



TETRA TECH



Subject Focus on Energy Evaluation

Collecting Company Size Information During E&T Courses

To Carol Stemrich,
Public Service Commission of Wisconsin
cc Monica Curtis, Ken Williams, WECC

From Shawn Bodmann, Chris Dyson, Tammy Kuiken,
and Mimi Goldberg, KEMA Inc.

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In the 2010 *Business Programs: Education and Training Untracked Attributable Savings* report¹, KEMA recommended that implementers of Education and Training (E&T) courses collect company size data from all participants. The purpose of this memo is to explain (1) why this information will be useful for future estimates of untracked attributable savings (UAS), (2) our recommended approach for collecting this company size data in the future, and (3) our current plans to pilot-test the company size questions with 2011 trainees.

Why These Data are Useful

Obtaining company size estimates—and the ability to convert these company size estimates to energy consumption based on the company type—will be useful for the estimation of UAS for E&T courses for the following reasons:

- 1. Allowing a stratified random sample for the CATI survey.** Collecting this company size/type information will allow us to create a stratified random sample of E&T trainees for the computer-aided telephone interview (CATI) survey. The CATI survey is our initial attempt to find evidence of potential spillover energy efficiency projects that resulted from trainees taking the E&T courses. Since there is likely a correlation between a company's energy consumption and its potential energy savings, we would prefer to include the company size/energy consumption variable in the stratification so that we can insure that we complete surveys with some of the larger companies. Yet because we currently do not have company size information before we field the CATI survey, we are forced to use a simple random sampling approach that made no distinction between large or small companies. Since smaller companies tend to be more numerous than larger companies, a simple random sample would have a greater chance of picking a smaller company than a larger company and this would



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¹ Shawn Bodmann, Christopher Dyson, Tammy Kuiken, Miriam Goldberg, KEMA Inc. *Business Programs: Education and Training Untracked Attributable Savings*. October 29, 2010.

cause the larger companies to be underrepresented relative to their energy consumption. Collecting company size and company type information from the E&T trainees at the course would give us the information we need to do this stratified sampling.

2. **Allowing us to use energy consumption as a weight rather than just the number of employees.** Some companies are more energy-intensive than others. For example, an aluminum manufacturer uses a lot more energy than a school even though both may have the same number of employees. As described below, our new methodology will allow an evaluator to use the information we collect on company type and the number of employees, as well as information from the Energy Information Administration, to estimate energy consumption for a given company.
3. **Allowing us to estimate the energy consumption of companies that are not in the sample.** Our ratio estimation method requires us to extrapolate the UAS estimates from our sample up to the larger population of E&T trainees. In our 2008 and 2010 E&T analyses we did not have any information about company size for the general population of E&T trainees. This is because this information was only available for the sample of trainees that completed the CATI survey. Therefore, when we were doing our ratio estimation we could not include company size as one of the variables for this weighting. Collecting company size and company type information from the E&T trainees at the course would give us the information we need to do this weighting. This would improve the accuracy and precision of our UAS estimates.

How We Recommend Collecting These Data

We are recommending that the E&T program staff ask trainees to provide the following company size/type information at the training course:

1. How many full-time equivalent employees (FTE) work in that facility.
2. How many FTEs work in that facility during the main shift.
3. The primary economic activity of the facility.

The survey questions we recommend using for collecting this information appear below.

We also compiled energy consumption data from the Energy Information Administration's surveys of facility energy use Manufacturing Energy Consumption Survey (MECS) and Commercial Buildings Energy Consumption Survey (CBECS) reports to create a conversion table that will allow evaluators to estimate energy usage at each trainee's facility. This conversion table (Table 1) appears below.

Pilot-Testing the Company Size/Type Questions

In December 2010, Chris Dyson and Shawn Bodmann of KEMA and Nancy Giere and Robin Smith of Nancy Giere Associates reviewed a draft version of the company size/type questions and discussed some changes to these questions to simplify and clarify them. The questions below reflect these changes. These changes will be pilot-tested for "user-friendliness" during a February 2011 training. We will use feedback from the course managers and trainees to further refine these questions.

Draft Company Size/Type Questions

We're trying to get some sense of the type of business or organization you work for and it's relative size. Please answer the following questions as best you can ...

1. About how many full-time employees work at the building(s) or facility(ies) where you are most likely to use the energy savings information from this course? _____ (YOUR BEST ESTIMATE IS FINE. IF YOU'RE NOT SURE, JUST WRITE "DON'T KNOW")
2. About how many employees work in the building(s) or facilities during the main shift, that is, when most employees are present? _____

3a. Choose the answer that best describes the primary economic activity at the facility where you are likely to make energy saving changes based on what you learn in this course.

- Industrial/Manufacturing
- Education
- Food Sales
- Food Service
- Health Care (Inpatient)
- Health Care (Outpatient)
- Lodging
- Mercantile (not a mall)
- Mercantile (enclosed or strip mall)
- Office
- Public Assembly
- Public Order and Safety
- Religious Worship
- Service
- Warehouse and Storage
- Other
(Specify _____)

3b. Choose the option that best describes the primary product of the facility.

- Food (Dairy)
- Food (non-Dairy)
- Beverages
- Tobacco
- Textile Mill
- Textile Product Mill
- Apparel
- Leather and Allied Products
- Wood Products
- Paper
- Printing and Related Support
- Petroleum and Coal
- Chemicals
- Pharmaceuticals and Medicine
- Plastics and Rubber
- Non-metallic Mineral Products
- Primary Metals
- Fabricated Metal Products
- Machinery
- Computer and Electronics
- Electrical Equipment, Appliances, Components
- Transportation Equipment
- Furniture and Related Products
- Miscellaneous
(Specify _____)

Table 1. Conversion Table for Converting Employee Counts to Energy Consumption

Economic Activity	Per Full-time Equivalent Employee Energy Use (Question 1) Sum of All Fuels in Millions BTU / Employee	Per Employee Energy Use (Main Shift, Question 2) Sum of All Fuels in Millions BTU / Employee
Industrial/Manufacturing		
Food (Dairy)	1,215.0	
Food (non-Dairy)	1,215.0	
Beverages	982.7	
Tobacco	353.3	
Textile Mill	880.2	
Textile Product Mill	107.5	
Apparel	55.6	
Leather and Allied Products	149.9	
Wood Products	1,059.5	
Paper	2,436.0	
Printing and Related Support	161.2	
Petroleum and Coal	26,618.9	
Chemicals	2,967.2	
Pharmaceuticals and Medicine	727.9	
Plastics and Rubber	327.7	
Non-metallic Mineral Products	3,064.4	
Primary Metals	5,242.5	
Fabricated Metal Products	352.3	
Machinery	264.3	
Computer and Electronics	195.0	
Electrical Equipment, Appliances, Components	222.9	
Transportation Equipment	378.7	
Furniture and Related Products	122.4	
Miscellaneous	115.2	
Commercial		
Education		65.7
Food Sales		175.5
Food Service		136.5
Health Care (Inpatient)		127.8
Health Care (Outpatient)		45.8
Lodging		207.6
Mercantile (not a mall)		92.1
Mercantile (enclosed or strip mall)		127.3
Office		40.3
Public Assembly		154.5
Public Order and Safety		93.5
Religious Worship		95.5
Service		85.1
Warehouse and Storage		104.4
Other		157.2