



# FEASIBILITY STUDY GUIDE

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FOR ELECTRIC AND  
NATURAL GAS ENERGY  
EFFICIENCY PROJECTS

DESIGN WITH ENERGY EFFICIENCY IN MIND.

 EFFICIENCY  
MANITOBA

# Feasibility Study Guide for Electric and Natural Gas Energy Efficiency Projects

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## I. Introduction

This guide has been written to assist you with the preparation of the Feasibility Study Proposal and the Feasibility Study Report.

The purpose of the **Feasibility Study Proposal** is to define the scope and cost of the study.

The purpose of the **Feasibility Study Report** is to present the results of the study in a common format and to quantify the benefits and costs that would be used in the completion and submission of a Custom Energy Solutions Program Application, where additional financial incentives may be available.

To be eligible for a Feasibility Study Incentive, the study proposal along with a **Feasibility Study Application form** must be approved by Efficiency Manitoba prior to initiating the actual study.

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## II. General Requirements

### Grammar and Style

The proposal and report should be grammatically correct. The language should be clear, concise and understandable by all readers.

### Documentation

- Electric savings shall be quoted in kW (demand) and kWh (energy). Natural gas savings shall be quoted in cubic meters (m<sup>3</sup>) (energy). Note that BTU or other thermal units can be used throughout the report, but final savings shall be converted to m<sup>3</sup>.
- All numbers related to the energy savings results must be supported by engineering calculations, equipment performance data sheets, etc. indicating how they were derived and all relevant assumptions should be clearly stated. This applies to equipment and installation costs as well as payback calculations.
- When quoting equipment capacities, clearly indicate whether input or output.
- Engineering calculations, equipment performance data sheets, cost estimate quotations, etc. must be included in an appendix.

### Mathematical Accuracy and Consistency

All calculations should be checked for mathematical accuracy and values should be consistent when repeated more than once.

### Illustrations

Tables, charts and other diagrams should be properly labeled. Duplication of similar information in varying forms is not generally necessary.



### III. Definitions - Base Case / Energy Efficient Case

For all projects, there will always be a lower cost, less efficient option and a higher cost, more efficient option.

The **Base Case** is defined as the lower cost, less efficient option.

The **Energy Efficient Case** is defined as the higher cost, more efficient option.

For **existing facilities**, lost opportunity projects and resource acquisition projects must be defined.

- *Lost opportunity projects* are defined as those where the original equipment has failed or is at end-of-life and must be either repaired or replaced. The Base Case would be either repair or replacement with similar equipment and the Energy Efficient Case would be the more efficient piece of equipment. If there are numerous more efficient options, the Base Case could be any one of these options and the Energy Efficient Case would be any other higher cost, more efficient option. The Base Case must meet the current minimum energy efficiency standard.

- *Resource acquisition projects* are defined as those where the original equipment has remaining equipment life and could remain in operation and there is at least one more efficient option available. For these types of projects, the Base Case could be either to do nothing or it could be one of the more efficient options. The Energy Efficient Case would be any other higher cost, more efficient option.

For **new facilities**, the Base Case would be defined as the lower cost, less efficient system that would normally be installed in the absence of a financial incentive program. The Energy Efficient Case would be defined as any higher cost, more efficient option.

If in doubt as to what the Base Case and Energy Efficient Case options should be for a particular project, contact Efficiency Manitoba Program personnel for assistance.

### IV. Energy Conversion Factors

Electricity	Natural Gas	Other
1 HP = 0.746 kW	1 m <sup>3</sup> = 35,310 BTU*	1 m <sup>3</sup> = 35.31 ft <sup>3</sup>
1 kW = 3,412 BTU / hr	1 therm = 100,000 BTU	
1 GJ = 278 kWh	1 CCF = 100,000 BTU	
	1 MCF = 1,000,000 BTU	
	1 GJ = 948,210 BTU	
	1 MMBTU = 1,000,000 BTU	

\* based on 1,000 BTU per ft<sup>3</sup>



## V. Feasibility Study Proposal Outline

The Feasibility Study Proposal should include all of the following sections and should normally be up to two to three pages in length. The recommended proposal format is as stated below with a sample Feasibility Study Proposal titled Example 1 included at the end of this document.

