UNDERTAKING JT1.2

UNDERTAKING

Technical Conference TR, page 8

Enbridge to advise what percentage of low income multi-residential buildings in Enbridge service territory have the air duct system versus the water heating system.

RESPONSE

Most of the low income multi-residential buildings in the Company's franchise area were built before 1985 (also referred to as post-war or mid-century buildings). Buildings of this vintage predominantly use hydronic heating systems. Though the Company is not aware of any specific research on this matter, Enbridge estimates that approximately 90% of these buildings use hot water (hydronic) heating systems.

Witnesses: M. Lister
E. Lontoc

UNDERTAKING JT1.5

UNDERTAKING

Technical Conference TR, page 16

Enbridge to summarize the offerings that do not count direct and Measurable CCM as the target metric, re Exhibit I.T3.EGDI.CME.3 part (B).

RESPONSE

Please see Enbridge's response below.

Resource Acquisition **Non-CCM based Offers**	**Metric**
Home Energy Conservation (HEC) [1]	*Participants*
Low Income **Non-CCM based Offers**	**Metric**
New Construction	*Applications*
Market Transformation **Non-CCM based Offers**	**Metric**
SBD Residential	*Builder Enrollment*
	Units Built
SBD Commercial	*Builder Enrollment*
School Competition	*School Enrollment*
Home Rating	*Audits Completed*
Energy Compass [2]	*Participants*
Run It Right (RIR) [2]	*Participants*
Comprehensive Energy Management (CEM) [2]	*Participants*
New Building Commissioning	*Participants*

1. Note that the scorecard metric for Home Energy Conservation (HEC) is based on the number of participants. However, each HEC participant still generates CCM savings, which are counted towards the CCM portion of the Resource Acquisition scorecard.
2. Note that the scorecard metrics for RIR, CEM, and Energy Compass within the MTEM scorecard are based on the number of participants. However, both RIR and CEM participants still generate CCM savings, which are counted towards the CCM portion of the Resource Acquisition scorecard.

Witnesses: M. Lister
F. Oliver-Glasford
B. Ott

UNDERTAKING JT1.6

UNDERTAKING

Technical Conference TR, page 19

Enbridge to make best efforts to provide best available information in response to Exhibit I.3.EGDI.VECC 9 (A) and (B); Enbridge to make best efforts to provide the numbers for the CCM program budget

RESPONSE

As a point of clarification, Enbridge provided the requested figures in its pre-filed evidence on page 8 of Exhibit B, Tab 1, Schedule 3. For convenience, the Company has included the requested 2015 figures in the table below.

Low Income	Program Budget			
	2015 Budget	2014 Budget	2013 Budget	2012 Budget
Single Family - Part 9	$4,655,790	$4,564,500	$4,363,950	$3,795,900
Multi Residential - Part 3	$2,208,300	$2,165,000	$2,274,375	$2,324,750
Total Low Income	**$6,864,090**	**$6,729,500**	**$6,638,325**	**$6,120,650**

VECC Interrogatory #9 found at Exhibit I.T3.EGDI.VECC.9, did not include a sub-question (b) as implied above.

Witnesses: M. Lister
E. Lontoc
F. Oliver-Glasford
B. Ott

UNDERTAKING JT1.19

UNDERTAKING

Technical Conference TR, page 89

Enbridge to provide the prescriptive C&I programs, measure-by-measure rebate levels that are proposed, that would be part of the budgets.

RESPONSE

A complete list of the 2016 to 2020 prescriptive measures and rebates levels can be found in SEC Interrogatory #15 found at Exhibit I.T5.EGDI.SEC.15.

Witnesses: P. Goldman
R. Kennedy
M. Lister

UNDERTAKING JT1.24

UNDERTAKING

Technical Conference TR, page 116

Percent allocation made between the merchant transmission and Distribution

RESPONSE

Please see the GTA Project Application at EB-2012-0451 Exhibit E, Tab 1, Schedule 2 and Exhibit A, Tab 3, Schedule 9.

