

ENBRIDGE RESPONSES TO 2015 ANNUAL VERIFICATION RECOMMENDATIONS

The following is a summary of the recommendations provided by the Evaluation Contractor in the 2015 Annual Verification and Enbridge’s responses where applicable to Enbridge.

Table 5-1 Summary of recommendations that apply to the overall annual verification¹

#	Overall Annual Verification Recommendation	Applies to		
		Union	Enbridge	Evaluation
O1A	Consider investing in a relational program tracking database.	✓	✓	
O1B	Enbridge should include site-level information for all measures installed through the program.		✓	
O2A	Deliver tracking data in a single flat file.	✓	✓	
O2B	Consider investing in a relational program tracking database.	✓	✓	
O3A	Develop and maintain an electronic summary of the TRM.	✓	✓	✓
O3B	Track prescriptive savings using unique measure descriptions that map to electronic TRM.	✓	✓	✓

¹ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

O1. Finding: The Enbridge tracking database does not currently include information that allows the evaluator to identify all the projects installed by a single customer. Without this information, the EC could not identify projects installed across customers to determine whether interactive effects may have reduced energy savings. Some prescriptive measures in the Enbridge data did not have site-level information at all, only a summary of the energy savings for that technology across all sites.

Recommendation A: Both utilities should strongly consider investing in relational program tracking databases. Relational program tracking databases and customer relationship management (“CRM”) systems allow for multiple measures and projects to be associated with a single customer and/or customer site. The incremental cost of implementation is low if it is part of the initial database design, populated as projects are started, and updated once they are complete.

Outcome: Reduced burden on utility staff and reduced evaluation costs. A relational database would streamline aggregation of program data for scorecards and make providing data simpler for annual savings evaluation and verification.

ENBRIDGE RESPONSE: As detailed in its 2015 to 2020 Multi-Year Plan, Enbridge outlined the need for a DSM IT system replacement. The Board approved this request in its January 20th, 2016 Decision. As a result, Enbridge DSM is currently undergoing a system upgrade that will include improved tracking & reporting and CRM components. This system upgrade is expected to be rolled out in 2018.

Recommendation B: Enbridge should include site-level information for every measure installed in the program.

Outcome: Confirmation that each installation is unique.

ENBRIDGE RESPONSE: Though the summary tracking information initially provided to the EC for quasi-prescriptive measures, in some cases, did not include all site-level information, upon request Enbridge provided the EC with all the detailed information maintained in back up documentation for each project. Enbridge will endeavour to include comprehensive information for every measure in its summary tracking data moving forward. Given the timing of the receipt of the 2015 Annual Verification Recommendations, in Q3 of 2017, after the completion of the 2016 program year, efforts to make significant changes to tracking for the already completed 2016 program year will be limited, however Enbridge will work to ensure all of the information requested is included in the tracking data summarized to the EC.

O2. Finding: Both utilities invested significant effort in developing Excel-based tracking workbooks that summarized data and calculated DSMSI based on utility-reported results. Union's workbook included a feature that was designed to allow evaluators to enter adjustment factors in a single location and automatically update DSMSI and LRAM calculations. Neither workbook was well suited for evaluation efforts.

Recommendation A: Deliver to evaluators a single, flat file of tracking data.² Each record should have measure-level information which includes the information listed below.

- Program identification information, such as scorecard, and program name
- Customer identification information, such as a unique customer ID, rate class, and location
- Measure identification information, such as measure description, unique

² In this context, a flat file is a table with one record per line and no summary information

measure identification, measure group, measure life, free rider rate, and savings per unit for prescriptive measures

- Savings information, such as annual gross and net savings, cumulative gross and net savings, and non-gas savings
- Additional information as needed to allow the evaluator to verify LRAM and cost-effectiveness

The Union tracking data most closely followed this recommendation, but both utilities invested in workbook features that did not enhance evaluation efficiency.

Outcome: Reduced burden on program staff, more flexibility for evaluators.

ENBRIDGE RESPONSE: With the exception of some quasi-prescriptive measures, project related measure-level information was included in the original tracking database provided by Enbridge to the EC for the 2015 Verification (all requested information was ultimately provided to the EC). Consistent with Enbridge's presentation of results during the 2012-2014 DSM Framework, the Enbridge tracking and reporting summary provided to the EC included dynamic calculation tools that linked measure level inputs to the energy savings calculations, cost-effectiveness calculations, scorecard achievements, and shareholder incentive calculations, as well as LRAM impacts for the 2015 program year. In line with the EC comment in this finding, like Union's workbook, Enbridge's workbook included a feature that was designed to allow evaluators to enter adjustment factors in a single location and automatically update DSMSI and LRAM calculations, Enbridge's tracking summary has evolved and improved through the review of previous audits to a comprehensive and transparent tool. Prior auditors and Audit Committees expected Enbridge's tracking database to have this level of transparency to fully illustrate the determination of scorecard achievements. Given the timing of the receipt of the 2015 Annual Verification Recommendations, after the completion of

the 2016 program year, efforts to make significant changes to the tracking tool for the already completed 2016 program year are challenging, however Enbridge is making every effort to ensure the 2016 tracking summary clearly provides the information requested.

Recommendation B: See recommendation O1A. The utilities should consider investing in a new database.

Outcome: Reduced burden on utility staff and reduced evaluation costs.

ENBRIDGE RESPONSE: See Enbridge Response O1A.

O3. Finding: Neither Union nor Enbridge tracking databases currently use prescriptive measure descriptions that map directly to the approved energy savings spreadsheet (“TRM”). The EC often struggled to align tracking measures to the correct TRM measure, which resulted in repeated back-and-forth between evaluation and the utilities for clarification. During this process, the EC found that some Enbridge measures were assigned to the wrong sub-category by capacity or other size measure. The EC also found that some Enbridge measures were assigned outdated savings values from previously-approved TRMs.

Recommendation A: Develop and maintain an electronic summary of the TRM, such as an Excel file. Each measure (identified as a unique savings value) should have an assigned measure ID number, and new ID numbers should be assigned when a measure is updated with a new savings value. This allows for a historical record of the changes in the TRM and allows the evaluation to identify outdated values.

ENBRIDGE RESPONSE: Board staff now coordinates the TRM update process.³

Recommendation B: Track prescriptive savings using unique measure descriptions that clearly map to the electronic TRM.

Outcome: Reduced burden on utility staff and reduced evaluation costs. Fewer errors in the tracking data.

ENBRIDGE RESPONSE: Enbridge will work to provide the EC with a clearer mapping of prescriptive measure descriptions in its tracking database to measure descriptions outlined in the TRM.

³ As outlined in the Board's March 4 letter, regarding the Transition of Technical Evaluation Committee Activities to the OEB the online portion of the TRM has been transitioned to OEB staff.

