Exhibit No.:	
Issue:	Missouri Energy Efficiency Investment Act of 2009
Witness:	Joseph O'Donnell
Type of Exhibit:	Surrebuttal Testimony
Sponsoring Party:	KCP&L Greater Missouri Operations Company
Case No.:	EO-2012-0009
Date Testimony Prepared:	May 10, 2012

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO.: EO-2012-0009

SURREBUTTAL TESTIMONY

OF

JOSEPH O'DONNELL

ON BEHALF OF

KCP&L GREATER MISSOURI OPERATIONS COMPANY

Kansas City, Missouri
May 2012

Certain Schedules Attached To This Testimony
Contain Highly Confidential Information
And Have Been Removed
Pursuant To 4 CSR 240-2.135.

SURREBUTTAL TESTIMONY

OF

JOSEPH O'DONNELL

Case No. EO-2012-0009

Q: Please state your name and business address.

A: My name is Joseph O'Donnell. My business address is 1200 Main St., Kansas City, Missouri 64105.

Q: By whom and in what capacity are you employed?

A: I am employed by Kansas City Power & Light Company ("KCP&L") as Manager, Market Intelligence.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of KCP&L Greater Missouri Operations Company ("GMO" or the "Company") for the territories served by St. Joseph Light & Power ("L&P") and Missouri Public Service ("MPS").

Q: Have you previously provided testimony in this case?

A: No, I have not.

Q: Please provide your education and work experience.

A: I graduated from the Polytechnic University of New York with a Bachelor of Science in Electrical Engineering (B.S.E.E.) that was awarded Cum Laude. I graduated from the Columbia Business School with a Masters of Business Administration with a dual major in Finance and Operations Management.

I worked for Consolidated Edison of New York from 1974 to 1989 in the System Operation division and held various technical, engineering and management positions.

From 1994 through 1996, I was an Assistant Professor on the adjunct faculty of the Columbia Business School where I taught graduate level classes in Production and Operations Management.

I worked for Dow Jones Telerate in the Energy Services group from 1996 to 1999 as the marketing manager of energy pricing and information services. We developed trading systems technology, and information services for the international oil, natural gas and electric power markets. We developed the first market price indexes for the emerging U.S. wholesale power markets, including the California-Oregon Border ("COB") electric power price index, and the PJM power price index.

Thereafter, I worked for Aquila Energy from 1999 to 2002 as a manager in the financial group responsible for energy deal structuring, the fundamental analysis of the U.S. electric power and natural gas markets, and the analysis of commodity pricing. I continued to work for Aquila Energy from 2003 to 2005 as a Director in the financial risk group. In that capacity, I was responsible for the assessment of electric and natural gas price risk for seven U.S. natural gas utilities, three electric power utilities and developed financial volumetric hedging strategies for the firm.

I began working for KCP&L in December of 2005 as a Technical Consultant supporting KCP&L's account executives. In this role, I was responsible for customer load research and customer technical support. In 2007, I accepted a Manager position in the Energy Solutions group where I am responsible for demand side research and planning, the economic analysis and development of demand-side programs, and customer technical support.

Q: What is the purpose of your surrebuttal testimony?

A: My testimony provides GMO's position on the Net-To-Gross ("NTG") concerns and issues with the Commercial and Industrial ("C&I") Prescriptive Rebate Program raised by Phillip Mosenthal in his direct testimony in this case on behalf of the National Resource Defense Council, the Sierra Club and Renew Missouri organizations. Regarding Staff recommendations, I address the following:

1. Staff's recommendation to reject GMO's demand-side program plan and for the Company to file an achievable, realistic and specific program plan to be delivered according to a specified implementation plan and budget;

2. Staff's issues with GMO's descriptions of the MPower and Energy Optimizer programs; and

3. Staff's Total Resource Cost ("TRC") calculations for the MPower and Appliance Turn-in programs.

Q: Please explain net-to-gross ratios.

A: The goal of the NTGs assessment is to measure energy savings attributable to the program. Free ridership and spillover are adjustments to gross savings to arrive at "net" program savings. The ratio of net program savings to gross program savings is referred to as the NTG ratio. Free riders are program participants who would have taken the same energy savings action, at the same time, and at the same quantity regardless of the program. Spillover is an adjustment to the net savings that comes from knowledge and awareness due to the program availability but not directly due to the program. An example would be a program participant who becomes aware of energy savings benefits and decides to adopt additional energy savings measures that were not covered by the

program.

Mr. Mosenthal raises concerns[1] relating to GMO's assumed 1.0 NTG ratios for all programs and the use of gross energy savings rather than net savings. Use of a 1.0 NTG ratio is supported by a study conducted by the Iowa Utility Association ("Iowa study").[2] The Iowa study concludes:

- Many states have assumed free ridership and spillover offset one another.
- A study of best practice programs found that over two-thirds of all identified programs had a net-to-gross ratio of 1.0.
- Assuming a net-to-gross ratio of 1.0 may provide conservative estimates.
- Estimating free ridership and spillover is difficult, with no consensus on an approach for how to best estimate these values[3].

Q: Did the Iowa study examine these issues in other states?

A: The Iowa study included an examination of the treatment of free ridership and spillover in 23 states and found that 15 states (69%) have rejected the concept of free ridership in estimating net savings.[4] The Iowa study also reported that "a number of states, including Minnesota and Wisconsin, have publicly stated free ridership and spillover effects cancel each other and therefore do not need to be estimated[5]." The Iowa study also recommended that the policy of assuming free ridership and spillover effect offset each other be continued[6].

[1] Case No. EO-2012-0009, Direct Testimony of Phillip Mosenthal, March 13, 2012, pp. 11-12.
[2] Quantec Energy Economics. "Assessment of Energy and Capacity Savings Potential in Iowa - Vol II," Portland., OR. February 2008. Appendix G.
[3] Schedule JMO-1, p. G-12-13.
[4] *Id,.* p. G-2 – G-3.
[5] *Id.*, p. G-3.
[6] *Id.*, p. G-13.

Q: Please continue.

A: The Iowa study also cited that, "Other states feel that estimating free ridership and spillover is too costly and inherently biased." For example, Michael Sherman, Manager for Energy Efficiency, Massachusetts Division of Electric Regulation, stated that, " . . . because the issues (free ridership and spillover) are very hard to quantify due to survey bias, we don't believe there is real value in requiring traditional NTGR quantification. We prefer that the utilities focus on market transformation programs and correct for factors affecting gross to net savings in program design."[7]

Another study[8] found that, "other states say estimating NTG is not a priority – they feel free ridership is balanced by spillover and make no further efforts, argue that measurement of free ridership and spillover is unreliable, or say that when they did measure it the value was close to one." This study is attached to my testimony as Schedule JMO-2.

In the 2008 IRP Nonunanimous Stipulation and Agreement, the parties agreed that KCP&L develop resource plans using a NTG ratio of 1.0.[9] GMO has also adopted the assumption of a NTG ratio of 1.0.

Q: Is it possible to assign accuracy and precision to estimates of NTG ratios?

A: There is considerable controversy regarding the use of NTG ratios. Much of the controversy stems from the potential for error and uncertainty in the measurement of NTG ratios due to difficulties in 1) determining an accurate baseline, 2) identifying and implementing a control group and 3) relying on self-responses to a survey. Sources of

[7] *Id.*, p. G-3.
[8] A National Review of Best Practices and Issues in Attribution and Net-to-Gross: Results of the SERA/CIEE White Paper, ACEEE 2010, pp. 5-354.
[9] Nonunanimous Stipulation and Agreement, Case No. EE-2008-0034, p. 15.

error with self-reporting surveys stem from faulty recall, bias towards claiming the program was or was not influential, and from bias introduced by hypothetical questions. Because of this issue, it is rare for program evaluators to report a level of precision or accuracy.

Q: Did witness Phillip Mosenthal have other issues with GMO's filing?

A: Yes, one other issue. My testimony also addresses concerns Mr. Mosenthal raised regarding the C&I Prescriptive Rebate Program. Mr. Mosenthal raised concerns regarding T12, T8 and LED lighting and states that T8 lamps "have already been banned by federal law starting in July 2012." The law has not banned T8 lamps, but the law will require T8 general service fluorescent lamps (GSFL) to meet minimum lumen per watt (LPW) requirements; products that do not meet the minimum LPW requirements as of July 14, 2012, can no longer be produced.

GMO is currently conducting a potential study to evaluate the potential for demand-side resources that will include an evaluation of the commercial lighting segment. GMO has contracted with Navigant, Inc., a nationally recognized consulting firm, to conduct the potential study. The potential study results will be available first quarter of 2013 and will provide recommendations to address the changing standards in lighting efficiency. GMO will then review the potential study results, and may adopt any recommended program changes.

Q: Has GMO taken any other steps to address concerns with the C&I Prescriptive Rebate Program?

Yes. GMO has made a slight revision to the C&I Prescriptive Rebate Program write-up and tariff. Rebates for Insulated Pellet Dryer Ducts have been revised to read linear feet.

Rebates for LED street lighting will not be offered as they are now considered standard baseline technology. The revised C&I Prescriptive Rebate program write-up and tariff are attached as Schedules JMO-3 (HC) and JMO-4, respectively.

Q: Please discuss Staff's recommendations regarding GMO's demand-side program plan.

A: Staff witness John Rogers recommends in his testimony that the MPSC "reject GMO's demand-side program plan and order GMO to file an achievable, realistic and specific demand-side program plan for its DSM programs to be delivered according to a specified implementation plan and budget as required by Rule 4 CSR 240-20.094(1)(K)."[10]

Section (1)(K) of this rule, 4 CSR 240.094, defines a Demand-Side Program plan as:

> Demand-side program plan means a particular combination of demand-side programs to be delivered according to a specified implementation schedule and budget.

Schedule JMO-5 (HC) attached to my testimony is the demand-side program plan that GMO believes meets the requirements of 4 CSR 240-20.094(1)(K). The GMO demand-side program implementation schedule and program budget is shown on page 1, Tables 1 and 2, respectively. The DSM monthly energy and demand savings are shown on pages 2 through 5. The evaluation, measurement and verification schedule for GMO's demand-side program plan is on page 7, Table 3.

Q: What are Staff's issues with GMO's descriptions of MPower and Energy Optimizer?

A: Staff witness Randy Gross was concerned that GMO failed to provide a description of the MPower and Energy Optimizer programs under MEEIA and 4 CSR 240.3.164(2)(C). A

[10] Rebuttal Testimony of John A. Rogers, Case No. EO-2012-0009, p. 3.

description of the Energy Optimizer program is attached in Schedule JMO-6 (HC). A description of the MPower program is attached as Schedule JMO-7 (HC).

Q: Please discuss Staff's issues with the TRC calculations for the MPower and Appliance Turn-in programs.

A: Staff witness Hojong Kang in his rebuttal testimony in this case requested that GMO recalculate the TRCs for the MPower and Appliance Turn-in programs. Those revised calculations are provided in Schedule JMO-8 attached to my testimony.

Q: Does that conclude your testimony?

A: Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of KCP&L Greater Missouri Operations Company's Application for Approval of Demand-Side Programs and For Authority to Establish a Demand-Side Programs Investment Mechanism	))))	Case No. EO-2012-0009

AFFIDAVIT OF JOSEPH M. O'DONNELL

STATE OF MISSOURI)
) **ss**
COUNTY OF JACKSON)

Joseph M. O'Donnell, being first duly sworn on his oath, states:

1. My name is Joseph M. O'Donnell. I work in Kansas City, Missouri, and I am employed by Kansas City Power & Light Company as Manager, Market Intelligence.

2. Attached hereto and made a part hereof for all purposes is my Surrebuttal Testimony on behalf of KC&PL Greater Missouri Operations Company consisting of _____ eight (8) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Joseph M. O'Donnell

Joseph M. O'Donnell

Subscribed and sworn before me this 10 day of May, 2012.

Nicole A. Wehry

Notary Public

My commission expires: Feb. 4, 2015

NICOLE A. WEHRY
Notary Public - Notary Seal
State of Missouri
Commissioned for Jackson County
My Commission Expires: February 04, 2015
Commission Number: 11391200

Final Report – Volume II

Assessment of **Energy and Capacity Savings Potential in Iowa**

Prepared for The Iowa Utility Association

February 15, 2008

In Collaboration with Summit Blue Consulting, Nexant, Inc., A-TEC Energy Corporation, and Britt/Makela Group

Raising the bar in analytics™

Investigators:

Hossein Haeri, Ph.D., Scott Dimetrosky, Charles Bicknell, Collin Elliot, Tina Jayaweera, Ph.D., Eli Morris, Tony Larson, Aquila Velonis, Allen Lee, Ph.D., Eric Flora, Ross Notebaart, Nathan Vellinga, Dan Groshans, Meghan Lee, Sara Wist, Rick Ogle and Ken Seiden
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Kevin Cooney, Randy Gunn, Mary Klos, Daniel Klos, Adam Knickelbein, Beth Baker, Rachel Freeman and Roger Hill
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K:\2007 Projects\2007-111 (IUA) IUA State-Wide Savings Potential\Reports and Presentations\Final Appendices_012308.pdf

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Appendix G: Attribution of Energy Savings: An Assessment of the Net-to-Gross Ratio Issue

Introduction

In 2002, Global Energy Partners and Quantec provided the Iowa Utilities Board a report on the issue of free riders and spillover.[1] The report provided definitions of free riders and spillover, discussed the historical background issues, and provided examples of studies performed. The report concluded with a recommendation for dealing with these issues in Iowa's Energy Efficiency Plans. The recommendation was that Iowa's investor-owned utilities, along with the Iowa Utilities Board, assume a net-to-gross ratio of 1.0 across all utility programs for the 2004-2008 Energy Efficiency Plans.

The purpose of this paper is to assess whether the policy of having a 1.0 net-to-gross ratio remains appropriate. The paper begins by providing definitions of what makes up the net-to-gross ratio, then examines the treatment of free ridership and spillover, both historically and currently. Results of evaluation efforts across the country are examined, many conducted following the 2002 recommendation that address the issues of program free riders and spillover. Finally, based on this review, recommendations are provided for future net-to-gross research.

Definitions

The goal of the net-to-gross assessment is to measure all energy saving attributable to the program. This is called "net" program savings. The ratio of net program savings to gross program savings is the "net-to-gross" ratio.

Free ridership and spillover are two main adjustments to gross savings to arrive at net savings. The first adjustment is to subtract from gross savings the actions of participants unaffected by the program. That is, participants are considered free riders if they would have taken the same energy saving action at the same time, in the same quantity, and at the same level of efficiency regardless of the program's existence.

The second adjustment is to add energy savings from high-efficiency actions taken outside the program to gross impacts attributable to the program. These additional energy savings come from greater knowledge and awareness of energy-efficient options due directly to program availability but falling outside of attaining the savings through the program. These savings are referred to as spillover.

Spillover can occur within both participant and nonparticipant groups. For example, participants may be inspired to adopt high-efficiency measures beyond those available within a program.

[1] *Assessment of Energy and Capacity Savings Potential in Iowa Volume 2: Free Riders and Spillover – A Look Back, A Path Forward,* prepared for the Iowa Utility Association by Global Energy Partners and Quantec, July 25, 2002

Nonparticipants can gain knowledge and awareness of energy-efficient options due to program availability and apply that knowledge and awareness to implement high-efficiency actions. These actions would not have occurred without the program's existence through savings gained outside the program structure. For most programs, the number of eligible nonparticipants is far greater than the number of participants; thus the potential exists for large spillover impacts within this nonparticipant population.

A third potential adjustment is for market effects.[2] Market effect impacts can be measured by evaluating and estimating the impacts of any changes the program causes to the way markets operate. As the result of programs, manufacturers may change the efficiency of their products, or retailers and wholesalers may change the composition of their inventories to reflect the demand for more efficient goods created through a program or group of programs. Such market transformation activities are the ideal achievement of energy-efficiency programs, and the impact could be very significant. However, because multiple actors may be involved in causing positive market effects and the need to avoid double-counting when measuring spillover and market effects, it is often difficult to determine how these effects should be attributed among the different market actors. Because of these attribution issues, measurement of market effects becomes a significant measurement and evaluation challenge.

Treatment of Free Ridership and Spillover

The Iowa Chapter 35 rules outline the inputs for all cost-effectiveness tests, including the Societal Test. The rules are based on the 1987 California Public Utilities Commission Standard Practice Manual of Economic Analysis of Demand-Side Management Programs. In calculating benefits for the Utility Cost Test (UCT), the manual states "the avoided supply costs should be calculated using net program savings, savings net of changes in energy use that would have happened in the absence of the program." This definition of net savings says impacts of free riders should be subtracted from gross savings, reducing benefits while keeping costs constant.[3] Therefore, identification of free riders in a program reduces the UCT cost-effectiveness. From a societal perspective, the CPUC Standard Practice Manual states participant costs and utility and participant benefits should be calculated using a net approach. Since administrative costs tend to be fixed, higher free ridership means these costs are essentially spread over fewer participants, and may have a negative impact on the Societal Test benefit/cost test. Given that administrative costs normally represent only a small percentage of program expenditures, this impact is assumed to be minor.

Policy Treatment across the U.S.

A recent study conducted for the Nevada Power Company and Sierra Pacific Power Collaborative included an examination of the treatment of free ridership and spillover in 23 states

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[2] Note that some of the literature includes nonparticipant spillover as part of market effects.

[3] Gross savings is typically total program savings adjusted for weather.

and/or utilities serving those states. The results, presented in Table G.1, found that 15 states (69%) have rejected the concept of free ridership in estimating net savings.[4]

A number of states, including Minnesota and Wisconsin, have publicly stated free ridership and spillover effects cancel each other and therefore do not need to be estimated.[5] The International Energy Agency has concurred with this opinion, even suggesting the assumption of offsets may be conservative:

> "These indirect effects (Free Riders and Spillover) work in opposite directions and both are difficult to quantify. Until better information is available, it may be practical to assume (as some regulatory jurisdictions in the case of traditional energy efficiency projects and programs) that these effects cancel each other out. As the literature search indicates, in many cases, when both effects are measured, spillover can actually be greater than free ridership, in which case the assumption that they cancel provides a conservative estimate of program energy savings.[6]

Other states feel that estimating free ridership and spillover is too costly and inherently biased. For example, Michael Sherman, Manager for Energy Efficiency Massachusetts Division of Electric Regulation stated that, ". . . because the issues (Free Ridership and Spillover) are very hard to quantify due to survey bias, we don't believe there is real value in requiring traditional NTGR quantification. We prefer that the utilities focus on market transformation programs and correct for factors affecting gross to net savings in program design."[7]

California, on the other hand, requires the use of deemed free ridership values. Table G.2 lists the California Public Utilities Commission's (CPUC) deemed net-to-gross ratios by program. Although spillover effects are not included in these net-to-gross values, the CPUC is allowing the evaluations of the 2006-2008 energy efficiency programs to include an examination and estimation of participant spillover. Should spillover be included it is likely that some of the net-to-gross ratios will be near or greater than 1.0.

The decision to include free ridership impacts without including spillover impacts is inherently an asymmetrical, biased view. The National Association of Regulatory Utility Commissioners (NARUC) Regulating DSM Evaluation Manual states that, ". . . as of 1994 virtually no regulators were requiring the measurement of spillover effects, yet, . . . most encourage or require Free Ridership assessments, resulting in potentially lopsided analyses, which could undervalue the benefits of utility DSM programs."[8]

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4 "A Study of Methodologies for Evaluating Free Ridership and Spillover throughout the United States." Draft Report to the Nevada Power/Sierra Pacific Power Collaborative Sub-Committee on Free Ridership and Spillover. Prepared by Paragon Consulting Services, Inc. November 20, 2006.

