and the client decides to proceed, an energy services proposal is completed and presented.

7. Energy Services Proposal

The energy services proposal (ESP) contains the following components:

ESCO Deliverables

- ***Descriptions of the client agency's facility and the buildings and systems that will receive ESCO equipment and services.*** These must include information on operating conditions (i.e. hours of operation, temperatures, lighting levels, etc.); identification of problem areas (i.e. indoor air quality, hazardous materials, maintenance etc.); and other findings that will impact the costs or savings that will be achieved by the project.
- ***Facility baseline energy consumption*** for at least a one-year calendar period. The baseline data is used to calculate the energy savings and determine the methodology for measuring and verifying the savings. The baseline data also is used to determine the cost of energy that will be used in the calculation of energy cost savings. If water savings or maintenance savings are included in the project, the baseline data also includes water cost and consumption as well as maintenance costs and frequency.
- ***Description of the EEMs*** proposed for installation and EEMs that have been analyzed but disqualified because of cost or other constraints. The client agency may use this information for future projects or for alternative financing beyond that offered by the ESCO.
- ***Recommendations for replacement of existing equipment, and improvements to the existing equipment and operating conditions.*** Some of these improvements can result in low or no-cost operating savings that can be used to pay for higher cost measures, where measure bundling has been agreed to within the cost-effectiveness criteria.
- ***Detailed schedule for project completion,*** including client agency facility schedules that affect the times that are available or not available for construction activity.
- ***Services that the ESCO will be performing or will cause to be performed during the course of the project.*** These services may include but not be limited to: engineering design, construction management, preparation of operations and maintenance procedures, training of facility personnel on new equipment or procedures, project commissioning, warranty services and equipment maintenance. These services will be tailored to the project, the needs of the facility, the capabilities of the client's maintenance staff and the chosen financing methods.
- ***Verification of the comfort conditions that will be maintained at the facility.*** Standards of comfort for the client agency's facility will be as follows, unless otherwise negotiated:
 - a) Indoor **occupied** temperatures:
 - a. Winter minimum – 70 degrees F
 - b. Winter maximum – 74 degrees F
 - c. Summer minimum – 72 degrees F (where mechanical cooling is employed)
 - d. Summer maximum – 78 degrees F (where mechanical cooling is employed)
 - b) Indoor **unoccupied** temperatures:
 - a. Minimum – 55 degrees F
 - b. Maximum – 85 degrees F (where mechanical cooling is employed)

- c) Relative humidity (where humidity control is provided)
 - a. Minimum – 40%
 - b. Maximum – 60%
- d) Minimum outside air per occupant shall be in accordance with American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) standards and *Washington State Ventilation and Indoor Air Quality Code*.
- e) Illumination levels shall be as recommended by the Illuminating Engineer’s Society of North America (IESNA). Design calculations shall be made for each space, using an 80% lamp depreciation/maintenance factor. Average illumination levels shall be checked in each space after 100 operating hours. Average illumination shall not be less than 12.5% above the design level. For primary and secondary schools, illumination will also meet 1997 WAC 246-366-120 lighting requirements.

Less stringent conditions will not be proposed unless specifically approved by the client agency or DES (if applicable).

- ***Identification of the nature and extent of the work and equipment that the ESCO will receive from other firms under sub-contract.*** The ESP will also identify how these firms will be selected.
- ***Determination of the time when title to the ESCO equipment will pass to the client agency.***

Project Financing

The method of financing impacts the scope of the project and the amount of risk that the client agency assumes. Utility funding or grant awards may be used to supplement the project financing. If the ESCO is unable to finance a project through construction completion, including the cost of the IGA, the energy services contract may be terminated at no cost to the client agency.

If the ESCO finances or causes the project to be financed, the client agency will retain the right to buy out the financing agreement at any time. The ESCO must provide the termination value for each year of the authorization, which is based on the method of payment.

Guaranteed maximum construction cost (GMax)

Upon completion of the project scope, consisting of one or more EEMs, the ESCO develops the guaranteed maximum construction cost (GMax) and the guaranteed minimum energy savings. The guarantees for the project are based on the total project – not on a measure-by-measure basis.

