



PLATTE RIVER
POWER AUTHORITY



City of
Fort Collins
Utilities



Building Tune-up Program Manual

for

Program Managers &
Retrocommissioning Service
Providers (RSP)

March 8, 2010

Version 1.0

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1.1 PROGRAM OVERVIEW

Most buildings have never gone through a formal, systematic commissioning or quality assurance process, and are likely performing below their potential. Efficient operation of existing major building systems presents a significant potential for energy and demand savings, usually with little or no capital investment. Recommissioning or retrocommissioning¹ is a “building tune-up” that not only identifies problems due to system operation deficiencies or design flaws that occurred during construction, just as traditional commissioning of a new building does, but it also identifies and recommends solutions to problems that have developed during the building’s existence. Retrocommissioning seeks to assist with equipment and system functionality, and optimizing their integrated operation to reduce energy waste and improve building performance and occupant comfort.

One of the primary objectives of Platte River Power Authority’s (Platte River’s) energy efficiency portfolio is to offer our Customers every opportunity to help manage their energy expenses. Platte River’s suite of available program initiatives provides rebates for many energy efficient technologies and products available in today’s market. Platte River’s *Building Tune-up Program* is uniquely suited to fit within Platte River’s existing capital improvement rebate programs by offering energy analysis services to identify low-cost and no-cost energy efficiency measures through retrocommissioning (RCx).

The *Building Tune-up Program* is an energy efficiency offering that provides Customers expert building analysis and RCx services at no upfront cost for services defined in this manual to help lower Customers’ electric energy costs by optimizing a facility’s energy using systems. Platte River’s *Building Tune-up Program* does not provide engineering support or rebates for capital equipment measures – rebates for these types of measures may be available under other Platte River energy efficiency programs. Savings are realized through the systematic evaluation of facility systems and Customer’s implementation of cost-effective measures targeted to improve facility operation that, in many cases, also improve occupant comfort and production efficiency.

Program participants are commercial and industrial facility owners who have demonstrated a commitment to spend \$4,000 or more depending on facility size to implement identified retrocommissioning (RCx) measures with an estimated total project simple payback of two years or less based upon total energy savings. It should be noted that even though this rebate program is focused on electricity, Customers who are in Xcel’s gas service territory may also be considered for a gas savings rebate through Xcel’s RCx program.

Eligible Customers include existing facilities that are:

1. Building site is served by one of the four following electric utilities: Town of Estes Park Light & Power Dept (970-577-3583), Fort Collins Utilities (970-221-6700), Longmont Power & Communications (303-651-8386), Loveland Water & Power (970-962-3000).
2. No major renovation or large capital investments for the facility shall be pending, and owner/O&M staff shall express a commitment for active involvement in the process.
3. Considered to have energy savings opportunities and measures that result in less than two year simple payback.
4. While the first two criteria are required for participation, two of the following three bulleted criterions must be met in order to participate.
 - Have at least 50,000 square feet of conditioned space that is at least 2 years old
 - Possess a functioning central control energy management system (EMS),

¹Recommissioning by definition is the commissioning of a building that has been previously commissioned in its life, Retrocommissioning by definition is the commissioning of a building that has NOT previously been commissioned. For purposes of the PRPA *Building Tune-up Program* documents, the term retrocommissioning will be used for both recommissioning and retrocommissioning.

- A unique circumstance (e.g., a relatively high energy use index (EUI) compared to the EUIs of buildings of the same class).

The program is a “service-rebate” program. This means the RCx analysis and service as defined in this document is the rebate to the Customer and is funded by Platte River. Participants are expected to cover the costs associated with implementing the measures recommended by the RCx analysis, attending meetings, and assisting Retrocommissioning Service Providers (RSPs) in acquiring facility information. Rebates for capital improvements such as lighting, HVAC, and motors are provided through the other elements of Platte River’s energy efficiency programs.

1.2 CONTACT INFORMATION

Platte River is Platte River for Building Tune-up Program. Questions about the program can be directed to Platte River via:

- Web
 - <http://www.prpa.org>
- Telephone
 - Customer informational hotline: (970) 226-4000
- Fax
 - (970) 229-5244
- Email
 - Retrocommissioning Service Provider inquiries: tuneup@prpa.org
 - Customer inquiries: tuneup@prpa.org
- Mail
 - Platte River Power Authority
Building Tune-up Program
2000 E. Horsetooth Rd
Fort Collins, CO 80525

1.3 MANUAL USE AND ORGANIZATION

This manual provides specific information about the program and the roles and responsibilities of RSPs in Platte River’s *Building Tune-up Program* offering and is organized as follows:

- Section 2 addresses eligibility requirements
- Section 3 discusses the rebate format
- Section 4 outlines the program overview
- Section 5 discusses the role of the Retrocommissioning Service Provider
- Section 6 details the Application Phase
- Section 7 explains the Planning Phase
- Section 8 discusses the Implementation Phase
- Section 9 address the Verification Phase
- Appendix A – RCx Project Application
- Appendix B – RCx Plan Approval Form
- Appendix C – Building Site Assessment Form
- Appendix D – RCx Plan Template

- Appendix E – RCx Customer Measure Selection Form
- Appendix F – RCx Form
- Appendix G – RCx Diagnostic and Calculation Plan
- Appendix H – RCx Verification Template
- Appendix I – Sample Electricity Bill Figures
- Appendix J – Platte River Energy Efficiency Programs
- Appendix K – Platte River Service Territory

Section 2

Eligibility Requirements

To participate in Building Tune-up Program, Customers must purchase electricity from one of the four owner municipalities of Platte River (Town of Estes Park Light & Power Department, Fort Collins Utilities, Longmont Power & Communications, and Loveland Water and Power) on an eligible non-residential retail electric rate schedule. Table 2-1 lists eligible Customer price plans.

Table 2-1 Eligible Rate Schedules for Building Tune-up Program

Municipality	Town of Estes Park Light & Power	Fort Collins Utilities	Longmont Power & Communications	Loveland Water and Power
ELIGIBLE RATE SCHEDULES	<ul style="list-style-type: none"> • Large Commercial • Small Commercial • Municipal 	<ul style="list-style-type: none"> • E400 series • E300 series • E200 series 	<ul style="list-style-type: none"> • CCD • CC • CD • CE • GFE (municipal energy) • GFD (municipal demand) 	<ul style="list-style-type: none"> • Loveland -PS • Loveland - LG • Loveland - SG

Customers can verify their rate schedule by looking on a recent bill. Appendix A shows where to find the rate schedule and account number on a typical Customer electric bill for Estes Park, Fort Collins, Longmont, and Loveland. Customers with questions regarding their account should contact their utility Account Manager.

For the purposes of Platte River's energy efficiency programs, a Customer is defined as a company or organization that receives electric service from one of the four owner municipalities of Platte River: Town of Estes Park Light & Power Department, Fort Collins Utilities, Longmont Power & Communications, and Loveland Water and Power under an approved rate schedule. A Customer is a holder of a single account, multiple accounts in aggregate or corporate accounts. Multiple accounts or corporate accounts with a single 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.

Platte River retains the right to make final determination of Customer eligibility.

2.1 FACILITY ELIGIBILITY

The facility owner and O&M staff must express a commitment to be actively involved in the RCx process. Active involvement will include:

- Providing access to the facility
- Providing time for facility personnel to interface with the RSP
- Providing and assisting with the reporting and collection of information pertaining to the RCx of the facility
- A commitment to spend at least:

Table 2. Facility Financial Commitment for RCx Implementation

Facility Size	Required Commitment to Implement Measures
under 50,000 ft ²	\$4,000
50,000 - 200,000 ft ²	\$4,000 + \$0.04 x ft ²
Over 200,000 ft ²	\$12,000

The estimated time commitment from the Customer to support the RCx effort is 60 to 100 hours of a senior facility engineer or manager over the 10 to 12-month project duration.

In reviewing Project Applications, Platte River will also look for evidence that cost-effective RCx opportunities exist and reserve the right to qualify potential projects based on energy savings potential. Two of the three following criterion shall be met at a minimum in order to participate:

- The facility shall have at least 50,000 ft² of conditioned space and be at least 2 years old
- The facility must have an existing and functional Energy Management System (direct digital control and/or pneumatic)
- The facility has a unique circumstance. For example, a relatively high EUI compared to the average EUIs of buildings of the same class and/or have a low ENERGY STAR rating from Portfolio Manager.

In addition to meeting two of the three above criterion at a minimum, the following other factors will be considered in the eligibility screening:

- The facility should have accessible and up-to-date building documentation and records (preferred)
- The facility should be free of major problems requiring capital repairs or replacements and have no planned major system renovations or retrofits (required)
 - A major renovation is defined as a change in facility use or where the existing system will not meet owner / Customer projected requirements within existing facility square footage
 - A retrofit is defined as changes, modifications or additions to systems or equipment in existing facility square footage

Platte River will select program participants based on the above (minimum) considerations and based on the level of opportunity for savings. Platte River's selection decisions will be final and binding for all parties.

2.2 PROGRAM DATES

Building Tune-up Program became effective on April 1, 2010 (tentative launch date). RCx rebates are not eligible for prior Customer-funded RCx activities or without necessary pre-approvals.

