

**Frames Evaluation of Coal, Nuclear, Electric and Alternative Fuels (CNEAF) Surveys
with the Manufacturing Sector of the 2002 Economic Census and the 2002
Manufacturing Energy Consumption Survey
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Purpose of Frames Evaluation:

The Energy Information Administration (EIA) contracted with the U.S. Census Bureau to conduct five frame evaluations for Coal, Nuclear, Electric and Alternative Fuels (CNEAF) surveys. Each of these survey frames contained manufacturing establishments in the 2002 Economic Census. The agreement was in support of EIA's Strategic Plan 2004-2008. This analysis was intended to evaluate whether or not EIA has sufficient coverage of production of solar thermal collectors and photovoltaic cells and modules, coal consumption, coke and breeze production, fuel consumption and/or electricity generation in the Manufacturing Sector, NAICS 31-33.

To date, the Census Bureau has completed all five of the evaluations for the following surveys:

- EIA-3, "Quarterly Coal Consumption and Quality Report, Manufacturing Plants"
(See Attachment II for results)
- EIA-860, "Annual Electric Generator Report" for Combined Heat and Power Plants"
(See Attachment III for results)
- EIA-5, "Quarterly Coal Consumption and Quality Report, Coke Plants"
(See Attachment IV for results)
- EIA-63a, "Annual Solar Thermal Collector Manufacturing Survey"
(See Attachment V for results)
- EIA-63b, "Annual Photovoltaic Module and Cell Manufacturing Survey"
(See Attachment VI for results)

EIA took the opportunity to share data with the Census Bureau to conduct this statistical analysis because the results of the 2002 Economic Census and the 2002 Manufacturing Energy Consumption Survey (MECS) were available to the Census Bureau at this time. The MECS is a sample of manufacturing establishments within the U.S. This survey was used for the evaluation of the EIA-3 and the EIA-860. The product detail collected on the Economic Census defines the Census frames for the EIA-5, EIA-63a and the EIA-63b evaluations. Coverage was measured using establishment counts, and volume of consumption from specific products collected on the 2002 Economic Census and consumption variables collected on the 2002 MECS. (See Attachment I for summary of EIA and Census Bureau frame.)

Title 13, US Code, protects individual establishment data for the Economic Census and the MECS. 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.

Matching and Analysis:

The first step in comparing the frames was to identify the establishments on EIA's frames. The next step was to determine where those establishments were classified in the Census Bureau's Business Register. The Business Register is the universe of establishments for the Economic Census. The MECS draws its sample from the manufacturing portion of the Economic Census. 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 is not manufacturing then the manufacturing information would be reported as a secondary activity and thus we would have no detailed information as to the manufacturing portion of the establishments' total receipts. Only establishments classified as manufacturing in the Census Bureau's Business Register are included in the evaluations.

For the 2002 Economic Census, the Business Register contained approximately 350,000 active manufacturing establishments. For conducting the manufacturing portion of the 2002 Economic Census, the Business Register partitions these establishments into "non-mail" and "mail" groups for processing purposes. Establishments that have fewer than 5 employees are grouped as "non-mail"; the Census Bureau uses administrative information obtained from other Federal Agencies to impute data for these establishments. They accounted for approximately 3% of the total receipts published for the manufacturing sector of the 2002 Economic Census. The MECS sample does not include the "non-mail" group of establishments.

The second step in the matching process was to compare those establishments, on EIA's frames, classified as manufacturing in the Census Bureau's Business Register to establishments that reported to the 2002 Economic Census or the 2002 MECS. The frame for comparison from the 2002 Economic Census was comprised of establishments that reported production of the product that the EIA frame was measuring. The frame for comparison from the 2002 MECS was comprised of establishments that reported consumption of coal for the EIA-3 and those that reported generation of electricity for the EIA-860. All establishments that were considered non-matches to the Census Bureau frames were researched for accuracy and appropriate corrections were made, if necessary.

Coverage by Counts: The coverage by number of establishments was measured as the percent of the total number of matched establishments on EIA's frames with the total number of in-scope manufacturing establishments on the frame for the 2002 Economic Census and the 2002 MECS.