The ESP details the GMax offered by the ESCO for installation of the recommended EEMs. For DES Energy Program managed projects, open book pricing principles are used for the project.

All project construction costs are reconciled at completion, and the client agency only pays the actual cost up to the GMax.

- ***The GMax includes*** the IGA cost, professional design fees, construction management fees, contingency on the construction cost, construction material and labor costs, including payment and performance bonds.
- ***The total project cost includes*** the sales tax on all components plus the DES project management fee, if applicable. Although these latter costs are not guaranteed by the ESCO they must be included in total project cost to establish overall project cost-effectiveness.

Guaranteed minimum energy savings

These are specified in native units of measure for the utility commodity purchased (e.g., electric savings would be in kWh, natural gas in Therms). The energy cost savings expected to result from the installation of the ESCO equipment and ESCO services are based on the baseline energy consumption previously developed. Baseline energy consumption may be adjusted to account for anomalies, code requirements or other issues (e.g., lack of outside ventilation air or recent facilities changes). The calculation methods used to determine the savings will be explained. This information can then be used to develop the overall M&V plan that will be used to track and verify the savings.

The guaranteed minimum energy savings is translated into dollars based on the current utility tariffs in effect. The guaranteed minimum energy savings does not have to equal the calculated energy savings; it can be slightly less to factor in risk associated with the particular EEM. The guaranteed energy savings is negotiated with the client agency and typically will be in the range of 90 to 95% of the calculated value.

Guaranteed equipment performance

Since energy savings is dependent on the performance of the actual equipment installed, performance parameters of the equipment also need to be met (e.g., boiler efficiency, heat pump SEER, control system capabilities.)

Statutory apprenticeship requirements

If the construction cost portion of the project exceeds \$1,000,000, the ESCO must comply with apprenticeship requirements pursuant to RCW 39.04.320.

8. Engineering Design

Final engineering design for ESPC projects typically is contracted to start concurrent with the construction or implementation phase of activity. This is very similar to design/build construction contracting since the IGA has defined the scope of work and a GMax. The ESCO is often the professional engineer and always the general contractor. This methodology minimizes the project risk for a client agency and reduces the delivery schedule by overlapping the design and construction phases of a project. In an ESCO project, the client agency, the agency's other

consultants, and the ESCO work together to determine what methods and materials will maximize the client agency's value. The client agency has more opportunity, through design review, to adjust the project without having to re-bid.

The ESCO, working with the client agency's project representative, maintains contact with the utility to maximize utility incentives. Further, the ESCO involves the utility company to the extent necessary to verify energy efficiency improvements consistent with that utility's conservation program requirements.

The ESCO conducts design and construction meetings and manages the selection of contractors and equipment suppliers after consultation with the client agency regarding responsible and acceptable bidders. The ESCO conducts all project meetings and issues meeting minutes within 3 working days of the meeting. Meeting minutes include all identified issues of concern, identification of those responsible for resolving these issues, and the time period expected for resolution. Unresolved issues should remain open from meeting to meeting until closed or resolved.

When the project design is complete and approved by the client agency and DES (when applicable), the ESCO solicits bids and selects sub-contractors. This bidding process differs from standard public works procurement. The ESCO does not need to publicly advertise or accept bids from any subcontractor that chooses to respond. Rather, only two or three subcontractors (pre-approved by the client agency and the ESCO) are typically asked to bid the work in each trade. The ESCO is not required to select the lowest bidder if it is deemed detrimental to the performance of the project. ESCOs that have self-construction capability may be allowed to perform/construct their own projects, but are encouraged to seek competitive bids to assure fair market value to the client agency. If the ESCO provides a competitive bid it should be submitted sealed to the client agency or DES, if applicable, at least 24 hours prior to the deadline for other sub-contractors to submit bids. This maintains fairness and competitiveness between the ESCO and the subs.

The ESCO is responsible for developing, providing, and implementing a project commissioning plan. Operation of all systems and equipment that are modified or installed as a result of the ESCO project should be verified by a qualified commissioning agent. This commissioning agent may work directly for the ESCO or may be hired as an independent third-party, depending upon the scope and complexity of the project or by client agency directive.