3.1 REBATES

Building Tune-up Program is a “service-rebate” program. This means the RCx services as defined in this document and implementation technical assistance provided by RSP is itself the rebate to the Customer.

In the program, RCx services are conducted exclusively by pre-approved RSPs. Platte River’s rebate paid to either the customer, or RSP with customer approval, covers RCx service costs at 100% for a RSP to investigate and identify savings opportunities. Program participants are responsible for covering the costs associated with attending meetings and assisting RSPs in acquiring facility information. Customers are also required to spend at least the amount laid out in Table 2 to contract and arrange for the implementation of identified RCx measures with an estimated total project simple payback of two years or less, within a mutually agreed upon timeline. Customers that fail to comply with this requirement will be required to reimburse Platte River for the full cost of any completed program-funded RCx planning, investigation, and verification costs incurred by the RSP.

No additional rebates will be available to participants through this program. However, if energy efficiency measures are identified that are beyond the scope of Building Tune-up Program, the Customer may seek to qualify those measures through Platte River’s standard and custom electric efficiency rebate programs. Customers will be subject to a rebate threshold of \$50,000 in total rebates per Customer per calendar year. Reaching this threshold will not necessarily limit future rebate received from Platte River, but will induce a rebate cost effectiveness evaluation for the Customer’s project(s). Upon this evaluation, Platte River reserves the right to stop or limit rebates over \$50,000 per Customer per calendar year. Any rebates received through Xcel Energy or other party as part of any Platte River program will not count towards the Customer’s annual rebate threshold.

3.2 REBATE AVAILABILITY

Customer Applications to participate in *Building Tune-up Program* will be reviewed on a first-come, first-served basis until all rebate funding has been committed. Customers seeking participation after reservation of available funding will be given the option to be placed on a wait list in the order requests were received by Platte River. Current availability of rebate funds can be checked by contacting Platte River.

3.3 PARTNERSHIP WITH XCEL ENERGY

Platte River’s Building Tune-up Program is partnering with Xcel Energy’s RCx program in order to maximize program benefits. Xcel Energy offers rebates for both RCx studies and for gas measures implemented during a RCx project. Xcel Gas Customers that participate in the program will be required to submit applications to Xcel Energy’s RCx program and should follow Xcel’s requirements for submitting and obtaining the RCx rebate. Platte River will work with Xcel RCx rebate to supplement the total cost of the RCx Study. For example, if the cost of the RCx is \$20,000 and Xcel’s rebate for the gas portion is \$2,000, Platte River will supplement the remaining \$18,000 for the cost of the study. Any rebates obtained from Xcel for implementation of gas saving measures will not be factored in Platte River’s program, and will be handled directly through Xcel Energy.

Platte River’s *Building Tune-up Program* is an energy efficiency offering that provides Customers expert building analysis at no cost to help lower Customers’ electric energy costs by optimizing a facility’s energy using systems. Platte River’s *Building Tune-up Program* does not provide engineering support or rebates for capital equipment measures – rebates for these types of measures may be available under other Platte River energy efficiency programs. The focus of the *Building Tune-up Program* is no- and low-cost RCx Measures (RCMs) that save electric energy. Table 4-1 lists some typical RCMs.

Table 4-1. Example Eligible and Ineligible RCMs

Eligible RCMs	Ineligible RCMs
Reduce minimum outside air flow Correct economizer operation Eliminate simultaneous heating and cooling Reduce/reset supply air static pressure set points Eliminate chilled water short-circuiting Improve chiller or other equipment sequencing Reduce/reset condenser water setpoints Correct refrigerant charge Improve equipment scheduling Reduce air flow in CV air handling systems Improve refrigeration system controls Improve process controls	Fuel switching Measures that negatively affect occupant comfort Major equipment replacement (capital expenditure) Measures necessary for basic facility operation Measures that produce electricity Terminate or relocate existing processes/operations Measures that compromise safety and/or code requirements

The program administrative process for each approved project follows four basic program phases:

- 1) Application Phase
- 2) Planning Phase
- 3) Implementation Phase
- 4) Verification Phase

This process is illustrated in Figure 4-1. An overview about each phase of *Building Tune-up Program* with a focus on Customer responsibilities is provided in this section. Sections 6 through 9 of this manual provide detailed information regarding the roles and responsibilities of the RSP during each of these phases. The total estimated time period to complete a retrocommissioning project is four to nine months.

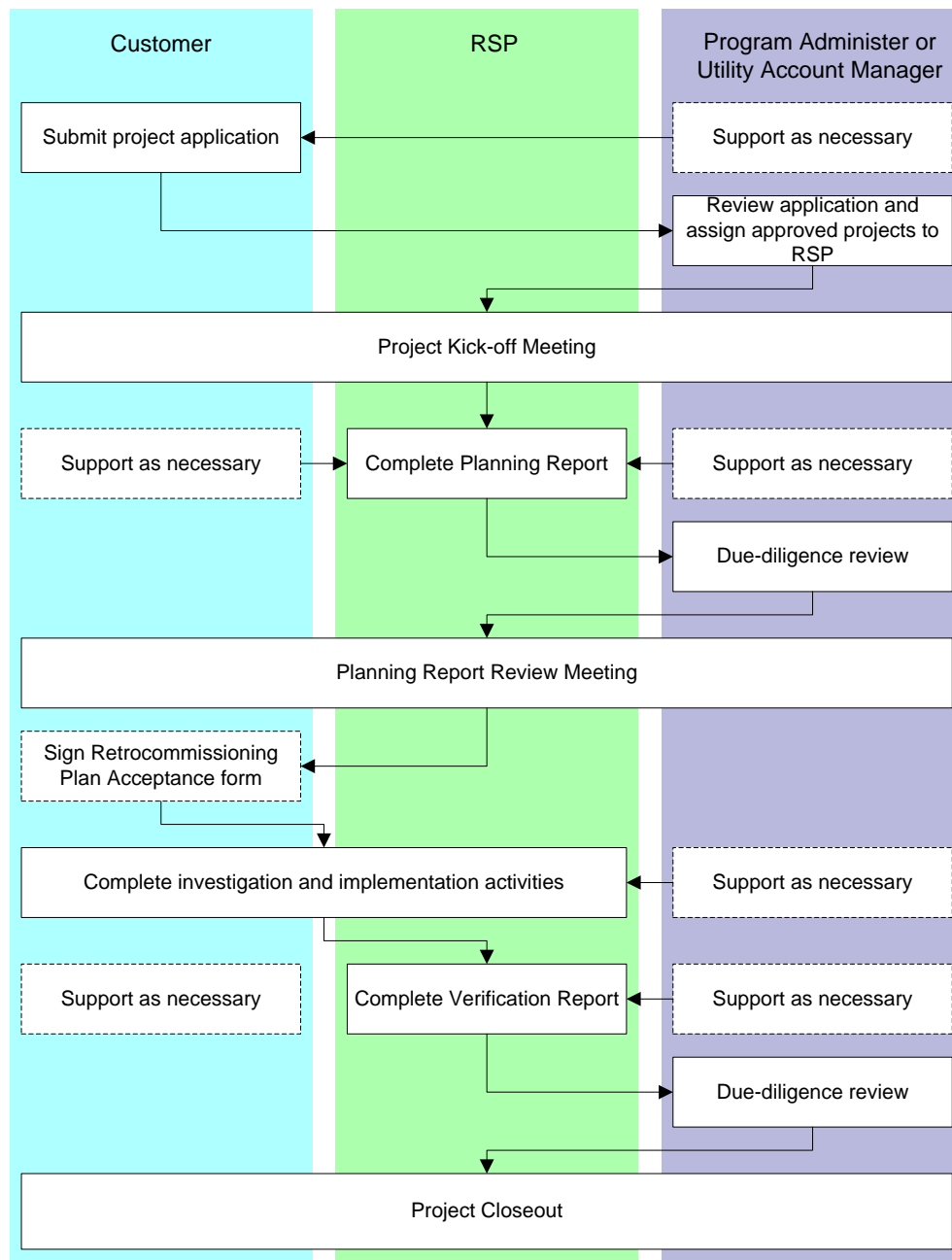


Figure 4-1 Building Tune-up Program Participation Procedures

4.1 APPLICATION PHASE

A project begins with the Application Phase. Project Applications (Appendix A) are completed by the facility owner or representative and submitted to Platte River. Based on a review of submitted applications and/or conducted feasibility study, Platte River will select facilities with the highest perceived opportunity for savings to participate in the program. A sample copy of the Project Application is included in Appendix A of this manual.

Platte River may conduct an on-site or telephone interview with facility personnel and review the 2 years of historical utility data to gauge building and system condition as well as potential RCx opportunities.

Upon acceptance of a Project Application, Platte River will arrange a kick-off meeting with the Customer's project team and the RSP.

If a facility is not selected to participate in the program, Platte River may recommend one of the other energy efficiency programs listed in Appendix C of this manual as a better fit for the facility's needs.

Customer Role: Complete Application and Agree to Terms & Conditions with Platte River

Select RSP from formal bid process

Contract with RSP for services to be performed as defined in this document for all phases of project

Deliverable: Program Acceptance or Rejection Letter

Duration: Two to three weeks

4.2 PLANNING PHASE

Following acceptance of a project into the program, work begins to establish the scope and timeline for the balance of the project. This Planning Phase typically takes about four to six weeks.