Witness: H. Thompson

UNDERTAKING JT1.37

UNDERTAKING

Technical Conference TR, page 32

Enbridge to supply documents prepared for the Demand Supply Working Group.

RESPONSE

Please see attachments.

Witness: F. Oliver-Glasford

Discussion around IRP – Call – March 19 @ 2pm

Attendees:

Ken Ross – Manager, IRP and EEC Reporting, Fortis BC (Ken looks after IRP and long term DSM Planning)

Dana Wong – Manager, IRP – Fortis BC

Fiona Oliver-Glasford and Hilary Thompson – EGD

Notes:

- IRP is very time intensive process, strategic and analytic
- Gas not the same thing
- Submit every 2 -3 years
- Working on the last 3 iteration
- Planning process never stops
- Take our snapshot at a given time
- Have IRP planning guidelines….Dana will send them over
- Everyone thinks electric
- Difference is resource options – upstream generation…..build or buy electricity.
- Don't allow much gas generation in BC
- Participate in the IRP technical committees for some of the jurisdictions around (mostly in US)
- Gas IRPs in other jurisdictions primarily about gas purchases…..pipeline and storage resources.
- Start with Demand forecast – 20 year planning horizon at Fortis BC
    - End-use model used from Marbek
- Show what demand side measures could impact
    - Marbek also done DSM planning work
- Account for 95% of the gas supply in BC
- Not impacting build as the DSM found not to impact peak at this point
- 4 years in on DSM
- Not being asked by commission to look at interruptible customers as a solution in IRP
- Only considering firm customers
- A few large Industrial customers coming on line as firm customers
- Been conservative as they "have to serve load on coldest day"
- Annual demand is dropping
- Little analysis of demand side measures on peak to-date – embarking on this now
- Considerations – everyone is going to use a different model for forecasting peak. Everyone has different customer characteristics. Peak demand is mostly residential.

- Launching a Conservation Potential Report (CPR) – both electric and gas – splitting costs with BCHydro (between two orgs cover 99% of energy needs) – starting shortly.
- 3 people in department – Ken, Dana, Tom – used to be 1.5 people but wasn't enough. Needed analytical power.
- Need to pull together a lot of departments and information….
- Project management is primarily the work – system (design) planning, dsm
- Long term planning for DSM also with Ken (EEC) – 5 year planning…
- They see others doing IRP having a mixed bag of approach to org planning, but seem to always have an IRP person or group
- Avista – have an IRP person for gas side and electric side….
- Puget Sound Energy – electric gas combined IRP – small team (5 -6 people doing IRP). Much more prescriptive process….
- In some places it's just about energy purchases versus dsm, in other places it is about build of infrastructure

Integrated Resource Planning Update

for Supply / Demand Working Group

Jan. 29th, 2015

ENBRIDGE

Agenda

- Background
- IRP and the Utility
- Status Update
- IRP Study

ENBRIDGE

Background: IRP – In Two Guises

[redacted]

	System Wide	Local IRP
Scope	Franchise wide	Local defined area
Goal	Savings on commodity + T&D infrastructure	Savings on infrastructure
Focus	Usage	Capacity
Impact on infrastructure	Indirect – passive deferral	Direct – active deferral
Impact on commodity	Direct	Indirect
Examples	Many: Mostly electric – some gas	Very Few: electric - ConEd
Metric	Peak Day and Annual Consumption	Peak Hour or "Instantaneous" Peak – Worst Case

ENBRIDGE

Background: Why renewed interest now?

- Pressure on utility rates – especially in the electricity sector
- GTA proceeding: DSM raised as a potential way to save on infrastructure costs
- GTA Decision:
  - "further examination of integrated resource planning for gas utilities is warranted"
- Minister's Directive to OEB: the Board to take steps to implement
  - "Government's policy of putting conservation first in … Gas Distributor infrastructure planning processes at the regional and local levels, where cost effective and consistent with maintaining appropriate levels of reliability."

ENBRIDGE

IRP & the Utility: Who needs to be engaged?