5 EnergyPulse article, "Energy Efficiency and the Spectre of Free Ridership, Is a Kilowatt Saved Really a Kilowatt Saved", Stephen Heins, Oct 2005

6 International Energy Agency papers, p. 7, July 2000

7 Paragon Consulting Services, November 26, 2006.

8 NARUC, 1994, p. 4-9; p. A-9

Table G.1. Treatment of Free Ridership and Spillover by State

State	Spillover:		Free-Ridership
	Participant	Non-participant	
Arizona*	No	No	No
California	Yes	No	Yes
Colorado*	No	No	No
Connecticut	Yes	Yes	Yes
Idaho	No	No	No
Iowa	No	No	No
Maine	No	No	No
Massachusetts	Yes	Yes	Yes
Minnesota	No	No	No
NE ISO	No	No	No
New Hampshire	Yes	Yes	No
New Jersey	No	No	No
New Mexico*	No	No	No
New York	Yes	Yes	Yes
North Carolina*	No	No	No
Ohio	No	No	No
Oregon*	Yes	Yes	Yes
Rhode Island	Yes	No	No
Texas	No	No	No
Utah	Yes	Yes	Yes
Vermont	Yes	Yes	Yes
Washington	No	No	No
Wisconsin	No	No	No

Table G.2. California Program Deemed Net-to-Gross Ratios

Program Area/Program	Net-to-Gross Ratios
Residential	
Appliance early retirement and replacement	0.80
California Home Energy Efficiency Rating System (CHEERS)	0.72
Residential Audits	0.72
Refrigerator Recycling/Freezer Recycling	0.35/0.54
Residential Contractor Program	0.89
Emerging Technologies	0.83
All other residential programs	0.80
Nonresidential	
Advanced water heating systems	1.0
Agricultural and Dairy Incentives	0.75
Coin Laundry and Dry Cleaner Education	0.7
Commercial and agricultural information, tools, or design assistance services	0.83
Comprehensive Space Conditioning	1.0
Lodging Education	0.7
Express Efficiency (rebates)	0.96
Energy Management Services, including audits (for small and medium customers)	0.83
Food Services Equipment Retrofit	1.0
Industrial Information and Services	0.74
Large Standard Performance Contract	0.70
All other nonresidential programs	0.80
New Construction	
Industrial and Agricultural Process	0.94
Industrial new construction incentives	0.62
Savings by Design	0.82
All other new construction programs	0.80

Source: "Energy Efficiency Policy Manual v2", Prepared by the California Public Utilities Commission, Energy Division, August, 2003

Measuring Free Ridership and Spillover

In addition to differing policies regarding the need to estimate free ridership and spillover, there remains no consensus on any one single approach to estimating net-to-gross among those that attempt to do so. The most widespread way to measure free riders and spillover is through surveys where respondents self-report the impact of the program on their actions. Methods of inquiry have become more sophisticated in recent years, with a string of questions and incremental answers to understand partial free riders. In general, free rider questions ask interviewees about actions they would have taken had the program not been in place. For spillover, recent survey-based studies have focused mainly on participant and non-participant spillover. Participant surveys elicit responses about whether or not customers have purchased additional energy-efficient measures of the same type without financial assistance. Non-participant free driver surveys ask customers if they purchased efficiency measures due to their awareness of the program.

While survey techniques are relatively straightforward, they contain inherent problems. In general, the problems related to the survey approach are referred to as "self-reporting bias." Specific to free riders, two problems include cognitive dissonance and hypothetical bias." [9] Cognitive dissonance occurs when the interviewees rationalize that they would have taken the correct action (e.g., installing environmentally friendly efficient technologies) without program inducement. This tends to increase free ridership estimates. Hypothetical bias occurs because the survey is asking a hypothetical question and getting a hypothetical answer. Because programs may impact the availability or relative prices of measures, the participants probably cannot know what they would have done faced with a landscape unaffected by the DSM program.

In terms of spillover, ideally, both participants and non-participants would report the efficiency measures they installed due to overall awareness created by the DSM program, regardless of the similarity to the actual program measure. Studies have found that interviewees have a difficult time self-reporting the details such as usage, size, and efficiency levels. These data are necessary to create reliable estimates of energy savings due to spillover.

The use of statistical models to estimate net impacts is viewed as a more sophisticated method. Generally, statistical models analyze participant and non-participant actions, characteristics and attitudes to predict free ridership and spillover. Therefore, these methods can avoid both hypothetical bias and cognitive dissonance. Interviewees are not asked hypothetical questions, nor are they asked questions that are perceived to have a "right" answer. Instead, they are asked about their recent purchase decisions, general awareness of energy efficient information, and attitude toward energy efficiency.

The disadvantage of statistical analysis is its inability to estimate all types of spillover. Specifically, the spillover upstream in the distribution channel cannot be estimated with this method. Further, very few studies have estimated both free riders and spillover. A robust statistical analysis includes surveys designed to minimize self-reporting bias while collecting data on other program and participant characteristics. This level of sophistication requires a relatively large expenditure on evaluation. This may be necessary for some projects, but for a marginally cost-effective program, large evaluation expenditures could burden the program to the extent it is no longer cost effective.

A number of studies have also found that, because of the inherent biases, net-to-gross results can vary sharply based on the method selected. For example, a study by Kenneth Train in 1995 found that self-reported estimates of free ridership can be over 50% higher than discrete choice approaches, presumably due to the cognitive dissonance effect of the self-reported approach (Table G.3). [10]

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[9] Ozog, M. and D.M. Waldman, "Behavioral Models of Free Riders in DSM Programs", 1993

[10] Train, K. and E. Paquette, "A Discrete Choice Method to Estimate Free ridership, Net-to-Gross Ratios, and the Effect of Program Advertising," Energy Services Journal, Vol. 1, No. 1, 1995.

Table G.3. Difference of Free Ridership Rates Based on Research Approach

	Free-Ridership Rates	
	Discrete Choice	Self-Reported
1995 Commercial Lighting Study	22%	32% to 38%
1994 PG&E Commercial Rebate	27%	42%

Cross-Program Research

An ongoing project sponsored by the California Public Utilities Commission called the National Energy Efficiency Best Practices Study provides some insight into how the net-to-gross issue has been handled in various programs across the country. [11] The objective of the Best Practices project is to identify best practices for 18 different program types and to communicate the findings to program planners to enhance the design of such programs in California and elsewhere. In-depth interviews were conducted with managers of over 100 programs. Based on the interviews, program profiles were developed, and best practices were identified from groups of programs. Information was also provided on whether a program included a net-to-gross adjustment and if this adjustment was based solely on free ridership or if it also included spillover. Table G.3 provides a summary listing of the net-to-gross values found in the programs included in the Best Practices project by program area. Most of the Best Practices reviews took place in 2004 and 2005.

Approximately half of the studies (49%) either assumed or calculated a net-to-gross value of 1.0, and 68% of the studies had net-to-gross values between 0.9 and 1.0 (most likely not statistically significantly different from 1.0 [assuming 10% precision]). In most cases, net-to-gross values, when used by a program, were only based on free ridership values or were on a deemed net-to-gross assumption. Free ridership values when identified varied significantly, even within program areas. There was very little reporting of spillover impacts. Also, some program areas, such as appliance recycling, were not included.

[11] This study is managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company. The website address is: http://www.eebestpractices.com/index.asp

Table G.4. Net-to-Gross Values Identified through the Best Practices Project

Program Area	Net-to-Gross Values	Free Ridership Values	Spillover Values
Residential			
Lighting (six programs)	3 - N/A, 0.8, 1.27, 1.04	4 – N/A, 6%, 5.7%	4 – N/A, 6%, 5.7%
Air Conditioning (six programs)	5 – N/A, 0.8	6 – N/A	6 – N/A
Single Family Comprehensive (six programs)	1 – N/A, 0.89, 0.89, 0.97, 0.93, 0.94	4 – N/A, 3%, 4.4%	6 – N/A
Multi-Family Comprehensive (six programs)	4 – N/A 0.78, 0.89	5 – N/A, 3%	6 – N/A
New Construction (seven programs)	3 – N/A, 0.8, 1.0, 1.0, 1.16	4 – N/A, 20%, 0%, 0%	7 – N/A
Non-Residential			
Lighting (six programs)	1 – N/A, 0.96, 0.96, 0.96, 0.96, 1.0	6 – N/A	6 – N/A
HVAC (six programs)	3 – N/A, 0.85, 0.96, 1.0	4 – N/A, 15%, 0%	6 – N/A
Large Comprehensive (ten programs)	3 – N/A, 0.7, 0.8, 1.0, 0.7, 0.8, 1.06	10 – N/A	10 – N/A (1 inferred of at least 6%)
New Construction (six programs	1 – N/A, 0.65, 0.75, 0.81, 0.67, 0.93	3 – N/A, 40%, 33%, 7%	6 – N/A

See the Best Practices website for detailed reports: http://www.eebestpractices.com/index.asp

Another cross-program study reviewed the evaluation efforts of 54 resource acquisition programs and 31 information-only programs from the 2002–2003 portfolio of California energy efficiency programs.[12] The California Evaluation Framework, which helps guide the California evaluation efforts, provides three primary components for evaluating energy and demand savings:[13]

1. Quantify the number of measures/actions installed or adopted.
2. Identify the savings achieved by the measures/actions installed or adopted.
3. Identify the savings that would have occurred in the program's absence.

Fifty of the 2002–2003 Portfolio evaluations were included in the study since not all evaluation efforts had been concluded by the time the report was developed. Within the net-to-gross analysis section of the study, only 23 of the 50 evaluation efforts took free ridership into consideration. Far fewer included efforts to account for spillover effects; three measured participant spillover, and three measured nonparticipant spillover. Although the study stated free ridership and spillover were important considerations that should be included in evaluation research, it provided no guidelines as to which effects may have had a greater impact or if it was appropriate to believe free ridership and spillover effects essentially cancelled each other out.

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12 *California 2002-2003 Portfolio Energy Efficiency Program Effects and Evaluation Summary Report*, prepared for Southern California Edison and the Project Advisory Group by TecMarket Works, January 16, 2006

13 *The California Evaluation Framework*, prepared for Southern California Edison by TecMarket Works, 2004

However, some specific program evaluation efforts were identified that will be reviewed in more detail in the next section of this report.

Specific Programs

Broad reviews of program results provided the first step to assess the need for detailed net-to-gross assessments by the Iowa Utility Board. In most cases, the assumed net-to-gross values were approximately 1.0, and those that were not 1.0 often did not consider the potential counterbalancing impacts to free ridership from spillover.

This section provides a second step for assessing the need for net-to-gross analysis by examining evaluation findings in more detail for specific program types, particularly examining studies that included both free ridership and spillover. A sample of program types were selected based on those considered to have high savings potential in Iowa, appearing to have low net-to-gross ratios, or being excluded from the previous meta-studies.

Lighting Programs

The net-to-gross values for both residential and nonresidential sector lighting programs are provided in Table G.2 and Table G.3. As shown in Table G.2, net-to-gross values for lighting programs range from 0.8 to 1.27. The 0.8 value represents the deemed net-to-gross value for the California residential lighting programs and does not include spillover effects. The net-to-gross values above 1.0 come from studies that include spillover effects.

Table G.5 lists results from three additional evaluation efforts that included lighting free ridership and spillover effects.[14] For each of these programs, the estimated net-to-gross value is 1.0 or higher, as spillover estimates are significantly higher than free ridership estimates. The spillover estimates for the Energy Trust program are very large and significantly higher than either Efficiency Vermont or NYSERDA.

Table G.5. Residential and Commercial Lighting Programs with Spillover Estimates

Sponsoring Organization	Net-to-Gross Values	Free Ridership Values	Spillover Values
Residential:			
Efficiency Vermont[15]	1.19	6%	25%
Energy Trust of Oregon[16]	capped at 1.0	15%	over 200%
Non-Residential:			
NYSERDA[17]	1.09	39%	79%

[14] Note: the NYSERDA net-to-gross value does not equal (1 - free ridership + spillover), which is the formula used by most programs, but uses (1-free ridership) * (1 + spillover). Note also that the efficiency Vermont values represent a more recent study than that identified in Table G.2.

[15] *Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs*, prepared for the Vermont Department of Public Service, prepared by KEMA, Inc, December 2005

[16] *2003-2004 Home Energy Savings Program Residential Impact Evaluation,* prepared for the Energy Trust of Oregon, prepared by Itron, Inc., December 2006

Non-Residential Large Comprehensive Programs

Non-Residential Large Comprehensive Programs, such as the California Standard Performance Contract (SPC) Program, promote the procurement and installation of high-efficiency energy technologies by providing incentive payments and design/audit assistance, in some cases, to partially offset incremental equipment costs. Customers can receive incentives for customized projects based on calculating the amount of kWh saved or based on a measurement and verification procedure. Providing incentives to shorten payback periods and assistance to quantify equipment performance increases the adoption of new technologies. The SPC program in California, as identified in Table G.2, has a relatively low net-to gross value of 0.7. However, this net-to-gross estimate only includes adjustments for free riders and includes no spillover effects.

Evaluations from two similar type programs that included estimation of spillover effects were also reviewed. As shown in Table G.5, similar to the California SPC program, free ridership is large, with a value of 30% for NYSERDA and 44% for Wisconsin. However, these high free ridership values are nearly offset by large spillover estimates, with an adjusted net-to-gross of 0.91 for Wisconsin and 0.97 for NYSERDA. Assuming an estimated precision of approximately 10%, these values are not significantly different from a net-to-gross of 1.0.

Table G.6. Non-Residential Large Comprehensive Programs with Spillover Effects

Sponsoring Organization	Net-to-Gross Values	Free Ridership Values	Spillover Values
Wisconsin Power & Light[18]	0.91	44%	34%
NYSERDA[19]	0.97	30%	39%

Refrigerator and Freezer Recycling Programs

Table G.2 indicates very low deemed net-to-gross estimates of 0.35 for refrigerators and 0.54 for freezers in California. This type of program likely does not lend itself to having much if any spillover effects as it is unlikely many participants or nonparticipants would dispose of additional qualified refrigerators and freezers beyond the ones they dispose of within the program. Therefore, these low net-to-gross values may be appropriate.

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[17] *New York Energy $mart Program Evaluation and Status Report for the Year Ending December 31, 2006*, New York State Energy Research and Development Authority, March 2007

[18] *Shared Savings Decision-Making Process Evaluation Research Results*, prepared for Wisconsin Power & Light by Summit Blue Consulting, April 11 2006

[19] *Commercial/Industrial Performance Program (CIPP) Market Characterization, Market Assessment and Causality Evaluation*, prepared for New York State Energy Research and Development Authority by Summit Blue Consulting and Quantec, April 2006

The only program evaluation examining net-to-gross for refrigerator and freezer recycling programs was the KEMA study, which was used to develop the 0.35 and 0.54 values found in Table G.2.[20] In this evaluation, gross savings were reduced for two reasons:

1. The attribution (free rider) factor
2. The part use factor

The attribution factor accounts for what the disposal of the recycled unit would have been in the program's absence. Options for the used refrigerators and freezers are: a) to be destroyed; b) kept by the owner as a second unit; or c) transferred to another owner. The KEMA evaluation estimated that the attribution factor for refrigerators was 41% and 73% for freezers.

The part use factor accounts for usage of the units if they are kept as second refrigerators/ freezers or transferred to a new owner. For example, savings due to removal of a unit used for only three months of the year is only one-quarter (3/12) the savings associated with full-year use. The KEMA evaluation estimated the part use factor 0.88 for refrigerators and 0.77 for freezers. Spillover issues were not addressed in the KEMA study, which was appropriate considering the program objectives.

Non-Residential New Construction Programs

Although information included in Table G.3 indicates a large number of nonresidential new construction programs have low net-to-gross estimates, none of the programs cited in Table G.3 included any estimates of spillover effects. Only one evaluation of a non-residential new construction program was found to include estimates of spillover effects. This was an evaluation of the NYSERDA new construction program,[21] with a 46% free ridership estimate. This is similar to two of the three free ridership estimates provided in Table G.3 for non-residential new construction programs.

Both participant and nonparticipant spillover were also estimated in the NYSERDA study. These combined spillover effects were estimated to be 54%, more than offsetting the 46% free ridership estimate.

Energy-Efficient Residential Clothes Washers

Many utilities offer programs that promote ENERGY STAR® residential appliances, including clothes washers. In recent years, however, evidence has appeared that the market for energy-efficient clothes washers is being transformed, with resulting low net-to-gross estimates. Attribution for this market transformation may lie with the ENERGY STAR program and not

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[20] Final Report: Measurement and Evaluation Study of 2002 Statewide Residential Appliance Recycling Program, prepared for Southern California Edison by KEMA-XENERGY, February 13, 2004

[21] *New Construction Program (NCP) Market Characterization, Market Assessment and Causality Evaluation*, prepared for New York State Research and Development Authority, prepared by Summit Blue Consulting and Quantec, May 2006.

with local utility financial incentive programs. If so, this would mean there would be very little spillover (especially nonparticipant spillover) from this program.

Efficiency Vermont[22] has performed evaluations of the energy-efficient clothes washers as part of its portfolio of energy-efficient appliances offered under the efficient products portion of it residential program. In 2001, they estimated the net-to-gross ratio for this part of their program was only 0.38. In 2004, they re-estimated net-to-gross, and it fell even further to only 0.17. Spillover was not specifically addressed in these Efficiency Vermont studies. However, a statement was made in the evaluation report that the high saturation of ENERGY STAR clothes washers in the market place is not a local but rather a national phenomenon, with an inference that attribution for spillover would be to a national, not local effort.

Despite this very low net-to-gross value, Efficiency Vermont plans to continue to administer rebates for ENERGY STAR clothes washers. They are doing this to maintain good relationships with retailer channels built up over many years.

Conclusions and Recommendations

This study examined the treatment of free ridership and spillover throughout the United States. Key findings include:

- ***Net-to-gross estimates would have minor, if any, impacts on the societal benefit test.*** If the benefit cost tests were run with net impacts, programs with a net-to-gross ratio less than one would have their administrative costs spread over fewer participants. Given that administrative costs normally represent only a small percentage of program expenditures, this impact is assumed to be minor.
- ***Many states have assumed free ridership and spillover offset one another***. A recent study conducted for the Nevada Power Company and Sierra Pacific Power Collaborative found 15 states (69%) have rejected the concept of free ridership in estimating net saving.
- ***Estimating free ridership and spillover is difficult, with no consensus on an approach for how best to estimate these values***. There are inherent biases with both the self-report and statistical approaches, and the selection of one approach over another can give significantly different results.
- ***A study of best practice programs found over two-thirds of all identified programs had a net-to-gross value of approximately 1.0.*** Approximately half of the studies (49%) either assumed or calculated a net-to-gross value of 1.0, and 68% of the studies had net-to-gross values between 0.9 and 1.0. In most cases, net-to-gross values, when used by a program, were only based on free ridership values; so an even higher percentage of programs would have a net-to-gross ratio of approximately 1.0 if spillover was examined.
- ***Assuming a net-to-gross ratio of 1.0 may provide conservative estimates***. Research indicates some programs, particularly for lighting, routinely achieve net-to-gross ratios of

[22] *Final Report: Phase 2 Evaluation of the Efficiency Vermont Residential Programs*, prepared for the Vermont Department of Public Service, prepared by KEMA, Inc, December 2005

well over 1.0 when spillover is examined. Assuming a net-to-gross of 1.0, therefore, is likely a conservative estimate, underestimating true program impacts for some measures.