9. Construction

The ESCO, as the general contractor, has more opportunity to perform on-site investigation (even demolition) to prepare the project site for early installation and start-up of equipment. This reduces overall project duration. RCW 39.35A.040 provides authorization for the project to exclude statutory purchasing requirements. This allows the ESCO to negotiate costs based on best value, not requiring advertisement for bidding and award to lowest bidder. ESPC projects have to follow all other state statutes (including RCW 39.04 where not superseded by RCWs 39.35A and 39.35C) with respect to performance contracting projects to minimize risks to public facilities, the public and the ESCO.

If the project is completely financed by the client agency through lease purchase or other loan provisions, no invoice should be submitted until the project or approved project phase is complete and the ESCO has submitted a “Notice of Commencement of Energy Cost Savings” for the project, or for that approved project phase. Payments to the ESCO that are dependent on grants, loans or utility incentive payments will be made within 30 days of the date the client agency receives the funds. Payments to the ESCO that are dependent on client agency capital or bond funding may be made using partial project invoicing on a monthly basis depending on services provided. The issues and expectations of partial payments should be defined in the financing section of the ESP and agreed to by the client agency.

The ESCO shall meet deadlines for project completion and invoicing to avoid delay in client agency financing. All contract invoices shall have a detailed break-down of the schedule of values, and back-up documentation of the expenditures from the subcontractors. Subcontractor’s invoices should clearly reference the project by name or number. Contract invoices shall itemize all materials and labor costs, even if that subcontractor is a subsidiary of the ESCO.

“Open book” pricing – a cornerstone of DES’s ESPC Program: Construction cost is defined as the actual cost of purchasing and installing the ESCO equipment, as demonstrated by the installation price quotes or construction contracts. This means that the ESCO furnishes all the subcontractor and equipment invoices as backup to the request for payment.

10. Commencement of Energy Savings

The “Notice of Commencement of Energy Savings” is a formal written notification to the client agency and DES (if applicable) that the ESCO has substantially completed installation of ESCO equipment and/or provided ESCO services. The ESCO is confirming that EEM construction is complete and energy savings are being realized.

11. Project Closeout

The ESCO will schedule the final inspection of the project with the client agency and DES (if applicable). The serving utility(s) shall be invited as appropriate. If the final inspection identifies items that are not completed or that require correction, a “punch list” will be developed. The punch list should only contain minor items and nothing of a significant nature. If the final inspection confirms that the project is complete, the substantial completion date can be set for the warranty period.

The ESCO will satisfy warranty items as required. The ESCO will measure project performance and collect data to determine energy savings in accordance with the established M&V plan.

Any malfunctioning equipment that was installed or modified in the course of the project will be returned to its full operating condition by the ESCO.

12. On-going Measurement and Verification (M&V)

After the project is constructed and the notice of commencement of energy savings has been issued, the on-going M&V period begins. At a minimum, M&V needs to be conducted to verify that the guaranteed energy savings actually occur. The energy savings guarantee by the ESCO typically lasts only during the period of on-going M&V. The proposed length of the on-going M&V should be identified in the ESP.

The frequency of M&V reporting can vary depending on the needs of the client agency or the project. M&V reporting can be done multiple times per year or at a minimum annually. The client agency should balance its need for information about the actual energy savings against the cost for the M&V reporting interval selected.

For projects developed and delivered through the DES Energy Program, the recommended minimum length of M&V is three (3) years. Client agencies are encouraged to have M&V performed for the length of the financing term to extend the length of the energy savings guarantee to fully cover the cost of financing the project.

The M&V report includes:

- *an executive summary* that gives a brief description of the EEMs installed and whether the guaranteed savings were achieved.
- *the body of the report*, including:
 - calculation of the energy savings verified for each measure.
 - a brief description of any changes to the facilities identified. If these changes have an impact on the verified energy savings, this needs to be identified and the impact calculated.
 - any other deliverables that were proposed, such as greenhouse gas reduction calculations or building energy performance benchmarks.
 - all physical measurements that were performed (e.g., boiler combustion test results, motor runtime logs). If necessary, these can be attached via appendix to the main report.

