MEMORANDUM

To: Michael Davis, LISC

From: Jane Colby, Cadmus

Subject: WegoWise Billing Analysis Review

Date: August 31, 2015

As part of its evaluation of the Green Retrofit Initiative, LISC staff requested that Cadmus review the billing analysis and the report regarding the billing analysis that was conducted by staff at WegoWise. We completed our first evaluation analysis in December 2014. This, our second phase of evaluation, encompassed two tasks, as described below. Similar to our previous evaluation, we have successfully validated to a high degree of accuracy the savings estimates calculated by WegoWise.

Task 1. Conduct PRISM analysis for five program participants

WegoWise provided Cadmus with raw billing data for each meter at a randomly selected sample of six participating low-midrise multifamily sites. These billing data were starting and ending meter readings for electricity, natural gas, and oil monthly usage. Additionally, WegoWise provided aggregated monthly allocated data for each site, weather data, monthly aggregated Btu usage, monthly model predicted usage, monthly model savings, and monthly percentage savings.

In a separate customer file, WegoWise provided additional details such as PRISM heating reference temperatures, heating slope estimates, base load estimates, average savings estimates, zip codes, type of measures installed, square footage, number of units, fuels served, weather station used, minimum and maximum retrofit dates, and pre-period min and max dates.

Cadmus read in the raw billing data, converted the usage to total Btu, and allocated the billing data to calendar months. This process yielded aggregated monthly allocated usage for each of the six multifamily sites nearly identical to WegoWise estimates. The difference was less than 0.01% and is probably due to rounding and slight variations in the conversion factors to Btu. Through this analysis, we confirmed the accuracy of WegoWise monthly allocation procedure and raw data processing.

We also independently obtained raw weather data for the two stations used in the analysis—Boston Logan Airport and East Milton, both in Massachusetts. The daily National Oceanic and Atmospheric Administration (NOAA) data were very similar to the monthly weather data WegoWise used.

At one of the sites (31), only base load measures were installed. Cadmus calculated identical average base load per-day pre-period usages as WegoWise. The monthly savings and percentage savings estimates were also identical to the estimates provided by WegoWise.

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Heating measures were installed at the other five sites (47, 217, 221, 227, and 245) and we therefore performed PRISM variable base heating models with heating reference temperatures ranging from 55°F to 85°F. We verified that the WegoWise models used the correct heating reference temperatures. Our results for all five of these models were within 0.01% of WegoWise's results, on average[1], for monthly predicted values, savings, and percentage savings.

Task 2. Review WegoWise report

We reviewed the WegoWise report and noted that, overall, the gas savings are in line with other studies we have conducted.

To validate the electric savings, which on first review appeared higher than other studies, we requested the pre-period usage, the savings, and the percentage savings along with the list of measures installed for each site and the electric usage and measure data. We reviewed the data provided by WegoWise and concluded that the overall electric savings results were reasonable for the measures installed.

Sincerely,

Jane Colby
Principal
Cadmus

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[1] The one exception is a deviation of 12% for retrofit ID 227 in November 2012 between the WegoWise estimate and ours. This was the only month where a difference of greater than 0.01% occurred for this site or any other site, meaning that the overall average match was still better than 0.25%.