Table 5-2 Summary of recommendations that apply to RunitRight⁴

#	RunitRight Recommendation	Applies to		
		Union	Enbridge	Evaluation
RR1	Consider adding independent variables to the regression to account for school breaks.		✓	
RR2A	Consider including the date when each activity was implemented.		✓	
RR2B	Provide information on both the baseline and installed case.		✓	
RR2C	Increase the level of documentation when a single change results in a significant portion of savings.		✓	
RR3A	Consider including a basic description of all end-use equipment served by the gas meter.		✓	
RR3B	Consider using engineering calculations to estimate electricity savings.		✓	
RR3C	Consider reviewing the process for selecting the HDD reference temperature.		✓	

RR1. Finding: Not all the RunitRight regression models provided a strong fit for the consumption data. In particular, school buildings, which have widely inconsistent occupancy throughout the year, show low R- squared values.

Recommendation: Consider including additional independent variables for schools to account for break periods, which may improve the regression fit.

⁴ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

Outcome: More confidence in the reported savings estimates.

ENBRIDGE RESPONSE: Where the consideration of baseline period is required to facilitate a regression model, to address the unique occupancy of school buildings, moving forward the selected baseline period for school projects is September to August and adjusted as appropriate depending on the date of implementation and data availability.

RR2. Finding: The RunitRight documentation includes a description of the activities at each site, which are documented in the calculation workbook and annual site report. The same level of documentation is included for all activities, regardless of the percentage of savings contributed by that activity.

Recommendation A: Consider including the date when each activity was implemented.

ENBRIDGE RESPONSE: Given the timing of the receipt of the 2015 Annual Verification Recommendations, in Q3 of 2017, beginning with the 2018 program year Enbridge will work to include the implementation date for each activity in the project documentation.

Recommendation B: Provide information on both the baseline and installed case. For example, when a schedule is reset, provide the pre- and post-installation schedule.

ENBRIDGE RESPONSE: Given the timing of the receipt of the 2015 Annual Verification Recommendations, in Q3 of 2017, beginning with the 2018 program year Enbridge will look at how to supplement the project file to include additional information

and details on both the baseline and installed case.

Recommendation C: Increase the level of documentation on end use equipment when a change to that equipment results in a significant reduction in consumption.

ENBRIDGE RESPONSE: The Run it Right offer is focused on achieving gas savings through the optimization of existing building systems and equipment through the implementation of low cost/no cost improvements to a building's operation as identified through the offer's investigation process and monitored through the support of an EMIS. Gas savings are determined based on a holistic comparison, where savings are determined through a regression analysis of the consumption data impacted by the combination of all measures implemented and not attributed to any specific measure.

Outcome: More confidence in the reported savings estimates.

RR3. Finding: The evaluator observed a number of opportunities to improve the savings estimates associated with the RunitRight program, including savings at the electric meter. Some sites had base loads that were unexpectedly sensitive to the reference temperature.

Recommendation A: Consider including a basic description of the end-use equipment served by the gas meter, such as DHW, heating, or cooking. This will help the reviewer better assess the consumption patterns occurring over time and the magnitude of base load and weather-sensitive savings estimated.

ENBRIDGE RESPONSE: Given the timing of the receipt of the 2015 Annual Verification Recommendations, in Q3 of 2017, Enbridge will work to incorporate this recommendation beginning in 2018.

Recommendation B: Consider using engineering calculations to estimate electric energy savings to capture the full value of the program.

ENBRIDGE RESPONSE: Though Enbridge recognizes that capturing electric savings would demonstrate additional value from the offer, the Run it Right offer will continue to focus on the determination of low cost/no cost gas savings that are identified through building optimization recommendations.

Recommendation C: Consider reviewing the process for selecting the HDD reference temperature to reduce baseload sensitivity.

Outcome: More accurate savings estimates.

ENBRIDGE RESPONSE: Given the timing of the receipt of the 2015 Annual Verification Recommendations, in Q3 of 2017, Enbridge will investigate the process for selecting the HDD reference temperature beginning in 2018.

Table 5-3 Summary of recommendations that apply to simulation modeling⁵

#	Simulation Modeling Recommendation	Applies to		
		Union	Enbridge	Evaluation
SM1	Provide simulation file and output to the evaluation team.	✓	✓	
SM2	Provide more explicit support for major measure installations.	✓	✓	
SM3	Consider reviewing and modifying program processes to avoid data entry or outdated simulation result errors.	✓	✓	
SM4	Consider funding a study to verify the models produced by the utility agents.			✓

SM1. Finding: Both utilities use building simulation modeling to estimate energy savings for their home retrofit programs, including Home Energy Conservation, Home Reno Rebate, Winterproofing, and the Home Weatherization Program. HOT2000 is the most common program used for those simulations, which is a program developed and released by NRCan for certified energy advisors. Because of the restrictions on the program, the evaluator could not consistently run the simulation files and produce the same result reported by the program.

Recommendation: Provide both the building simulation file and the program output to the evaluation team. By delivering both, the evaluation team would not have to follow

⁵ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

up with the utility to obtain output for models that could not be run, but could still verify the output for models that can be run.

Outcome: Reduced burden on utility staff and reduced evaluation costs.

ENBRIDGE RESPONSE: In the 2015 Verification, Enbridge provided the HOT2000 files to the EC as per the EC's request. When the EC subsequently indicated to Enbridge that they were experiencing some difficulty opening these files, Enbridge offered to provide excel files which provided an extract of data contained in the EnerGuide HOT2000 files. Enbridge would be pleased to provide both the HOT2000 files and the excel file containing the HOT2000 file outputs in any future request.

SM2. Finding: Both utilities have market-rate scorecard metrics that rely on a definition of deep savings that is related to the number of "major" measures installed at a site. Both utilities also collect and deliver photographs to support many of the changes made at a home retrofit site. However, the evaluator could not consistently confirm the number or type of major measures installed based on the photographs or other documentation provided.

Recommendation: Consider providing more explicit support for each major measure to eliminate uncertainty around the number of deep savings program participants.

Outcome: Greater certainty around scorecard achievements.

ENBRIDGE RESPONSE: Enbridge endeavours to provide all available supporting information to the EC as requested. The Home Energy Conservation ("HEC") offer is modelled after NRCan's Residential ecoENERGY Retrofit program which ran until March 2012. Supporting information gathered for measures installed through the

HEC offer is consistent with what NRCan continues to require of all certified Energy Advisors for use of NRCan's licensed HOT2000 energy modelling software in EnerGuide mode, for example invoices or receipts to support upgrades and supporting photographs. Enbridge commits to continue to work to ensure the EC has the available information to facilitate the confirmation of the number or type of major measures installed in a home undergoing review.

SM3. Finding: The evaluator identified a number of inaccurate savings entries due to data entry errors or outdated Union home retrofit simulation results. Many of these errors could be avoided through changes in program processes.

Recommendation: Consider reviewing and modifying program processes to avoid similar errors in the future.

Outcome: Reduced burden on utility staff and reduced evaluation costs.