The guaranteed minimum energy savings identified in the ESP and the verified actual energy savings should be identified in tabular form for easy reference by the client agency. The energy savings should be:

- identified in the native unit of measure for each utility commodity, such as kWh or Therms, for both guaranteed and verified;
- translated into utility bill dollar savings; and
- denoted in dollars, using the energy rates in effect at the time of the report. This will help the client agency understand the actual impact on their budget.

The comparison of actual to guaranteed savings should be denoted using the energy rates in effect at the time of project implementation.

The report should indicate what remedies the ESCO will provide if the guaranteed savings are not being met. Specify whether and by when the physical aspects of the project that led to the loss of savings will be corrected. Specify how the ESCO will reimburse the client agency for the identified difference between the verified savings and the guaranteed level of savings. Specify the timing of when the ESCO will make the reimbursement to the client agency.

If the project was not done through DES, the report must be delivered to the client agency within 30 days of the end of the M&V period for review and acceptance. Otherwise, the report is submitted to DES for review within 30 days. DES reviews the report and forwards it to the client agency when approved. If there are questions or concerns, DES will return it to the ESCO for corrections and resubmittal.

Appendix 1

List of Acronyms Used:

ASHRAE:	American Society of Heating Refrigerating and Air-Conditioning Engineers
Btu:	British thermal unit
Btu/sq ft/yr:	British thermal unit per square foot per year
DBB	Design-Bid-Build
EEM:	Energy Efficiency Measure
ESCO:	Energy Services Company
ESP:	Energy Services Proposal
ESPC:	Energy Savings Performance Contracting
EUI:	Energy utilization index
DES:	Washington State Department of Enterprise Services
GMax:	Guaranteed maximum construction cost
HVAC:	Heating, ventilating and air-conditioning
IESNA	Illuminating Engineer's Society of North America
IGA:	Investment-grade Audit
IPMVP:	International Performance Measurement and Verification Protocol
KW:	Kilowatts
kWh:	Kilowatt hours
LOCAL:	Washington State Treasury's Local Option Capital Asset Lending Program
M&V:	Measurement and Verification
MACC:	Maximum allowable construction cost
NTE:	Not to exceed
O&M:	Operation and Maintenance
RCW:	Revised Code of Washington
RFP:	Request for Proposals
RFQ	Request for Qualifications
SEER:	Seasonal Energy Efficiency Rating
\$/sq ft:	Dollars per square foot

Appendix 2

Guidance for agencies that do not use energy savings performance contracting

This appendix is for agencies that choose to (a) use the traditional design, bid, build process rather than energy savings performance contracting; and (b) want to submit to the Department of Commerce (Commerce) for energy and operational cost savings improvements to public school district and higher education facilities.

Per ESHB 2836 (section 1016 (6)), agencies that do not use energy savings performance contracting must:

- a) Verify energy and operational cost savings for ten years or until the energy and operational costs savings pay for the project, whichever is shorter.
- b) Follow the department of Enterprise Services' energy savings performance contracting project guidelines.
- c) Employ a licensed engineer for the energy audit and construction.

Section 1016 (6) states:

“Projects that do not use energy savings performance contracting must: (a) Verify energy and operational cost savings for ten years or until the energy and operational costs savings pay for the project, whichever is shorter; (b) follow the department of Enterprise Services' energy savings performance contracting project guidelines; and (c) employ a licensed engineer for the energy audit and construction. The department of commerce may require third-party verification of savings if a project is not implemented by an energy savings performance contractor selected by the department of Enterprise Services through the request of qualifications process. Third-party verification must be conducted either by an energy savings performance contractor selected by the department of Enterprise Services through a request for qualifications, a licensed engineer that is a certified energy manager, a project resource conservation manager, or educational service district resource conservation manager.”

1. Energy Consultant Selection

The energy consultant selection for the energy audit will be for a licensed engineer that is a certified energy manager^[1]. The selection process for these professional services shall be consistent with RCW 39.80 (contracts for architectural and engineering services). The agency (both state and local agencies and special districts) is required to publish in advance its requirement for professional services. This shall include a concise statement of the general scope

^[1] “Certified energy manager” refers to the certification process provided by the Association of Energy Engineers <http://www.aeecenter.org/i4a/pages/index.cfm?pageid=3330>

and nature of the project or work for which the services are required, and the address of a representative of the agency who can provide further details.