- Distribution Planning and Work Management
- Engineering and Integrity
- Market Development and Customer Care
- DSM Group
- Gas Supply and Business Development
- Regulatory Affairs
- Others, e.g., Public and Government Affairs

ENBRIDGE

IRP and the Utility: What are the utilities required to do?

EB-2014-0134 DSM FRAMEWORK for Natural Gas Distributors, December 22, 2014.

- Conduct a Study to "determine the appropriate role that DSM may be able to serve in future system planning efforts"…..
- By March 31 file with Multi-year plan
  - "a preliminary scope of the study" … and
  - "a preliminary transition plan"
- Complete study in time for Mid-Term Review (June 1, 2018)
- As part of all future leave to construct applications "provide evidence of how DSM has been considered as an alternative at the preliminary stage of project development."

ENBRIDGE

Status Update: What have we done to date?

- Formed working group (Distribution Planning and Market Development)
- Held Discovery Session for staff of Distribution Planning and Market Development
- Conducted preliminary research into
  - IRP processes in other jurisdictions
  - Cost effectiveness analysis for IRP
  - Options for external review of the Study
- Developed
  - draft Study Outline and Methodology,
  - Timeline,
  - Case Study Process, and
  - Preliminary Transition Plan
- Met with Union Gas team

ENBRIDGE

Status Update: What do we need to do NOW?

Prepare for March 31st filing:

- Finalize Study Outline
- Determine governance structure for the Study
- Determine approach to External Review
- Finalize Preliminary Transition Plan
- Determine position on:
  - Treatment of "all leave to construct applications" (while the Study is in progress)

ENBRIDGE

IRP Study: Strategy

This is a foundational study for gas utilities in North America.

The UTILITY will play a leadership role:

- Define the issues
- Direct the study
- Educate the Board and stakeholders on the issues
- Engage "disinterested" external review
- (Disinterested reviewers - individuals who:
  - have no interest in the direct outcomes of the Study, and
  - who have specialized knowledge and/or experience relating to the subject of the Study.)

ENBRIDGE

IRP Study: Focus and Approach

STUDY FOCUS

- Targeted DSM as an alternative

STUDY APPROACH

- Case Studies in EGD franchise. Focus research on 2-3 case studies of future leave to construct applications
- Combine Preliminary Transition Plan with the Study