The Planning Phase commences with a project kick-off meeting with the owner representative, the Customer's facility staff and contractors, the RSP, Platte River, and/or the Utility Account Manager. A site assessment and data acquisition plan is completed by the RSP during this phase. The site assessment and data acquisition plan identifies system operational characteristics and parameters (e.g. static pressure, discharge air temperature, damper position, etc.) that will be collected using the building's EMS. The Customer's facility staff responsibilities during this phase are to provide building documentation and to support the RSP's orientation and knowledge regarding the building. These findings are used to generate the RCx Plan for the project and assess potential measures and project economics.

The RCx Plan establishes the framework and direction for the Implementation Phase. Upon the plan's completion, a Planning Review meeting is held with the owner representative and engineering staff to review the scope of the plan, its impacts, and the economics of the identified potential measures. At the completion of the Planning Review meeting, the facility owner reviews the RCx opportunities and acknowledges the measures to be investigated further and implemented in the Implementation Phase.

Prior to commencing the Implementation Phase, the Customer must sign the RCx Plan Acceptance form. This document includes several components that define the roles and responsibilities of each party and the project goals. The primary goal of this process is to mutually agree to and formally document the Customer's commitment to spending at least the amounts designated in Table 2 for implementation of mutually accepted RCx measures that result in a bundled estimated simple payback of 2 years or less.

If the Customer chooses to not continue into the Implementation Phase of the project, Platte River will reimburse the RSP for their costs to complete the Planning Phase at no cost to the Customer. For projects that are not completed within an agreed to timeframe after the Planning Phase, the Customer will not be provided a rebate from Platte River for the cost of program-funded RCx services pertaining to the planning, implementation, and/or verification costs incurred by the RSP.

Platte River will reserve the right to determine at their sole discretion the final scope of the RCx Plan for eligible projects to continue participating in the program.

- Customer Role:** 1) Provide building documentation and support RSP's information collection process.
- 2) Implement programming the data acquisition, trending and retrieval of relevant building systems, equipment, set points and operation as requested by the RSP
- 3) Sign RCx Plan Acceptance form
- Deliverable:** 1) RCx Plan
- 2) Signed RCx Plan Acceptance form with Platte River
- Duration:** Four to six weeks

4.3 IMPLEMENTATION PHASE

The Implementation Phase builds upon the Planning Phase to include activities such as conducting detailed site assessments, diagnostic testing, and trending analyses to evaluate current facility operating procedures, equipment functionality, and to verify planning phase assumptions. As RCx opportunities are finalized, the Customer will be asked to fund and lead the implementation of such measures.

Throughout the Implementation Phase, the RCx measures and associated costs, savings, and economic impacts will be updated and summarized in the Customer Selection Form. This document will be utilized throughout the entire RCx process to communicate RCx opportunities and seek Customer approval to proceed with implementation. In the event that additional RCx measures are discovered or existing measures are modified, the RSP will update the Customer Selection Form and review such measures with the owner.

During the Implementation Phase, the RSP works hand-in-hand with the Customer's implementation team to identify the recommended measures and provide recommendations to "fix" the problems. The Customer's implementation team includes the facility engineers, operational staff, and the mechanical, electrical, and controls contractors. As RCx measures are approved by the Customer, the implementation team will be asked to "fix" the items associated with the relevant measures. The goal of this phase is to fully implement all agreed-upon RCx measures.

The implementation costs used to calculate project economics under the program of the measures are based upon reasonable market costs as determined solely by Platte River's Program Administrator. Resources to obtain market costs include, but are not limited to, industry accepted project estimation resources, vendor quotes, or professional judgment. The Customer is afforded the flexibility to utilize in-house staff or an outside contractor to implement RCx measures. Final implementation costs may vary from the estimated market costs; however, the market costs will be utilized to document Customer implementation obligations.

- Customer Role:** 1) Assist with RSP's investigation activities
- 2) Arrange for implementation activities
- 3) Manage completion of recommended measures
- Deliverable:** Implementation of mutually accepted RCx Measures
- Duration:** Eight to 20 weeks

4.4 VERIFICATION PHASE

During the Verification Phase, the RSP evaluates facility trending data (from the building EMS, facility sub-meters, or utility meter) and revisits the site to verify that measures have been properly completed

(e.g. new control strategies are functioning properly, repairs have been made, retesting as needed, etc). The RSP prepares and submits the Verification Report that summarizes the final findings and impacts from the project.

Customer Role: Support RSP's verification process

Deliverable: Verification Report

Duration: Three to ten weeks

RCx activities and services available through the *Building Tune-up Program* will be delivered through approved RSPs. An overview of RSP program administration and coordination issues is presented in this section. Detailed information regarding the roles and responsibilities of RSPs during each of the four project phases is presented in the remaining sections of this manual.

5.1 RETROCOMMISSIONING RSPS

RSPs will be selected through a competitive RFQ process and will be required to sign a Participation Agreement and become a part of the pool of qualified individuals/firms that provide services under the program. The number of RSPs that can qualify for the program will not be limited. RSPs may be removed from the program at Platte River's discretion. Examples of activities that will lead to removal include, but are not necessarily limited to:

- failure to meet project timelines
- poor quality deliverables
- false representation or marketing of the program to Platte River and city utility Customers

5.2 PROGRAM MARKETING AND CUSTOMER COMMUNICATION

RSPs play a critical role in identifying viable RCx project opportunities and facilitating the Customer application process. However, due to the fact that not all program applications will be accepted, extreme care must be taken to avoid creating false Customer expectations and dissatisfaction with the process or Platte River. Therefore, RSPs are responsible for understanding the entire suite of energy efficiency program options available from Platte River and determining which program is best suited to a Customer's particular needs. Platte River will provide education and training to RSPs on a regular basis to help meet this objective.

During the process of completing a project under the *Building Tune-up Program*, RSPs are encouraged to contact the designated Customer contact as necessary to coordinate RCx activities and information exchange. However, **all written and electronic correspondence pertaining to the program between the Customer and the RSP must include Platte River on the distribution list**. Customers should also work with their Utility Account Managers if desired and provide the same access to correspondence.

5.3 PAYMENT FOR PROGRAM SERVICES

The RCx RSP Participation Agreement signed by approved RSPs outlines the general Terms and Conditions for services provided by RSPs. In addition, Platte River will issue a written authorization to proceed with each approved project to the selected RSP. This authorization will include the payment schedule of fixed project rebates for the delivery of each phase deliverables to the customer, or other approved alternative recipient, and satisfactory completion, in Platte River's sole opinion, of the following key RSP deliverables:

- 1) Planning Phase: RCx Plan
- 2) Implementation Phase: All RCM Diagnostic and Calculation plans and the final Customer Selection Form
- 3) Verification Phase: Verification Report

Rebates associated with completed and approved deliverables will be paid directly to the customer, or approved alternative payment recipient, according to the following payment schedule: 15% of the project fixed cost following the Planning phase, 70% of the project fixed cost following the Implementation phase, and 15% of the project fixed cost following the Verification phase. Payment schedule and payment amounts may change if deemed necessary by the Customer or Platte River. If the Customer chooses to

not continue the RCx project at the completion of the planning phase, Platte River will reimburse the RSP for their cost of service to complete the planning phase.

5.4 ADDITIONAL CUSTOMER SERVICES

The primary objective of the program is to identify and verify the Customer implementation of RCMs targeting electric energy savings. However, it is recognized that additional economies of scale can be realized during the RCx process to identify other, non-electric savings opportunities within a facility. Platte River realizes the benefits of this additional work and will support additional work scope for natural gas, measures based on their partnership with Xcel Energy's RCx program to supplement the cost of gas measures. Additionally, Customers are free to pursue additional contracting with the RSP to expand the work scope for other non-electric measures (e.g. identify water or other fuel type savings opportunities) and cover all RSP time and costs associated with these additional services. Addition of these services must not create an unnecessary delay in the Platte River -sponsored RCx services.

Under the Platte River *Building Tune-up Program*, RSPs provide implementation assistance to Customers during the Implementation Phase to assist them in completing the RCMs. Due to the expertise of the RSPs and their involvement in the RCx process, some Customers may request that RSPs conduct more in-depth RCM implementation services which are outside the RSP's program-funded scope. Examples of these enhanced implementation activities include mechanical contracting, significant controls modifications, and electrical installation. Under these circumstances, the RSP and Customer will be responsible for all contracting activities related to providing these services. Depending on the level of implementation activities conducted by the RSP, the scope of the RSP's Verification Phase activities may be reduced in order to ensure independent verification of the RCMs. RSPs shall contact Platte River when they intend to conduct in-depth implementation services.

6.1 APPLICATION PHASE OVERVIEW

A project begins with the Application Phase. Project applications are completed by the facility owner or representative and submitted to Platte River or the Utility Account Manager. Platte River will evaluate applications and select program participants with a high potential for cost-effective energy saving measures. If necessary, Platte River, will conduct a high level feasibility study, which will include a phone interview and utility bill analysis to determine energy savings potential. Platte River’s decision regarding selection of program applicants to participate in the program will be final and binding for all parties. The Application Phase typically takes about two to three weeks.

