

# Data Center Efficiency

## STUDY PREAPPROVAL APPLICATION

**INTERNAL USE ONLY**

Project No. \_\_\_\_\_

Date submitted \_\_\_\_\_

**Business Customer Information**

Xcel Energy Customer Name \_\_\_\_\_

Company name (IF TENANT OR IF DIFFERENT THAN CUSTOMER NAME) \_\_\_\_\_

Billing address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Building address (if different) \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Contact person (PRINT) \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-mail\* \_\_\_\_\_

\* By providing your e-mail address, you are granting Xcel Energy permission to send further e-mails regarding our programs and services.

Xcel Energy premise number:

Elec \_\_\_\_\_ Natural gas \_\_\_\_\_

Customer is an Xcel Energy ☐ Electric customer ☐ Gas customer**Study Provider Information**

Study provider performing study \_\_\_\_\_

Firm address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ ZIP \_\_\_\_\_

Principal Investigator performing study \_\_\_\_\_

If not on Data Center Efficiency provider list, complete "provider qualification form" and attach

Qualifications \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_ E-mail\* \_\_\_\_\_

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**Xcel Energy Funding**

Xcel Energy will provide a study rebate for studies to help customers identify and implement energy-saving data center opportunities. In order to receive a rebate, the study must be preapproved and a study rebate form must be submitted no later than three (3) months after study completion. To obtain Xcel Energy rebate approval for a study, a customer and the selected provider should complete this form and attach a proposal addressed to the customer. (Please refer to "Proposal Requirements" section.)

**Note: The Xcel Energy Funding Authorization section of the application must be signed prior to initiation of a Study to qualify for Xcel Energy study rebate. The Study is limited to the evaluation of potential energy of data center impact project(s). If other strategies are included, cost breakout is required.**

**INTERNAL use only – do not write in this section****Must be completed by the account rep when submitting for preapproval:**

This project has: JEOP dated \_\_\_\_\_ Study dated \_\_\_\_\_ Conditional dated \_\_\_\_\_ Rejection dated \_\_\_\_\_

MOU dated \_\_\_\_\_ Earliest invoice dated \_\_\_\_\_ ☐ None of theseCustomer's electric rate code: ☐ Primary ☐ Secondary ☐ Transmission ☐ Transmission Transformed**To be completed by engineering:**

Model year \_\_\_\_\_ Payback limit \_\_\_\_\_ Incremental cap \_\_\_\_\_

Rebate levels \_\_\_\_\_ /kW \_\_\_\_\_ /Dth

### Proposal Requirements

The proposal should provide a description of energy impact measures that will be investigated. Please attach a building description and a proposal with costs to customer that addresses the following items:

- Describe the basic data center layout.
- What are the customer's concerns, issues or problems that you found in your walk-through?
- What are the preliminary recommendations to be proposed in this study based on your initial walkthrough?

### Customer's Declarations

The information in this application is accurate and complete. I have read, understood and agree to the "Terms and Responsibilities" section of this application.

I, (Customer/Tenant name) \_\_\_\_\_, agree to pay the full cost of the Study, after Xcel Energy has approved the final report, and am fully responsible for supervising and directing a study provider in the performance of the Study. We understand that if Xcel Energy does not approve the final report submitted by a study provider, that Xcel Energy will not provide the customer a study rebate.

Customer Signature\* \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

Tenant Signature\* \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

\* I give permission for Xcel Energy, and other utility companies that serve my facility, to release billing history for affected business facilities to the firm conducting the Data Center Efficiency study, solely for the purpose of completing the study.

### Study Provider Declaration

(Study Provider's name) \_\_\_\_\_ will produce a study according to the Study Workscope section of the application or as revised according to the attached amendments and has read, understood, and agreed to the "Terms and Responsibilities" section of this application. We also do not expect customer payment for the study until Xcel Energy has approved the final report submitted by us. The cost for performing the Study is \$ \_\_\_\_\_

|  |                    |               |
|--|--------------------|---------------|
| <b>Data Center Info</b>                                  | Square Ft _____    | Peak kW _____ |
| Anticipated energy savings to be identified in the study | % of peak kW _____ | kWh _____     |

Signature \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

Name (PRINT) \_\_\_\_\_ Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-Mail\* \_\_\_\_\_

\*By providing your e-mail address, you are granting Xcel Energy permission to send further e-mails regarding our programs and services.

Estimated study completion date: \_\_\_\_\_

### Xcel Energy Study Rebate Application

Xcel Energy agrees to fund this project up to \$ \_\_\_\_\_. The customer is responsible for paying the balance of the Study cost.

