FY27 SRP Business Solutions New Construction Program Qualified Service Provider Manual

May 1, 2026

Contents

Section 1 Introduction

1.1 PROGRAM OVERVIEW

The FY27 SRP Business Solutions New Construction Program (New Construction Program) provides technical assistance and financial rebates to help architects, engineering professionals, and building owners optimize energy and demand savings and reduce operating costs in eligible new construction projects.

The New Construction Program employs a whole building performance-based strategy that fosters an integrated design approach with the project's design team starting during the early stages of the building design. This process is supported via two distinct tracks under the program: 1) Enhanced Performance Track and 2) Expedited Track. Both of these tracks would involve integrated design process. Guided by the results of the integrated design process, the design team (typically the owner, architect, lighting and HVAC engineers, and general contractor) are presented with multiple high efficiency design strategies and their associated economic impacts at key milestones throughout the design process. The New Construction Program is designed to be scalable for projects of varying size and flexible to grow with customer needs.

Projects participating in the Enhanced Performance Track would qualify to receive Energy Design Assistance (EDA) services rebates as well as design team rebates funded by the program. Early involvement combined with the comprehensive interaction of key project stakeholders (EDA and design teams) afford the opportunity to cost-effectively evaluate and incorporate efficiency strategies while design components are still fluid. Under the Enhanced Performance Track, the qualifying buildings, except for new construction multifamily buildings, will have ≥50,000 square feet of conditioned floor space (new construction/renovation/additions). For multifamily new construction projects to be eligible under the Enhanced Performance Track, a minimum of 20,000 square feet or more of conditioned floor area will be required.

While EDA service rebates and design team rebates are not available for projects participating under the Expedited Track, the program provides financial assistance to cover 50% cost of the required Energy Modeling up to $15,000. The Expedited Track is suited for projects with accelerated design schedules that are unable to invest the time necessary for participating under the Enhanced Performance Track. The buildings under this track will have less aggressive savings targets; typically, these buildings will have less than 75,000 square feet of conditioned floor space but must be ≥20,000 square feet (new construction/renovation/additions).

The New Construction Program will assist interested SRP customers to achieve higher level energy efficiency towards green building certification, such as the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C), by providing modeling and technical support necessary to maximize Energy and Atmosphere (EA) credits.

For new construction projects that do not lend themselves to a comprehensive whole building approach, SRP offers equipment rebates through the SRP Business Solutions Standard or SRP Business Solutions Custom Programs. For more information on both programs, please visit www.savewithsrpbiz.com. Once a project has been selected in the SRP Business Solutions New Construction Program, rebates cannot be obtained from or combined with other programs offered by SRP for the same measures.

1.2 CONTACT INFORMATION

SRP has retained Resource Innovations. as the Program Administrator for the SRP Business Solutions New Construction Program. Questions about the program can be directed to the Program Administrator via:

- Web
  - www.savewithsrpbiz.com
- Telephone
  - Customer informational hotline: (602) 236-3054
- Fax
  - (480) 345-7601
- Email
  - Customer inquiries: Savewithsrpbiz@srpnet.com
  - Qualified Service Provider inquiries: Savewithsrpbiz@srpnet.com
- Mail
  SRP Business Solutions New Construction Program
  3100 W Ray Road, Suite 230
  Chandler, AZ 85226

1.3 MANUAL USE AND ORGANIZATION

This program manual is designed for use by customers, contractors, architecture and engineering firms, energy services companies, and equipment manufacturers, outlines the rules and requirements of the New Construction Program. The manual is organized as follows:

- Section 2 – Addresses eligibility requirements, measures and baseline definition
- Section 3 – Discusses rebate information
- Section 4 – Outlines the program participation process
- Section 5 – Explains modeling guidelines
- Section 6 – Provides information on the requirements for commissioning

Sample program submittal forms, frequently asked questions, and other general program support information are contained in appendices at the end of this manual.

1.4 PROGRAM DATES

SRP's FY27 SRP Business Solutions New Construction Program year is effective from May 1, 2026 through April 30, 2027. All qualifying equipment and measures must be purchased or installed in accordance with the program requirements as they exist in the fiscal year the project is first submitted to be eligible for the New Construction Program.

Section 2 Eligibility Requirements

2.1 CUSTOMER ELIGIBILITY

For the purposes of SRP's energy efficiency programs, a customer is defined as a company or organization that receives electric service from SRP under an approved SRP price plan. A customer is a holder of a single account, multiple accounts in aggregate or corporate accounts. Multiple accounts or corporate accounts with a single SRP customer identification number will be considered a single customer. An organization of this type can participate in multiple efficiency programs but will be subject to any applicable customer rebate caps and program requirements.

To participate in the New Construction Program, a customers must install qualifying measures in an SRP served facility on a qualifying SRP non-residential retail electric price plan. Table 2.1 lists eligible customer price plans.

Table 2.1: Eligible Price Plans for the SRP Business Solutions New Construction Program

Description	Price Plan
General Service	E-31
Time-of-Use General Service	E-32
Super Peak Time-of-Use General Service	E-33
M-Power for Pre-Pay General Service	E-34
Standard General Service	E-36
Standard Pumping Service	E-47
Time-of-Week Pumping Service	E-48
Standard Large General Service	E-61
Primary Large General Service	E-63
Substation Large General Service	E-65
Substation Large General Service with Interruptible Load	E-66
Large Extra High Load Factor Substation Large General Service	E-67

Customers with multifamily projects that will have dwelling spaces served by SRP residential meters are eligible to participate provided they have an eligible facility and at least one meter containing an eligible price plan from Table 2.1. Customers can verify their price plan by looking on a recent bill. **Figure 2.1** shows where to find the price plan and account number on a typical SRP customer bill. Customers with questions regarding their account should contact the Program Administrator or their SRP Account Manager. SRP retains the right to make final determination of customer eligibility.

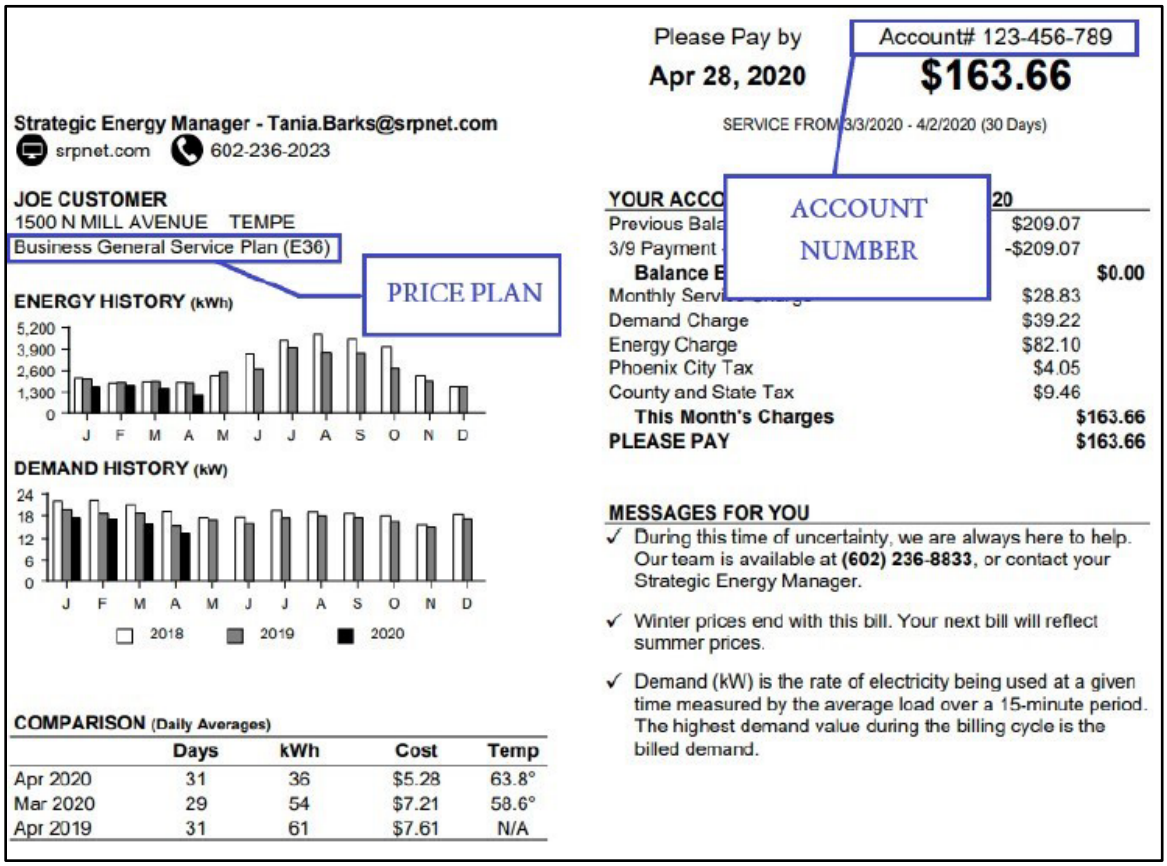


Figure 2.1: Representative SRP Electric Bill

2.2 FACILITY ELIGIBILITY

The New Construction Program is an application-based program that accepts projects that are most likely to succeed. Projects must be new construction, major renovation, or additions for commercial, industrial, retail, multifamily, core and shell use, or interior build-out of an existing Commercial/Industrial shell building. Two mutually exclusive tracks are offered for customer participation:

2.2.1 ENHANCED PERFORMANCE TRACK

The Enhanced Performance Track is intended for large buildings that can incorporate a facilitated energy design assistance process into their project schedule. Except for new construction multifamily buildings, key project criteria for selection into this program track includes, but is not limited to, planned buildings with 50,000 square feet or more of conditioned floor and is in the preliminary design stage (at or before Schematic Design is complete). For multifamily new construction projects to be eligible for NCS EDA service rebates under the NCS Enhanced Performance Track, a minimum of 20,000 square feet or more of conditioned floor area will be required. A high degree of flexibility must still be available regarding choices for building design, envelope, HVAC, and electrical systems. Early involvement in the design process by SRP's Design Assistance team ensures that all energy-saving options can be considered.

Total building conditioned floor area may be defined for candidate projects as the total aggregate conditioned floor area of multiple buildings. It is imperative that the project intends to utilize a professional design team and establish energy efficiency goals.

2.2.2 EXPEDITED TRACK

The Expedited Track is suited for smaller sized buildings or projects with accelerated design and build schedules that are unable to invest the time necessary for the Enhanced Performance Track. Eligible projects will be planned buildings with at least 20,000 square feet or more of conditioned floor area and may be eligible for rebates even after design has been completed, but prior to energy efficient equipment being ordered, purchased or installed. The buildings under this track will have less aggressive savings targets; typically, these buildings will have less than 75,000 square feet of conditioned floor space. Projects under the Expedited Track are not eligible for either EDA or Design Team rebates. However, the program will provide financial assistance to participating SRP customers to cover 50% of the required Energy Modeling cost up to $15,000. These projects must be utilizing a professional design team, established energy efficiency goals, and an integrated design method which includes whole-building energy modeling not facilitated by the program. The participation process involves submitting the program application before any of the identified energy efficiency measures are purchased. As-built buildings performance will be established with a calibrated energy model and supporting documentation.

2.2.3 ADDITIONAL ELIGIBILIY CRITERIA

In addition to the specific requirements described above, all projects must meet the below eligibility requirements:

1. Involve commercial, industrial, retail, multifamily, core and shell buildings planned for new construction, major renovation, or additions; or, interior build-out of an existing Commercial/Industrial shell building. A major renovation is defined under the New Construction Program as which requires professional design services and review by code authorities; or that involves a change in space usage type.
2. Involve a project where ASHRAE Standard 90.1-2016 or IECC 2018 can be applied (energy savings and project costs will be determined compared to a baseline building built according to one of these standards).
3. A project scope that will be improving the electric efficiency of the whole building design, so it exceeds the baseline building's energy performance by 10% or more. One of the following compliance paths may be used to demonstrate projects meet or exceed the 10% improvement target:
    - Modeling guidelines consistent with ASHRAE 90.1-2016 Normative Appendix G, Performance Rating Method (PRM)
    - Modeling guidelines consistent with ASHRAE Standard 90.1-2016 Chapter 11 Energy Cost Budget Method
    - Modeling guidelines consistent with IECC 2018 Section C407 Total Building Performance

Facilities not subject to ASHRAE Standard 90.1-2016 or IECC 2018 should contact the Program Administrator to discuss available options. SRP retains the right to make final determination of facility eligibility.

2.3 MEASURE ELIGIBILITY

The program aims to provide rebates for those projects whose whole building design exceeds ASHRAE Standard 90.1-2016 or IECC 2018 by 10% or more. The program is designed to encourage energy efficiency measures in the following disciplines:

- High efficiency LED lighting design
- HVAC mechanical systems
- Building envelope thermal design and efficiency
- Fenestration efficiency
- Enhanced HVAC and lighting controls

Measures that are *excluded* from consideration in this program include those that:

- Receive a rebate through any other energy efficiency program offered by SRP
- Rely solely on changes in customer behavior and require no capital investment
- Produce an electric energy reduction through substitution of another energy source for electricity
- Merely terminate existing processes, facilities, or operations
- Relocate existing processes, facilities, or operations out of SRP's service territory
- Are required by local, state, or federal law; building or other codes; or are standard industry practice
- Involve plug loads and related receptacle controls (Automatic receptacle controls may be required by ASHRAE Standard 90.1 2016 Sec. 8.4.2)
- Generate electricity, including cogeneration using non-renewable fuel sources

Examples of measures that may assist in achieving a 10% or more improvement over the baseline building are listed in Table 2.2a. Program participants are free to propose measures not included in the table, so long as the above requirements are met. For measures not covered by ASHRAE Standard 90.1-2016 or IECC 2018, the baseline is industry standard practice. However, the baseline use and savings for measures not covered by ASHRAE Standard 90.1-2016 or IECC 2018 shall not be used to determine if a whole building design meets the program requirements by exceeding ASHRAE Standard 90.1-2016 or IECC 2018 by 10%. SRP retains the right to make final determination of measure eligibility.