### Title Page

- Feasibility Study Proposal Title
- Client name and facility location
- Consultant name
- Date

### 1.0 Project Description

#### 1.1 Application/Process Description

Describe the application or process to be studied including equipment type, size and condition/age. Provide a basic single line process schematic showing major pieces of equipment.

#### 1.2 Current Operating Situation

Describe how the current system, called the Base Case, is operating including hours of operation, loading conditions and control schemes. This will establish the duty cycle for the Base Case system. Electric or natural gas usage for the Base Case will be compared to the electric or natural gas usage for the Energy Efficient Case to establish the potential energy savings.

#### 1.3 Potential for Energy Savings

Identify the efficiency measures for the Energy Efficient Case that will be assessed and describe how energy savings will be achieved for each measure. Consider all portions of the system including end uses, distribution network, supply equipment and controls for optimization. For each measure, provide an estimate of possible electrical demand and annual electric or natural gas energy savings in terms of Base Case energy usage.

#### 1.4 Other Project Benefits

Identify other quantifiable project non-energy benefits such as reductions in water or sewer charges, solid waste or air emissions as well as reduced maintenance, increased reliability, increased productivity, less raw material, etc. that might be realized as a result of system optimization.

#### 1.5 Scope of Work

Identify the study tasks and describe the work to be done in each task. Include a basic schedule for completion of the study tasks.

*Note: It is expected that some pre-feasibility evaluation has been completed to indicate the potential cost savings associated with the efficiency measures are attractive enough to justify the cost of performing this feasibility study.*

### 2.0 Study Team

Identify the proposed engineering consultant, technical specialist or other personnel who will be involved in the study.

### 3.0 Study Cost

Provide the total estimated cost for the study including labour, disbursements and PST.



## VI. Feasibility Study Report Outline

The Feasibility Study Report should include all of the sections identified below. Sample Feasibility Study Reports are included at the end of this document. Example 2 illustrates a study for electric savings and Example 3 illustrates a study for natural gas savings.

### Title Page

- Feasibility Study Report Title
- Client name and facility location
- Consultant name
- Date

### 1.0 Project Description

- Describe the manufacturing operation or process in general terms.
- Identify if the project is for a production capacity change or a retrofit to maintain the same production capacity.
- Describe the Base Case and Energy Efficient Case options that have been evaluated.
- Confirm the expected equipment life (should be 10 years or greater).
- Include a basic single line process schematic showing the Base Case and Energy Efficient Case options.

### 2.0 Project Assessment

#### 2.1 Energy Savings Estimate

- State the electric or natural gas usage for both the Base Case and Energy Efficient Case. Calculate the savings for kW demand reduction, kWh and/or m<sup>3</sup> annual energy reduction. Clarify if savings occur in winter months (Nov - Apr) and/or summer months (May - Oct). Present the energy savings, along with the corresponding cost savings, in tabular form as shown in Examples 2 and 3. Explain how the energy savings estimates were determined (e.g. engineering calculations, manufacturer's equipment performance datasheets, etc.) and include all calculations and energy rates used to calculate cost savings in an Appendix.

#### 2.2 Other Project Benefits

- For quantifiable project non-energy benefits, provide a description of how the other project benefits were determined (e.g. maintenance records, calculations, manufacturer's data, etc.). Include applicable taxes such as Provincial Utility Tax, Municipal Tax, and Federal Carbon Charge as appropriate.

#### 2.3 Project Costs

- Provide breakdown of project costs, in tabular form as shown in Examples 2 and 3, for both the Energy Efficient and Base Cases in terms of equipment, installation and engineering cost components. The Incremental Project Cost is the difference between the Energy Efficient Case Cost and the Base Case Cost.
- State equipment sizes, model numbers, quantities and associated costs of each item.
- Include copies of written quotes from suppliers and/or contractors to justify equipment, installation and engineering project costs.
- Note that contingency, GST, spare parts, and warranty maintenance plans are not eligible costs. PST is eligible for equipment that is not tax exempt.