Given these findings, we recommend the Iowa Utilities Board and Iowa's investor-owned utilities continue the policy of assuming free ridership and spillover offset each other. However, findings from this study indicate that although an average, a net-to-gross ratio of 1.0 is a reasonable assumption, specific measures are likely to have net-to-gross values less than 1.0. Quantec therefore recommends utilities make efforts to design effective programs that minimize free ridership by:

- ***Reviewing studies that indicate certain measures are achieving high market shares and thus high free ridership rates***. For example, ENERGY STAR clothes washers continue to gain market share throughout the country, and results from Vermont indicate high free ridership and a net-to-gross ratio of less than 1.0.
- ***Carefully setting incentive levels to minimize free ridership***. As programs mature and market share for efficiency measures increase, program administrators may be inclined to reduce incentive levels. Paradoxically, however, as incentives *drop*, free ridership *increases*. This occurs because lower incentives are less likely to motivate participants who would not have installed a measure in the incentive's absence (i.e., a low incentive is not enough to motivate a customer to do what he or she was not already planning). Incentive levels should thus be carefully reviewed and set so to make sure to motivate a substantial number of participants to install an efficiency measure they would likely not have installed in a program's absence.

A National Review of Best Practices and Issues in Attribution and Net-to-Gross: Results of the SERA/CIEE White Paper

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ABSTRACT

Energy efficiency evaluation / attribution methods have reached a point that they must evolve in order to provide credible evaluation results for the next generation of programs. Recognizing this need, a national review was undertaken to examine the state of the art, gaps, and next steps needed to meet the evaluation needs for new programs, including behavioral and educational initiatives.

This study used interviews, a literature review, and analysis from around the United States to examine technical, research, and policy issues associated with the attribution of savings to programs – including net-to-gross (NTG) ratios and its components, free ridership, spillover, and other issues. The project reviewed results of net-to-gross (and component) estimations from around the country to identify patterns in results for "categories" of programs, and examined best practices in net savings estimation methods used to date for traditional measure-based programs.

This study found considerable variation in NTG methods, coverage, and component results. This project also examined policies used by different states related to this topic, such as whether NTG or its components are used at all, whether "deemed" levels are used, or whether the regulators endorse or include NTG estimates based on primary research. Protocols from several states were reviewed and compared, and the strengths and weaknesses of the approaches were examined.

Beyond reviewing the "state of the art" in traditional attribution work, savings and NTG issues for behavior, education, and training-based programs were also analyzed. For these programs, savings are difficult to measure, and marketplace "chatter" and overlapping programs and deliverers make measurement especially challenging. Some areas of the country are specifically addressing issues related to errors in measurement associated with NTG, and these results are highlighted. Finally, the project examined gaps in existing research, promising techniques for non-measure-based programs, and recommended next steps.

Project Introduction / Context

On behalf of the California Public Utilities Commission (CPUC), this project sought to identify current and improved techniques – and associated policy issues – related to[1]:

- **Gross effects**: Measuring the broad array of impacts caused, or potentially caused, by program interventions – measure-based, market-based, education or other interventions. This includes the measurement of gross energy savings and non-energy impacts.

[1] This paper presents the findings from one of eight white papers on behavior and energy that were funded by the CPUC and managed by the California Institute for Energy and Environment (CIEE). This work does not necessarily represent the views of the CPUC or CIEE or any of its employees. The white papers are available at: http://uc-ciee.org/energyeff/energyeff.html.

- **Net effects attribution**: Identifying the share of those effects – direct and indirect – that can be attributed to the influence of the interventions undertaken – above and beyond what would have occurred without the intervention – either naturally or due to the sway of other market influences or trends.

The overall research examined four key topics in evaluation: gross savings; attribution / free ridership / net to gross (NTG); non-energy benefits; and persistence. This paper focuses on the second of these evaluation topics. The findings from these evaluation efforts play a critical role in an array of applications, from analysis to program design. Given that evaluation results are often used in making program and reward decisions that put significant investment dollars at risk, it becomes prudent to revisit methods and approaches. Further, as programs have evolved, evaluation has become more complex:

- Programs have moved away from "widget"-based programs toward behavioral, education, advertising, and upstream programs that make it harder to "count" impacts.
- There is an increasing number of actors delivering these programs – leading to market "chatter" and increasing difficulty in identifying which among all the deliverers of the energy efficiency "message" are responsible for the change in energy efficiency behaviors, actions, or purchases. The increased chatter in the marketplace creates a situation in which consumers may be influenced by any number of programs by local utilities as well as influences from outside the utility (national programs, neighboring programs, movies / media, etc.).

As a result, attributing or assigning responsibility for changed behaviors and the adoption of energy efficiency measures or services is muddied and challenging.

For this project,[2] SERA[3] reviewed more than 250 conference papers and reports, and reached out to 100 professional researchers for interviews to identify improved techniques (and associated policy issues) for quantifying the share of direct and indirect effects that can be attributed to the influence of program interventions above and beyond what would have occurred without the intervention – either naturally or due to the sway of other market influences or trends. The white paper addresses all four evaluation topics, but this conference paper focuses only on "net-to-gross" and its constituents, free ridership and spillover.[4]

The literature indicates that there are a number of uses to which free ridership, spillover, or NTG ratios are relevant. Free ridership helps to identify superior program designs and helps to identify program exit timing. Spillover helps to assess the performance of education / outreach

[2] The context for this paper (California) relates to, but is not exclusive to, the situation of programs run by utilities with oversight by a public service commission and where shareholder incentives are at stake and depend on the determination of attribution. This review has relevance beyond this situation, but readers in other states may need to make a few adjustments in terminology, etc.

[3] Skumatz Economic Research Associates (SERA) was commissioned by CIEE to conduct this review. The lead author wishes to thank the following for assistance in preparing the white paper: D. Juri Freeman, Dana D'Souza, and Dawn Bement (Skumatz Economic Research Associates), Carol Mulholland, Jamie Drakos, and Natalie Auer (Cadmus Group), and Gregg Eisenberg (Iron Mountain Consulting).

[4] This paper does not discuss "takeback". An example of takeback is when a homeowner turns up the thermostat after more efficient HVAC systems are installed. This review found little recent work on this topic.

/behavioral programs,[5] and it helps to identify program exit timing. Not examining free ridership and spillover *ex post* will make it impossible to distinguish and control for poorly designed / implemented programs, as well as for programs that may have declining performance over time and may have outlived their usefulness, at least in their current incarnation. Some interviewees said 'deemed savings are ridiculous' for this reason.

Definition and Methods – Net To Gross (NTG)

Identifying the "net" effects is a significant element of the assessment of benefits and costs for a program, computations that, in some states, can determine the start, continuation, or termination of a program's funding. Estimating the effects of the program above and beyond what would have happened without the program involves identifying the share of energy-efficient measures installed / purchased that would have been installed / purchased without the program's efforts. Some purchasers would have purchased the measure without the program's incentive or intervention. They are called "free riders" – they received the incentive but didn't need it. Others may hear about the benefits of the energy-efficient equipment and may install it even though they do not directly receive the program's incentives for those installations and are not recorded directly in the program's "count" of installations. This is called "spillover," and there are three types of spillover:

- Inside project spillover occurs, for example, when refrigerators are rebated, and the person receives / installs that equipment, and then later installs an energy-efficient dishwasher.
- Outside project spillover occurs, for example, when a builder receives rebates on one project, but installs similar efficient measures in other homes without rebates.
- Non-participant spillover occurs, for example, when a builder hears about energy efficiency and does not participate or receive any rebates, but decides to install efficient equipment to serve his customers or to keep up with other builders, etc. No incentives were provided for these measures.

Sometimes, the first two examples are referred to as Participant Spillover and the third example as Non-Participant Spillover.

The combination of the "negative" of free ridership and the "positive" of spillover are computed as a "net to gross" (NTG) ratio, and are applied to the "gross" savings to provide an estimate of attributable "net" savings for the program.[6] The NTG ratio only equals free ridership (FR) if spillover (SO) is (or is assumed to be) zero. The NTG, or its components, have been addressed in four main ways, described below. Each approach has pros and cons. We list key strengths and weaknesses of each method based on our literature review and interviews with evaluation professionals.

[5] For some of these types of programs, spillover is actually the point of the program, and omitting it ignores important program effects. Ignoring free ridership (in favor of "deemed" NTG figures) allows the continuation of poorly-designed or implemented programs, which wastes ratepayer money.

[6] The literature shows computations of this NTG ratio by adding the factors (1-FR+SO) or by multiplying the factors ((1-FR)*(1+SO)). Both are used in practice.

Deemed (Stipulated) NTG

A NTG ratio is assumed (1, 0.8, 0.7, etc.)[7] that is applied to all programs or all programs of specific types. This is generally negotiated between utilities and regulators or assigned by regulators.

- Advantages: Simple, uniform, and eliminates debate; no risk in program design or performance; inexpensive.
- Disadvantages: Does not recognize actual differences in performance from different programs, designs, or implementations.

NTG Adjusted by Models with Dynamic Baseline

A baseline of growth of adoption of efficient measures is developed, and the gross savings are adjusted by the changes in the baseline for the period.

- Advantages: Can reflect differences in performance for good or poor designs and implementation.
- Disadvantages: Complicated to identify appropriate baseline; data intensive; potentially expensive; introduces more risk to program designers related to program performance; may lead to protracted discussions.

Paired Comparisons NTG

Saturations (or changes in saturations) of equipment can be compared for the program (or "test") group versus a control group. The control group is similar to the test group but does not receive the program. Ideally, pre- and post- measurement is conducted in both test and control groups to allow strong "net" comparisons.

- Advantages: Can reflect differences in performance for good or poor designs and implementation; straightforward concept and reliable evaluation design.
- Disadvantages: Control groups can be difficult to obtain; if imperfect control groups are used, statistical corrections may be subject to protracted discussions.

Survey-Based NTG

A sophisticated battery of questions is asked about whether the participant would have purchased the measures or adopted the behavior without the influence of the program. Those participating despite the program are the free ridership percentage. These are then netted out of the gross savings. Spillover batteries can also be administered to samples of potential spillover groups (participants, non-participants).

- Advantages: Provides an estimate of free ridership and spillover; can explore causes and rationales.

[7] If the NTG is less than zero, then this reflects the likelihood of some free ridership.

- Disadvantages: Responses are self-reported leading to potential bias or recall issues; may be expensive; can be difficult to get good sample of respondents for free ridership; requires well-designed survey instrument which can be long and which affects response rate.

The measurement of spillover involves different issues than the measurement of free ridership. Free ridership emanates from the pool of identified program participants; the effects from spillover are not realized from the participating projects and, in many cases, not even the entities that participated. Identifying who to contact to explore the issue of spillover and associated indirect effects can be daunting.

Our interviews and literature review suggest that a number of states consider free ridership in the calculation of NTG, but do not include spillover in their analyses of program effects, such as California. This analytic asymmetry undervalues energy efficiency by incorporating only subtractions (such as free riders) from gross savings and ignoring potential additions (such as spillover).

Issues and Controversies in NTG Determination

There is considerable – and growing - controversy regarding the use of net to gross, particularly in regulatory proceedings. As noted above, NTG ratios can be used to reduce (incorporating free ridership) or potentially expand (if spillover associated with the program exceeds free ridership) the amount of savings attributable to a program. The concern is that evaluations carefully estimate (gross) savings that were delivered, but then the savings (and, directly, the associated financial incentives to the agency delivering the program) are discounted by a free ridership factor measured by methods that are less "trusted" – in other words, specifically measuring gross savings based on statistical analysis of meter readings/ billing records, compared to measuring free ridership and/or spillover based on self-report surveys of hypothetical decisions and behavior.

Another controversy relates to the fact that only a small minority of free ridership, spillover, or NTG studies report any confidence ranges, or even discussions of uncertainty. Until these issues are addressed, given the financial implications, it is unlikely much additional progress will be made in a more comprehensive treatment of free riders, spillover, or NTG in the regulatory realm. Furthermore, most behavioral and educational programs seem to be treated as indirect programs and not included in regulatory tests. This has a problematic side effect: lack of credits for benefits or savings from these programs results in an under-investment in these efforts. Because of their spillover implications, this puts educational (and potentially behavioral) programs at a disadvantage in portfolio development, designing rewards and incentives, and in resource supply applications.

In some states (e.g., California), these measurements have huge potential financial impacts in which utilities may receive financial awards for running programs and running them well. Based on the interviews and research, the controversy seems to arise from the following main sources:

- The potential for error and uncertainty associated with these measurements, because of difficulties in (1) identifying an accurate baseline; (2) identifying and implementing a control group; or (3) relying on self responses to a survey.

- The expense of high quality analysis – with arguments that the money could be better spent on program design, implementation, incentives, etc.
- Baselines and effects are harder and harder to identify and analyze as programs move up stream, involve different levels of vendors and other actors, and lead to changes in baselines up the chain. In addition, program spillover complicates the identification of a reasonable control or comparison group.
- The difficulty in separating out the effects and influences of different programs within a marketplace (own utility / agency and outside utility / agency), often called "chatter".
- Concerns that using measured NTG or free ridership ratios introduces a great deal (to some, an unacceptable level) of risk or uncertainty into the potential financial performance metrics for the program, which will lead to "same old / same old" programs and reduce innovation in program offerings. [8]

Baselines are a very important part of the problem of measuring NTG, free ridership, and spillover. The calculation of baselines is complicated by several factors, including the difference between prescribed and actual practice, and the challenge of documenting what has not happened. Baselines relate to what would have happened without the program, which is generally understood to mean standard practice. Standard practice might generally be expected to relate to codes and standards, but this is not necessarily the case. In one study (referred to in Mahone 2008), the issue of baseline was found to be quite complex. Mahone (2008) notes that for at least the multifamily sector, none of the buildings were being built to the level of baseline codes – i.e., they were underperforming, so that the actual baseline of standard practice was below the baseline of codes. In this case, NTG would be estimated as greater than "one," since the energy efficiency program improved performance over the standard practice baseline.

Documenting what "would have happened" is the biggest challenge in evaluation (Saxonis 2007). Many interviewees suggested that strong market assessment is needed up-front to provide the maximum amount of baseline information. However, when it comes to the dynamic retail sector, it may be impossible to predict what they would have done without the program (Messenger 2009) – especially if changes occur upstream.[9] More research on standard practice in the field would provide a stronger basis for baselines and provide a sounder basis for determining NTG ratios.

What Precision Is Needed?

Assuming part of the concern about NTG relates to the accuracy of its computations, two questions arise before either including or excluding NTG – and specifically free ridership - across the board. First, how accurate does the NTG need to be for different possible applications, and second, are there computation approaches that provide that – or those varying – degree(s) of accuracy?

[8] Innovation is valuable, but agencies will not innovate (cannot justify innovating) in programs unless the risk is reasonably predictable. However, on the other side, regulators must assure that the reward structure doesn't encourage ineffective programs and that funding is spent appropriately and prudently.

[9] For example, some upstream changes may spill over to areas that might otherwise be considered potential control areas. If a manufacturer is induced to change the manufacture or mix of product, and they do so for California which is a big enough market to swing production in general, then the new product lines will become available in the potential control areas and the (important) market effect is then reduced.

The 2003 Nobel-award winning economist, W.J. Granger, noted that evaluations should be designed to the level of 'helping *avoid making wrong decisions (about programs)*'. The evaluation industry also makes a pertinent point that things that are measured tend to improve. Evaluators want to make sure that the following right decisions are made:

1) Assure public dollars are being responsibly spent;
2) Apportion dollars and efforts between alternative strategies; and
3) Help to identify the appropriate time for exit strategies (or program revisions).

This overriding principle has implications relevant to standards for evaluation in energy efficiency. It implies that the level of accuracy applied to evaluation research can be flexible, based on the value (cost) of the possibility of a wrong decision coming out of the particular advisory research. For example, making a decision on going ahead with a program or intervention may allow a much less accurate estimate for input information than a decision about the precise level of shareholder dollars that should be allowed for a particular agency. Thus, it is important to see how NTG results will be used, such as in the following activities:

- **Program planning**: Providing estimates of savings attributable to a program that can be used for program planning purposes (e.g., cost-benefit data).
- **Program marketing and optimization**: Providing quantitative feedback that helps to inform the design, delivery, marketing, or targeting of programs, including revisions to incentives, outreach, exit timing, or other feedback. The evaluation information can be used to understand tradeoffs, benefit-cost analysis, and decision making.
- **Integrated planning, portfolio optimization, and scenario analysis**: Providing savings and other feedback across and between programs that helps optimize program portfolios.
- **Generation alternative**: Providing an estimate of energy savings attributable to a program which may support a decision in deferring new generation.[10]
- **Performance incentives**: Providing estimates of savings attributable to a program that may be used to compute incentives to various agencies in return for efforts in program design, implementation, and delivery.

The degree of accuracy needed in the NTG computation for these various applications are more stringent (higher) if higher dollars are involved, e.g., if shareholder incentives are involved, or if a new power supply is being sought. The accuracy needed to avoid making a wrong decision varies directly with the potential dollars associated with that wrong decision. To illustrate the point, consider the following. "One size fits all" policies are perhaps not the best approach for including or excluding spillover in NTG computations. Ignoring spillover (because we are concerned that the accuracy of the estimates is of concern) for a program for which spillover is a key goal and outcome increases the chances of making a "wrong decision" about that program investment – and eliminates the chance to improve that performance (assuming measurement breeds improvement). Estimating spillover and applying ranges or confidence intervals to the

[10] For example, if a high amount of savings or value is assigned to the program.

values in assessing the program[11] may be preferable to ignoring spillover. On the other hand, ignoring spillover for a low value program or for a program for which spillover is not an integral part may not be a significant concern.

NTG Practices, Results, and Patterns

Several states use the California Standard Practice Manual, or large portions of it, for estimating energy savings, free ridership, non-energy benefits, and benefit-cost regulatory tests, including Oregon, Washington, Idaho, Montana, Wyoming, Utah[12], Iowa, Kansas, Missouri, New Mexico, and Colorado (Hedman, 2009). Several studies specifically examined state and utility practices regarding free ridership and net-to-gross. These studies find that utilities treat the issue of NTG differently. In some cases, there is no regulatory agreement on the estimation of NTG, and they historically treat free ridership only in the calculation of the NTG ratio. The Nevada Power and Sierra Pacific Power collaborative examined free ridership and spillover in 23 states and/or utilities serving states. They found 15 states (69%) did not use free ridership in estimating net savings (Quantec 2008). Other states say NTG is too costly and biased. Massachusetts prefers to have utilities focus on market transformation programs and correct for factors affecting NTG savings in program design. California requires deemed free ridership values in the calculation of the NTG, but excludes spillover. Several other states say estimating NTG is not a priority - they feel free ridership is balanced by spillover and make no further efforts, argue that measurement of free ridership and spillover is unreliable, or say that when they did measure it the value was close to one.

In Illinois, NTG ratios of 0.8 are assumed for low income programs and are lower for appliance efficiency programs (Baker 2008). Washington reportedly doesn't support savings from behavioral changes or NTG allowances or disallowances (Drakos 2009).

In addition to studies reviewing state and regulatory practices or guidelines, this project also examined patterns in NTG values, results, or methods across programs and regions. The authors assembled and reviewed more than 80 evaluation studies from California, New England, and the Midwest that contained estimates of free ridership and/or other elements of NTG. The studies, which covered residential (including low income) and commercial programs, provided estimates for lighting, HVAC, new construction, appliances, motors, and other measures delivered through incentive and non-incentive programs. The studies covered programs dating from 1991 to 2008. The project examined the studies for patterns in methods between areas of the country, and in free ridership and NTG results by sector, measure, or region. Although the studies were assembled as a convenience sample, and not a statistical sample, we found the following general results, methods, and gaps presented in Table 2.

Measure-level NTG performance varied, presumably depending on elements of the underlying program design and possibly due to measurement techniques as well. While these findings are useful, additional, and more comprehensive, work of this type is clearly needed before broad conclusions can be drawn.

[11] Or looking for that threshold value of spillover that "turns the decision" may be another way to address the accuracy issue. If the threshold is outside the estimated range for spillover or outside any credible or feasible range based on the rough estimate, the program decisionmaking is improved.

[12] Utah only allows one year of lost revenues in the Rate Impact Test.