An agency may comply with this section by:

- a) Publishing an announcement on each occasion when professional services provided by a consultant are required by the agency; or
- b) Announcing generally to the public its projected requirements for any category or type of professional services.

2. Cost Effectiveness Criteria

Chapter 39.35C.010 RCW provides one definition for cost-effectiveness. It states:

"Cost-effective" means that the present value to a state agency or school district of the energy reasonably expected to be saved or produced by a facility, activity, measure, or piece of equipment over its useful life, including any compensation received from a utility or the Bonneville power administration, is greater than the net present value of the costs of implementing, maintaining, and operating such facility, activity, measure, or piece of equipment over its useful life, when discounted at the cost of public borrowing."

This means that projects may be considered cost-effective if they result in a net positive present value over their economic lifetime. For purposes of determining economic lifetime, energy consultants rely on generally accepted engineering practice as is guided by entities such as the American Society of Heating Refrigerating and Air-Conditioning Engineers (ASHRAE), or other national or international standard setting bodies.

The agency also may establish supplementary cost-effectiveness criteria, including but not limited to: simple payback, budget neutrality, or maximum financing term.

The following factors should be considered in developing cost-effectiveness criteria:

- State Treasurer's lease/purchase or LOCAL Program^[2];
 - Other third-party financing (banks, etc.);
 - Energy cost savings, utility cost savings, and approved O&M savings to pay off any of the above debt structures;
 - Grants, loans and/or incentives from utilities or other funding sources; and
 - The agency's capital budget or any other funds at the agency's discretion.
- The financing term may not exceed the economic life of the energy efficiency measures (EEM), unless otherwise approved by the agency.

^[2] Chapter 39.94 RCW authorizes the State Treasurer to enter into financing contracts for the state or on behalf of another agency for the use and acquisition for public purposes of real and personal property. The State Treasurer's state agency lease/purchase program details can be found at <http://www.tre.wa.gov/government/leasePurchaseProgram.shtml>

- Not more than 90% of the energy cost savings should be used to repay the financing, unless otherwise approved by the agency.
- Up to 100% of utility grants may be used to defray project costs or to repay the financing agreement.
- Labor or maintenance cost savings should not be included in energy cost savings for the purpose of determining cost-effectiveness, unless specifically approved by the agency. These cost savings typically represent costs for purchased parts and service contracts, rather than internal labor cost savings.
- The total cost of implementing the EEMs can include the cost of the investment-grade audit and preparation of the energy services proposal, project design, construction, construction and project administration, project commissioning, subcontractor bidding, bonding, insurance, overhead and profit, permits, taxes, agency training, and other costs that may be agreed to by the client agency.
- Current utility rates should be used to calculate energy and utility cost savings. Energy and utility cost inflation factors should not be used without the client agency's expressed approval.
- It must be agreed to at the outset whether proposed measures will be considered as cost-effective on a stand-alone basis or as a bundled total. Under the bundling consideration, measures are considered to meet the economic criteria even though some individual measures with high paybacks are supported by other measures with low paybacks.

3. Preliminary Audit

A preliminary audit is conducted by the energy consultant to determine the likelihood that further investigation and analysis will yield a project of cost-effective energy efficiency measures (EEMs). The energy consultant and the agency use the preliminary audit and subsequent proposal process to ensure there are projects that appear to meet the agency's cost-effectiveness criteria and address those systems within the facility as specified by the agency.

The preliminary audit also may be used to initiate equipment data-logging opportunities when appropriate. (It is difficult, for instance, to get a good representation of cooling equipment operation in the winter or true occupancy patterns of a school over the summer.) Data collection on parameters such as equipment operating hours, space and system temperatures, air flow rates, and facility occupancy may ultimately be used to create building energy use models or support other analyses by the energy consultant to establish the project.