## 2.4 Simple Payback and Incentive Calculation

- Simple payback is determined using the incremental project costs and electric or natural gas benefits and other process benefit savings that have been previously calculated.
- An Incentive Calculation Worksheet will be used to calculate the project payback and any potential incentive amounts that may be eligible under Efficiency Manitoba's Custom Energy Solutions Program. A copy of the worksheet is available from Efficiency Manitoba upon request.
- The eligible incentive amount is related to the estimated amount of electric or natural gas savings, the total project benefits and the incremental cost of the project. The amount of the incentive is determined as the lesser of three values: a performance based amount based on electric or natural gas savings, a value of 50% of incremental project cost, or a value that is the amount required to reduce the project simple payback to 1.0 year.
- Projects with a simple payback of less than 1.0 years are not eligible for incentives under the Custom Energy Solutions Program.

## 2.5 Recommendations and Summary

- Indicate the option recommended for implementation and the reason for its selection.

## 3.0 Measurement and Verification of Savings

- The Custom Energy Solutions Program follows the principles described in the International Performance Measurement and Verification Protocol (IPMVP/EVO). It is the responsibility of the project proponent to develop an appropriate measurement and verification plan and it is to be included in the Feasibility Study Report. The applicant and Efficiency Manitoba must agree in advance how the energy savings will be measured and verified.
- Briefly describe how and when the energy savings verification will be accomplished.
- Describe test instrumentation, measurement points, and duration of testing for the purpose of savings verification.

## 4.0 Implementation Schedule

- Provide an implementation schedule showing major project milestones and expected start and completion dates. Note that projects must be completed within one year of the Custom Energy Solutions incentive approval unless agreed otherwise.

## Appendix A

Incentive Calculation Worksheet

## Appendix B

Engineering calculations for energy savings, single line schematics, manufacturer equipment performance data sheets, cost quotations, and other information as necessary to support the Feasibility Study Report (Note: must be provided as an appendix, but are not included in the examples in this guide).

## VII. Example 1 - Feasibility Study Proposal Sample



ABC Manufacturing, Winnipeg, Manitoba  
Consultant Name  
November 2020

### PROCESS WATER SYSTEM FEASIBILITY STUDY

#### 1.0 Project Description

##### 1.1 Application/Process Description

The existing process water system consists of two 300 USGPM centrifugal pumps each equipped with 50 HP motors operating on a duty/standby basis, a control valve and distribution piping to several areas of the plant. The existing pumps and motors are over 20 years old and the system has been expanded several times since its original installation. Process water is drawn from an onsite storage reservoir. A single line process schematic is shown in Figure XX.

##### 1.2 Current Operating Situation

The system operates for roughly 4,000 hours per year (two shift basis, five days per week). The pumps are manually started at the beginning of each day and run continuously, recirculating water back to the reservoir when there is no plant demand.

##### 1.3 Potential for Energy Savings

The installation of a variable frequency drive is expected to result in both electric demand and energy savings in excess of 20% of current values. Primary focus of this study will be on confirming actual plant process water flows and estimating potential electric demand and energy savings.

##### 1.4 Other Project Benefits

There will be some reduced maintenance costs resulting from upgrading the pumps however actual cost savings are expected to be minor.

##### 1.5 Scope of Work

The main work activities will include:

- initial site visit to ABC Manufacturing
- gather site and equipment related data, i.e. pump curves, water consumption records, etc.
- analysis of options for energy savings
- preparation of Feasibility Study Report and submission within four weeks of receiving approval to proceed.

#### 2.0 Study Team

The Feasibility Study will be completed by Mr. Joe Consultant, P.Eng., a Senior Mechanical Engineer with 20 years of experience in pumping systems. Other staff, including technical and clerical personnel, will assist Mr. Consultant in carrying out the work.

#### 3.0 Study Cost

Total costs for the work are estimated to be \$5,000 including disbursements and PST.