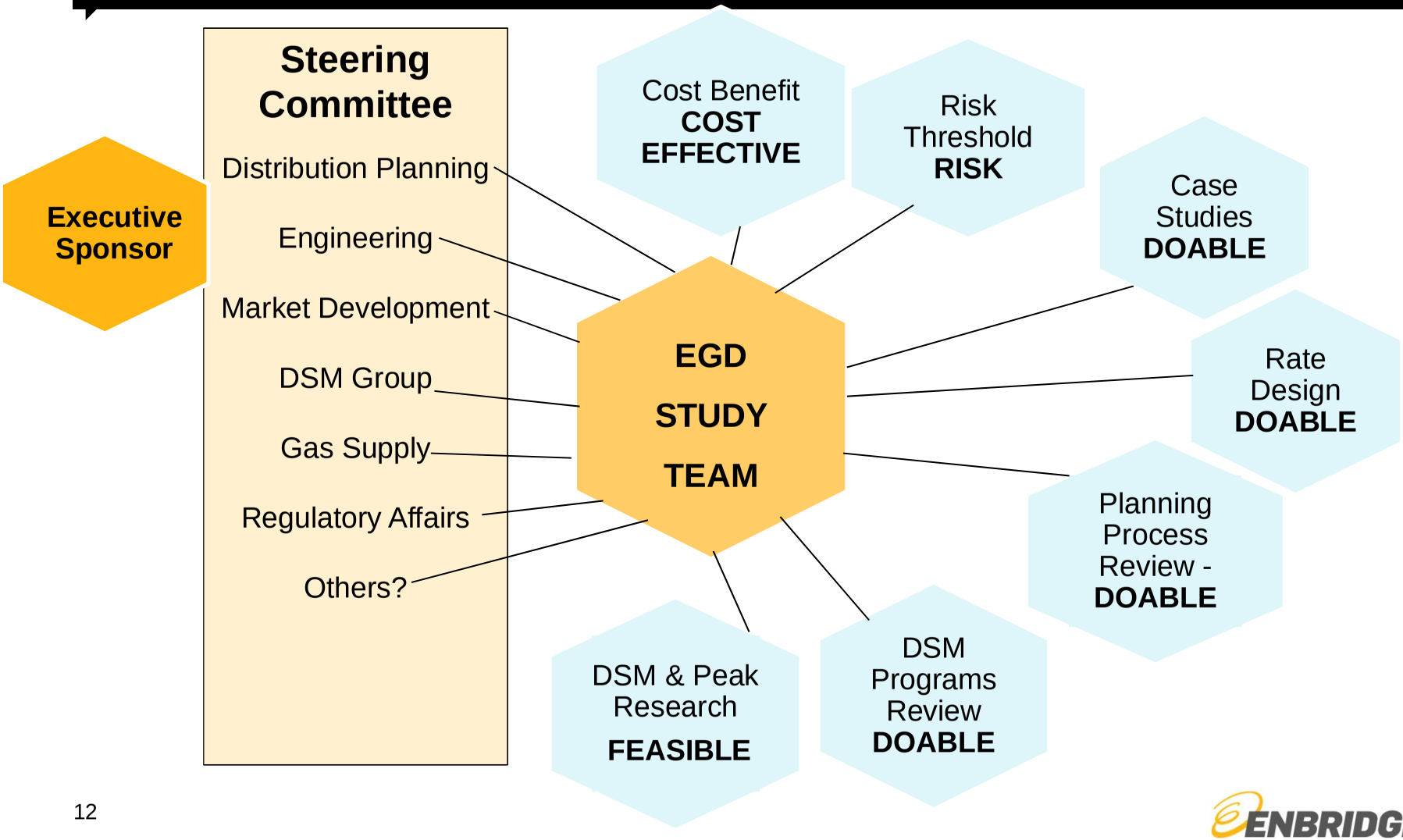
ENBRIDGE

IRP Study: Focus and Method

Targeted DSM – Key Questions	Tailor Research to the Questions
Is it Technically Feasible? Is It Doable? Does it meet risk requirements? Is it cost-effective?	Internal Review • Infrastructure planning processes • DSM programs Primary Research - Load research - Market penetration - Market potential - Market acceptance - DSM measures & technologies Secondary Research - Literature review - Technology scan - Jurisdictional scan

ENBRIDGE

IRP Study: Structure



ENBRIDGE

IRP Study: Outcomes

- Report on Targeted DSM as an alternative
  - Case Study Reports: Analysis of targeted DSM option for 2-3 leave to construct examples
  - Tested Analytical Method to be applied in future leave to construct applications (if applicable)
- Report on related aspects
  - broad-based DSM and infrastructure planning
  - DSM and subdivision planning
- A Transition Plan – changes needed to:
  - long range infrastructure planning processes
  - DSM programs

ENBRIDGE

IRP Study: External Review

Purpose

1. Provide avenue for Ontario stakeholders to comment (and Board representatives)
2. Engage other external reviewers to support the quality of the Study

Two Streams	Perspective	Participation
1. Ontario based	• Ratepayer interests • Special interest groups	• Utility stakeholders and Intervenors • Board staff
2. North America (and Europe?)	• Other utilities • Experience in IRP • Experience in targeted DSM • Knowledge of DSM measures and peak Knowledge of regional and local planning	Individuals from organizations such as: - ACEEE - Canadian Gas Association - Other gas utilities - RAP - Canadian Urban Institute

ENBRIDGE

IRP Study: Timeline

Study Timeline	2015 March	2015 April	2015 April - Dec	2016 Jan - Dec	2017 Jan - March	2017 March - Dec	2018 Jan - July
Board Timetable							
Utilities' Multi-year Plans due		1					
Board Decision			Oct?				
Mid-Term Review							July
Study Timeline							
Preliminary work							
> Information gathering							
> Develop Detailed Workplan							
> Develop RFPs as needed							
Conduct research as per plan							
Synthesize Results							
Write Synthesis Report (including Transition Plan)							
Prepare for Mid-term Review							

ENBRIDGE

UNDERTAKING JT1.44

UNDERTAKING

Technical Conference TR, page 218

To provide the 2013 audit.

