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An Exelon Company

**Smart Ideas for Your  
Business  
Retro-Commissioning**

***Participant Manual***



October 2008

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**1.1 PROGRAM OVERVIEW**

One of the primary objectives of ComEd’s Smart Ideas for Your Business energy efficiency portfolio is to offer our customers every opportunity to help manage their energy expenses. ComEd’s suite of available program initiatives provides incentives for nearly every energy efficient technology and product available in today’s market. The Retro-Commissioning service is uniquely suited to fit within ComEd’s existing capital improvement incentive programs by offering energy analysis services to identify low-cost and no-cost energy efficiency measures.

ComEd’s Retro-Commissioning Program is designed to help customers achieve demand and energy savings in commercial and industrial facilities in our Illinois service territory. 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 a demonstrated commitment to spend \$10,000 or more to implement identified retro-commissioning measures with an estimated total project simple payback of one-and-a-half years or less based upon electric savings.

Eligible sites include existing facilities on a qualifying ComEd retail rate schedule with a peak demand of at least 500 kW (Table 1). In addition, program participants should have a facility that is at least 5 years old, have at least 150,000 square feet of conditioned floor space, and have a relatively high Energy Use Index (EUI) compared to the EUIs of buildings of the same class. 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.

**Table 1 – Eligible Nonresidential Customer Rate Schedules**

<b>A75</b>	<b>B75</b>	<b>H75</b>	<b>R75</b>
<b>A76</b>	<b>B78</b>	<b>H76</b>	<b>R76</b>
<b>A77</b>	<b>B95</b>	<b>H77</b>	<b>R77</b>
	<b>B98</b>	<b>H78</b>	<b>R78</b>

The Retro-Commissioning Program is a “service-incentive” program. This means the retro-commissioning analysis is the incentive to the customer and is fully funded by ComEd. Participants are expected to cover the costs associated with implementing the measures recommended by the retro-commissioning analysis, attending meetings, and assisting Retro-commissioning Service Providers (RSPs) in acquiring facility

information. Incentives for capital improvements such as lighting or HVAC are provided through the Prescriptive and Custom elements of the Smart Ideas for Your Business program.

## **1.2 MANUAL ORGANIZATION**

This program manual is specifically designed for use by facility owners, property managers, and O&M staff and is organized as follows:

- Section 2 provides an overview of ComEd’s other current commercial and industrial energy efficiency program offerings available in Illinois.
- Section 3 outlines the parameters and eligibility requirements for the Retro-Commissioning Program.
- Section 4 provides an overview of the Program process.
- Section 5 includes information on available resources and contact information for the Program Administrator.
- Appendix A contains a map showing the approximate service territory covered by ComEd within the State of Illinois.
- Appendix B shows a typical process flowchart for the Retro-Commissioning Program.
- Appendix C contains a sample copy of the Retro-Commissioning Program application.

## Section 2

## ComEd Efficiency Programs Overview

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In addition to Retro-Commissioning, ComEd offers its Illinois commercial and industrial customers other programs with financial incentives to save energy and money. These incentives are available for qualifying customers through the Smart Ideas for Your Business Program. Visit the ComEd Web site ([www.comed.com](http://www.comed.com)) to learn more about ComEd's incentives for many energy efficient technologies. Incentives are provided to encourage energy efficiency in the following areas:

**Lighting** - To encourage businesses to take advantage of lighting energy efficiency opportunities, ComEd is offering incentives to generate an even larger return on your energy investment and accelerate the payback period.

**HVAC** - Heating, ventilation and air conditioning can account for as much as 30% of a building's annual energy usage. Consequently, any efficiency improvement in these systems can mean big savings on one's energy bill, while also maintaining or improving the comfort and quality of the indoor air.

**Refrigeration** - There are numerous cost-effective, energy-saving technologies available to improve the efficiency and performance of refrigeration systems. ComEd offers powerful incentives for any business with refrigeration systems that may yield significant savings for refrigeration-intensive businesses such as supermarkets, convenience stores and restaurants.

**Electric Motors** - Motors are considered the workhorse in many industrial applications, often operating for extended periods of time and consuming significant amounts of energy in the process. Not all motors operate with the same efficiency. ComEd provides incentives for qualifying premium efficiency motors to encourage the installation of NEMA Premium-efficiency motors on all units one horsepower or greater. This is increasingly important for motors that operate for extended periods of time. Installing premium efficiency motors can save up to three percent in motor energy consumption.

**Other** - Business operations vary widely, which is why ComEd has developed a truly customized incentive program that encourages its customers to implement energy efficiency measures. Projects involving compressed air, motors greater than 200 HP, non-HVAC variable-speed drive applications and other unique projects that improve energy efficiency may be eligible for a custom incentive. To qualify for ComEd's custom incentives, a business must submit an application for pre-approval.