Table 2.2a: Examples of Eligible New Construction Energy Efficiency Measures

Category	Measure	
Envelope	• Improved wall insulation • Thermal mass wall • High efficiency glazing	• Improved roof insulation • Cool reflecting roof
Lighting	• High efficiency fixtures (Interior) • Adjustable ambient lighting levels, Task tuning/High-end trimming • Highly reflective ceiling	• Open ADR Networked Lighting controls • LED exterior lighting fixtures
Daylighting	• Light conveyors/Light pipes • Interior/exterior light shelves • Sloped ceiling	• Stepped daylighting controls • Dimming daylighting controls • Skylights
HVAC/DHW (Central/Zone/Point of Use)	• High efficiency chiller • Water side economizer • Ground-source heat pump • Water-source heat pump • Variable refrigerant flow heat pumps • Building thermal mass • Point-of-use domestic hot-water heaters • VFDs on HW pumps • VFDs on CHW pumps • High efficiency refrigeration equipment	• Evaporative cooling technologies • VFDs on cooling tower fans • Infrared heating • Domestic cold-water pre-cooling • Displacement ventilation • Radiant heating/cooling • Natural ventilation • Chilled beams • Heat recovery systems

To encourage the inclusion of integrated demand side solutions like energy conservation, demand shifting with storage, electric technologies, and distributed and renewable energy resources in the design of new buildings under the program, additional incentives are available for a list of these grid enabling technologies as outlined in Table 2.2b.

Table 2.2b: Examples of Eligible Integrated Demand Side New Construction Measures

Category	Measure	
Integrated Demand Side Measures	• On-site solar PV and other renewable generations • Heat Pump Water Heater (Beneficial Electrification)	• EV charging stations • Demand shifting with energy storage

Any on-site solar photovoltaic (PV) or renewable energy generation will help the project team to reduce net site-emissions and may achieve long term sustainability goals by attaining higher level of LEED certification for the new facility. However, any on-site generation will have an impact on the customer's

(efficiency) rebate as it is based on energy savings that is actually realized at the SRP's grid. In light of this, the following guiding rule shall be used in attributing kW/kWh savings for the affected new construction (NC) energy efficiency measures (EEMs) whenever, to meet a part or all of the facility's power (kW) demand, there are on-site solar PV systems and/or any other renewable energy systems in the proposed building's design.

Guiding Rule on Onsite Renewable Generation to Estimate Customer Rebate Impact: The energy savings from the EEMs will only be eligible for the customer equipment rebate under the program as long the measures' savings results in a non-zero reduction of purchased kWh from the grid. So, at any point in time when the facility is not purchasing energy from the utility, any energy savings that contribute to additional PV-generated energy being fed into the grid is not incentivized.

Rebate Impact Calculation Methodology: An estimate of the full year of projected purchased kWh and PV generated kWh is established based on 3-6 months of metered purchased kWh and PV generated kWh collected from the occupied facility at hourly intervals. The projected hourly kWh savings for the project is compared alongside the metered kWh on an hourly basis for the full year. For hours when onsite solar PV/renewable generation output is not zero, kWh savings is subtracted from metered purchased kWh at each hour to find the negative values (periods when savings is higher than purchased energy). This total negative kWh differential is subtracted from the actual total kWh savings to calculate the eligible kWh savings. For hours when onsite solar PV/renewable generation output is zero, the entire estimated kWh savings are taken as eligible hourly kWh savings. Once the eligible hourly kWh savings are calculated as per outlined above, average demand (kW) savings are calculated during the peak hours as defined under the program[1].

2.4 BASELINE DEFINITION

A baseline energy simulation model will be created in accordance with the requirements (including minimum equipment efficiency requirements) set forth in either 1) ASHRAE Standard 90.1-2016 Appendix G, PRM, 2) ASHRAE Standard 90.1-2016 Chapter 11 Energy Cost Budget Method or 3) IECC 2018 Section C407 Total Building Performance. This baseline model provides a consistent benchmark against which to compare energy performance metrics and energy savings for subsequent energy strategy alternatives.

Only energy savings achieved above this baseline level will be eligible to receive rebates. This concept is further illustrated in Figure 2.2**.**

[1] For the calculation of the peak kW savings, affected hours during 4 p.m. to 7 p.m. Monday – Friday, July and August will be used

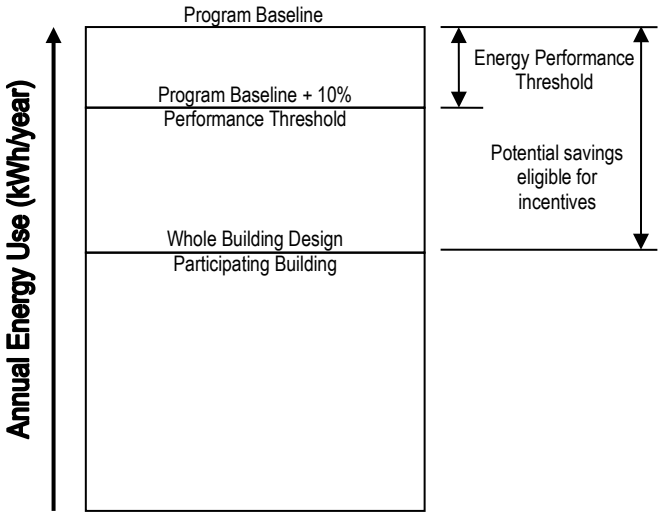


Figure 2.2: Illustration of program baseline and savings eligibility

ASHRAE Standard 90.1-2016 Normative Appendix G and IECC C407 contain guidance on approved energy simulation programs.

2.5 CALCULATION OF ENERGY IMPACTS

Energy savings will be calculated based on the % improvement between the baseline building and the whole building design energy use as determined by the energy simulation model. The electrical demand savings will be based on the peak demand use of the whole building design model during the peak hours under the program.

The energy design assistance (EDA) and design team service rebates, offered under the Enhanced Performance Track, are contingent on the design documented in 100% construction documents (CDs) exceeding the baseline building by at least 10%.

For projects participating under the Enhanced Performance Track, building owner equipment rebates are contingent on the (100% CDs and as-built) energy models exceeding the baseline building by at least 10%. The building owner equipment rebate will be split into two payments. The first payment will be for 50% of the approved savings based on the results of the approved pre-construction energy analysis report and will be issued once the building construction begins. Once the construction is complete and the building is fully commissioned and occupied, the remaining equipment rebates will be issued based on the verified energy impacts of the as-built building as evidenced in the approved verification report.

For projects participating under the Expedited Track, all eligible equipment rebates will be issued to the building owner as a single payment based on the final verified savings from the 'as-built' whole building energy simulation and as evidenced in the approved verification analysis and/or related report. In addition, to help offset the energy modeling costs for Expedited Track projects, a reimbursement of 50% of the energy modeling costs, up to $15,000 will be paid directly to the building owner. The reimbursement amount for energy modeling costs will be based on submitted invoices for energy modeling work completed by an SRP approved QSP.

Associated natural gas energy savings as obtained from the energy simulation model will be provided in the reports for informational purposes only. Owners are welcome to request additional services from SRP's (energy modeling) QSP under a separate owner paid contract with the QSP. These items may include: quantifying water or maintenance savings, (or any) LEED BD+C submittal requirements, etc.

Section 3 Rebate Information

3.1 REBATE CAPS AND AVAILABILITY

Rebate funding for the New Construction Program is limited and applications will be accepted on a first-come, first-served basis until all rebate funding has been committed. After that time, Customers will be given the option to be placed on a waiting list in the order requests were received by SRP. Current availability of rebate funds can be checked at www.savewithsrpbiz.com or by contacting the Program Administrator.

SRP's Business Solutions programs allow customers to participate in multiple programs subject to the rebate cap established by SRP. The rebate cap is the maximum rebate amount that a customer is eligible to be paid for that program year. Customers are subject to a maximum rebate of $450,000 from May 1 through April 30 for all SRP programs., with separate program area caps of $300,000 for Energy Efficiency programs, $300,000 for Business EV programs, and $100,000 for Beneficial Electrification programs. Program or technology-based limits may also be applicable, based on program terms and conditions. SRP reserves the right to determine at their sole discretion the program year to which a rebate is attributed.

3.2 REBATES

The New Construction Program provides the following service and equipment rebates under the Enhanced Performance Track to encourage the implementation of energy efficiency measures in new construction projects:

1. Design Team Service Rebates
2. EDA Service Rebates (paid directly to the energy modeling QSP)
3. Building Owner Equipment Rebates

Projects approved under the Expedited Track are eligible for the building owner equipment rebates based on final verified savings. The program also co-funds 50% of the energy modeling cost (up to $15,000, paid directly to the building owner upon completion of the project) for projects under the Expedited Track. Design Team rebates are not available for Expedited Track projects.

Design Team Service Rebates

The design team can consist of the owner, architect, lighting and HVAC engineers, general contractor, and others for a project. Design team service rebates offered by the New Construction Program can offset a portion of the expenses for the design team's participation in the project. These efforts may include, but are not limited to, the following:

- Attending design assistance meetings
- Reviewing energy efficiency measures
- Calculating incremental costs
- Assisting with energy simulation models
- Supporting energy efficiency measures during design and value engineering
- Submitting construction documents for review

The design team service rebate is a fixed value based on the conditioned square footage of the project. The design team service rebate is paid provided that proposed building's energy simulation model associated with the 100% construction documents exceeds the baseline building energy performance by 10% or more. A summary of the rebate levels as a function of the project size is shown in Table 3.1.

Table 3.1: Design Team Service Rebate Schedule

Project Size (SF)	Design Team Service Rebate
20,000 - 99,999	$10,000
100,000 - 399,999	$12,000
400,000 +	$15,000

If the project encompasses several buildings (e.g. a retail shopping center or more than one office building), the design team service incentive is based on the total combined square footage of the buildings.

The design team service incentive is paid after the Qualified Service Provider's review of the 100% construction documents and verification that the building design exceeds the baseline building energy performance by at least 10%. Payment is provided to one entity (architect, engineer, etc.). It is the design team's responsibility to determine any disbursement of monies between the various parties.

Design Team Service Rebate Example:

Office Building Campus (3 Buildings):

- Office Building A: 50,000 SF
- Office Building B: 75,000 SF
- Office Building C: 20,000 SF

Combined Project Size: 145,000 SF

Total Design Team Service Incentive: $12,000

EDA Service Rebates

Electric and gas energy savings will be obtained through the implementation of a comprehensive selection of energy efficiency measures identified and evaluated during the design process by the EDA Service Provider (energy modeling QSP) appointed by SRP using an approved hourly building simulation tool. The services of the energy modeling QSP is provided at no cost to the SRP customer. All EDA service rebates under the New Construction Program are paid directly to the EDA team (i.e., the Energy Modeling QSP.

EDA service rebates will be determined on a performance basis, based on the project's energy savings over the first year. The combined total EDA service rebates will not exceed $0.08/kWh, capped at $50,000. EDA service rebates will be partially paid at different program phases as follows:

Phase	EDA Incentive	Deliverable
Preliminary Energy Analysis (PEA)	**$0.03/kWh identified at PEA**, not to exceed $15,000	Preliminary Energy Analysis (PEA) Report
Pre-construction Energy Analysis (PcEA)	**$0.05/kWh identified at PcEA**, combined PEA + PcEA payments not to exceed $30,000	Pre-construction Energy Analysis (PcEA) Report
Verification (VR)	**$0.08/kWh verified**, combined PEA + PcEA + VR payments not to exceed $50,000	Final Verification Report
Combined Total EDA Rebates: $0.08/kWh, up to $50,000		

EDA Finder's Fee (Enhanced Track)

The EDA team or the energy modeling QSP may qualify to receive an additional bonus payment of 7.5% of a customer's final equipment rebate for projects brought in to participate under the Enhanced Performance Track.

SPIFF Bonus (Expedited Track)
Any SRP approved NCS QSP may qualify to receive a SPIFF payment of 5% of a customer's final equipment rebate for projects brought in to participate under the Expedited Track.

Building Owner Equipment Rebates

To help offset incremental costs associated with energy efficiency measures, eligible financial rebates are available for the building owner. Customers may be eligible to receive building owner equipment efficiency rebates paid at $0.11 per kilowatt-hour for the first year of electrical energy savings, capped at 100% of the project's incremental costs; with a minimum of 10% improvement over the baseline building.

Building owner equipment rebates for other non-efficiency integrated demand side measures as outlined in Table 2.2b will be paid based on the following schedules:

Measure	Rebate
On-site solar PV and other renewable generations	Rebates are paid at $0.11 per kilowatt-hour for the first year of **electrical energy exported back to the grid during the peak hours** as defined under the program
Heat Pump Water Heater (Beneficial Electrification)	Rebates are paid at $0.11 per kilowatt-hour for the first year of any **off-peak electric energy usage**
EV charging stations	Rebates paid at $0.11 per kilowatt-hour for the first year of **energy usage during the peak hours** as defined under the program
Demand shifting with energy storage	Rebates paid at $100 per average kW for demand shifting **during the peak hours** as defined under the program (no energy rebate). Measure's eligible savings under the program is estimated by calculating equivalent energy usage that is displaced from peak to off-peak hours.

For projects participating under the Enhanced Performance Track, the building owner equipment rebates will be split into two payments. Upon submitting the "Measures Selection Form" as soon as 100% CD is ready for the EDA team's review and use, the pre-construction energy analysis (PcEA) report will be prepared by the EDA team for SRP's review and approval. A partial equipment rebate for the 50% of the projected energy savings as evidenced in the approved PcEA report will be issued to the building owner only after the construction of the proposed building has started. All remaining eligible equipment rebates will be paid to the building owner as soon as the final verification report is approved upon completion of the whole building energy model simulation according to the 'as-built construction documents' and findings from the 'final inspection'. The total building owner equipment rebate paid shall be no more than 150% of the rebate amount approved in the PcEA report, subject to funding availability.