## VIII. Example 2 - Feasibility Study Report for Electric Savings Sample

Note that the energy savings and project costs used in the example below are for illustrative purposes only.



XYZ Manufacturing – Winnipeg, Manitoba  
Consultant Name  
December 2020

### EXHAUST FAN REPLACEMENT STUDY

#### 1.0 Project Description

XYZ Manufacturing operates a wood furniture manufacturing facility in Winnipeg, Manitoba. They are a General Service Large (750 V to 30 kV) electric customer with Manitoba Hydro with demand costs of \$9.39 per kVA and energy costs of \$0.04065 per kWh.

The plant presently has a large dust collection system consisting of ten major exhaust fans and two dust collectors with total airflows in excess of 200,000 cfm and connected horsepower of approximately 750 HP. Wood dust is collected from the various manufacturing processes within the plant and conveyed to the dust collectors where it is transferred to the cyclone and eventually into silo storage for disposal. A single line process schematic is shown in Figure 1 in Appendix B.

At this time, XYZ Manufacturing is planning to replace an existing exhaust fan that serves work cell #5 and discharges to dust collector #1. The existing fan, rated at 8,500 cfm and equipped with a 40 HP motor, is roughly 20 years old. The new fan will have a rated capacity of 15,000 cfm and be equipped with a 50 HP motor. The new fan will be connected to the existing control system that operates the plant wide dust collection system.

When new exhaust fans are purchased, XYZ Manufacturing uses fan operating costs as one of their evaluation criteria for selecting new exhaust fans. Where possible, they evaluate fan operating efficiencies as part of the evaluation process. In this case, they have considered the purchase of two different fans, one with an efficiency of 72% and the other with an efficiency of 62%. It is XYZ Manufacturing's intention to purchase the more efficient fan, and they are now applying for a project incentive to help offset the higher cost for the more efficient unit. Equipment data sheets for the two fans are included in Appendix B.

#### 2.0 Project Assessment

##### 2.1 Electric Savings Estimate

It is estimated that the exhaust fan replacement will result in demand savings of 5.6 kW and annual energy savings of 33,600 kWh, on the basis of operating 6,000 hours per year. The estimated annual electrical cost savings are \$2,030 as shown in the Incentive Calculation Worksheet in Appendix A.

The electrical savings were calculated as the difference between the fan power requirements at the specified operating conditions of 15,000 cfm and 13" W.G. As per the manufacturer's specifications, included in Appendix B, the horsepower requirements are 42.6 bhp and 49.3 bhp for the two different fans. The motor efficiency is assumed to be 90%.

	Demand [kW]	Energy [kWh]
Base Case Usage	40.9	245,400
EE Case Usage	35.3	211,800
EE Case Savings	5.6	33,600

## VIII. Example 2 - Continued

### 2.2 Other Project Benefits

The new fan has been selected to provide additional exhaust capacity to support increased production requirements. Selecting a new fan that will operate very close to its best efficiency point on its operating curve will increase reliability and therefore reduce maintenance costs. An allowance of \$400 per year based on ten hours of labour at \$40 per hour has been provided for reduced maintenance costs. Other benefits also include \$130 for 1.4% Provincial Utility Tax (PUT) and 5% City of Winnipeg Tax on the estimated annual \$2,030 energy benefits.

### 2.3 Project Costs

The incremental project cost before tax is estimated to be \$21,000 and is based on costs provided by XYZ Manufacturing as follows:

	EE Case	Base Case	Incremental Project Cost
Equipment	37,000	20,000	17,000
Installation	10,000	10,000	0
Engineering	5,000	1,000	4,000
TOTALS*	\$52,000	\$31,000	\$21,000

\*The total cost including 7% PST is \$33,170 for the Base Case and \$55,640 for the Energy Efficient Case.

Copies of equipment cost estimates and other costs are provided in Appendix B.

### 2.4 Simple Payback and Incentive Calculation

Simple payback and incentive calculations based on the above estimates are shown on the Incentive Calculation Worksheet included in Appendix A. Payback calculates to 6.8 years with an incentive of \$5,040 from the Efficiency Manitoba Custom Energy Solutions Program.