**Energy Insights Online** - Savvy energy managers know that managing the "how" and "when" of electricity consumption can return huge savings. But up until now, acquiring specific measures of energy consumption meant significant investments in hardware and software. Not any more!

Energy Insights Online monitors your electricity consumption via special recording meters and converts this data into simple, easy-to-understand usage graphs and reports that you can access anywhere via the Internet.

Energy Insights Online gives you the power to:

- Develop more effective incentive-earning electricity curtailment strategies.
- Produce half-hourly, daily or monthly energy usage reports.
- Compare energy usage amounts against previous periods -- or other enrolled accounts.
- Examine energy usage trends.
- Validate machine or process efficiency upgrades.
- Establish relationships between electricity usage and outside temperature.
- Improve "cost-based accounting" procedures.
- Devise "load-shifting" strategies to lower monthly demand charges.

Call your ComEd Account Manager or 1-877-4-ComEd-1 (1-877-426-6331) today to sign up or to get more information.

## **Section 3                      Retro-Commissioning Program Parameters**

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### **3.1      CUSTOMER ELIGIBILITY**

Customers must meet the following minimum eligibility requirements to be considered for the Retro-Commissioning Program:

- Facility is a ComEd delivery services customer, regardless of the electric supplier.
- Facility has a peak demand of 500kW or greater
- Facility operates under one of the following rate schedules: A75, A76, A77, B75, B78, B95, B98, H75, H76, H77, H78, R75, R76, R77, R78.
- The facility owner must express a willingness to commit funding for participating in the process, completing the project plan, and implementing measures. The owner must be prepared to assume costs and expenses of at least \$10,000 for agreed-upon measures that result in an estimated simple payback of 18 months or less based upon electrical savings.
- Public buildings such as government, municipal, and public schools are not eligible for the Smart Ideas Retro-Commissioning Program at this time. Please refer to the Illinois Department of Commerce and Economic Opportunity (DCEO) program for information about additional program offerings. For more information on DCEO's Retro-Commissioning Program, visit [www.illinoisenergy.org](http://www.illinoisenergy.org).

In reviewing program applications, ComEd will look for evidence that cost-effective retro-commissioning opportunities may exist at your facility. ComEd will consider the following factors when reviewing your application:

- The facility should have accessible and up-to-date building documentation and records.
- The facility should have a relatively high Energy Use Index (EUI) compared to the average EUIs of buildings of the same class and/or have a low ENERGY STAR rating from Portfolio Manager.
- Preferably, the facility should be at least 5 years old and exceed 150,000 ft<sup>2</sup> in air-conditioned floor space
- The facility should be free of major problems requiring capital repairs or replacements and have no planned major system renovations or retrofits.
  - 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.

- The facility should have an existing and functional building or system energy management system (EMS) with direct digital control (DDC)
- The facility owner and O&M staff should express a commitment to be actively involved in the retro-commissioning process. Active involvement will include:
  - Providing access to the facility
  - Providing time for facility personnel to interface with the Retro-Commissioning Service Provider
  - Providing and assisting with the reporting, and collection of, information pertaining to the retro-commissioning of the facility

The estimated time commitment from the customer to support the retro-commissioning effort is likely to total 60 to 100 hours of a senior facility manager over the 10- to 12-month project duration.

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

### **3.2 INCENTIVES**

The Retro-Commissioning Program is a "service-incentive" program. This means the retro-commissioning analysis and implementation technical assistance is itself the incentive to the customer and is fully funded by ComEd. In the program, Retro-Commissioning services are conducted exclusively by pre-approved service providers. ComEd covers Retro-Commissioning service costs at 100% for a program service provider to investigate and identify savings opportunities *if the measures are implemented by April 1<sup>st</sup> after the start of the project under the program.* For projects that are not completed within this timeline, the customer will be expected to reimburse ComEd for the full cost of any completed Retro-Commissioning Planning costs, program-funded Investigation activities, and Verification Report costs.

Program participants are expected to cover the costs associated with contracting or arranging for the implementation of recommended measures, attending meetings, and assisting RSPs in acquiring facility information. No additional incentives will be available to participants through this Program. However, if energy efficiency measures are identified that are beyond the scope of the Retro-Commissioning Program, the customer may seek to qualify those measures through ComEd's Prescriptive or Custom programs.

### **3.3 RETRO-COMMISSIONING SERVICE PROVIDER**

A qualified Retro-Commissioning Service Provider (RSP) team will be provided by the program administrator to conduct the retro-commissioning services at no cost to the customer.

