

**Frames Evaluation
of Five CNEAF Surveys
with Establishments in the Manufacturing Sector of the 2002 Economic Census
October 15, 2004**

Purpose of Frames Evaluation: EIA contracted with the Census Bureau to conduct evaluations for five CNEAF surveys, each with establishments in the manufacturing sector of the 2002 Economic Census. The results of the frame evaluation will indicate the percentage of coverage, both by count and volumes where possible, for these surveys. The analysis will cover the following surveys:

Coal Industry

- EIA-3, “Quarterly Coal Consumption and Quality Report, Coke Plants”
- EIA-5, “Quarterly Coal Consumption and Quality Report, Manufacturing Plants”

Renewable Energy Industry

- EIA-63a, “Annual Solar Thermal Collector Manufacturing Survey”
- EIA-63b, “Annual Photovoltaic Module and Cell Manufacturing Survey”

Electric Power Industry

- EIA-860, “Annual Electric Generator Report” for Combined Heat and Power (CHP) Plants and Independent Power Producers (IPPs) with NAICS in manufacturing sector.

Key variables selected for analysis of coverage include an input, an output, or both. These surveys are intended to evaluate coverage of coal consumption (EIA-3); coke and breeze production (EIA-5), solar thermal collector production (EIA-63a); photovoltaic cells/module production (EIA-63b); and fuel consumption and/or electricity generation (EIA-860).

Individual establishment data collected during the Economic Census are protected by Title 13, US Code. Therefore, the results of these assessments are subject to the Census Bureau’s disclosure policy. The Census Bureau has agreed to analyze and provide as much detail as allowed by law.

EIA will use the information provided to establish an action plan for improving coverage where necessary.

Matching and Analysis

Matching

1. Identify establishments on EIA frames.
2. Identify establishments on Census frame (using Business Register)
3. Match establishments
4. Research establishments that do not match

Analysis

1. Summarize results of analysis by count and by volume
2. Summarize differences between frames which impact coverage (classification or boundary of establishments)
3. Characterize establishments missing from EIA frame (e.g. location, size, type of establishments)

Schedule

By December 2004, Census will provide final results of evaluations for EIA-5, EIA-63a, and EIA-63b. Census will also provide preliminary results of matching for EIA-3 and EIA-860.

By July 2005, Census will provide final results of evaluation for EIA-3 and EIA-860

Attachments

- I. Summary of EIA and Census Frames (page 2)
- II. Proposed Frame Comparison (page 3)
- III. Preliminary EIA-63a Report (page 4)

Attachment I: Summary of EIA and Census Frames

Below are both the EIA and Census surveys used for conducting the frame evaluations. This list includes five EIA surveys and three surveys conducted by Census – Economic Census (EC), Current Industrial Report (CIR), and the Manufacturing Energy Consumption Survey (MECS), an EIA sponsored survey.

Survey	Name and frequency of survey	Population	Frame size
EC	<i>Economic Census</i> Conducted every 5 years	The 2002 Economic Census covers nearly all of the U.S. economy in its basic collection of establishment statistics. Censuses of agriculture and governments are conducted at the same time.	There are approximately 7 million establishments contained in the Census Bureau's Business Register, approximately 250,000 establishments are classified as manufacturing.
MECS	<i>Manufacturing Energy Consumptions Survey</i> Conducted every 4 years	Manufacturing sector of 2002 Economic Census	Sample Frame of 15,500 drawn from the 250,000 establishments in manufacturing sector of Economic Census.
CIR	<i>Current Industrial Report (MA334Q)</i>	This survey covers the manufacture of semi-conductors, printed circuit boards, connectors, capacitors and other electronic components (except relays), in the US.	Approximately 3,000 manufacturing establishments report to the MA334Q. (This includes establishments that produce photovoltaic cells and modules.)
EIA-63a	<i>Annual Solar Thermal Collector Manufacturers Survey</i>	Census of manufacturers, wholesale, import/export of solar thermal collectors	20
EIA-63b	<i>Annual Photovoltaic Module and Cell Manufacturers Survey</i>	Census of manufacturers, wholesale, import/export of photovoltaic modules and cells	20
EIA-5	<i>Quarterly Coal Consumption and Quality Report, Coke Plants</i>	Census of active coke plants	21
EIA-3	<i>Quarterly Coal Consumption and Quality Report, Manufacturing Plants</i>	Census of manufacturers which consume coal	507
EIA-860	<i>Annual Electric Generator Report</i>	Combined Heat and Power Plants and Independent Power Producers in manufacturing sector, NAICS 31 to 33	221 IPPs 625 CHPs

Attachment II: Proposed Frame Comparisons

EIA Survey Population	Census Survey EC/MECS or CIR	Key variables: Input (I) and Output (O)	Frame Size: number of establishments
EIA-3 Manufacturing Plants	EC/MECS	Coal, tons (I)	507
EIA-5 Coke Plants	EC/MECS	Coal coke, tons (O) Breeze, tons (O)	21
EIA-63a Solar Collectors	EC	Solar Panels, \$ (O)	20
EIA-63b Photovoltaic Cells/Modules	Current Industrial Report (CIR) MA334Q	Photovoltaic cell, megawatts (O)	20
EIA-860 CHPs and IPPs	EC/MECS	Electricity generation (O)	221 IPPs 625 CHPs

Attachment III: Report on Frames Coverage for EIA-63a

Background: The EIA-63a is an annual survey that publishes data collected from manufacturers, wholesalers, and importer/exporters of Solar Collector Panels within the United States. There are 20 establishments in 5 states on EIA-63a frame.