Coverage by Volume: The coverage by volume was measured as the percent of the total product value for matched establishments with the total number of in-scope manufacturing establishments on the frame for the 2002 Economic Census and the 2002 MECS.

Attachment I:

Summary of EIA and Census Bureau Frames

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 350,000 establishments are classified as manufacturing.
MECS	<i>Manufacturing Energy Consumption Survey</i> Conducted every 4 years	Manufacturing sector of the 2002 Economic Census	Sample Frame of 15,500 drawn from the 200,000 mailed establishments in manufacturing sector of Economic Census.
CIR	<i>Current Industrial Report (MA334Q) Annual Survey of Semiconductors and Electric Components Manufacturers</i>	This survey covers the manufacture of semi-conductors, printed circuit boards, connectors, capacitors and other	Approximately 3,000 manufacturing establishments report to the MA334Q. (This includes establishments that produce photovoltaic cells and modules.)
EIA-3	<i>Quarterly Coal Consumption and Quality Report, Manufacturing Plants</i>	Census of manufacturers which consume coal	507 reporting units that include single establishments and companies.
EIA-860	<i>Annual Electric Generator Report</i>	Combined Heat and Power Plants in manufacturing sector, NAICS 31 to 33	645 CHPs
EIA-63a	<i>Annual Solar Thermal Collector Manufacturers Survey</i>	Census of manufacturers, wholesale, import/export of solar thermal collectors	20 reporting units that include single establishments and companies.
EIA-63b	<i>Annual Photovoltaic Module and Cell Manufacturers Survey</i>	Census of manufacturers, wholesale, import/export of photovoltaic modules and cells	19 reporting units that include single establishments and companies.
EIA-5	<i>Quarterly Coal Consumption and Quality Report, Coke Plants</i>	Census of active coke plants	19 reporting units that include single establishments and companies.

Attachment II: Report on Frames Coverage for EIA-3

The EIA-3 is a quarterly survey that publishes data on coal consumption within the manufacturing sector of the U.S. There are 507 establishments in 45 states on the EIA-3 frame.

Methodology

Matching:

During the first phase of the matching, we determined that 470 of the 507 EIA-3 establishments were classified in manufacturing. The Business Register had 23 establishments classified in the mining sector, four establishments classified in utility, three establishments classified in government, four were classified in some other sector other than those listed above, and three establishments did not match to any Business Register establishment. These 37 establishments accounted for 14% of the total consumption of coal reported to the EIA-3. They are not included in the tables below.

The Manufacturing Energy Consumption Survey (MECS) collects data regarding consumption of coal for both fuel or non-fuel purposes. The establishments that reported consuming coal as either a fuel or non-fuel made up the frame used to compare establishments on the EIA-3 frame. The MECS survey, which is a sample, had 97 more establishments reporting coal consumption than the EIA-3 and was 27% of the total consumption of coal in short tons reported to the MECS. There were 28 establishments on the MECS consuming less than 1000 short tons, which were removed from this evaluation because the EIA frame has a threshold of 1000 short tons for establishments to be in the survey.

Coverage:

Coverage by Counts: For the EIA-3, the following equation applies to percentage of coverage by count:

$$0.79 = \frac{\text{Number of Matched Establishments on MECS that consume Coal}}{\text{Number of Active Establishments In-scope on MECS that consume Coal}}$$

Table I: Regional Counts

Region	EIA-3 Manufacturing Plants	MECS Sampled Cases	MECS and EIA-3	On MECS and Not on EIA-3	On EIA-3 and Not on MECS	Coverage by Count
Region 1 – Northeast	48	46	36	10	12	78%
Region 2 - Midwest	180	173	143	30	37	83%
Region 3 - South	204	188	145	42	60	77%
Region 4 - West	38	45	31	14	7	69%
Total	470	452	355	97	116	79%