During the retro-commissioning process, the facility's staff will assist the RSP in acquiring access and information regarding the building systems, operation, controls system, and any other pertinent information necessary to identify and evaluate potential retro-commissioning measures. The RSP will use the information gathered from the site visit to generate the Retro-Commissioning Plan.

The RSP is not responsible for implementing the Retro-Commissioning Plan measures. However, the RSP will provide guidance and technical assistance during the Implementation phase to aid in the successful implementation of the agreed upon measures. Implementation of the retro-commissioning measures is the responsibility of the facility owner.

Upon completion of the customer's implementation activities, the RSP will return to inspect the facility to verify the installation and proper operation of the retro-commissioning measures. The RSP will prepare and submit the Verification Report that summarizes the final findings and impacts from the project.

### **3.4 FACILITY OWNER**

The facility owner shall make available to the RSP a competent facility representative who is knowledgeable in the building systems, equipment and operation. The individual shall provide the RSP access to the building, its Building Automation System (BAS), and any pertinent building documentation necessary to develop a thorough understanding of the operation, systems, equipment and use of the building.

The estimated time commitment from the customer to support the retro-commissioning effort is likely to total 60 to 100 hours of a senior facility manager over the 10- to 12-month project duration.

The facility owner is responsible for implementing the agreed upon retro-commissioning measures. The owner may exercise the option to subcontract the effort to a contractor or use his own staff to complete the work.

The program administrative process for each Retro-Commissioning Project follows four basic program phases:

- Application Phase
- Planning Phase
- Implementation Phase
- Verification Phase

### 4.1 APPLICATION PHASE

The Retro-Commissioning Project begins with the Application Phase. Project applications are completed by the facility owner or representative and submitted to the Program Administrator. Based on a review of submitted applications, the Program Administrator will select facilities with the highest perceived opportunity for savings to participate in the program.

The Program Administrator may conduct an on-site or telephone interview with facility personnel to gauge building and system condition as well as potential retro-commissioning opportunities. Upon acceptance of a participant application, the Program Administrator will arrange a kick-off meeting with the customer's project team and RSP.

If your facility is not selected to participate in the program, ComEd may recommend one of the other energy efficiency programs listed in Section 2 of this manual as a better fit for your facility.

**Customer Role: Complete Application and Agree to Terms & Conditions**

**Deliverable: Program Acceptance or Rejection Letter**

**Duration: 1 to 2 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, and the Program Administrator. A site assessment and data acquisition plan is completed by the RSP during this phase, where findings are used to generate the Retro-Commissioning Plan for the project and assess potential measures and project economics. The site assessment and data acquisition plan identifies system operational characteristics and parameters

(ie. static pressure, discharge air temperature, damper position) that will be collected using the building automated control system. The customer's facility staff responsibilities during this phase is to provide building documentation and support the RSP's orientation within the building.

The Retro-Commissioning 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, the impacts and economics of the identified potential measures. At the completion of the Planning Review meeting, the facility owner reviews the retro-commissioning opportunities and acknowledges the measures to be investigated further and implemented in the Implementation Phase.

Prior to commencing the Implementation Phase, the customer enters into a formal Program Agreement. The Program Agreement includes several components that define the roles and responsibilities of each party, the project goals, and customer information release language. The primary goal of the Program Agreement is to formally document the customer's commitment to spending at least \$10,000 for agreed-upon retro-commissioning measures that result in a bundled estimated simple payback of 1.5 years or less. These measures must be installed by April 1<sup>st</sup> of the following year. For projects that are not completed by April 1<sup>st</sup>, the customer will be expected to reimburse ComEd the full cost of any completed Retro-Commissioning Planning costs, program-funded Investigation activities, and Verification Report costs.

**Customer Role:** Provide building documentation and support RSP's information collection process. Sign program agreement.

**Deliverable:** Retro-Commissioning Plan  
Signed Program Agreement with ComEd

**Duration:** 4 to 6 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 retro-commissioning opportunities are finalized, the customer will be asked to fund and lead the implementation of such measures.

Throughout the Implementation Phase, the retro-commissioning 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 retro-commissioning process to communicate retro-commissioning opportunities and seek customer approval to proceed with implementation. In the event that additional retro-

commissioning 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 implementation team includes the facility engineers, operational staff, and the mechanical, electrical, and controls contractors. As retro-commissioning 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 retro-commissioning measures and stand ready for final verification.

The implementation costs used to calculate project economics under the program of the measures are based upon reasonable market costs as determined solely by ComEd. 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 retro-commissioning measures implementation. Final implementation costs may vary from the estimated market costs; however, the market costs will be utilized to support contractual obligations.

