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# **SEADS 3.0**

## **Sectoral Energy/Employment Analysis and Data System**

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December 2007



**Pacific Northwest**  
NATIONAL LABORATORY

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**SEADS 3.0**  
**Sectoral Energy/Employment Analysis and Data System**

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**Methodology, Description, and Users' Guide**

**Two Policy Scenarios Examined:**  
**An Increase in Government R&D**  
**Implementation of Voluntary Intensity Reductions in Industry**

**J. M. Roop**  
**D. M. Anderson**  
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## Executive Summary

SEADS 3.0, the Sectoral Energy/Employment Analysis and Data System, is a revision and upgrading of SEADS-PC, a software package designed for the analysis of policy that could be described by modifying final demands of consumer, businesses, or governments (Roop, *et al.*, 1995).

If a question can be formulated so that implications can be translated into changes in final demands for goods and services, then SEADS 3.0 provides a quick and easy tool to assess preliminary impacts. And SEADS 3.0 should be considered just that: a quick and easy way to get *preliminary* results. Often a thorough answer, even to such a simple question as, “What would be the effect on U. S. energy use and employment if the Federal Government doubled R&D expenditures?” requires a more sophisticated analytical framework than the input-output structure embedded in SEADS 3.0.

This tool uses a static, input-output model to assess the impacts of changes in final demands on first industry output, then employment and energy use. The employment and energy impacts are derived by multiplying the industry outputs (derived from the changed final demands) by industry-specific energy and employment coefficients. The tool also allows for the specification of regional or state employment impacts, though this option is not available for energy impacts.

This report has four sections. The first chapter describes the tool and the underlying methodology. The second provides a users’ manual by walking through a simple example. Screen shots of the tool in action provide the user with a visual clue to how to extract the information an analyst might want from the model. The third and fourth chapters provide two examples and report the results.

The examples in Section 4 are two: an increase of 150 percent in DOE R&D that has a similar impact as has prior R&D for the Office of Industrial Programs, EERE; implementation of Section 106 of EPCA 2005 that mandates voluntary agreements with energy intensive industries that would agree to improving energy intensity by 2.5 percent per year. Our analysis shows that an increase in of \$110 million would reduce total energy by 1.39 quadrillion Btu and increase jobs by about 560,000. Earnings would increase by \$17.8 billion and industry output would increase by \$38.7 billion.

Implementation of Section 106, absent growth over the 10 year period, would reduce energy by more than 2 Quad, though it would only apply to the most energy-intensive industries. With growth of GDP by a third (as projected by EIA), energy consumption would be expected to increase by over 29 Quad and the resulting savings would also increase to 2.7 Quad.



## Acronyms

BEA	Bureau of Economic Analysis, U. S. Department of Commerce
BLS	Bureau of Labor Statistics, U. S. Department of Labor
Btu	British Thermal Units
DOE	U. S. Department of Energy
EERE	Office of Energy Efficiency and Renewable Energy, DOE
EIA	Energy Information Administration, U. S. Department of Energy
EPAct	Energy Policy Act (2005 for this report, 1992 also has an EPAct)
GDP	Gross Domestic Product
I/O	Input-Output
MECS	Manufacturing Energy Consumption Survey
NAICS	North American Industrial Classification System
Quad	Quadrillion Btu
R&D	Research and Development (often with another D, demonstration)
SEADS	Sectoral Energy/Employment Analysis and Data System
SIC	Standard Industrial Classification
TBtu	Trillion Btu





## **Acknowledgements**

David B. Belzer, in the mid-1980s, developed a tool conceptually identical to SEADS for policy analysis, and thanks to his implementation that attracted the attention of sponsors in the Department of Energy, that concept lives on today. His contribution is gratefully acknowledged. The continuing support of Peggy Podolak, Office of Planning, Analysis, and Evaluation, Energy Efficiency and Renewable Energy, U. S. Department of Energy, has made the evolution of this analytical tool possible. Her continuing support is gratefully acknowledged.

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Inquiries about SEADS 3.0 should be made to Group Manager, Technology Planning and Deployment, Energy and Environment Directorate, Pacific Northwest National Laboratory, P.O. Box 999, Richland, Washington, 99352. This publication is available on the web at: <http://www.pnl.gov/publications/>



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## **1.0 Introduction**

This guide is written for users of SEADS 3.0 (Sectoral Energy/Employment Analysis and Data System) for a Windows-based personal computer. SEADS is designed to show the employment and energy implications of changing patterns of final demands for goods within the U.S. economy.

This version of SEADS 3.0 is written in Visual Basic (Version ?) with extensive documentation provided through help documents. This user's guide provides instructions for preparing various scenarios with the system and walks the user through a typical exercise of running a scenario and preparing tables and spreadsheets. The example used to demonstrate the analytical tool is a hypothetical government program that simulates retrofits of buildings to save energy. First, the program's effect on construction is shown, and then similar dollar amounts of reduced energy expenditures are analyzed. While these examples are used to demonstrate the tool, a more detailed analysis of two policy scenarios is undertaken in the last chapter of this report.

SEADS 3.0 contains core data for analysis for two base years: 1997 and 2002. The core data include a vector of final demands, an input-output table, energy intensities, labor (jobs and earnings) intensities at the national level, and labor and hours multipliers which convert national data to the state level. The input-output structure is the 1997 Benchmark data from the Bureau of Economic Analysis of the Department of Commerce. We have collapsed that table down to 187 sectors and embedded the direct and indirect requirements matrix as part of the core data. The energy intensities are derived from the Manufacturing Energy Consumption Survey (MECS) for 2002 published by the Energy Information Administration. Employment data (i.e., jobs and earnings intensities and the coefficients that share this to the state level) are from the Department of Labor's Bureau of Labor Statistics (BLS) for the year 2002.

This report is organized into three additional sections. The next section provides the accounting framework for the analytical tool and describes the data that constitute the core data set provided with the model. The third section describes the capabilities of SEADS 3.0 and indicates how the tool can be used to examine a variety of policy question that are of interest either from an energy or employment impacts perspective. The final section demonstrates the analytical tool by applying it to two examples.



## 2.0 Description and Methodology

SEADS 3.0 follows much the same structure as its predecessors, with the exception of the significantly modified front-end and the addition of industry detail. This chapter first describes the basic accounting structure, the details of the final demand vector, the calculation of industry output and how both the energy- and employment-intensities are used to compute energy and employment impacts. These items constitute the core data supplied with the system. The final section of this chapter describes the 187-industry structure used for this system, derived from the benchmark input-output table of the U. S. economy.

### 2.1 The Basic Accounting Structure

The basic input-output accounting structure employed in SEADS is shown in Figure 2.1. The box at the top of the figure represents the final demand for commodities by industry sector. The second box is labeled the input-output table and shows sales of any particular commodity to other industry sectors along a given row of this array. The third box is the multiplication of final demands by the direct and indirect requirements matrix, which yields industry output. The total final demand of commodities consist of sales to

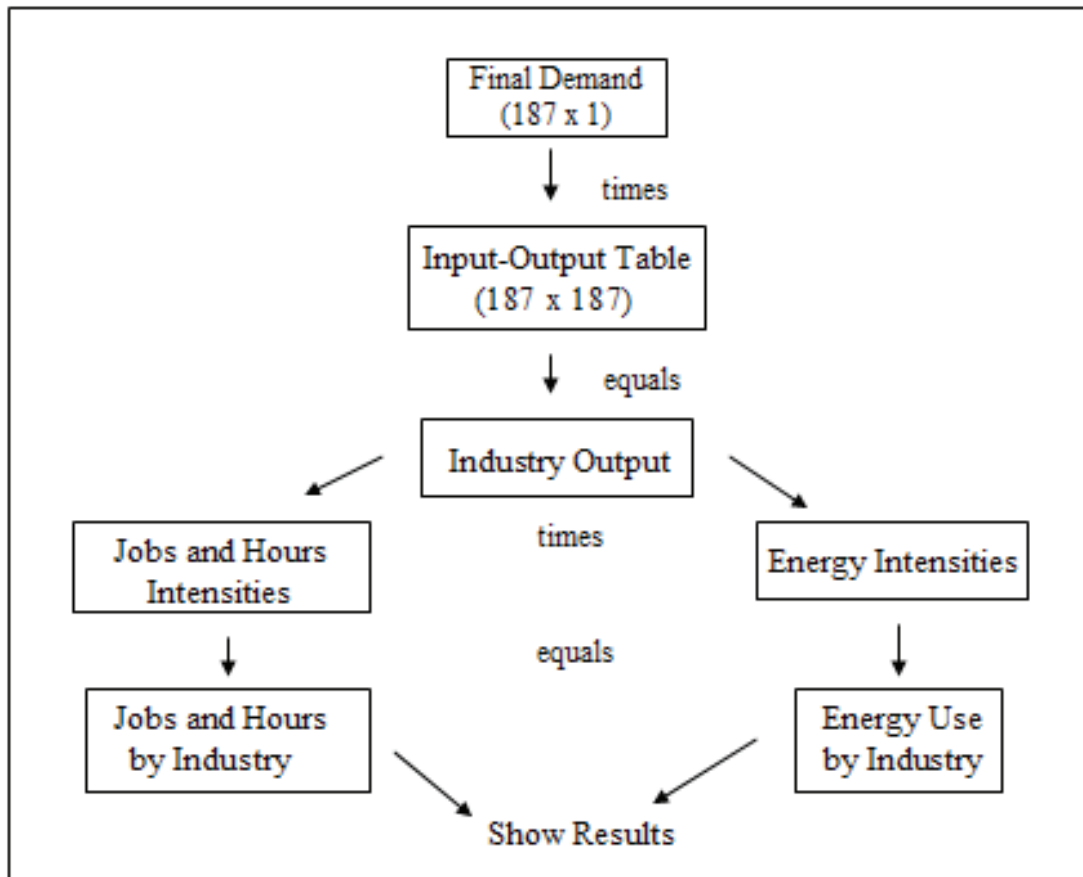


Figure 1-1. Basic Accounting Structure for SEADS 3.0

consumers (Personal Consumption Expenditure or PCE), sales to business or capital account and change in business inventories, (gross private domestic investment), foreign trade (exports minus imports), and sales to government (government purchases). The sum of all final demands is Gross Domestic Product, represented by the first box. The total dollar value of the output of each industry is the dollar value of the purchases of inputs plus the values added in the production process – compensation of employees, indirect business taxes, and profits.

On the right-hand side below the industry outputs, is the calculation for energy consumption. Energy intensity is defined in terms of 2002 Btu/per 1997 current dollar of output<sup>1</sup>. Although the figure suggests a single intensity for each industry, in SEADS 3.0 intensities are defined for three separate fuel types – electricity, fossil fuels, and total. Energy use, in the lower left hand box, is computed as the product of output multiplied by intensity, on an industry-by-industry basis.

On the left-hand side is a similar calculation for labor impacts. Separate jobs and earnings intensities (e.g., 2002 industry jobs divided by 1997 industry output) are multiplied by industry output to calculate aggregate jobs and earnings impacts. These can then be shared out to states or regions using another set of weights, derived from BLS data.

Figure 2.1 helps to provide some perspective on the relationship between composition of GDP and energy use and employment on the economy. One of the key capabilities in SEADS 3.0 is the ability to calculate energy use based on an arbitrary set of final demands. By itself, Figure 2.1 does not spell out how this procedure is performed. For this, we turn to the basic matrix algebra underlying the input-output method employed in SEADS.

## 2.2 Final Demand

We begin with final demands by commodity which we refer to as the column vector  $F$ . In SEADS we have converted from the Bureau of Economic Analysis (BEA) 495 input-output sectors to the 187 sectors used in SEADS 3.0. The details of this industry sector plan are reported in Appendix B. Unlike the previous version of SEADS, we work directly with this final demand vector rather than converting from a set of forecasts to the IO structure.

So the final demand vector used contains 187 rows each reflecting the sale of commodities to final demand. Note that some of these numbers are negative because imports exceed domestic production.

---

<sup>1</sup> Our intent is to replace the 1997 benchmark table with the 2002 benchmark table when it is released. Since SEADS is a static analytical tool, it makes little difference whether the numerator is in 1997 or 2002 data as long as the intensities reflect the current denominator.



### 2.3 Industry Output

The next step is to compute the levels of output that would be required to satisfy the final demands by commodity (F). In *standard* I/O analysis, the fundamental identity is:

$$X_c = AX_c + F \quad (2.1)$$

where: A = an nxn matrix of direct requirements coefficients.

$X_c$  = an nx1 vector of outputs, and

F = an nx1 vector of final demands.

A is defined on a commodity-by-commodity basis, where  $a_{ij}$  represents the amount of commodity i required in the production of a dollar's worth of commodity j. From Equation (2.1), the solution for F is obtained by:

$$X_c = (I-A)^{-1} F \quad (2.2)$$

Where  $(I-A)^{-1}$  is commonly known as the Leontief inverse.

This simple solution to (2.2) is based on the existence of a commodity-to-commodity direct requirements table, A. Such a table is not published as part of the official input-output accounts for the U.S. Rather, the U. S. Department of Commerce in the 1972 and subsequent input-output studies has released two separate tables, a "use" table and "make" table. The use table shows how each industry (column) *uses* commodities (rows) in the production of that industry's output; it is much like a recipe for the production of industry output. The make table, on the other hand, shows the value of each commodity *produced* by each industry. Industries are presumed to employ commodities in fixed proportion to their total *industry* (rather than commodity) output. To determine industry output, a second assumption must also be made, namely that the market share by each industry in the production of a specific commodity remains constant.

The derivation of the solution for industry output using these assumptions is somewhat tedious and will not be given here. The final result is:

$$X = D (I-BD)^{-1} F \quad (2.3)$$

where:

- X is a vector of industry outputs
- F is a vector of final demands by commodity, and
- D is an industry-by-commodity matrix in which entries in each column show for a given commodity the proportion of total output of that commodity produced in each industry. D is referred to as the market share matrix.
- B is a commodity-by-industry matrix in which entries in each column show the amount of a commodity used by an industry per dollar of output of that industry.

In the development of this version of SEADS, the matrix  $D(I-BD)^{-1}$  for 1997 (hereafter referred to as the total requirements matrix) was developed by collapsing the benchmark table to the 187x187 make and use table used in the construction of Equation 2.3.

## 2.4 Energy Intensities

The computation of energy intensities was straightforward. Energy use data by industry and fuel were taken from the Manufacturing Energy Consumption Survey (MECS) for the 2002, then augmented by various Census data reports to fill out the 187 sector detail. Fuel types were aggregated to three major categories, electricity, fossil fuels, and total (the sum of the other two).

While much of the Census data are collected without fuel identification, in most cases the distinction between electricity and expenditures on fossil fuels is identified, along with the amount of electricity consumed in kilowatt hours. The kilowatt hours of electricity consumption was converted to Btu by multiplying by 3412. Estimates of the fossil fuels Btu content was obtained by fuel prices and the historic evidence of types of fuels used. Intensities for each fuel type were then computed as simply the energy use by IO sector divided by the industry output.