Table 2: NTG Results

	Net To Gross , Free Ridership, Spillover
General results	• Most utilities and regulators exclude NTG or assume values that incorporate only free riders and range from about 0.7 to 1.0 (*ex ante*). *Ex post* results have been measured for many programs; spillover is measured much less often than free ridership (and spillover is more commonly reported in the Northeast than in California). • Most studies rely on self-report surveys using variations in questions incorporating partial free ridership/likelihoods; only a small percent used logit/ranking/discrete choice modeling. • Some studies included both *ex ante* and *ex post* NTG figures for the same program. The *ex post* values were generally 10-20% lower than the *ex ante* values. The most obvious exceptions were some cooking measure programs (*ex post* was about half the *ex ante* value), and some refrigerator programs that reported spillover values greater than 0.5. • Gaps included: Fewer than 10% reported confidence intervals; only a small subset covered NTG for gas savings; and very few studies identified free ridership for electricity savings; most considered only kWh effects.
Variations by measure type, program type or region	• Clear patterns for free ridership, spillover, or NTG results by measures, program types, and regions have not been demonstrated to date. The assumption is that variations in specific program design and measure eligibility definitions are important to results. NTG results in the literature are also affected by whether or not spillover is included in the assessment. • *Ex-post* free ridership clustered around 0.1-0.3 but ranged as high as 0.5 to 0.7 for some commercial HVAC / motors and refrigerator initiatives. *Ex-post* NTG clustered around 0.7-1.0, but dipped as low as 0.3 and as high as 1.3. The lowest free ridership was low income programs (as low as 0.03). • NTG for whole homes and home retrofits tended to be high (0.85 to 0.95), but ranged from 0.5 to more than 1.0. • Net realization rates were provided for about one-third of the programs, and the values averaged about 0.7 to 1.0. A number of values exceeded 1.0, including commercial HVAC rebate programs (1.07) and refrigerator rebate programs (1.15). Several programs showed net realization rates between 0.3 and 0.5 including several CFL programs, some refrigerator programs, some gas cooktop rebate programs, and some energy management system initiatives.
Variations for behavioral vs. measure-based programs	• Studies addressing NTG, free ridership, or spillover estimates associated with strictly behavioral programs were not found, and if available, are probably too few in number to lead to overarching conclusions or patterns.

Emerging Methods and Recommendations

Based on this project's analysis of the literature and interviews with evaluation professionals, the following findings and recommendations regarding NTG determination are presented:

- **Incorporate the refinements made in standard practices**. Historically, fairly simplistic measurement methods have been used to estimate free ridership. The computations have been based on self-reports. Sources of error with this method stem from faulty recall, bias toward claiming the program was not influential or influential, and from bias introduced in the form of hypothetical questions.

  The literature review noted improvements in self-report methodology including questions to distinguish "partial" free ridership. Later, studies combined partial free ridership with a review of "influencing factors" or "corroborating questions" which were used to adjust free ridership reports based on the combined evidence from the other

questions. For example, the questions might ask about the importance of the rebate in decision-making, whether the purchase was moved forward two years or more, whether they were already aware of the measures, and similar questions, and used these responses to validate or adjust responses to direct free ridership responses (Skumatz, Woods, and Violette 2004).

Other approaches have established multiple criteria for free ridership. In one study, free riders had to meet four criteria: aware of the measure before the program, intending to purchase before the program, aware of where to purchase the measure, and willing to pay full price. If the four conditions were met, the household or business was classified as a free rider. In another example, the Energy Trust of Oregon conducts long-term tracking on a number of programs –they assess the market, identify program influencers, and conduct in-depth research in order to determine how much of the gross savings to claim for the programs (Gordon 2008).

- **Recognize we may need to allow "credit-splitting or credit-sharing".** One key refinement may be the recognition that we may not be able to attribute "causality" to one program or intervention, but may need to consider splitting the credit. The issue of "chatter in the marketplace" is a concern, but this is also an issue for technology / measure / economic based programs as well as education / outreach programs. However, the industry has been more willing to apply causality to technology measures because we can see something put an implementation or desired decision "over the top" more clearly. It is important to understand what is happening in the market and if a 0/1 litmus test is required for causality, it is unlikely to be "proved" as attributable to a particular program or element (Messenger 2008). Recent attitudinal research from the Energy Center of Wisconsin confirmed that people get energy-saving information from multiple sources and concluded that… "it may take a village to raise a behavioral kilowatt-hour sometimes" (Bensch 2009). This may make it hard to attribute the kilowatt-hour to one specific influencer, but that doesn't make the kilowatt-hour less real or mean that the program had zero effect. The solution may be to acknowledge shares of the kilowatt-hour to multiple contributing factors (for behavioral and technology measures) and share the credit (Bensch 2009). And sharing the credit may be the right answer, as people may only pay attention if it is a 'whole choir singing the "save energy" song' (Bensch 2009). Sulyma (2009) argues that it is more than time to move beyond only "one" plausible explanation for impacts, and that probabilistic methods should be used to address this attribution issue.

- **Require random assignment for participants and non-participants for as many program types as feasible**. The experimental design approach has been well known for decades, with random assignment of eligible participants assigned to treatment and non-treatment groups. This helps address the baseline issue in a credible way. However, to implement this option would require the regulators, utilities, or agencies to "bite the bullet" in terms of the political fallout from those that want to participate but are put into the "no treatment" bucket. Or future participants could be put "on hold" – they could be used as a control group in the short term, but can participate in the program at a later time. This approach may be especially important for outreach and behavioral programs. Train (2009) suggests pairing this with a discrete choice model to predict behavior.

- Many interviewees also agreed that well-designed randomized control and treatment groups are well-suited to impact evaluation (and attribution) for behavioral programs; however, the evaluators and regulators have not developed the kind of faith in them that they have in other programs. The use of these approaches with appropriate modeling (including mixed logit, discrete choice, etc.) shows promise (Ridge et. al. 2009, Train 2009). There is also concern that these random techniques may become more complicated, as controlling for the many influences is complex (including spillover), making a battery of questions important to the analysis (Messenger 2008, Cooney 2008, Train 2009). However, these kinds of tools – well-accepted in other social fields and with history in energy - apply well to energy-based behavioral programs. More evaluations of behavioral programs, and greater widespread cataloguing of the results (along with time), may be necessary to gain greater acceptance by regulators.

- **Consider survey designs that introduce a real-time data collection element.** There have been several instances in which utilities have introduced NTG-surveys as part of the program participation documents and gather early feedback – near the point of actual decision-making – on the program's influence in adopting the measures (Gordon and Skumatz 2007). This provides several benefits: increases return rate / sample size (and eliminates the problem of finding participants after they have moved or after years of delay); provides on-going data and allows evaluation at virtually any point after the program is implemented to support on-going refinement of programs; significantly reduces the cost of surveying and evaluation; provides more accurate data if the point of feedback is close to decision-making (recall may be improved); and helps to sort out which programs had what degree of influence. This may be suited to education and behavioral programs as well as "widget" programs, but needs testing, as the approach has not been widely applied.[13]

- **Consider discrete choice modeling approaches.** These approaches introduce explanatory variables that help to address issues of imperfect control groups, unobserved factors, etc. to allow improved estimates of attributable impacts. A discrete choice model predicts a decision made by an individual (purchase a measure, adopt a behavior, participate in a program) as a function of a number of variables, including demographic, attitudinal, economic, programmatic, and other factors. The model can be used to estimate the total number of eligible households, businesses, etc. that change their behavior in response to a program or action. The model can also be used to derive elasticities, i.e., the percent change in participation or behavior change in response to a given change in any particular (program design, demographic, or other) variable.

- **Consider compromise or "hybrid" approaches for fiscal-related applications.** A case might be made that the most "accurate" metric is pure *ex-post* measurement especially when those estimates are used for planning and reward purposes. If the main "rub" arises when NTG elements are part of the computations of financial reward or program approval, there are several possible options for the short term (until a "grander" solution is identified). Short-term deemed values (1-2 years of a new program that differs from

[13] It has been suggested that the smart grid or technologies might enhance the opportunity for real time collection of some important data elements.

traditional offerings) could be identified, allowing time for development and refinement of new, creative programs without punishing fiscal consequences. The program could be dropped if performance doesn't meet the offerer's expectations, and the method avoids an innovation penalty. True-up at some point is necessary to assure that the field learns about the performance of different types of programs and to assure that ineffective programs are not rewarded indefinitely. Deemed spillover values may be especially needed for programs targeted at education. Long-term deemed values could be allowed for well-known program types based on measured NTG from programs around the nation, where program performance is checked every 3 years, and where programs are penalized that perform more poorly than the norm, or require program comparisons against "best practices" periodically (every 3 or so years). Again, periodic true-up is needed. Another "tweak" to test to encourage innovation might be allowing differential rewards: upside incentives could potentially be larger than downside penalties for innovative programs. For some large, important, or innovative programs, negotiations for a priori values might be used.[14] Fiscal incentives must encourage (or at least not penalize) innovation, or only mediocre or "same old" programs will be offered – and they will be offered well past when they should be out of the market.

Reliable measurement methods are available that suit many program types, but more work remains, including research needs in the following areas: [15]

- Greater application of enhanced NTG, free ridership, and spillover methods incorporating partial (and/or deferred) free ridership and corroborating information.
- Greater use of experimental design (including random assignment for participants and non-participants) for as many program types as feasible.
- Comprehensive market assessment work for baseline support, on non-participant spillover, and modeling of decision-making. This is particularly important for many training, education, and behavioral programs.
- Data collection approaches that introduce a real-time data collection element piggybacking on program handouts / materials / forms and to allow periodic reviews of performance in time to refine programs.
- Discrete choice and other modeling methods, and statistical techniques to help address issues of imperfect control groups, unobserved factors, etc., to allow for improved estimates of attributable impacts.
- Accumulation of results on elements of NTG in a database and continuously updated with new research and evaluations, so comparisons and tracking are facilitated.

[14] This may cover programs such as those offered to only a very few large businesses (industrial, etc.), for example. This is suggested by the method NYSERDA is implementing for measuring NTG from their custom program that has very few participants (Cook 2008).

[15] And, as recognized by one of the paper's reviewers, these "methods-type recommendations" do not touch on issues such as who does the evaluation and the ability to share results for real-time program improvement.

Summary

Estimating the effects of the program above and beyond what would have happened without the program involves a relatively complicated step – identifying the share of energy-efficient measures installed / purchased that would have been installed / purchased without the program's efforts. Traditional elements include free ridership and spillover, combined into a NTG ratio. Spillover is more complicated than free ridership to measure, and as a consequence, a number of utilities that include free ridership never estimate spillover. However, given that many of the benefits from outreach and educational programs – and from a host of "non-widget-based programs – are realized from "spreading the word" (and the behaviors that follow), developing and using reliable and trusted methods that incorporate free ridership in program computations is a priority. These results are needed for applications including program design / assessment / refinement / portfolio development, program exit timing, and incentives.

Reasonable reliability is needed to provide useful information. To provide the best chance for optimal programs, several things are needed. NTG, free ridership and spillover estimates that are as reliable and precise as needed for the particular use – with greater precision needed for the calculation of program or portfolio incentives vs. quasi-quantitative / qualitative uses. NTG, free ridership and spillover estimates that provide replicable results and are based on credible, defensible estimation methods suited to the accuracy needed are a critical step in getting NTG results included in design and evaluation. Methods suited to different levels of accuracy for estimates of NTG, free ridership and spillover at reasonable cost levels would help optimize expenditures where they are most needed, and balance the tradeoffs of program funds vs. evaluation expenditures. Similarly, there should be flexibility in the application of NTG, free ridership and spillover results depending on type of program (whether programs are new / innovative / pilot; "same-old-same-old"; cookie cutter; custom; information-based; etc.).

Finally, it is critical that the application of NTG results is conducted in ways that avoid discouraging the development of new and creative and potentially effective programs. NTG should be applied in ways that properly assess program performance, but makes the risk of fiscal investment in (especially, new and innovative) programs manageable and reasonably predictable.

Current incentive structures, calculating attribution among actors, and the difficulty in identifying "participants" in new programs are discouraging innovation and leading researchers to consider discarding NTG analyses as a tool in energy efficiency evaluation. This is throwing the baby out with the bathwater. Instead, more widespread application of some of the approaches summarized in this paper can preserve the positives but not be hampered by the negatives of traditional NTG assessment. These evaluations are needed to "help avoid making a wrong decision…" with the public's money. To do this effectively, we need good methods, and we need to make sure the results are fed back into programs to be used in decision-making.

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Schedule JMO-2

KCP&L-Great Missouri Operations (GMO)

COMMERCIAL AND INDUSTRIAL PRESCRIPTIVE REBATE PROGRAM

The following information regarding GMO's Commercial and Industrial Prescriptive Rebate Program is provided in compliance with 4 CSR 240-3.164(2)(C).

1. Program Description

- The primary goal of the Commercial & Industrial Prescriptive Rebate Program (Program) is to encourage GMO's C&I customers to install energy efficient measures in existing facilities. More specifically, the program is designed to: (1) provide incentives to facility owners and operators for the installation of high efficiency equipment and controls; and (2) provide a marketing mechanism for electrical contractors, mechanical contractors, and their distributors to promote energy efficient equipment to end users.

Prescriptive Energy Efficiency Measures
GMO's rebates for C&I prescriptive energy efficiency measures provides prescriptive incentives to C&I customers for the installation of energy efficient equipment for numerous end use applications. Rebates will be fixed per eligible energy efficiency measure.

The Company will maintain and make available a list of cost-effective energy efficiency Prescriptive Measures on its Company website. The Prescriptive Measure list, rebate amounts, and minimum efficiency criteria will be updated as market or industry conditions change. Measure category headings may include, but are not limited to:

- Lighting and Controls;
- Motors, Pumps, and Variable Frequency Drives;
- HVAC;
- Process;
- ENERGIY STAR® Equipment;
- Business Computing; and
- Food Service and Refrigeration.

Incentives for each technology will vary based on cost effectiveness and market response. The program strives to cover at least 50% of the incremental cost of the measure to stimulate the market if it is cost effective. Additional guidelines may be established such as total incentives available pre customer per year to assure that funds are allocated across all customer opportunities.

2. Prescriptive Energy Efficiency Measures List

Below is a listing of proposed eligible prescriptive energy efficiency measures and rebates.

LIGHTING & CONTROLS PRESCRIPTIVE MEASURES	
Measure	Rebate
T8 with Electronic Ballast	
T8 8ft 1 lamp replacing T12 (retrofit only)	$ 25.00
T8 8ft 2 lamp replacing T12 (retrofit only)	$ 27.00
T8 4ft 4 lamp replacing T12 (retrofit only)	$ 28.50
T8 4ft 3 lamp replacing T12 (retrofit only)	$ 27.00
T8 4ft 2 lamp replacing T12 (retrofit only)	$ 18.00
T8 4ft 1 lamp replacing T12 (retrofit only)	$ 16.50
T8 3ft 4 lamp replacing T12 (retrofit only)	$ 28.50
T8 3ft 3 lamp replacing T12 (retrofit only)	$ 27.00
T8 3ft 2 lamp replacing T12 (retrofit only)	$ 18.00
T8 3ft 1 lamp replacing T12 (retrofit only)	$ 16.50
T8 2ft 4 lamp replacing T12 (retrofit only)	$ 28.50
T8 2ft 3 lamp replacing T12 (retrofit only)	$ 27.00
T8 2ft 2 lamp replacing T12 (retrofit only)	$ 18.00
T8 2ft 1 lamp replacing T12 (retrofit only)	$ 16.50
T8 HO 8ft 1 lamp replacing T12 (retrofit only)	$ 33.00
T8 HO 8ft 2 lamp replacing T12 (retrofit only)	$ 36.00
T8 HB 4ft 4L (retrofit only replacing 250-399W HID)	$ 80.00
T8 HB 4ft 6L (retrofit only replacing 400-999W HID)	$ 60.00
T8 HB 4ft 8L (retrofit only replacing 400-999W HID)	$ 100.00
2 fixtures – T8 32W HB 4ft 8 Lamp (retrofit only replacing 1,000W HID-2 for one replacement)	$ 200.00

T5 with Electronic Ballast		
T5 1 lamp replacing T12 (retrofit only)	$	30.00
T5 2 lamp replacing T12 (retrofit only)	$	37.00
T5 3 lamp replacing T12 (retrofit only)	$	40.00
T5 4 lamp replacing T12 (retrofit only)	$	44.00
T5 HO 1 lamp replacing T12 (retrofit only)	$	60.00
T5 HO 2 lamp replacing T12 (retrofit only)	$	70.00
T5 HO 3 lamp replacing T12 (retrofit only)	$	88.00
T5 HO 4 lamp replacing T12 (retrofit only)	$	112.00
T5 HO HB 3L (retrofit only replacing 250-399W HID)	$	90.00
T5 HO HB 4L (retrofit only replacing 400-999W HID)	$	96.00
T5 HO HB 6L (retrofit only replacing 400-999W HID)	$	175.00
2 fixtures – T5 HO HB 6 Lamp (retrofit only replacing 1,000W HID-2 for one replacement)	$	350.00
Compact Fluorescents (CFL)		
42W 8 lamp HB CFL	$	200.00
CFL – Screw In (lamp only)	$	2.00
CFL – Hardwired (Fixture and lamp)	$	22.00
320W Pulse Start Halide (retrofit only)	$	75.00
Low Watt High Performance T8 Lighting		
Re-lamp T8 fixtures with low Watt T8 lamps-30 watts or less. Replace standard T8 systems with 4' 25W, 28W, or 30W T8 U lamps and approved ballast OR relamp existing T8 fixtures with low Watt T8 lamps 28W or less. In order to qualify for incentives, ballasts must be from CEE approved list (www.cee1.org).	$	0.50/lamp

Other Efficient Lighting Technologies	
21" Tubular Skylight/Light Tube	$250.00/fixture
LED Exit Signs (replacement fixture only)	$10.00/fixture
Daylight Sensor Lighting Control	$0.09 per Watt controlled
Centralized Lighting Control	$0.09 per Watt controlled
Multilevel Lighting Control	$0.09 per Watt controlled
Occupancy Sensors	
Under 500 W connected to sensor	$0.11 per Watt controlled
Over 500 W connected to sensor	$0.11 per Watt controlled

MOTORS, PUMPS, AND VFDs PRESCRIPTIVE MEASURES		
Nominal Efficiencies for "NEMA Premium™" Induction Motors		
HP	Rebate per HP	Minimal Efficiency
1 to 5	$ 46.50	Motors must be 1-200 hp NEMA Design A/B, 460 volts, TEFC or ODP and 1200rpm, 1800 rpm, or 3600 rpm, and the motor must be included in the most recent Consortium for Energy Efficiency (CEE) Premium Efficiency Motors List. http://www.cee1.org/ind/mot-sys/mtr-ms-main.php3
7.5 to 20	$ 104.80	
25 to 100	$ 271.00	
125 - 200	$ 820.00	
300	$ 820.00	Motors must be general-purpose, single-speed, polyphase, 250-500 horsepower, 2,4, and 6 pole, squirrel cage induction motors, NEMA Design A or B, continuous rated which meet or exceed the nominal energy efficiency levels presented in NEMA Standards Publication MG1-2003, in Table 12-12.
VFD = Variable frequency drive		

To be eligible to be included in the CEE Premium Efficiency Motors List, a motor's nominal efficiency must be at least one full National Electrical Manufacturers Association (NEMA) band higher than the 2007 US Energy Independence and Security Act (EISA) specified nominal efficiency (as defined in NEMA Motor Guide 1 Table 12-12) and the motor and corresponding nominal efficiency must be listed in a publicly available document, such as product catalog or cut sheet amounting to an advertised claim of performance, or the reporting entity must wish it to be treated as publicly available (and expressly claim to achieve performance based upon the noted test procedure).