ENBRIDGE RESPONSE: Enbridge understands it had minimal inaccurate savings entries due to data entry errors or outdated simulation results, however in line with the utility's objective of continuous improvement, Enbridge will carry on working to increase accuracy wherever possible. Notwithstanding the EC's recommendations, in each of the 2016 and 2017 program years, Enbridge has expanded tracking and reporting including a deeper analysis of EnerGuide data exports to identify data entry errors,

SM4. Finding: The energy savings from the home retrofit programs rely exclusively on the simulations provided by the delivery agents. Those simulations likely rely on a number of assumptions or standard modeling practices which may or may not follow industry standards.

A detailed review of the models was outside the scope of the annual audit.

Recommendation: Consider funding a study to verify the models produced by the utility agents to ensure they conform to standard industry practice.

Outcome: Greater certainty around savings estimates.

ENBRIDGE RESPONSE: This recommendation was not directed to Enbridge but for clarity, HOT2000 is developed and managed by the Office of Energy Efficiency at Natural Resources Canada (“NRCan”). HOT2000 simulations in EnerGuide mode can only be completed by Energy Advisors who have been certified by NRCan to use NRCan’s HOT2000 modelling software. Periodically, NRCan updates the software to reflect learnings and implement improvements. Most recently in 2017, NRCan released the newest version, HOT2000 V. 11.3 and EnerGuide Rating System (“ERS”) V. 15.1. In order to deliver services and perform energy audits using this version, NRCan expects energy advisor candidates to demonstrate proficiency by passing the Foundation Level exam; passing the Energy Advisor exam, and be affiliated with a service organization; and they must complete probationary HOT2000 files to the satisfaction of the service organization to show competence with energy simulation modeling and field work in addition to training on current NRCan industry standard inputs and modeling practices. All HOT2000 simulation files, once completed by certified energy advisors for HEC, are provided by the service organizations to NRCan and are subject to NRCan’s QA procedure.

Table 5-4 Summary of recommendations that apply to cost-effectiveness⁶

#	Cost-effectiveness Recommendation	Applies to		
		Union	Enbridge	Evaluation
CE1	Allocate "sector"-level administrative costs and overhead to each individual program and report program-level cost-effectiveness results.	✓	✓	
CE2	Use a consistent real discount rate of 4% when using real streams of benefits and costs.	✓	✓	
CE3	Explore the possibility of better defining water avoided costs.	✓	✓	✓
CE4	Work towards better uniformity in methods and assumptions.	✓	✓	✓

CE1. Finding: In some cases, the Union program costs were grouped together for several programs. To get program- or sector-level cost-effectiveness results, the EC prorated costs to programs based on natural gas savings.

Recommendation: Allocate "sector"-level administrative costs and overhead to each individual program and report program-level cost-effectiveness results.

Outcome: Greater certainty around program-level achievements.

ENBRIDGE RESPONSE: Enbridge will continue to work to appropriately allocate DSM costs, practically and reasonably, in line with direction provided in the Board's

⁶ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

Guidelines, including for the purpose of conducting cost-effectiveness screening. As outlined in section 9.1.2 of the Guidelines:

For the purpose of the TRC-Plus test, the Program Costs relate [sic] to DSM program [sic] include the following components:

- i) Development and Start-up;
- ii) Promotion;
- iii) Delivery;
- iv) Evaluation, Measurement and Verification (“EM&V”) and Monitoring; and
- v) Administration.

Of the above costs, only Start-up, Promotion, Delivery, some Evaluation and Verification are applicable to individual programs. Other costs related to the design and delivery of DSM programs, are appropriately considered at the DSM portfolio level. These include Development, some Evaluation costs, and Monitoring, Tracking and Administration costs.⁷

The Guidelines further specify, “for practical purposes, if certain administrative costs cannot be assigned to individual programs these costs should be accounted at the portfolio level.”⁸

CE2. Finding: Enbridge uses a real discount rate of 4% and applies it to streams of current (nominal) values. However, the real discount rate should only be applied to real (inflation-adjusted) streams of benefits and costs. Nominal discount rates should be applied to streams of current (nominal) values.

Recommendation: Use a consistent real discount rate of 4% for both Enbridge and Union when using “real” (inflation-adjusted) streams of benefits and costs.

Outcome: More accurate cost-effectiveness results.

⁷ Filing Guidelines to the 2015-2020 DSM Framework, EB-2014-0134, page 28.

⁸ Ibid. page 29

ENBRIDGE RESPONSE: Enbridge agrees it is appropriate to apply the real discount rate of 4% to real (inflation-adjusted) streams of benefits and costs. Enbridge further agrees it is appropriate to apply nominal discount rates to streams of current (nominal) values.

CE3. Finding: Water rates are currently used as a proxy for the water avoided costs. Water avoided costs should only include the marginal impact from reduced consumption. Using the full rate as the avoided cost may be appropriate in some jurisdictions with a completely variable rate structure. However, those with high fixed costs (which, in our experience, can represent 75% to 80% of water costs) should use a true avoided cost.

Recommendation: Explore the possibility of better defining water avoided costs.

Outcome: More accurate cost-effectiveness results.

ENBRIDGE RESPONSE: Enbridge agrees that water avoided costs should include only the marginal impact from reduced consumption. As part of the 2015 verification, the EC recommended an adjustment to Enbridge's avoided water costs to reflect a more appropriate estimate of avoided water costs. Enbridge applied a similar approach with its 2016 avoided water costs.

CE4. Finding: The EC found major discrepancies in the way the utilities calculate cost-effectiveness. Some areas of discrepancies included the discount rate, the use of a non-energy benefit adder, the format of reporting results, and the allocation of administration and overhead costs by program. While there is always a balance to be found between uniform methods and the need to account for each specific utility's needs, greater uniformity could be achieved.

Recommendation: Work towards a better uniformity of cost-effectiveness methods and assumptions between the two gas utilities.

Outcome: More accurate and consistent cost-effectiveness results.

ENBRIDGE RESPONSE: Enbridge acknowledges the EC’s recommendation and moving forward, Enbridge will consult with Union in an effort to work towards better uniformity of cost-effectiveness methods and assumptions.

Table 5-5 Summary of recommendations that apply to other areas⁹

#	Other Recommendation	Applies to		
		Union	Enbridge	Evaluation
OR1	When the C&I deep savings metric is used, deliver monthly billing data for each C&I participant.	✓		
OR2	Provide a detailed explanation for the DSMSI calculation.	✓	✓	

OR1. Finding: The Union scorecard includes a metric that relies on an understanding of the whole- building energy use for each C&I program participant. The program data included the total annual consumption at each site, normalized by a regional (north or south) estimate of heating degree days. The calculation appeared to assume that industrial sites were not weather-sensitive but commercial sites were.

⁹ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

Recommendation: When the C&I deep savings metric is used, deliver monthly billing data for each C&I participant to allow the EC to verify the annual consumption values and the weather sensitivity assumptions. Provide the supporting information (and calculation, if possible) for the normalized regional heating degree days.

Outcome: Greater certainty around scorecard achievements.