### 2.5 Recommendations and Summary

It is recommended that XYZ Manufacturing proceed with the purchase and installation of the more efficient fan.

### 3.0 Measurement and Verification of Savings

Savings will be verified by using data loggers that will be installed for a period of seven days after the new fan is installed to capture electrical demand and energy usage and run-time hours. This will be compared to the estimated Base Case fan demand and energy usage to establish verified savings.

### 4.0 Implementation Schedule

Installation is scheduled for summer of 2021.

#### Appendix A

Incentive Calculation Worksheet

#### Appendix B

Equipment performance data sheets, cost quotations, single line process schematics and other report supporting information would be provided in an appendix. This reference is for illustrative purposes only.

## Appendix A (Example 2)

Incentive Calculation Sheet for Electricity and Natural Gas Projects						
PROJECT: <i>Example 2: Exhaust Fan Replacement Study - Electricity Savings for XYZ Manufacturing</i>						
<b>Energy Savings Summary</b>						
<b>Energy Rate:</b>		<b>Program:</b>	<b>Winter</b>	<b>Summer</b>	<b>Total</b>	<b>Customer</b>
Electricity			(Nov - Apr)	(May - Oct)		
\$9,390	per kVA	Demand kW	5,6	5,6	N/A	5.6 W
95.0%	power factor					5.6 S
\$0.04065	per kWh	Annual Energy kWh	16,800	16,800	<b>33,600</b>	
Natural Gas						
\$0.18760	per m3	Annual Energy m3	0	0	<b>0</b>	
<b>Project Cost &amp; Benefits Summary</b>						
			<b>Electricity</b>	<b>Natural Gas</b>	<b>Total</b>	
Total Installed Project Cost - High Efficiency Case			\$55,640	\$0	\$55,640	
Total Installed Project Cost - Base Efficiency Case			\$33,170	\$0	\$33,170	
Total Installed Project Cost - Incremental			\$22,470	\$0	<b>\$22,470</b>	
Annual Energy Benefits			\$2,030	\$0	\$2,030	
Annual Non-Energy Benefits			\$530	\$0	\$530	
Annual Total Benefits			\$2,560	\$0	<b>\$2,560</b>	
<b>Incentive Calculation Summary</b>						
			<b>Electricity</b>	<b>Natural Gas</b>	<b>Total</b>	
1	\$0.15 \$/kWh * kWh saved per year		\$5,040			
	\$0.30 \$/m3 * m3 saved per year			\$0	<b>\$5,040</b>	
2	50% of Incremental Project Cost		\$11,235	\$0	<b>\$11,235</b>	
3	100% Amount to reduce payback to 1 year (Incremental Cost - Total Benefits)				<b>\$19,910</b>	
			\$5,040	\$0	<b>\$5,040</b>	
<b>Eligible Incentive*</b>					<b>\$5,040</b>	
<i>*(Based on lesser of amounts 1, 2, 3 and 4)</i>						
<b>Project Economics Summary</b>						
Simple Payback (Total Benefits)					<b>8.8</b>	years
Simple Payback (Total Benefits plus Incentive)					<b>6.8</b>	years
<b>Environmental Benefits Summary</b>						
<b>GHG Savings</b>			<b>Factor</b>			
Electricity	33,600 kWh annually		0.75 kg CO2e/kWh		<b>25,200</b>	kg CO2e
Natural Gas	0 m3 annually		1.90 kg CO2e/m3		<b>0</b>	kg CO2e
Other Fuel (specify)	0 m3 annually		0 kg CO2e/m3		<b>0</b>	kg CO2e
<b>Water Savings</b>	0 m3 annually					

### Notes:

- Customer electric demand savings may have to be adjusted if measure doesn't save customer electric demand. (cells J17 and J18)
- Electric energy benefits formula may have to be adjusted if customer demand doesn't occur for 6 months in both the winter and summer periods. (cell G30)
- Costs should include PST but not GST. (cells G26, G27, H26 and H27)
- Non-energy benefits should include Provincial Utility Tax (PUT), City of Winnipeg Tax, Federal Carbon Charge, natural gas demand savings, labour, water, etc. Do not include GST. (cells G31 and H31)



# IX. Example 3 - Feasibility Study Report for Natural Gas Savings Sample

Note that the energy savings and project costs used in the example below are for illustrative purposes only.