Preparation for the Preliminary Audit

Prior to the audit walk-through, the energy consultant shall obtain necessary information about the facility from the agency, including:

- utility billing information from at least the most current 12-month period (data covering the past two years is preferable). These data may include electricity and natural gas usage (including all heating fuels routinely purchased (e.g., propane, diesel, or other petroleum products, biomass, etc.) and water consumption records, as appropriate.

- information about the facility such as operating schedules, typical number of occupants and square footage.

These data are analyzed to establish the energy utilization index (EUI) of the facility. The energy utilization index is a measure of building energy efficiency and is calculated as total energy consumed per year (in Btu's) divided by building square footage (Btu/sq ft/yr).

The Audit Walk-Through

During the preliminary audit walk-through, the energy consultant should have access to a person from the agency familiar with the operation and maintenance of the facility. This person should be able to provide basic information about facility operations, maintenance practices, and existing problems associated with building comfort, high energy consuming or faulty equipment, and other issues to be assessed.

During development of this preliminary audit, energy baseline development and measurement and verification (M&V) methods may be discussed. The agency will review and agree on the methods proposed.

The preliminary audit stage is an opportunity for the agency to clarify with the energy consultant the cost-effectiveness criteria and any specific requirements or limitations for the project they envision.

Results of the Preliminary Audit

The description of facility systems and building areas where the energy consultant will thoroughly investigate energy efficiency upgrades will identify measures that are likely to be:

- a) Fully cost-effective in that the energy savings will repay the investment within the measure's useful lifetime;
- b) Cost-effective if the agency has additional capital to invest other than the borrowed funds; and
- c) Necessary for safe and comfortable operation of the facility, but probably not meeting basic cost-effectiveness criteria for simple payback.

A preliminary audit report will identify which systems, facilities and/or measures will be analyzed and evaluated in the investment grade audit. This report will form the basis for the energy consultant's investment grade audit proposal where a scope of work is identified and an audit cost is negotiated.

4. Proposal for the Investment Grade Audit

A proposal for an investment-grade audit (IGA) is based on the potential cost-effective EEMs that were identified in the preliminary audit, and should include at least the following components:

- the scope of the IGA;
- timeline for completing the IGA;

- cost of the IGA;
- preliminary measurement and verification (M&V) plan;
- other information that the agency needs to provide the energy consultant.

The scope of the IGA should include a list of any facilities that will be investigated in the audit. If only select energy consuming systems in a given facility are to be investigated, they need to be clearly defined directly or by exclusion of systems not to be investigated. The scope should include the number of square feet of the facilities to be investigated. Any additional deliverables beyond the ESP, e.g., Greenhouse Gas Inventory creation or Energy Star Benchmarking establishment should also be identified.

The timeline for completing the IGA should identify major milestones, including decision points for the agency to identify individual EEMs and when certain information is due.

The cost of the IGA can be determined using either of the following methods:

- dollar-per-square-foot basis: The \$/sq ft cost will typically be higher for smaller square footages or more complex systems being investigated.
- time and materials basis.

Either of these methods should identify a not to exceed (NTE) cost for the IGA.

The preliminary M&V plan should indicate:

- the likely method of measurement and verification that will be used, and should be based on the International Performance Measurement and Verification Protocol (IPMVP^[3]).
- when M&V will occur (pre-installation, post-installation, and on-going). The M&V that occurs during the IGA phase must be indicated on the timeline. Seasonal equipment energy use should be measured during the appropriate season as much as possible. Otherwise the forced loading requirements needed to simulate normal seasonal operation should be clearly defined in the plan.

Other necessary information, documentation or assistance needed by the energy consultant in the performance of the IGA must be identified in the proposal. In addition, any exclusions or limitations must be clearly identified up front and agreed to by all parties. These may include things such as the range of systems being analyzed or the scope of technical analysis expected to be employed by the energy consultant in the IGA.

^[3] <http://www.nrel.gov/docs/fy02osti/31505.pdf> Note that M&V plans can specify Options A, B, or C or a combination of the options. Option A is typically used for lighting system improvements whereas Options B and C are used for other types of EEMs.