High Efficiency Pumps		
HP	Minimal Efficiency	Rebate
1.5	Pump efficiency of 75% or greater for the dominant operating conditions as demonstrated by a pump performance curve	$ 210.00
2		$ 220.00
3		$ 230.00
5		$ 240.00
7.5		$ 250.00
10		$ 260.00
15		$ 300.00
20		$ 400.00

Variable Frequency Drives (VFDs)	
HP	Rebate
1.5	$ 1,930.25
2	$ 1,985.25
3	$ 2,047.65
5	$ 2,176.50
7.5	$ 2,751.50
10	$ 2,864.00
15	$ 3,580.50
20	$ 4,030.50
25	$ 4,705.50
30	$ 5,414.00
40	$ 5,685.00
50	$ 7,128.00

VFD = Variable frequency drive
HP = Horsepower

HVAC PRESCRIPTIVE MEASURES		
Size	Efficiency	Rebate
Unitary and Rooftop Air Conditioning		
<65,000 BTUH (1 Phase)	14 SEER	$200.00
<65,000 BTUH (3 Phase)	13 SEER	$200.00
65,000-135,000 BTUH	11.5 EER	$400.00
136,000-240,000 BTUH	11.5 EER	$800.00
241,000-760,000 BTUH	10.5 EER	$1,000.00
>760,000 BTUH	10.5 EER	$2,600.00
Unitary and Rooftop HP		
<65,000 BTUH (1 Phase)	14 SEER	$200.00
<65,000 BTUH (3 Phase)	13 SEER	$200.00
65,000-135,000 BTUH	11.5 EER	$400.00
136,000-240,000 BTUH	11.5 EER	$800.00
>240,000 BTUH	10.5 EER	$1,000.00
Water Source Heat Pump		
<17,000	11.5 EER	$16.00
17,000-65,000	12.3 EER	$46.00
65,000-135,000	12.3 EER	$115.00
Ground Source Heat Pump		
Ground Source HP Closed Loop, all	13.7 EER	$300
Water Cooled Chillers, Rotary Screw and Scroll		
< 75 Tons	FL: 0.702 kW/T ILPV: 0.540 kW/T	$25 / T
≥ 75 and < 150 T	FL: 0.698 kW/T ILPV: 0.527 kW/T	$25 / T
150-300 tons	FL: 0.612 kW/T ILPV: 0.486 kW/T	$40 / T
> 300 tons	FL: 0.588 kW/T ILPV: 0.441 kW/T	$40 / T
Water Cooled Chillers, Centrifugal		
< 150 T	FL: 0.571 kW/T ILPV: 0.405 kW/T	$30 / T
150-300 tons	FL: 0.571 kW/T ILPV: 0.405 kW/T	$35 / T
> 300 tons	FL: 0.513 kW/T ILPV: 0.360 kW/T	$20 / T

Air Cooled Chillers		
	Minimum Full Load Efficiency (FL) of a 10.52 EER, or an Integrated Part Load Value (ILPV) of 13.75 EER for units less than 150 Tons or an ILPV of 14.03 EER for units greater than or equal to 150 Tons	$25 / Ton
HP Water Heater		
500 gallon/day	3.0 COP	$3,500.00
1000 gallon/day	3.0 COP	$5,000.00
1500 gallon/day	3.0 COP	$7,000.00
Packaged Terminal A/C		
	9.2 EER	$60.00
Packaged Terminal HP		
	9.0 EER	$60.00

HVAC PRESCRIPTIVE MEASURES-Continued	
Size/Measure	Rebate
Chilled Water Reset Air Cooled	
0-100 tons	$550.00
100-200 tons	$750.00
200-300 tons	$875.00
300-400 tons	$875.00
400-500 tons	$900.00
Chilled Water Reset Water Cooled	
0-1000 tons	$500.00
1000-2000 tons	$750.00
2000-3000 tons	$875.00
Energy Star Sleeve Air Conditioners	
> 14,000 BTU/h	$15.00
< 14,000 BTU/h	$15.00
Other Measures	
Economizer	$50.00
Tuneup - Refrigerant Charge (retrofit only)	$15.00
Setback/Programmable Thermostat	$35.00
Window Film	$1 sq. ft.

PROCESS PRESCRIPTIVE MEASURES	
Measure	Rebate
Engineered Nozzles	$20.00/nozzle
Barrel Wraps for Injection Molders & Extruders	$1.00/ton
Insulated Pellet Dryer Ducts-3" diameter	$15.00/ linear ft.*
Insulated Pellet Dryer Ducts-4" diameter	$20.00/ linear ft.*
Insulated Pellet Dryer Ducts-5" diameter	$25.00/ linear ft.*
Insulated Pellet Dryer Ducts-6" diameter	$30.00/ linear ft.*
Insulated Pellet Dryer Ducts-8" diameter	$40.00/ linear ft.*
*capped at 50% of final invoiced product cost	

ENERGY STAR® PRESCRIPTIVE MEASURES	
Measure	Rebate
ENERGY STAR Commercial Solid Door Refrigerators	
Less than 20 ft^3	$125.00/refrigerator
20-40 ft3	$250.00/refrigerator
More than 48 ft^3	$450.00/refrigerator
ENERGY STAR Commercial Solid Door Freezers	
Less than 20 ft^3	$75.00/freezer
20-40 ft3	$200.00/freezer
More than 48 ft^3	$350.00/freezer
Ice Machines*	
Less than 500 lbs ice production	$300.00/machine
500-1000 lbs ice production	$750.00/machine
More than 1000 lbs ice production	$1,000/machine
Energy Star Commercial Clothes Washers	
Washers Only	$130.00/washer
* Must meet Consortium for Energy Efficiency's (CEE) Tier 1 ice machine specification. Flake and nugget machines are not included.	

BUSINESS COMPUTING PRESCRIPTIVE MEASURES	
Measure	Rebate
Plug Load Occupancy Sensor Document Stations*	$40.00/station
80 PLUS Desktop Computer	$5.00/computer
80 PLUS Desktop-Derived Server	$10.00/server
Network Desktop Computer Power Management Software	$15.00/desktop computer
*Must have three (3) devices connected to plug load service	

FOOD SERVICE AND REFRIGERATION PRESCRIPTIVE MEASURES	
Measure	Rebate
Cold Beverage Vending Machine Controllers	$50.00/unit
Anti-sweat Heater Controls*	$40.00/door
Efficient Refrigeration Condenser	$17.50/ton of refrigeration capacity
Night Covers For Open Displays**	$17.50/per lineal foot
Head Pressure Control*	$60.00/ton of refrigeration
*Up to 50% of project costs **Store operation must allow covers to be covering cases at least 6 hours per 24 hour period.	

3. Program Goal

A. Expected energy and demand savings – time horizon

The expected annual, cumulative gross and net energy and demand savings for the Commercial and Industrial Prescriptive Rebate Program over the estimated life of the program is shown below.

Cumulative	Program Energy Savings (kWh) - gross	Program Energy Savings (kWh) - net	Program Demand Savings (kW) - gross	Program Demand Savings (kW) - net
Year 1	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 2	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 3	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 4	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 5	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 6	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **

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Year 7	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 8	**		**	**		**	**		**	**		**
Year 9	**		**	**		**	**		**	**		**
Year 10	**		**	**		**	**		**	**		**
Year 11	**		**	**		**	**		**	**		**
Year 12	**		**	**		**	**		**	**		**
Year 13	**		**	**		**	**		**	**		**
Year 14	**		**	**		**	**		**	**		**
Year 15	**		**	**		**	**		**	**		**
Year 16	**		**	**		**	**		**	**		**
Year 17	**		**	**		**	**		**	**		**
Year 18	**		**	**		**	**		**	**		**
Year 19	**		**	**		**	**		**	**		**
Year 20	**		**	**		**	**		**	**		**

B. Proposed annual and demand savings targets – time horizon

The proposed annual energy and demand savings targets and cumulative energy and demand savings targets for the Commercial and Industrial Prescriptive Rebate Program over the estimated life of the program is shown below.

	Energy Savings (kWh) targets		Energy Savings (kWh) targets - cumulative		Demand Savings (kW) targets		Demand Savings (kW) targets- cumulative	
Year 1	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**
Year 2	**		**	**		**	**		**	**
Year 3	**		**	**		**	**		**	**
Year 4	**		**	**		**	**		**	**
Year 5	**		**	**		**	**		**	**
Year 6	**		**	**		**	**		**	**
Year 7	**		**	**		**	**		**	**
Year 8	**		**	**		**	**		**	**
Year 9	**		**	**		**	**		**	**

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Year 10	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 11	**		**	**		**	**		**	**		**
Year 12	**		**	**		**	**		**	**		**
Year 13	**		**	**		**	**		**	**		**
Year 14	**		**	**		**	**		**	**		**
Year 15	**		**	**		**	**		**	**		**
Year 16	**		**	**		**	**		**	**		**
Year 17	**		**	**		**	**		**	**		**
Year 18	**		**	**		**	**		**	**		**
Year 19	**		**	**		**	**		**	**		**
Year 20	**		**	**		**	**		**	**		**

4. Program Framework/Strategy

A. Relationship to other programs

The C&I Prescriptive Rebate Program are designed for commercial and industrial customers; therefore, the program has a strong relationship through promotion with the Company's other Commercial and Industrial (C&I) demand side management (DSM) programs, such as the C&I Custom Rebate Program-Retrofit, C&I Custom Rebate Program-New Construction, Building Operator Certification (BOC) program, MPower, Optimizer (for small general service customers), and Business Energy Analyzer.

B. Marketing strategy

All GMO commercial and industrial customers are eligible for these rebate programs. Customers may apply for individual or multiple efficiency measures within the same facility under any of these programs.

In order to promote the various Prescriptive Energy Efficiency Measures, targeted messaging will be done to reach specific industries. The table below lists the seven possible subcategories of the program with the industries and entities that will be targeted to market the rebates.

C&I Prescriptive Energy Efficiency Measures	Industries and Entities
Prescriptive Motors, Pumps & VFDs	Motor manufacturers and distributors
Food Service & Refrigeration	Restaurant associations, equipment manufacturers and distributors, grocery stores, convenience stores, gas stations
HVAC	HVAC dealers, manufacturers and distributors
Lighting	Lighting manufacturers and distributors
Process	Air compressors, injection molding manufacturers
ENERGY STAR Commercial Appliances	Manufacturers and distributors of refrigerators, freezers, ice machines, clothes washers
Office Computing	Data centers, facility managers, schools, office managers, hospitals

GMO will use Energy Consultants to help promote the C&I Prescriptive Rebate Programs with Tier 1 customers.

Marketing Tactics

For the C&I Prescriptive Rebate Programs, GMO will continue to develop and foster our relationships with commercial professional/trade associations. Listed below are the associations that GMO believes will be instrumental in the continued success of this program.

Commercial Professional / Trade Organizations	Acronym
Air Conditioning Contractors of America	ACCA
American Council of Engineering Companies	ACEC-KS
American Institute of Architects of KCMO	AIA
American Institute of Architects of Mid-America	AIA – Mid Am
American Society of Heating Refrigeration Air Conditioning Engineers	ASHRAE
Association of Energy Engineers	AEE
Business Owners and Managers Association	BOMA
Design-Build Institute of America Mid-America Region	DBIA-MAR
Electric League of Missouri & Kansas	EL -- KS
Illuminating Engineering Society – KC Section	IES -- KC
International Facilities Management Association	IFMA
Mechanical Contractors Association of KC	MCA
National Electrical Contractors Association	NECA
The Builders Association	BA
U.S. Green Building Council	USGBC

For the C&I Prescriptive Rebate Program, GMO has identified the following internal and external print communications as possible marketing channels:

Externally Published Communications:

- The Kansas City Star – Business section on Tuesdays;
- HVAC/Lighting contractor newsletters/magazines;
- Kansas City Business Journal (Book of Lists); and
- Builder/Architect magazine.

Internally Published Communications

- Energy Talk. This is a monthly newsletter e-mailed to Tier 1 customers from GMO's Energy Consultants.
- The Wire. (Commercial version). This is a quarterly newsletter from GMO that is included with a customer's bill.
- Bill messaging.
- On line promotion with GMO's other e-Services products.

Other marketing activities may include:

- Online advertising will be used with Google AdWords;
- Placement of information on trade ally Web sites;
- Attend and present at conferences and public events, such as Chamber of Commerce meetings, to increase general awareness of the program and distribute program promotional materials;
- Hold seminars with targeted messages to different industry classifications;
- Hold seminars with architects and engineers, trade allies, and trade organizations; or
- Sponsor spots on public radio.

C. Program delivery

The C&I Prescriptive Rebate Program will be implemented by GMO with necessary resources to administer the Program. A Program Administrator will be responsible for items such as incentive processing, rebate processing, communication with the customer to resolve application issues, and status reporting associated with the Program as GMO directs.

GMO will utilize an internal program manager to conduct its own administration of the program. GMO's program manager will maintain oversight of the Program.

GMO will continue to market the program and utilize their sales teams to work with specific customers, such as Tier 1 or Tier 2/3 customers.

D. Partners

Partners include GMO internal staff, various trade associations, local Chamber of Commerce organizations, and others as needed to promote and encourage customer participation in the program.

5. Program Beneficiaries

A. Expected number of participants by customer class or subclass

The number of expected program end use measures (net-free) expected to be undertaken by Missouri C&I customers over the five-year period is shown below.

	Missouri Annual End Use Program Measures (Net-Free)		
Year 1	**	[redacted]	**
Year 2	**		**
Year 3	**		**
Year 4	**		**
Year 5	**		**
Total	**		**

B. Other beneficiaries

No other beneficiaries have been observed.

6. Program Benefit-Cost Analysis

All five benefit-cost tests are shown below for the roll-up of the C&I Rebate programs. The dollar values below are on a present value basis with the assumption that all future cash flows start at the beginning of each annual period, discounted at the appropriate discount rate.

Commercial & Industrial Rebates		
Test Name	**Market Based Test Results**	**Cost Based Test Results**
Utility Test	4.00	2.66
TRC Test	3.56	2.37
RIM Test	1.07	0.71
RIM (Net Fuel)	1.31	0.87
Participant Test	2.86	2.86
Societal Test	4.11	2.92

Assumptions		
Utility Discount Rate (%)	7.45%	7.45%
Participant Discount Rate (%)	10.00%	10.00%
Electric Losses (%)	5.50%	5.50%
Societal Discount Rate (%)	3.00%	3.00%

Avoided Costs						
Avoided T&D ($ / kW)	**	[redacted]	**	**	[redacted]	**
Avoided Market-Based Ancillary Service Charges (OATT)	**	[redacted]	**	**	[redacted]	**
Cost-Based Proxy for Avoided Capacity ($ / kW Annualized)	**	[redacted]	**	**	[redacted]	**
CO2 emissions (kG/kWh)	**	[redacted]	**	**	[redacted]	**

Cost Based Avoided Electric Production	**	[redacted]	**
Avoided T&D Electric, w OATT	**	[redacted]	**
Avoided Electric Capacity	**	[redacted]	**
Total Cost Based Avoided Costs	**	[redacted]	**

Market Based Avoided Electric Production Costs	**	[redacted]	**

Program Costs			
Administration Costs	**	[redacted]	**
Implementation / Participation Costs	**	[redacted]	**
Customer Incentives	**	[redacted]	**
Other / Miscellaneous Costs	**	[redacted]	**
Total Program Cost	**	[redacted]	**

Participant Cost (Gross)	**	[redacted]	**

Environmental Benefits, NOx SOx	**	[redacted]	**

Lost Revenue			
Gross Lost Revenue, Electric	**	[redacted]	**
Net Fuel Lost Revenue, Electric	**	[redacted]	**

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7. Program Evaluation, Measurement and Verification Plan

Program evaluation, measurement and verification (EM&V) are key elements of demand-side management (DSM) programs. EM&V is used to document and measure the effects of a program and determine whether the program met its goal with respect to being a reliable energy resource. EM&V is also used to help understand why certain effects occurred and identify ways to improve current programs and to select future programs.

The two types of evaluation which will be utilized by GMO are:

Process evaluation: Process evaluation assesses program delivery, from design to implementation, in order to identify bottlenecks, efficiencies, what did and did not work, constraints and potential improvements.

Evaluation plans will be developed by the selected evaluation contractor(s) as set forth in 4 CSR 240-20.093(7) and will describe all necessary data collection, process evaluation tasks and impact evaluation tasks by program. Evaluation Plans include the following information:

- Study Methodology by Program;
- Data Collection Strategies;
- Data Requests by Program; and
- Detailed Work Plan and Schedule.

Impact evaluation: Impact evaluation determines the impacts (energy and demand savings) and co-benefits (avoided emissions, energy security, transmission/distribution benefits) that directly result from a program. Impact evaluations also support cost-effectiveness analyses aimed at identifying relative program costs and benefits.

The Monitoring and Verification process acts as a quality control and quality assurance process for the savings, tracking and accounting for the program.

Monitoring: This is the monitoring of installations when needed to determine or verify savings from a measure that is applied in a unique way, is significant in savings, or is new to the market. Working with the evaluation contractor, guidelines are developed to determine which projects should be monitored.

Verification: During the processing of an application for customer incentives (rebates), GMO reviews the equipment specifications by model number to determine if that measure qualifies. This "paper" verification occurs on all applications. Additionally, there are random field visits to assure the correct number and types of measures were installed at the customer's facility.

Market Transformation: This is the strategic process of intervening in a market to create lasting change in market behavior by removing identified barriers or using opportunities to accelerate the adoption of all cost-effective energy efficiency as a matter of standard practice.

GMO will retain one or more EM&V contractors to perform process and impact evaluations for its programs and assess progress of market transformation in order to avoid conflicts of interest and to insure credibility of the evaluation results, as well as comply with Commission requirements. GMO expects to conduct EM&V after Program Year 2 is completed.

8. Program Budget (Five-Year)

Although the C&I Prescriptive Energy Efficiency Measures Rebate Program is a new facet to GMO's already established C&I Rebate Programs, GMO does not have any start-up costs. The expected budget for the C&I Rebate Program over the five-year period is shown below.

Commercial & Industrial Prescriptive Rebate Program												
	Admin			Incentive			Implementation			Other including M&V			Total		
Year 1	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 2	**		**	**		**	**		**	**		**	**		**
Year 3	**		**	**		**	**		**	**		**	**		**
Year 4	**		**	**		**	**		**	**		**	**		**
Year 5	**		**	**		**	**		**	**		**	**		**
Total	**		**	**		**	**		**	**		**	**		**

9. Strategies to minimize free riders and maximize spillover

The development of this program incorporated available information from market studies, consultant studies and the California DEER database on program impacts of free ridership and spillover in the initial program design. After two years of program implementation, KCP&L will perform an evaluation, measurement and verification study and these results will be incorporated into the program design. This process provides the input necessary to minimize free-ridership and maximize spillover.

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9.29 Commercial & Industrial Prescriptive Rebate Program

A. PURPOSE: The Commercial & Industrial Prescriptive Rebate Program (Program) is designed to encourage Commercial & Industrial (C&I) customers to install energy efficient measures in existing facilities. More specifically, the program is designed to:

• provide incentives to facility owners and operators for the installation of high efficiency equipment and controls; and
• provide a marketing mechanism for electrical contractors, mechanical contractors, and their distributors to promote energy efficient equipment to end users.

B. AVAILABILITY: These Programs are available to any of the Company's customers served under GS, SGS, LGS, or LPS rate schedules. Customer applications will be evaluated and the rebates will be distributed on a first-come basis according to the date of the customer's application.

This Program is offered in accordance with Section 393.1075, RSMo. Supp. 2009 (the Missouri Energy Efficiency Investment Act).

Customer participation is limited to fund availability and the Company reserves the right to modify or terminate this Program at any time, subject to Commission approval.

C. DEFINITIONS:

Administrator – The Program will be implemented by a third-party vendor specializing in programs of this type. The Administrator will be responsible for marketing, training, incentives and reports.

Eligible Measure – Products incentivized in the Program which are pre-screened and determined to provide the required energy efficiency benefit.