AAA Manufacturing - Winnipeg, Manitoba  
Consultant Name  
April 2021

## STEAM GENERATION EQUIPMENT UPGRADE

### 1.0 Project Description

AAA Manufacturing operates a flooring products manufacturing facility in Winnipeg, Manitoba. They are a Large General Service natural gas customer with Manitoba Hydro with an energy cost of \$0.18760 per m<sup>3</sup>.

The plant presently has a steam boiler that provides process steam for a number of plant uses. A single line process schematic is shown in Figure 1 in Appendix B.

At this time, AAA Manufacturing is planning to add a new process line that can be supplied with steam off the current system or it can be supplied from a new steam generator. When making purchase decisions, AAA Manufacturing uses steam operating costs as one of their evaluation criteria for selecting new equipment. In this case, they are considering a steam generator that has a rated fuel-to-steam efficiency of 85%. Equipment data and performance sheets for the proposed steam generator are provided in Appendix B. The existing boiler was recently tested and found to have an efficiency of 81%. Copies of the combustion test results are also included in Appendix B. Allowing for a 2% loss due to radiation and convection, the existing boiler has an estimated fuel-to-steam efficiency of 79%.

### 2.0 Project Assessment

#### 2.1 Natural Gas Savings Estimate

It is estimated that the new process load would have consumed 250,000 m<sup>3</sup> per year based on the existing boiler (Base Case) operating 6,000 hours per year. The estimated annual natural gas savings from using the more efficient steam generator (Energy Efficient Case) are 17,750 m<sup>3</sup> per year. The estimated annual natural gas cost savings are \$3,330 as shown in the Incentive Calculation Worksheet in Appendix A.

The natural gas savings were calculated using the fuel-to-steam efficiencies of the two different technologies to determine the efficiency saving factor and then multiplying by the estimated annual usage.

	Technology	Fuel-to-Steam Efficiency	
Base Case	Existing Boiler	79%	Efficiency Saving Factor = $1 - \left( \frac{\text{lower efficiency}}{\text{higher efficiency}} \right)$ , or = $1 - (0.79/0.85)$ or 0.071
EE Case	Steam Generator	85%	

Therefore, the estimated annual natural gas savings are 250,000 m<sup>3</sup>/year x 0.071 = 17,750 m<sup>3</sup>/year.

#### 2.2 Other Project Benefits

The steam generator is expected to use less water and chemicals with an estimated annual cost savings of \$750 including PST. Other benefits also include 7% Provincial Utility Tax (PUT) and 5% City of Winnipeg tax on the annual \$3,330 energy benefits and a Federal Carbon Charge of \$0.0783 per m<sup>3</sup> on the annual energy savings.

## IX. Example 3 - Continued

### 2.3 Project Costs

The incremental project cost before tax is estimated to be \$35,000 and is based on costs provided by AAA Manufacturing as follows:

	EE Case	Base Case	Incremental Project Cost
Equipment	60,000	40,000	20,000
Installation	30,000	15,000	15,000
Engineering	5,000	5,000	0
<b>TOTALS*</b>	<b>\$95,000</b>	<b>\$60,000</b>	<b>\$35,000</b>

*\*The total cost including 7% PST is \$64,200 for the Base Case and \$101,650 for the Energy Efficient Case.*

Copies of equipment, installation and engineering cost estimates are provided in Appendix B.

### 2.4 Simple Payback and Incentive Calculation

Simple payback and incentive calculations based on the above estimates are shown on the Incentive Calculation Sheet included in Appendix A. Payback calculates to 5.5 years with a potential incentive of \$5,325 from Efficiency Manitoba's Custom Energy Solutions Program.

### 2.5 Recommendation and Summary

It is recommended that AAA Manufacturing proceed with the purchase and installation of the more efficient steam generator.