ENBRIDGE RESPONSE: Not Applicable

OR2. Finding: The evaluator was unable to locate a source document that supports the utilities' calculation of DSMSI. Given the importance of the shareholder incentive, it is appropriate to have a clearly defined and detailed explanation of how it is calculated.

Recommendation: Provide a detailed explanation for the DSMSI calculation for review by the EC and OEB.

Outcome: Greater certainty around shareholder incentives.

ENBRIDGE RESPONSE: This recommendation was previously addressed in the course of the 2015 verification process. Enbridge provided a detailed explanation regarding the calculation of the shareholder incentive to the EC and the EAC during the course of the 2015 verification. The approach followed the calculation outlined by the Board in the previous Guidelines, EB-2008-0346. The calculation to be used by Enbridge in 2016 was subsequently provided and has also been reviewed with the EC and EAC.

Table 5-6 Energy savings and program performance recommendations¹⁰

#	Energy Savings and Program Performance Recommendation	Applies to		
		Union	Enbridge	Evaluation
ES1	The utilities should continue in their commitment to accuracy.	✓	✓	
ES2	Evaluate free-ridership for the programs annually and couple the free-ridership evaluation with process evaluation			✓
ES3	Error ratios from this report inform sample design for future evaluation.			✓
ES4	Align the program design with cumulative net goals	✓	✓	
ES5	Do not pay incentives until after installation is complete.	✓	✓	
ES6	Develop policies to collaborate across electric and gas projects to avoid double-counting fuel savings and increases from energy efficiency measures.	✓	✓	
ES7	Consider establishing a policy to define rules around energy savings calculation for fuel switching and district heating/cooling measures.	✓	✓	✓
ES8	Consider establishing a policy that defines an eligibility floor and cap based on simple payback period for energy efficiency projects.	✓	✓	
ES9	Consider establishing an official definition for EUL and implementing a study to define EULs for program measures	✓	✓	✓
ES10	Track metrics for how long it takes from the final installation verification to the posting of incentive payments.	✓	✓	
ES11	Increase transparency of "influence adjustments" and do not include in gross	✓		

¹⁰ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

#	Energy Savings and Program Performance Recommendation	Applies to		
		Union	Enbridge	Evaluation
	savings			
ES12	Conduct a process evaluation to improve Large Volume influence on customer projects	✓		
ES13	Consider approaches to market that leverage third-party vendors.	✓	✓	

ES1. Finding: Both utilities exhibit a strong commitment to accurate energy savings estimates. Both utilities have made significant investments in developing calculation tools which model savings accurately. For example, Union’s dock door seal calculator is well considered and designed, and Enbridge’s Etools calculator is very thorough in attempting to model savings for key measures. Both utilities chose to retain engineers with strong understandings of their customers’ building and process systems. We had numerous opportunities to interact with these engineers on phone calls and site visits, and have grown to respect their knowledge and engagement with the types of systems that matter to their customers. Both utilities showed a commitment to finding accurate savings. On several occasions, both on the phone and in writing, the evaluation team suggested a value that would have increased savings in a way that the program engineer did not think was valid. When this happened, neither utility was shy in suggesting that we may want to make a more conservative choice.

Recommendation: The utilities should continue in their commitment to accuracy.

Outcome: Accurate energy savings.

ENBRIDGE RESPONSE: Enbridge is committed to continue striving for accurate savings calculation estimates. Enbridge has been a leader in refining savings calculations for many technologies and will continue to look for opportunities to improve approaches and calculation tools with consideration for new information and learnings.

ES2. Finding: Free-ridership in the utilities' programs is high

Recommendation: With high free-ridership and rapidly changing programs, consistent evaluation of free-ridership annually and free-ridership evaluation coupled with process evaluation will help identify specific ways for each program to manage and reduce free-ridership.

Outcome: Effective free-ridership management will allow the programs to increase their net savings significantly in future years.

ENBRIDGE RESPONSE: This recommendation was not directed to Enbridge however, Enbridge finds it necessary to make clear that it does not have confidence in the ECs findings. There are well documented failings and concerns with self-report survey approaches that were proven out in the EC's findings. Enbridge notes there were significant concerns with the measurement of free-riders conducted by the EC on the 2015 program year custom offers. The study did not, in a number of instances, reflect industry best practice. Also, given the limited information shared with the utility with respect to how survey responses were interpreted and translated into scores, and with

no way to know if calculations of NTG scores were done corrected, Enbridge does not have confidence in the results. Enbridge is particularly concerned with the reliability of scoring that was determined based on feedback from customer representatives regarding projects undertaken up to 2 ½ years earlier. Beyond the ability to reach truly informed participants to the projects, Enbridge is concerned the delayed research significantly exacerbated the inherent recall bias of survey participants. In addition, the limited research conducted to ascertain utility influence delivered through the utility's business partners; the focus in the survey instrument on the payment of incentives rather than assessment of the entire suite of services and values provided to customers; the posing of questions that did not ensure clarity of properly captured efficiency improvements relative to specific project utilized baselines to ensure there could be no double counting of adjustments; and, the dismissal of consideration of utility influence and long standing customer support prior to the current program year, collectively contributed to proposed free-rider values in which there can be no confidence.

Notwithstanding Enbridge's concerns with the NTG study findings and the approach taken in the 2015 evaluation effort, given the EC's recommendation here, and the considerable discussion on this process during the 2015 verification, it is puzzling that OEB Staff has decided to not proceed with planned free-ridership/NTG evaluation on custom programs in the following year's evaluation.

ES3. Finding: Relative precision targets were exceeded for some programs and not met for others.

Recommendation: Error ratios from the results provided in this report should be used to inform sample design for future evaluation years.

Outcome: Better defined error ratios for the measures in the programs will allow more

efficient sample design for future evaluations, improving precisions and reducing costs.

ENBRIDGE RESPONSE: This recommendation was not directed to Enbridge however, Enbridge has shared its concerns with the EC and the EAC regarding the error ratios in the results presented in the CPSV and NTG sampling and the resulting uncertainties regarding any accuracy in the proposed adjustments.

ES4. Finding: Attribution for the programs came primarily through acceleration rather than changes in efficiency or quantity/size. This is partly due to the measures that dominate the programs: controls, maintenance, and optimisation. These measures do not have varying efficiencies, so the programs are either affecting the number of units implemented or accelerating the measure. Acceleration is less valuable to programs that are seeking to meet cumulative net goals. Acceleration periods tend to be considerably shorter than the estimated useful life (“EUL”) of a measure and thus the partial attribution that results is low relative to cumulative gross savings.

Recommendation: To align the programs with cumulative net goals, the utilities should seek to:

- continue promoting long life measures and consider discontinuing promotion of short lived measures
- proactively upsell equipment purchases from standard to efficient products
- target hard to reach customers who have not participated in the past
- promote EE measures with low market penetration (such as heat reflector panels)
- motivate customers to increase the scope of their projects, some options include multi-measure bonuses or escalating incentive structures that pay more

for doing more

Outcome 1: Focusing on proactive sales rather than reactive will help the net-to-gross (“NTG”) ratio.

