High Reported Energy Savings — Are They Real or Fake? International Case Applications Help To Understand Pitfalls in Energy Savings Calculations

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International Comparison of Energy Savings Calculations

Experts from France, Korea, the Netherlands, Norway, Spain, Switzerland and the USA are working together to get a better understanding in each other's national energy savings calculations. This research project is one of the on-going projects in the international collaboration of the International Energy Agency in the field of Demand Side Management (IEA DSM Agreement). Each of the experts collected information for case applications on the following technologies and energy end-users:

1. Industry—Variable Speed Drive and High Efficient Motor
2. Commercial Buildings—Heating System
3. Commercial Buildings—Integrated Air conditioning System
4. Households—Retrofit Wall Insulation
5. Households—Lighting

During several meetings, the experts discussed the information needed to understand the ex-post energy savings calculations, the related greenhouse gas reductions, and the relevance of energy savings projects and programs for Demand Response. The case applications will be available by the end of 2011 at www.ieadsm.org

Key Information on Energy Savings Calculations

Each of the case applications presents the information in a common format within four groups:

1. Summary of the program;
2. Formula for calculation of annual energy savings;
3. Input data and calculations of energy savings; and
4. Greenhouse gas savings.

The key elements for understanding the calculation of annual energy savings are:

1. Specification of the formula;
2. Specification of the parameters in the calculation;
3. Specification of the unit for the calculation;
4. Baseline issues;
5. Normalisation; and
6. Energy savings corrections (gross-net corrections; corrections due to data collection problem)

Lessons Learned

In each of the national case applications for a specific technology, the formula often contains the same parameters. But the national formulas are most of the time presented with all key elements included, which results in rather complex equations. One conclusion is that a presentation of the formula in a simple way and a separate presentation of baseline choices, normalisation, and corrections can speed up the process of finding the real differences between the calculated savings.

Also the national choice to use a particular notation for a parameter makes it difficult to see immediately whether a section in the equations is common over the case applications or not. Using notations from (inter)national standards wherever possible is another step to improve understanding.

The use of default values shows up in an increasing number of calculations. Although there is often a discussion of the "fit" of these values to the specific project, almost no information is available on the uncertainty ranges of such default values. Comparison of national default values can help to improve a good set of default values.

The use of default values will increase the cost efficiency of energy savings calculations. From discussions during the project, we learned that differences between country-specific default values are often rather helpful to understand. The understanding of how another country developed a default value was discovered during the project to be valuable and rather inexpensive information to be used to improve one's own default value in the future.