Table II: State Counts

States	EIA-3 Manufacturing Plants	MECS Sampled Cases	MECS and EIA- 3	On MECS and Not on EIA-3	On EIA-3 and Not on MECS	Coverage by Count
Alabama	20	24	19	5	2	79%
Arkansas	3	5	3	2	0	60%
Arizona	4	3	3	0	1	100%
California	10	10	9	1	1	90%
Colorado	3	4	3	1	0	75%
Delaware	1	2	1	1	0	50%
Florida	7	7	5	2	2	71%
Georgia	20	18	12	6	8	67%
Hawaii	1	1	1	0	0	100%
Iowa	15	11	10	1	5	91%
Idaho	4	5	4	1	0	80%
Illinois	19	18	14	4	5	78%
Indiana	22	19	16	3	6	84%
Kansas	4	4	4	0	0	100%
Kentucky	15	16	8	8	7	50%
Louisiana	1	2	1	1	0	50%
Massachusetts	2	6	2	4	0	33%
Maryland	5	5	5	0	0	100%
Maine	2	2	2	0	0	100%
Michigan	28	30	24	6	4	80%
Minnesota	9	9	8	1	1	89%
Missouri	10	13	10	3	0	77%
Mississippi	2	1	1	0	1	100%
Montana	2	3	1	2	1	33%
North Carolina	30	20	17	3	13	85%
North Dakota	3	4	3	1	0	75%
Nebraska	4	4	4	0	0	100%
New Jersey	1	1	1	0	0	100%
New Mexico	1	0	0	0	1	----
Nevada	2	3	2	1	0	67%
New York	8	7	4	3	4	57%
Ohio	45	38	31	7	14	82%
Oklahoma	4	5	4	1	0	80%
Oregon	1	5	1	4	0	20%
Pennsylvania	35	30	27	3	8	90%
South Carolina	20	19	13	6	7	68%
South Dakota	2	1	1	0	1	100%
Tennessee	23	17	16	1	7	94%
Texas	16	19	15	4	1	79%
Utah	4	4	3	1	1	75%
Virginia	26	20	18	2	8	90%
Washington	2	3	1	2	1	33%
Wisconsin	19	22	18	4	1	82%
West Virginia	11	8	7	1	4	88%
Wyoming	4	4	3	1	1	75%
Total	470	452	355	97	116	79%

Table III: NAICS3 by State

NAICS--- States	311 Food	312 Beverage & Tobacco	313 Textile	314 Textile Products	322 Paper	324 Petroleum & Coal Products	325 Chemical	327 Non- metallic Mineral Products	331 Primary Metal	332 Fabricated Metal	335 Electrical Equipment, Appliance, and Component	Total
Alabama	1							2	2			5
Arkansas								1	1			2
California	1											1
Colorado									1			1
Delaware									1			1
Florida					1			1				2
Georgia			1	3	2							6
Iowa	1											1
Idaho								1				1
Illinois	1							2	1			4
Indiana								1	2			3
Kentucky		3					2	1	1		1	8
Louisiana					1							1
Massachusetts						2		2				4
Michigan	1				3		2					6
Minnesota										1		1
Missouri							1	2				3
Montana								2				2
North Carolina		1			1				1			3
North Dakota							1					1
Nevada								1				1
New York								1	2			3
Ohio	1	1					3	1	1			7
Oklahoma								1				1
Oregon							1	1	2			4
Pennsylvania						1		1	1			3
South Carolina			1		1		2	1	1			6
Tennessee											1	1
Texas								3	1			4
Utah								1				1
Virginia							1		1			2
Washington								2				2
Wisconsin					3			1				4
West Virginia							1					1
Wyoming							1					1
Total	6	5	2	3	12	3	15	29	19	1	2	97

Coverage by Volume:

$$0.89 = \frac{\text{Unweighted Quantity of Shipments of coal consumed Matched Mfg Estabs on MECS}}{\text{Unweighted Quantity of Shipments of coal consumed All In-Scope Active Mfg Estabs on MECS}}$$

Table IV: Regional Volumes (Quantity of Short Tons)

Regional Volumes	Matched Cases on MECS	All In-Scope Coal Consumption Cases on MECS	Coverage by Percentage
(Short Tons)			
Region 1 - Northeast	3,190,022	3,675,150	87%
Region 2 - Midwest	17,979,414	20,481,094	88%
Region 3 - South	25,302,991	27,644,908	92%
Region 4 - West	3,490,409	4,348,030	80%
US Total	49,962,836	56,149,182	89%

Table V: US Volumes by Consumption (Quantity of Short Tons)

Fuel Uses	Matched Cases	All Cases	Coverage by Percentage
(Short tons)			
US Total	34,943,775	40,868,511	86%

Non-Fuel Uses	Matched Cases	All Cases	Coverage by Percentage
(Short tons)			
US Total	15,019,061	15,280,671	98%

What are potential reasons for differences between EIA and the 2002 MECS?