Outcome 2: Effective free-ridership management will allow the program to increase net savings significantly in future years.

ENBRIDGE RESPONSE: While Enbridge does focus its efforts on achieving cumulative gas savings, and agrees to continue to work to align programs to seek improvements in areas recommended above by the EC, Enbridge also intends to continue to deliver programming to support a wide range of eligible energy conservation projects to address the multiple key priorities set out by the Board. The Framework specifically stated that:

DSM budgets will be driven by the gas utilities’ ability to increase activity and address the key priorities discussed below, including delivering tailored service to those customers who have already increased their efficiency levels but can continue to realize savings, increasing operational efficiency improvements, and incorporating behavioural changes into program offerings.¹¹

ES5. Finding: A handful (<5) of respondents indicated that all or part of their incentivized project had not yet been installed over a year after the incentive was paid.

Recommendation: Do not pay incentives until after installation is complete.

Outcome: Cost-effectiveness of the program will increase as it avoids paying for savings that do not materialize.

¹¹ EB-2014-0134, Report of the Board, DSM Framework for Natural Gas Distributors (2015-2020), Section 4.2, page 19

ENBRIDGE RESPONSE: Enbridge did not receive details from the EC identifying any projects where this was the case. Enbridge is unaware of any specific project(s) that received incentive payments having not yet been installed. Enbridge requires that projects are completed prior to the payment of incentives.

ES6. Finding: Some customers receive incentives from their electric provider and natural gas utility to complete the same EE measure. Both providers may claim the same changes in energy use, resulting in overlap when aggregated across fuels at the provincial level.

Recommendation: Develop policies to collaborate across electric and gas projects to avoid double-counting fuel savings and increases from energy efficiency measures.

Outcome: More accurate energy and carbon savings estimates across the province.

ENBRIDGE RESPONSE: Enbridge is not aware of the EC providing details regarding any observations of double counting of fuel savings for custom projects that were reviewed through the course of the 2015 Verification. As outlined in the Board's Framework and Guidelines (EB-2014-0134), Enbridge continues with efforts to co-ordinate DSM and CDM programs and increase collaboration with electricity programs where possible and appropriate.

ES7. Finding: Some measures (e.g., geothermal heat pumps, combined heat and power, and those that save district heating energy) have difficult-to-define baseline technologies.

Recommendation: Consider establishing a policy to define rules around energy savings calculation for fuel switching and district heating/cooling measures.

Outcome: Less evaluation risk and a better alignment between province energy efficiency goals and program implementation.

ENBRIDGE RESPONSE: Enbridge will look at considerations to define approaches to energy savings calculations for fuel switching and district heating/cooling measures.

ES8. Finding: Projects with very long and very short simple payback periods often have low NTG ratios. However, from a customer service standpoint, it may be difficult for utilities to deny incentives to customers unless they have pre-established rules to point to.

Recommendation: Consider establishing a policy that defines an eligibility floor and cap based on simple payback period for energy efficiency projects.

Outcome: The rule will give utilities a guideline to restrict the program to projects that are more likely to result in net savings. It will also allow the utilities to reject potentially poor projects without a large effect on customer satisfaction.

ENBRIDGE RESPONSE: As set out in the Board's Decision and Order, Section 5.2.6 on Enbridge's 2015-2020 Plan (EB-2015-0049), the OEB rejected the need to introduce a policy defining payback eligibility criteria for the Commercial and Industrial custom offer.

ES9. Finding: Members of the EAC and evaluation team have different

understandings of the definition of some evaluation inputs.

Recommendation: Consider establishing an official definition for EUL and implementing a study to define EUL for all measures, especially steam traps, pipe leaks, steam leaks, condensate leaks, and pipe insulation.

Outcome: The study will improve the accuracy of lifetime savings estimates.

ENBRIDGE RESPONSE: A definition for EUL was included in the glossary of terms developed as part of the Board approved TRM filed in December 2016. Enbridge understands that Board Staff has issued an RFP for a CI custom measure life review as part of the 2016 evaluation process.

ES10. Finding: A handful (<5) of sites reported unhappiness with delays in receiving their incentive payment (5 months).

Recommendation: Track metrics for how long it takes from the final installation verification to the posting of incentive payments. Consider holding program managers accountable to these metrics by considering them during performance reviews, building in performance bonuses if all payments are posted within one month, and/or implementing a penalty if it takes greater than three months to post any payments.

Outcome: Improved customer satisfaction.

ENBRIDGE RESPONSE: Enbridge requires that projects must be completed prior to the payment of incentives. Incentives are paid only after the measure(s) are installed, and the project is completed and fully commissioned. Enbridge is unaware of any

customer complaints regarding payment delays. In any case where such an observation has been made, Enbridge suggests a review of the specific circumstances is in order to confirm that the customer had completed and submitted all project requirements necessary to meet project completion standards and facilitate timely payment; this may help clarify the circumstances for any identified delays.

ES11. Finding: Influence adjustments were made to projects that adjusted the gross savings for “net” or program influence reasons. Accounting of which projects had these adjustments was not maintained by the program and the adjustments were included in different places in project calculation workbooks, making their identification challenging. In addition, the program NTG was also applied to these projects, effectively double discounting savings in scorecards.

Recommendation: If the utility chooses to continue making influence adjustments to the savings upon which it calculates savings, these adjustments should be made more transparent and not included in the reported gross savings for the program in scorecards. Instead the specific project influence adjustment should be included in the scorecard in place of the general program or domain level NTG factor.

Outcome: Reduced risk of double adjustments.

ENBRIDGE RESPONSE: Not Applicable

ES12. Finding: Union’s Large Volume program has a very high amount of free-ridership.

Recommendation: This evaluation did not include a process evaluation. Union should consider conducting a process evaluation focused on how to reduce the rate of free-ridership. Three options that the Union might consider are:

- Eliminate measure types with high free-ridership (Union indicated that most maintenance type measures were eliminated in 2016).
- Use an application process that includes a committee review that can reject free riders. This option is hard for utilities to manage as it can affect customer satisfaction negatively
- Clear payback criteria such as initial payback must be longer than X years and the incentive paid must reduce payback below Y years. This has the advantage of being a rule that account representatives can explain when talking to customers.
- Non-energy benefits of projects that large industrial customers gravitate to are often large compared to energy saving benefits, so simple payback criteria will not eliminate all free rider projects. Awareness of this issue should be promoted among the implementation team.

Outcome: Effective free-ridership management may allow the program to increase its net savings significantly in future years.

ENBRIDGE RESPONSE: Not Applicable

ES13. Finding: Vendor attribution did not increase overall program attribution significantly. Of the vendors that customers cited as influences, few indicated that either program had much effect on the projects.

Recommendation: The utilities should consider approaches to market that leverage third-party vendors. A process evaluation that includes vendor interviews might uncover opportunities.

Outcome: Effective leveraging of vendors could both increase NTG ratios and

increase program uptake.

