Past Gas: Natural Gas Efficiency Program Realization Rate Error Ratios in Four States

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Natural gas energy efficiency programs are maturing and proliferating. As new programs are evaluated for the first time, evaluation planners should leverage the knowledge gained in evaluation work completed so far in other jurisdictions, particularly since recent gas evaluation studies have revealed substantial differences between gas and electric program evaluation results. This poster and summary present recent experience with error ratios.

What Is an Error Ratio?

The goal of energy efficiency program impact evaluation is to determine how much energy or demand the program is saving. For most commercial and industrial programs, this is done by (1) evaluating project-specific savings for a sample of participants, (2) calculating the sample's realization rate by dividing the sample's evaluated savings by the sample's program-reported savings (with appropriate weighting), and then (3) multiplying the sample realization rate by the program-level reported savings.

The sample size has a major effect on the evaluation cost and level of engineering rigor possible. If the realization rates vary greatly from project to project the sample must be large; if the realization rate is varies little then the sample can be small. In stratified ratio estimation - the preferred sample design technique in many evaluations - the error ratio is the parameter that quantifies realization rate variation.

The challenge is that the error ratio must be assumed at the beginning of the evaluation but it will not be known until the end. A poor guess at the beginning means either disappointing precision at the end of the evaluation or excessive spending for unnecessary extra sample.

Results

This poster presents a survey of the realization rate error ratios for thirteen different natural gas efficiency programs and portfolios to inform planners. The error ratios range from 0.30 to 2.15, and the median is 1.1. The error ratios would have been higher had the values included extreme outlier projects, which they did not. The median is a higher value than typically found for either prescriptive or custom electric incentive programs. All else being equal, gas program evaluations either need to have larger samples or lower expectations regarding sampling precision than electric evaluations.

Recommendations

Planners should expect higher error ratios for natural gas program evaluations than for electric. No less than 0.6 is recommended, even for programs that report savings based entirely on project-specific calculations. A value of 1.1 is warranted in many circumstances.

Until natural gas efficiency programs mature and error ratios decrease, it is important to learn *why* variation is so high. This can only be learned from intensive engineering examination. Therefore,

the author recommends that planners maintain high engineering rigor. Do not sacrifice rigor for larger sample counts to deliver better sampling precision. Rather, expect decreased precision (or increase funding) until the industry matures, find out what is causing the high degree of variation, and correct the problem. Better sampling precision will follow.