For projects participating under the Expedited Track, all eligible equipment rebates will be issued to the building owner as a single payment based on the final verified savings from the 'as-built' whole building energy simulation and as evidenced in the approved verification analysis and/or related report. The final building owner equipment rebate paid shall be no more than 150% of the reserved rebate amount, subject to funding availability. In addition, to help offset the energy modeling costs for Expedited Track projects, a partial reimbursement of 50% of the QSP fees associated with the energy modeling services,

up to $15,000, will be paid directly to the building owner. The reimbursement amount for energy modeling costs will be based on submitted invoices for energy modeling work completed by an approved QSP.

The savings for measures not covered by ASHRAE Standard 90.1-2016 or IECC 2018 shall not be included to determine if the building design exceeds the baseline building energy performance by 10%. Rebates for measures not covered by ASHRAE Standard 90.1-2016 or IECC 2018 will be paid at a fixed amount of $0.08 per first year kWh of energy savings, using industry standard practice as a baseline. Rebates for measures not covered by ASHRAE Standard 90.1-2016 or IECC 2018 are capped at 75% of the incremental customer cost.

The owner's equipment rebate will be subject to an energy efficiency program customer cap of $300,000 per program year, less any other equipment rebate, service rebates paid to the design teams and the EDA team associated with all affected customer's projects under the same program year.

The baseline energy simulation model will be created in accordance with the requirements set forth in either 1) ASHRAE Standard 90.1-2016 Normative Appendix G, PRM, 2) ASHRAE 90.1-2016 Chapter 11 Energy Cost Budget Method or 3) IECC 2018 Section C407 Total Building Performance. This baseline model provides a consistent benchmark against which to compare energy performance metrics and energy savings for subsequent energy strategy alternatives. Energy savings will then be calculated as the baseline (code compliant) annual energy use minus the as-built annual energy use as determined by the energy simulation model based upon the results of a final verification report paid for by SRP.

Building owner equipment rebates are contingent on the as-built building exceeding the baseline building energy performance by 10% or more. If the 10% improvement threshold is not met, no rebates are available through the New Construction Program. Rebates may be available through the SRP Business Solutions Standard or SRP Business Solutions Custom Programs (rebate caps may apply). Building owner equipment rebates are also subject to compliance with program commissioning requirements, outlined in further detail in Section 6 of this manual.

Associated natural gas energy savings as obtained from the energy simulation model will be provided in the reports and are for informational purposes only. Owners are welcome to request additional services from the EDA service providers under a separate owner paid contract between the EDA team and owner and independent of the New Construction Program. These items may include quantifying water, or maintenance savings; LEED BD+C certification related submittal requirements; etc.

3.3 CORE AND SHELL/TENANT IMPROVEMENT PROJECTS

Core and shell (C&S) and tenant improvement (TI) projects typically result from an owner who is constructing a building with the purpose to lease out the floor area. In some cases, the building may contain mixed used occupancy (e.g. retail on the first floor and office space on the upper floors).

Measures that are typically included under C&S versus those that are common for TIs are summarized in Table 3.2.

Table 3.2: Example measures for C&S and TI Projects

C&S Measures	TI Measures
Building envelope (walls, roof, floor, glazing)	Tenant area lighting
Common area/exterior lighting	Tenant area daylighting controls
Common area daylighting controls	Air handling equipment upgrades
Central plant measures	Data center measures
Air handling equipment measures	VAV box control sequences

During the typical design phase of the new C&S building, tenants have not been secured for all spaces and therefore the TI design has not been completed yet. However, under the New Construction Program, the project must meet or exceed the 10% minimum improvement over the baseline building.

To provide C&S projects an opportunity to maximize the building owner equipment rebates, the percentage savings will be calculated for systems that are designed, installed, and commissioned, and as specified in TI guidelines for future installation(s). The building owner equipment rebate will be calculated based on the savings attributed to building systems and equipment that are installed and verified as part of the completed C&S project (exclusive of uninstalled TI measures, equipment, and systems) as long as projected savings inclusive of future TI improvements meet or exceed the 10% performance target.

Supporting documentation (in the form of lease agreements, or tenant improvement construction guidelines and specifications) shall be furnished to SRP under the terms of the program in order to receive rebate payment for C&S projects. Such documentation shall clearly identify that current and future tenant “buildouts” will incorporate the energy efficiency measures indicated and incorporated in the C&S project. TIs not completed at the time of building construction may be eligible for rebates under the SRP Business Solutions Standard or SRP Business Solutions Custom Programs.

DESIGN TEAM C&S / TI BUILDING OWNER EQUIPMENT REBATE EXAMPLE:

Project Highlights:

Systems designed, installed and commissioned in the C&S phase:

- Core and Shell office building, 175,000 SF
- Variable volume air handlers with premium efficiency motors
- High efficiency water cooled chiller
- Premium efficiency chilled water pumps with variable frequency drives
- Premium efficiency T8 lamps with electronic ballasts installed in common area lobbies and corridors
- Improved glazing solar heat gain coefficient and envelope insulation
- High efficient elevators

Tenant systems designed and/or specified in Tenant Lease Agreement and TI Requirements during the C&S phase, however not installed in the C&S Phase:

- Premium efficiency T8 lamps with electronic ballasts
- Daylighting controls and occupancy sensors
- VAV box control sequences

Calculated energy savings as a result of implementing EEMs:

▪ Systems designed, installed and commissioned in the C&S phase	263,000 kWh/yr and 32 kW
▪ Tenant systems designed and/or specified in the C&S phase (not installed in the C&S phase)	112,000 kWh/yr and 14 kW
▪ Total estimated savings	375,000 kWh/yr and 46 kW

The total estimated savings yields a 15% savings above standard for this example.

Building Owner Equipment Rebate calculation

- Applicable rebate rate $0.11/kWh:

  $0.11/kWh x 263,000 kWh/yr= $28,930

- $28,930 is the eligible building owner equipment rebate for those EEMs that are designed, installed and commissioned under the C&S project.

3.4 COMMERICAL/INDUSTRIAL INTERIOR DESIGN-CONSTRUCTION PROJECTS

Due to the prevalence of design-build new construction projects, it has become common for new construction shell buildings to move through the concurrent design and construction process ahead of the interior design and build-out activities. As such, these projects do not typically fall into the Core and Shell/Tenant Improvement category. In order to influence the design-construction of these type of projects, the program encourages the affected design teams to exploit the EDA services available under

the Enhanced Performance Track as long as the interior design is still early in the design process (before the schematic design is complete) and meets all other eligibility requirements. If the new construction shell building has already been constructed, the construction completion date needs to be within the current NCS program application year for the project to remain rebate eligible.

Measures that are typically included under Commercial/Industrial Interiors are summarized in the table given below:

Commercial/Industrial Interiors Measures
High-efficiency lighting
Daylighting controls and occupancy sensors
Higher efficiency HVAC (High-efficiency units, VFDs, economizers)
AHU controls (Thermostat setpoint and setbacks, DCV)
High-efficiency equipment (elevator motor, sprinkler pump, and industrial equipment)

Savings for the proposed interior design-construction project, inclusive of any savings from the existing shell building, must meet or exceed the 10% minimum improvement over the baseline building. The rebate eligible energy savings will be based on those realized from the efficiency measures implemented in the Commercial/Industrial interior buildouts as well as those already implemented in the existing shell building components (walls, roof, floor, glazing).

Section 4 Program Participation Process

4.1 ENHANCED PERFORMANCE TRACK

Providing quality information in a timely fashion is critical to incorporating energy efficiency measures into buildings. The process commences with a brainstorming session for potential measures, followed by an investment-grade energy analysis report that quantifies the economic impacts of each measure, and completes with a review of the construction documents to ensure that the measures are included in the final design and a final verification report on the as-built building design. The schedule and duration of time between each meeting can be varied to accommodate individual design team's needs. However, the key milestone meetings described below are required to ensure that progress towards energy efficient decisions are achieved.

Detailed information about the EDA service provider selection and the three-meeting design assistance process is contained in the following sections. Figure 4.1 provides an overview of the timeline and participation process while Figure 4.2 provides a detailed flow chart of the Enhanced Performance Track program process and roles of participating parties.

4.1.1 CUSTOMER APPLICATION AND APPROVAL PROCESS

The first step in participating in the program is to complete a New Construction Program Project Application. The application requests information about the anticipated facility's design goals, building characteristics, and owner and design team contact information. Based upon SRP's review of the application, the project can be expedited to the most appropriate rebate program offering or the New Construction Program. In some cases, there may be a preliminary meeting to review the application and discuss program options and how a project is "tracked" once a program option is selected prior to participation approval.

Rebates paid for measures implemented for projects participating in the New Construction Program are not eligible to receive rebates through the other program offerings. However, if a point is reached during the project (e.g. during late design or early construction) where the 10% improvement beyond the baseline building energy performance cannot be achieved, SRP may consider providing rebates through another program offering.

4.1.2 EDA TEAM SELECTION & TASK ORDER

SRP will assign the EDA team consisting of an energy modeling QSP to serve as the energy analyst and energy modeler for accepted projects under the program. Energy modeling QSPs providing services under the New Construction Program must be pre-approved by SRP. As part of the Project Application Approval Form, SRP will submit to the customer the name(s) and contact information of the recommended EDA team (energy modeling QSP) and the terms and conditions under which the Design Team Service Rebates will be paid for customer's review and approval. Contact the Program Administrator for more information.

Upon SRP's decision to move forward with the project under the SRP Business Solutions New Construction Program, SRP will request a proposal from a pre-approved QSP to perform the energy design assistance services. The Project Application/Agreement may be provided to assist the QSP in drafting the proposal. Proposals should include scope of work for energy analysis and modeling, 100% CD review, and final inspection and verification and any other services (e.g. meeting facilitation and participation) as requested by the Program Administrator. Upon approval of the proposal, a written authorization will be prepared by SRP with deliverable dates and EDA rebates payment schedule.