Program Partner – A retailer, distributor, or manufacturer of ENERGY STAR® qualified products who has met the qualifications and executed the necessary agreements for participating in the Lighting and Appliance Program. Participating Program Partners will be listed on the KCPL.com website with store name and location listed as well as any in-store promotions being offered at the current time.

D. PROGRAM PROCESS: The following general process will be followed:

• Participants should obtain and review the C&I Prescriptive Rebate Program Application.
• Contact the Company to reserve rebate funds for the premise.
• Purchase and install eligible energy efficient measures.
• Complete the rebate Application documents along with a copy of all purchase receipts.

9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

E. PROGRAM PROVISIONS: Reservations for rebates are required and will be accepted on a first-come, first-served basis prior to the installation of any product(s). Rebates will not be paid without a corresponding reservation. Multiple rebate reservations for different phases of the energy efficiency retrofit projects for the same premise are acceptable. A single Participant cannot have more than $250,000 in rebate reservations at any point in time. Reservations are valid for 90 calendar days from the date of reservation request. Contact details will be posted on KCPL.com.

Participants are free to hire any licensed contractor to install these eligible measures. The Company has no liability or responsibility whatsoever, concerning the contractor.

Participants are responsible for complying with applicable permitting requirements, restrictions, codes, ordinances, rules, and regulations pertaining to all installations. All eligible measures must be purchased new. Measures that are used, rebuilt, resale, rented or leased, won as prizes, or provided by insurance companies do not qualify.

Rebates are limited to only one rebate per eligible measure (for example, lighting retrofit) per premise every five (5) years. The final requested total rebate amount for the total project cannot exceed the reserved total rebate amount.

The Company may conduct an on-site inspection to verify eligible measure(s) eligibility, installation, and operation prior to payment of the rebate.

Eligible measures installed and paid incentives under this Program are not eligible for an incentive through any of the Company's other Energy Efficiency programs.

A rebate check for eligible measure(s) will be mailed no later than eight weeks after the Company receives the completed application including all required documentation. If the project is selected for inspection, the verification process may delay payment. Incomplete or incorrect applications cannot be processed.

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9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

F. ELIGIBLE MEASURES:

LIGHTING & CONTROLS PRESCRIPTIVE MEASURES	
Measure	Rebate
T8 with Electronic Ballast	
T8 8ft 1 lamp replacing T12 (retrofit only)	$25.00
T8 8ft 2 lamp replacing T12 (retrofit only)	$27.00
T8 4ft 4 lamp replacing T12 (retrofit only)	$28.50
T8 4ft 3 lamp replacing T12 (retrofit only)	$27.00
T8 4ft 2 lamp replacing T12 (retrofit only)	$18.00
T8 4ft 1 lamp replacing T12 (retrofit only)	$16.50
T8 3ft 4 lamp replacing T12 (retrofit only)	$28.50
T8 3ft 3 lamp replacing T12 (retrofit only)	$27.00
T8 3ft 2 lamp replacing T12 (retrofit only)	$18.00
T8 3ft 1 lamp replacing T12 (retrofit only)	$16.50
T8 2ft 4 lamp replacing T12 (retrofit only)	$28.50
T8 2ft 3 lamp replacing T12 (retrofit only)	$27.00
T8 2ft 2 lamp replacing T12 (retrofit only)	$18.00
T8 2ft 1 lamp replacing T12 (retrofit only)	$16.50
T8 HO 8ft 1 lamp replacing T12 (retrofit only)	$33.00
T8 HO 8ft 2 lamp replacing T12 (retrofit only)	$36.00
T8 HB 4ft 4L (retrofit only replacing 250-399W HID)	$80.00
T8 HB 4ft 6L (retrofit only replacing 400-999W HID)	$60.00
T8 HB 4ft 8L (retrofit only replacing 400-999W HID)	$100.00
2 fixtures – T8 32W HB 4ft 8 Lamp (retrofit only replacing 1,000W HID-2 for one replacement)	$200.00
T5 with Electronic Ballast	
T5 1 lamp replacing T12 (retrofit only)	$30.00
T5 2 lamp replacing T12 (retrofit only)	$37.00
T5 3 lamp replacing T12 (retrofit only)	$40.00
T5 4 lamp replacing T12 (retrofit only)	$44.00
T5 HO 1 lamp replacing T12 (retrofit only)	$60.00
T5 HO 2 lamp replacing T12 (retrofit only)	$70.00
T5 HO 3 lamp replacing T12 (retrofit only)	$88.00
T5 HO 4 lamp replacing T12 (retrofit only)	$112.00
T5 HO HB 3L (retrofit only replacing 250-399W HID)	$90.00
T5 HO HB 4L (retrofit only replacing 400-999W HID)	$96.00
T5 HO HB 6L (retrofit only replacing 400-999W HID)	$175.00
2 fixtures – T5 HO HB 6 Lamp (retrofit only replacing 1,000W HID-2 for one replacement)	$350.00

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9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

F. ELIGIBLE MEASURES: (continued)

LIGHTING & CONTROLS PRESCRIPTIVE MEASURES - Continued	
Measure	Rebate
Compact Fluorescents (CFL)	
42W 8 lamp HB CFL	$200.00
CFL – Screw In (lamp only)	$2.00
CFL – Hardwired (Fixture and lamp)	$22.00
320W Pulse Start Halide (retrofit only)	$75.00
Low Watt High Performance T8 Lighting	
Re-lamp T8 fixtures with low Watt T8 lamps-30 watts or less	$0.50/lamp
Replace standard T8 systems with 4' 25W, 28W, or 30W T8 U lamps and approved ballast OR relamp existing T8 fixtures with low Watt T8 lamps 28W or less. In order to qualify for incentives, ballasts must be from CEE approved list (www.cee1.org).	
Other Efficient Lighting Technologies	
21" Tubular Skylight/Light Tube	$250.00/fixture
LED Exit Signs (replacement fixture only)	$10.00/fixture
Daylight Sensor Lighting Control (over 10,000 square feet controlled)	$0.09 per Watt controlled
Centralized Lighting Control (over 10,000 square feet controlled automatically)	$0.09 per Watt controlled
Multilevel Lighting Control (over 10,000 square feet controlled)	$0.09 per Watt controlled
Occupancy Sensors	
Under 500 W connected to sensor	$0.11 per Watt controlled
Over 500 W connected to sensor	$0.11 per Watt controlled

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9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

F. ELIGIBLE MEASURES: (continued)

MOTORS, PUMPS, AND VFDs PRESCRIPTIVE MEASURES		
Nominal Efficiencies for "NEMA Premium™" Induction Motors		
HP	Rebate per HP	Minimal Efficiency
1 to 5	$ 46.50	Motors must be 1-200 hp NEMA Design A/B, 460 volts, TEFC or ODP and 1200rpm, 1800 rpm, or 3600 rpm, and the motor must be included in the most recent Consortium for Energy Efficiency (CEE) Premium Efficiency Motors List. http://www.cee1.org/ind/mot-sys/mtr-ms-main.php3
7.5 to 20	$ 104.80	
25 to 100	$ 271.00	
125 - 200	$ 820.00	
300	$ 820.00	Motors must be general-purpose, single-speed, polyphase, 250-500 horsepower, 2,4, and 6 pole, squirrel cage induction motors, NEMA Design A or B, continuous rated which meet or exceed the nominal energy efficiency levels presented in NEMA Standards Publication MG1-2003, in Table 12-12.
VFD = Variable frequency drive		

To be eligible to be included in the CEE Premium Efficiency Motors List, a motor's nominal efficiency must be at least one full National Electrical Manufacturers Association (NEMA) band higher than the 2007 US Energy Independence and Security Act (EISA) specified nominal efficiency (as defined in NEMA Motor Guide 1 Table 12-12) and the motor and corresponding nominal efficiency must be listed in a publicly available document, such as product catalog or cut sheet amounting to an advertised claim of performance, or the reporting entity must wish it to be treated as publicly available (and expressly claim to achieve performance based upon the noted test procedure).

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9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

F. ELIGIBLE MEASURES: (continued)

MOTORS, PUMPS, AND VFDs PRESCRIPTIVE MEASURES		
High Efficiency Pumps		
HP	Minimal Efficiency	Rebate
1.5	Pump efficiency of 75% or greater for the dominant operating conditions as demonstrated by a pump performance curve	$210.00
2		$220.00
3		$230.00
5		$240.00
7.5		$250.00
10		$260.00
15		$300.00
20		$400.00
Variable Frequency Drives (VFDs)		
HP		Rebate
1.5		$1,930.25
2		$1,985.25
3		$2,047.65
5		$2,176.50
7.5		$2,751.50
10		$2,864.00
15		$3,580.50
20		$4,030.50
25		$4,705.50
30		$5,414.00
40		$5,685.00
50		$7,128.00
VFD = Variable frequency drive HP = Horsepower		

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9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

F. ELIGIBLE MEASURES: (continued)

HVAC PRESCRIPTIVE MEASURES		
Size	Efficiency	Rebate
Unitary and Rooftop Air Conditioning		
<65,000 BTUH (1 Phase)	14 SEER	$200.00
<65,000 BTUH (3 Phase)	13 SEER	$200.00
65,000-135,000 BTUH	11.5 EER	$400.00
136,000-240,000 BTUH	11.5 EER	$800.00
241,000-760,000 BTUH	10.5 EER	$1,000.00
>760,000 BTUH	10.5 EER	$2,600.00
Unitary and Rooftop HP		
<65,000 BTUH (1 Phase)	14 SEER	$200.00
<65,000 BTUH (3 Phase)	13 SEER	$200.00
65,000-135,000 BTUH	11.5 EER	$400.00
136,000-240,000 BTUH	11.5 EER	$800.00
>240,000 BTUH	10.5 EER	$1,000.00
Water Source Heat Pump		
<17,000	11.5 EER	$16.00
17,000-65,000	12.3 EER	$46.00
65,000-135,000	12.3 EER	$115.00
Ground Source Heat Pump		
Ground Source Closed Loop	13.7 EER	$300
Water Cooled Chillers, Rotary Screw and Scroll		
< 75 Tons	FL: 0.702 kW/T ILPV: 0.540 kW/T	$25 / T
≥ 75 and < 150 T	FL: 0.698 kW/T ILPV: 0.527 kW/T	$25 / T
150-300 tons	FL: 0.612 kW/T ILPV: 0.486 kW/T	$40 / T
> 300 tons	FL: 0.588 kW/T ILPV: 0.441 kW/T	$40 / T
Water Cooled Chillers, Centrifugal		
< 150 T	FL: 0.571 kW/T ILPV: 0.405 kW/T	$30 / T
150-300 tons	FL: 0.571 kW/T ILPV: 0.405 kW/T	$35 / T
> 300 tons	FL: 0.513 kW/T ILPV: 0.360 kW/T	$20 / T

KCP&L Greater Missouri Operations Company For Territory Served as L&P and MPS
KANSAS CITY, MO 64106

RULES AND REGULATIONS
ELECTRIC

9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

E. ELIGIBLE MEASURES:

HVAC PRESCRIPTIVE MEASURES - Continued		
Size	Efficiency	Rebate
Air Cooled Chillers		
Minimum Full Load Efficiency of a 10.52 EER, or an Integrated Part Load Value of 13.75 EER for units less than 150 Tons or an ILPV of 14.03 EER for units greater than or equal to 150 Tons		$25 / Ton
HP Water Heater		
500 gallon/day	3.0 COP	$3,500.00
1000 gallon/day	3.0 COP	$5,000.00
1500 gallon/day	3.0 COP	$7,000.00
Packaged Terminal A/C		
	9.2 EER	$60.00
Packaged Terminal HP		
	9.0 EER	$60.00
Chilled Water Reset Air Cooled		
0-100 tons		$550.00
100-200 tons		$750.00
200-300 tons		$875.00
300-400 tons		$875.00
400-500 tons		$900.00
Chilled Water Reset Water Cooled		
0-1000 tons		$500.00
1000-2000 tons		$750.00
2000-3000 tons		$875.00
Energy Star Sleeve Air Conditioners		
> 14,000 BTU/h		$15.00
< 14,000 BTU/h		$15.00
Other Measures		
Economizer		$50.00
Tuneup - Refrigerant Charge (retrofit only)		$15.00
Setback/Programmable Thermostat		$35.00
Window Film		$1 sq. ft.

KCP&L Greater Missouri Operations Company For Territory Served as L&P and MPS
KANSAS CITY, MO 64106

RULES AND REGULATIONS
ELECTRIC

9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

E. ELIGIBLE MEASURES:

PROCESS PRESCRIPTIVE MEASURES	
Measure	Rebate
Engineered Nozzles	$20.00/nozzle
Barrel Wraps for Injection Molders & Extruders	$1.00/ton
Insulated Pellet Dryer Ducts-3" diameter	$15.00 / linear ft.*
Insulated Pellet Dryer Ducts-4" diameter	$20.00 / linear ft.*
Insulated Pellet Dryer Ducts-5" diameter	$25.00 / linear ft.*
Insulated Pellet Dryer Ducts-6" diameter	$30.00 / linear ft.*
Insulated Pellet Dryer Ducts-8" diameter	$40.00 / linear ft.*
*capped at 50% of final invoiced product cost	

ENERGY STAR® PRESCRIPTIVE MEASURES	
Measure	Rebate
ENERGY STAR Commercial Solid Door Refrigerators	
Less than 20 ft^3	$125.00/refrigerator
20-48 ft3	$250.00/refrigerator
More than 48 ft^3	$450.00/refrigerator
ENERGY STAR Commercial Solid Door Freezers	
Less than 20 ft^3	$75.00/freezer
20-40 ft3	$200.00/freezer
More than 48 ft^3	$350.00/freezer
Ice Machines*	
Less than 500 lbs ice production	$300.00/machine
500-1000 lbs ice production	$750.00/machine
More than 1000 lbs ice production	$1,000/machine
Energy Star Commercial Clothes Washers	
Washers Only	$130.00/washer
* Must meet Consortium for Energy Efficiency's (CEE) Tier 1 ice machine specification. Flake and nugget machines are not included.	

9.29 Commercial & Industrial Prescriptive Rebate Program (continued)

E. ELIGIBLE MEASURES:

BUSINESS COMPUTING PRESCRIPTIVE MEASURES	
Measure	Rebate
Plug Load Occupancy Sensor Document Stations*	$40.00/station
80 PLUS Desktop Computer	$5.00/computer
80 PLUS Desktop-Derived Server	$10.00/server
Network Desktop Computer Power Management Software	$15.00/desktop computer
*Must have three (3) devices connected to plug load service	

FOOD SERVICE AND REFRIGERATION PRESCRIPTIVE MEASURES	
Measure	Rebate
Cold Beverage Vending Machine Controllers	$50.00/unit
Anti-sweat Heater Controls*	$40.00/door
Efficient Refrigeration Condenser	$17.50/ton of refrigeration capacity
Night Covers For Open Displays**	$17.50/per linear foot
Head Pressure Control*	$60.00/ton of refrigeration
*Up to 50% of project costs	
**Store operation must allow covers to be covering cases at least 6 hours per 24 hour period.	

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

Table 1: Program Implementation Schedule

Program Implementation Schedule

	Tariff Filed	MEEIA Approval	Implement Existing Programs under new tariffs	Prepare RFP for new program vendors	RFP for new vendors Issued	Vendor selection for new programs	RFP for new vendors awarded	Implement new program
Low-Income Weatherization Program	Dec-11	TBD (June 2012)	Jul-12					
Energy Star® New Homes Program	"	"	"					
Cool Homes Program	"	"	"					
Home Performance with Energy Star® Program	"	"	"					
Commercial and Industrial Rebate Program Program	"	"	"					
MPower Rider	"	"	"					
Energy Optimizer Program	"	"	"					
Building Operator Certification Program	"	"	"					
Home Energy Analyzer Program	"	"	"					
Business Energy Analyzer Program	"	"	"					
Appliance Turn-In Program	"	"		2nd Q 2012	3rd Q 2012	4th Q 2012	4th Q 2012	Jan-13
Commercial and Industrial Prescriptive Rebate Program	"	"		"	"	"	"	"
Multi-Family Rebate Progam	"	"		"	"	"	"	"
Residential Energy Reports Program	"	"		"	"	"	"	"
Residential Lighting and Appliance Program	"	"		"	"	"	"	"

Table 2: Program Budget

Program Budgets	2012	2013	2014	2015
Low-Income Weatherization Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Energy Star® New Homes Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Cool Homes Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Home Performance with Energy Star® Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Commercial and Industrial Rebate Program Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
MPower Rider	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Energy Optimizer Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Building Operator Certification Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Home Energy Analyzer Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Business Energy Analyzer Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Appliance Turn-In Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Commercial and Industrial Prescriptive Rebate Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Multi-Family Rebate Progam	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Residential Energy Reports Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Residential Lighting and Appliance Program	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
GMO Totals	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **

Schedule JMO-5

HIGHLY CONFIDENTIAL

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

GMO Plan Gross Energy Savings, kWh 2012 – 2015

	Total 2012	Total 2013	Total 2014	Total 2015
Low-Income Weatherization Program	80,000	421,627	428,627	436,279
Energy Star® New Homes Program	200,000	1,264,882	1,285,882	1,308,838
Cool Homes Program	1,500,000	5,059,526	5,143,528	5,235,353
Home Performance with Energy Star® Program	350,000	2,108,136	2,143,137	2,181,397
Commercial and Industrial Rebate Program Program	12,000,000	19,394,851	19,716,858	20,068,853
MPower Rider	0	0	0	0
Energy Optimizer Program	0	0	0	0
Building Operator Certification Program	0	0	0	0
Home Energy Analyzer Program	0	0	0	0
Business Energy Analyzer Program	0	0	0	0
Appliance Turn-In Program	0	937,535	1,285,882	1,308,838
Commercial and Industrial Prescriptive Rebate Program	0	6,250,234	8,572,547	8,725,588
Multi-Family Rebate Progam	0	1,250,047	1,714,509	1,745,118
Residential Energy Reports Program	0	4,572,073	11,180,029	11,180,029
Residential Lighting and Appliance Program	0	1,875,070	2,571,764	2,617,676
Total Energy Savings, Gross kWh	**14,130,000**	**43,133,982**	**54,042,762**	**54,807,969**

2012 Energy Savings Targets, kWh

	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Total 2012
Low-Income Weatherization Program								16,000	16,000	16,000	16,000	16,000	80,000
Energy Star® New Homes Program								50,000	50,000	50,000	50,000	0	200,000
Cool Homes Program								500,000	500,000	500,000	0	0	1,500,000
Home Performance with Energy Star® Program								70,000	70,000	70,000	70,000	70,000	350,000
Commercial and Industrial Rebate Program Program								2,400,000	2,400,000	2,400,000	2,400,000	2,400,000	12,000,000
MPower Rider													
Energy Optimizer Program													
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program													
Commercial and Industrial Prescriptive Rebate Program													
Multi-Family Rebate Progam													
Residential Energy Reports Program													
Residential Lighting and Appliance Program													
Total								**3,036,000**	**3,036,000**	**3,036,000**	**2,536,000**	**2,486,000**	**14,130,000**