- The EIA frames include utilities, construction, and government. For the purpose of these evaluations, these establishments were excluded from the comparison.
- The MECS frame included establishments consuming less than 1,000 short tons of coal. For the purpose of this evaluation, these establishments were excluded from the comparison
- Coke Plants were removed from MECS before matching, except for the five coke plants that reported on EIA-3 and EIA-5.
- Changes in ownership, including joint ownership of a single coke plant.

What are the characteristics of missing establishments?

- 30% of missing establishments were classified in NAICS 327 (Non-Metallic Mineral Products).
- Possibly not sampled in the MECS survey for 2002.

Attachment III: Report on Frames Coverage for the EIA-860

The EIA-860, “Annual Electric Generator Report” is an annual survey that publishes data collected from electric power producers. The EIA-906, “Power Plant Report” is a monthly survey that publishes data collected from regulated and unregulated electric power plants in the U.S.

The following analysis will evaluate coverage of the combined heat and power plants in the manufacturing sector, which is a subset of the EIA-860 frame. There are over 5,700 establishments on the EIA-860 frame of which 2,562 are non-regulated establishments on the EIA-906 frame in 2002. The non-regulated portion of the electric power industry consists of Combined Heat and Power Plants (most, though not all of which are in the manufacturing sector) and Independent Power Producers. The following analysis will focus on the 645 combined heat and power plants (CHPs) self-classified in the Manufacturing Sector, NAICS 31-33 in the U.S. For the remainder of this paper, the combined heat and power plants will be called the CHP frame.

Methodology

Matching:

During the first phase of the matching, we determined that 617 of the 645 establishments on the CHP frame were classified in manufacturing. The Business Register had 8 establishments classified in the utility sector, 3 establishments classified in government and 17 establishments did not match to any Business Register establishment, often because it appeared there could be several establishments which might match. The 618 manufacturing establishments are the only ones that were included in the tables.

The Manufacturing Energy Consumption Survey (MECS) collects data regarding generation of electricity onsite by either cogeneration or some other process. The establishments that reported generating electricity by either of these processes made up the frame used to compare establishments on the CHP frame. The MECS survey is a sample of establishments from the Economic Census.

The CHP frame includes plants whose nameplate capacity is 1 megawatt or greater for the sum of the generators. In order to exclude establishment whose nameplate capacity was less than 1 megawatt, we analyzed the relationship between nameplate capacity and electricity generation for those establishments on the EIA frame whose nameplate capacity was close to 1 megawatt. From this analysis, we decided to exclude establishments on the MECS whose electricity generation was less than 2,000 megawatthours.

Coverage:

Coverage by Counts: For the CHP, the following equation applies to percentage of coverage by count:

$$0.70 = \frac{\text{Number of Matched Establishments on MECS that generated Electricity}}{\text{Number of Active Establishments Inscope on MECS that generated Electricity}}$$