Upon acceptance of a participant application, Platte River will assist the customer with assigning the project to a RSP with a written authorization outlining deliverable dates and costs under the terms of the RCx RSP Participation Agreement.

RSP responsibilities associated with the Application Phase of the program center around providing supplemental outreach and marketing support for the program, and submitting a scope of work including targeted savings and costs upon request from Platte River. The Customer holds the primary responsibility for completing and submitting an application to Platte River.

6.2 APPLICATION REVIEW

In reviewing program applications, factors that Platte River will consider include:

- No planned major system renovations or retrofits
- Square footage of the facility – at least 50,000 ft² of conditioned space and at least 2 years old
- The presence of an existing energy management system
- A facility that is free of major problems requiring costly repairs or replacements
- Accessible and up to date building documentation and records
- Facilities with high normalized electric demand (kW/square foot peak) and annual energy costs (\$/square foot year), or low energy use, relative to similar building type.
- A commitment by the facility owner and engineering staff to be actively involved in the RCx process.
- A minimum financial commitment based on the facility size to pay for implementation costs as shown in Table.

Table 2. Facility Financial Commitment for RCx Implementation

Facility Size	Required Commitment to Implement Measures
under 50,000 ft ²	\$4,000
50,000 - 200,000 ft ²	\$4,000 + \$0.04 x ft ²
Over 200,000 ft ²	\$12,000

6.3 RSP ASSIGNMENT AND BID PROCESS

Upon acceptance of a participant application, Platte River will begin the selection process to match a qualified RSP to the Customer. Factors that will be considered when choosing RSP for project consideration will include, but are not necessarily limited to:

- The role of a RSP in soliciting the project
- A match between the RSP's experience and anticipated RCMs
- RSP availability to complete the work in a timely manner
- RSP performance, timeliness in meeting deadlines, and work quality on previous RCx projects
- Distribution of projects among RSPs
- RSP costs

To complete the RSP assignment process, Platte River will request from one or more RSPs a scope of work including a project schedule, preliminary target savings goal, and fixed cost price to provide the required RSP services. The scope of work(s) will then be submitted to the Customer for final selection. It will be at Platte River's discretion on the process in which an RSP will be selected per project; in every case the RSP(s) will be notified of the selection process prior to the request for bid(s). In some cases, accepted program applications will be assigned to the RSP that identified the project opportunity, facilitated the project application process, and has proposed reasonable fees for services to be performed.

To help ensure that the project will result in cost-effective savings for Platte River, Platte River will establish a target annual electric and natural gas energy savings value for the facility based on the preliminary site assessment and application. This target savings will be a function of the facility type, size, and the estimated RCx service costs. This value will serve as a benchmark against which the RCx Plan will be evaluated. For projects where preliminary RCx savings potential estimates fail to meet or exceed the target value, Platte River may revise the contracted work scope with the RSP, or alternatively, redirect the project towards another energy efficiency program offering from Platte River.

Upon acceptance of a participant application, Platte River will facilitate the RSP selection for the project and obtain an outline of project deliverable dates, target savings levels, and fixed RSP costs under the terms of the RCx RSP Participation Agreement.

Key RSP Application Phase Deliverables

- I) Project Scope of Work proposal including:
 - a. Proposed project schedule
 - b. Preliminary annual electric energy savings target (kWh/yr)
 - c. Fixed price cost for required RSP services

7.1 PLANNING PHASE OVERVIEW

Following the acceptance of a project into the program and selection of an RSP, work begins by establishing the scope and timeline for the balance of the project. This Planning Phase typically takes about four to six weeks. Key activities include a project kick-off meeting with the owner representative, engineering staff, RSP, and Platte River. A preliminary site assessment is completed by the RSP during this phase, where findings are used to generate the RCx Plan for the project and assess overall project feasibility. The RCx Plan establishes the general framework for the balance of the RCx activities. Upon its completion, a Planning Review meeting is held with the owner representative and engineering staff to review the scope of the plan. At the completion of the Planning Phase, the facility owner enters into the formal RCx Agreement with Platte River if the project appears viable.

7.2 PROJECT KICK-OFF MEETING

The initial project kick-off meeting is held soon after acceptance of the project application. Key attendees include the owner's representative, facility engineering staff, contractors, the RSP Platte River, and/or the Utility Account Manager. The meeting is used to introduce key performers for the RCx project team and explain the timing and key steps of the project.

7.3 SITE ASSESSMENT ACTIVITIES

Site assessment activities often follow directly after the kick-off meeting with the RSP conducting a preliminary site visit to understand key facility systems and their operation. Site assessment activities conducted by the RSP also involve:

- Consulting with the facility's personnel to understand their concerns and identify areas where additional focus may be warranted
- Reviewing the facility system documentation and utility bills
- Performing non-invasive measurements and functional tests as necessary to provide a thorough understanding of the facility's systems
- Completing a Building Site Assessment Form

Facility operations, maintenance schedules, equipment control sequences, set points, control parameters, schedules, occupant activities, and component operation are also documented at this point in the project.

Appendix C of this manual includes a sample copy of the Building Site Assessment Form. Deviations from this template must be pre-approved in writing by Platte River. Similar documentation is required for compressed air, refrigeration, and industrial process systems if applicable.

7.4 IDENTIFICATION OF RCMS

Utilizing the information gathered during the kick-off meeting, utility usage data, and from the site assessment, the RSP is responsible for identifying potential RCMs. For each RCM, the RSP will evaluate and document the following parameters:

- Annual electric energy savings potential
- Peak electric demand savings potential
- Natural gas savings
- Technical feasibility
- Likelihood of owner buy-in
- Accessibility and constructability
- Estimated implementation cost
- Savings persistence
- Impacts on building occupant comfort and process operations
- Impact of effect on safety and code requirements

Savings calculations must be supported by field observations, actual equipment specifications, and operating conditions. Calculations based solely on rules of thumb or unsupported assumptions are not acceptable.

7.5 RETROCOMMISSIONING PLAN

Using the information gathered and identified RCMs, the RSP develops the RCx Plan. The RCx Plan describes the building energy systems, identifies specific RCMs, estimates electric energy and demand savings, natural gas savings, and demonstrates project feasibility. The plan serves as the guiding document for the balance of the project. A viable RCx Plan is required before a Customer signs the RCx Plan Acceptance Form and for the project to continue under the program. A sample of the required RCx Plan template is included in Appendix D of this manual. The RCx Plan template will be updated, if necessary, to align with Xcel Energy's reporting requirement for an RCx study. Deviations from this template must be pre-approved in writing by Platte River.

If identified savings opportunities fail to meet or exceed the project savings target, Platte River may renegotiate a reduced scope of work and fee for the Implementation and Verification Phase with the RSP. If a project cannot demonstrate reasonable feasibility, the owner may be redirected towards another energy efficiency program offering from Platte River. If this is the case, the RSP will be paid for Planning Phase services only. No additional work will be performed or payments made.

7.6 PLANNING REVIEW MEETING

Upon Program Administrator approval of the RCx Plan, the Planning Review meeting is held with the owner representative and engineering staff to review the scope of the plan, the impacts and economics of the identified potential measures. To help facilitate this meeting, RSPs are required to prepare a copy of the Customer Selection Form based on the RCx Plan approved by Platte River. This document will be utilized throughout the balance of the RCx process to communicate RCx opportunities and seek Customer approval to proceed with implementation. A sample of this form is provided in Appendix E of this manual.

At the completion of the Planning Review meeting, the facility owner reviews the RCx opportunities, completes a copy of the RCx Plan Acceptance Form, and provides initial indication and approval of the measures to be refined and/or implemented in the Implementation Phase.

Key RSP Planning Phase Deliverables

- 1) Attendance at Project Kick-off Meeting
- 2) RCx Plan, including the Building Site Assessment Form
- 3) Customer Selection Form
- 4) Attendance at Project Planning Meeting

8.1 IMPLEMENTATION PHASE OVERVIEW

The Implementation Phase consists of a detailed analysis followed by implementation of the recommended measures. It involves the detailed investigation of the RCMs identified in the RCx Plan, and further investigation to identify additional RCMs. The investigation component of this phase includes activities such as conducting detailed site assessments, diagnostic testing, and trending analyses to evaluate current facility operating procedures, equipment functionality, and to verify planning phase assumptions. Throughout the Implementation Phase, the RCx measures and associated costs, savings, and economic impacts will be updated and summarized in the Customer Selection Form. This phase may require eight to twenty weeks and is conducted during times when affected building systems are operational.

As RCx opportunities are finalized, the Customer will be asked to fund the implementation of such measures. The Customer is responsible for implementing the RCMs identified and agreed to during the Implementation Phase. Upon completion, the Customer will notify Platte River that the measures have been installed.