SEADS-PC saves the results of calculating the projected or simulated energy use by industry. Let  $E$  represent this array, with dimension: industry  $\times$  fuel type. Let  $e$  be a matrix of energy intensities (for a specific year) of dimension fuel type  $\times$  industry. In matrix notation the energy use matrix is calculated as:

$$E = e.X \quad (2.4)$$

where  $.$  represents a dot product operation, i.e.  $X$  is diagonalized before matrix multiplication. Using the matrix  $E$ , energy consumption for any desired aggregation of industries can be easily calculated.

## 2.5 Relationship to SEADS Variables

The complete procedure in SEADS to go from the final demand vector to the matrix of energy use by industry by fuel type can be summarized in the following matrix expression:

$$E = e. [D (I-BD)^{-1}] F \quad (2.5)$$

In the instructions to follow in the next section, the user will generally alter either elements of  $F$  or elements of  $e$  in (2.5) in order to perform a wide variety of analyses. These and the employment coefficients are the only items for which editing is allowed, to tailor the analysis to some special purpose applications. To facilitate these applications, the SEADS variables corresponding to these components are as follows:

## 2.6 Industry Classifications

The industry classification used in this version of SEADS is an aggregation of IO industries to those most likely to be directly affected by changes in energy policy. Thus many of the industries either produce energy or produce products that consume energy when purchased by consumers or governments. This classification is shown in Appendix 2. The mapping from the larger IO structure to the 187 sector is shown in Appendix C.

## **2.7 Employment Data**

Jobs and Earnings data for SEADS are taken directly from the Bureau of Labor Statistics web site and aggregated to the 187 industries. The data from BLS are not, of course, structured the same way that the IO table is, so we mapped the published data from the BLS structure to the SEADS structure. The concordance between BLS and SEADS is shown in Appendix 4. Similarly, the state data are from BLS that share jobs and earnings from the national to the regional/state level also have to be converted as were the aggregate data. Again, the Appendix D concordance was used.



## 3.0 SEADS 3.0: A Compact Users' Guide

This chapter starts with the installation of SEADS 3.0, followed by the construction of a set of examples to show the capabilities of the program.

### 3.1 Installation Procedure

The program is distributed as an executable file called "SeadsSetup.exe." That may be distributed from a CD or it can be downloaded from: <http://www.pnl.gov/Seads/> the web site designated for the distribution of this program. When stored on your computer, an installation window opens just as with any other Windows application and steps you through the installation of the program. An icon labeled "SEADS 3.0" should be available on your desktop after the installation is complete.

### 3.2 Starting the Program




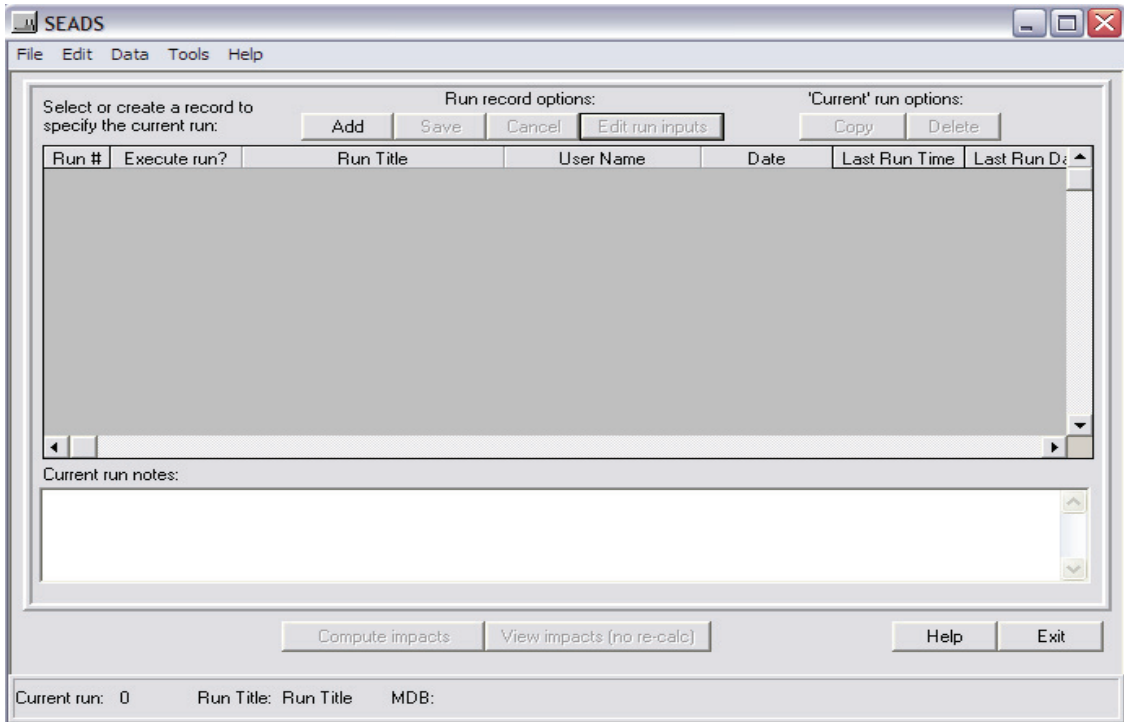
Double clicking the mouse on this  icon initiates SEADS 3.0. The first screen that you see thereafter is shown below as Figure 3.1.



Figure 3-1. Opening Logo

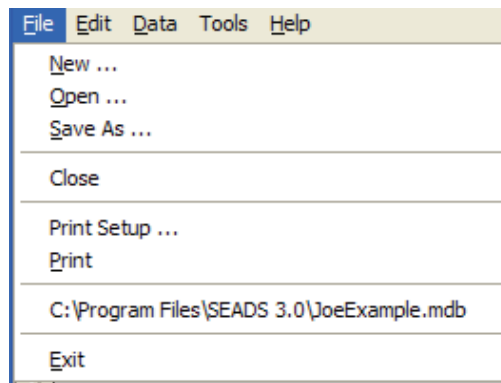
The logo disappears and is replaced by the opening screen, which is shown as Figure 3.2, below. Initially, the area under Run #, which is where different runs are identified, is blank. So the next step is to click on File (as with most Windows programs, in the upper left of the screen beneath the SEADS title) menu (see Figure 3.3) and select "New."

A "Create new user file as" screen appears (Figure 3.4, below) in which you can give a name to the new file and save it. You return to the opening screen as though nothing had occurred, but there is now a new data base attached to SEADS. At this point, you click on the "Add" button under "Run record options" in the middle of the screen, and a new line appears as in Figure 3.4. Initially all items are blank except for the number 1. I have added a name, "Base Case", indicated for future reference that the analyst was "jmroop" and indicated the date of the new run: 9/6/2007. In addition, I activated the "Execute run?" button so that results would be obtained with the program was executed. To establish the base case, I computed the impacts by clicking on the button, "Compute



**Figure 3-2. Opening Screen.**

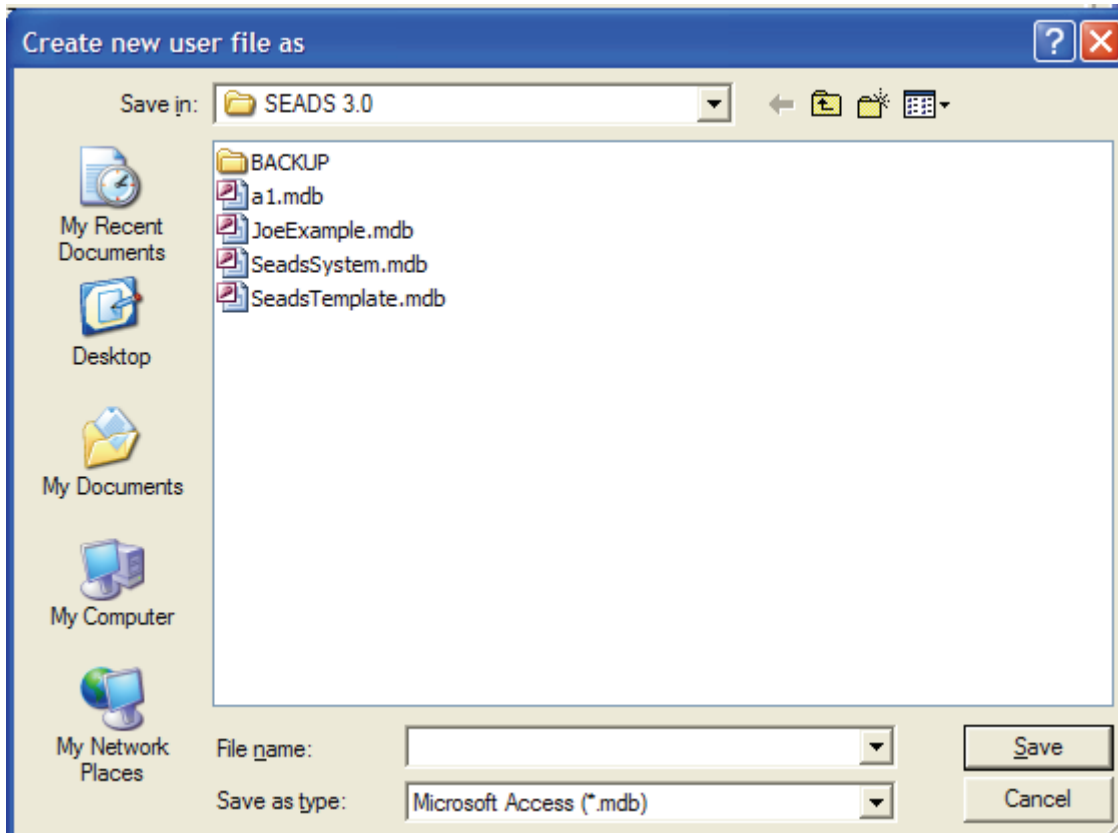
impacts” at the bottom left-center of the screen. This then applied the default data to calculate industry output, which is then multiplied by energy- and employment-intensities to get base case output, employment and energy use.



**Figure 3-3 File Menu**

Additional runs can easily be added by clicking on the “Add” button under “Run record options” or clicking on the “Copy” button under “Current run options” located in the upper left of the screen. The copy button is especially useful if one wants to make a slight change to an established scenario.

In this particular case two new runs were added, one called Policy 1, the other Policy 2. How these were defined is explained in the next section. But before we develop these runs, consider the other options available at this stage.



**Figure 3-4. Saving a new data base**

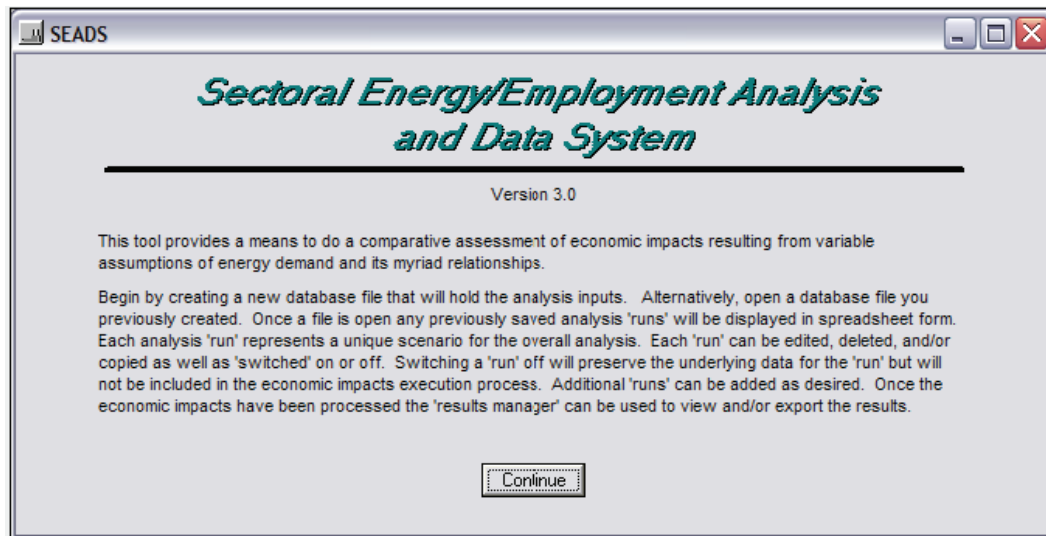
Run #	Execute run?	Run Title	User Name	Date	Last Run Time	Last Run Date
1	<input checked="" type="checkbox"/>	Base Case	jmroop	9/6/2007	1:31:15 PM	9/6/2007

**Figure 3-5. Adding a new run to the new data base**

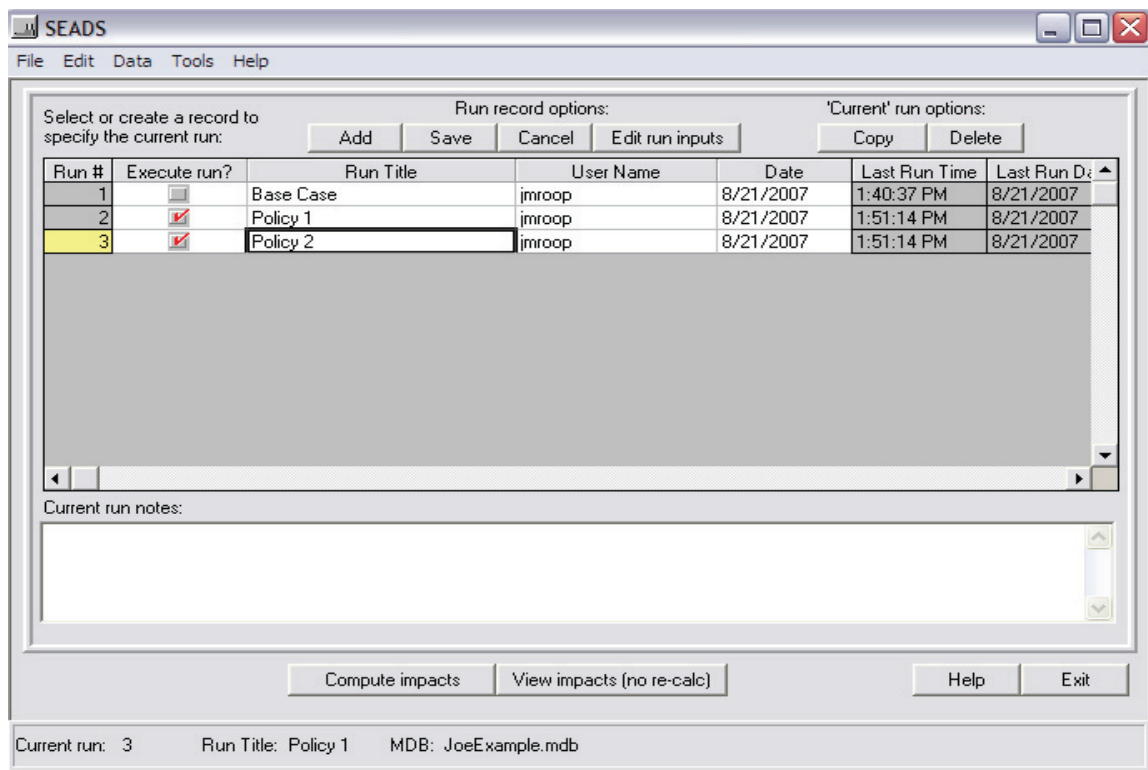
The Edit, Data, and Tools options at the top of the screen should be familiar to most Windows users. Edit lets you cut, copy, and paste; Data lets you save a particular data base, and Tools allows you to either execute the run or show results; the same options that are available at the bottom left-center of the program screen. The Help menu has a field called, “About SEADS . . .” that shows the following screen (Figure 3.6).