To compare the frame of the EIA-63a to the 2002 Economic Census, it was necessary to determine where each of the 20 establishments was classified in the Census Bureau's Business Register. (A more detailed account of the matching done for this comparison is below under the methodology section.) The Business Register classifications of establishments are based on primary activity performed at the establishment. This implies that an establishment may have some manufacturing capabilities but if the primary activity were not manufacturing then the manufacturing information would be reported as secondary activity. In this case, detailed information at the 10-digit product as to the manufacturing portion of the establishment's total receipts may not be available.

For establishments that are classified in manufacturing, the Economic Census collects and publishes general statistics such as employment, payroll, inventories, etc. at the 6-digit NAICS industry level. The EC also publishes product detail regardless of the industry classification of the establishments that manufacture the given product. Establishments that have less than 5 employees are not mailed an Economic Census form; the Census Bureau uses administrative information obtained from other Federal Agencies to impute data for these establishments. These establishments account for approximately three percent (3%) of the total receipts published for the manufacturing sector of the 2002 Economic Census.

What is Methodology for evaluating coverage?

1. Matching: Matching establishments on the EIA-63a frame to establishments on the 2002 Economic Census was conducted in three phases. First, establishments on the EIA-63a frame were matched to establishments on the Census Bureau's Business Register to determine whether or not detailed information was available about solar panel manufacturing. Establishments were matched on EIA-63a frame with establishments on the Economic Census. Second, all establishments which produced solar panels (Product Code 333414A36) were identified and these establishments were matched to the EIA-63a frame. Finally, for establishments within the non-mailed portion of the Economic Census that reported production of solar panels to the EIA-63a, we researched and verified that they manufactured solar panels then added the data reported to the EIA-63a to the Product Code 333414A136. We researched establishments that did not match to the EIA-63a; where we found response error present we made corrections to product code 333414A136.
2. Coverage analysis: Analysis is provided both by counts and by volume. The more significant of the two is the coverage by volume since it reflects the percent of the total value of shipments.

Coverage by counts: The coverage by number of establishments was measured as the percent of the total number of matched establishments on EIA's frame (numerator) with the total number of in-scope establishments on the frame for the MECS or the Census of Manufacturers (denominator). For the EIA-63, the following equation applies to percent of coverage by count:

$$\% = \frac{\text{Number of Matched Establishments on Economic Census that produced solar panels}}{\text{Number of Active Establishments Inscope on Economic Census that produced solar panels}}$$

Coverage by volume: The value of shipments (dollars) that was used to calculate the coverage ratio by volume was the same in the denominator and numerator for establishments that match since the value was from the Economic Census. The denominator also includes values for nonmatched "in-scope" establishments on Economic Census. Not all the establishments on the Economic Census are "in-scope" due to differences between the surveys. For the EIA-63, the following equation applies to percent of coverage:

$\% = \frac{\text{Unweighted Value of Shipments of solar panels for matched active Establishments on Economic Census}}{\text{Unweighted Value of Shipments of solar panels for all active establishments Inscope on Economic Census}}$

Is the Coverage Sufficient?

The following tables provide a template for the proposed results.

Table I: Regional counts

	Counts/Percentage	State 1	State2	State 3	State 4	State 5	U.S. Total
a	Both CM/EIA-63a	#	#	#	#	#	#
b	EC only	#	#	#	#	#	#
c	EIA only	#	#	#	#	#	#
b-c	Difference	#	#	#	#	#	#
a/(a+b)	Coverage by count	%	%	%	%	%	%

Table II: Regional Volumes (Value of Shipments)

	Counts/Percentage	Region I	Region II	Region III	Region IV	U.S. Total
a	Both CM/EIA-63a	\$	\$	\$	\$	\$
b	EC only	\$	\$	\$	\$	\$
c	EIA only	\$	\$	\$	\$	\$
b-c	Difference	\$	\$	\$	\$	\$
a/(a+b)	Coverage by volume	%	%	%	%	%

What are potential reasons for differences between EIA and Economic Census?

Potential causes for differences between surveys may include: differences in boundaries of establishments and other factors regarding construction of the two frames, differences in question-wording (measurement) which impact establishment counts and key variables used to evaluate coverage.

What are Characteristics of Missing Establishments?

Table I (above) is intended to identify location of establishments which may be missing from EIA-63a frame. Additional characteristics of missing establishments might include size, NAICS classification, and other potential differences.