During the Implementation Phase, the RSP, with assistance from the facility engineering staff, will expand upon the site assessment activities completed during the Planning Phase to develop and implement the RCx measures. The principal RSP Implementation Phase activities include the following:

- Working with facility staff to guide the RCx activities and identify additional RCMs
- Gathering additional information to assess equipment operation
- Updating the Customer Selection Form
- Developing Diagnostic testing and Calculation plans for each RCM
- Estimating the potential electric and natural gas energy savings for identified RCMs
- Assessing the cost to implement RCMs
- Assisting the Customer's implementation team to implement the RCM
- Educating the implementation team on the ramifications of RCM and how and why to maintain the changes implemented
- Closing out/updating items either in a punch list or master list of deficiencies as they are mitigated

The facility owner typically implements RCMs after all RCM Diagnostic and Calculation Plans have been finalized. However, the facility owner is encouraged to implement selected RCMs as individual measures are finalized. A key requirement to the success of this approach is that sufficient information be collected by the RSP to document the baseline and estimate the RCMs' electric and natural gas energy savings potential before implementation begins.

The implementation costs used to calculate project economics under the program are based upon reasonable market costs as determined by the RSP and approved solely by Platte River. Resources to obtain market costs include, but are not limited to industry accepted project estimation resources, vendor quotes, or professional judgment. The Customer is afforded the flexibility to utilize in-house staff or an outside contractor to implement RCx measures implementation. Final implementation costs may vary from the estimated market costs; however, the market costs will be utilized to support the \$4,000-12,000 minimum contractual obligations.

8.2 FOCUSED ASSESSMENT

A focused assessment of the energy using systems and equipment is necessary to build on the general site assessment done in the Planning Phase. The assessment focuses on problem areas identified by facility staff, identified RCMs, and potential new RCMs. At the facility level, the following information is typically collected and documented:

- Facility location, use, and operating/occupancy schedule
- Systems with highest electric/natural gas energy use and demand
- Significant control, operational, and maintenance problems
- Comfort problems
- Operations and maintenance (O&M) practices
- Major equipment sequences of operation

At the system and equipment level, the assessment involves collecting nameplate information and conducting a minimum standard set of diagnostic tests and parameter measurements. Standardized RCx forms for common equipment types are provided in Appendix F. The system and equipment assessments generally include the following information:

- Nameplate data
- Design and operational intent
- Actual operation (e.g. set points, schedule, sequence of operation)
- Actual operating parameters (e.g. temperature, pressure, flow)

Results from the assessment will be used to develop the Diagnostic and Calculation Plans, the Customer Selection Form, and a punch list or master list of deficiencies. The tasks outlined in Table 8-1 provide a summary of the typical investigation activities expected to be executed for major system components. This scope of work is provided as an example, and may change for different facility types.

Table 8-1. RCx Survey Elements Summary (Example)

System or equipment	Survey minimum requirements
Chiller	<ul style="list-style-type: none"> • document sequence of operations (SeqOp) • verify / justify SeqOp • document actual schematic • spot measure actual performance (kW/ton) • document setpoints • verify temperature and pressure sensor calibration • verify thermostat calibration • document operations and maintenance (O&M) procedures • collect trend data to identify operational problems and establish baseline operation

System or equipment	Survey minimum requirements
Air Handling Unit	<ul style="list-style-type: none"> • document SeqOp • verify / justify SeqOp • document system type • document nameplate ratings • document actual schematic • document temperature, pressure at control points • verify economizer operation (if present) • verify damper operation and sealing • verify temperature and pressure sensor calibration • verify proper chilled water, hot water, and/or steam valve operation • measure motor/fan load, flow, pressure • identify operating point on fan curve • verify inlet guide vane / discharge damper / VFD operation (if present) • document O&M procedures • collect trend data to identify operational problems and establish baseline operation
Cooling Tower	<ul style="list-style-type: none"> • document SeqOp • verify / justify SeqOp • document system type • document nameplate ratings • document temperature, flow at control points • document O&M procedures • collect trend data to identify operational problems and establish baseline operation
Control System	<ul style="list-style-type: none"> • document SeqOp for the HVAC system, integrating the equipment SeqOps • verify / justify SeqOp • verify and sketch system schematic

8.3 RCX DIAGNOSTIC AND CALCULATION PLANS

Because the *Building Tune-up Program* relies heavily on accurate and comprehensive characterization of all RCMs, the RSP must exercise additional diligence in collecting data, documenting field conditions, and calculating savings. During the early part of the investigation, the RSP will develop Diagnostic and Calculation plans that document the following for each RCM:

- Functional tests required characterizing the RCM
- Deficiencies that can impact the full implementation of an RCM
- Governing equations for calculating electric energy savings
- Necessary inputs to the equations, to be trended or measured
- Identification of data collection mode (facility EMCS, stand-alone loggers, spot measurements, etc.)
- Operating conditions for which savings will occur, and necessary data collection period

For non-capital measures identified in the Customer's Selection Form, the estimated annual electricity savings and natural gas are calculated, implementation costs are estimated, and a simple payback period is calculated. All calculations must be submitted in detail, as well as any data used in support of the calculations. **Because implementation costs are paid by the Customer on the basis of the estimates provided in the RCM diagnostic and calculation plans, it is essential that the savings calculations are accurate. Estimates for implementation costs must be accurate market costs and must be obtained directly from the Owner/representative, vendor or an accepted cost estimating source. These estimates must be documented in the RCM Diagnostic and Calculation plans.** The basis for calculating electric demand and energy savings is summarized in Table 8-2.

Table 8-2. Savings Calculation Guidelines

Savings Calculation	Calculation Guidelines
Peak electric demand (kW)	Calculate Customer's electric annual peak billing demand savings.
Annual electric energy (kWh/yr)	Use system operating hours and operating characteristics (e.g. demand dependence on outside air temperature) as applied to the electrical demand
Annual natural gas energy (therms/yr)	Calculate Customer's annual natural gas use dependent on outside air temperature, operating hours, and observed operating characteristics

Calculations must be done in spreadsheet format and compatible with Microsoft Excel 97-2003, and be clearly presented for review. The calculations must use Typical Meteorological Year 3 (TMY3) data (typically binned in 5°F increments). This ensures that the resulting savings estimates are representative of typical weather, not the weather that occurred during the project study period. Weather data are available from Platte River, or they can be downloaded from http://rredc.nrel.gov/solar/old_data/nsrdb/1991-2005/tmy3/by_state_and_city.html. Calculation spreadsheets in the recommended format for some common RCMs are available from Platte River. An example of a Diagnostic and Calculations plan is provided in Appendix G of this manual. Calculations done using whole-building simulation software will not be accepted without prior written approval from Platte River.

In preparing estimates of RCM implementation cost and paybacks, estimates should be market costs provided by the owners/representatives, vendors or an accepted cost-estimating source. Should the Customer request the RSP to assist in the implementation of identified RCMs, it will be expected that costs prepared for the RCM diagnostic and calculation plans are honored by the RSP.

The RSP must submit a copy of the RCM Diagnostic and Calculation Plans to Platte River for review and approval during the Implementation Phase. A copy of the required RCM Diagnostic and Calculation Plan template is included in Appendix F of this manual. Deviations from this template must be pre-approved in writing by Platte River.

8.4 PRESENTATION OF RCMS

Following approval of the RCM Diagnostic and Calculation Plans by Platte River, the RSP will update the Customer Selection Form. This form includes measure descriptions, energy savings, implementation costs, simple payback periods, and estimated completion dates. The Customer Selection Form also identifies three separate RCM bundles recommended by the RSP with an option for customization.

Together with the RSP and Platte River; the facility representatives review the project recommendations. The bundle of RCMs to be implemented is agreed upon by all parties, taking into consideration factors such as comfort, safety, or liability as input by the participants in the meeting. Also to be considered is the Customer's commitment to spending at least the minimum amount for the facility as stated in Table 2 for

implementation of agreed upon RCx measures that result in a bundled estimated simple payback of 2 years or less. Although this meeting provides a singular formal communication of results, the RSP is also encouraged to review RCM status with the building ownership on an ongoing basis to facilitate a quick implementation timeframe.

8.5 IMPLEMENTATION SUPPORT

During the Implementation Phase, the RSP works hand-in-hand with the Customer's implementation team to identify the recommended measures and provide recommendations to "fix" the problems. The implementation team includes the facility engineers, operational staff, and the mechanical, electrical, and controls contractors. As the Customer approves RCx measures, the implementation team will be asked to "fix" the items associated with the relevant measures. The goal of this phase is to fully implement all agreed-upon RCx measures and stand ready for final verification.

Implementation of the RCMs is the sole responsibility of the Customer. However, the RSP is required to provide technical support during this phase for the Customer to implement the RCMs. A description of the Customer's role and the RSP's role in implementation is provided below.

- **Customer Implementation** activities are specific to funding implementation of the recommended RCMs (\$4,000 minimum commitment or more depending on facility size). Examples may include: mechanical/electrical contracting, professional engineering design, controls modifications, and installation of equipment that is required for the RCM. The Customer may choose to solicit these services from the RSP, in which case the RSP would be working under direct contract with the Customer and not Platte River.
- **RSP Implementation** assistance is provided to Customers to guide them from a recommended solution to the physical installation of the RCM. These activities may take the form of troubleshooting recommended control sequences, suggesting alternative RCM strategies during implementation, commenting on alternative design solutions, and answering technical questions. These costs are included as part of the RSP's price for the implementation phase of the project.