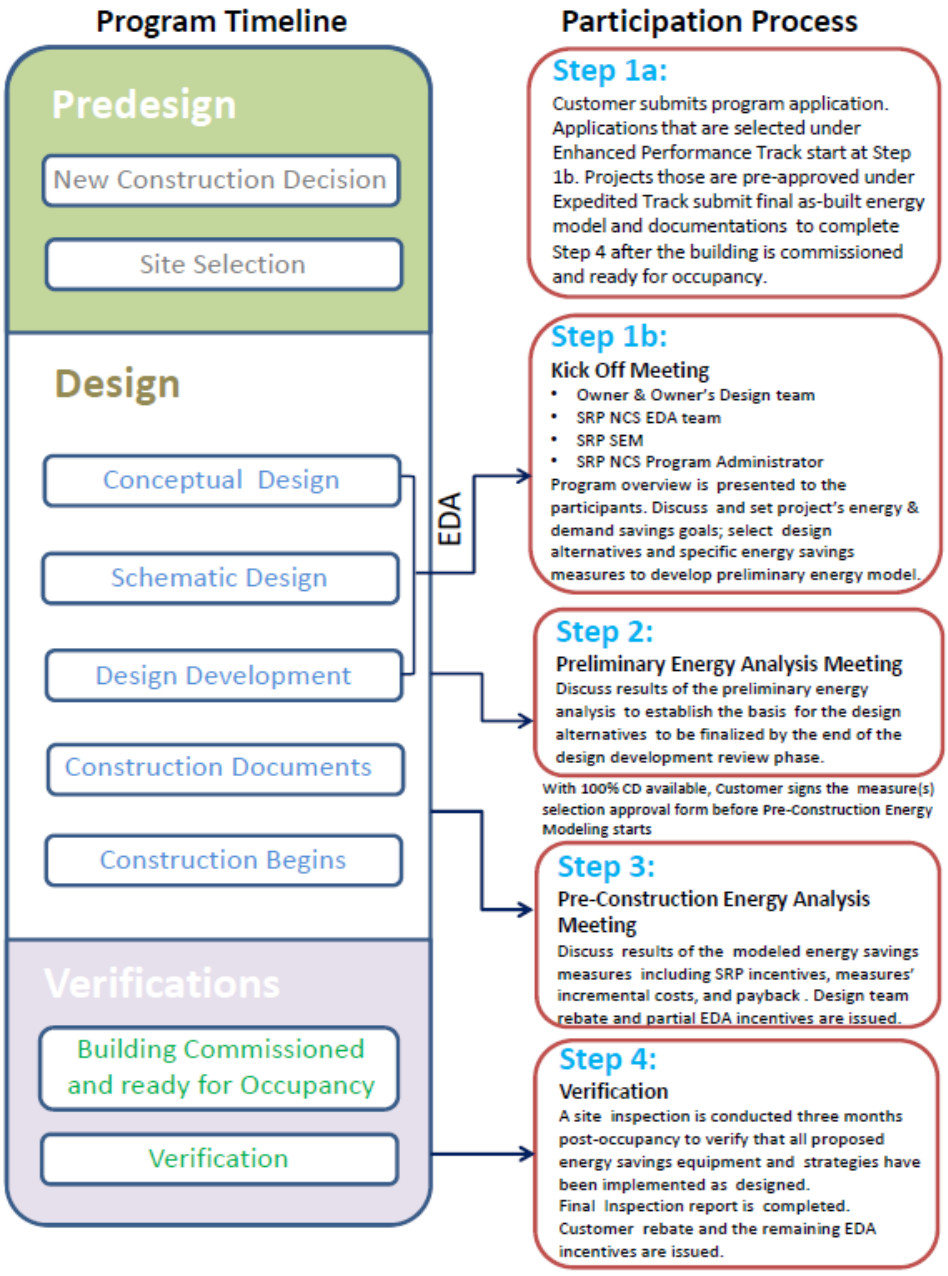


Figure 4.1: New Construction Program Timeline and Participation Process Overview

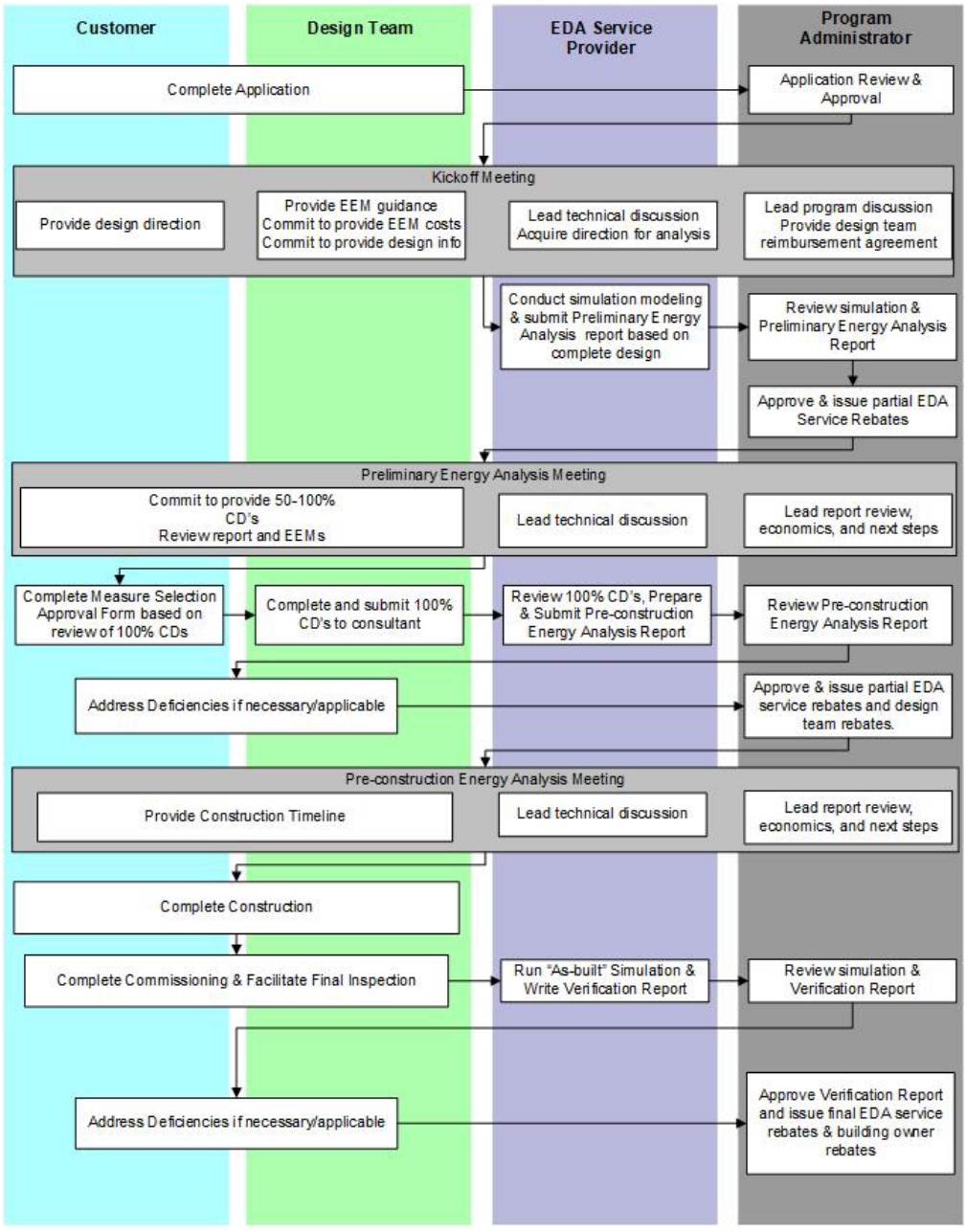


Figure 4.2: New Construction Program Enhanced Performance Track Overview

4.1.3 MEETING 1: KICK-OFF MEETING

This meeting is the official "kick-off" of the process. The meeting is scheduled by the Program Administrator and includes the EDA team and representatives of the owner, architects, engineers, utility and sometimes the developer and contractor(s). At this meeting, the schedule is established, programming is discussed, or the schematic design of the building is reviewed and a list of potential strategies to be reviewed during the process is discussed.

In preparation for the meeting, the EDA team will be asked to draft a meeting agenda as well as a list of potential EEMs to be analyzed based on the building type, size, and minimum requirements.

In conjunction with the Program Administrator, the EDA team will attend the meeting and lead the technical discussions about EEMs and energy simulation modeling. By the end of the meeting, the EDA team will have direction from the design team regarding the following:

- EEMs to be modeled
- Building characteristics to compile a baseline model
- Schedule for the design team to provide EEM costs to the EDA team
- Anticipated design assistance schedule and future meeting dates

The kick-off meeting also provides an opportunity for the design team and owner to discuss the scope of the utility-funded technical services through EDA. If the customer desires additional services from the EDA team, they may contract separately for those items (e.g. LEED certification, non-energy analysis). Once the scope of the offerings has been finalized, the energy modeling QSP will complete the initial simulation modeling and develop the Preliminary Energy Analysis (PEA) report.

Table 4.1: Kick-off Meeting Roles & Responsibilities

Program Administrator	EDA Team	Design Team/Owner
Maintain contact with design team. Facilitate questions or concerns with process.	In advance of meeting, prepare meeting agenda and prepare preliminary EEM list.	Provide programming and design documents to EDA team.
	After meeting, develop baseline model according to Appendix G utilizing input from the design team's programming and design documents.	Provide estimated measure costs for selected strategies.
	Model strategies agreed upon in the meeting. The PEA report includes all DD phase updates from the design team and is submitted to the program at the end of the DD phase.	Contract for additional services with EDA team (if applicable)

Key EDA Team Kick-Off Meeting Deliverables

- Kick off meeting Agenda
- Participate in kick off meeting, lead technical discussion and acquire details for analysis.
- Anticipate design assistance schedule and future meeting dates.

4.1.4 MEETING 2: PRELIMINARY ENERGY ANALYSIS MEETING

In the second meeting, SRP will present and discuss the PEA report that details the economic impacts and potential rebates for a number of viable energy efficiency measures to be finalized by the end of the design development review phase. Using costs provided by the design team, simple payback information for each individual strategy and also for potential design bundle are presented.

The PEA report will also provide a commissioning plan for the owner to complete upon the building's completion. The plan outlines functional testing requirements as well as trending parameters to ensure that the systems, when installed, operate as intended.

If a project cannot demonstrate reasonable feasibility in the New Construction Program, the owner may be redirected towards another energy efficiency program from SRP. If this is the case, the EDA team will be paid for services provided through the Preliminary Energy Analysis report only. No additional work will be performed, or payments made.

4.1.4.1 Energy Simulation Modeling for the Preliminary Energy Analysis

Following the kick-off meeting, the energy modeling QSP constructs a baseline energy simulation model based upon direction from the design team and the current design drawings obtained at the meeting or from follow-up communications. Upon completion of the baseline model, a proposed model simulation with proposed EEMs should be performed. The design team will be tasked with weighing the value of the strategies and group them into a single bundled package. This bundle will show the interactive effects of the combined EEMs as well as the individual savings from each EEM. The packaged approach provides significant benefit over the measure-level option that requires each measure to be evaluated individually. The goal of the proposed mechanism is to treat the building as a functionally integrated structure rather than a base building with "add-on" efficient systems. By combining the strategies into a design alternative package, the influence of trade-offs and interactions between systems can be appropriately evaluated both from an energy and cost perspective. Energy simulation modeling should be performed in accordance with modeling guidelines presented in Section 5.

Facility schedules, occupant activities, and building space types should be based upon the anticipated building use upon project completion. Changes in operation beyond the Commissioning period should not be modeled without approval from SRP. In other words, if the design scheduled use of the building changes significantly after the building is constructed (e.g., a school decides to add summer school classes as opposed to being closed for the summer) and the commissioning has been completed, it is up to the discretion of SRP to revise the energy model.

Table 4.2: Preliminary Energy Analysis Meeting Roles & Responsibilities

Program Administrator	EDA Team	Design Team/Owner
Maintain contact with design team. Facilitate questions or concerns with process/program.	Maintain contact with design team, respond to questions or concerns with model.	Review report and EEMs. Commit to provide 100% CDs and completed Measure Selection Form

Program Administrator	EDA Team	Design Team/Owner
Pay the corresponding EDA rebates at the conclusion of the Preliminary Energy Analysis Report review meeting.		

4.1.4.2 Preliminary Energy Analysis (PEA) Report

Utilizing the information gathered during the kick-off meeting and results from the simulation modeling, the QSP is responsible to draft the Preliminary Energy Analysis (PEA) Report. The PEA report describes the baseline building, describes specific EEMs, estimates energy savings, summarizes rebates, and demonstrates project economics. The QSP, by coordinating with the design team will identify the EEMs that would be installed and include those in the PEA report.

A Commissioning Plan for the identified EEMs is required in the PEA report outlining the necessary functional testing as well as the trending parameters to ensure that the energy efficient systems, when installed, will operate as intended. The intent of commissioning and verification is to ensure that the functionality of the as-built systems matches the expected response simulated in the energy model. The Commissioning Plan shall recommend that the owner provide copies of startup reports and functional test procedures performed by the contractors proving that the systems are calibrated and operating per the design control sequence.

Upon completion of the draft PEA report, the QSP provides a copy for the Program Administrator's review and comment. Deviations from this template must be approved in writing by SRP.

Key EDA Team Preliminary Energy Analysis Phase Deliverables

- Preliminary Energy Analysis (PEA) meeting agenda
- Participate in Preliminary Energy Analysis meeting and lead technical discussion
- Provide necessary support and coordination with Design team
- Perform baseline building simulation model and proposed design model with EEMs for PEA report
- Develop M&V related commissioning plan for PEA report
- Submit draft PEA report to Program Administrator for QC
- Revise and submit final PEA report to Program Administration for Preliminary Energy Analysis meeting

4.1.5 MEETING 3: PRE-CONSTRUCTION ENERGY ANALYSIS MEETING

After the energy efficiency measures have been selected and incorporated into the construction documents (CDs), the design team is responsible for providing the EDA team with the complete 100% CDs package. At this time, the customer must submit a "**Measures Selection Approval Form**" before the

EDA team starts any tasks towards the Pre-construction Energy Analysis (PcEA) Report. The EDA team will review the 100% CDs and check the specifications to ensure the selected design alternatives are included and identified as intended. If some measures of the final design alternative selection have been overlooked, efforts will be made to encourage the design team to incorporate them at this point. If these efforts prove unsuccessful, the savings estimates, and corresponding rebate levels will be reduced accordingly.

In the third meeting, the results of the PcEA will be discussed that have taken into account final selections of the efficiency measures or bundle of measures as agreed upon in the "**Measures Selection Approval Form**" submitted by the building owner. If the measures as selected by the owner's design team demonstrate a 10% or more improvement over the baseline building energy performance, the design team service rebate is provided. Based on the energy savings of the final approved PcEA Report, 50% of the building owner equipment rebate is issued once the building construction has started. Rebate funds for the remaining portion of the building owner equipment rebate will be reserved for the current program year only. Rebate funds can be re-reserved for the following one year only if the project is on track during the previous year. Submission of project milestone documents every six months will be required to confirm project is on track.

4.1.5.1 Energy Simulation Modeling for Pre-construction Energy Analysis Report

Based on the measures selected in the "Measures Selection Approval Form", and review of the 100% CD package, the energy modeling QSP will update the energy simulation model to remove any EEMs that were not selected and include any updates or changes to selected EEMs. Under certain circumstances, EEMs may be removed from the project and cause the performance to approach the 10% threshold. In these situations, energy simulation modeling of the remaining EEMs will be important to ensure that the project is still viable under the program.

Table 4.3: Pre-construction Energy Analysis Review Roles & Responsibilities

Program Administrator	EDA Team	Design Team/Owner
Maintain contact with design team. Facilitate questions or concerns with process. Pay the Design Team rebates and partial EDA rebates after satisfactory review of the construction documents, completion of PcEA report. A partial payment of the customer equipment rebate is issued once the construction begins.	Review 100% CDs for inclusion of selected measures. Notify design team of any EEMs' omissions. Update PEA energy model to reflect final measures as selected by the owner for installations and any other changes observed in 100% CDs.	When possible correct omissions in 100% CDs. Communicate changes to EDA team. Provide refined measures costs to EDA team Provide Construction timeline

4.1.5.2 Pre-construction Energy Analysis (PcEA) Report

The PcEA report will document the approved EEMs implemented by the design team in the 100% construction documents drawing set and list the EEMs that were not implemented. If the performance values of a given system (e.g., glazing) are different than the values used in the energy simulation model, the report will include both values and make recommendations to adjust the values accordingly before the final set of drawings are issued. Deviations from this template must be approved in writing by SRP.

Key EDA Team Pre-Construction Energy Review Phase Deliverables

- Review 100% construction documents package
- Revise energy simulation model as necessary to reflect actual EEMs contained in construction documents to ensure that the project is still viable under the program
- Provide necessary support and coordination with design team
- Submit draft PcEA report to Program Administrator for review
- Revise as applicable and submit final PcEA report to Program Administration for Pre-construction Energy Analysis review meeting

4.2 EXPEDITED TRACK

The Expedited Track is suited for smaller buildings or for projects with aggressive design schedules driven by business requirements. These projects are expected to have an integrated design process inclusive of whole-building energy modeling simulation not facilitated by the program. Depending on the targeted goals of the design team, necessary simulation rigor and schedules are implemented during the design phase. The participation process involves submitting the program application before any of the identified energy efficiency measures are purchased. As-built building's performance will be established with a calibrated energy model and supporting documentation.