Authorized by (product portfolio manager) \_\_\_\_\_ Date \_\_\_\_\_

Authorized by (technical consultant) \_\_\_\_\_ Date \_\_\_\_\_

#### INTERNAL use only – do not write in this section

Account Managers, please attach 12 months building usage history and complete the following:

Xcel Energy Account Manager (PRINT) \_\_\_\_\_ Phone \_\_\_\_\_

Xcel Energy Account Manager (signature) \_\_\_\_\_ Date \_\_\_\_\_

Peak kW \_\_\_\_\_ Annual kWh \_\_\_\_\_ MCF \_\_\_\_\_

For CO customers only: Is customer on gas transport? ☐ Yes ☐ No

### Upon Study Completion

Once the Study is complete, please send the study draft, energy savings, calculation detail and the ECO Form (template to be supplied by Xcel Energy upon study preapproval) to: Xcel Energy, Energy Efficiency Engineer noted in preapproval letter. Upon Xcel Energy approval of the Study, the study provider should send a final copy of the Study to the customer, along with the invoice, and to the Xcel Energy account manager. The Study should not be presented to the customer until Xcel Energy conditionally approved the content. To receive the study rebate, the customer should submit the Study rebate form, within 3 months of the report presentation, to Xcel Energy along with a copy of their paid invoice.

### Terms and Responsibilities

1. Study rebates available to Xcel Energy business customers in Minnesota and Colorado. Colorado gas transport customers do not qualify for gas rebate.
2. Individuals with demonstrable experience, appropriate to the type of Study being performed must be responsible for conducting the Study. Xcel Energy, at its discretion, may approve a non-P.E. to perform a study after reviewing their qualifications.
3. The study provider performing this Study must do so with impartiality towards equipment suppliers, distributors, and all equipment or product brand names.
4. The Study must be performed according to the Study Workscope Section of this application.
5. Xcel Energy makes no warranties regarding the Study. All such warranties are between the study provider and the Customer. Rebate qualifications do not imply any representation or warranty of the Study by Xcel Energy.
6. Xcel Energy's decision relating to customer eligibility for the Study or other issues will be final and binding for all parties.
7. The Customer shall be responsible for directing the work of the consultant or the contractor; at no time shall the consultant or contractor be considered an agent, employee, or a contractor of Xcel Energy.
8. The Xcel Energy Funding Authorization section of this application must be signed prior to initiation of the Study.
9. The Study must be completed within three (3) months of the Xcel Energy Funding Authorization Date.
10. Xcel Energy reserves the right to perform pre- and post-installation energy testing and data collection.
11. Xcel Energy reserves the right to accept or reject any application, Study, or portion thereof.

### Study Workscope: Business Case Justification

Requirements: The purpose of the Study is to provide a customer with the necessary business case justification to implement the energy-saving opportunities. All studies should include the information listed in the business case justification and the program requirements section.

#### A. Executive summary

Report will include a recommended project bundle briefly describing the purpose of the Study, existing conditions, and options considered.

#### B. Introduction

In addition, the report will contain an introduction section consisting of customer information, description of facility, and an Xcel Energy (Company) disclaimer.

#### C. Study summary

The study provider will summarize rebate forms (i.e. material and/or format provided by Company) of capital costs, incentives, energy reduction/increase in kW and/or kWh, and reduction/increase in natural gas Dth, reduction/increase in district cooling energy use, reduction/increase in other fuels/utilities and the life of the energy saving measure.

#### D. Project description

The following will be provided for each energy conservation opportunity (ECO):

- A description of the existing equipment and/or system, or the proposed new "standard" equipment or system
- A description of the proposed energy efficient alternative equipment and/or system(s)
- The estimated annual energy use of the existing or "standard" equipment/system and of the energy efficient equipment/system

#### E. Energy estimate

The estimated annual energy use calculations for the existing or "standard" equipment/systems and the energy efficient equipment/systems shall include the following:

- A calculated estimate of annual electric energy use in kWh, monthly maximum demand in kW and/or natural gas Dth. This calculation will include an indication of when, during the day and year, the demand and energy consumption will occur.
- Indication of how estimate data was derived (e.g., theoretical calculations, field measurements, manufacturer's data, etc.)
- An estimate of the ECO project cost, simple payback, and measure life.
- Calculation of weather-influenced variables must use, at a minimum, the temperature bin method.
- Document all calculations on an Excel spreadsheet and submit as part of the study.
- We recommend using Xcel Energy tools whenever possible (virtualization, humidification, and air flow management).

#### F. Measurement of energy and computing work

Detailed pre-monitoring and verification of existing IT and facilities systems energy use may be required before implementing any data center improvements.