RESPONSE

As requested below are the excerpts related to the Run it Right Audit Recommendations from the 2013 Audit Summary Report (EB-2014-0277 DSM Clearance – Pages 284-287).

10. Recommendation:

Establish a free rider rate for the Run It Right program. Currently, there is no OEB approved free rider rate for this program. As part of this audit process, Enbridge proposed a free rider rate. Optimal conducted an informal review of free rider rates for gas retro-commissioning programs in other jurisdictions and recommended adoption of Enbridge's requested rate for purposes of this audit. Enbridge should formally establish a free rider rate that is subsequently filed and approved by the OEB.

Enbridge Response:
This Audit Recommendation will be directed to the TEC, as Union has indicated that they have a similar program. As such, there may be value in developing a free ridership rate for both utilities through the TEC. If it is determined that this is not the case, Enbridge will proceed with establishing its own free ridership rate for the RIR offer.

AC Response:
The AC endorses this response.

11. Recommendation:

Survey Run It Right participants. Ideally, Enbridge or its evaluator should survey participants prior to any billing regression analysis. This would ensure better data and avoid noted problems with ex-post adjustments to the sample that resulted from exogenous factors affecting gas usage. The importance of conducting a survey prior to

the analysis is that all data is treated equally, and any obvious outliers or other problem data can be removed or adjusted without bias. In addition, this process will allow for removal of any obviously bad or incomplete data. Surveys should accomplish the following:

- Determine whether the participant implemented the measures recommended in the timeframe indicated.
- Determine whether the participant made any significant changes to the facility, its operations, or equipment outside of the Run It Right Program. If changes were made, determine whether changes can be attributed to Run It Right spillover savings, are completely independent of the Program, or were already counted in another Enbridge program.
- Collect basic participant characteristics, including building type, occupancy load, usage, and size. Based on this information, the analyst can remove or adjust all data in a consistent fashion. For example, if a major piece of equipment was replaced with a more efficient one, it may be appropriate to adjust the ex-post data to subtract the expected additional savings. Further, if building usage or operations have changed significantly, the data can be adjusted if the impacts of these changes can be estimated with relative certainty. In some cases, it may be more appropriate to simply remove a participant from the sample.

Enbridge Response:
Enbridge agrees that completing a survey with a random sample of participants would be more appropriate in order to gain further insight into results. The random sample would be conducted in a manner similar to the CPSV process. A survey of all participants would be cost prohibitive (this is in line with recommendation #13).

AC Response:
The AC endorses this response.

12. Recommendation:

Include a “comparison group” of similar customers that did not participate in the Run It Right program. A comparison group of customers that are matched to the participant group (in terms of building type, major end-uses, size, and consumption) should be included in the analysis. Typically this would be done with a “dummy variable” that indicates whether the customer was a participant or not. The biggest benefit of including a comparison group is that it can more explicitly control for weather and other variations over time. Because all sites will have been exposed to the same weather, the analysis inherently controls for weather without the need to identify balance temperature points for each facility. It also avoids introducing uncertainty from determining a building

specific relationship between weather and gas usage. This will significantly simplify the analysis and result in a more accurate isolation of weather effects.
A comparison group also can adjust for unknown variables that may be important but are difficult to identify and control for. For example, there may be natural growth in existing buildings' gas usage that would mask some of the true program savings. Comparing participants with similarly situated nonparticipants would automatically control for any such effects.

Enbridge Response:
Enbridge's proposal for recommendation #11 appropriately addresses the need for increased accuracy and information, without unduly increasing the cost and complexity of the offer.