ENBRIDGE RESPONSE: Enbridge’s approach to market for its commercial and industrial offers fully leverages third party vendors. For many years, Enbridge has extensively engaged business partners including vendors/contractors/engineers and distributors to promote the Enbridge DSM program and support customers in the decision making process, propelling customers to implement energy efficiency improvements. Enbridge has found this approach to be highly effective in extending the utilities reach and increasing project uptake.

Table 5-7: Verification process recommendations¹²

#	Verification Process Recommendation	Applies to		
		Union	Enbridge	Evaluation
VP1	Modify contracts to require participants to agree to comply with EM&V as well as utility representatives as part of the requirements for participation in the program.	✓	✓	
VP2	The verification and utility staff should agree to a code of conduct for each role during onsite visits.	✓	✓	✓

VP1. Finding: DNV GL was unable to obtain access to all the equipment at all the sites selected for verification. Both Enbridge and Union have several large projects with industrial companies, including food processing, refineries, and other industries. In

¹² EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

many cases, the customer refused to provide SCADA data or similar trend data to allow a reasonable verification of the project. This means we were unable to do more than a reasonableness check on the savings.

A review of the Enbridge contract shows that the customer is not required to provide the information that is necessary for EM&V. The most relevant sections are:

- Item 6 states: Payment of the Incentive Payment is subject to the completion of a satisfactory site inspection of the improvements, including the installed equipment by an authorized representative of Enbridge.
- Item 9 states: Upon request within eighteen months of the commissioning date of the Project, and with reasonable notice, the Customer agrees to provide authorized representatives of Enbridge with access to the Project, and with required information or data relating to the project for the purposes of the Application and these General Terms and Conditions.

Neither of these are sufficient for EM&V.

Recommendation: Modify contracts to require participants to agree to comply with EM&V as well as utility representatives as part of the requirements for participation in the program.

Outcome: Reduced evaluation costs and risks. Participant non-compliance requires evaluators to request documentation for a large backup sample, and to survey and/or visit additional sites to obtain sufficient data for the evaluation. The process of contacting a site and getting a refusal costs time and money, as does the substitution of an additional site to make up for the unobtained data. In some cases, there might not be additional sites to sample, in which case the evaluation estimates will have lower precision than they would with full compliance.

ENBRIDGE RESPONSE: Enbridge encourages its customers to comply, cooperate

and participate with all EM&V verification activities. At the same Enbridge recognizes it is important to be respectful that customers are busy running business and requests for customers' time should not be overly burdensome. Up until this 2015 Verification, virtually 100% of sampled participants selected for verification have complied with verification related requests. In the 2015 sample, in some cases, Enbridge received feedback from customers that onerous time requirements and/or specific data requests made of customers may not have been considered reasonable and/or comprised customer privacy concerns or safety policies. In addition, the delay between project completion and third party evaluation, of greater than 2 years in some cases, may have further discouraged customers to participate fully in the 2015 Verification because the appropriate person that should respond was now not available. Enbridge believes the language contained in Item 9 in Enbridge's Energy Efficiency Project Application General Terms and Conditions details that the customer has agreed to allow access to the project and the required information or data relating to the project as a condition of participation. Enbridge will investigate however how it might improve the language.

VP2. Finding: Verification engineers and verification forms caused confusion with site contacts and the length of visits also led to a handful of customer complaints. Utility staff at a handful of sites responded to questions in place of participating customers and in one case interfered with data collection.

Recommendation: The verification and utility staff should agree to a code of conduct for each role. The teams should receive clear direction as to the dos and don'ts of all parties involved in site visits, including both verification engineers and utility staff should they attend the visit. Open lines of communication between the site team and utility staff should be maintained to reduce misunderstandings and ensure that the teams are on the same page as to each other's role.

In general, the following should be part of standard verification practices:

- Ensure site engineer reviews final site report for accuracy post-audit.
- Align data collection forms with site report structure to reduce communication and transcription errors.
- Ensure data appropriate to determining EUL is collected while on-site (i.e., make EUL determination a primary, rather than secondary focus).
- Request specific documentation or data from systems prior to site visit (allowing for adequate time for site contact to obtain).

Outcome: Improved data collection and customer satisfaction.

ENBRIDGE RESPONSE: Enbridge is unaware of any customer site visits/project reviews where verifiers indicated any concerns with the conduct of Enbridge utility staff, however as communicated to the EC early in the process, Enbridge shared concerns regarding observations of the verifiers at a number of the site visits. These included poor/untimely communication regarding site visit scheduling, concerns about questions asked of customers regarding unrelated or irrelevant information about the project indicating a poor understanding of the project or technology, site visit reports that included measurements or findings that were in fact not completed, and requests for data that were perceived to compromise customer privacy.

Enbridge concurs that a verification code of conduct for verification and utility staff should be established. Enbridge also suggests that protocols ensure there is a project review with utility staff undertaken prior to the site visit to ensure a clear understanding of the project.

Table 5-8 Documentation and Support recommendations¹³

#	Documentation and Support Recommendation	Applies to		
		Union	Enbridge	Evaluation
DS1	Take steps to improve documentation: <ul style="list-style-type: none"> • Include explicit sources for all inputs and assumptions in the project documentation. • Store background studies and information sources with the project files and make them available to evaluators. • Provide evaluators full access to customer data. • Provide pre- and post-installation photos, where available. • Document and provide internal M&V documents where available. • Institute a checklist as part of project closeout to ensure all relevant project documentation is assembled as ready for verification 	✓	✓	
DS2	Ensure that incremental costs are supported by invoices or other documentation	✓	✓	
DS3	Increase the amount of documentation and source material for projects that have greater energy savings.	✓	✓	

¹³ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

DS4 A	Digitize and file project documentation for all projects as they are completed and paid during project closeout.	✓	✓	
DS4 B	Until the utilities can implement an effective digital document storage process, the evaluation should allow more time for the utilities to assemble and deliver the documentation.			✓
DS5	Consider providing more training or adding quality control steps to ensure the summary workbook front page is completed and stored in a consistent manner.	✓		
DS6	Use a consistent summary workbook.		✓	

DS1. Finding: Project documentation for some projects lacked sufficient details to allow evaluators to reproduce the calculations made by program staff or third-party vendors. Specific issues included:

- Project data or details missing
- Insufficient measure-level details to fully describe what was installed
- Descriptions that were difficult to understand
- Use of black box tools
- Hardcoded information in calculation spreadsheets
- Energy intensity changes presented without providing the data to justify it
- Undocumented assumptions
- Sources referenced but not included or available, such as feasibility studies and historical analysis of energy use that was left out of the project documentation
- Scanned documents that were unreadable
- Input adjustments that approximate other effects, but are not explained
- Insufficient access to customer data (by customers) for confidentiality reasons.