Table I: State Counts

States	On MECS and EIA	MECS Frame	EIA Frame	On MECS and Not on EIA	On EIA and Not on MECS	Coverage by Count
Alabama	13	16	16	3	3	81%
Alaska	0	2	7	2	7	0%
Arizona	2	2	3	0	1	100%
Arkansas	5	9	8	4	3	56%
California	32	55	48	23	16	58%
Colorado	1	2	2	1	1	50%
Connecticut	5	7	5	2	0	71%
Delaware	2	3	3	1	1	67%
Florida	19	26	30	7	11	73%
Georgia	13	16	24	3	11	81%
Hawaii	2	3	3	1	1	67%
Idaho	4	5	6	1	2	80%
Illinois	21	29	37	8	16	72%
Indiana	10	12	18	2	8	83%
Iowa	3	3	6	0	3	100%
Kansas	2	3	6	1	4	67%
Kentucky	2	7	2	5	0	29%
Louisiana	33	43	41	10	8	77%
Maine	11	15	17	4	6	73%
Maryland	3	4	3	1	0	75%
Massachusetts	12	15	20	3	8	80%
Michigan	12	27	20	15	8	44%
Minnesota	11	12	13	1	2	92%
Mississippi	7	7	9	0	2	100%
Missouri	2	4	3	2	1	50%
Montana	1	1	2	0	1	100%
Nebraska	2	2	2	0	0	100%
Nevada	2	2	2	0	0	100%
New Hampshire	3	6	9	3	6	50%
New Jersey	11	19	15	8	4	58%
New Mexico	2	3	2	1	0	67%
New York	8	14	21	6	13	57%
North Carolina	13	14	21	1	8	93%
North Dakota	4	4	4	0	0	100%
Ohio	10	14	14	4	4	71%
Oklahoma	3	5	5	2	2	60%
Oregon	5	10	8	5	3	50%

Table I: State Counts Cont.

States	On MECS and EIA	MECS Frame	EIA Frame	On MECS and Not on EIA	On EIA and Not on MECS	Coverage by Count
Pennsylvania	16	27	22	11	6	59%
Rhode Island	0	0	1	0	1	---
South Carolina	4	8	4	4	0	50%
Tennessee	12	14	15	2	3	86%
Texas	45	58	62	13	17	78%
Utah	0	2	1	2	1	0%
Vermont	0	1	1	1	1	0%
Virginia	10	12	16	2	6	83%
Washington	9	11	10	2	1	82%
West Virginia	4	5	6	1	2	80%
Wisconsin	15	23	21	8	6	65%
Wyoming	3	4	3	1	0	75%
Total	409	586	617	177	208	70%

Table II: Regional Counts

States	On MECS and EIA	MECS Frame	EIA Frame	On MECS and Not on EIA	On EIA and Not on MECS	Coverage by Count
Region 1	66	104	111	38	45	63%
Region 2	92	133	144	41	52	69%
Region 3	188	247	265	59	77	76%
Region 4	63	102	97	39	34	62%
Total	409	586	617	177	208	70%

Table III: NAICS3 by State

	311	312	313	321	322	323	324	325	326	327	331	333	334	335	336	337	Total
Alaska					1			1									2
Alabama					2		1										3
Arkansas	1			2	1												4
California	3			1	4	2	4	1	3	1	1		2		1		23
Colorado								1									1
Connecticut					1			1									2
Delaware								1									1
Florida	2				2			3									7
Georgia	1				2												3
Hawaii	1																1
Idaho	1																1
Illinois	1				2			1	1			2			1		8
Indiana											1				1		2
Kansas							1										1
Kentucky				2	1			1			1						5
Louisiana	1				2		3	4									10
Massachusetts								1		1	1						3
Maryland					1												1
Maine					4												4
Michigan	3				8			2							1	1	15
Minnesota					1												1
Missouri		1													1		2
North Carolina										1							1
New Hampshire				1	1									1			3
New Jersey	1				2		1	3	1								8
New Mexico										1							1
New York	4				1								1				6
Ohio		1			2				1								4
Oklahoma							1			1							2
Oregon				3	2												5
Pennsylvania	2				3		1	1		1	2				1		11
South Carolina					3										1		4
Tennessee				1												1	2
Texas							2	10			1						13
Utah											2						2
Virginia			1					1									2
Vermont					1												1
Washington					2												2
Wisconsin		1			7												8
West Virginia								1									1
Wyoming	1																1
Total	22	3	1	10	56	2	14	33	6	6	9	2	3	1	7	2	177

311 — Food	326 — Plastics & Rubber Products
312 — Beverage & Tobacco	327 — Nonmetallic Mineral Products
313 — Textile	331 — Primary Metal
321 — Wood	333 — Machinery
322 — Paper	334 — Computer & Electronic Product
323 — Printing	335 — Electrical Equipment, Appliance & Component
324 — Petroleum & Coal Products	336 — Transportation Equipment
325 — Chemical	337 — Furniture

Coverage by Volume:

$$0.75 = \frac{\text{Unweighted Quantity of Generated Electricity Matched Mfg Estabs on MECS}}{\text{Unweighted Quantity of Generated Electricity All In-Scope Active Mfg Estabs on MECS}}$$