**Customer Role:** Assist in RSP's investigation activities  
Contract or arrange for implementation activities  
Manage completion of recommended measures

**Deliverable:** Implementation of Retro-commissioning Measures

**Duration:** 8 to 20 weeks, depending on the month in which Implementation activities commence

#### 4.4 VERIFICATION PHASE

During the Verification Phase, the RSP evaluates facility trending data (from the building EMS, facility submeters, 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.

**Customer Role:** Support RSP's verification process

**Deliverable:** Verification Report

**Duration:** 3 to 10 weeks, depending on the month in which Verification activities are completed.

**5.1 COMED WEB SITE**

The most current information about program information, eligibility requirements, and other updates is available from the program Web site at [www.ComEd.com](http://www.ComEd.com).

**5.2 RETRO-COMMISSIONING PROGRAM ADMINISTRATOR CONTACT INFO**

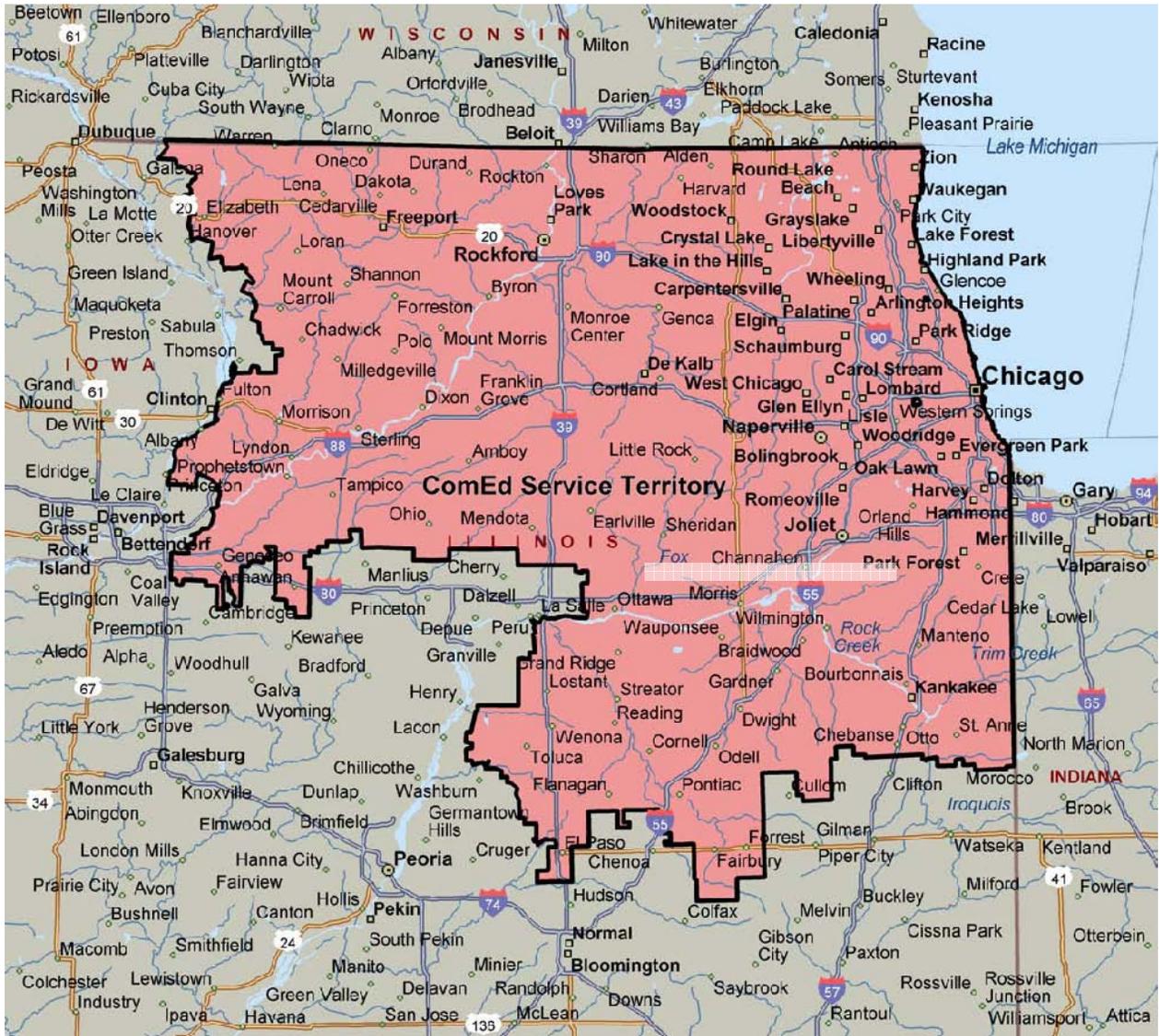
All questions about ComEd's Retro-Commissioning Program should be directed to your ComEd Account Manager or the Program Administrator at:

ComEd Smart Ideas for Your Business  
44 E. Roosevelt Rd. #338  
Lombard, IL 60148  
Phone: 1-888-806-2273  
Fax: (630) 396-9036  
Email: [ComEdSmartIdeas@KEMA.com](mailto:ComEdSmartIdeas@KEMA.com)

## Appendix A

## ComEd Service Area Map for Illinois

The service area map below illustrates ComEd's service territory. Customers and RSPs are encouraged to review a copy of their recent utility bill to ensure that they are eligible to participate in the program.



## ComEd Retro-Commissioning Program Overview

### Minimum Application Requirements:

- Minimum peak demand of 500 kW (aggregation only with Administrator pre-approval)
- Facility must receive power over ComEd wires regardless of electrical supplier
- Facility operates under on of the following rate schedules: A75, A76, A77, B75, B78, B95, B98, H75, H76, H77, H78, R75, R76, R77, R78
- Customer commitment to spend up to \$10,000 on project implementation with estimated SPB  $\leq$  1.5 year
- Public buildings such as government, municipal, and public schools are not eligible for the Smart Ideas Retro-Commissioning program at this time. Refer to the Illinois Department of Commerce and Economic Opportunity program for information about additional program offerings

### Application Considerations

- Commercial facility at least 5 years old and have a conditioned area > 150,000 sq ft
- Existing and functional building or system energy management system with direct digital control
- A relatively high Energy Use Index (EUI) compared to the average EUI's of buildings of the same class and/or have a low ENERGY STAR rating from portfolio manager
- No major renovations pending
- No major system problems requiring large capital investments for repair or replacement
- Accessible and up-to-date building documentation and records
- Owner and O&M staff express a commitment to be actively involved in the retro-commissioning process

### Planning Phase

- Utility funded\*
- Initial site visit and collection of building documentation
- Development of Retro-Commissioning Plan

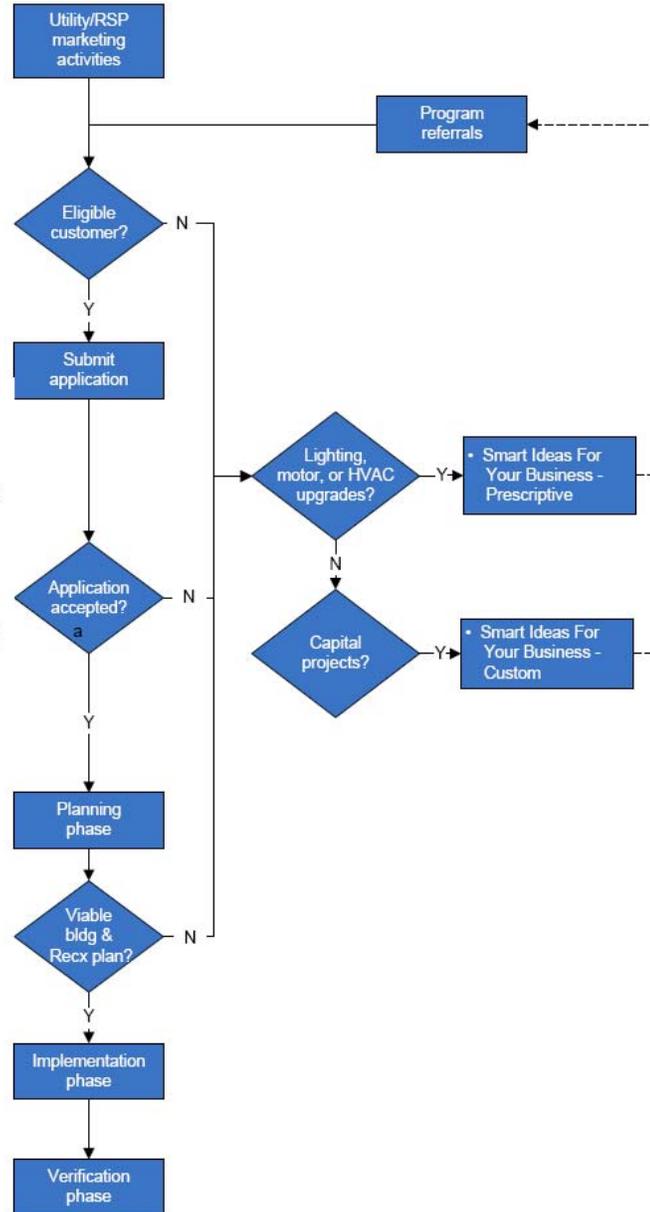
### Implementation Phase

- Detailed site assessment
- Design and implementation of diagnostic monitoring and test plans
- Customer works hand-in-hand with the RSP to implement identified and accepted Rxcx measures
- Customer is responsible for the implementation costs

### Verification Phase

- Utility funded\*
- Verification of measure installation
- Final analysis and/or measurement of project savings
- Development of Verification Report

\* Customer expected to fund normal and customary costs associated with completing program application, attending meetings, providing building documentation, etc.