4.2.1 CUSTOMER APPLICATION AND APPROVAL PROCESS

The first step in participating in the program is to complete a New Construction Program Project Application. The application requests information about the anticipated facility's design and savings goals, building characteristics, and owner and design team contact information. If it is determined that the project is not eligible to participate under the EDA or the Enhanced Performance Track of the Business Solutions New Construction Program, the project can be routed to the other appropriate rebate program offerings. In some instances, there may be a preliminary meeting to review the application and discuss program options and how a project is "tracked" once a program option is selected.

Rebates paid for measures implemented for projects participating in the New Construction Program are not eligible to receive rebates through the other program offerings. If, after construction, a point is reached where the 10% improvement beyond the baseline building energy performance cannot be achieved, SRP may consider providing rebates through another program offering.

The Customer must appoint an SRP approved Energy Modeling QSP to serve as the energy analyst for accepted expedited track projects in their Project Application. For Expedited Track projects, QSP fees

associated with the energy modeling as required by the New Construction Program, are the responsibility of the customer. However, the customer will qualify to receive a 50% reimbursement of any eligible energy modeling costs up to $15,000, once the project is completed and the associated project's savings are verified by SRP.

It is required that project applications for expedited track projects be approved in writing by SRP prior to purchasing any of the affected energy efficient equipment. Upon receiving the pre-approval letter from SRP, customer may purchase the proposed energy efficiency measures to complete the construction and all necessary building commissioning activities***.***

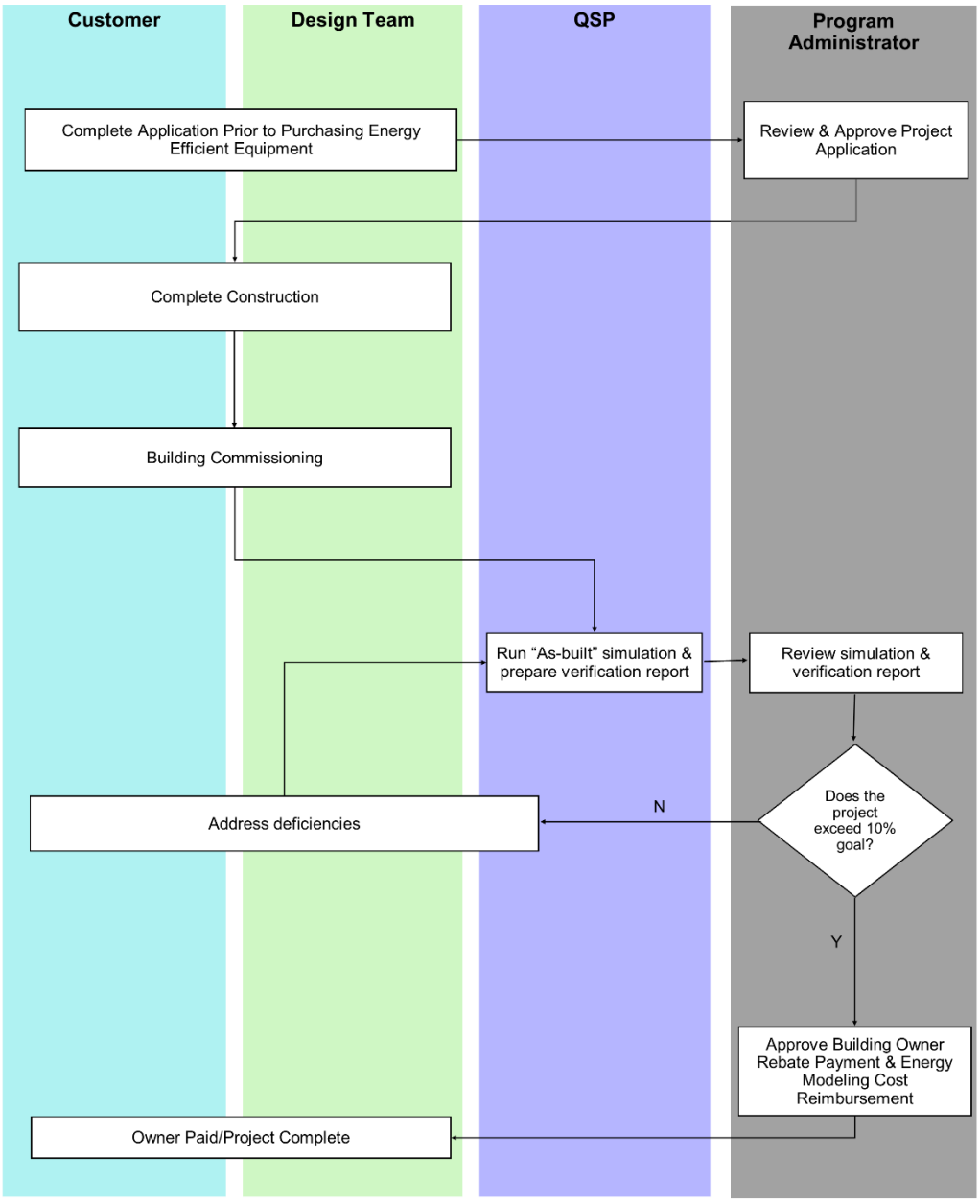


Figure 4.3: SRP Business Solutions New Construction Program Expedited Track Overview

4.2.2 COMMISSIONING

For purposes of this track under the New Construction program, commissioning includes verification that the installed energy efficiency measures are operating as modeled. This ensures that the predicted

energy savings are being achieved and that the system's operation and performance has been optimized. General guidelines for commissioning requirements are specified in the Project Application as well as Section 6 of this manual. The guidelines are intended to provide general direction as to acceptable standards for building performance verification, not to replace or change any other commissioning or installation guidelines the project may be required to perform.

Commissioning is required to be completed when the building is fully occupied and when the system's operation can be verified. Some measures may require operation during the cooling or heating seasons.

4.2.3 VERIFICATION

Upon review of the customer's Commissioning Report, the EDA team/Energy Modeling QSP will evaluate any variations found for each strategy as compared to its expected functionality, characteristics, and scope of installation. If variations are found for specific strategies, the energy simulation model is refined to match the functionality, characteristics and/or scope of the verified strategies. The as-built model is then used to calculate the final energy impacts. The QSP will issue the verification report and energy simulation model to SRP along with other required documents. In some cases, SRP may request clarification or revision to the simulation model. All revisions and responses should be made by the QSP within a timely manner. In some cases, SRP may request to inspect the installed equipment on-site. The building owner equipment rebate is paid based on the savings confirmed through a calibrated as-built energy simulation model per requirements of the program.

Section 5 Modeling Guidelines

5.1 ENERGY SIMULATION PROGRAM SELECTION

Any implemented item that can reduce the overall energy usage (electricity) of a building that exceeds ASHRAE Standard 90.1-2016 or IECC 2018 can be considered an EEM. These items are typically related to the envelope, mechanical, electrical, and building controls systems. It is up to the QSP's expertise to recommend EEMs to the design team that will have a reasonable simple payback period (SPB) or meet the expectations of the design team.

Since there are limitations in the accuracy that certain energy building simulation programs can provide in modeling certain EEMs, it is up to the QSP to choose a program that is appropriate for the anticipated EEMs. However, the building energy simulation program for each project needs to be consistent with approved software in Section G2 of Appendix G of ASHRAE Standard 90.1-2016 or IECC 2018 C407.

If the selected energy simulation program cannot explicitly model an EEM, the QSP may utilize a thermodynamically similar component model that can approximate the expected performance. QSPs have the flexibility to utilize industry accepted methodologies where such deficiencies in the model occur. For example, when modeling a displacement ventilation system, the QSP may choose to:

- Utilize published methodologies for simulating this type of system using eQUEST or EnergyPlus
- Conduct the simulation with another model that is thermodynamically equivalent

5.2 BASELINE DEFINITION

The baseline energy model for the purposes of the SRP Business Solutions New Construction Program follows the modeling guidelines set forth in ASHRAE Standard 90.1-2016 Appendix G, PRM, ASHRAE Standard 90.1-2016 Chapter 11 ECB, IECC 2018 C407 or industry code practice, where standard does not apply. Only energy savings achieved beyond ASHRAE Standard 90.1-2016 or IECC 2018 will be eligible to receive rebates assuming the whole building design performance exceeds code by 10%. If the whole building design does not exceed one of these standards by 10%, no rebates will be provided[1]. This concept is illustrated in Figure 5.1.

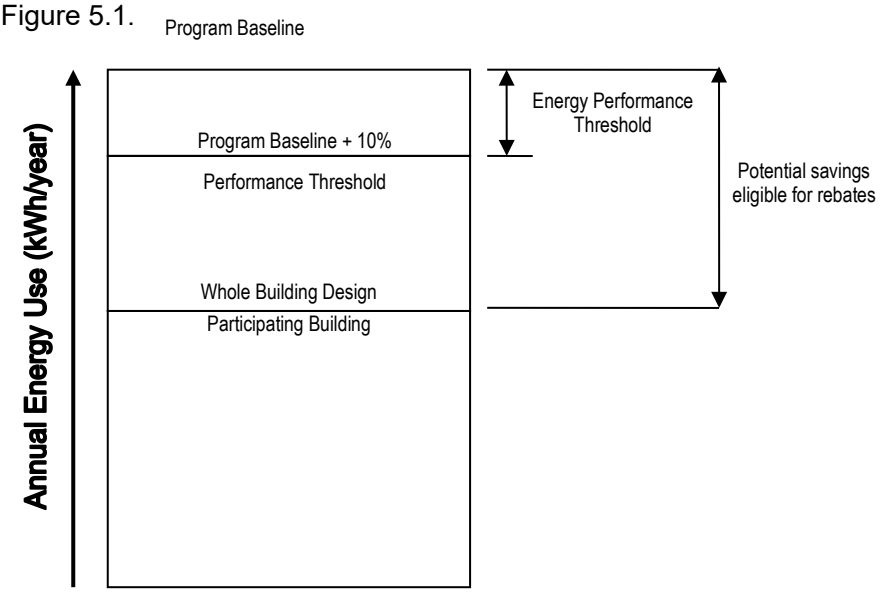


Figure 5.1: Illustration of program baseline and savings eligibility

[1] No rebates will be provided through the SRP Business Solutions New Construction Program; however, rebates may be available through another SRP Business Solutions program.

This strategy provides a consistent benchmark against which to compare energy performance metrics and energy savings for subsequent energy strategy alternatives. All building parameters for the baseline model will be set to the minimum performance requirements of the selected compliance path (ASHRAE 90.1-2016 or IECC 2018) based on the most current architectural and engineering design and operation schedule of the project available at the schematic design phase. If ASHRAE Standard 90.1-2016 Appendix G, Performance Rating Method is selected for project compliance under the program, the following modeling guidelines that are to be followed include, but are not limited to:

- Performance Rating Method G1.2
  - Mandatory Provisions
  - Performance Rating Calculation
- Modeling requirements for each of the sections noted in Table G3.1
  - Design model
  - Additions and alteration
  - Space use classification
  - Schedules
  - Building envelope
  - Lighting
  - Thermal blocks –HVAC Zones Designed
  - Thermal blocks –HVAC Zones Not Designed
  - Thermal blocks –Multifamily Residential Buildings
  - HVAC systems
  - Service Hot-water Systems
  - Receptacle and other loads
  - Modeling limitations to the simulation program
  - Exterior Conditions
  - Distribution Transformers
- HVAC Modeling Guidelines (Sections G3.1.1, G3.1.2, G3.1.3)
  - Baseline HVAC system selection
  - Equipment capacities
  - Sizing runs
  - Fan system operation
  - Economizer controls

- Design airflow rates
- Supply/return fan power
- Exhaust air energy recovery
- Heat pump controls
- Hot water pump size and controls
- Chilled water system (chiller and chilled water pumps) size and controls
- Heat rejection (cooling tower and condenser water pumps) size and controls
- Supply air temperature reset
- VAV minimum airflows
- Fan power
- VAV fan part load performance

The performance guidelines in ASHRAE 90.1-2016, Appendix G shall be used to determine the baseline systems:

- Building envelope requirements (Appendix G)
- Building mechanical systems' performance guidelines (Appendix G & Section 6)
- Electric power and lighting systems performance guidelines (Appendix G)
- Electrical motor performance guidelines (Appendix G)

5.2.1 BASELINE MODELING ITEMS TYPICALLY OVERLOOKED

A few critical items, which are noted above, that tend to be overlooked in building a baseline model per Appendix G include:

- appropriate fan sizing,
- calculating the baseline power usage of the fans and pumps,
- separating out the fan and compressor energy component of the EER and COP for packaged HVAC and heat pump systems,
- averaging the energy use of the building in 4 directions to represent baseline energy use,
- wall/roof thermal performances including thermal bridging,
- total fenestration assembly U-values including the frame, and
- baseline window percentages per ASHRAE (e.g., 40% windows by window to wall area are the maximum allowed in the baseline).

Of these noted items, determining the appropriate fan sizing is often driven by the assumptions that the QSP makes in regard to the internal gains and supply/return air temperatures for the building. It is strongly encouraged that the QSP communicate directly with the mechanical design team to ensure that they are using similar or the same values (e.g., envelope characteristics, occupant densities and heat gains, equipment, and lighting power densities) for sizing the fans. If the design team is using values for internal gains that are significantly higher than those published in such resources as the *ASHRAE 90.1-*

2016 User's Manual, the QSP should ask the design team for documentation to support their assumptions. These discussions and values shall be documented accordingly in the Preliminary Energy Analysis Report.

Once the fans are sized and the power of the fans and pumps are calculated, these values need to be hard entered into the baseline model. The baseline capacities also need to be entered at "sea level" conditions, since the model will account for the altitude correction, if applicable. If these values are not hard entered, the model will auto-size the fan capacities for each EEM, which could result in over-inflating the EEMs savings.