Table IV: Regional Volumes (Quantity of Kilowatt Hours)

Regional Volumes	Matched Cases on MECS	All Quantity of Generated Electricity Cases on MECS In--Scope	Coverage by Percentage
(kwh)			
Region 1 - Northeast	7,440,661,216	11,460,686,707	65%
Region 2 - Midwest	9,655,144,849	12,734,347,167	76%
Region 3 - South	66,067,474,046	84,758,657,088	78%
Region 4 - West	8,397,457,290	12,571,585,147	67%
US Total	91,560,737,401	121,525,276,109	75%

Table V: Volumes for Non-Matched Establishments (NAICS3 x Region)

Regional Volumes	311 Food	321 Wood	322 Paper	324 Petroleum & Coal Product	325 Chemical	Total
(kwh)						
Region 1	195,602,234	W	1,946,920,354	W	475,124,394	4,020,025,491
Region 2	W	0	1,688,830,429	W	W	3,079,202,318
Region 3	458,995,558	56,147,993	5,422,242,217	662,079,347	11,787,941,779	18,691,183,042
Region 4	147,174,501	76,494,757	2,086,822,271	W	W	4,174,127,857

NOTE: W – Withheld to avoid disclosing data for individual establishments.

What are potential reasons for differences between EIA and the 2002 MECS?

- Boundaries of the facility may be different.
- NAICS Codes are self-determined on the EIA frame.
- The EIA frames include manufacturing and non-manufacturing establishments. For the purpose of this frame we looked at only manufacturing.
- Removed plants that we determined were outside the 1-megawatt capacity threshold for EIA frames.
- Data collected on the generation of electricity is measured differently on each survey.

What are the characteristics of missing establishments?

- Having multiple owners for a single facility made matching difficult and could result in some non-matches.
- Possibly not sampled in the MECS survey for 2002.

Attachment IV: Report on Frames Coverage of EIA 5

The EIA-5 is an annual survey that publishes data collected from coke plants within the United States. There are 19 establishments in 10 states on the EIA-5 frame¹.

Methodology

Matching:

During the first phase of the matching, we determined that all 19 establishments were classified in manufacturing. The establishments that reported in the following ten digit product codes² made up the frame used to compare establishments on the EIA-5 frame.

3241991111	Coke oven products, coke (excluding screenings and breeze) made in coke oven establishments
3241991121	Coke oven products, screenings and breeze, made in coke oven establishments
3311111101	Coke oven products, coke (excluding screenings and breeze) made in steel mills
3311111103	Coke oven products, screenings and breeze, made in steel mills

Coverage:

Coverage by Counts: For the EIA-5, the following equation applies to percent of coverage by count:

$$0.83 = \frac{\text{Number of Matched Mfg Establishments that produced Coke and Breeze}}{\text{Number of Active Mfg Establishments that produced Coke and Breeze}}$$

There are 4 establishments on the EC frame missing from EIA's frame and; there is one establishment on EIA's frame missing from EC frame. Addresses were used based on EIA's frame.

Table I: States counts

Counts	AL	IL	IN	KY	MI	NY	OH	PA	VA	WV	U.S. Total
On both EC and EIA-5 Frames	3	1	4	1	1	1	2	4	1	1	19
EC Frame (Product Codes 3241991111, 3311111101, 3241991121, and 3311111103)	3	1	5	1	3	1	2	5	1	1	23
EIA-5 Frame	3	1	5	1	1	1	2	4	1	1	20
On EC and Not on EIA-5	0	0	1	0	2	0	0	1	0	0	4
On EIA-5 and Not on EC	0	0	1	0	0	0	0	0	0	0	1
Coverage by count	100	100	0.80	100	0.33	100	100	0.8	100	100	0.83

¹ One establishment is jointly owned by two respondents on EIA's Frame counting as one in tables.

² These codes are reported in two different 6-digit NAICS industries. Coal Coke Oven establishments are classified in All Other Petroleum and Coal Products Manufacturing 324199, and Steel Mills are classified in Iron and Steel Mills 331111.