### 3.3 Structuring the Policy Scenarios

Having defined new Policy cases, we now need to differentiate these from the base case. Figure 3.7 shows these run options for the current data base. Note that the highlighted number (in yellow) is the run currently under consideration (Policy 2). To modify this run so that it is different from the base case, first click on “Edit run inputs” under the “Run record options.” After a brief scene change, the SEADS 3.0 screen now appears as in Figure 3.8.



**Figure 3-6. The About SEADS screen.**



**Figure 3-7. Three Run Options in the Data Base**



SEADS - [SEADS Run Inputs]

File Edit Data Tools Help

Run # Run title

3 Policy 2

Final Demand Energy Data Labor Data Filters

Enter 'Final Demand' data for applicable sectors (\$ Millions):

ID	Sector	Final Demand
15	New Single-Family Const.	172439.0
16	New Multifamily Const.	26234.4
17	New Residential Remodeling Const.	57679.0
18	New Farm Housing	5429.0
19	Industrial Building Construction	27486.9
20	Commercial Building Construction	190817.6
21	Road Construction	60608.0
22	Other New Construction	90757.0
23	Res. Maintenance & Repair	50742.1
24	Food Processing	264721.7
25	Alcoholic Beverage Processing	27537.3
26	Tobacco Processing	37764.2
27	Textile Mills	1088.0
28	Textile Product Mills	20176.3

Save Cancel Close

Current run: 3 Run Title: Policy 2 MDB: JoeExample.mdb

**Figure 3-8. Altering the Final Demands for Policy 2 Run**

This screen displays the final demand vector which can be modified to reflect the new policy scenario. It is recommended that changes to this vector, if they are extensive, be made outside SEADS 3.0. The program is structured so that any of the data in this or the Energy Data and Labor Data screens can be copied and pasted into an excel worksheet. From there, changes can be pasted back into SEADS. Indeed, Appendix B, which lists the 187 industries contained within SEADS 3.0, was constructed just that way.

As a Policy 1 example, all the building construction industries (rows 15 – 20 above) will be increased by 4.7 percent. Think of this as a concerted policy effort to upgrade buildings so that they become more energy efficient. Our Policy 2 example will then repeat this change, but reduce household expenditures on fuel by 10 percent (so that the total increase in construction is about offset by a reduction in fuel costs). While this may not be a realistic example, it allows us to see what impact these changes have on energy use, jobs and earnings, and output.

Figure 3.9 shows the Energy Data screen. These coefficients show the energy intensity of each of the 187 industries for three categories: electricity, fossil fuels, and total energy use. As Figure 2.1 shows, when these are multiplied by industry output, they show the amount of fuel used by these industries. If any of these coefficients are changed inadvertently, they can be restored by clicking on the “Restore to system defaults” button, which appears in all three of these data input screens.

Figure 3.10 shows the Labor Data screen. As with the Energy Data screen, this screen shows the Jobs and Earnings intensities that apply to each of the industries.

SEADS - [SEADS Run Inputs]

File Edit Data Tools Help

Run # Run title  
3 Policy 2

Final Demand **Energy Data** Labor Data Filters

Specify 'Energy Intensities' for applicable sectors (MMBtu / \$1000 Output):

ID	Sector	Elec. Intensity	All Fossil	All Fuels
1	Crop Farming	0.5740	7.4030	7.9770
2	Animal Farming	1.3150	5.4630	6.7780
3	Forest Products	0.1950	13.4620	13.6570
4	Fish/Hunt/Ag Support	1.2430	17.1580	18.4010
5	Oil and Gas Extraction	0.1940	0.2650	0.4590
6	Coal Mining	0.7840	19.1210	19.9050
7	Metal Mining	5.7140	9.1370	14.8510
8	Nonmetallic Mineral Mining	2.2630	7.7630	10.0260
9	Oil and Gas Drilling	0.1250	11.6580	11.7830
10	Oil and Gas Support	0.4990	5.8010	6.3000
11	Other Mining Support	2.1330	32.9770	35.1100
12	Electricity Gen. and Trans.	37.5390	85.2852	122.8242
13	Natural Gas Distribution	0.0080	0.0980	0.1060
14	Water/Sewer, Other Systems	2.5580	14.8500	17.4080

Save Cancel Close

Current run: 3 Run Title: Policy 2 MDB: JoeExample.mdb

Figure 3-9. Energy Intensity Coefficients Screen.

SEADS - [SEADS Run Inputs]

File Edit Data Tools Help

Run # Run title  
3 Policy 2

Final Demand Energy Data **Labor Data** Filters

Specify 'Labor Intensities' for applicable sectors (Jobs and \$ Millions Earnings / \$ Millions Output):

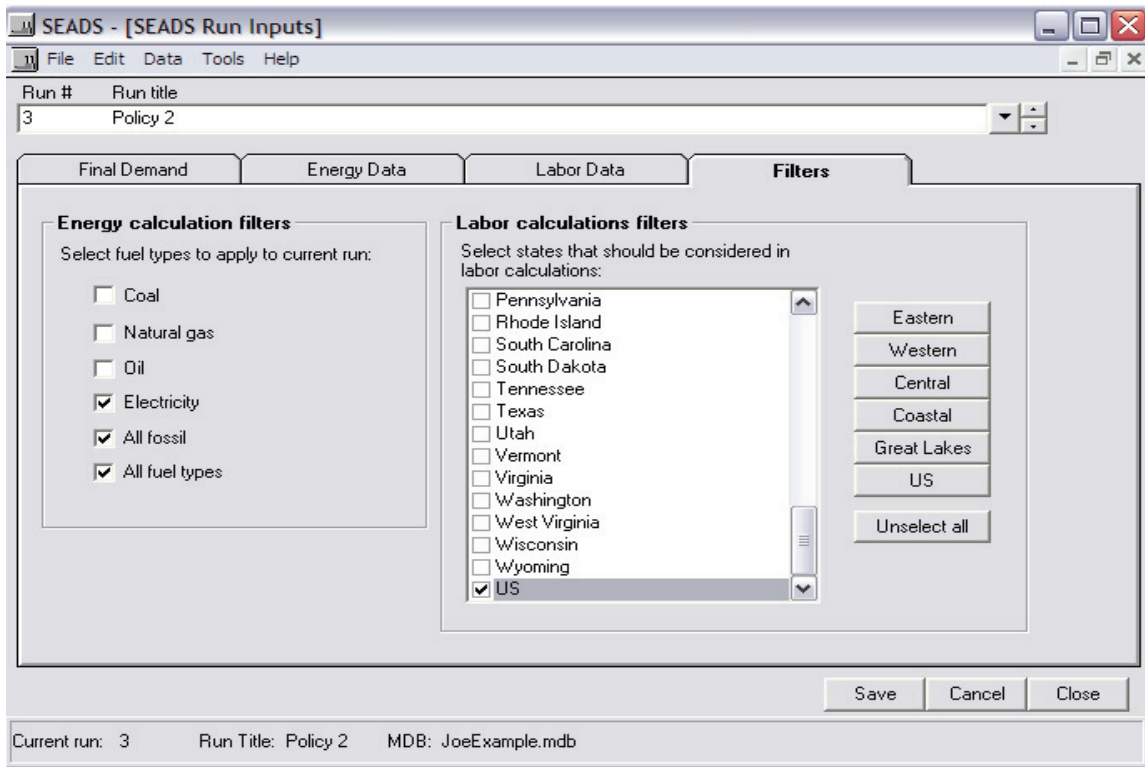
ID	Sector	Job Intensity	Earnings
1	Crop Farming	18.1411	0.3653
2	Animal Farming	9.1276	0.2118
3	Forest Products	13.0554	0.3435
4	Fish/Hunt/Ag Support	29.3616	0.7427
5	Oil and Gas Extraction	3.1357	0.2612
6	Coal Mining	3.4149	0.1809
7	Metal Mining	4.5175	0.2165
8	Nonmetallic Mineral Mining	5.7602	0.2321
9	Oil and Gas Drilling	13.7574	0.6902
10	Oil and Gas Support	7.4940	0.3636
11	Other Mining Support	8.3241	0.4056
12	Electricity Gen. and Trans.	2.0148	0.1301
13	Natural Gas Distribution	1.2797	0.0709
14	Water/Sewer, Other Systems	4.4632	0.1832

Save Cancel Close

Current run: 3 Run Title: Policy 2 MDB: JoeExample.mdb

Figure 3-10. Job and Earnings Intensity Screen.

The Filters screen, shown below as Figure 3.11, allows the user to select which fuels will be included in the analysis and what regions to include for the jobs and earnings. Note that these filters do not interact – one cannot calculate energy use for a single state or region; the energy calculations are just for the economy as a whole. But the jobs and earnings data can be shared out to a specific region, state, or set of states selected by the user.



**Figure 3-11. Filters Screen.**

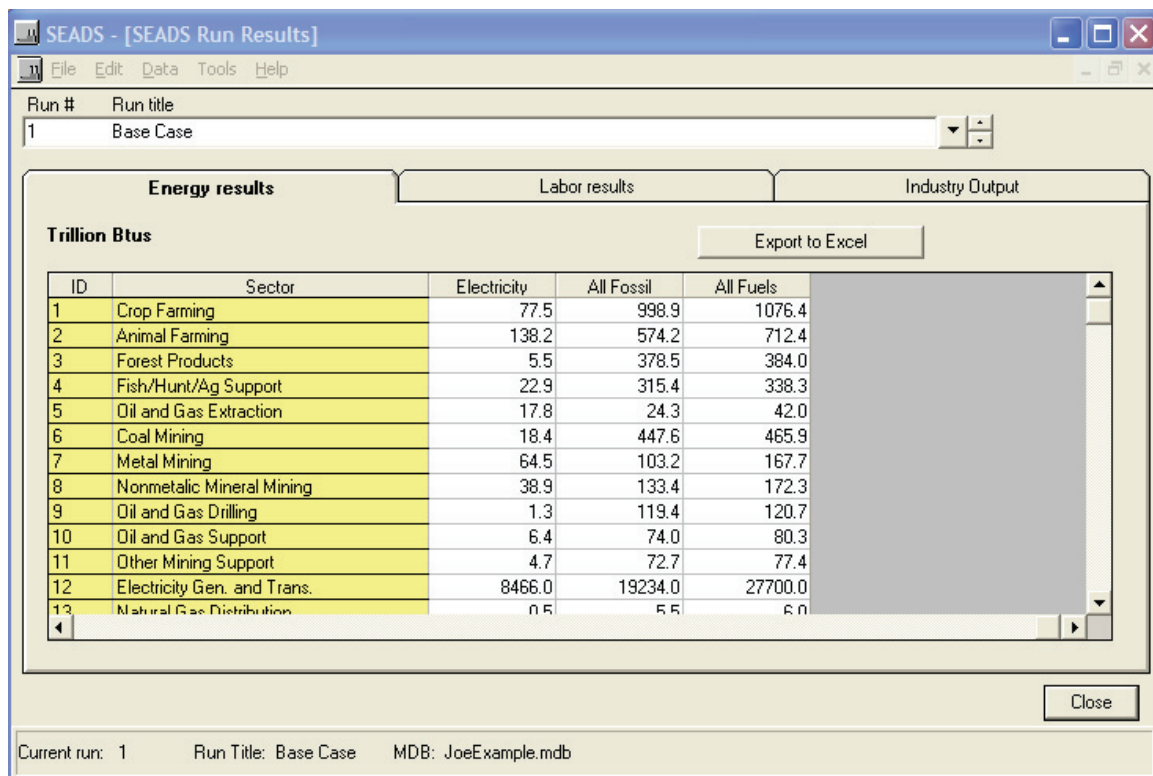
The actual changes that were made to the final demand vector were the following:

**Table 1. Example changes to final demand**

Industry #	Base Case Value	Policy 1 Value	Policy 2 Value
15	172439	180578	180578
16	26234	27473	27473
17	57679	60401	60401
18	5429	5685	5685
19	27487	28784	28784
20	190818	199824	199824
12	113332		101998
13	43345		39010
40	70069		63062

The difference between the Base Case and Policy 1 construction expenditures sums to \$22660, and increase of 4.7 percent. The difference between the Base Case and Policy 2 fuel expenditures is -\$22675. Thus the construction expenditure increases are almost exactly offset by declines in fuel expenditures. While this is not realistic, it provides an example.

After these changes are made to final demands for each of the scenarios, the “Save” button on the lower right side will save the scenarios to the data base. Then the “Close” button returns to the original screen. When all three of the “Execute run?” buttons are activated, the “Compute impacts” button to the lower left is clicked and the following screen appears, shown as Figure 3.12.



**Figure 3-12. Energy Results Screen**

Note that these results can be exported to Excel. By clicking on the “Labor results” or “Industry Output” screens you can toggle between results, write data to files, or move to the bottom of the results and collect the results as show in Table 3.2, below. Note also that by clicking on the arrow button to the right of the line that shows the run number and title, one can toggle between scenarios.

**Table 3.2. Example Results**

Results:	Energy Use			Labor		Output
	Electricity	Fossil	Total	Jobs	Earnings	
Base Case	15957.5	70193.4	86150.9	139810.2	5082.8	14862869.4
Policy1	15989.8	70400.5	86390.4	140161.0	5095.5	14909036.4

Diff P1-BC	32.3	207.1	239.5	350.8	12.7	46167
Policy 2	15550.0	69025	84575	139969.3	5086.2	14860665.9
Diff P2-BC	-407.5	-1168.4	-1575.9	159.1	3.4	-2203.5

As expected, the additions to construction demand increase energy use by a total of 240 trillion Btu (TBtu) and increase jobs by 351 thousand and earnings by \$12.7 billion. Total output is increased by \$46.2 billion when final demand is increased by \$22.7 billion.

When compensating dollar value reductions are made in the final demand vector for fuel expenses, energy use drops by over 1.5 Quad, more than six times the change that occurs for the Policy 1 run. Note also that while jobs and earnings increase, the increases are much smaller than previously. It is also interesting to note that output is now reduced, by \$2.2 billion.



## **4.0 Two Policy Scenarios Examined**

The first scenario examined in this chapter is a simple expression of an increase in Government R&D expenditures that effect energy intensity. The major changes in the data in SEADS are changes in Government expenditures and changes in energy intensity derived from evidence provided by the tracking of commercialized technologies from the Industrial Programs Office of the Department of Energy's Office of Energy Efficiency and Renewable Energy. The second scenario explores the impact of a successful program of voluntary commitments to reduce industrial energy intensity. The Energy Policy Act of 2005 (EPAct), Public Law 109-58, Section 106 calls for the Secretary of Energy to enter into voluntary agreements with one or more persons in the industrial sector to reduce primary energy intensity by at least 2.5 percent per year from 2007 to 2016. The second scenario assesses what impact such a program would have on energy use and employment in the United States.