- Modelling files that could not be opened
- Adjustments to savings estimates for safety or influence that were not clearly marked, sourced, or carried out in a consistent fashion
- Etools files not provided for many industrial boiler & boiler add-on projects

Recommendation: Several steps could be taken to improve data quality:

- Include explicit sources for all inputs and assumptions in the project documentation.
- Store background studies and information sources with the project files and make them available to evaluators.
- Provide evaluators full access to customer data.
- Provide pre- and post-installation photos, where available.
- Document and provide internal M&V documents where available.
- Institute a checklist as part of project closeout to ensure all relevant project documentation is assembled as ready for verification

Outcome: Properly explaining and sourcing the savings calculation method and assumptions allows the evaluating engineer to more easily identify what needs to be verified. It also makes it easier to determine whether the methods and assumptions are reasonable and use ex ante assumptions rather than seek documented values elsewhere.

ENBRIDGE RESPONSE: Enbridge continually strives to improve the comprehensiveness of custom project documentation and generally works to ensure full and detailed inputs and supporting evidence is clearly outlined for each project. Nonetheless, Enbridge will review these recommendations to improve data quality moving forward. Given the timing of the receipt of the 2015 Annual Verification

Recommendations, in Q3 of 2017, incorporation of any such recommendations will be made in the 2018 program year.

DS2. Finding: Invoices were not always included with documentation, and we saw a handful (<5) of cases where utility program staff were overclaiming incremental costs. This did not appear to be systemic, but higher incremental costs enable payment of a larger incentive.

Recommendation: Ensure that incremental costs are supported by invoices or other documentation, especially for add-on and optimization measures where the total cost and incremental cost are likely to be the same. Equipment replacement measures may require an additional standard efficiency quote to produce incremental cost.

Outcome: Incremental cost is an important component of simple payback, which is often used to judge the economic benefit of energy efficiency projects. It is also an input to some benefit-cost tests.

ENBRIDGE RESPONSE: Enbridge endeavours to ensure that claimed incremental costs are supported by invoices or other documentation. In some cases, project costs are bundled within invoices for larger work being completed in tandem at a customer site. Enbridge will continue to work to minimize any instances where incremental costs are not clearly documented.

DS3. Finding: Larger projects appeared to fall under the same documentation standards as smaller projects.

Recommendation: Increase the amount of documentation and source material for projects that have greater energy savings.

Outcome: Projects that are better documented tend to have more accurate savings estimates and receive fewer evaluation adjustments than those that are less documented. Large projects have a greater effect on overall savings adjustment factors. Therefore, large projects with better documentation are more likely to result in adjustment factors closer to 100%.

ENBRIDGE RESPONSE: For consistency, Enbridge strives to ensure project documentation captures all the relevant information to support accurate savings calculation estimates regardless of the size of project.

DS4. Finding: Enbridge did not maintain complete digital project files prior to the evaluation request. Union appeared to have digital documentation that was not completely assembled prior to evaluation.

Recommendation A: Digitize and file project documentation for all projects as they are completed and paid during project closeout. PDF and Excel files associated with a project should be stored in a way that allows them to be easily found and associated with a specific project and/or customer. The best practice is to include a document repository as part of the program tracking system with a separate folder for each project.

ENBRIDGE RESPONSE: Enbridge DSM is currently undergoing a DSM IT system upgrade that will include improvements to the organization and facilitation of digitized project files. This system upgrade is expected to be rolled out in 2018.

Recommendation B: Until the utilities can implement an effective digital document storage process, the evaluation should allow more time for the utilities to assemble

and deliver the documentation.

Outcome: In our experience, DSM programs that store complete and well-organized digital records experience less evaluation risk. In other words, their gross savings adjustments are closer to 100%. This happens for three reasons:

- Digitization facilitates internal review of project documentation, providing additional opportunities to identify missing information and errors
- Assembly during project closeout improves the comprehensiveness of the documentation because less time has elapsed than if it was assembled for evaluation, so less information is lost or forgotten

Easy retrieval makes it more likely that the complete file is sent to the evaluation team, reducing the information gap between implementation and evaluation.

ENBRIDGE RESPONSE: This recommendation was not directed to Enbridge

DS5. Finding: Union custom projects utilized a project application summary workbook that summarizes the key project inputs, calculations, and most details. In general, this is a good approach that facilitates internal review and evaluation. One challenge was that different projects used the workbook in different ways:

- The notes section was sometimes used to identify and highlight specific unique approaches and features in projects, but not always.
- Calculations internal to the summary page were consistent for most projects, but not all (additional factors were sometimes added).
- Sub-methods critical to the calculation were contained in hidden sheets.
- Safety and influence adjustments were inserted in different locations and not always explained.

Recommendation: Consider providing more training or adding quality control steps to ensure the summary workbook front page is completed and stored in a consistent manner. Identify a common approach for common measures and, if necessary, document deviations and the reasons for the deviations in a clearly labelled field on the summary sheet.

Outcome: A consistent summary workbook aids both internal and external quality assurance, quality control, and measurement and verification.

ENBRIDGE RESPONSE: Not Applicable

DS6. Finding: The Enbridge Etools is used as both a calculation tool and as a communication tool with customers. While it appears to serve the needs of the program, this form of communication is difficult for the evaluation efforts.

- Etools does not easily allow for assumptions to be sourced within the record.
- Some Etools selections may be site-specific and some may be defaults; the calculator does not distinguish.
- Energy savings that are calculated outside of Etools are hard-entered in Etools but not always sourced.

Recommendation: Use a consistent summary workbook.

Outcome: A consistent summary workbook aids both internal and external quality assurance, quality control, and measurement and verification.

ENBRIDGE RESPONSE: Enbridge is committed to continue in its efforts to improve upon the comprehensiveness and clarity of all relevant project information, data and underlying input assumptions. Given the timing of the receipt of the 2015 Annual

Verification Recommendations, in Q3 of 2017, considerations to improve on a project summary workbook will be reviewed for the 2018 program year.

Table 5 9: Data management recommendations¹⁴

#	Data Management Recommendation	Applies to		
		Union	Enbridge	Evaluation
DM1 A	Track contacts associated with projects in the program tracking database.	✓	✓	
DM1 B	Strongly consider investing in relational program tracking databases.	✓	✓	
DM1 C	Include structure for improved data integrity in the evaluator request for contact information for the 2016 and 2017 savings verification and evaluation.			✓
DM2 A	Consider offering bonus incentives early in the year to combat the "hockey stick" phenomenon where a large percent of projects get closed in the fourth quarter of the year (which results in rushed QC for data).	✓	✓	
DM3	Track and provide to evaluators dates for key milestones in the project.	✓	✓	
DM4	Maintain a customer identifier in the database to clearly identify related sites.	✓	✓	
DM5	Include EUL (also remaining useful life for dual baselines), NTG, and each of the key savings types (i.e., annual and cumulative, gross and net) in the program tracking extracts provided to evaluators.	✓	✓	

¹⁴ EB-2015-0245, Ontario Gas DSM Evaluation Contractor, 2015 Natural Gas Demand Side Management Annual Verification, October 12, 2017

DM1. Finding: Neither Union nor Enbridge currently track participating customer or participating vendor contact information in their program tracking database. Providing the information to the evaluation put significant burden on utility staff. When contact information was provided, there were significant data integrity issues including contacts listed in the wrong places, partial addresses, and incorrect or missing phone numbers and email addresses.