Key RSP Implementation Phase Deliverables

- 1) Diagnostic and Calculation Plans for all RCMs
- 2) Updated Customer Selection Form
- 3) Participation in presentation of final Customer Selection Form to Customer
- 4) Ongoing RCM implementation support for Customer

9.1 VERIFICATION PHASE OVERVIEW

During the Verification Phase, the RSP evaluates facility trending data (from the building EMS, facility sub-meters, or utility meter) and revisits the site to verify that measures have been properly completed (e.g. new control strategies are functioning properly, repairs have been made, etc). The RSP prepares and submits the Verification Report that summarizes the final findings and impacts from the project. The target timeline for completion of the Verification Phase is approximately three to ten weeks for a typical project.

9.2 VERIFY RCM IMPLEMENTATION

Initial RSP verification activities will include a site visit to confirm the installation of the RCMs approved in the Customer Selection Form. Activities will consist of visual inspections and functional testing/retesting as appropriate to ensure RCMs were completed as anticipated. The RSP will report these preliminary findings to Platte River. If discrepancies are found between the implemented RCMs and those agreed to with the building owner during the Implementation Phase of the project, Platte River may require that all verification activities be halted until they are implemented by the Customer.

To confirm that the recommended RCMs were properly implemented and savings estimates are accurate, the RSP is required to complete the verification activities identified in the completed RCMs' Diagnostic and Calculation Plans. The verification may consist of data trending, spot measurements, visual checks, and/or interviews with the party responsible for implementation. Generally, the verification procedures follow Option A or Option B of the International Performance Measurement & Verification Protocol.

Any discrepancies noted between the actual and recommended RCMs must be documented and presented in the Verification Report. It is essential that documented data be included in the report to support the final savings calculations and account for such implementation discrepancies. If discrepancies exist, the associated savings are recalculated, and the revised savings for each measure are presented in the report.

9.3 VERIFICATION REPORT


The Verification Report serves as final documentation for each of the project's implemented RCMs. The purpose of this report is to verify that the RCMs were properly implemented and document verified electrical demand, energy, and natural gas savings for each RCM. Planning and results of the verification activities for each implemented RCM will be used by the RSP to prepare the Verification Report. This report includes a summary of completed RCMs, a summary of trending and functional testing, and the final estimated costs and energy savings.

The Verification Report is submitted to Platte River for review and comment. Any requested changes are incorporated and a copy of the approved report is presented to the Customer. A copy of the required Verification Report template is included in Appendix H of this manual. Deviations from this template must be pre-approved in writing by Platte River.

Key RSP Verification Phase Deliverables

- 1) Verification Report
- 2) Participation in presentation of Verification Report to Customer

A sample copy of the *Building Tune-up Program* Project Application (front page) is provided here in this appendix. A Microsoft Word version of this application is available by contacting Platte River.


**PLATTE RIVER
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Building Tune Up Program Project Application (v1.0)

Instructions

Platte River Power Authority's (Platte River) *Building Tune-up Program* aims to help you identify low-cost opportunities to improve the efficiency of existing major mechanical and electrical systems and reduce energy costs without adversely affecting your facility or system operations.

To participate in this rebate program, please review the following steps:


1. **Read** the Terms and Conditions included in this packet.
2. **Pre-Screening Application Checklist – Required to determine project eligibility**
3. **Project Application** – If project is determined to be eligible, complete the following pages included with this application packet:
 1. **General Information** – Include all required customer and account information.
 2. **Facility Information** – Include all information requested in the application that is applicable to the facility.
 3. **Facility Staff and Control System Management** – Include staff and existing control system information for the facility.
4. **Sign** the Terms and Conditions page.
5. **Retain** a copy of the completed application. Submitted applications will become the property of Platte River.
6. **Submit** the completed application and required documentation to:


Platte River Power Authority
 Building Tune-up Program
 2000 E Horsetooth Rd
 Fort Collins, CO 80525
 Fax: (970) 229-5244
 Email: petrya@prpa.org


For More Information. For more information about the *Building Tune-up Program*, measure eligibility, rebates, or other Platte River's programs please contact us:


- Online at www.prpa.org
- By phone at (970) 226-4000
- By email at petrya@prpa.org

Working Together










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Version 1.0

A sample copy of the front page of the RCx Plan Approval Form is provided in this appendix. This form will be completed by Platte River upon completion of the RCx Planning Phase for projects approved by Platte River to proceed to the Implementation and Verification Phases of the program.



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Building Tune Up Program Retrocommissioning Plan Approval Form (v1.0)

Retrocommissioning Plan Approval Form (v1.0)

Important: Receipt of this form indicates that the Retrocommissioning Planning Phase of Platte River Power Authority's (Platte River's) Building Tune-up Program has been completed and Platte River has identified and recommended Retrocommissioning measures ("Recommended RCMs") attached to this form to improve the efficiency of the Customer's use of electricity and natural gas use. Please sign and return this form by the stated deadline to proceed with the Implementation and Verification Phases.

Customer: _____

Customer contact name: _____

Customer contact phone/email: _____

Facility address: _____

Platte River account number(s): _____

Deadline for Customer acceptance: _____

Terms and Conditions

1 Definitions.

1.1 "Minimum Customer Implementation Commitment" shall mean the Customer's commitment to implement a Retrocommissioning Measure (RCM) Bundle with a minimum RCM Bundle Cost of \$4,000 if your facility is under 50,000 ft², \$4,000 + \$0.04/ft² if your facility is between 50,000-200,000 ft², or \$12,000 if your facility is over 200,000 ft² and a simple payback of 2.0 years or less based upon electrical savings.

1.2 "Customer Selection Form" shall mean the document maintained by the Retrocommissioning Service Provider (RSP) which summarizes the Recommended RCMs selected by the Customer for implementation.

1.3 "RCM Bundle" shall mean the selection of Recommended RCMs chosen by Customer and documented in the Customer Selection Form.

1.4 "Recommended RCMs" shall mean the individual Retrocommissioning measures that are recommended by the RSP.

1.5 "Recommended RCM Costs" shall mean reasonable market costs incurred by Customer (net of any discounts, rebates, or other consideration that reduces Recommended RCM Costs incurred by Customer) to purchase and implement Recommended RCMs at Customer's Facility by the Required Implementation Date. The Recommended RCM Costs will be stipulated in the Customer Selection Form.

1.6 "Required Implementation Date" shall mean the date which the Customer completes the Minimum Customer Implementation Commitment. The Required Implementation Date is a mutually agreed upon and documented date between Platte River and Customer. For this project, the Required Implementation Date is insert date.

2 Customer Obligations

2.1 Provide access to the facility and time for facility personnel to interface with the RSP.

2.2 Provide and assist with the reporting and collection of information pertaining to the operation of the Facility.

2.3 Not later than the Required Implementation Date.

2.3.1 Properly fulfill the Minimum Customer Implementation Commitment and.


2.3.2 Provide Platte River with written notification stating that all of the Recommended RCMs in the RCM Bundle are

Page 1 of 4
Version 1.0

Appendix C

Sample Building Site Assessment Form

A sample copy of the front page of the *Building Tune-up Program* Building Site Assessment Form is provided in this appendix. A Microsoft Word version of this form is available by contacting Platte River.



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Building Tune-up Program Building Site Assessment Form (v1.0)

General Information

R.SP: _____

Project name: _____

Project number: _____

Facility address: _____

Facility city, state, zip: _____


Building Characteristics

Characteristic	Description	
Year of construction		
Gross area (gross square footage)		
Percent of gross area designated as prime office space		
Percent of gross area designated as computer data center space		
Percentage and type of other secondary space uses (e.g. parking, clarify below if necessary)		
Building configuration (e.g. campus, towers, low-rise)		
Building use (e.g. office, school, hospital)		
Number of floors (levels)		
Number of occupants		
Annual occupancy rate of primary space by year	Year	Occupancy Rate (%)
	2007	
	2008	
	2009	
Number of personal computers in operation (approx.)		
Type of lighting equipment installed (e.g. T12, T8, HID)		
Describe the lighting current systems and control		
Weekly hours of operation by major space type	Space type	Hours/week
Building occupied for 11 or more of last 12 months?		
Brief renovation history		
Brief description of building improvements planned		

Page 1 of 13

Enter Project Name
Enter Date Here

A sample copy of the front page of the BTU Retrocommissioning Plan Report Template is provided in this appendix. A Microsoft Word version of this form is available by contacting Platte River.



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**Building Tune-up Program -
Retrocommissioning Plan**

[Click here to type project name](#)

Located at:
[Click here to type address](#)
[Click here to type City, State, ZIP](#)

Presented to:
[Click here to type customer's name](#)

Project # **[Click here to type project # \(Provided by Prog. Admin\)](#)**

[Click here to type date \(For e.g. January XX, 20XX\)](#)

Appendix E

Customer Measure Selection Form

A sample copy of the Customer Selection Form is provided in this appendix. A Microsoft Excel version of this form is available by contacting Platte River.