### **4.1 Energy Efficiency through Increased Government R&D**

The National Academy committee that studied of energy research at DOE (NRC, 2001) concluded that, "DOE's RD&D programs in fossil energy and energy efficiency have yielded significant benefits ..., important technological options ..., and important additions to the stock of engineering and scientific knowledge in a number of fields." (p. 5). Some of the examples were drawn directly from the documented tracking of commercialized technologies that the Industrial Technologies Program (ITP) of DOE/EERE, and its predecessor agencies have engaged in since the late 1970s. This example asked the question: "What would be the energy consumption and employment impacts of a 50 percent increase in Federal Government funded industrial energy RD&D if the impacts on efficiency are similar to the results obtained in the past?" By framing the question this way, we can exploit the tracking data from ITP to come up with credible estimates of impacts.

The tracking program is provides the evidence of successful commercialization of technologies that were wholly or in part financed with Government funds. The justification for these expenditures is explained on page 1:

ITP's primary role is to invest in high-risk, high-value RD&D that will reduce industry's energy requirements while stimulating economic productivity and growth. Because energy is an important input for many of the nation's key manufacturing industries, reducing energy requirements will also reduce energy costs, greenhouse gases, and other emissions and will improve productivity per unit of output. As a Federal program, ITP invests in advanced technologies that are anticipated to produce dramatic energy and environmental benefits for the nation.

Those dramatic benefits are achieved by a seven-part strategy:

1. Investigate cross-cutting R&D to save energy in the top energy-consuming processes used across industry.
2. Exploit fuel and feedstock flexibility to give manufacturers options for responding to energy price and supply pressures.
3. Invest in “next-generation” technologies adaptable to processes throughout industry that could dramatically change the way products are manufactured.
4. Strengthen planning and analysis to identify opportunities with the greatest potential for energy savings and develop a robust market transformation strategy.
5. Institute rigorous stage-gate project and portfolio management procedures to assure sound project management and funding decisions.
6. Emphasize commercialization planning throughout the R&D life cycle.
7. Encourage private investment in energy efficiency through new partnerships and strategies to reach industry.

Through calendar year 2005, this technology RD&D program had achieved cumulative savings of 402 TBtu, valued at about \$4.44 billion since its inception in 1978. So what would be the consequences of increasing such a program by 50 percent for five years? The first subsection explains how such a scenario is implemented in SEADS 3.0; the second subsection shows the results of implementing this scenario.

#### ***4.1.1 Implementing RD&D Increases in SEADS***

We rely on an ITP Report and the resident data within SEADS to implement this scenario – the *Impacts* document for the savings that could be expected from an increase in RD&D; and the resident data for final demand. We rely on the detailed calculations of savings that underlies the *Impacts* report. The salient elements of those details are summarized as follows.

The first year when commercialized technologies saved energy was in 1980, after the program had been operational for four years. Savings then was 7.4 TBtu. In 1983, when annual savings were 45.3 TBtu, annual expenditures (the first year these are reported) were \$27.9 million, or about 0.66 TBtu per million dollars spent. Cumulative expenditures that year were \$246 million (i.e., \$218 million had been spent the prior 7 years) and cumulative savings per million dollars was 0.18 TBtu/\$1 million. On an annual basis, energy saving has increased to an average of 1.5 TBtu/\$1 million over 23 years, with a range from 0.66 to 3.03. The cumulative numbers have increased gradually from an initial 0.18 TBtu/\$1 million to current levels of 1.4 TBtu/\$1 million expenditures. When these energy savings are translated into dollar savings (valued at fuel prices) the savings per \$1 million dollars of expenditures has increased from \$7.39 million in 1983 to \$229 million in 2005. Cumulative savings per cumulative expenditure has increased over this same period from \$1.54 million to \$56 million.

The final year expenditure, in 2005 was \$73.4 million; to implement this scenario, we assume that this number grows by 150 percent, an increase of \$110.1 million. The cumulative impact of this would be \$25.2 billion, if the savings over time went



unchanged from the 2005 figure (which is a conservative estimate, given that the number has grown over time). The energy savings are in the proportion of 9.4 percent refined petroleum products, 32.6 percent electricity, 50.5 percent natural gas, and 7.5 percent coal, so energy savings for refined petroleum products would be \$2.37 billion, for electricity \$8.2 billion, for natural gas \$12.7 billion, and for coal \$1.9 billion. The savings less the additional expenditures (\$25,212.9 million less \$110.1 million) \$25.1 billion, would be allocated back to final demand to retain the original level of expenditure. This then creates our SEADS scenario, once we allocate the additional expenditures and savings to the final demand vector.

To summarize, we subtract the energy savings (in dollars) from the expenditures on coal, natural gas, refined petroleum products, and electricity, add the additional \$110.1 million into the research budget, then renormalize the total final demand vector to the original total.

#### ***4.1.2 Results of RD&D Increases***

The table below summarizes the impact to energy use and employment as a result of the increases in energy efficiency R&D.

Table 4.1.2. Results of an R&D Increase  
Energy (TBtu)

	Electricity	Fossil	Total Energy	Jobs (x1000)	Earnings (Billions)	Output (Millions)
Base	15957.5	70193.4	86150.9	139810.2	5082.81	14862869
Policy	15622.9	69140.9	84763.8	140369.9	5100.58	14901583
Difference	-334.6	-1052.5	-1387.1	559.7	17.77	38713.6

Baseline total energy consumption in 2002, by the portion of the economy represented by the input-output table (which leaves household and government energy use unaccounted for) includes a little over 86 Quads, with 70 Quads in fossil energy and the remainder in electricity. With the expansion of R&D that reduces energy use as indicated by the *Impacts* document, total energy would drop by about 1.4 Quad, with over a Quad of that in fossil fuel reduction.

Employment, however, would benefit, both by increases in jobs and an increase in earnings. Jobs would increase by over half a million, and earnings would increase by nearly \$18 billion. Total output would increase by nearly \$39 billion. Understand that these changes are net for the economy as a whole. With the changes made to the final demand sector and the changes made to energy intensity in the energy-intensive industries, there will likely be a decline in employment of the energy supplying industries and an increase in the employment in other industries that off-set these losses in the amount of the net figure shown in the table. We could show where these increases and decreases occurred by copying output and employment intensities to a spread sheet and comparing the results with the base case.

## 4.2 Successful Implementation of Section 106 of EPAct, 2005

This section allows the Secretary of Energy to enter into voluntary agreements with industries in energy-intensive sectors to reduce the energy intensity of the production activities of that industry, where intensity was defined as the primary energy required to produce a physical unit of output. The goal of these voluntary agreements would be the reduction of energy intensity by not less than 2.5 percent each year during the period 2007 through 2016. The reward to the industry that met their voluntary targets would be recognition and publicizing of their achievements. The section also calls for grants and technical assistance to meet targets. The section also calls for reporting that evaluates the success of the program at 5- and 10-year intervals that includes verification of energy savings.

Compounding 2.5 percent improvements over 10 years suggests that the energy intensive firm would improve its intensity by 28 percent. So if it currently takes 14 MBtu to produce a metric ton of iron in a blast furnace, over ten years, that would drop to 11 MBtu. Moreover, Section 106 explicitly refers to intensive industries, so these must be identified and we need to parcel out the fraction of the industry that will engage in this program and be successful.

### 4.2.1 Implementing Section 106 in SEADS

We rely on the forecasts of changes in industry output and in energy intensity, both from the *Annual Energy Outlook*. We also rely on the assumption about GDP growth used in *AEO07*. The real growth rate will, absent tremendous improvements in energy efficiency, lead to an increase in energy use over time. A subsidiary question then is this: will that increase be offset by improvements in energy efficiency in industry?

Supplemental tables to the AEO forecast provide estimates of energy efficiency improvement for the major energy-intensive industries. The annual intensity changes for the energy-intensive industries are reported below:

**Table 4.2.1** AEO Annual Rates of Intensity Change

Refining	1.16%
Food	-0.76%
Paper	-0.46%
Bulk Chemicals	-0.50%
Glass	-0.41%
Cement	-0.41%
Iron and Steel	-1.55%
Aluminum	-1.71%

With the exception of refining, all of these energy intensive industries are expected to have a decline in energy intensity, ranging from 1.7 percent per year for aluminum to 0.41 percent for cement and glass. On an annual basis, the refining industry is expected to increase its energy intensity by nearly 1.2 percent per year. With this increase, refining intensity goes from 17,072 Btu/dollar in 2007 to 19,158 Btu/\$ in 2017. A compound rate of improvement in energy intensity of 2.5 percent per year would lead to a reduction in

intensity of 22.4 percent over 10 years ( $0.975^{10} = 0.776$ ). If that sort of improvement in refining occurred, the terminal intensity in 2017 would be 14,888 Btu/\$ rather than the 19,158 currently forecast. Compared to the refining industry's initial 17,072, getting to 14,888 would require a decline in intensity of 1.36 percent per year, not the 2.5 percent called for in Section 106. Because that increase in intensity is probably due to the use of heavier crude and more refining to eliminate unwanted components from fuels (sulfur from diesel, for example), expecting this reduced goal seems reasonable and we will use it in our analysis. While the AEO seems to provide the wherewithal to capture the effects of energy efficiency improvements, how do we deal with economic growth over ten years?

The assumptions underlying the AEO forecast suggest that GDP will grow by 33.5 percent between 2007 and 2017. If we apply this growth rate to our base case numbers, GDP goes from \$8,368 billion to \$11,169 billion over these 10 years. These numbers probably will not be affected by the improvements in energy efficiency. While the energy companies supplying the energy-intensive industries will suffer sales declines, there will be off-setting benefits to the energy intensive industries that likely will compensate. These benefits include reduced energy purchase costs, lower total costs, and higher profits for the energy-intensive industry.

So to implement this scenario, we will first modify the energy intensity coefficients for the major energy-intensive industries for which AEO provides forecasts, then we will alter GDP growth to reflect the 33.5 percent, ten-year, growth in the economy to see what might be the net effect in terms of energy use, output, and employment effects.

#### ***4.2.2 Results for a Successful Voluntary Program***

The results of a voluntary program as specified by Section 106 are reported in Table 4.2.2. Note that there is no difference between the employment and output numbers unless growth occurs. If by 2017 the economy grows as indicated by AEO07, then there would be an addition 47 million jobs and earnings would grow by \$1,718 billion. The program would, however, bring about substantial energy savings.

**Table 4.2.2** Aggregate Impacts of a Voluntary Efficiency Improvement Program

Case	Elec	Fossil	Total	Jobs	Earnings	Output
Base	15957.5	70193.4	86150.9	139810.2	5082.81	14862869
Policy-Energy	15666.3	68442	84108.3	139810.2	5082.81	14862869
Policy/ Growth	21342	93965.6	115307.6	187076.7	6801.1	19899500
Policy/Both	20952	91620.9	112573	187076.7	6801.1	19899500
Difference 1-2	-291.2	-1751.4	-2042.6	0	0	0
Difference 3-1	5384.5	23772.2	29156.7	47266.5	1718.29	5036630
Difference 4-1	4994.5	21427.5	26422.1	47266.5	1718.29	5036630
3-1 – 4-1	-390	-2344.7	-2734.6	0	0	0

If the voluntary program was implemented in an environment where no growth occurred, the savings would be substantial. Electricity would be reduced by 291 TBtu and fossil energy would decline by 1751 TBtu for a total reduction in energy use of over 2 Quad.

With growth in the economy but with no efficiency program, energy use would grow to slightly over 115 Quad from a current level of 86 Quad (again, remember that this does not include household or government consumption). If both growth occurred and an efficiency program was implemented, energy consumption would still grow substantially by 26.4 Quad over ten years. The energy savings with growth and a program would be 390 TBtu for electricity, 2,345 TBtu for fossil energy, for a total energy savings of 2.7 Quad.

While we report only the aggregate results here, Appendix A provides much more detail and shows how each of the sectors has been affected in terms of changes from the base case to the energy efficiency case.

#### **4.3 Observations on the Use of SEADS 3.0**

SEADS is designed to provide quick answers to questions that can be formulated in terms of programmatic changes that can be reflected in changes to final demand – the aggregated components that sum to Gross Domestic Product. As we demonstrate in this chapter, fairly simple questions may involve some data development and analysis prior to constructing the inputs to SEADS; the extent of this analysis is provided by the more detailed tables shown in Appendix A. At this point, SEADS can provide some initial results that may hold up on further analysis.

As the second section of this chapter shows, there may be implications of a program that can be translated into changes in either energy intensity coefficients or jobs and earnings coefficients that allow results that would not show up just through changes in final demand.

But this final caution should be kept in mind: SEADS uses a static input-output framework that has limitations when policies are being implemented in a dynamic world. It can provide rough, first-cut, bounds on what impacts are likely to result from policy cases, but considerable care should be taken, especially when forecasting many years into the future. The I/O structure provides only a snapshot of current technology relationships as of the date of the I/O table (1997 in this case). Forecasting results to future years implies that technology relationships have remained stable between the table year and the forecast out year. While this may hold for some well established or entrenched industries, growth industries or relatively young industries are likely to more rapidly change production technology – thereby invalidating the use of a static I/O approach to impact analysis for such industries.

## 5.0 References

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<http://e-center.doe.gov/doebiz.nsf/d76fbc294818822885256d98006c63b6/f16dec64fa6d012e85257333006ca644?OpenDocument>

The BEA Benchmark Input-output table is located at:

[http://www.bea.gov/industry/io\\_benchmark.htm#1997data](http://www.bea.gov/industry/io_benchmark.htm#1997data)

The BLS Current Employment Statistics home page is:

<http://stats.bls.gov/ces/home.htm>

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State data are available from BLS at: <http://stats.bls.gov/sae/home.htm>



## Appendix A: Detailed Results

The results of the changes in final demand and energy use not, shown in the text, are provided here. Since the labor and output changes are dependent entirely on changes in final demand, we do not report these in detail.

### A.1 Implementing and R&D Increase

The final demand vector components that change by more than \$1 billion are shown in Table A.1. The reduction in energy use is shown in the column labeled “Change before rescaling.” Since this subtracted \$25.1 billion from final demand, the entire vector, after these subtractions, was increased by 1.0472, or 4.72% to return the total of final demand to the original total. That is why the reductions are slightly smaller than the original changes.