Study providers should submit recommended M&V within the study. The plan should describe how to measure and verify the energy savings for each energy conservation opportunity analyzed in the study.

#### G. Non-energy project impacts

- Quantifiable non energy related costs and benefits must be included in the simple payback calculations, including initial costs or benefits and ongoing costs or benefits
- The Study also will provide an indication of project impacts that may be difficult to quantify, such as safety and environmental considerations and product quality.

#### H. Project costs/vendor quotations

Estimates and/or vendor quotations for the ECO costs must be included. The ECO cost estimates must include a breakdown of the equipment and material costs, software costs, internal labor costs, external contractor labor costs, and additional engineering costs within the text of the study.

#### I. Financial analysis

The Study must include a financial analysis according to criteria established by the customer (i.e. simple payback, return on investment, net present value).

Xcel Energy's ECO form, to be filled out with all studies, will calculate simple paybacks and applicable data center rebates. The study provider is responsible for calculating prescriptive rebate estimates.

The financial analysis must consider all energy and non-energy project costs and benefits including applicable Company prescriptive rebate amounts.

Energy cost savings calculations must be based on the customer's actual rate structure. Contact the customer's Xcel Energy account manager to obtain the rates used to calculate the energy cost savings.

If applicable, assess cost savings from improved building power factor, ratchet charges and Company's Saver's Switch program and Electric Rate Savings program, including Time of Day and Peak-Controlled Tiers I and II.

### J. Implementation

The Study is intended to provide Business Case justification and sufficient information to proceed with implementation.

### Study Workscope: Program Requirements

Data Center Efficiency studies may examine the IT systems, facility systems or both as defined in customer proposal and detailed below.

#### 1) IT Systems:

- Include a description of the existing data center IT equipment, applications, architecture, total square footage and square footage available for growth. Provide a simple drawing of the data center space showing rack layouts, CRAC/CRAH unit locations, etc.
- An estimate of the current IT energy use through spot measurement or customer data if available
- Projected growth including IT workload, power requirements, space requirements, and growth timetable
- Opportunities for improved IT system efficiency, such as virtualization, more efficient power supplies or cooling fans, server placement in racks.

#### 2) Facilities systems load reductions including cooling, humidification, airside or waterside economizer, airflow management, lighting, UPS and PDU efficiency, battery efficiency, etc.

- Provide a detailed description of the existing systems including layout, sizes, efficiencies, and current set points such as air temperature, chilled water temperature, cooling tower temperature, fan airflow, humidification, dehumidification, free cooling outdoor air temperature.
- Hot aisle / cold aisle rack configuration, improved cable management, or other items impacting air flow management.
- Current system deficiencies and recommended improvements.
- Energy conservation opportunities.
- If appropriate, a formal computational fluid dynamics (CFD)-based analysis of the computer space.

### Study Approval: Project Preapproval Process

#### 1) Study Preapproval

- Study Provider submits customer proposal with pricing and completed and signed preapproval application
- Xcel Energy reviews, assigns funding, sends preapproval notification

#### 2) Study

- Provider conducts study and submits to Xcel Energy
- Xcel Energy will review the content, calculations, and monitoring and verification plans included in study, and may request changes prior to approval of the study or the M&V recommendations.
- The Xcel Energy account manager and energy efficiency engineer, study provider, and customer may meet to discuss planned bundles and monitoring and verification requirements
- Xcel Energy analyzes the bundle of measures the customer plans to implement.
- Xcel Energy notifies customer and provider of study approval and project preapproval.
- Customer submits study invoice and study rebate application; Xcel Energy processes study rebate.

#### 3) Pre-monitoring

- Pre-monitoring is performed by an Xcel Energy contractor
- If pre-monitored data does not support the preapproved project analysis, rebate amounts may be reanalyzed accordingly.
- The customer begins implementing energy efficiency measures

#### 4) Implementation stage

- The customer implements approved bundled projects
- When the project is complete the customer signs off on bundle list and provides documentation

#### 5) Post metering, rebate

- Pre and post metered data are used to determine the actual energy savings of the implemented measures
- If the actual energy savings are within 10% of the preapproval estimate, the preapproved rebate is processed
- If the actual energy savings are +/-10% of the preapproval estimate, the rebate is recalculated based on the actual energy savings and the new rebate is processed

### Rebates

Additional rebates for implementing identified conservation measures will be determined by Xcel Energy upon completion of the study. The rebate amounts are based on Xcel Energy prescriptive and Custom Efficiency rebate programs. Rebates cannot be offered for projects implemented or invoiced prior to study approval.