Building Tune-up Program
Customer Measure Selection Table (v1.0)

Project:

RSP:

Phase:


Date:

Measure Description					Savings Summary					Project Approval					
RCM Bundle 1	RCM Bundle 2	RCM Bundle 3	Measure Selected by Owner ¹ (X)	RCM No.	Measure Description	Interruption Factor	Peak Demand Savings (KW)	Annual Energy Savings (kWh/yr)	Electrical Cost Savings (\$/yr)	Measure Incremental Cost (\$)	Simple Payback (yrs)	Estimated Completion Date	Owner Initials	GSP Initials	Program Admin Initials
				1							#DIV/0!				
				2							#DIV/0!				
				3							#DIV/0!				
				4							#DIV/0!				
				5							#DIV/0!				
				6							#DIV/0!				
				7							#DIV/0!				
				8							#DIV/0!				
				9							#DIV/0!				
				10							#DIV/0!				
				11							#DIV/0!				
				12							#DIV/0!				
				13							#DIV/0!				
				14							#DIV/0!				
				15							#DIV/0!				
				16							#DIV/0!				
				17							#DIV/0!				
				18							#DIV/0!				
Totals (For all Selected (X) values only)							-	-	\$0.00	\$0.00	#DIV/0!				
Retrocommissioning Bundle 1							-	-	\$0.00	\$0.00	#DIV/0!				
Retrocommissioning Bundle 2							-	-	\$0.00	\$0.00	#DIV/0!				
Retrocommissioning Bundle 3							-	-	\$0.00	\$0.00	#DIV/0!				

Notes
1. Owner selects / de-selects measures by editing the column labeled "Measure Selected By Owner". Use the X key to select / de-select measures.

A sample copy of the front page of the Standardized Retrocommissioning Form for the program is provided in this appendix. A Microsoft Word version of this form is available by contacting Platte River.



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Building Tune-up Program Standardized Retrocommissioning Forms (v1.0)

General Instructions for Retrocommissioning Procedures

The retrocommissioning procedures do not address fire and life safety or basic equipment safety controls. To ensure that the retrocommissioning procedures will not damage any equipment or affect any equipment warranties, obtain clearance for all test procedures from the building engineer or maintenance supervisor prior to execution.

The retrocommissioning procedure forms are intended to serve two purposes; they assure that a minimum level of investigation is completed, and provide retrocommissioning information to Platte River in a standard format. The retrocommissioning procedures are designed to be "generic" for the equipment class. If the complexity, configuration, or other aspects of a specific project require additional tests or information, explain in the comments area of the appropriate section, and attach the additional test procedures and field data.

In all sections, circle or otherwise identify any responses that indicate deficiencies. All deficiencies must be included on the Master List. The forms generally consist of the following sections (some forms do not include all sections):

- Operator Interview.** Determine from a discussion with the building operator whether the system or equipment is operating properly to the best of their knowledge. Use the table to note any reported problems, and the building representative's proposed solutions.
- System Schematic.** This should be a clear but simple hand sketch, not a detailed CAD-generated drawing. The sketch should show the major control points sufficiently that someone unfamiliar with the site could understand the sequence of operations of the system or equipment covered in the procedure.
- Nameplate (and Operating) Data.** Record only field-verified data from actual equipment, not from equipment schedules, drawings, etc. Exceptions to this include items such as cooling coil capacity. If additional information is available but not included on the form, record it in the comment space below the form. If an item does not apply, write "NA" for not applicable. Operating data must be field-measured and documented with date and time of measurement, at a minimum.
- Controls Calibration.** The tests outlined in this section determine whether the installed sensors are reporting correct information to the Energy Management and Control System (EMS). It is critical that the field measurement and the EMS reading are taken simultaneously to avoid mistaking time variation of values for sensor miscalibration.
- Functional Performance Testing.** The field tests in this section provide a "snapshot" of system operation, and verify that the equipment, as installed, operates as intended by the manufacturer and designer. If the field observation does not correspond to the intended design operation, does not follow the intended sequence of operations, or appears inappropriate, write a comment number that refers to an explanatory comment in the comments section or on attached comments sheets/Master List. If a test does not apply, write "NA" for not applicable. Write "ND" for tests not done, and explain in a comment. For items that refer to an activity, such as documenting the sequence of operations, indicate completion with a check mark, and attach supporting information on separate sheets as necessary.

Units
Values should be reported using the inch-pound (I-P) system of units, e.g. psi, F, gpm, etc.


General Instructions for Retrocommissioning Procedures, continued

Variable Frequency Drives
For motors with VFDs, special precautions should be taken. Running the motor at less than about 25 to 30% of the full load speed rating may cause motor overheating due to inadequate motor ventilation. Also, if the motor is driven at less than 50% of the full load speed rating, the thermal over-load protection may not properly protect the motor. The motor should not be driven below 50% of its full load speed rating without consulting the building engineer or the motor manufacturer's representative.

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Enter Project Name
Date Here

Appendix G RCx Diagnostic and Calculation Plan Template

A sample copy of the front page of the Retrocommissioning Diagnostic and Calculation Plan template is provided in this appendix. A Microsoft Word version of this form is available by contacting Platte River.



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Building Tune Up Program Retrocommissioning Diagnostic & Calculation Plan (v1.0)

General Information

RSP: [Click here to type Name](#) _____

Project name: [Click here to type Name](#) _____

Project number: [Click here to type project number](#) _____

Date: _____

Completed by: [Click here to type Name](#) _____

Measure Summary

Measure Name	Click here to complete		
RCM end use category	<input type="checkbox"/> Cooling	<input type="checkbox"/> Lighting	<input type="checkbox"/> Refrigeration
	<input type="checkbox"/> Heating	<input type="checkbox"/> Cooking	<input type="checkbox"/> Other _____
	<input type="checkbox"/> Ventilation	<input type="checkbox"/> Plug Loads	<input type="checkbox"/> Other _____
	<input type="checkbox"/> Pumping	<input type="checkbox"/> Controls	<input type="checkbox"/> Other _____
	<input type="checkbox"/> Water Heating	<input type="checkbox"/> Compressed Air	<input type="checkbox"/> Other _____
Affected sub-system(s)	Click here to complete		
Detailed RCM description	Click here to complete		

Data Acquisition Summary

Investigation approach	Click here to complete
Parameter(s) trended	Click here to complete
Parameters(s) functionally tested	Click here to complete
Dates of testing/trending	Click here to complete
Summarize Findings	Click here to complete
Insert applicable supporting graphs	
Other	

Savings Calculations Methodology

Peak demand savings (kW)	Click here to complete
Annual energy savings (kWh)	Click here to complete
Annual electric cost savings (\$)	Click here to complete
Additional equations	Click here to complete
Calculation assumptions	Click here to complete

Page 1 of 3

Enter Project Name
Enter Date Here

A sample copy of the Verification report template is provided in this appendix. A Microsoft Word version of this form is available by contacting Platte River.



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Building Tune Up Program Verification Report (v1.0)

[Click here to type project name](#)

Located at:

[Click here to type address](#)

[Click here to type City, State, ZIP](#)

Presented to:

[Click here to type customer's name](#)

Project # RCS**[Click here to type project # \(Provided by Prog. Admin\)](#)**

[Click here to type date \(For e.g. January XX, 20XX\)](#)

Appendix I

Sample Electric Utility Bill Figures

Representative Fort Collins Utility Bill



Fort Collins Utilities
Customer Service
 330 S. College Ave.
 Hours: 8 a.m. to 5 p.m., Mon., Tue., Thur., & Fri.
 10 a.m. to 5 p.m. Wed.

Phone: (970) 212-2900
 E-mail: utilities@fcgov.com
 Web: www.fcgov.com/utilities

Account Number	Customer Name	Service Address	Bill Date	Date Due	Amount Due
123456-7890	Widgets Plus	1111 Widget Avenue	12-04-09	12-29-09	\$1,734.58

Account Number

side for customer information and explanation of abbreviations.

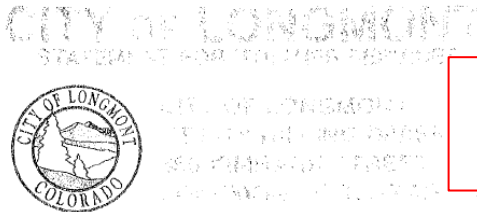
Billing and Payment Summary

Billing period	\$	3,224.92
Payments received since last billing	\$	1,668.75
Previous balance; please pay now	\$	1,556.17
Charges for this billing period due 12-29-09	\$	1,734.58
Total amount due	\$	3,290.75

Rate Schedule

Service	Rate Code	Service Date From	To	Units	Rate	Multiplier	Usage	Charge
Electric Energy	E300	11-01-09	12-01-09	30	4068	4299	27720 KWH	\$573.03
Facility Demand	E300	11-01-09	12-01-09	30		.69	82.8 KW	\$378.28
Coincident Peak	E300	11-01-09	12-01-09	30		.4	48 KW	\$667.55
Late Fee	P900							\$10.00
Sub-total								\$1,628.86
City Sales Tax								\$45.82
State/County Sales Tax								\$59.90
Total charges this billing period								\$1,734.58

Representative Longmont Utility Bill



For billing inquiries, call 303-651-8664

Pay on-line: www.ci.longmont.co.us Power Outages: 303-776-0011

Customer Account No.	[Redacted]
Service date	13-DEC-2009
Service Address	
Current Balance	\$.00
Amount Due	\$1,976.81
Due Date	06-JAN-2010
TOTAL DUE	\$1,976.81