Coverage by Volume: Manufacturing establishments on the EIA-5 accounted for 98% of the total shipments reported to the Economic Census.

NOTE: There is a 6% imputation rate on the total volumes for coke and breeze from the Economic Census non-response.

$$0.98 = \frac{\text{Unweighted Quantity of Shipments of Coke and Breeze Matched Mfg Establishments on EC}}{\text{Unweighted Quantity of Shipments of Coke and Breeze All active Mfg Establishments on EC}}$$

Table II: Total Volumes (Quantity of Shipments for Coke and Breeze in Short Tons)

Volume (Short Tons)	U.S. Total
Matched Cases on EC	13,238,329
All Cases on EC	13,503,791
Coverage by Volume	0.98

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

- Steel companies are contracting out coke production.
- Changes in ownership, including joint ownerships of a single coke plant.

Attachment V: Report on Frame Coverage for EIA-63a

The EIA-63a is an annual survey that publishes data collected from manufacturers of Solar Thermal Collectors within the United States. The frame consisted of 20 establishments in 10 states.

Methodology:

Matching:

During the first phase, we determined that 13 of the 20 EIA-63a establishments were classified as manufacturing. The BR had 3 establishments classified in the wholesale sector, 2 establishments classified in construction, 2 did not match to any Business Register establishment. Also 1 establishment in manufacturing went out of business in 2002 and had reported no value to the EIA-63a. These 8 establishments accounted for 10% of the total product value reported to the EIA-63a. They are not included in tables below. After subtracting out the value of the 8 establishments, the EIA-63a total product value was 90% of the total product value reported to the Economic Census for Solar Thermal collectors. The Economic Census had 3 more establishments reported than did the EIA-63a and the value reported by these establishments was 6% of the total product value reported to the Economic Census. For each of the 3 establishments, Solar Thermal Collectors were not the primary product manufactured. The EIA-63a surveyed all 4 establishments that reported Solar Thermal Collectors as the primary product. These 4 establishments accounted for 83% of the total product value reported to the Economic Census.

The manufacturing sector of the Economic Census has production of these Solar Thermal Collectors in NAICS industry 333414, Heating Equipment (Except Warm Air Furnaces) Manufacturing. The Solar Thermal Collectors producers report code 333414A136, Solar Energy Collectors (Water or Air). The establishments that reported code 333414A136 make up the frame for comparison.

When the file for product code 333414A136 was initially created, we found 6 establishments in the EIA-63a frame were non-mailed establishments within the manufacturing sector of the 2002 Economic Census. We researched these establishments and verified that they were manufacturing Solar Thermal Collectors and added the detailed data from the EIA-63a to the product code 333414A136. These additions to product code 333414A136 brought the number of establishments to 14. One establishment was found to have incorrectly reported in product code 333414A136, this establishment was corrected and the total number of establishments in the frame for the 2002 Economic Census for Solar Thermal Collectors producers was 13.

Coverage:

Coverage by Counts: For the EIA-63a, the following equation applies to percent of coverage by count:

$$0.77 = \frac{\text{Number of Matched Mfg Establishments that produced Solar Thermal Collectors}}{\text{Number of Active Mfg Establishments that produced Solar Thermal Collectors}}$$

Table I: State counts

Counts	CA	FL	ME	MI	NJ	NV	TX	Total US
On both EC and EIA-63a Frames	5	2	0	0	3	0	0	10
EC Frame (Product Code 333414A136)	6	2	0	0	3	1	1	13
EIA-63a Frame	6	2	1	1	3	0	0	13
On EC and Not on EIA-63a	1	0	0	0	0	1	1	3
On EIA-63a and Not on EC	1	0	1	1	0	0	0	3
Coverage by count	0.83	100	-	-	100	-	-	0.77

Coverage by Volume: EIA-63a total product value from matched manufacturing establishments was 94% of the total product value reported to the Economic Census.

$$0.94 = \frac{\text{Unweighted product value of Matched Mfg Establishments that produce solar thermal collectors}}{\text{product value of all Mfg Establishments that produce Solar Thermal Collectors}} \quad \text{Unweighted}$$

Reasons and Characteristics for difference between EIA and Economic Census

- There are 7 establishments on EIA's frame not in manufacturing.
- There are 3 establishments on EIA's frame not on the Economic Census.
- There are 3 different establishments that reported Solar Thermal Collectors to the Economic Census not on EIA's frame.
 - These 3 establishments missing from EIA's frame are located in California, Nevada, and Texas.
 - These 3 establishments missing from EIA's frame account for 6% of the total production value reported to Economic Census.