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

2013 Energy Savings Targets, kWh

	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Total 2013
Low-Income Weatherization Program	84,325	21,081	42,163	42,163	21,081	84,325	63,244	21,081	21,081	21,081	0	0	421,627
Energy Star® New Homes Program	0	189,732	63,244	63,244	63,244	63,244	63,244	316,220	63,244	63,244	252,976	63,244	1,264,882
Cool Homes Program	0	0	0	252,976	505,953	758,929	1,264,882	1,264,882	758,929	252,976	0	0	5,059,526
Home Performance with Energy Star® Program	105,407	210,814	210,814	105,407	105,407	316,220	210,814	210,814	210,814	105,407	210,814	105,407	2,108,136
Commercial and Industrial Rebate Program Program	969,743	969,743	1,939,485	969,743	1,939,485	1,939,485	1,939,485	1,939,485	1,939,485	1,939,485	969,743	1,939,485	19,394,851
MPower Rider													
Energy Optimizer Program													
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	31,251	31,251	62,502	93,754	93,754	104,171	104,171	104,171	104,171	104,171	104,171	937,535
Commercial and Industrial Prescriptive Rebate Program	0	208,341	208,341	416,682	625,023	625,023	694,470	694,470	694,470	694,470	694,470	694,470	6,250,234
Multi-Family Rebate Progam	0	41,668	41,668	83,336	125,005	125,005	138,894	138,894	138,894	138,894	138,894	138,894	1,250,047
Residential Energy Reports Program	0	152,402	152,402	304,805	457,207	457,207	508,008	508,008	508,008	508,008	508,008	508,008	4,572,073
Residential Lighting and Appliance Program	0	62,502	62,502	125,005	187,507	187,507	208,341	208,341	208,341	208,341	208,341	208,341	1,875,070
Total	**1,159,475**	**1,887,535**	**2,751,871**	**2,425,863**	**4,123,666**	**4,650,700**	**5,195,553**	**5,406,366**	**4,647,437**	**4,036,078**	**3,087,417**	**3,762,020**	**43,133,982**

2014 Energy Savings Targets, kWh

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Total 2014
Low-Income Weatherization Program	85,725	21,431	42,863	42,863	21,431	85,725	64,294	21,431	21,431	21,431	0	0	428,627
Energy Star® New Homes Program	0	192,882	64,294	64,294	64,294	64,294	64,294	321,471	64,294	64,294	257,176	64,294	1,285,882
Cool Homes Program	0	0	0	257,176	514,353	771,529	1,285,882	1,285,882	771,529	257,176	0	0	5,143,528
Home Performance with Energy Star® Program	107,157	214,314	214,314	107,157	107,157	321,471	214,314	214,314	214,314	107,157	214,314	107,157	2,143,137
Commercial and Industrial Rebate Program Program	985,843	985,843	1,971,686	985,843	1,971,686	1,971,686	1,971,686	1,971,686	1,971,686	1,971,686	985,843	1,971,686	19,716,858
MPower Rider													
Energy Optimizer Program													
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	0	0	64,294	128,588	192,882	321,471	321,471	192,882	64,294	0	0	1,285,882
Commercial and Industrial Prescriptive Rebate Program	428,627	428,627	857,255	428,627	857,255	857,255	857,255	857,255	857,255	857,255	428,627	857,255	8,572,547
Multi-Family Rebate Progam	85,725	171,451	171,451	85,725	85,725	257,176	171,451	171,451	171,451	85,725	171,451	85,725	1,714,509
Residential Energy Reports Program	0	0	0	413,271	912,199	1,121,961	1,271,556	1,365,053	1,439,850	1,495,948	1,552,046	1,608,144	11,180,029
Residential Lighting and Appliance Program	0	385,765	128,588	128,588	128,588	128,588	128,588	642,941	128,588	128,588	514,353	128,588	2,571,764
Total	**1,693,078**	**2,400,313**	**3,450,450**	**2,577,839**	**4,791,277**	**5,772,568**	**6,350,790**	**7,172,953**	**5,833,280**	**5,053,555**	**4,123,810**	**4,822,849**	**54,042,762**

2015 Energy Savings Targets, kWh

	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Total 2015
Low-Income Weatherization Program	87,256	21,814	43,628	43,628	21,814	87,256	65,442	21,814	21,814	21,814	0	0	436,279
Energy Star® New Homes Program	0	196,326	65,442	65,442	65,442	65,442	65,442	327,210	65,442	65,442	261,768	65,442	1,308,838
Cool Homes Program	0	0	0	261,768	523,535	785,303	1,308,838	1,308,838	785,303	261,768	0	0	5,235,353
Home Performance with Energy Star® Program	109,070	218,140	218,140	109,070	109,070	327,210	218,140	218,140	218,140	109,070	218,140	109,070	2,181,397
Commercial and Industrial Rebate Program Program	1,003,443	1,003,443	2,006,885	1,003,443	2,006,885	2,006,885	2,006,885	2,006,885	2,006,885	2,006,885	1,003,443	2,006,885	20,068,853
MPower Rider													
Energy Optimizer Program													
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	0	0	65,442	130,884	196,326	327,210	327,210	196,326	65,442	0	0	1,308,838
Commercial and Industrial Prescriptive Rebate Program	436,279	436,279	872,559	436,279	872,559	872,559	872,559	872,559	872,559	872,559	436,279	872,559	8,725,588
Multi-Family Rebate Progam	87,256	174,512	174,512	87,256	87,256	261,768	174,512	174,512	174,512	87,256	174,512	87,256	1,745,118
Residential Energy Reports Program	0	0	0	413,271	912,199	1,121,961	1,271,556	1,365,053	1,439,850	1,495,948	1,552,046	1,608,144	11,180,029
Residential Lighting and Appliance Program	0	392,651	130,884	130,884	130,884	130,884	130,884	654,419	130,884	130,884	523,535	130,884	2,617,676
Total	**1,723,304**	**2,443,165**	**3,512,049**	**2,616,482**	**4,860,528**	**5,855,593**	**6,441,467**	**7,276,639**	**5,911,714**	**5,117,067**	**4,169,723**	**4,880,240**	**54,807,969**

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

GMO Plan Gross Demand Savings, kW 2012 – 2015

	Total 2012	Total 2013	Total 2014	Total 2015
Low-Income Weatherization Program	6	30	30	31
Energy Star® New Homes Program	61	386	392	399
Cool Homes Program	1,187	4,004	4,070	4,143
Home Performance with Energy Star® Program	80	481	489	498
Commercial and Industrial Rebate Program Program	1,626	2,628	2,672	2,719
MPower Rider[1]	14,308	18,132	21,637	24,637
Energy Optimizer Program	900	2,977	2,822	2,662
Building Operator Certification Program	0	0	0	0
Home Energy Analyzer Program	0	0	0	0
Business Energy Analyzer Program	0	0	0	0
Appliance Turn-In Program	0	107	147	149
Commercial and Industrial Prescriptive Rebate Program	0	1,172	1,162	1,182
Multi-Family Rebate Progam	0	84	115	117
Residential Energy Reports Program[1]	0	1,090	1,465	1,465
Residential Lighting and Appliance Program	0	107	147	149
Total Demand Savings, Gross kW	**18,167**	**31,197**	**35,148**	**38,153**

2012 Demand Savings Targets, kW

	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Total 2012
Low-Income Weatherization Program								1	1	1	1	1	6
Energy Star® New Homes Program								15	15	15	15	0	61
Cool Homes Program								396	396	396	0	0	1,187
Home Performance with Energy Star® Program								16	16	16	16	16	80
Commercial and Industrial Rebate Program Program								325	325	325	325	325	1,626
MPower Rider								2,862	2,862	2,862	2,862	2,862	14,308
Energy Optimizer Program								180	180	180	180	180	900
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program													
Commercial and Industrial Prescriptive Rebate Program													
Multi-Family Rebate Progam													
Residential Energy Reports Program													
Residential Lighting and Appliance Program													
Total								**3,795**	**3,795**	**3,795**	**3,399**	**3,384**	**18,167**

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

2013 Demand Savings Targets, kW

	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Total 2013
Low-Income Weatherization Program	6	1	3	3	1	6	4	1	1	1	0	0	30
Energy Star® New Homes Program	0	58	19	19	19	19	19	96	19	19	77	19	386
Cool Homes Program	0	0	0	200	400	601	1,001	1,001	601	200	0	0	4,004
Home Performance with Energy Star® Program	24	48	48	24	24	72	48	48	48	24	48	24	481
Commercial and Industrial Rebate Program Program	131	131	263	131	263	263	263	263	263	263	131	263	2,628
MPower Rider	319	319	319	319	319	319	319	319	319	319	319	319	18,132
Energy Optimizer Program	248	248	248	248	248	248	248	248	248	248	248	248	2,977
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	0	0	5	11	16	27	27	16	5	0	0	107
Commercial and Industrial Prescriptive Rebate Program	0	71	71	141	212	212	85	85	85	85	42	85	1,172
Multi-Family Rebate Progam	4	8	8	4	4	13	8	8	8	4	8	4	84
Residential Energy Reports Program	0	0	0	40	89	109	124	133	140	146	151	157	1,090
Residential Lighting and Appliance Program	0	16	5	5	5	5	5	27	5	5	21	5	107
Total	**732**	**901**	**984**	**1,141**	**1,596**	**1,883**	**2,151**	**2,256**	**1,754**	**1,320**	**1,047**	**1,124**	**31,197**

2014 Demand Savings Targets, kW

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Total 2014
Low-Income Weatherization Program	6	2	3	3	2	6	5	2	2	2	0	0	30
Energy Star® New Homes Program	0	59	20	20	20	20	20	98	20	20	78	20	392
Cool Homes Program	0	0	0	204	407	611	1,018	1,018	611	204	0	0	4,070
Home Performance with Energy Star® Program	24	49	49	24	24	73	49	49	49	24	49	24	489
Commercial and Industrial Rebate Program Program	134	134	267	134	267	267	267	267	267	267	134	267	2,672
MPower Rider	292	292	292	292	292	292	292	292	292	292	292	292	21,637
Energy Optimizer Program	235	235	235	235	235	235	235	235	235	235	235	235	2,822
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	0	0	7	15	22	37	37	22	7	0	0	147
Commercial and Industrial Prescriptive Rebate Program	58	58	116	58	116	116	116	116	116	116	58	116	1,162
Multi-Family Rebate Progam	6	11	11	6	6	17	11	11	11	6	11	6	115
Residential Energy Reports Program	0	0	0	54	120	147	167	179	189	196	203	211	1,465
Residential Lighting and Appliance Program	0	22	7	7	7	7	7	37	7	7	29	7	147
Total	**755**	**862**	**1,001**	**1,044**	**1,511**	**1,814**	**2,223**	**2,340**	**1,821**	**1,376**	**1,091**	**1,179**	**35,148**

2015 Demand Savings Targets, kW

	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Total 2015
Low-Income Weatherization Program	6	2	3	3	2	6	5	2	2	2	0	0	31
Energy Star® New Homes Program	0	60	20	20	20	20	20	100	20	20	80	20	399
Cool Homes Program	0	0	0	207	414	621	1,036	1,036	621	207	0	0	4,143
Home Performance with Energy Star® Program	25	50	50	25	25	75	50	50	50	25	50	25	498
Commercial and Industrial Rebate Program Program	136	136	272	136	272	272	272	272	272	272	136	272	2,719
MPower Rider	250	250	250	250	250	250	250	250	250	250	250	250	24,637
Energy Optimizer Program	222	222	222	222	222	222	222	222	222	222	222	222	2,662
Building Operator Certification Program													
Home Energy Analyzer Program													
Business Energy Analyzer Program													
Appliance Turn-In Program	0	0	0	7	15	22	37	37	22	7	0	0	149
Commercial and Industrial Prescriptive Rebate Program	59	59	118	59	118	118	118	118	118	118	59	118	1,182
Multi-Family Rebate Progam	6	12	12	6	6	18	12	12	12	6	12	6	117
Residential Energy Reports Program	0	0	0	54	120	147	167	179	189	196	203	211	1,465
Residential Lighting and Appliance Program	0	22	7	7	7	7	7	37	7	7	30	7	149
Total	**704**	**812**	**954**	**997**	**1,471**	**1,779**	**2,195**	**2,314**	**1,785**	**1,332**	**1,042**	**1,131**	**38,153**

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

Evaluation, Measurement & Verification (EM&V)

Implementation Plan, Schedule, and Budget

KCP&L will prepare a request for proposal ("RFP") to conduct an evaluation, measurement and verification ("EM&V") of all demand-side programs and demand-side rates that are included in KCP&L's preferred resource plan.

EM&V Process Evaluation

The scope of work for the RFP will require that the Vendor conduct a process evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (A) and require the Vendor to provide answers to questions 1 through 5 of this rule section in the EM&V final report ("Report").

EM&V Impact Evaluation

The scope of work for the EM&V RFP will require that the Vendor conduct the impact evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (B) and require the Vendor to provide answers to questions 1 and 2 of this rule section in the Report.

EM&V Data Collection

The scope of work for the EM&V RFP will require that the Vendor collect participation rate data, utility cost data, participant cost data and total cost data pursuant to requirements of 4 CSR 240-22.070 (8) (C).

EM&V Reporting Requirements

The scope of work for the EM&V RFP will also require that the Vendor perform, and report EM&V of each commission-approved demand-side program in accordance with 4 CSR 240-3.163 (7).

KCP&L will provide the Missouri Public Service Commission ("Commission") Staff and other stakeholders with an opportunity to review and comment on the RFP and to also review and comment on a proposed list of potential vendors that have experience conducting demand-side program and demand-side rate EM&Vs prior to issuance of the EM&V RFP.

The proposed EM&V RFP and the proposed list of vendors will be available for Commission staff and stakeholder review three months after Commission approval of these demand-side resources pursuant to 4 CSR 240-20.094 and the approval KCP&L's demand-side program investment mechanism ("DSIM") pursuant to 4 CSR 240-20.093 ("Approval Date").

KCP&L will conduct a workshop to review the proposed EM&V RFP and vendor list and to provide stakeholders with an opportunity to present questions, or offer comments or suggestions prior to issuance of the RFP. The proposed RFP may be modified to incorporate any important issues or concerns raised by the Commission staff or stakeholders. The EM&V RFP will be issued five months after the Commission Approval Date. Vendor selection will be six months after the Commission Approval Date.

KCP&L-Greater Missouri Operations

Demand-Side Program Implementation Plan, Schedule & Budget

An evaluation, measurement and verification ("EM&V") for all demand-side programs and demand-side rates that are included in KCP&L's preferred resource plan will begin seven months after the Commission Approval Date.

The EM&V RFP will require the selected vendor to evaluate and prepare an annual program performance report. The first annual report will be available twelve months after the Approval Date. The second annual report will be available twenty-four months after the Approval Date.

Preliminary EM&V reports will be available thirty months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

The final EM&V report will be available thirty-three months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

EM&V Schedule and Budget

The EM&V budget shall not exceed five percent (5%) of the total budget for all approved demand-side program costs. The EM&V schedule is shown in table 2 below.

Table 3: EM&V Schedule

Program Type	New or Existing?	Sector	Program Name	Tariff Filed	EM&V plan submitted	MEEIA and DSM program approved	RFPs for new vendor selection issued	Vendor selected and contract awarded	Program Implemented	Annual Report	2nd Annual Report & Evaluations Started	EM&V Completed and report available
Energy Efficiency	Existing	Residential	Low-Income Weatherization Program	Dec-11	Dec-11	Jun-12	N/A	N/A	1 month after MEEIA approval	12 months after MEEIA approval	24 months after MEEIA approval	36 months after MEEIA approval
Energy Efficiency	Existing	Residential	Energy Star® New Homes Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Energy Efficiency	Existing	Residential	Cool Homes Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Energy Efficiency	Existing	Residential	Home Performance with Energy Star® Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Energy Efficiency	Existing	C&I	Commercial and Industrial Rebate Program Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Demand Response	Existing	C&I	MPower Rider	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Demand Response	Existing	Residential	Energy Optimizer Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Educational	Existing	C&I	Building Operator Certification Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Educational	Existing	Residential	Home Energy Analyzer Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Educational	Existing	C&I	Business Energy Analyzer Program	Dec-11	Dec-11	Jun-12	N/A	N/A	" "	" "	" "	" "
Energy Efficiency	New	Residential	Appliance Turn-In Program	Dec-11	Dec-11	Jun-12	1 month after MEEIA approval	3 months after MEEIA approval	6 months after MEEIA approval	" "	" "	" "
Energy Efficiency	New	C&I	Commercial and Industrial Prescriptive Rebate Program	Dec-11	Dec-11	Jun-12	" "	" "	" "	" "	" "	" "
Energy Efficiency	New	Residential	Multi-Family Rebate Progam	Dec-11	Dec-11	Jun-12	" "	" "	" "	" "	" "	" "
Energy Efficiency	New	Residential	Residential Energy Reports Program	Dec-11	Dec-11	Jun-12	" "	" "	" "	" "	" "	" "
Energy Efficiency	New	Residential	Residential Lighting and Appliance Program	Dec-11	Dec-11	Jun-12	" "	" "	" "	" "	" "	" "

KCP&L-Greater Missouri Operations (GMO)

Energy Optimizer Program

The following information regarding GMO's proposed Energy Optimizer Program is provided in compliance with 4 CSR 240-3.164(2)(C).

1. Program Description

GMO's Residential, Small and Medium General Service Energy Optimizer Program addresses the need for load reduction on GMO's system on peak summer days. This demand response program focuses on residential and small to mid-tier commercial customers with peak demand less than 200 kW.

Customers who partner with GMO in this program receive a free programmable thermostat that they can use to help manage their energy usage throughout the year. Programmable thermostats can reduce heating and cooling costs by automatically adjusting temperature settings throughout the day to match homeowners' or businesses' schedules. The thermostat is maintained by GMO, free of charge to the customer, and can be accessed by the customer via the Internet as long as the customer remains a participant in the program.

The Company achieves load reduction with the Energy Optimizer Program by sending a signal to each participating customer's thermostat. The signal contains instructions that are used by the thermostat to enact one of several possible load reduction strategies:

- The thermostat can cycle the outdoor compressor on and off at a level set by GMO;
- The thermostat can adjust the temperature by immediately raising the temperature several degrees at the beginning of an event;
- The thermostat can raise the temperature one degree per hour for a few hours; or

- A one hour pre-cooling option is available whereby the temperature of a building is lowered by a few degrees before the start of a cycling event.

The Energy Optimizer Program is designed to run from June 1 to September 30 each year. Curtailments can be called on weekdays only, with no limit on the total number of curtailments or number of consecutive days curtailed. Curtailment length is limited to a maximum of four hours per day per participant. The overall curtailment period can be lengthened by strategically and sequentially curtailing load across the service territory (although this will reduce the maximum load reduction available for any one event). Program participants are permitted to override the system once per month and must communicate their override request via the Internet or by phone.

2. Program Goal

a. Expected energy and demand savings – time horizon

The expected annual, cumulative gross and net energy and demand savings for the Energy Optimizer Program over the estimated life of the program is shown below. The estimated useful life of the thermostat

	Program Energy Savings (kWh) - gross	Program Energy Savings (kWh) - net	Program Demand Savings (kW) - gross	Program Demand Savings (kW) - net
Year 1	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 2	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 3	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 4	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 5	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 6	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 7	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 8	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **

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Year 9	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 10	**		**	**		**	**		**	**		**
Year 11	**		**	**		**	**		**	**		**
Year 12	**		**	**		**	**		**	**		**
Year 13	**		**	**		**	**		**	**		**
Year 14	**		**	**		**	**		**	**		**
Year 15	**		**	**		**	**		**	**		**
Year 16	**		**	**		**	**		**	**		**
Year 17	**		**	**		**	**		**	**		**
Year 18	**		**	**		**	**		**	**		**
Year 19	**		**	**		**	**		**	**		**
Year 20	**		**	**		**	**		**	**		**

b. Proposed annual and demand savings targets – time horizon

The proposed annual energy and demand savings targets and cumulative energy and demand savings targets for the Energy Optimizer Program over the estimated life of the program is shown below.