5. Development of the Investment Grade Audit

Once the energy consultant and the agency agree on the energy saving potential in the facility, the next step is the investment-grade audit. This process includes:

- Development of a proposed scope of work, including the systems to be evaluated, the timeline to completion and the cost to conduct the IGA. The agency then reviews the proposal and negotiates the cost of the audit.
- Agreement on the scope of work and costs, culminating in an agency contract for energy consultant services.
- Submittal to the agency by the energy consultant of the detailed findings of the IGA.

The IGA is conducted to analyze all cost-effective EEMs for the systems identified in the IGA proposal. These may include, but are not limited to: lighting, HVAC equipment, building envelope, steam, chilled water, domestic hot water and other water using systems, building controls, energy generation and distribution, and waste management systems. The IGA includes an evaluation of the energy performance and investment value of the EEMs.

Potential outcomes of the IGA include:

- a) If a facility does not have EEMs that meet the “cost-effectiveness criteria” established by the agency, there is usually no cost to the agency for the IGA. This is true unless the agency agrees to other arrangements. In that case these special arrangements must be reflected in the contract documents.
- b) If the energy consultant identifies cost effective measures and the agency decides not to proceed, the energy consultant will be reimbursed the pre-authorized fee for the IGA.
- c) If the energy consultant identifies cost effective measures and the agency decides to proceed to construction, a finalized IGA is presented to the agency. The finalized IGA clearly outlines the maximum allowable construction cost (MACC) and identifies the energy savings that will be achieved through implementing the project. The finalized IGA must meet the cost-effectiveness criteria established by the agency.

6. Finalized Investment Grade Audit (IGA)

The agency selects energy efficiency measures (EEMs) from the finalized IGA for the project that will be included in the Commerce grant application. The finalized IGA contains:

- descriptions of the facility, buildings, and systems that will receive energy savings equipment. The descriptions will be complete with information on operating conditions (i.e. hours of operation, temperatures, lighting levels, and etc.); identification of problem areas (i.e. indoor air quality, hazardous materials, maintenance etc.); and other findings impacting the costs or savings that will be achieved by the project.

- baseline energy consumption for at least a one-year calendar period. The baseline data will be used to calculate the energy savings and to determine the methodology for measuring and verifying the savings. The baseline data will also be used to determine the cost of energy that will be used in the calculation of energy cost savings. If water savings or maintenance savings are going to be included in the project, the baseline data will also include water cost and consumption as well as maintenance costs and frequency.
- descriptions of the EEMs that are proposed for installation and EEMs that have been analyzed but disqualified because of cost constraints. The agency may use this information for future projects.
- recommendations for replacement of existing equipment and improvements to the existing equipment and operating conditions. Some of these improvements can result in low or no cost operating savings which can be used to pay for higher cost measures.
- identification of the energy savings and energy cost savings that are expected to result from the installation of the energy savings equipment, based on the baseline energy consumption previously developed. Baseline energy consumption may be adjusted to account for operational anomalies, code requirements or other issues (e.g. lack of outside ventilation air or recent facility changes.) The outlined calculation methods used to determine the savings can then be used to develop the overall M&V plan used to track and verify the savings. The energy savings is determined in native units of measure for the utility; (e.g., electric savings would be in kWh, natural gas in Therms). The energy savings would then be translated into dollars based on the current utility tariff in effect.

The Maximum Allowable Construction Cost (MACC) is developed by the energy consultant once a final project has been identified consisting of one or more EEMs. The MACC has several components: the IGA cost, design fees, construction management fees, construction costs, including payment and performance bonds, plus sales tax, and construction contingency.

The finalized IGA will contain:

- ***a detailed schedule for project completion.*** The schedule will also identify facility schedules that affect the times that are available or not available for construction.
- ***a description of the equipment warranties.*** The energy savings depends upon the performance of the actual equipment installed. Therefore, performance parameters of the equipment also need to be identified, (e.g., boiler efficiency or heat pump SEER).
- ***a professional stamp and signature*** by the engineer of record for the project.

Note: A sample finalized investment grade audit content list is included at the end of this appendix.

7. Engineering Design

Final design for EEM projects is developed before the project is put out to bid. The energy consultant is usually the professional engineer who designs the project.