### 3.0 Measurement and Verification of Savings

The fuel-to-steam efficiency of the new steam generator will be determined from a stack combustion analysis to be completed after the equipment is installed and operating. Final savings values will be determined using the actual efficiency values from the stack combustion analysis.

### 4.0 Implementation Schedule

Installation is scheduled for the summer of 2021.

### Appendix A

Incentive Calculation Worksheet

### Appendix B

Equipment performance data sheets, cost quotations, single line process schematics and other report supporting information would be provided in an appendix. This reference is for illustrative purposes only.

## Appendix A (Example 3)

Incentive Calculation Sheet for Electricity and Natural Gas Projects						
PROJECT: <i>Example 3: Steam Generation Equipment Upgrade - AAA Manufacturing - NG Savings</i>						
<b>Energy Savings Summary</b>						
<b>Energy Rate:</b>	<b>Program:</b>	<b>Winter</b>	<b>Summer</b>	<b>Total</b>	<b>Customer</b>	
Electricity		(Nov - Apr)	(May - Oct)			
\$9.390 per kVA	Demand kW	0.0	0.0	N/A	0.0 W	
95.0% power factor					0.0 S	
\$0.04065 per kWh	Annual Energy kWh	0	0	0		
Natural Gas						
\$0.18760 per m3	Annual Energy m3	8,875	8,875	17,750		
<b>Project Cost &amp; Benefits Summary</b>						
		<b>Electricity</b>	<b>Natural Gas</b>	<b>Total</b>		
Total Installed Project Cost - High Efficiency Case		\$0	\$101,650	\$101,650		
Total Installed Project Cost - Base Efficiency Case		\$0	\$64,200	\$64,200		
Total Installed Project Cost - Incremental		\$0	\$37,450	<b>\$37,450</b>		
Annual Energy Benefits		\$0	\$3,330	\$3,330		
Annual Non-Energy Benefits		\$0	\$2,539	\$2,539		
Annual Total Benefits		\$0	\$5,869	<b>\$5,869</b>		
<b>Incentive Calculation Summary</b>						
		<b>Electricity</b>	<b>Natural Gas</b>	<b>Total</b>		
1	<b>\$0.15</b> \$/kWh * kWh saved per year	\$0				
	<b>\$0.30</b> \$/m3 * m3 saved per year		\$5,325	<b>\$5,325</b>		
2	<b>50%</b> of Incremental Project Cost	\$0	\$18,725	<b>\$18,725</b>		
3	<b>100%</b> Amount to reduce payback to 1 year (Incremental Cost - Total Benefits)			<b>\$31,581</b>		
		\$0	\$5,325	<b>\$5,325</b>		
				<b>Eligible Incentive*</b>	<b>\$5,325</b>	
<i>*(Based on lesser of amounts 1, 2, 3 and 4)</i>						
<b>Project Economics Summary</b>						
Simple Payback (Total Benefits)				<b>6.4</b>	years	
Simple Payback (Total Benefits plus Incentive)				<b>5.5</b>	years	
<b>Environmental Benefits Summary</b>						
<b>GHG Savings</b>		<b>Factor</b>				
Electricity	0 kWh annually	0.75 kg CO2e/kWh			0 kg CO2e	
Natural Gas	17,750 m3 annually	1.90 kg CO2e/m3			<b>33,725</b> kg CO2e	
Other Fuel (specify)	0 m3 annually	0 kg CO2e/m3			0 kg CO2e	
<b>Water Savings</b>	0 m3 annually					

### Notes:

- Customer electric demand savings may have to be adjusted if measure doesn't save customer electric demand. (cells J17 and J18)
- Electric energy benefits formula may have to be adjusted if customer demand doesn't occur for 6 months in both the winter and summer periods. (cell G30)
- Costs should include PST but not GST. (cells G26, G27, H26 and H27)
- Non-energy benefits should include Provincial Utility Tax (PUT), City of Winnipeg Tax, Federal Carbon Charge, natural gas demand savings, labour, water, etc. Do not include GST. (cells G31 and H31)



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