ComEd's Smart Ideas for Your Business Retro-Commissioning program is available to qualifying customers within ComEd's Illinois service area. The goal of this program is to help you identify opportunities to improve the efficiency of major electrical systems and reduce energy costs without adversely affecting facility or system operations.

For complete information about program terms and conditions, please view the program manual and sample customer agreement which is available at **ComEd.com**. You can also contact the program administrator at **1-888-806-2273** or via e-mail, **ComEdSmartIdeas@KEMA.com**.

### **Pre Application Checklist**

Please confirm you meet the following minimum eligibility requirements before submitting an application to participate in the program:

- Are you a ComEd delivery services customer, regardless of which electric supplier you have chosen to purchase power from?
- Do you have a peak demand of 500 kW or greater?<sup>1</sup>
- Are you served under one or more of the following rate schedules; A75, A76, A77, B75, B78, B95, B98, H75, H76, H77, H78, R75, R76, R77, R78?<sup>1</sup>
- (*For Public Buildings only*) Public buildings such as government, municipal, and public schools are not eligible for the Smart Ideas Retro-Commissioning Program at this time. Please refer to the Illinois Department of Commerce and Economic Opportunity (DCEO) program for information about additional program offerings.

### **If selected for participation in the program, can you accept the following responsibilities?**

- Are you willing to commit to spending \$10,000 on the implementation of identified retro-commissioning measures with an estimated simple payback of 18 months or less based upon electrical savings?
- Provide access to the facility and time for facility personnel to interface with the retro-commissioning service provider during all phases of the project.
- Provide and assist with the reporting and collection of information pertaining to the operation of the facility during all phases of the project.
- Implement the mutually accepted retro-commissioning measures according to the scope and procedures outlined by ComEd no later than April 1<sup>st</sup> of the year following the start of your project under the program.

### **Next Steps**

If you answered yes to the above questions, please complete this application and submit it to ComEd for consideration. In reviewing your application, ComEd will look for evidence that cost-effective retro-commissioning opportunities exist at your facility. ComEd's decision regarding selection of program applicants and the retro-commissioning program will be final and binding for all parties.

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<sup>1</sup> Visit [www.comedpowerpath.com](http://www.comedpowerpath.com) for your peak demand and rate information. Please have your account number and meter number available.

## Customer acceptance of application terms

By signing below, I certify that:

- The information contained in this application is accurate and complete to the best of my knowledge, and will provide additional information if requested;
- I have read and understood the obligations of program participants, including the commitment of \$10,000 to implement identified retro-commissioning measures, and agree to a make a good faith effort to comply with all requirements if selected for participation in the program;
- ComEd may release historical account data to the program administrator for the facility under consideration.

(Signature of individual with authority to bind applicant to these terms required)

**Signature:** \_\_\_\_\_

**Name (printed):** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## Submit completed applications to:

ComEd Smart Ideas for Your Business  
44 E. Roosevelt Rd. #338  
Lombard, IL 60148  
Fax: (630) 396-9036  
E-mail: ComEdSmartIdeas@KEMA.com





## Facility general description

Outline the major facility space types, their scheduling, and typical occupant density (e.g. 10,000 ft<sup>2</sup>, 24-hour computer center that is unoccupied).

Describe the major interior loads of the facility and identify any that dictate how the HVAC system is operated. (add additional rows as necessary)

Space/Location	Type	# of Occupants	Scheduled Hours and Days of Occupancy

Briefly describe past energy efficiency projects or studies completed for the facility.

Describe any currently planned energy efficiency, renovation, or equipment replacement/upgrade projects for the facility.

Are there any scheduling issues that could affect the retro-commissioning work (e.g. major renovations or equipment replacements/upgrades)?