The energy consultant or agency maintains contact with the utility to maximize utility incentives, and to verify energy efficiency improvements consistent with that utility's conservation program requirements.

The agency manages design and construction meetings and the selection of contractors and equipment suppliers.

When the project design is completed, the agency will solicit bids in accordance with RCW 39.04.

A construction contingency of up to 10% is recommended for unforeseen conditions.

The energy consultant shall be responsible for developing, providing, and implementing a Commissioning Plan.

8. Construction

Construction will be in accordance with RCW 39.04 and employ a licensed engineer to oversee the construction.

If the construction cost portion of the project exceeds \$1,000,000, the contractor must comply with RCW 39.04.320, apprenticeship participation.

9. Project Closeout

The construction contractor shall schedule the final inspection of the project with the agency's facility representative. The serving utility should be invited as appropriate. If the final inspection identifies items that are not completed or that require correction a "punch list" will be established. The punch list should only contain minor items and nothing of a significant nature. If the final inspection confirms the project is complete, the substantial completion date can be set for the general one-year warranty period.

The contractor shall satisfy warranty items as required.

10. On-going Measurement and Verification

After the project is constructed the on-going M&V period begins. Projects that do not use energy savings performance contracting must verify energy and operational cost savings for ten years or until the energy and operational cost savings pay for the project, whichever is shorter (per section 1016 (6) (a)). Third-party verification must be conducted by an energy savings performance

contractor selected by the Department of Enterprise Services through a request for qualifications, a licensed engineer that is a certified energy manager, a project resource conservation manager, or an educational service district resource conservation manager.

The frequency of M&V reporting can vary depending on the needs of the agency or the project. M&V reporting can be done multiple times per year or at a minimum annually. The agency should balance its need for information about the actual energy savings against the cost for the M&V reporting interval selected.

The M&V report includes:

- ***an executive summary*** that gives a brief description of the EEMS identified and if the energy savings were achieved.
- ***the body of the report***, containing calculation of the energy savings verified for each measure; a brief description of any changes to the facilities; identification and calculation of impacts of these changes on the verified energy savings; other deliverables that were proposed (e.g., greenhouse gas reductions); and all physical measurements that were performed (i.e., boiler combustion test results, motor runtime logs). If necessary, these can be attached via appendix to the main report.

The estimated energy savings identified in the finalized IGA and the verified energy savings should be identified in tabular form for easy reference by the agency. The savings should be identified in the native unit of measure, such as kWh or Therms, for both estimated and verified. The savings should also be translated into dollar savings. The comparison of actual to estimated savings should be denoted using the energy rates in effect at the time of project implementation. To help the agency understand the actual impact on its budget the actual savings in dollars should also be denoted using the energy rates in effect at the time of the report.

The report is submitted to the agency for review within 30 days of the end of the M&V period.

Sample Finalized Investment Grade Audit Contents:

A. Audit Phase Services will include:

The energy consultant will undertake an IGA of the facilities. The IGA will identify cost-effective energy efficiency measures (EEMs). The energy consultant will present to the agency a written finalized IGA. The finalized IGA will set forth at least the following:

- A description of the facility and those building systems that will receive energy efficiency equipment.
- The cost-effective EEMs to be installed and a description of the EEMs analyzed but disqualified under cost-effectiveness criteria.

- The maximum allowable construction cost, itemized in detail.
- Recommendations for replacement of existing equipment, along with recommendations for improvements to existing equipment and operating conditions.
- The standards of comfort and service appropriate for the facility.
- The baseline energy consumption for the facility, including the data, methodology and variables used to compute the baseline, and the baseline calendar period that will not be less than twelve months.
- The estimated energy savings and energy cost savings that are expected to result from the installation of the energy efficiency equipment and an explanation of the method or methods used to make the estimate.
- The method by which energy savings and energy cost savings will be calculated during the term of the energy services agreement.
- The schedule for project completion.

Conservation measures can include items that save energy, water or other resources (including various cost saving measures). The IGA will provide detailed documentation to support of the recommendations, economic and engineering assumptions, sketches, floor plans, and any other information developed in the course of the IGA.