5.3 CALCULATION METHODOLOGIES: ENHANCED PERFORMANCE TRACK

5.3.1 KICKOFF MEETING

This meeting is the official "kick-off" of the EDA process. The meeting is scheduled by the Program Administrator and includes the EDA team (energy modeling QSP) and representatives of the owner, architects, engineers, utility and sometimes the developer and contractor(s). At this meeting, the project schedule is established, programming is discussed, or the schematic design of the building is reviewed, and a list of potential strategies to be reviewed during the process is discussed.

This meeting also provides an opportunity for the design team and owner to discuss the scope of the utility-funded analysis. If the customer desires additional services from the EDA team, they may contract separately for those items (e.g., LEED certification, non-energy analysis). Once the scope of the analysis has been finalized, the QSP will complete the initial simulation modeling.

For systems that are not covered by code, the baseline is industry standard practice. The energy simulation model can be used to perform the analysis. However, if the simulation tool is not able to perform the analysis, a thermodynamically similar model that considers loads, schedules, equipment sizes, efficiencies, and part load efficiencies shall be used in its place. These savings shall be reported as a separate line item in the results tables in the report. However, the baseline use and savings for non-code compliant EEMs shall not be included as part of the total energy savings to exceed code by 10%.

After the design team selects the EEMs for inclusion into their building, the QSP builds an interactive model of the proposed facility. To properly portray the impacts of each measure within the interactive model, the order in which the EEMs shall be modeled based on the EEM type shall start with measures that affect the building loads, then systems, and conclude with EEMs that affect the plant. Table 5.1 shows a table with an example of the types of EEMs and their hierarchy in determining the energy modeling order, which was discussed in the prior section.

Table 5.1: Example EEMs and Modeling Order

	Loads	Systems	Plant
EEMs	Envelope Measures		Chiller Plant
	Cool Roof	Air Handler VFDs	Plant Controls
	Lighting/ Plug Loads	Air Handler Controls	Pumping Arrangements
	Lighting/Equipment Controls		Cooling Tower VFD

In an effort to streamline the QC efforts, any available parametric run feature shall be used to model the EEMs. In cases where the EEM cannot be modeled using a parametric run, multiple models may need to be created. The modeling results that are presented for each of the chosen EEMs in the PEA report summary tables must total the combined interactive effects off all the EEMs. This shall be accomplished by having a "rolling baseline" that each EEM model is based on the previous EEM, until all of the

proposed EEMs have been modeled. For example, EEM 1 shall be based on the baseline model (average of the four rotations); EEM 2 shall be based on EEM 1, and so forth.

In addition, if the size of the air handler fans and pumps are different in the baseline model sizing run, compared to the actual design, the actual air handler fan and pump sizes shall be incorporated in all EEM models. Note: measure savings should be defined such that one can add savings for each measure and arrive at the project total savings (no interactive savings line item). Any discrepancies between the baseline and design equipment sizes shall be noted in the PEA report.

5.3.2 ENERGY MODELING APPROACH FOR EACH REPORT PHASE

Table 5.2 summarizes the components that will need to be incorporated into the PEA report project phase model in order to comply with the New Construction Program requirements. Table 5.2 also includes items that are required in both energy models, regardless of the project phase. An "X" under each report type denotes whether that component shall be included in the energy model report phase.

Table 5.2: Project Phase Modeling Guidelines

Baseline Energy Modeling Components	PEA Report
HVAC Zoning Consistent With the Design	X
Averaging the Baseline Energy Use by Rotating the Building 4 Directions	X
HVAC System Selection Type	X
Building Envelope Performance Values (e.g., minimum R-values)	X
Building Mechanical Systems Efficiencies (e.g., EERs, COPs, etc.)	X
Electric Power and Lighting Systems' Performance Values (e.g., lighting power density, equipment power densities)	X
Equipment Capacity Over-sizing	X
HVAC Unmet Hours Requirement	X
Control Setpoints/Algorithms	X
Baseline Fan/Pump Sizing Runs Input	X
Baseline Fan/Pump Energy Use Input	X
Fan Powered VAV Boxes Energy Use Input	X
VAV Fan System Part Load Performance Curves	X

5.4 CALCULATION METHODOLOGIES: EXPEDITED TRACK

The Expedited Track simply requires an as-built simulation model after construction, commissioning has completed, and occupancy has commenced. The as-built model should incorporate all applicable modeling requirements from ASHRAE 90.1-2016 or IECC 2018 as well as the as-built equipment, features, and characteristics.

The as-built model's inputs shall be based off of information obtained from construction documents, equipment submittals, commissioning reports, and other reliable sources of information; all of which will

need to be provided to SRP in support of review activities and summarized in a report. To properly portray the impacts of each measure within the interactive model, the order in which the EEMs shall be modeled based on the EEM type shall start with measures that affect the building loads, then systems, and conclude with EEMs that affect the plant. Table 5.1 shows a table with an example of the types of EEMs and their hierarchy in determining the energy modeling order, which was discussed in the prior section.

In an effort to streamline the QC efforts, any available parametric run feature shall be used to model the EEMs. In cases where the EEM cannot be modeled using a parametric run, multiple models may need to be created. The modeling results that are presented for each of the installed EEMs in the supporting report must total the combined interactive effects off all the EEMs. This shall be accomplished by having a "rolling baseline" that each EEM model is based on the previous EEM, until all of the proposed EEMs have been modeled. For example, EEM 1 shall be based on the baseline model (average of the four rotations); EEM 2 shall be based on EEM 1, and so forth.

In addition, if the size of the air handler fans and pumps are different in the baseline model sizing run, compared to the actual design, the actual air handler fan and pump sizes shall be incorporated in all EEM models. Note: measure savings should be defined such that one can add savings for each measure and arrive at the project total savings (no interactive savings line item). Any discrepancies between the baseline and design equipment sizes shall be noted in the summary report.

5.5 ESTIMATING MEASURE COSTS

Customer decisions and program cost-effectiveness are based upon accurate costs recorded for each measure. As such, project costs should be reviewed by the QSP for accuracy and reasonableness. EEM costs shall be provided by the appropriate design team member (mechanical, electrical, architect, contractor, etc.). However, if a general contractor (GC) is already a part of the team at the preliminary energy analysis phase of the project, this would be the best resource. If a GC has not been hired then the architect shall provide the costs for envelope related measures, the mechanical engineer shall provide mechanically related cost data, and so-forth for the electrical engineer.

This data shall be the incremental costs between code level equipment cost and the proposed EEM cost. Sometimes, it can be assumed that the labor costs will be the same for the baseline and EEM in which case the difference in material costs is sufficient. In an effort to provide an accurate SPB analysis for each EEM, the QSP shall check the accuracy of the cost data provided by the design team by comparing it to related projects or to published cost data. Under the context of the Enhanced Performance Track, the accuracy of these costs shall be reviewed by the QSP at each of the three report phases noted below:

- During the Preliminary Energy Analysis (PEA) Report phase of the project, the building envelope parameters should be nearing finalization, and the mechanical and electrical system types, quantity, and capacities should be defined. The QSP will coordinate with the design team to gather estimated measure costs to include in the PEA report.
- At the Pre-construction Energy Analysis (PcEAR) Report phase of the project, the QSP should confirm with the project team whether the costs in the PEA report are still accurate. Any necessary changes shall be revised by QSP.
- In the Verification Report (VR), the QSP should confirm with the project team whether the costs in the PcEA report are still accurate. The QSP should revise the costs in the verification report if changes are required.

Under the context of the Expedited Track, the QSP shall note in the summary verification report the incremental costs for the EEMs as provided by design team personnel.

5.6 PRESENTATION OF RESULTS AND REBATE CALCULATIONS

The modeling results for both the individual EEMs and bundled EEM (if any) analysis under the Enhanced Performance Track shall be provided in the PEA, PcEA and Verification reports. The presented results shall be consistent in format with the text, sample tables, and figures provided in the template.

The modeling results for both the individual EEMs and bundled EEM analysis under the Expedited Track shall be provided in a summary verification report.

5.7 OVERLAP WITH LEED

The New Construction Program process and the requirements of the United States Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) Energy and Atmosphere (EA) Credit 2 – Optimize Energy Performance guideline requirements are similar. LEED BD+C v4 EAc2 provides ASHRAE 90.1-2016 Normative Appendix G Performance Rating Method as a compliance path to estimate percentage improvement beyond ASHRAE 90.1-2016 using metrics of cost or greenhouse gas (GHG) emissions. In alignment with LEED, the SRP New Construction Program allows metrics of cost to determine the percentage improvement beyond ASHRAE Standard 90.1-2016.

For owners interested in pursuing LEED compliance on a project, the New Construction Program will assist interested SRP customers to achieve higher level energy efficiency towards green building certification, such as the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C), by providing modeling and technical support necessary to maximize Energy and Atmosphere (EA) credits. The modeling and technical support is limited to Energy and Atmosphere (EA) credit: Optimize Energy Efficiency. The following technical services are not provided with the EDA offerings under the SRP NCS program:

- Additional efforts to identify and calculate fossil fuel savings measures
- Providing an estimate of the percentage of LEED BD+C EA points that the project will achieve based on energy use costs
- Assembling the LEED documentation for USGBC

The owner may benefit by contracting directly with the QSP to provide the above additional services. However, if requested, the QSP is required to turn over the model to SRP or the building owner upon request.

Section 6 Commissioning Guidelines

6.1 COMMISSIONING

For purposes of this program, commissioning includes verification that the installed EEMs are operating as modeled. This ensures that the predicted energy savings are being achieved and that the system's operation and performance has been optimized. In the preliminary energy analysis report, SRP will provide a commissioning plan for the owner to complete once the building is constructed and all systems operational. The plan outlines functional testing requirements as well as trending parameters to ensure the systems operate as intended. M&V data collection of the installed EEMs is required to receive a full rebate.

6.1.1 PURPOSE OF COMMISSIONING

For purposes of this program, commissioning of the installed EEMs helps ensure that the predicted energy savings are being achieved and that the system's operation and performance has been optimized. Commissioning is required to be completed when the building is fully occupied and when the system's operation can be verified. Some measures may require commissioning during the cooling or heating seasons.

Commissioning requirements, as they relate to the EEMs' measurement and verification, for the Enhanced Performance Track will be established by the EDA team in consultation with the program administrator and will be outlined in the Preliminary Energy Analysis Report. The energy modeling QSP, will lead the required M&V data collection activities in coordination with the building owner. The QSP may solicit support from the Program Administrator, if necessary, to successfully complete the required EEM data collection.

6.1.2 COMPONENTS OF COMMISSIONING

The main components of commissioning include:

- Submittal reviews,
- Functional testing,
- Data collection, and
- Providing a summary report.

Submittal reviews ensure that the equipment that is about to be purchased, which is noted in the submittals, is consistent in size and efficiencies as noted on the design drawings and the equipment that was modeled.

It is also recommended that the commissioning agent or the installing contractors perform functional tests on the equipment to confirm that the sensors are calibrated and the equipment is working per the design sequence of controls. Often times, the trending period commences prior to performing functional equipment tests, which results in trending the equipment performance several times before the "bugs" are worked out of the system.

A minimum of two weeks of trend data demonstrating that the predicted energy savings are being achieved, if not maximized, is required per the program rules. The two weeks of trend data need to show the system working correctly for the entire time. The data cannot show the system incorrectly operating for one week then, one week operating as designed. Before the trending period begins, the weather needs to be appropriate to test the desired systems and there needs to be a load on the equipment. Trending chiller operation during the winter months for an office building in a cold climate may be inappropriate since the cooling load is minimal. The trend data is defined in the commissioning plan in the Preliminary Energy Analysis report for each EEM. The collected data points vary depending on the EEM.

Typically, the data is either collected through a building control system with trending capabilities or with portable data loggers.

Once two weeks of trending data is collected confirming the systems are operating per the design sequence of controls, a summary report is assembled. This report should include results of the submittal reviews, functional testing results, summary graphs of the trends, and the design sequence of control. Comments should also be included below the charts noting proper system operation.

6.1.3 SYSTEMS TO BE COMMISSIONED

Table 6.1 is a summary table of example EEMs that typically require commissioning and other EEMs that do not require commissioning. The performance can be verified for the EEMs that do not require commissioning by obtaining a copy of the submittal from the installing contractor and field verifying that the systems were installed per the submittal.

Table 6.1: Example of Measures that Require and Do Not Require Commissioning

EEMs that Require Commissioning	EEMs that do not Require Commissioning
Air handlers with advanced controls	Building envelope measures
Indirect/direct evaporative cooling systems	Premium efficiency motors
Central Plants	High efficiency lighting
Daylighting Controls	Cool roof

6.1.4 COMMISSIONING GUIDELINES: EXPEDITED TRACK

The following guidelines are to serve as general direction for items necessary to provide to SRP that eligible energy efficiency measures are installed properly and operating as modeled. Commissioning requirements for the Expedited Track will be established by the Program Administrator, in coordination with the QSP, and outlined in the Expedited Track Application Approval form.