## Facility staff

**Please identify key individuals responsible for the operation of the facility and state how long they have held their current positions.**

Contact Name	Position	Years in this position	Facility Responsibilities

**Please indicate the level of access and capability the chief facility engineer, staff, and/or controls contractor have to interact with the facility’s energy management control system (select one):**

- None
- Some (e.g. able to adjust set points and schedules)
- Full (e.g. able to modify control logic and trend facility data)

**Indicate what training resources are available to the facility staff (check all that apply):**

- None
- In-house
- Manufacturer or vendor courses
- Utility courses
- College/vocational schools
- Professional associations
- Other: \_\_\_\_\_

**Describe the facility manager’s and staff’s receptiveness to and interest in improving the energy efficiency of the facility.**

**If accepted into the program, designate individuals that will act as a part of the owner’s project team and the amount of discretionary time to assist in the retro-commissioning process:**

<b>Position</b>	<b>Name</b>	<b>Amount of Time to Assist (per week)</b>
Building Chief Engineer:		
Operations Manager:		
Safety Manager:		
Internal Controls Specialist:		
External Controls Contractor:		
Others:		

**Identify the type and manufacturer of the facility’s energy management control system (EMS). If the facility does not have an automated control system, please indicate.**

**Is the EMS capable of trending and storing data for numerous points simultaneously?**

**When is the EMS likely to be replaced or receive a major upgrade?**

**What components of the facility are controlled with direct digital control (DDC) equipment?**

**What components of the facility are controlled, not just actuated, pneumatically?**

**Summarize any peak load shedding strategies currently being used.**

**Is the EMS managed internally or through an external controls contractor?**

**If managed externally, please provide the following:**

Company Name: \_\_\_\_\_

Name (of the company specialist): \_\_\_\_\_

Phone Number (of the company specialist): \_\_\_\_\_

Email Address (of the company specialist): \_\_\_\_\_

**Please complete the following table listing the facilities major HVAC and lighting system components. Add more rows as necessary.**

<b>Equipment</b>	<b>Type</b>	<b>Size</b>	<b>Age</b>
<b>Cooling equipment</b>			
Chiller 1 (example)	Centrifugal	300 tons	15 years
<b>Heat Rejection equipment</b>			
Cooling Tower 1 (example)	Open, cross flow, induced draft	350 tons	15 years
<b>Air handling equipment</b>			
AHU 1 (example)	VAV w/hot water reheat	25,000 CFM	5 years
<b>Lighting systems</b>			
Main office area (example)	32W T8s w/electronic ballasts	40% of occupied ft <sup>2</sup>	4 years

**Outline the current control strategies of the facility’s HVAC and lighting systems.**

Strategy	Description
<b>Cooling Equipment</b>	
What is the operating schedule of major cooling equipment?	
What is the chilled water supply temperature set point?	
What is the condenser water set point? Is it reset?	
Are there VFDs on the cooling tower fans?	
Describe the cooling equipment staging strategy	
Describe the use of any air-side or water-side economizers	
<b>Air Handling Equipment</b>	
Does the HVAC system have an automatic shutdown?	
Is an optimum start/stop strategy used?	
Is the air distribution system VAV or CV?	
Are the VAV boxes Fan Powered?	
For VAV systems, what is the supply static pressure set point?	
For VAV systems, is a supply static pressure reset strategy used? If yes, please indicate the strategy(ies) used.	
Are VAV terminal units DDC controlled through a global controller?	
Do the VAV terminal units’ DDC controllers have capability to be scheduled?	
Does the facility use a zone temperature setback/setup strategy?	
What is the supply air temperature set point during the summer?	
Is a supply air temperature reset strategy used? If yes, please indicate the strategy(ies) used. If there is not enough room on the application please attach information to the application.	
What type of reheat does the air distribution system have, if any?	
What is the heating energy source (e.g. gas, electric)?	
How is outdoor air intake controlled?	
What is the minimum outside air fraction setting?	
Is the system equipped with zone isolation devices for minimizing energy use in off-peak hours?	
Is there exhaust air heat recovery?	
<b>Lighting systems</b>	
Describe the lighting system controls and current scheduling	

**What type of glazing is installed at the facility (e.g. single-pane tinted)?**

**Describe the age and availability of any as-built drawings and sequences of operation for the facility's HVAC system?**

**Summarize problems or opportunities for improvement that currently exist related to the HVAC and lighting systems.**

**Describe any opportunities for improved operation and maintenance procedures at the facility.**

**What is currently the most prominent issue related to operation of the HVAC and lighting systems, and how is it being managed?**

**What is the primary source of occupant complaints within the facility?**

## Facility compressed air, processing, and refrigeration system information

**Complete this section only if your facility has compressed air systems, process equipment and/or refrigeration systems. Examples of these systems include, but are not limited to:**

- Compressed Air Systems – Air compressor(s) and refrigerated air dryers that serve a manufacturing or process related activities.
- Process Equipment – Equipment such as conveyor lines, manufacturing equipment or equipment that; run continuously or for significant periods of time, have motors, and/or have specific heating/cooling requirements.
- Refrigeration Systems – Refrigeration equipment that is used to satisfy supply cooling requirements for food storage, manufacturing, or process equipment.