**Table A.1.1** Changes in Final Demand (FD) Greater than \$1 billion

Sector	FD Change	Change before rescaling	Sector Description
6	-1888.5	-1,890	Coal Mining
12	-7872.4	-8215	Electricity Gen. and Trans.
13	-12578.3	-12,726	Natural Gas Distribution
15	8680		Water/Sewer, Other Systems
16	1320.6		New Single-Family Const.
17	2903.3		New Multifamily Const.
19	1383.6		Industrial Building Construction
20	9605.2		Industrial Building Construction
40	-2152.9	-2,369	Commercial Building Construction
167	1121.1		Healthcare Providers
168	1080.4		Hospitals and Residential Care

Table A.2 shows the level of energy use by all industry sectors that have a change greater than 2 TBtu from the base. It also shows, on the last three columns, these changes. With the major changes being in the energy sectors, 6, 12, 13, and 40, one would expect that these sectors might also experience major changes but that is not always the case. For example, the natural gas distribution sector has a total energy savings of only 0.9 TBtu, not enough to qualify to be in the table, except that it is included because to the major change to the final demand sector. The major impact as a result of that change does not show up in sector 12, but rather in the pipeline sectors, 148, where total energy use has been reduced 374 TBtu. Because many of the major affected industries as shown in Table A.1 are building sectors, the industries that supply buildings materials to those sectors also show major changes in energy use. For example, Lumber Mills, Paper Mills, Cement Manufacturing, and Cement Products Manufacturing (sectors 31, 36, 56, and 57 respectively) all had substantial increases in total energy use.

**Table A.1.2** Energy Levels and Changes greater than 2 TBtu

Sector	Description	Energy Consumption			Change from Base Case		
		Elec	Fossil	Total	Elec	Fossil	Total
6	Coal Mining	16.2	394.2	410.4	-2.2	-53.3	-55.5
12	Electricity Gen. and Trans.	8105.8	18415.5	26521.3	-360.2	-818.5	-1178.7
13	Natural Gas Distribution	0.4	4.7	5.1	-0.1	-0.8	-0.9
15	New Single-Family Const.	28.3	264.2	292.4	1.4	12.7	14.0
16	New Multifamily Const.	5.9	135.0	140.9	0.3	6.5	6.8
17	New Residential Remodeling Const.	8.2	232.5	240.7	0.4	11.1	11.5
19	Industrial Building Construction	4.6	146.5	151.1	0.2	7.0	7.2
20	Commercial Building Construction	40.3	1068.1	1108.4	1.9	51.2	53.1
31	Lumber Mills	55.4	251.6	306.9	1.0	4.6	5.6
36	Paper And Paperboard Mills	179.3	1742.0	1921.3	0.6	6.2	6.9
40	Petroleum Refineries	118.7	2222.7	2341.4	-1.8	-33.4	-35.1
41	Oth. Petroleum/Coal Prod. Mfg.	13.0	794.0	807.1	0.1	5.7	5.8
43	Organic Chemical Mfg.	81.5	932.0	1013.4	0.3	3.2	3.5
56	Cement Manufacturing	37.4	201.5	238.9	0.6	3.2	3.8
57	Concrete Products Mfg.	13.8	106.2	120.0	0.3	2.1	2.3
62	Iron And Steel Mills	159.9	865.2	1025.1	0.6	3.5	4.2
143	Air Transportation	0.6	2861.6	2862.2	0.0	9.2	9.2
144	Rail Transportation	0.1	808.4	808.5	0.0	-3.8	-3.8
145	Water Transportation	0.2	861.7	861.9	0.0	1.5	1.5
146	Truck Transportation	0.3	2409.3	2409.6	0.0	11.7	11.7
147	Transit & Related Services	0.3	1721.3	1721.7	0.0	5.1	5.1
148	Pipeline Transportation	1.9	4343.5	4345.5	-0.2	-373.9	-374.0
151	Warehousing And Storage	620.2	697.7	1317.9	1.9	2.1	4.0
178	S/L Government Passenger Transit	13.5	12719.4	12733.0	0.0	37.9	38.0
179	S/L Government Electric Utilities	0.0	192.5	192.5	0.0	-6.8	-6.8

**A.2 Implementing Section 106**

The strategy in this example is to modify, as per the requirements of Section 106, the energy intensity coefficients to match the improvement rate required by EPA. We have imposed the 2.5% improvement for all energy-intensive industries with the exception of petroleum refining, which according to *AEO07* is forecast to increase as a result of reliance on greater processing and/or heavier/higher-sulfur crude oil supplies. So rather than apply the 2.5% decrease in intensity to the 2007 numbers, we applied the ten-year



intensity improvement to the forecasted intensity used in *AEO07*. The changes to the intensity coefficients used in SEADS 3.0, compared to the base case, are shown in Table A.2.1, below.

**Table A.2.1** Intensity Changes for Energy-Intensive Industries

Sector Number and Description	Energy Intensity Changes		
	Electricity	Fossil	Total
24 Food Processing	-0.1211	-0.434	-0.5551
35 Pulp Mills	-0.5431	-6.8588	-7.4019
36 Paper And Paperboard Mills	-0.5858	-5.6905	-6.2763
37 Paperboard Container Mfg.	-0.1722	-1.2464	-1.4186
38 Converted Paper Product Mfg.	-0.159	-0.5089	-0.6679
40 Petroleum Refineries	-0.0995	-1.8634	-1.9629
42 Inorganic Chemical Mfg.	-0.8682	-3.5283	-4.3965
43 Organic Chemical Mfg.	-0.3037	-3.4741	-3.7779
44 Plastics Material & Resin Mfg.	-0.2952	-0.97	-1.2652
45 Synthetic Rubber Mfg.	-0.2626	-1.3332	-1.5958
46 Organic Fiber Mfg.	-0.3874	-1.0373	-1.4248
47 Fertilizer & Pesticide Mfg.	-0.2502	-1.0517	-1.3019
54 Glass Container Mfg.	-0.6433	-4.4707	-5.114
55 Glass and Glass Products Mfg.	-0.3471	-1.8543	-2.2014
56 Cement Manufacturing	-1.2921	-6.9542	-8.2464
62 Iron And Steel Mills	-0.6204	-3.3574	-3.9778
65 Aluminum Mills	-2.1687	-1.0683	-3.237

We impose these improvements in energy intensity and compare them to the base case; then we increase GDP at a rate consistent with the growth forecast used in *AEO07*, which is an increase of 33.84 percent. When the two higher growth scenarios are compared, (intensity improvements when the higher level of GDP is obtained) the total energy saved is substantially increased. After all, the GDP growth alone would cause an increase in energy consumption of over 29 Quad. A large fraction of that increase (18.7 Q) comes from nine industries shown in Table A.2.2 below.

**Table A.2.2** Change from Base Case, Growth and Intensity Changes (> 350 TBtu)

Sector	Description	Change from Base Case		
		Electricity	Fossil	Total
1	Crop Farming	25.99	335.21	361.20
12	Electricity Gen. and Trans.	2848.60	6471.77	9320.37
20	Commercial Building Construction	15.26	404.44	419.70
40	Petroleum Refineries	19.91	372.79	392.69
143	Air Transportation	0.20	958.69	958.89
146	Truck Transportation	0.11	813.81	813.92
147	Transit & Related Services	0.12	575.70	575.81
148	Pipeline Transportation	0.70	1588.89	1589.60
178	S/L Government Passenger Transit	4.53	4253.84	4258.37



## Appendix B: Industrial Structure

1	Crop Farming	48	Pharmaceutical & Medicine Mfg.
2	Animal Farming	49	Misc. Chemical Prod. Mfg.
3	Forest Products	50	Plastics & Related Prod. Mfg.
4	Fish/Hunt/Ag Support	51	Rubber Products Mfg.
5	Oil and Gas Extraction	52	China & Porcelain Prod. Mfg.
6	Coal Mining	53	Clay Products Mfg.
7	Metal Mining	54	Glass Container Mfg.
8	Nonmetallic Mineral Mining	55	Glass and Glass Products Mfg.
9	Oil and Gas Drilling	56	Cement Manufacturing
10	Oil and Gas Support	57	Concrete Products Mfg.
11	Other Mining Support	58	Lime Manufacturing
12	Electricity Gen. and Trans.	59	Gypsum Product Manufacturing
13	Natural Gas Distribution	60	Oth. Nonmetallic Mineral Prod.
14	Water/Sewer, Other Systems	61	Mineral Wool Manufacturing
15	New Single-Family Const.	62	Iron And Steel Mills
16	New Multifamily Const.	63	Ferroalloy Product Mfg.
17	New Residential Remodeling Const.	64	Steel Shape Mfg.
18	New Farm Housing	65	Aluminium Mills
19	Industrial Building Construction	66	Aluminum Product Mfg.
20	Commercial Building Construction	67	Nonferrous Metals Mfg.
21	Road Construction	68	Ferrous Metal Foundaries
22	Other New Construction	69	Aluminum Foundries
23	Res. Maintenance & Repair	70	Iron And Steel Forging
24	Food Processing	71	Other Forging and Stamping
25	Alcoholic Beverage Processing	72	Tool and Utensil Mfg.
26	Tobacco Processing	73	Fabricated Metal Mfg.
27	Textile Mills	74	Plate Work Manufacturing
28	Textile Product Mills	75	Metal Window & Door Mfg.
29	Apparel Manufacturing	76	Other Metal Work Mfg.
30	Leather Products Mfg.	77	Power Boilers & Heat Exchangers
31	Lumber Mills	78	Metal Tank Manufacturing
32	Specialized Wood Product Mfg.	79	Other Fabricated Metal Mfg.
33	Misc. Wood Product Mfg.	80	Ordinance and Ammunition Mfg.
34	Manufactured Buildings	81	Heavy Machinery Mfg.
35	Pulp Mills	82	Lawn & Garden Eq. Mfg.
36	Paper And Paperboard Mills	83	Wood Processing Machinery Mfg.
37	Paperboard Container Mfg.	84	Plastics & Rubber Machinery Mfg.
38	Converted Paper Product Mfg.	85	Paper Industry Machinery Mfg.
39	Commercial Printing	86	Textile Machinery Mfg.
40	Petroleum Refineries	87	Printing Industry Machinery Mfg.
41	Oth. Petroleum/Coal Prod. Mfg.	88	Food Product Machinery Mfg.
42	Inorganic Chemical Mfg.	89	Commercial Service Machinery Mfg.
43	Organic Chemical Mfg.	90	Air Purification Eq. Mfg.
44	Plastics Material & Resin Mfg.	91	Com/Ind Fan & Blower Mfg.
45	Synthetic Rubber Mfg.	92	Nonfurnace Heating Eq. Mfg.
46	Organic Fiber Mfg.	93	AC, Ref., Heat Pumps & Forced Air
47	Fertilizer & Pesticide Mfg.	94	Industrial Mold Manufacturing

## Industrial Structure, Continued

95	Metalworking Machinery Mfg.	142	Wholesale Trade
96	Turbines and Related Mfg.	143	Air Transportation
97	Other Engine Eq. Manufacturing	144	Rail Transportation
98	Power Transmission Equipment Mfg.	145	Water Transportation
99	Pumps and Related Eq. Mfg.	146	Truck Transportation
100	Air And Gas Compressor Mfg.	147	Transit & Related Services
101	Measuring And Dispensing Pump Mfg.	148	Pipeline Transportation
102	Other Electric Machinery Mfg.	149	Sightseeing Transportation
103	Ind. Process Furnace & Oven Mfg.	150	Postal and Courier Services
104	Misc. Machinery Mfg.	151	Warehousing And Storage
105	Computer Products Mfg.	152	Retail Trade
106	Communications Eq. Mfg.	153	Publishers
107	Electronic Components Mfg.	154	Telecom & Entertainment
108	Instruments Manufacturing	155	Credit Counseling
109	Automatic Environmental Controls	156	Investment Services
110	Ind. Process Variable Instruments	157	Insurance
111	Fluid Meters & Counting Devices	158	Fund Management
112	Electricity & Signal Testing Inst.	159	Monetary Authorities
113	Other Lab & Related Instruments	160	Real Estate
114	Electronic Media Processing	161	Car Rental Agencies
115	Electric Lamp Bulb And Part Mfg.	162	Rental Services
116	Lighting Fixture Manufacturing	163	Other Professional/Technical Svc.
117	Household Eq. Mfg.	164	Architectural & Engineering Svc.
118	Household Cooking Appliance Mfg.	165	Other Business Services
119	HH Refrigerator & Freezer Mfg.	166	Education
120	Household Laundry Equipment Mfg.	167	Healthcare Providers
121	Other Major HH Appliance Mfg.	168	Hospitals and Residential Care
122	Electric Power, Etc. Transformers	169	Day Care and Social Assistance
123	Motor And Generator Manufacturing	170	Amusement & Recreation
124	Industrial Controls	171	Lodging
125	Battery Manufacturing	172	Food & Beverage Services
126	Misc. Electric Eq. Mfg.	173	Personal Services
127	Car and Light Truck Mfg.	174	Other Services
128	Truck Manufacturing	175	Households
129	RV Manufacturing	176	Federal Electric Utilities
130	Motor Vehicle Parts Manufacturing	177	Other Fed. Gov. Enterprises
131	Aerospace Product Manufacturing	178	S/L Government Passenger Transit
132	Railroad Rolling Stock Mfg.	179	S/L Government Electric Utilities
133	Ship Building And Repairing	180	Other S/L Government Enterprises
134	Boat/Cycle & Parts Mfg.	181	Noncomparable Imports
135	Other Transportation Eq.	182	Scrap
136	HH & Institutional Furniture	183	Used And Secondhand Goods
137	Office Furniture Mfg.	184	General Government Industry
138	Custom Woodwork And Millwork	185	RTW Adjustment
139	Misc. Furniture Mfg.	186	Inventory Valuation Adjustment
140	Laboratory Instruments & Eq.	187	Owner-Occupied Dwellings
141	Misc. Manufacturing		

## Appendix C. Translation of Industry Structure between BEA Input-Output Sectors, Capital Flows Industries and SEADS Sectors

IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
1111A0	Oilseed farming	S001	Crop Farming	110C	Crop and animal production
1111B0	Grain farming	S001	Crop Farming	110C	Crop and animal production
111200	Vegetable and melon farming	S001	Crop Farming	110C	Crop and animal production
111335	Tree nut farming	S001	Crop Farming	110C	Crop and animal production
1113A0	Fruit farming	S001	Crop Farming	110C	Crop and animal production
111400	Greenhouse and nursery production	S001	Crop Farming	110C	Crop and animal production
111910	Tobacco farming	S001	Crop Farming	110C	Crop and animal production
111920	Cotton farming	S001	Crop Farming	110C	Crop and animal production
1119A0	Sugarcane and sugar beet farming	S001	Crop Farming	110C	Crop and animal production
1119B0	All other crop farming	S001	Crop Farming	110C	Crop and animal production
112100	Cattle ranching and farming	S002	Animal Farming	110C	Crop and animal production
112300	Poultry and egg production	S002	Animal Farming	110C	Crop and animal production
1123A0	Animal production, except cattle and poultry and eggs	S002	Animal Farming	110C	Crop and animal production
113300	Logging	S003	Forest Products	113F	Forestry, fishing, and related activities
113A00	Forest nurseries, forest products, and timber tracts	S003	Forest Products	113F	Forestry, fishing, and related activities
114100	Fishing	S004	Fish/Hunt/Ag Support	113F	Forestry, fishing, and related activities
114200	Hunting and trapping	S004	Fish/Hunt/Ag Support	113F	Forestry, fishing, and related activities
115000	Agriculture and forestry support activities	S004	Fish/Hunt/Ag Support	113F	Forestry, fishing, and related activities
211000	Oil and gas extraction	S005	Oil and Gas Extraction	2110	Oil and gas extraction
212100	Coal mining	S006	Coal Mining	2120	Mining, except oil and gas
212210	Iron ore mining	S007	Metal Mining	2120	Mining, except oil and gas
212230	Copper, nickel, lead, and zinc mining	S007	Metal Mining	2120	Mining, except oil and gas
2122A0	Gold, silver, and other metal ore mining	S007	Metal Mining	2120	Mining, except oil and gas
212310	Stone mining and quarrying	S008	Nonmetallic Mineral Mining	2120	Mining, except oil and gas
212320	Sand, gravel, clay, and refractory mining	S008	Nonmetallic Mineral Mining	2120	Mining, except oil and gas
212390	Other nonmetallic mineral mining	S008	Nonmetallic Mineral Mining	2120	Mining, except oil and gas
213111	Drilling oil and gas wells	S009	Oil and Gas Drilling	2130	Support activities for mining
213112	Support activities for oil and gas operations	S010	Oil and Gas Support	2130	Support activities for mining
21311A	Support activities for other mining	S011	Other Mining Support	2130	Support activities for mining
221100	Power generation and supply	S012	Electricity Gen. and Trans.	2200	Utilities
221200	Natural gas distribution	S013	Natural Gas Distribution	2200	Utilities
221300	Water, sewage and other systems	S014	Water/Sewer, Other Systems	2200	Utilities
230110	New residential 1-unit structures, nonfarm	S015	New Single-Family Const.	2300	Construction
230120	New multifamily housing structures, nonfarm	S016	New Multifamily Const.	2300	Construction
230130	New residential additions and alterations, nonfarm	S017	New Residential Remodeling Const.	2300	Construction
230140	New farm housing units and additions and alterations	S018	New Farm Housing	2300	Construction
230210	Manufacturing and industrial buildings	S019	Industrial Building Construction	2300	Construction
230220	Commercial and institutional buildings	S020	Commercial Building Construction	2300	Construction

IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
230230	Highway, street, bridge, and tunnel construction	S021	Road Construction	2300	Construction
230240	Water, sewer, and pipeline construction	S021	Pipeline Construction	2300	Construction
230250	Other new construction	S022	Other New Construction	2300	Construction
230310	Maintenance and repair of farm and nonfarm residential structures	S023	Res. Maintenance & Repair	2300	Construction
230320	Maintenance and repair of nonresidential buildings	S023	Non-Res. Maintenance & Repair	2300	Construction
230330	Maintenance and repair of highways, streets, bridges, and tunnels	S023	Road Maintenance & Repair	2300	Construction
230340	Other maintenance and repair construction	S023	Other Maintenance & Repair	2300	Construction
311111	Dog and cat food manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311119	Other animal food manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311211	Flour milling	S024	Food Processing	311A	Food, beverage, and tobacco
311212	Rice milling	S024	Food Processing	311A	Food, beverage, and tobacco
311213	Malt manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311221	Wet corn milling	S024	Food Processing	311A	Food, beverage, and tobacco
311222	Soybean processing	S024	Food Processing	311A	Food, beverage, and tobacco
311223	Other oilseed processing	S024	Food Processing	311A	Food, beverage, and tobacco
311225	Fats and oils refining and blending	S024	Food Processing	311A	Food, beverage, and tobacco
311230	Breakfast cereal manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311310	Sugar manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311320	Confectionery manufacturing from cacao beans	S024	Food Processing	311A	Food, beverage, and tobacco
311330	Confectionery manufacturing from purchased chocolate	S024	Food Processing	311A	Food, beverage, and tobacco
311340	Nonchocolate confectionery manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311410	Frozen food manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311420	Fruit and vegetable canning and drying	S024	Food Processing	311A	Food, beverage, and tobacco
311511	Fluid milk manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311512	Creamery butter manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311513	Cheese manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311514	Dry, condensed, and evaporated dairy products	S024	Food Processing	311A	Food, beverage, and tobacco
311520	Ice cream and frozen dessert manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311611	Animal, except poultry, slaughtering	S024	Food Processing	311A	Food, beverage, and tobacco
311612	Meat processed from carcasses	S024	Food Processing	311A	Food, beverage, and tobacco
311613	Rendering and meat byproduct processing	S024	Food Processing	311A	Food, beverage, and tobacco
311615	Poultry processing	S024	Food Processing	311A	Food, beverage, and tobacco
311700	Seafood product preparation and packaging	S024	Food Processing	311A	Food, beverage, and tobacco
311813	Frozen cakes and other pastries manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
31181A	Bread and bakery product, except frozen, manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311821	Cookie and cracker manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311822	Mixes and dough made from purchased flour	S024	Food Processing	311A	Food, beverage, and tobacco
311823	Dry pasta manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311830	Tortilla manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311911	Roasted nuts and peanut butter manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311919	Other snack food manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311920	Coffee and tea manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311930	Flavoring syrup and concentrate manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311941	Mayonnaise, dressing, and sauce manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco

IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
311942	Spice and extract manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
311990	All other food manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
312110	Soft drink and ice manufacturing	S024	Food Processing	311A	Food, beverage, and tobacco
312120	Breweries	S025	Alcoholic Beverage Processing	311A	Food, beverage, and tobacco
312130	Wineries	S025	Alcoholic Beverage Processing	311A	Food, beverage, and tobacco
312140	Distilleries	S025	Alcoholic Beverage Processing	311A	Food, beverage, and tobacco
312210	Tobacco stemming and redrying	S026	Tobacco Processing	311A	Food, beverage, and tobacco
312221	Cigarette manufacturing	S026	Tobacco Processing	311A	Food, beverage, and tobacco
312229	Other tobacco product manufacturing	S026	Tobacco Processing	311A	Food, beverage, and tobacco
313100	Fiber, yarn, and thread mills	S027	Textile Mills	313T	Textile and textile product mills
313210	Broadwoven fabric mills	S027	Textile Mills	313T	Textile and textile product mills
313220	Narrow fabric mills and schiffli embroidery	S027	Textile Mills	313T	Textile and textile product mills
313230	Nonwoven fabric mills	S027	Textile Mills	313T	Textile and textile product mills
313240	Knit fabric mills	S027	Textile Mills	313T	Textile and textile product mills
313310	Textile and fabric finishing mills	S027	Textile Mills	313T	Textile and textile product mills
313320	Fabric coating mills	S027	Textile Mills	313T	Textile and textile product mills
314110	Carpet and rug mills	S028	Textile Product Mills	313T	Textile and textile product mills
314120	Curtain and linen mills	S028	Textile Product Mills	313T	Textile and textile product mills
314910	Textile bag and canvas mills	S028	Textile Product Mills	313T	Textile and textile product mills
314992	Tire cord and tire fabric mills	S028	Textile Product Mills	313T	Textile and textile product mills
31499A	Other miscellaneous textile product mills	S028	Textile Product Mills	313T	Textile and textile product mills
315111	Sheer hosiery mills	S029	Apparel Manufacturing	315A	Apparel and leather and allied products
315119	Other hosiery and sock mills	S029	Apparel Manufacturing	315A	Apparel and leather and allied products
315190	Other apparel knitting mills	S029	Apparel Manufacturing	315A	Apparel and leather and allied products
315200	Cut and sew apparel manufacturing	S029	Apparel Manufacturing	315A	Apparel and leather and allied products
315900	Accessories and other apparel manufacturing	S029	Apparel Manufacturing	315A	Apparel and leather and allied products
316100	Leather and hide tanning and finishing	S030	Leather Products Mfg.	315A	Apparel and leather and allied products
316200	Footwear manufacturing	S030	Leather Products Mfg.	315A	Apparel and leather and allied products
316900	Other leather product manufacturing	S030	Leather Products Mfg.	315A	Apparel and leather and allied products
321113	Sawmills	S031	Lumber Mills	3210	Wood product manufacturing
321114	Wood preservation	S031	Lumber Mills	3210	Wood product manufacturing
321219	Reconstituted wood product manufacturing	S031	Lumber Mills	3210	Wood product manufacturing
32121A	Veneer and plywood manufacturing	S031	Lumber Mills	3210	Wood product manufacturing
32121B	Engineered wood member and truss manufacturing	S031	Lumber Mills	3210	Wood product manufacturing
321911	Wood windows and door manufacturing	S032	Specialized Wood Product Mfg.	3210	Wood product manufacturing
321912	Cut stock, resawing lumber, and planing	S032	Specialized Wood Product Mfg.	3210	Wood product manufacturing
321918	Other millwork, including flooring	S032	Specialized Wood Product Mfg.	3210	Wood product manufacturing
321920	Wood container and pallet manufacturing	S033	Misc. Wood Product Mfg.	3210	Wood product manufacturing
321999	Miscellaneous wood product manufacturing	S033	Misc. Wood Product Mfg.	3210	Wood product manufacturing
321991	Manufactured home, mobile home, manufacturing	S034	Manufactured Buildings	3210	Wood product manufacturing
321992	Prefabricated wood building manufacturing	S034	Manufactured Buildings	3210	Wood product manufacturing
322110	Pulp mills	S035	Pulp Mills	3220	Paper manufacturing
3221A0	Paper and paperboard mills	S036	Paper And Paperboard Mills	3220	Paper manufacturing
322210	Paperboard container manufacturing	S037	Paperboard Container Mfg.	3220	Paper manufacturing

IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
322225	Flexible packaging foil manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322226	Surface-coated paperboard manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
32222A	Coated and laminated paper and packaging materials	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
32222B	Coated and uncoated paper bag manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322231	Die-cut paper office supplies manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322232	Envelope manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322233	Stationery and related product manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322291	Sanitary paper product manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
322299	All other converted paper product manufacturing	S038	Converted Paper Product Mfg.	3220	Paper manufacturing
323116	Manifold business forms printing	S039	Commercial Printing	3230	Printing and related support activities
323117	Books printing	S039	Commercial Printing	3230	Printing and related support activities
323118	Blankbook and looseleaf binder manufacturing	S039	Commercial Printing	3230	Printing and related support activities
32311A	Commercial printing	S039	Commercial Printing	3230	Printing and related support activities
323121	Tradebinding and related work	S039	Commercial Printing	3230	Printing and related support activities
323122	Prepress services	S039	Commercial Printing	3230	Printing and related support activities
324110	Petroleum refineries	S040	Petroleum Refineries	3240	Petroleum and coal products manufacturing
324121	Asphalt paving mixture and block manufacturing	S041	Oth. Petroleum/Coal Prod. Mfg.	3240	Petroleum and coal products manufacturing
324122	Asphalt shingle and coating materials manufacturing	S041	Oth. Petroleum/Coal Prod. Mfg.	3240	Petroleum and coal products manufacturing
324191	Petroleum lubricating oil and grease manufacturing	S041	Oth. Petroleum/Coal Prod. Mfg.	3240	Petroleum and coal products manufacturing
324199	All other petroleum and coal products manufacturing	S041	Oth. Petroleum/Coal Prod. Mfg.	3240	Petroleum and coal products manufacturing
325110	Petrochemical manufacturing	S042	Inorganic Chemical Mfg.	3250	Chemical manufacturing
325120	Industrial gas manufacturing	S042	Inorganic Chemical Mfg.	3250	Chemical manufacturing
325130	Synthetic dye and pigment manufacturing	S042	Inorganic Chemical Mfg.	3250	Chemical manufacturing
325180	Other basic inorganic chemical manufacturing	S042	Inorganic Chemical Mfg.	3250	Chemical manufacturing
325190	Other basic organic chemical manufacturing	S043	Organic Chemical Mfg.	3250	Chemical manufacturing
325211	Plastics material and resin manufacturing	S044	Plastics Material & Resin Mfg.	3250	Chemical manufacturing
325212	Synthetic rubber manufacturing	S045	Synthetic Rubber Mfg.	3250	Chemical manufacturing
325221	Cellulosic organic fiber manufacturing	S046	Organic Fiber Mfg.	3250	Chemical manufacturing
325222	Noncellulosic organic fiber manufacturing	S046	Organic Fiber Mfg.	3250	Chemical manufacturing
325311	Nitrogenous fertilizer manufacturing	S047	Fertilizer & Pesticide Mfg.	3250	Chemical manufacturing
325312	Phosphatic fertilizer manufacturing	S047	Fertilizer & Pesticide Mfg.	3250	Chemical manufacturing
325314	Fertilizer, mixing only, manufacturing	S047	Fertilizer & Pesticide Mfg.	3250	Chemical manufacturing
325320	Pesticide and other agricultural chemical manufacturing	S047	Fertilizer & Pesticide Mfg.	3250	Chemical manufacturing
325400	Pharmaceutical and medicine manufacturing	S048	Pharmaceutical & Medicine Mfg.	3250	Chemical manufacturing
325510	Paint and coating manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325520	Adhesive manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325611	Soap and other detergent manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325612	Polish and other sanitation good manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325613	Surface active agent manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325620	Toilet preparation manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325910	Printing ink manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325920	Explosives manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325991	Custom compounding of purchased resins	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
325992	Photographic film and chemical manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing



IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
325998	Other miscellaneous chemical product manufacturing	S049	Misc. Chemical Prod. Mfg.	3250	Chemical manufacturing
326110	Plastics packaging materials, film and sheet	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
326120	Plastics pipe, fittings, and profile shapes	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
326130	Laminated plastics plate, sheet, and shapes	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
326160	Plastics bottle manufacturing	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
326192	Resilient floor covering manufacturing	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
32619A	Plastics plumbing fixtures and all other plastics products	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
3261A0	Foam product manufacturing	S050	Plastics & Related Prod. Mfg.	3260	Plastics and rubber products manufacturing
326210	Tire manufacturing	S051	Rubber Products Mfg.	3260	Plastics and rubber products manufacturing
326220	Rubber and plastics hose and belting manufacturing	S051	Rubber Products Mfg.	3260	Plastics and rubber products manufacturing
326290	Other rubber product manufacturing	S051	Rubber Products Mfg.	3260	Plastics and rubber products manufacturing
327111	Vitreous china plumbing fixture manufacturing	S052	China & Porcelain Prod. Mfg.	3270	Nonmetallic mineral product manufacturing
327112	Vitreous china and earthenware articles manufacturing	S052	China & Porcelain Prod. Mfg.	3270	Nonmetallic mineral product manufacturing
327113	Porcelain electrical supply manufacturing	S052	China & Porcelain Prod. Mfg.	3270	Nonmetallic mineral product manufacturing
327121	Brick and structural clay tile manufacturing	S053	Clay Products Mfg.	3270	Nonmetallic mineral product manufacturing
327122	Ceramic wall and floor tile manufacturing	S053	Clay Products Mfg.	3270	Nonmetallic mineral product manufacturing
327125	Nonclay refractory manufacturing	S053	Clay Products Mfg.	3270	Nonmetallic mineral product manufacturing
32712A	Clay refractory and other structural clay products	S053	Clay Products Mfg.	3270	Nonmetallic mineral product manufacturing
327213	Glass container manufacturing	S054	Glass Container Mfg.	3270	Nonmetallic mineral product manufacturing
32721A	Glass and glass products, except glass containers	S055	Glass and Glass Products Mfg.	3270	Nonmetallic mineral product manufacturing
327310	Cement manufacturing	S056	Cement Manufacturing	3270	Nonmetallic mineral product manufacturing
327320	Ready-mix concrete manufacturing	S057	Concrete Products Mfg.	3270	Nonmetallic mineral product manufacturing
327331	Concrete block and brick manufacturing	S057	Concrete Products Mfg.	3270	Nonmetallic mineral product manufacturing
327332	Concrete pipe manufacturing	S057	Concrete Products Mfg.	3270	Nonmetallic mineral product manufacturing
327390	Other concrete product manufacturing	S057	Concrete Products Mfg.	3270	Nonmetallic mineral product manufacturing
327410	Lime manufacturing	S058	Lime Manufacturing	3270	Nonmetallic mineral product manufacturing
327420	Gypsum product manufacturing	S059	Gypsum Product Manufacturing	3270	Nonmetallic mineral product manufacturing
327910	Abrasive product manufacturing	S060	Oth. Nonmetallic Mineral Prod.	3270	Nonmetallic mineral product manufacturing
327991	Cut stone and stone product manufacturing	S060	Oth. Nonmetallic Mineral Prod.	3270	Nonmetallic mineral product manufacturing
327992	Ground or treated minerals and earths manufacturing	S060	Oth. Nonmetallic Mineral Prod.	3270	Nonmetallic mineral product manufacturing
327999	Miscellaneous nonmetallic mineral products	S060	Oth. Nonmetallic Mineral Prod.	3270	Nonmetallic mineral product manufacturing
327993	Mineral wool manufacturing	S061	Mineral Wool Manufacturing	3270	Nonmetallic mineral product manufacturing
331111	Iron and steel mills	S062	Iron And Steel Mills	3310	Primary metal manufacturing
331112	Ferroalloy and related product manufacturing	S063	Ferroalloy Product Mfg.	3310	Primary metal manufacturing
331210	Iron, steel pipe and tube from purchased steel	S064	Steel Shape Mfg.	3310	Primary metal manufacturing
331221	Rolled steel shape manufacturing	S064	Steel Shape Mfg.	3310	Primary metal manufacturing
331222	Steel wire drawing	S064	Steel Shape Mfg.	3310	Primary metal manufacturing
331311	Alumina refining	S065	Aluminum Mills	3310	Primary metal manufacturing
331312	Primary aluminum production	S065	Aluminum Mills	3310	Primary metal manufacturing
331314	Secondary smelting and alloying of aluminum	S065	Aluminum Mills	3310	Primary metal manufacturing
331315	Aluminum sheet, plate, and foil manufacturing	S066	Aluminum Product Mfg.	3310	Primary metal manufacturing
331316	Aluminum extruded product manufacturing	S066	Aluminum Product Mfg.	3310	Primary metal manufacturing
331319	Other aluminum rolling and drawing	S066	Aluminum Product Mfg.	3310	Primary metal manufacturing
331411	Primary smelting and refining of copper	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing

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331419	Primary nonferrous metal, except copper and aluminum	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331421	Copper rolling, drawing, and extruding	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331422	Copper wire, except mechanical, drawing	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331423	Secondary processing of copper	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331491	Nonferrous metal, except copper and aluminum, shaping	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331492	Secondary processing of other nonferrous	S067	Nonferrous Metals Mfg.	3310	Primary metal manufacturing
331510	Ferrous metal foundries	S068	Ferrous Metal Foundries	3310	Primary metal manufacturing
33152A	Aluminum foundries	S069	Aluminum Foundries	3310	Primary metal manufacturing
33152B	Nonferrous foundries, except aluminum	S069	Other Nonferrous Foundries	3310	Primary metal manufacturing
332111	Iron and steel forging	S070	Iron And Steel Forging	3320	Fabricated metal product manufacturing
332112	Nonferrous forging	S071	Other Forging and Stamping	3320	Fabricated metal product manufacturing
332114	Custom roll forming	S071	Other Forging and Stamping	3320	Fabricated metal product manufacturing
33211A	All other forging and stamping	S071	Other Forging and Stamping	3320	Fabricated metal product manufacturing
332211	Cutlery and flatware, except precious, manufacturing	S072	Tool and Utensil Mfg.	3320	Fabricated metal product manufacturing
332212	Hand and edge tool manufacturing	S072	Tool and Utensil Mfg.	3320	Fabricated metal product manufacturing
332213	Saw blade and handsaw manufacturing	S072	Tool and Utensil Mfg.	3320	Fabricated metal product manufacturing
332214	Kitchen utensil, pot, and pan manufacturing	S072	Tool and Utensil Mfg.	3320	Fabricated metal product manufacturing
332311	Prefabricated metal buildings and components	S073	Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332312	Fabricated structural metal manufacturing	S073	Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332313	Plate work manufacturing	S074	Plate Work Manufacturing	3320	Fabricated metal product manufacturing
332321	Metal window and door manufacturing	S075	Metal Window & Door Mfg.	3320	Fabricated metal product manufacturing
332322	Sheet metal work manufacturing	S076	Other Metal Work Mfg.	3320	Fabricated metal product manufacturing
332323	Ornamental and architectural metal work manufacturing	S076	Other Metal Work Mfg.	3320	Fabricated metal product manufacturing
332410	Power boiler and heat exchanger manufacturing	S077	Power Boilers & Heat Exchangers	3320	Fabricated metal product manufacturing
332420	Metal tank, heavy gauge, manufacturing	S078	Metal Tank Manufacturing	3320	Fabricated metal product manufacturing
332430	Metal can, box, and other container manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332500	Hardware manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332600	Spring and wire product manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332710	Machine shops	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332720	Turned product and screw, nut, and bolt manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332811	Metal heat treating	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332812	Metal coating and nonprecious engraving	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332813	Electroplating, anodizing, and coloring metal	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332910	Metal valve manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332991	Ball and roller bearing manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332996	Fabricated pipe and pipe fitting manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332997	Industrial pattern manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332998	Enameled iron and metal sanitary ware manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332999	Miscellaneous fabricated metal product manufacturing	S079	Other Fabricated Metal Mfg.	3320	Fabricated metal product manufacturing
332994	Small arms manufacturing	S080	Ordinance and Ammunition Mfg.	3320	Fabricated metal product manufacturing
332995	Other ordnance and accessories manufacturing	S080	Ordinance and Ammunition Mfg.	3320	Fabricated metal product manufacturing
33299A	Ammunition manufacturing	S080	Ordinance and Ammunition Mfg.	3320	Fabricated metal product manufacturing
333111	Farm machinery and equipment manufacturing	S081	Heavy Machinery Mfg.	3330	Machinery manufacturing
333120	Construction machinery manufacturing	S081	Heavy Machinery Mfg.	3330	Machinery manufacturing

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333131	Mining machinery and equipment manufacturing	S081	Heavy Machinery Mfg.	3330	Machinery manufacturing
333132	Oil and gas field machinery and equipment	S081	Heavy Machinery Mfg.	3330	Machinery manufacturing
333112	Lawn and garden equipment manufacturing	S082	Lawn & Garden Eq. Mfg.	3330	Machinery manufacturing
333210	Sawmill and woodworking machinery	S083	Wood Processing Machinery Mfg.	3330	Machinery manufacturing
333220	Plastics and rubber industry machinery	S084	Plastics & Rubber Machinery Mfg.	3330	Machinery manufacturing
333291	Paper industry machinery manufacturing	S085	Paper Industry Machinery Mfg.	3330	Machinery manufacturing
333292	Textile machinery manufacturing	S086	Textile Machinery Mfg.	3330	Machinery manufacturing
333293	Printing machinery and equipment manufacturing	S087	Printing Industry Machinery Mfg.	3330	Machinery manufacturing
333294	Food product machinery manufacturing	S088	Food Product Machinery Mfg.	3330	Machinery manufacturing
333295	Semiconductor machinery manufacturing	S088	Misc. Industrial Machinery Mfg.	3330	Machinery manufacturing
333298	All other industrial machinery manufacturing	S088	Misc. Industrial Machinery Mfg.	3330	Machinery manufacturing
333313	Office machinery manufacturing	S089	Commercial Service Machinery Mfg.	3330	Machinery manufacturing
333314	Optical instrument and lens manufacturing	S089	Commercial Service Machinery Mfg.	3330	Machinery manufacturing
333315	Photographic and photocopying equipment manufacturing	S089	Commercial Service Machinery Mfg.	3330	Machinery manufacturing
333319	Other commercial and service industry machinery manufacturing	S089	Commercial Service Machinery Mfg.	3330	Machinery manufacturing
33331A	Automatic vending, commercial laundry and drycleaning machinery	S089	Commercial Service Machinery Mfg.	3330	Machinery manufacturing
333411	Air purification equipment manufacturing	S090	Air Purification Eq. Mfg.	3330	Machinery manufacturing
333412	Industrial and commercial fan and blower manufacturing	S091	Com/Ind Fan & Blower Mfg.	3330	Machinery manufacturing
333414	Heating equipment, except warm air furnaces	S092	Nonfurnace Heating Eq. Mfg.	3330	Machinery manufacturing
333415	AC, refrigeration, and forced air heating	S093	AC, Ref. & Forced Air Heating	3330	Machinery manufacturing
333511	Industrial mold manufacturing	S094	Industrial Mold Manufacturing	3330	Machinery manufacturing
333512	Metal cutting machine tool manufacturing	S094	Machine Tool Manufacturing	3330	Machinery manufacturing
333513	Metal forming machine tool manufacturing	S094	Machine Tool Manufacturing	3330	Machinery manufacturing
333514	Special tool, die, jig, and fixture manufacturing	S094	Machine Tool Manufacturing	3330	Machinery manufacturing
333515	Cutting tool and machine tool accessory manufacturing	S094	Machine Tool Manufacturing	3330	Machinery manufacturing
33351A	Rolling mill and other metalworking machinery	S095	Metalworking Machinery Mfg.	3330	Machinery manufacturing
333611	Turbine and turbine generator set units manufacturing	S096	Turbines and Related Mfg.	3330	Machinery manufacturing
333618	Other engine equipment manufacturing	S097	Other Engine Eq. Manufacturing	3330	Machinery manufacturing
33361A	Speed changers and mechanical power transmission equipment	S098	Power Transmission Equipment Mfg.	3330	Machinery manufacturing
333911	Pump and pumping equipment manufacturing	S099	Pumps and Related Eq. Mfg.	3330	Machinery manufacturing
333912	Air and gas compressor manufacturing	S100	Air And Gas Compressor Mfg.	3330	Machinery manufacturing
333913	Measuring and dispensing pump manufacturing	S101	Measuring And Dispensing Pump Mfg.	3330	Machinery manufacturing
333921	Elevator and moving stairway manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333922	Conveyor and conveying equipment manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333923	Overhead cranes, hoists, and monorail systems	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333924	Industrial truck, trailer, and stacker manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333991	Power-driven handtool manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333992	Welding and soldering equipment manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333993	Packaging machinery manufacturing	S102	Other Electric Machinery Mfg.	3330	Machinery manufacturing
333994	Industrial process furnace and oven manufacturing	S103	Ind. Process Furnace & Oven Mfg.	3330	Machinery manufacturing
333995	Fluid power cylinder and actuator manufacturing	S104	Misc. Machinery Mfg.	3330	Machinery manufacturing
333996	Fluid power pump and motor manufacturing	S104	Misc. Machinery Mfg.	3330	Machinery manufacturing
33399A	Scales, balances, and miscellaneous general purpose machinery	S104	Misc. Machinery Mfg.	3330	Machinery manufacturing
334111	Electronic computer manufacturing	S105	Computer Products Mfg.	3340	Computer and electronic product manufacturing

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334112	Computer storage device manufacturing	S105	Computer Products Mfg.	3340	Computer and electronic product manufacturing
334113	Computer terminal manufacturing	S105	Computer Products Mfg.	3340	Computer and electronic product manufacturing
334119	Other computer peripheral equipment manufacturing	S105	Computer Products Mfg.	3340	Computer and electronic product manufacturing
334210	Telephone apparatus manufacturing	S106	Communications Eq. Mfg.	3340	Computer and electronic product manufacturing
334220	Broadcast and wireless communications equipment	S106	Communications Eq. Mfg.	3340	Computer and electronic product manufacturing
334290	Other communications equipment manufacturing	S106	Communications Eq. Mfg.	3340	Computer and electronic product manufacturing
334300	Audio and video equipment manufacturing	S107	Electronic Components Mfg.	3340	Computer and electronic product manufacturing
334411	Electron tube manufacturing	S107	Electronic Components Mfg.	3340	Computer and electronic product manufacturing
334413	Semiconductors and related device manufacturing	S107	Electronic Components Mfg.	3340	Computer and electronic product manufacturing
33441A	All other electronic component manufacturing	S107	Electronic Components Mfg.	3340	Computer and electronic product manufacturing
334510	Electromedical apparatus manufacturing	S108	Instruments Manufacturing	3340	Computer and electronic product manufacturing
334511	Search, detection, and navigation instruments	S108	Instruments Manufacturing	3340	Computer and electronic product manufacturing
334512	Automatic environmental control manufacturing	S109	Automatic Environmental Controls	3340	Computer and electronic product manufacturing
334513	Industrial process variable instruments	S110	Ind. Process Variable Instruments	3340	Computer and electronic product manufacturing
334514	Totalizing fluid meters and counting devices	S111	Fluid Meters & Counting Devices	3340	Computer and electronic product manufacturing
334515	Electricity and signal testing instruments	S112	Electricity & Signal Testing Inst.	3340	Computer and electronic product manufacturing
334516	Analytical laboratory instrument manufacturing	S113	Other Lab & Related Instruments	3340	Computer and electronic product manufacturing
334517	Irradiation apparatus manufacturing	S113	Other Lab & Related Instruments	3340	Computer and electronic product manufacturing
33451A	Watch, clock, and other measuring and controlling device mfg.	S113	Other Lab & Related Instruments	3340	Computer and electronic product manufacturing
334611	Software reproducing	S114	Electronic Media Processing	3340	Computer and electronic product manufacturing
334612	Audio and video media reproduction	S114	Electronic Media Processing	3340	Computer and electronic product manufacturing
334613	Magnetic and optical recording media manufacturing	S114	Electronic Media Processing	3340	Computer and electronic product manufacturing
335110	Electric lamp bulb and part manufacturing	S115	Electric Lamp Bulb And Part Mfg.	3350	Electrical equipment and appliance manuf.
335120	Lighting fixture manufacturing	S116	Lighting Fixture Manufacturing	3350	Electrical equipment and appliance manuf.
335211	Electric housewares and household fan manufacturing	S117	Household Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335212	Household vacuum cleaner manufacturing	S117	Household Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335221	Household cooking appliance manufacturing	S118	Household Cooking Appliance Mfg.	3350	Electrical equipment and appliance manuf.
335222	Household refrigerator and home freezer manufacturing	S119	HH Refrigerator & Freezer Mfg.	3350	Electrical equipment and appliance manuf.
335224	Household laundry equipment manufacturing	S120	Household Laundry Equipment Mfg.	3350	Electrical equipment and appliance manuf.
335228	Other major household appliance manufacturing	S121	Other Major HH Appliance Mfg.	3350	Electrical equipment and appliance manuf.
335311	Electric power and specialty transformer manufacturing	S122	Electric Power, Etc. Transformers	3350	Electrical equipment and appliance manuf.
335312	Motor and generator manufacturing	S123	Motor And Generator Manufacturing	3350	Electrical equipment and appliance manuf.
335313	Switchgear and switchboard apparatus manufacturing	S124	Industrial Controls	3350	Electrical equipment and appliance manuf.
335314	Relay and industrial control manufacturing	S124	Industrial Controls	3350	Electrical equipment and appliance manuf.
335911	Storage battery manufacturing	S125	Battery Manufacturing	3350	Electrical equipment and appliance manuf.
335912	Primary battery manufacturing	S125	Battery Manufacturing	3350	Electrical equipment and appliance manuf.
335921	Fiber optic cable manufacturing	S126	Misc. Electric Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335929	Other communication and energy wire manufacturing	S126	Misc. Electric Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335930	Wiring device manufacturing	S126	Misc. Electric Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335991	Carbon and graphite product manufacturing	S126	Misc. Electric Eq. Mfg.	3350	Electrical equipment and appliance manuf.
335999	Miscellaneous electrical equipment manufacturing	S126	Misc. Electric Eq. Mfg.	3350	Electrical equipment and appliance manuf.
336110	Automobile and light truck manufacturing	S127	Car and Light Truck Mfg.	336M	Motor vehicle, body, trailer, & parts manuf.
336211	Motor vehicle body manufacturing	S127	Car and Light Truck Mfg.	336M	Motor vehicle, body, trailer, & parts manuf.
336120	Heavy duty truck manufacturing	S128	Truck Manufacturing	336M	Motor vehicle, body, trailer, & parts manuf.