	Energy Savings (kWh) targets		Energy Savings (kWh) targets - cumulative		Demand Savings (kW) targets- incremental		Demand Savings (kW) targets- cumulative	
Year 1	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 2	**		**	**		**	**		**
Year 3	**		**	**		**	**		**
Year 4	**		**	**		**	**		**
Year 5	**		**	**		**	**		**
Year 6	**		**	**		**	**		**
Year 7	**		**	**		**	**		**

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Year 8	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**	**	[redacted]	**
Year 9	**		**	**		**	**		**	**		**
Year 10	**		**	**		**	**		**	**		**
Year 11	**		**	**		**	**		**	**		**
Year 12	**		**	**		**	**		**	**		**
Year 13	**		**	**		**	**		**	**		**
Year 14	**		**	**		**	**		**	**		**
Year 15	**		**	**		**	**		**	**		**
Year 16	**		**	**		**	**		**	**		**
Year 17	**		**	**		**	**		**	**		**
Year 18	**		**	**		**	**		**	**		**
Year 19	**		**	**		**	**		**	**		**
Year 20	**		**	**		**	**		**	**		**

3. Program Framework/Strategy

a. Relationship to other programs

The Energy Optimizer Program has significant brand awareness throughout the GMO service territory. This awareness serves as a natural conduit to promote other demand-side management (DSM) programs and energy efficiency in general.

b. Marketing strategy

The marketing strategy will consist of tactics to maintain customers in the program. Examples of messaging may include reminding customers how to program their thermostat to achieve maximum energy savings, notices when the curtailment season begins, and information on and what to expect during the season. Various channels to communicate these messages may include, but are not limited to, bill inserts, direct mail, html emails, and the GMO website. The five-year budget indicates a continuation of this marketing strategy throughout the five-year period; however, the strategy will be re-evaluated each year with

any changes brought to the attention of the Commission Staff.

c. Program Delivery

This Energy Optimizer program is a turn-key program provided by Honeywell Utility Solutions. Honeywell supplies the call center, marketing, appointment setting, installation and service. This program is managed by a GMO Product Manager.

d. Partners

Honeywell Utility Solutions is currently the primary partner for the Energy Optimizer program, providing marketing, appointment setting, installation, thermostat maintenance, and ongoing customer service.

4. Program Beneficiaries

	GMO Estimated Particpants		
Year 1	**	[redacted]	**
Year 2	**		**
Year 3	**		**
Year 4	**		**
Year 5	**		**
Total	**		**

5. Program Benefit-Cost Analysis

All five benefit-cost tests are shown below. The dollar values below are on a present value basis with the assumption that all future cash flows start at the beginning of each annual period, discounted at the appropriate discount rate.

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Energy Optimizer		
Test Name	**Market Based Test Results**	**Cost Based Test Results**
Utility Test	3.27	3.27
TRC Test	3.27	3.27
RIM Test	3.27	3.27
RIM (Net Fuel)	3.27	3.27
Participant Test	N/A	N/A
Societal Test	3.27	3.27

Assumptions		
Utility Discount Rate (%)	** [redacted] **	
Participant Discount Rate (%)	10.0%	
Electric Losses (%)	** [redacted] **	
Societal Discount Rate (%)	3.00%	

Avoided Costs			
Avoided T&D ($ / kW)	** [redacted]	**	
Avoided Market-Based Ancillary Service Charges (OATT) ($/kW)	** [redacted]	**	
Cost-Based Proxy for Avoided Capacity ($ / kW Annualized)	** [redacted]	**	
CO2 emissions (kG/kWh)	** [redacted]	**	

Cost Based Avoided Electric Production	**	[redacted]	**
Avoided T&D Electric, w OATT	**	[redacted]	**
Avoided Market-Based Ancillary Service Charges (OATT)	**	[redacted]	**

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Avoided Electric Capacity	**	[redacted]	**
Total Cost Based Avoided Costs	**		**

Market Based Avoided Electric Production Costs	**	[redacted]	**
Program Costs			
Administration Costs	**	[redacted]	**
Implementation / Participation Costs	**		**
Customer Incentives	**		**
Other / Miscellaneous Costs	**		**
Total Program Cost	**		**

Participant Cost	**	[redacted]	**

Environmental Benefits, NOx SOx	**	[redacted]	**

Lost Revenue			
Gross Lost Revenue, Electric	**	[redacted]	**
Net Fuel Lost Revenue, Electric	**		**

6. Program Evaluation, Measurement and Verification Plan

Program EM&V provides a key element of demand side management (DSM) programs. EM&V is used to document and measure the effects of a program and determine whether the program met its goal with respect to being a reliable resource. EM&V is also used to help understand why certain effects occurred and identify ways to improve current programs and to select future programs.

The two types of evaluation GMO has utilized are:

Process evaluation: Process evaluation assesses program delivery, from design to implementation, in order to identify bottlenecks, efficiencies, what did and did not work, constraints and potential improvements.

Evaluation plans were developed by GMO's evaluation contractor(s) and describe all necessary data collection, process evaluation tasks and impact evaluation tasks by program. Evaluation Plans include the following information:

- ✓ Study Methodology by Program;
- ✓ Data Collection Strategies;
- ✓ Data Requests by Program; and
- ✓ Detailed Work Plan and Schedule.

Impact evaluation: Impact evaluation determines the impacts (energy and demand savings) and co-benefits (avoided emissions, energy security, transmission & distribution benefits) that directly result from a program. Impact evaluations also support cost-effectiveness analyses aimed at identifying relative program costs and benefits.

The Monitoring and Verification (M&V) process acts as a quality control and quality assurance process for the savings, tracking and accounting for the program.

Monitoring: This is the monitoring of installations when needed to determine or verify savings from a measure that is applied in a unique way, is significant in savings, or is new to the market. Working with the evaluation contractor, guidelines are developed to determine which projects should be monitored.

Verification: During the processing of an application for customer incentives (rebates), GMO reviews the equipment specifications by model number to determine if that measure qualifies. This "paper" verification occurs on all applications. Additionally, there are random field visits to assure the correct number and types of measures were installed at the customer's facility.

Historically, GMO retained one or more EM&V contractors to perform process and impact evaluations for its programs in order to avoid conflicts of interest and to insure credibility of the evaluation results. EM&V was conducted by the implementation team with advice of the EM&V contractor.

- **Going forward, EM&V of the Energy Optimizer Program will be completed consistent with requirements of 4 CSR 240-22.070 (8).**

Specifically, GMO will prepare a request for proposal ("RFP") to conduct an evaluation, measurement and verification ("EM&V") of the Energy Optimizer program.

EM&V Process Evaluation

The scope of work for the RFP will require that the Vendor conduct a process evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (A) and require the Vendor to evaluate and provide answers to questions 1 through 5 of this rule section in the EM&V final report ("Report").

EM&V Impact Evaluation

The scope of work for the EM&V RFP will require that the Vendor conduct the impact evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (B) and require the Vendor to provide answers to questions 1 and 2 of this rule section in the Report.

EM&V Data Collection

The scope of work for the EM&V RFP will require that the Vendor collect participation rate data, utility cost data, participant cost data and total cost data pursuant to requirements of 4 CSR 240-22.070 (8) (C).

EM&V Reporting Requirements

The scope of work for the EM&V RFP will also require that the Vendor perform, and report Energy Optimizer EM&V in accordance with 4 CSR 240-3.163 (7).

GMO will provide the Missouri Public Service Commission ("Commission") Staff and other stakeholders with an opportunity to review and comment on the RFP and to also review and comment on a proposed list of potential vendors that have experience conducting demand-side program and demand-side rate EM&Vs prior to issuance of the EM&V RFP.

The proposed EM&V RFP and the proposed list of vendors will be available for Commission staff and stakeholder review three months after Commission approval of these demand-side resources pursuant to 4 CSR 240-20.094 and the approval GMO's demand-side program investment mechanism ("DSIM") pursuant to 4 CSR 240-20.093 ("Approval Date").

GMO will conduct a workshop to review the proposed EM&V RFP and vendor list and to provide stakeholders with an opportunity to present questions, or offer comments or suggestions prior to issuance of the RFP. The proposed RFP may be modified to incorporate any important issues or concerns raised by the Commission staff or stakeholders.

Preliminary EM&V reports will be available thirty months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

The final EM&V report will be available thirty-three months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

7. Program Budget (Five-Year)

The expected budget for the Energy Optimizer Program over the five-year period is shown below.

	Program Delivery	Admin	Marketing	Customer Incentive	EM&V	Total
Year 1	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **		** [redacted] **
Year 2	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **		** [redacted] **
Year 3	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **		** [redacted] **
Year 4	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 5	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **		** [redacted] **
Total	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **

8. Strategies to minimize free riders and maximize spillover

GMO customers would not be expected to cycle their A/C equipment unless they were participating in the Energy Optimizer.

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KCP&L-Greater Missouri Operations (GMO)

MPOWER PROGRAM

The following information regarding GMO's proposed MPower Program is provided in compliance with 4 CSR 240-3.164(2)(C).

1. Program Description

MPower is a commercial and industrial customer peak electric load reduction program. GMO collaborates with customers to curtail (or reduce) their energy use during times of peak electric demand during the months of June through September. The customer can accomplish the required curtailment by reducing lighting and HVAC load, shutting down equipment, or switching facility load to a generator. MPower provides two forms of payment to participating customers. Participants receive a monthly "participation payment" for signing up for the program and being "on call" to reduce power consumption at GMO's request. Participating customers also receive an additional "event payment" for successfully reducing demand each time they are called upon to do so.

2. Program Goal

As of June of 2011, the MPower program had 13,313 kW of curtailable load under contract in GMO. GMO expects the following capacity reductions to be available through the MPower program over the next five years:

	Contracted Curtailable Load @ meter		
Year 1	**	[redacted]	**
Year 2	**		**
Year 3	**		**
Year 4	**		**
Year 5	**		**

3. Program Framework/Strategy

a. Relationship to other programs

MPower is a demand response program for commercial customers with peak loads greater than 200 kW. It is designed to reduce system load during times of peak demand. It is one of two programs in GMO's demand response portfolio with the other being the Energy Optimizer program which is designed for residential and small commercial customers with peak loads under 200 kW.

b. Marketing strategy

GMO's will market the MPower program through GMO's team of Energy Consultants (EC). EC's meet with potential MPower participants to inform them about the features and benefits of the MPower program, and to assist them in identifying specific load and load reduction strategies for MPower participation.

For the MPower Program, GMO has identified the following internal and external print communications as possible marketing channels:

Externally Published Communications:

- The Kansas City Star – Business section on Tuesdays;
- HVAC/Lighting contractor newsletters/magazines;
- Kansas City Business Journal (Book of Lists); and
- Builder/Architect magazine.

Internally Published Communications

- Energy Talk. This is a monthly newsletter e-mailed to Tier 1 customers from GMO's Energy Consultants.

- The Wire. (Commercial version). This is a quarterly newsletter from GMO that is included with a customer's bill.
- Bill messaging.
- On line promotion with GMO's other e-Services products.

Other marketing activities may include:

- Placement of information on trade ally Web sites;
- Attend and present at conferences and public events, such as Chamber of Commerce meetings, to increase general awareness of the program and distribute program promotional materials;
- Hold seminars with targeted messages to different industry classifications;
- Hold seminars with architects and engineers, trade allies, and trade organizations; or

c. Program Delivery

The MPower program is managed by an internal GMO product manager. Back-office systems and support are handled by a third party vendor, currently Ziphany.

The product manager is responsible for educating and training account managers, analyzing customer loads and curtailment capabilities, processing contracts, setting customers up in the MPower database, conducting market analyses, forecasting, developing marketing strategies and materials, processing payments and penalties and conducting annual baseline reviews for each account. The product manager also executes curtailments at the direction of GMO's power supply group.

Ziphany, the back-office support vendor, manages the customer database, produces reports, provides event notification services, analyzes event meter data and supplies the product manager with monthly customer credit and penalty tables, which the product manager then reviews and submits to GMO's billing and accounting departments for the application of monthly credits and penalties to customer bills.

d. Partners

GMO partners with Ziphany for back-office support and meter data management services. It also relies on various meter manufacturers for support in providing necessary data to customers and the company.

4. Program Budget (Five-Year)

Since the MPower Program is an established program, GMO does not have any start-up costs. The expected budget for the MPower Program over the five-year period is shown below.

	Admin	Delivery	Customer Incentive	EM&V	Total
Year 1	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 2	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 3	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 4	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Year 5	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **
Total	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **	** [redacted] **

5. Program Beneficiaries

a. Expected number of participants by customer class or subclass

Historically, about 75 percent of MPower participants are on a large power service rate and 20 percent are on a large general service rate. Customer counts by class in Kansas are expected to be as follows over the next five years:

	Year 1	Year 2	Year 3	Year 4	Year 5
Large Power Service	32	40	47	54	61
Large General Service	8	11	13	14	16
Small General Service	2	2	3	4	4
Total	42	53	63	72	81

b. Other beneficiaries

Demand response programs such as the MPower program are designed to postpone the need for new peaking power plants – plants that provide energy only during peak demand periods. While the direct financial beneficiaries of the MPower program are the customers who participate in the program, to the extent that construction of new peaking power plants is postponed, all GMO customers will benefit.

4. Program Benefit-Cost Analysis

All five benefit-cost tests are shown below. The dollar values below are on a present value basis with the assumption that all future cash flows start at the beginning of each annual period, discounted at the appropriate discount rate.

MPower		
Test Name	**Market Based Test Results**	**Cost Based Test Results**
Utility Test	1.49	1.49
TRC Test	7.44	7.44
RIM Test	1.17	1.17
RIM (Net Fuel)	1.17	1.17
Participant Test	N/A	N/A
Societal Test	7.44	7.44

Assumptions		
Utility Discount Rate (%)	** [redacted] **	
Participant Discount Rate (%)	10.0%	
Electric Losses (%)	** [redacted] **	
Societal Discount Rate (%)	3.00%	

Avoided Costs			
Avoided T&D ($ / kW)	** [redacted]	**	
Avoided Market-Based Ancillary Service Charges (OATT) ($/kW)	** [redacted]	**	
Cost-Based Proxy for Avoided Capacity ($ / kW Annualized)	** [redacted]	**	
CO2 emissions (kG/kWh)	** [redacted]	**	

Cost Based Avoided Electric Production	**	[redacted]	**
Avoided T&D Electric	**		**
Avoided Market-Based Ancillary Service Charges (OATT)	**		**
Avoided Electric Capacity	**		**
Total Cost Based Avoided Costs	**		**

Market Based Avoided Electric Production Costs	**	[redacted]	**
Program Costs			
Administration Costs	**		**
Implementation Costs	**		**
Customer Incentives	**		**
Other / Miscellaneous Costs	**		**
Total Program Cost	**		**

Participant Cost	**	[redacted]	**

Environmental Benefits, NOx SOx	**	[redacted]	**

Lost Revenue			
Gross Lost Revenue, Electric (Demand Charges Only)	**	[redacted]	**
Net Fuel Lost Revenue, Electric (Demand Charges Only)	**	[redacted]	**

5. **Program Evaluation, Measurement and Verification Plan**

Program EM&V provides a key element of demand side management (DSM) programs. EM&V is used to document and measure the effects of a program and determine whether the program met its goal with respect to being a reliable resource. EM&V is also used to help understand why certain effects occurred and identify ways to improve current programs and to select future programs.

The two types of evaluation GMO has utilized are:

Process evaluation: Process evaluation assesses program delivery, from design to implementation, in order to identify bottlenecks, efficiencies, what did and did not work, constraints and potential improvements.

Evaluation plans were developed by GMO's evaluation contractor(s) and describe all necessary data collection, process evaluation tasks and impact evaluation tasks by program. Evaluation Plans include the following information:

- ✓ Study Methodology by Program;
- ✓ Data Collection Strategies;
- ✓ Data Requests by Program; and
- ✓ Detailed Work Plan and Schedule.

Impact evaluation: Impact evaluation determines the impacts (energy and demand savings) and co-benefits (avoided emissions, energy security, transmission &

distribution benefits) that directly result from a program. Impact evaluations also support cost-effectiveness analyses aimed at identifying relative program costs and benefits.

The Monitoring and Verification (M&V) process acts as a quality control and quality assurance process for the savings, tracking and accounting for the program.

Monitoring: This is the monitoring of installations when needed to determine or verify savings from a measure that is applied in a unique way, is significant in savings, or is new to the market. Working with the evaluation contractor, guidelines are developed to determine which projects should be monitored.

Verification: During the processing of an application for customer incentives (rebates), GMO reviews the equipment specifications by model number to determine if that measure qualifies. This "paper" verification occurs on all applications. Additionally, there are random field visits to assure the correct number and types of measures were installed at the customer's facility.

Historically, GMO retained one or more EM&V contractors to perform process and impact evaluations for its programs in order to avoid conflicts of interest and to insure credibility of the evaluation results. EM&V was conducted by the implementation team with advice of the EM&V contractor.

- **Going forward, EM&V of the MPower Program will be completed consistent with requirements of 4 CSR 240-22.070 (8).**

Specifically, GMO will prepare a request for proposal ("RFP") to conduct an evaluation, measurement and verification ("EM&V") of the MPower program.

EM&V Process Evaluation

The scope of work for the RFP will require that the Vendor conduct a process evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (A) and require the Vendor to evaluate and provide answers to questions 1 through 5 of this rule section in the EM&V final report ("Report").

EM&V Impact Evaluation

The scope of work for the EM&V RFP will require that the Vendor conduct the impact evaluation pursuant to requirements of 4 CSR 240-22.070 (8) (B) and require the Vendor to provide answers to questions 1 and 2 of this rule section in the Report.

EM&V Data Collection

The scope of work for the EM&V RFP will require that the Vendor collect participation rate data, utility cost data, participant cost data and total cost data pursuant to requirements of 4 CSR 240-22.070 (8) (C).

EM&V Reporting Requirements

The scope of work for the EM&V RFP will also require that the Vendor perform, and report MPower EM&V in accordance with 4 CSR 240-3.163 (7).

GMO will provide the Missouri Public Service Commission ("Commission") Staff and other stakeholders with an opportunity to review and comment on the RFP and to also review and comment on a proposed list of potential vendors that have experience conducting demand-side program and demand-side rate EM&Vs prior to issuance of the EM&V RFP.

The proposed EM&V RFP and the proposed list of vendors will be available for Commission staff and stakeholder review three months after Commission approval of these demand-side resources pursuant to 4 CSR 240-20.094 and the approval GMO's demand-side program investment mechanism ("DSIM") pursuant to 4 CSR 240-20.093 ("Approval Date").

GMO will conduct a workshop to review the proposed EM&V RFP and vendor list and to provide stakeholders with an opportunity to present questions, or offer comments or suggestions prior to issuance of the RFP. The proposed RFP may be modified to incorporate any important issues or concerns raised by the Commission staff or stakeholders.

Preliminary EM&V reports will be available thirty months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

The final EM&V report will be available thirty-three months after the Commission Approval Date. Commission Staff and stakeholders will be provided with an opportunity to review, and comment on the preliminary report.

6. **Strategies to minimize free riders and maximize spillover**

Customers would not be expected to curtail load if they were a non-participant. NTG 1.0

- **Appliance Turn-In Program Benefit-Cost Analysis**

All five benefit-cost tests are shown below for the Appliance Turn-In program. The dollar values below are on a present value basis with the assumption that all future cash flows start at the beginning of each annual period, discounted at the appropriate discount rate.

Appliance Turn-In		
Test Name	**Market Based Test Results**	**Cost Based Test Results**
Utility Test	2.66	1.61
TRC Test	4.23	2.56
RIM Test	0.71	0.43
RIM (Net Fuel)	0.82	0.50
Participant Test	N/A	N/A
Societal Test	5.00	3.33

- **MPower Program Benefit-Cost Analysis**

All five benefit-cost tests are shown below for the MPower Turn-In program[1]. The dollar values below are on a present value basis with the assumption that all future cash flows start at the beginning of each annual period, discounted at the appropriate discount rate.

MPower		
Test Name	**Market Based Test Results**	**Cost Based Test Results**
Utility Test	1.53	1.53
TRC Test	21.60	21.60
RIM Test	1.20	1.20
RIM (Net Fuel)	1.20	1.20
Participant Test	N/A	N/A
Societal Test	21.60	21.60

[1] Based upon historical EM&V data