Attachment VI: Report on Frames Coverage of EIA 63b

The EIA-63b is an annual survey that publishes data collected from manufacturers, wholesalers, and importers/exporters of Photovoltaic Modules and Solar Cells. The frame consisted of 19 establishments in 13 states. This frame was matched to the MA 334Q.

For establishments that are classified as manufacturing, the MA 334Q publishes data on value of shipment at the 7 and 10 digit product detail regardless of the industry classifications of the establishments that manufactures the given product.

Methodology

Matching:

During the first phase of the matching, we determined that 7 of the 19 establishments were not classified in manufacturing. The BR had 4 establishments classified as service, 2 establishments classified in the wholesale sector, 1 establishments classified as retail. These 7 establishments accounted for 29% of the total product value reported to the EIA-63b. They are not included in tables below. One establishment classified in manufacturing did not report production of photovoltaic modules or solar cells on the MA 334Q. The remaining 11 establishments are reporting manufacturing activity in 10 states.

The MA 334Q has production of these photovoltaic modules and solar cells in NAICS industry 334413, Semiconductor and Related Device Manufacturing. The MA 334Q publishes products by seven-digit product class and by ten-digit product detail. The photovoltaic modules producers report code 334413A110, Light sensitive and light-emitting devices, photovoltaic modules. The solar cell producers report code 334413A105, Light sensitive and light-emitting devices, solar cells. The establishments reporting in 334413A110 or 334413A105 or both make up the frame for comparison. The file contained 9 establishments all reporting photovoltaic modules, 8 establishments reporting producing solar cells. Five of the 8 establishments reporting solar cells were also reporting photovoltaic modules. We compared 11 in manufacturing on EIA with 12 on MA334Q in the manufacturing sector.

Coverage:

Coverage by Counts: For the EIA-63b, the following equation applies to percent of coverage by count:

$$1.00 = \frac{\text{Number of Matched Mfg Establishments that produced Photovoltaic Modules}}{\text{Number of Active Mfg Establishments that produced Photovoltaic Modules}}$$

$$0.88 = \frac{\text{Number of Matched Mfg Establishments that produced Solar Cells}}{\text{Number of Active Mfg Establishments that produced Solar Cells}}$$

Five of 12 establishments manufacture both photovoltaic modules and solar cells. Four establishments only manufacture photovoltaic modules, and three establishments only solar cells.

Table I: State counts

Counts	CA	DE	IA	MA	MD	ME	MI	NM	OH	PA	U.S. Total
On both MA334Q and EIA-63b Frames	2	1	1	2	1	0	1	1	1	1	11
MA334Q Frame (Product Code 334413A110 or 334413A105)	3	1	1	2	1	0	1	1	1	1	12
EIA-63b Frame	2	1	1	2	1	1	1	1	1	1	12
On MA334Q and Not on EIA-63b	1	0	0	0	0	0	0	0	0	0	1
On EIA-63b and Not on MA334Q	0	0	0	0	0	1	0	0	0	0	1
Coverage by count	0.66	100	100	100	100	---	100	100	100	100	0.92

Coverage by Volume: The coverage is 100% for photovoltaic modules and unavailable for solar cells due to disclosure limitations.

$$1.00 = \frac{\text{Unweighted product value of Matched Mfg Establishments that produce Photovoltaic Modules}}{\text{product value of all Mfg Establishments that produce Photovoltaic Modules}} \text{ Unweighted}$$

Reasons and Characteristics for difference between EIA and Economic Census

- One establishment in the manufacturing sector that reported production on EIA's frame did not report photovoltaic production on the MA 334Q.
- Establishments manufacturing integrated circuits, opt-electronics, non-photovoltaic semiconductors were not part of the EIA's frame and not included in counts.
- EIA is missing one establishment reporting solar cells production in California.