- Copies of submittal review reports vs. design specifications
- Copies of manufacturer or contractor pre-functional checkout sheets
- Copies of functional testing results and discrepancy and repair logs
- Trended or logged data files (in Excel or CSV format) and summary reports recorded during normal operation and operation inclusive of the following data points as applicable. SRP may provide further direction or specific requirements upon request. Unless otherwise noted, data points should be recorded for a minimum of two (2) weeks taken at a maximum of 15 minute increments.
    - For projects with central chiller plants:
        - All equipment status' (chillers, pumps and fans) digital outputs
        - All VFD speeds(%, Hz) and/or water flows (GPM) as available
        - All entering and leaving water temperatures (°F, chilled and condenser water) across equipment or loops
        - All equipment or loop loads (%FLA, % load, BTU) as available
        - All equipment power (kW) or electric current (A) as available
        - All other control points or outputs relevant to EEMs, such as differential or discharge pressure (psi)
    - For projects with VAV systems:

- For all air handling units:
  - Equipment status' (compressors, fans, heating systems, etc.) digital outputs
  - Fan speed(s) (supply, return, relief, etc.) and/or airflow (CFM)
  - Valve positions (%, CHW, HW) and/or as applicable
  - Air temperatures (°F, return air, mixed air, supply air, etc.)
  - Static pressure setpoints and analog output (in. w.c.)
  - Equipment power (kW) or electric current (A) as available
  - Damper position(s) (%) and/or airflow (CFM) as available
  - Other control points or outputs relevant to EEMs (e.g. CO_2 ppm for DCV measures)

- For a representative sample of zonal equipment:
  - Damper positions (%) and/or airflow (CFM)
  - Supply and zone temperatures (°F)
  - Heating stage(s) status' digital output
  - Zonal fan outputs
  - Occupancy signal as applicable

- For projects with air-side heat recovery wheels, ERVs, evaporative pre-coolers or similar devices:
  - All entering and leaving air temperatures from both sides of heat exchanger
  - All damper(s) positions (%)
  - All fan(s) output signals
  - All other control points or outputs relevant to EEMs

- For projects with constant volume air-side equipment (SZ, MZ, fan-coil units, etc.) from representative sample:
  - Equipment status' (compressors, fans, heating systems, etc.) digital outputs
  - Fan speed(s) (supply, return, relief, etc.) and/or airflow (CFM)
  - Valve positions (%, CHW, HW) and/or as applicable
  - Air temperatures (°F, return air, mixed air, supply air, zone/room air etc.)
  - Equipment power (kW) or electric current (A) as available
  - Damper position(s) (%) and/or airflows (CFM) as available
  - Other control points or outputs relevant to EEMs (e.g. CO_2 ppm for DCV measures)

- For projects with lighting control systems (photocell controls, occupancy sensors, dimming controls, etc.) from representative sample of systems
  - Occupancy status' digital output (change of state)
  - Zone lighting input / control point (footcandles, etc.)
  - Lighting output or stage (%, stage #)
  - Lighting circuit power (kW) or amperage (A) as available
  - Other control point or outputs relevant to EEMs that support energy savings and EEM functionality.

6.2 VERIFICATION: ENHANCED PERFORMANCE TRACK

Upon review of the Commissioning Report, SRP will evaluate any variations found for each strategy as compared to its expected functionality, characteristics, and scope of installation. Under the context of the Enhanced Performance Track, the QSP will perform a site visit to inspect the installed equipment and operation of the equipment. If variations are found for specific EEMs, the energy simulation model is refined to match the functionality, characteristics and or scope of the verified strategies. The as-built model is then used to calculate the final energy impacts. The Verification Report is issued to the design team and the building owner as the final step in the enhanced performance track.

6.2.1 ENERGY SIMULATION MODELING FOR VERIFICATION

Based upon the findings in the commissioning report and final inspection, the whole building design energy simulation model will most likely need to be refined. Given the model-to-model comparison nature of the savings calculations, refinements to the model are based upon truing up assumptions and inputs. Final energy results of the as-built simulation model should be shown to reasonably agree with site utility data. The energy modeling QSP may be asked to refine models further if significant deviations exist between simulated and actual energy usage.

6.2.2 CALIBRATION OF ENERGY SIMULATION MODEL FOR VERIFICATION

Building model calibration is the process of improving the accuracy of the building energy model to reflect the as-built condition and operating conditions as compared to the actual utility energy usage. The energy modeling QSP will provide the calibrated as-built energy simulation based on a statistical analysis that calculates the Normalized Mean Bias Error (NMBE) in conjunction with the Coefficient of Variation of the Root Mean Square Error CV(RMSE). The acceptable tolerance for the NMBE and CV(RMSE) using monthly data is provided in the table below:

Calibration Criteria of the As-Built Model

Index		Criteria
Monthly	NMBE	±5%
	CV(RMSE)	15%

The NMBE and CVRMSE tolerances are calculated using the following equations:

$$\boldsymbol{NMBE} = \frac{\mathbf{1}}{\overline{\boldsymbol{Ai}}} \frac{\sum_{i}^{n}(\boldsymbol{Ai}-\boldsymbol{Si})}{\boldsymbol{n}} * \mathbf{100}\%$$

$$\boldsymbol{CV(RMSE)} = \frac{\mathbf{1}}{\overline{\boldsymbol{Ai}}} \sqrt{\frac{\sum_{i=1}^{n}(\boldsymbol{Ai}-\boldsymbol{Si})^{2}}{\boldsymbol{n}}} * \mathbf{100}\%$$

Where,

A_i	= Actual Energy Consumption from metered data
S_i	= Simulated Energy Consumption from energy model
$\overline{Ai}$	= Average of actual metered utility data
n	= total months

4-6 months of utility usage data should be used to calibrate the as-built model simulation after the building has reached a minimum of 80% of the designed occupancy level. Actual weather data that corresponds to the same time period as the utility usage data to which the model is being calibrated should be used. Once the 'as-built' model is calibrated, the final savings must then be normalized to represent a typical year using the National Climatic Data Center TMYx-2007-2021 weather data file for Phoenix Sky Harbor, or the nearest station. A sample calculation following the program's calibration guidelines using 12 months of utility energy usage data is provided in the table below for reference:

As-built Model Calibration Example

Month	Actual Metered Utility Data (Ai), kWh	Model Simulation Result (Si), kWh	(Ai - Si)	(Ai-Si)^2	error
1	128,400	115,968	12,432	154,560,866	9.68%
2	142,500	148,934	-6,434	41,398,565	-4.52%
3	156,900	152,233	4,667	21,784,097	2.97%
4	185,100	176,516	8,584	73,677,688	4.64%
5	186,900	180,090	6,810	46,380,299	3.64%
6	203,700	225,029	-21,329	454,924,143	-10.47%
7	218,400	220,924	-2,524	6,368,666	-1.16%
8	215,400	199,349	16,051	257,634,672	7.45%
9	189,900	172,064	17,836	318,121,731	9.39%
10	153,600	142,471	11,129	123,850,306	7.25%
11	147,900	134,730	13,170	173,442,204	8.90%
12	135,600	121,049	14,551	211,733,309	10.73%
Total	**2,064,300**	**1,989,357**	**74,943**	**1,883,876,547**	
Average	**172,025**	**165,780**	**6,245**	**156,989,712**	

$$\text{NMBE} = \frac{1}{\overline{Ai}} \frac{\sum_i^n (Ai - Si)}{n} = \frac{74{,}943}{172{,}025 * 12} * 100\ \% = 3.63\ \%$$

$$\text{CV(RMSE)} = \frac{1}{\overline{Ai}} \sqrt{\frac{\sum_{i=1}^{n} (Ai - Si)^2}{n}} = \frac{1}{172{,}025} \sqrt{\frac{1{,}883{,}876{,}547}{12}} * 100\ \% = 7.28\ \%$$

In this example, both the NMBE as well as CV(RMSE) values are within the allowable tolerance according to the program calibration guidelines.

Table 6.2: Commissioning/Final Verification: Enhanced Performance Track (Model Calibration)

Program Administrator	EDA Team	Design Team/Owner
Maintain contact with design team. Facilitate questions or concerns with process. Pay the remaining building owner equipment rebates and EDA rebates when project is complete.	Lead M&V data collection activities with support from the Program Administrator, if necessary. Review Commissioning Report and conduct final on-site inspection.	Execute Commissioning Plan and provide report to EDA team. Provide proof of construction milestone documents every 6 months following the start of construction.
	Notify design team of deficiencies.	
	Refine energy simulation model and prepare Verification Report.	

Key EDA Team Verification Phase Deliverables

- Provide necessary support for commissioning team
- Lead M&V data collection activities for EEMs as outlined in PEA Report
- Review commissioning report and submittals
- Conduct final on-site visit inspection
- Refine energy simulation model
- Submit draft Verification Report to Program Administrator for QC
- Revise and submit final Verification Report to Program Administration for final verification

6.3 VERIFICATION: EXPEDITED TRACK

Upon review of the Commissioning Report, the QSP shall evaluate any variations found for each strategy as compared to its expected functionality, characteristics, and scope of installation. If necessary, the QSP may perform a site visit to inspect the installed equipment and operation of the equipment. If variations are found for specific EEMs, the energy simulation model is refined to match the functionality, characteristics and or scope of the verified strategies. The as-built model is then used to calculate the final energy impacts. A final summary verification report is submitted to the Program Administrator along with energy simulation model input files, and other supporting documentation requested by the Program Administrator.

6.3.1 ENERGY SIMULATION MODELING FOR VERIFICATION

The whole building design energy simulation model shall be refined based upon the findings in the commissioning report and installed equipment. Final energy results of the as-built simulation model should be shown to reasonably agree with site utility data following the calibration guidelines outlined in section 6.2.2. The QSP may be asked to refine models further if significant deviations exist between simulated and actual energy usage.

Table 6.3: Commissioning/As-Built Submittal Roles & Responsibilities: Expedited Track

<table>
<tr><th>Program Administrator</th><th>Qualified Service Provider (QSP)</th><th>Design Team/Owner</th></tr>
<tr><td rowspan="2">Facilitate questions or concerns with process.

Provide M&V data collection support, if needed.

Pay the building owner equipment rebate when project is complete.</td><td>Review Commissioning Report and Submittals</td><td rowspan="2">Execute Commissioning Plan and provide report and other required documentation to QSP.

Provide proof of construction milestone documents every 6 months following the start of construction.</td></tr>
<tr><td>Refine energy simulation model and prepare summary verification report.</td></tr>
</table>

Key QSP Verification Phase Deliverables

- Provide necessary support for commissioning team
- Review commissioning report and submittals
- If necessary, conduct final on-site visit inspection
- Refine energy simulation model
- Prepare summary verification report

Appendix A SRP Energy Efficiency Programs

SRP offers a range of energy efficiency opportunities to help commercial and industrial customers save energy and money. Reduced energy costs, technical assistance, and/or incentives are available for qualifying customers. A summary of other available commercial and industrial energy efficiency programs is provided below. Additional information regarding eligibility requirements, rebates, and participation processes is available at www.savewithsrpbiz.com or by contacting the Program Administrator.

SRP Business Solutions Standard Program

The SRP Business Solutions Standard Program promotes the purchase of industry-proven, high-efficiency equipment. Rebates serve to buy down the difference between the cost of high-efficiency and standard equipment, thereby making the high-efficiency equipment a more attractive option for customers. Rebates are available for qualifying lighting, HVAC, data center, building envelope, compressed air, and refrigeration measures. There is an additional HVAC Tune-up tract within the program to help customers ensure that their air conditioners are running optimally.

SRP Business Solutions Custom Program

The SRP Business Solutions Custom Program provides a comprehensive platform for cost-effective non-residential energy efficiency projects not addressed by the SRP Business Solutions Standard Program. One of the primary goals of the program is to obtain verifiable, cost-effective and persistent electrical energy savings that result from the installation of energy efficiency measures.

In addition to equipment rebates, SRP offers eligible customers the opportunity to receive energy efficiency assessments performed by a Qualified Service Provider (QSP). These assessments focus on a predefined system or scope of energy efficiency business practices, strategies and capital improvement opportunities, and can provide both initial and investment grade reports to assist customers in screening, evaluating and prioritizing complex energy efficiency projects.

SRP Business Solutions Retrocommissioning Program

The SRP Business Solutions Retrocommissioning Program is designed to help customers achieve demand and energy savings in commercial and industrial facilities. Savings are realized through the systematic evaluation of facility systems and customer's implementation of cost-effective, energy efficiency measures targeted to improve facility operation that, in many cases, also improve occupant comfort and production efficiency.

Program participants are customers with 50,000+ sq. ft. of conditioned space or 1,000,000 kWh in usage who have demonstrated a commitment to spend $3,000 or more to implement identified retrocommissioning measures with an estimated total project simple payback of 2 years or less based upon electric and savings. Additionally, a Monitoring-Based Commissioning (MBCx) option is available for customers with 150,000+ sq. ft. or 3,000,000 kWh to utilize data analytics to find additional potential savings.

SRP Business Solutions New Construction Program

The SRP Business Solutions New Construction Program provides technical assistance and financial rebates to help architects, engineering professionals, and building owners optimize energy and demand savings, and reduce operating costs in commercial new construction projects. Projects must be new construction or major renovation and must be 20,000 square feet or greater for commercial, industrial, retail, multifamily, or core and shell use. Projects that are most likely to succeed in meeting the program's goals will be accepted. The program offerings will be designed to be scalable for projects of varying sizes under two different tracks, and flexible to grow with customer demand.

The Expedited Track is suitable for projects with accelerated design schedules that are unable to invest the time necessary for participating under the enhanced performance track. The buildings under this track will have less aggressive savings targets; typically, these buildings will have less than 75,000 square feet of conditioned floor space but must be ≥20,000 square feet (new construction/renovation/additions).

The Enhanced Performance Track offers Energy Design Assistance (EDA) service incentives. This track employs a whole building performance-based strategy that fosters an integrated design approach with the project's design team starting during the project's schematic design phase. Early involvement combined with the comprehensive interaction of key project stakeholders afford the opportunity to cost-effectively evaluate and incorporate efficiency strategies while design components are still fluid. Under the Enhanced Performance Track, the buildings will have ≥50,000 square feet of conditioned floor space (new construction/renovation/additions).

SRP Business Solutions Small Business Program

The SRP Business Solutions Small Business Program promotes the purchase of high-efficiency lighting and HVAC upgrades in small commercial and industrial facilities. No-cost assessments are available to qualifying customers to help identify lighting efficiency and HVAC upgrade opportunities. Rebates are also available to pre-approved installation contractors to buy down the difference between the cost of energy-efficient systems and standard lighting and HVAC equipment, thereby making the high-efficiency equipment a more attractive option for customers. Rebates are available for qualifying lighting and HVAC measures.