AC Response:
The AC agrees that the revisions associated with Auditor recommendation #11 are a good next step in the evolution of the evaluation of this program, and that the addition of a control group is not necessary at this point in time. However, that decision should be revisited in the future as more experience with the program (and its evaluation) is gained, particularly if the program grows substantially in size.

13. Recommendation:

Consider sampling approaches that balance required resources with level of importance. When performing the analysis and incorporating the two previous recommendations, we recognize that this approach may add additional program costs related to surveying participants and using comparison groups. We also understand that Enbridge intends for this program to expand and hopefully have more participants in the future. As a result, it may be appropriate to analyze a sample of participants rather than a full census of participants. This is appropriate, particularly if the number of participants grows significantly. We recommend that the sample of participants first be stratified by size. The largest usage customers will tend to have a disproportionately high impact on overall savings. As a result, we recommend developing size strata and oversampling the largest stratum (depending on range of usage and number of participants, it may make sense to oversample more than one large stratum). Often, the very largest stratum might only have a few participants, who would all be included in the sample. This approach of devoting more resources to the largest projects will enhance the overall precision of the sample without the need to actually increase the numbers of participants sampled. Once the strata cut points are selected, the samples should be drawn in a randomized way (except for any strata where a full census is used).

Witnesses: R. Idenouye
R. Kennedy
R. Sigurdson

Similarly, the comparison group should align with the same strata and also be randomly selected.

Enbridge Response:
Please refer to the response to recommendation #11.

AC Response:
The AC endorses this response.

Witnesses: R. Idenouye
R. Kennedy
R. Sigurdson

UNDERTAKING JT1.45

UNDERTAKING

Technical Conference TR, page 236

Enbridge to advise what other considerations besides payback were considered in the design of the eligibility requirements to minimize free ridership

RESPONSE

The Commercial and Industrial offers are designed and delivered to minimize free ridership as part of Enbridge's standard business practices. Enbridge leverages its internal expertise by providing educational elements to its customers and channel partners, such as webinars, training sessions, newsletters, and other similar efforts. These offer elements drive awareness of energy efficiency financial incentives, and create opportunities for Enbridge to provide technical support which leads to the encouragement, facilitation and validation of customers' decision making regarding operational practices and capital expenditures. In terms of delivery, Enbridge focuses on influencing decision making on projects in advance of implementation.

Witnesses: P. Goldman
R. Kennedy
M. Lister

UNDERTAKING JT1.46

UNDERTAKING

Technical Conference TR, page 239

To provide the excerpt from the auditor report re: jurisdictions.

RESPONSE

As requested, below is the excerpt from Enbridge's 2013 DSM Auditor's report in which the Auditor provides their rationale for supporting Enbridge's recommended free rider rate for the Run it Right offer (EB-2014-0277 DSM Clearance – Page 228).

Free Rider Rate

To date, a free rider rate has not been approved for this program. Enbridge was asked to recommend a free rider rate along with a justification for the proposed rate. Based on its own internal research, Enbridge proposed a free rider rate of 0%.
Optimal reviewed EM&V reports of other retro-commissioning gas programs. Results from eight different programs suggest that free ridership estimates were wide ranging (8-32%). Three of these calculations also included estimates of spillover, which ranged from 10 to 20%. When using either the average or median values of the free rider rate and the spillover rates, the net-to-gross calculation equals 0.96 or 96%. While it is likely that a pre/post billing analysis would inherently include short term participant spillover, Optimal still feels that spillover should be included in the overall review of Enbridge's free rider rate based on the following:

- It is possible that the program will lead to longer term participant spillover that is not currently captured in the billing analysis
- It is likely that continued program efforts will lead to non-participant spillover in the long run by building market expertise and creating more service providers and demand for retro-commissioning services

Because the average net-to-gross value is close to one, Optimal supports Enbridge's recommended free rider rate. However, Optimal recommends that additional efforts be made to better estimate free rider and spillover rates for this program.

Witnesses: R. Idenouye
R. Sigurdson