**What are your primary objectives in managing your systems (check all that apply)?**

Compressed Air	Process	Refrigeration	Objective
			Maintain continuous operation
			Improved or increased production
			Control and/or reduce energy use and costs
			Reduce capital costs
			Meet process quality standards
			Improve safety
			Reduce equipment maintenance
			Other:

**What management approaches and tools do you currently employ (check all that apply)?**

Compressed Air	Process	Refrigeration	Resources
			Preventative diagnostic testing
			Short term monitoring
			Long term monitoring
			Leak detection and repair
			Tracking energy use/costs
			Improving control strategies
			Using life-cycle costing to select opportunities
			Other:

**What are the top two barriers to more effective operation of your facility's systems?**

Compressed Air	Process	Refrigeration	Barriers
			Not enough staff time
			Lack of budget for efficiency improvements
			Capital expenses are too high
			Paybacks are too long
			Primary focus is on production
			Lack of accountability for system energy costs
			Lack of information about opportunities
			Lack of in-house technical expertise
			Lack of training
			Management approval
			Other:

**What influences you the most in terms of adopting new management tools or approaches (rank on a 1 to 10 scale, where 10 is high)?**

Compressed Air	Process	Refrigeration	Influences
			Books
			Industry articles and professional publications
			Peers/Professional organizations
			Classes/continuing education
			Demonstrated success of others in the market
			Internal pilot program success
			Outside consultants
			Equipment vendors and manufacturer reps
			Other:

## Compressed air systems

Complete this section only if applicable for the facility being submitted for consideration in the retro-commissioning program

**Please list all air compressors that are currently located at your facility (add more rows as necessary).**

<b>Air Compressors</b>					
<b>Equipment ID/Manufacturer</b>	<b>HP</b>	<b>Compressor Type</b> <small>(E.g. Scroll, Screw, Reciprocating, Centrifugal)</small>	<b>Capacity Control Mode</b> <small>(E.g. Load/Unload, VFD, Inlet Modulation, Blow-off)</small>	<b>Age (years)</b>	<b>Annual Operating Hours</b>
CNP 75588-750 (example)	150	Screw	Load/Unload	15	4,000
<b>Dryers</b>					
<b>Equipment ID/Manufacturer</b>	<b>Type</b>	<b>Status (Op/standby)</b>	<b>Age (years)</b>		
Dryer #1 (example)	Refrigerated	Operational	15 years		
<b>Storage</b>					
<b>Equipment ID/Manufacturer</b>	<b>Size (Gallons)</b>	<b>Status (Op/standby)</b>	<b>Age (years)</b>		
Receiver A (example)	600	Operational	15 years		

**Describe the compressed air system operating schedule at the facility.**

**What is the system pressure? Do you have trouble maintaining this pressure?**

**Describe the staging of the air compressors (e.g. manual, automatic, always on, etc.).**

Is there a management system or manual procedure in place to shut compressors OFF sometimes? If so, do you think the system is properly tuned?

Are you willing to change your control strategy or usage of compressed air if recommended in the retro-commissioning study?

## Processing equipment

Complete this section only if applicable for the facility being submitted for consideration in the retro-commissioning program:

Please list all major processing equipment currently located at your facility (add more rows as necessary).

Equipment Description/ID	HP or kW	Average loading (% full capacity)	Status (Op/standby)	Age
300 ton Servo Press – SP1 (example)	180 HP	50%	Operational	6 years

Describe the process equipment schedule at your facility.

What percentage of the facility electric use is attributable to operation of processing equipment?

Are there any current operational issues with your equipment?

## Refrigeration

Complete this section only if applicable for the facility being submitted for consideration in the retro-commissioning program

Please list all major refrigeration equipment that is currently located at your facility (add more rows as necessary).

Unit description/ID	Absorption unit	Tons	Average loading (% full capacity)	Status (Op/standby)	Age
Walk in cooler – RS60A	No	60	60-80%	Operational	8 years

Unit description/ID	Absorption unit	Tons	Average loading (% full capacity)	Status (Op/standby)	Age

**Describe the loads served by equipment identified above.**

**Describe the temperature and pressure set points for the identified refrigeration equipment.**

**Outline the sequencing of refrigeration equipment at the facility.**

**Is floating head pressure control utilized?**

**Describe defrost schedules/controls for refrigeration equipment at the facility.**

**What type of capacity control does the refrigeration equipment have (e.g. hot gas bypass, VFDs, etc.)?**

**What percentage of the facility electric use is attributable to operation of the refrigeration equipment?**

**Is there an energy recovery system in place to capture waste heat?**