# DNV·GL

## Massachusetts C&I Evaluation Contract Project Summary:
## Methods and Evaluation of Control Measures

**Project timeframe: 08/01/17 – 6/15/18**

**Research area: Impact**

**High-level study objectives: Is energy consumption data analysis using monthly data sufficient to estimate whole-facility interactive savings of the magnitude potentially produced by building automation systems?**

## Selected key supporting findings

- The exploratory analysis finds that aggregate energy consumption data analysis (ECDA) with a comparison group may be a technically suitable choice for the estimation of BAS measure savings in selected branded food service applications given the number of BAS being installed and the magnitude of expected savings.

- It is an approach that addresses the potential for biased savings estimates due to non-stable consumption, year over year.

- The homogeneity of selected branded foodservice chains will support reasonable precision for electric savings estimates of expected magnitude, even with additional variance introduced by a comparison group. Gas savings estimates should be statistically significant but may only have relative precision of in the range of 90/40–90/50.

- The end-use metering data that is available for the early BAS implementations could support an engineering approach for some end-uses. In combination with the ECDA, the end-use data could improve that accuracy of savings estimates and facilitate the breaking out of non-BAS measure savings.

- In 2015 and 2016, there was a natural, non-program-related decrease in electric consumption. This lack of stability, or drift, does not support ECDA for individual sites with the available monthly data. Further, the availability of hourly data is not likely to mitigate the lack of stability and drift.



Figure.1. Number of incentivised BAS projects for the sample coffee chain for Eversource and National Grid, 2016–2018

- The availability of only monthly (and not hourly) data limits the options for whole-facility ECDA. AMI or other sources of hourly data from pre- and post-installation periods, coupled with additional data (e.g., sales volumes, customers served) could offer a more viable whole facility solution.

- It has not been determined whether ECDA methods will shorten the evaluation timeline or reduce costs.

- Additional analysis of the ECDA methods described here should be performed on BAS project sites before a final determination is made regarding the appropriateness of using ECDA to evaluate savings from BAS projects.
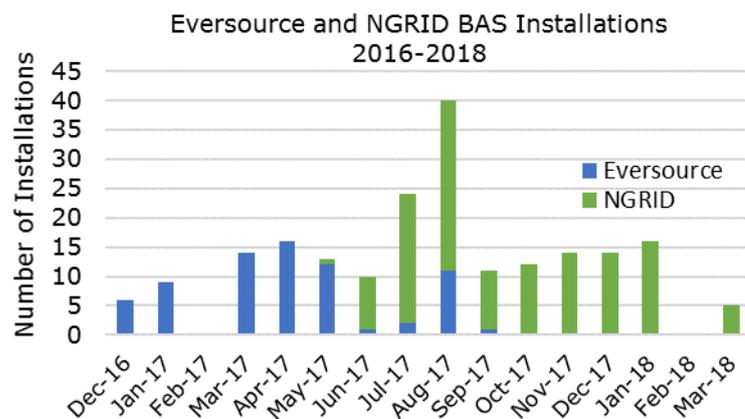
**For full report see: Methods and Evaluation of Control Measures on the EEAC website, http://ma-eeac.org/studies/**

# Methods and Evaluation of Control Measures Report Summary (cont.)

## Comprehensive findings and recommendations matrix

| Recommendations | | |
|---|---|---|
| *Category 1* | *Recommendation 1* | *The PA's should consider calculating preliminary savings estimates on an actual weather conditions (rather than a typical weather basis) because it will increase the flexibility and timeliness of the estimates.* |

| Findings | The PA's should consider calculating preliminary savings estimates on an actual weather conditions (rather than a typical weather basis) because it will increase the flexibility and timeliness of the estimates. |
|---|---|
| **Finding category 1** | |
| *The exploratory analysis finds that aggregate energy consumption data analysis (ECDA) with a comparison group may be a technically suitable choice for the estimation of BAS measure savings in selected branded food service applications given the number of BAS being installed and the magnitude of expected savings.* | *X* |
| *It is an approach that addresses the potential for biased savings estimates due to non-stable consumption, year over year.* | *X* |
| *The homogeneity of selected branded foodservice chains will support reasonable precision for electric savings estimates of expected magnitude with ECDA, even with additional variance introduced by a comparison group. Gas savings estimates should be statistically significant but may only have relative precision of in the range of 90/40–90/50.* | *X* |
| *The end-use metering data that is available for the early BAS implementations could support an engineering approach for some end-uses. In combination with the ECDA, the end-use data could improve that accuracy of savings estimates and facilitate the breaking out of non-BAS measure savings* | *X* |
| *In 2015 and 2016, there was a natural, non-program-related decrease in electric consumption. This lack of stability, or drift, does not support ECDA for individual sites with the available monthly data. Further, the availability of hourly data is not likely to mitigate the lack of stability and drift* | |
| *It has not been determined whether ECDA methods will shorten the evaluation timeline or reduce costs. This could potentially be tested in a follow-on analysis.* | |
| *The availability of only monthly (and not hourly) data limits the options for whole-facility ECDA. AMI or other sources of hourly data from pre- and post-installation periods, coupled with additional data (e.g., sales volumes, customers served) could offer a more viable whole-facility solution.* | |