SRP Business Solutions Electrification Program

Thinking of switching to electrically fueled equipment at work? The SRP Business Solutions Electrification Program promotes the purchase of qualifying equipment to convert fossil fuel powered equipment to electric to reduce carbon emissions and make for healthier and safer work environments. Rebates for electric forklifts, electric truck refrigeration, and electrified truck parking spots are available, with additional custom rebates available for site specific equipment like industrial process heating or mid or large heavy-duty fleet conversions. More information can be found at https://savewithsrpbiz.com/etech, by calling 602-236-9650, or by emailing etechrebates@srpnet.com

SRP Business Solutions Business EV Program

The SRP Business Solutions Business EV Program promotes the purchase of qualifying charging equipment to power electric vehicles. Your customers and employees will welcome the convenience to charge at work, to encourage customers to stay longer, and to count this initiative towards your sustainability goals. The program provides a per port rebates for level 2 chargers. For technical assessments or program support visit https://savewithsrpbiz.com/rebates/evcharger.aspx

SRP Business Solutions Multifamily Program

The SRP Business Solutions Multifamily Program promotes the purchase of high-efficiency lighting, HVAC, building envelope, and tenant upgrades in apartments and other multifamily properties. Contractors promote rebates for both tenant spaces and common areas, with a variety of rebate opportunities available. Be on the lookout for more information at https://savewithsrpbiz.com

SRP Business Demand Response Program

SRP is collaborating with a company called Enel X to offer commercial, institutional, and industrial organizations incentive payments for participating in a new program to maintain a reliable and cost-effective electric grid. Between the months of May and October each year, large energy consumers can

earn payments for making targeted energy reductions during times of peak demand. Interested customers can contact their Strategic Energy Manager (SEM) for more details and to determine if they would be a good fit for the program.

Appendix B Resources

A brief listing of energy efficiency resources available on the Web is provided below.

- AHRI Online Directory of Certified Equipment. The Air Conditioning, Heating and Refrigeration Institute (AHRI) is a national trade association of HVAC equipment manufacturers. A publicly available online directory lists detailed equipment information for all certified equipment. (www.ahridirectory.org)
- Air Conditioning Contractors of America (ACCA). The ACCA is a non-profit organization representing HVAC contractors in the U.S. Current industry information and resources are available from their web site. (www.acca.org)
- Consortium for Energy Efficiency (CEE). CEE is a non-profit organization that develops national initiatives to promote the manufacture and purchase of energy-efficient products and services. (www.cee1.org)
- Department of Energy – Energy Efficiency and Renewable Energy (EERE). EERE provides information for consumers on a wide range of energy efficiency topics. (www.eere.energy.gov)
- ENERGY STAR. ENERGY STAR is a government-backed program designed to help consumers increase their energy efficiency. (www.energystar.gov)
- Electrical Apparatus Service Association, Inc. (EASA). EASA provides it members with current information on materials, equipment, and technological advances in the electromechanical industry. (www.easa.com)
- Motor Decisions Matter. Motor Decisions Matter is a nation program encouraging proper motor selection and management. The program is supported by a number of industry trade groups and orchestrated by the Department of Energy's Office of Industrial Technologies. (www.motorsmatter.org)
- National Electrical Manufacturers Association (NEMA). The Motor and Generator section of NEMA has developed an industry standard for premium efficiency motors. (www.nema.org)
- US Green Building Council (USGBC). USGBC is composed of more than 13,500 organizations from across the building industry that are working to advance structures that are environmentally responsible, profitable, and healthy places to live and work. (www.usgbc.org)

Appendix C Definitions

New construction: A newly constructed facility or newly constructed square footage added to an existing facility.

Major renovation: A change in facility use type or where the existing system will not meet owner/customer projected requirements within existing square footage.

Retrofit: Changes, modifications or additions to systems or equipment in existing facility square footage.

Typical Acronyms and Definitions:

Design/Construction Process (Typical Commercial Construction)	
Programming	First construction phase to discuss building concept/use, basis of design, and owner objectives (2-month process)
SD	Schematic Design Development – assembly preliminary floor plans, elevations, types of mechanical and electrical system to be considered (3-month process)
DD	Design Development – finalize building zoning, design and size building systems, and select equipment (3-month process)
CD	Construction Document Development – continue to add details to design and finalize (4-month process)
Bidding	CDs are present to bidders and bids are accepted for selection (1 month)
Construction	Building is constructed and commissioned (9 months)
Acceptance	Building is turned over to owner and final punch list items are closed out. (2 months)
Units	
ACH	Air changes per hour - measurement of building air infiltration
BHP	Brake Horsepower
BTU/H	British Thermal Units per Hour - energy that is produced or rejected from a system
°C	Degree Celsius - measure of temperature in the International System (SI)
CF	Cubic Feet - measure of volume
CFM	Cubic Feet per Minute - measurement of airflow
COP	Coefficient Of Performance
EER	Energy Efficiency Ratio
°F	Degree Fahrenheit - measure of temperature in the US Customary System)
fc	Foot-candles (lumens/ft^2) - measure of lighting luminance
FPM	Feet Per Minute - measurement of air velocity
ft^2	Square feet - measure of area
GPM	Gallons per minute - measurement of fluid flow
HP	Horsepower
kBtu	One thousand British Thermal Units
kW	Kilowatt – (1,000 Watts) unit of measurement for electrical demand
kWh	One thousand (k) watt-hours – electricity use over a period of time
LPD	Lighting Power Density (W/ft^2) - lighting power use per area
MWh	One million (M) watt-hours – electricity use over a period of time
RH	Relative Humidity - measurement of the moisture in the air
SEER	Seasonal Energy Efficiency Ratio
SF	Square Feet - measure of area
W/ft^2	Watt per square foot - energy use (lighting/plug loads) per floor area

Wk	Week (s)
Yr	Year (s)
General	
AHU	Air Handling Unit
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers
BAS	Building Automation System
CDD	Cooling Degree Day
CFL	Compact Fluorescent Lamp - type of fluorescent lamp
CV	Constant Volume
Cx	Commissioning
DDC	Direct Digital Control
DHW	Domestic Hot Water
DOE	Department of Energy
DX	Direct Expansion - refers to the thermodynamic process in most refrigeration system
ECM	Electronically Commutated Motor
EEM	Energy Efficiency Measure
EF	Exhaust Fan
EPACT	Energy Policy Act
eQUEST	A Quick Energy Simulation Tool
EUI	Energy Use Index - annual energy use per square foot of floor area)
HID	High Intensity Discharge - family of lamps
HO	High output
HPS	High Pressure Sodium - type of HID lamp
HVAC	Heating, Ventilation, and Air-conditioning
IAQ	Indoor air quality
IDEC	Indirect/Direct Evaporative Cooling
IECC	International Energy Conservation Code
IR	Infrared
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MAU	Make-up Air Unit
MH	Metal Halide - type of HID lamp
M&V	Measurement and Verification
MZ	Multi-zone air handler
NC/MR	New Construction/Major Renovation
O&M	Operation and Maintenance
Pckgd	Packaged - DX rooftop unit
RCx	Recommissioning or Retro-Commissioning
RF	Return Fan
RTU	Roof-top Unit
SF	Supply Fan
SZ	Single zone air handler
T12/T8/T5	The diameter of a fluorescent lamps in eighths of an inch (common types of fluorescent lighting)
US	Ultrasonic
VAV	Variable Air Volume
VFD	Variable Frequency Drive
WEH	Weekends and holidays

Appendix D Frequently Asked Questions

What happens if my project cannot achieve the 10% improvement threshold?

The project will be transferred to either the SRP Business Solutions Standard or SRP Business Solutions Custom Programs. If the 100% construction documents do not achieve the 10% improvement target, the design team reimbursement will also be forfeited.

Are there any examples of anomalies with the Appendix G baseline selection?

Design teams may opt to install air-cooled chilled water systems for buildings which require a packaged DX VAV system baseline. In this particular case, the overall energy consumption of the proposed high efficiency air cooled chiller combined with the additional chilled water pumping energy exceeds the baseline mechanical system's energy consumption. In these instances, the QSP may need to recommend that the design team pursue water cooled chilled water plant or install a high efficiency packaged VAV system that exceeds code.

What types of facilities are eligible to participate in the SRP Business Solutions New Construction Program?

Facilities where the majority of the systems are subject to ASHRAE Standard 90.1-2016 or IECC 2018 would be eligible for design team rebates, EDA service rebates and building owner equipment rebates through the SRP Business Solutions New Construction Program. Data center projects may also be eligible, contingent on approval from the Program Administrator. Facilities that are primarily composed of non-code compliant systems are not eligible for building owner equipment or design team rebates through the SRP Business Solutions New Construction Program. However, the project is eligible for rebates and technical assistance through the SRP Business Solutions Standard or Custom Programs.

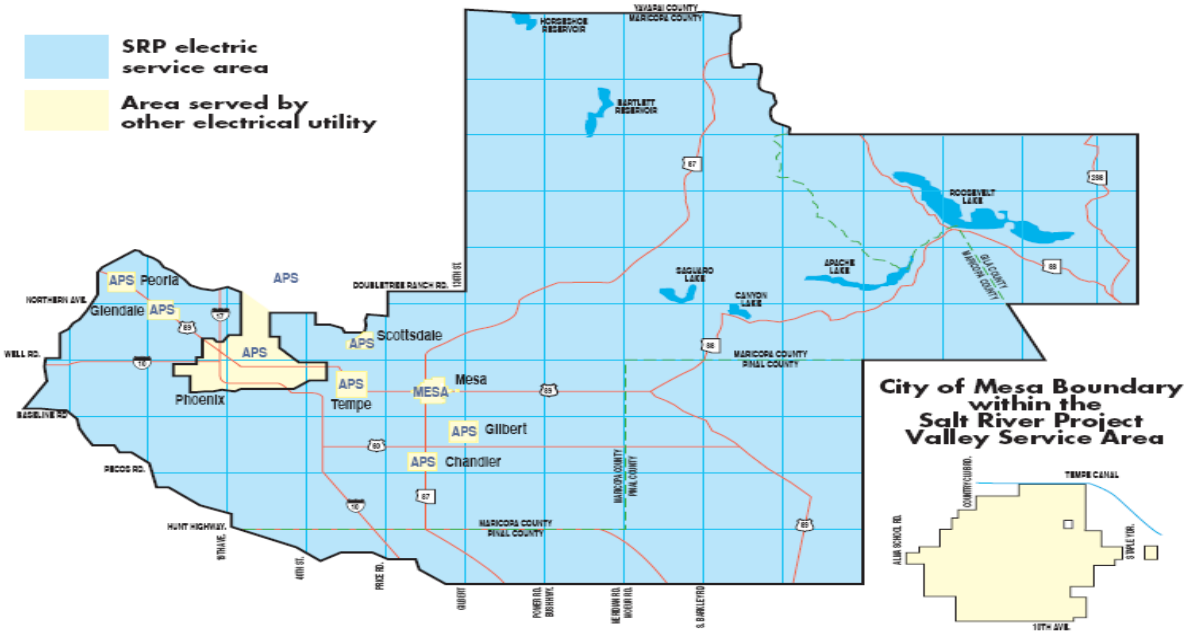
What if the design team's assumptions vary significantly from typical values such as plug loads, internal loads, and occupancy?

Assumptions used by the design team should be evaluated by the design team. When values vary significantly from industry standard, efforts should be made to confirm them with the design team and the owner. If valid arguments can be made for the design team's assumptions and are deemed appropriate for the program, the values should be documented in the respective reports.

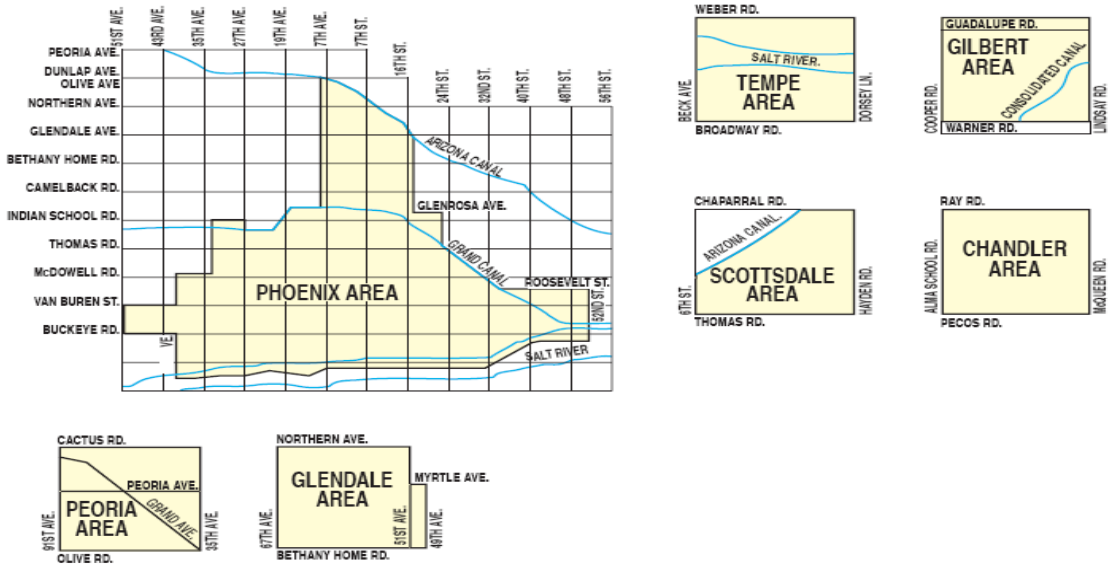
Appendix E Service Territory Map

An illustration of SRP's service area is provided below. A more detailed map of SRP service area is available by contacting the Program Administrator.

SRP electric service area



APS Boundaries within the Salt River Project Valley Service Area



Customer hotline: (602)-236-3054

Qualified Service Provider hotline: (602)-263-9650

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