Recommendation A: Track contacts associated with projects in the program tracking database. At a minimum, the program tracking database should include:

- Project site address
- Customer mailing address
- Primary customer contact name
- Primary customer contact phone
- Primary customer contact email
- Primary customer contact mailing address
- Addresses are best tracked as multiple fields including:
 - Street address line 1
 - Street address line 2
 - City
 - Province
 - Postal code

Phone number fields should include data validation to enforce a consistent format and avoid missing or extra digit errors. Phone extensions should be tracked in a field separate from the ten-digit phone number and be restricted to numeric data only.

The best practice is to maintain contacts in a table separate from specific project or customer data. This allows for a single contact to be connected to multiple accounts and/or projects as necessary without creating duplication. This structure also makes it easier to associate multiple contacts with a single project.

Vendor contact information should also be tracked in the database, in the same table as the participating customer contact information. With a relational database, the contact ID from the table can be added to a project record in the role consistent with the contact's participation (such as vendor, decision maker, or technical expert) with a separate table that allows a single vendor contact to be associated with multiple projects.

Outcome A: Reduced burden on utility staff to seek contact information for projects, whether for internal or evaluation use. Reduced evaluation costs and improved sample design expectations.

ENBRIDGE RESPONSE: Enbridge is currently undergoing a tracking & reporting system upgrade that will enable the capture of participant and vendor information in a single database. This upgrade is expected to be rolled out in 2018.

Recommendation B: The utilities should strongly consider investing in relational program tracking databases. Relational program tracking databases and customer relationship management ("CRM") systems allow for multiple contacts to be associated with a single account and/or project. This allows programs to easily clarify aspects of projects during implementation and to provide accurate, timely, and usable contact information to evaluators and verifiers. The incremental cost of implementation is low if it is part of the initial database design, populated as projects are started, and updated once they are complete.

Outcome B: Reduced burden on utility staff and reduced evaluation costs. A relational database would streamline aggregation of program data for scorecards and make providing data simpler for annual savings evaluation and verification.

ENBRIDGE RESPONSE: Enbridge DSM is currently undergoing an IT system upgrade that will include improved tracking & reporting and CRM components. This system upgrade is expected to be rolled out in 2018.

Recommendation C: For 2016 (and perhaps 2017), we do not anticipate that contact information will have been entered into the program tracking databases. When the evaluation requests contact information for the 2016 and 2017 savings verification and evaluation, the contact request spreadsheet will be updated to provide additional fields to enforce data integrity (e.g., specific fields for a parsed address and company name for the technical and decision-making contacts).

Outcome C: Reduced evaluation costs due to less data cleaning and research to fill missing information. Improved data collection with less returned advance letters and more accurate connection between projects and contacts.

ENBRIDGE RESPONSE: This recommendation was not directed to Enbridge

DM2. Finding: Both utilities have indicated that inputting and/or extracting data necessary for annual reporting and evaluation requires significant effort.

Recommendation A: Consider offering bonus incentives early in the year to combat the “hockey stick” phenomenon where a large percent of projects get closed in the fourth quarter of the year.

Outcome: Reduced burden on program staff, more consistency in meeting annual filing deadlines.

ENBRIDGE RESPONSE: In the case of the 2015 Verification, the data requests from the EC were delivered in Q4 at year end, not in Q2 or Q3 as contemplated in the Board's new governance structure. This is the busiest time of the year. However, Enbridge does not agree that offering a bonus incentive early in the year to combat the "hockey stick" phenomenon would address the EC's finding. Firstly, in many cases, particularly in industrial setting, customers utilize primarily two time periods to execute a major change to their process or the facility: summer shutdown, for those customers that incorporate this mid-year break and more often Christmas shutdown.

The EC's observation regarding the utilities' effort was in large part as a result of the change in process, new data categorization requirements and the increased volume of project files requested for the CPSV, free-ridership and spillover studies encompassing substantially more projects compared to previous years.

Recommendation B: See recommendation DM1B. The utilities should consider investing in a new database.

Outcome: Reduced burden on utility staff and reduced evaluation costs.

ENBRIDGE RESPONSE: See Enbridge's response to DM1B.

DM3. Finding: The extracts from the utility program tracking database do not include dates for key project milestones. Enbridge's data did not include any dates and Union's included only the "installation date."

Recommendation: Track and provide to evaluators dates for key milestones in the project.

Dates for project start, installation, and those that define the program year provide useful context for interviewers that is not always easy to find in project documentation

Outcome: Improved data collection through more informed interviewers and reduced evaluation costs through less need to search for dates in documentation.

ENBRIDGE RESPONSE: Though all “key project milestones” may not have been presented in Enbridge’s summary tracking database, Enbridge does include the measure(s) “Turn on Date”, which denotes when the measure(s) has been installed and fully commissioned in the tracking summary. The incentive payment process commences only after this date has been entered into the tracking database and the custom project file submitted for claim. This date is also utilized for LRAM purposes. In addition ESCs are expected to track other relevant key milestones in the project file including project initiation and meeting dates with customers.

Enbridge DSM is currently undergoing an IT system upgrade that will include improved tracking & reporting and CRM components that will facilitate the improved capture of milestone dates. This upgrade is expected to be rolled out in 2018.

DM4. Finding: Customers with multiple sites are not tracked in the program tracking database. A few property management groups had many sites selected in the sample, but it was not clear from project tracking or the provided contact information that the sites were related. Property management firms were the most significant but not the only customer type where this was true.

Recommendation: Maintain a customer identifier in the database to clearly identify related sites. This is easiest to deploy in a relational database see recommendation DM1B.

Outcome: Reduced evaluation costs and reduced customer burden. In some cases, a failure to identify related sites can result in multiple calls to the same customer, which a customer identifier would avoid. In addition, tracking related sites could improve program implementation by increasing awareness of connected opportunities.

ENBRIDGE RESPONSE: Enbridge's custom projects are designated with a unique project ID. Although a customer identifier to identify related sites is not utilized for custom projects, projects can be linked on the basis of billing information, site address, or at the customer name assignment for multiple addresses. There are some exceptions however are schools boards and property managers with many sites.

DM5. Finding: EUL and cumulative gross savings were not provided in the standard program tracking database extracts. The evaluation team backed out the missing information from the fields provided.

Recommendation: Include EUL (also remaining useful life for dual baselines), NTG, and each of the key savings types (i.e., annual and cumulative, gross and net) in the program tracking database.

Outcome: Improved data integrity results in less evaluation risk and more accurate savings totals. Providing each of the key savings types and their components allows evaluation to confirm that the savings provided are internally consistent.

ENBRIDGE RESPONSE: Enbridge tracks the EUL for all custom projects and includes the RUL where it is determined to be applicable; in addition Enbridge includes the remaining categories listed above in its tracking summary.