Account Number

					RATES				
	From	To			NetRdg	Mult	Usage	Rate	\$-Cost
Commercial Demand Rate									
Meter Out 03473340	10/29/09	10/29/09	13482	13483	1	X	120	120	
Demand KW								23.4	
Meter In 98911407	10/29/09	11/30/09	0	200	200	X	120	24000	
Demand KW								95.4	
Monthly service charge								95.40	
								10.70000	\$1,020.78
									\$10.00
									Electric subtotal
									\$1,662.72
									Total electric services
									\$1,662.72

WATER & WASTEWATER SERVICES

Representative Estes Park Utility Bill

Page 1

TOWN OF ESTES PARK, UTILITY BILLING DEPARTMENT
 P.O. BOX 1747, 170 MACGREGOR AVENUE
 ESTES PARK, CO 80517-1747
 PHONE: 970-586-5331 OR 1-800-748-1717 www.estesnet.com

SERVICE ADDRESS			
ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
[Redacted]	02-27	12/29/09	1/15/10



Total Current Charge 2,240.81
 Balance Forward 2,361.24
 Total Amount Due 4,602.05

CHECK HERE FOR ADDRESS CHANGE AND COMPLETE FORM ON BACK

Account Number

AMOUNT PAID



00001039700000874800000460205

4672 HOLD DETACH WITH PAYMENT MADE TO: TOWN OF ESTES PARK
 SERVICE ADDRESS RETAIN BOTTOM PORTION FOR YOUR RECORDS

Rate Schedule

ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
[Redacted]	02-27	12/29/09	1/15/10

Rate Class : **COMMERCIAL LARGE**
 Last payment amount/date: 2,135.53 12/02/09

Last Bill Amount 4,496.77
 Payments 2,135.53-
 Adjustments .00
 Balance Forward 2,361.24

Service Period	Days	Meter Number	Mult	Units	Current	Previous	Usage
EL 11/04/09 12/07/09	33	14109A	360.0	KWH	5749.24	5651.03	35355.60
EL 11/04/09 12/07/09	33	14109B	360.0	KW	.23	.24	82.80

Representative Loveland Utility Bill



City of Loveland Water and Power Department • Utility Billing Office
 500 East Third Street • Loveland, Colorado 80537 • 970-962-2111

SERVICE ADDRESS			
500 ANY STREET			
ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
11111-2222	04-05	12/04/09	12/22/09

Total Current Charges 131.16
 Balance Forward .00
Total Amount Due 131.16

Account Number

CITY OF LOVELAND
 PO BOX 3500
 LOVELAND CO 80539-3500

CITY OF LOVELAND UTILITY CUSTOMER
 500 ANY STREET
 LOVELAND CO 80537

THANK YOU FOR YOUR PROMPT PAYMENT
 2560 00099

Rate Schedule

RETAIN BOTTOM PORTION FOR YOUR RECORDS. DETACH

DE PAYABLE TO: CITY OF LOVELAND.

SERVICE ADDRESS			
500 ANY STREET			
ACCOUNT NUMBER	CYCLE	BILL DATE	DUE DATE
11111-2222	04-05	12/04/09	12/22/09

Rate Class : **SMALL GEN SVC** - 1/88

Last Bill Amount 97.14
Payments 97.14-
Adjustments .00
Balance Forward .00

Service	Period	Days	Meter Number	Mult	Units	Current	Previous	Usage
EL	11/03/09 - 12/02/09	29	44628	1	KWH	6830	4948	1882
Consumption						Charge		Total
EL	ELECTRIC					1,882.00		
EL	PIF					1,882.00	8.36	
TOTAL ELECTRIC								131.16
Total Current Charges								131.16
Balance Forward								.00
Total Amount Due								131.16

Electric Usage (KWH) Last Year 970 This Year 1882

Appendix J Platte River and City Energy Efficiency Programs

Platte River and the electric utilities of Fort Collins, Estes Park, Longmont and Loveland offer a range of energy efficiency opportunities to help non-residential Customers save energy and money. Reduced energy costs, technical assistance, and/or rebates are available for qualifying Customers. A summary of other available non-residential energy efficiency programs is provided below. Additional information regarding eligibility requirements, rebates, and participation processes is available at <http://www.PlatteRiver.org/productservices/eervicesbus/index.htm> or by contacting Platte River.

LIGHTENUP

The LIGHTENUP program provides a comprehensive platform for cost-effective non-residential lighting energy efficiency projects. LIGHTENUP helps maximize the value and minimize the electricity cost of Customers lighting by providing funding and technical assistance to upgrade old, inefficient lighting technology with modern, efficient technology. The rebates serve to buy down the cost of installing high efficiency lighting over standard efficiency lighting, thus making the high-efficiency option more attractive to Customers.

Electric Efficiency Program for New Construction and Renovations

The Electric Efficiency Program for New Construction and Renovations promotes the purchase of industry-proven, high-efficiency equipment during projects that are either new construction or for major renovations. 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, envelope, food service equipment, grocery equipment, office equipment, premium efficiency motors, and even custom measures.

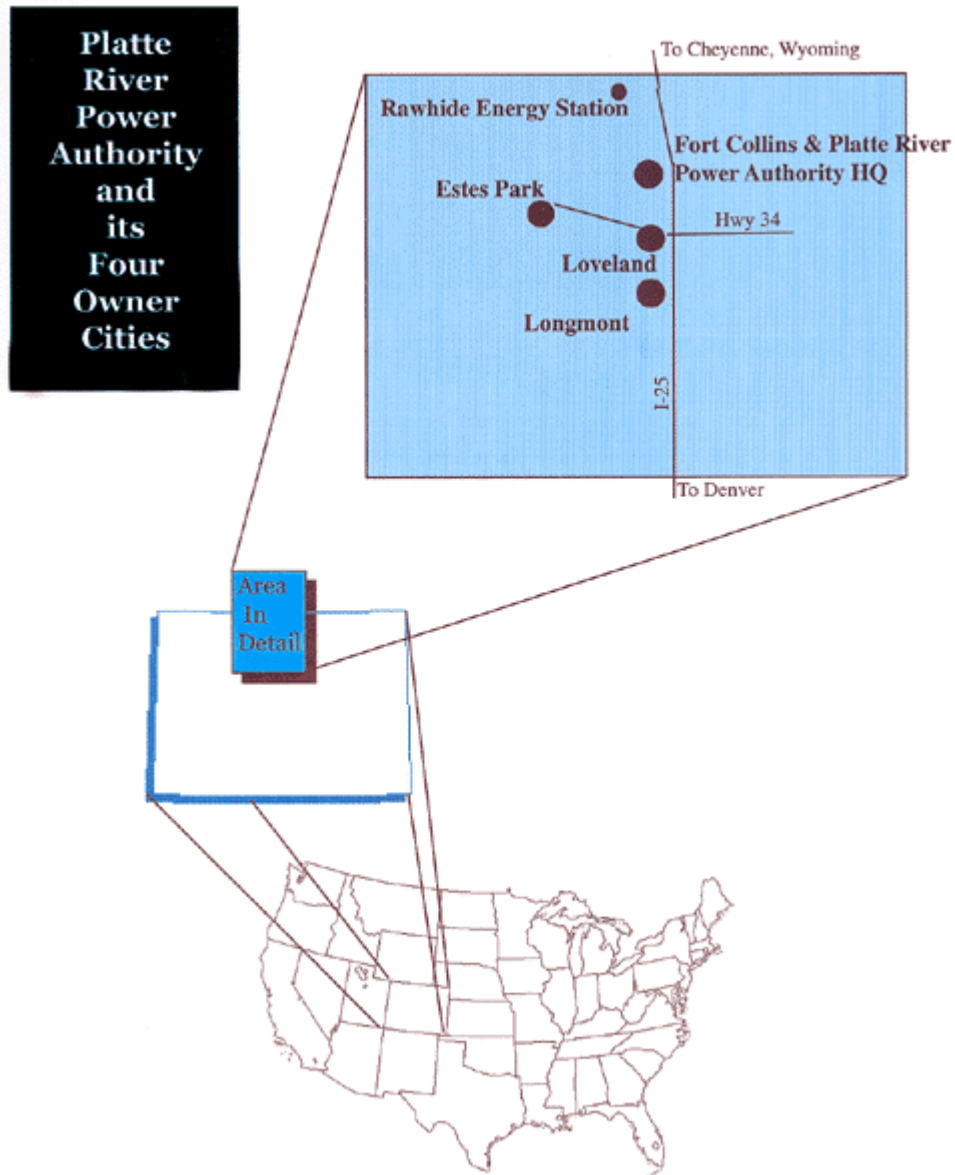
Electric Efficiency Program for Existing Buildings

The Electric Efficiency Program for Existing Buildings promotes the purchase of industry-proven, high-efficiency equipment to replace current, less efficient 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, envelope, food service equipment, grocery equipment, office equipment, premium efficiency motors, and even custom measures.

Appendix K

Platte River Service Territory

An illustration of Platte River's service area is provided below.





**PLATTE RIVER
POWER AUTHORITY**

Estes Park • Fort Collins • Longmont • Loveland

Building Tune-up Program Phone: (970) 226-4000

tuneup@prpa.org