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336212	Truck trailer manufacturing	S128	Truck Manufacturing	336M	Motor vehicle, body, trailer, & parts manuf.
336213	Motor home manufacturing	S129	RV Manufacturing	336M	Motor vehicle, body, trailer, & parts manuf.
336214	Travel trailer and camper manufacturing	S129	RV Manufacturing	336M	Motor vehicle, body, trailer, & parts manuf.
336300	Motor vehicle parts manufacturing	S130	Motor Vehicle Parts Manufacturing	336M	Motor vehicle, body, trailer, & parts manuf.
336411	Aircraft manufacturing	S131	Aerospace Product Manufacturing	336O	Other transportation equipment manufacturing
336412	Aircraft engine and engine parts manufacturing	S131	Aerospace Product Manufacturing	336O	Other transportation equipment manufacturing
336413	Other aircraft parts and equipment	S131	Aerospace Product Manufacturing	336O	Other transportation equipment manufacturing
336414	Guided missile and space vehicle manufacturing	S131	Aerospace Product Manufacturing	336O	Other transportation equipment manufacturing
33641A	Propulsion units and parts for space vehicles and guided missiles	S131	Aerospace Product Manufacturing	336O	Other transportation equipment manufacturing
336500	Railroad rolling stock manufacturing	S132	Railroad Rolling Stock Mfg.	336O	Other transportation equipment manufacturing
336611	Ship building and repairing	S133	Ship Building And Repairing	336O	Other transportation equipment manufacturing
336612	Boat building	S134	Boat/Cycle & Parts Mfg.	336O	Other transportation equipment manufacturing
336991	Motorcycle, bicycle, and parts manufacturing	S134	Boat/Cycle & Parts Mfg.	336O	Other transportation equipment manufacturing
336992	Military armored vehicles and tank parts manufacturing	S135	Other Transportation Eq.	336O	Other transportation equipment manufacturing
336999	All other transportation equipment manufacturing	S135	Other Transportation Eq.	336O	Other transportation equipment manufacturing
337110	Wood kitchen cabinet and countertop manufacturing	S136	HH & Institutional Furniture	337O	Furniture and related product manufacturing
337121	Upholstered household furniture manufacturing	S136	HH & Institutional Furniture	337O	Furniture and related product manufacturing
337122	Nonupholstered wood household furniture manufacturing	S136	HH & Institutional Furniture	337O	Furniture and related product manufacturing
337127	Institutional furniture manufacturing	S136	HH & Institutional Furniture	337O	Furniture and related product manufacturing
33712A	Other household and institutional furniture	S136	HH & Institutional Furniture	337O	Furniture and related product manufacturing
337124	Metal household furniture manufacturing	S137	Office Furniture Mfg.	337O	Furniture and related product manufacturing
337211	Wood office furniture manufacturing	S137	Office Furniture Mfg.	337O	Furniture and related product manufacturing
337214	Office furniture, except wood, manufacturing	S137	Office Furniture Mfg.	337O	Furniture and related product manufacturing
337215	Showcases, partitions, shelving, and lockers	S137	Office Furniture Mfg.	337O	Furniture and related product manufacturing
337212	Custom architectural woodwork and millwork	S138	Custom Woodwork And Millwork	337O	Furniture and related product manufacturing
337910	Mattress manufacturing	S139	Misc. Furniture Mfg.	337O	Furniture and related product manufacturing
337920	Blind and shade manufacturing	S139	Misc. Furniture Mfg.	337O	Furniture and related product manufacturing
339111	Laboratory apparatus and furniture manufacturing	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339112	Surgical and medical instrument manufacturing	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339113	Surgical appliance and supplies manufacturing	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339114	Dental equipment and supplies manufacturing	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339115	Ophthalmic goods manufacturing	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339116	Dental laboratories	S140	Laboratory Instruments & Eq.	338A	Miscellaneous manufacturing
339910	Jewelry and silverware manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339920	Sporting and athletic goods manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339930	Doll, toy, and game manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339940	Office supplies, except paper, manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339950	Sign manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339991	Gasket, packing, and sealing device manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339992	Musical instrument manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339994	Broom, brush, and mop manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
339995	Burial casket manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
33999A	Buttons, pins, and all other miscellaneous manufacturing	S141	Misc. Manufacturing	338A	Miscellaneous manufacturing
420000	Wholesale trade	S142	Wholesale Trade	4200	Wholesale trade

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481000	Air transportation	S143	Air Transportation	4810	Air transportation
482000	Rail transportation	S144	Rail Transportation	4820	Rail transportation
483000	Water transportation	S145	Water Transportation	4830	Water transportation
484000	Truck transportation	S146	Truck Transportation	4840	Truck transportation
485000	Transit and ground passenger transportation	S147	Transit & Related Services	4850	Transit and ground passenger transportation
486000	Pipeline transportation	S148	Pipeline Transportation	4860	Pipeline transportation
48A000	Scenic and sightseeing transportation and support activities for transportation	S149	Sightseeing Transportation	487S	Other transportation and support activities
491000	Postal service	S150	Postal and Courier Services	487S	Other transportation and support activities
492000	Couriers and messengers	S150	Postal and Courier Services	487S	Other transportation and support activities
493000	Warehousing and storage	S151	Warehousing And Storage	4930	Warehousing and storage
4A0000	Retail trade	S152	Retail Trade	44RT	Retail trade
511110	Newspaper publishers	S153	Publishers	5110	Publishing industries
511120	Periodical publishers	S153	Publishers	5110	Publishing industries
511130	Book publishers	S153	Publishers	5110	Publishing industries
5111A0	Database, directory, and other publishers	S153	Publishers	5110	Publishing industries
511200	Software publishers	S153	Publishers	5110	Publishing industries
512100	Motion picture and video industries	S154	Telecom & Entertainment	5120	Motion picture and sound recording industries
512200	Sound recording industries	S154	Telecom & Entertainment	5120	Motion picture and sound recording industries
513100	Radio and television broadcasting	S154	Telecom & Entertainment	5130	Broadcasting and telecommunications
513200	Cable networks and program distribution	S154	Telecom & Entertainment	5130	Broadcasting and telecommunications
513300	Telecommunications	S154	Telecom & Entertainment	5130	Broadcasting and telecommunications
514100	Information services	S154	Telecom & Entertainment	5140	Information and data processing services
514200	Data processing services	S154	Telecom & Entertainment	5140	Information and data processing services
522A00	Nondepository credit intermediation and related activities	S155	Credit Counseling	5220	Credit intermediation and related activities
523000	Securities, commodity contracts, investments	S156	Investment Services	5230	Securities, commodity contracts, investments
524100	Insurance carriers	S157	Insurance	5240	Insurance carriers and related activities
524200	Insurance agencies, brokerages, and related	S157	Insurance	5240	Insurance carriers and related activities
525000	Funds, trusts, and other financial vehicles	S158	Fund Management	5250	Funds, trusts, and other financial vehicles
52A000	Monetary authorities and depository credit intermediation	S159	Monetary Authorities	5210	Federal Reserve banks
531000	Real estate	S160	Real Estate	5310	Real estate
532100	Automotive equipment rental and leasing	S161	Car Rental Agencies	5320	Rental and leas. serv. & lessors of intangibles
532230	Video tape and disc rental	S162	Rental Services	5320	Rental and leas. serv. & lessors of intangibles
532400	Machinery and equipment rental and leasing	S162	Rental Services	5320	Rental and leas. serv. & lessors of intangibles
532A00	General and consumer goods rental except video tapes and discs	S162	Rental Services	5320	Rental and leas. serv. & lessors of intangibles
533000	Lessors of nonfinancial intangible assets	S162	Rental Services	5320	Rental and leas. serv. & lessors of intangibles
541100	Legal services	S163	Other Professional/Technical Svc.	5411	Legal services
541200	Accounting and bookkeeping services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
541300	Architectural and engineering services	S164	Architectural & Engineering Svc.	5412	Other prof., scientific and technical svcs
541400	Specialized design services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
541511	Custom computer programming services	S163	Other Professional/Technical Svc.	5415	Computer systems design and related services
541512	Computer systems design services	S163	Other Professional/Technical Svc.	5415	Computer systems design and related services
54151A	Other computer related services, including facilities management	S163	Other Professional/Technical Svc.	5415	Computer systems design and related services
541610	Management consulting services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
5416A0	Environmental and other technical consulting services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs

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541700	Scientific research and development services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
541800	Advertising and related services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
541920	Photographic services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
541940	Veterinary services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
5419A0	All other miscellaneous professional and technical services	S163	Other Professional/Technical Svc.	5412	Other prof., scientific and technical svcs
550000	Management of companies and enterprises	S165	Other Business Services	5500	Management of companies
561100	Office administrative services	S165	Other Business Services	5610	Administrative and support services
561200	Facilities support services	S165	Other Business Services	5610	Administrative and support services
561300	Employment services	S165	Other Business Services	5610	Administrative and support services
561400	Business support services	S165	Other Business Services	5610	Administrative and support services
561500	Travel arrangement and reservation services	S165	Other Business Services	5610	Administrative and support services
561600	Investigation and security services	S165	Other Business Services	5610	Administrative and support services
561700	Services to buildings and dwellings	S165	Other Business Services	5610	Administrative and support services
561900	Other support services	S165	Other Business Services	5610	Administrative and support services
562000	Waste management and remediation services	S165	Other Business Services	5620	Waste management and remediation services
611100	Elementary and secondary schools	S166	Education	6100	Educational services
611A00	Colleges, universities, and junior colleges	S166	Education	6100	Educational services
611B00	Other educational services	S166	Education	6100	Educational services
621600	Home health care services	S167	Healthcare Providers	6210	Ambulatory health care services
621A00	Offices of physicians, dentists, and other health practitioners	S167	Healthcare Providers	6210	Ambulatory health care services
621B00	Other ambulatory health care services	S167	Healthcare Providers	6210	Ambulatory health care services
622000	Hospitals	S168	Hospitals and Residential Care	622H	Hospitals
623000	Nursing and residential care facilities	S168	Hospitals and Residential Care	6230	Nursing homes and residential care
624400	Child day care services	S169	Day Care and Social Assistance	6240	Miscellaneous health care and social assistance
624A00	Social assistance, except child day care services	S169	Day Care and Social Assistance	6240	Miscellaneous health care and social assistance
711100	Performing arts companies	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
711200	Spectator sports	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
711500	Independent artists, writers, and performers	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
711A00	Promoters of performing arts and sports and agents for public figures	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
712000	Museums, historical sites, zoos, and parks	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
713940	Fitness and recreational sports centers	S170	Amusement & Recreation	711A	Performing arts, museums, & related act.
713950	Bowling centers	S170	Amusement & Recreation	7130	Amusements, gambling, and recreation
713A00	Other amusement, gambling, and recreation industries	S170	Amusement & Recreation	7130	Amusements, gambling, and recreation
7211A0	Hotels and motels, including casino hotels	S171	Lodging	7210	Accommodation
721A00	Other accommodations	S171	Lodging	7210	Accommodation
722000	Food services and drinking places	S172	Food & Beverage Services	7220	Food services and drinking places
811192	Car washes	S173	Personal Services	8100	Other services, except government
8111A0	Automotive repair and maintenance, except car washes	S173	Personal Services	8100	Other services, except government
811200	Electronic equipment repair and maintenance	S173	Personal Services	8100	Other services, except government
811300	Commercial machinery repair and maintenance	S173	Personal Services	8100	Other services, except government
811400	Household goods repair and maintenance	S173	Personal Services	8100	Other services, except government
812100	Personal care services	S173	Personal Services	8100	Other services, except government
812200	Death care services	S173	Personal Services	8100	Other services, except government
812300	Drycleaning and laundry services	S173	Personal Services	8100	Other services, except government

IOcode	BEA Industry (1997 Benchmark IO)	SEADScode	PNNL SEADS Sector	CFcode	BEA Capital Flows Industry
812900	Other personal services	S173	Personal Services	8100	Other services, except government
813100	Religious organizations	S174	Other Services	8100	Other services, except government
813A00	Grantmaking and giving and social advocacy organizations	S174	Other Services	8100	Other services, except government
813B00	Civic, social, professional and similar organizations	S174	Other Services	8100	Other services, except government
814000	Private households	S175	Households	8100	Other services, except government
S00101	Federal electric utilities	S176	Federal Electric Utilities		
S00102	Other Federal Government enterprises	S177	Other Fed. Gov. Enterprises		
S00201	State and local government passenger transit	S178	S/L Government Passenger Transit		
S00202	State and local government electric utilities	S179	S/L Government Electric Utilities		
S00203	Other State and local government enterprises	S180	Other S/L Government Enterprises		
S00300	Noncomparable imports	S181	Noncomparable Imports		
S00401	Scrap	S182	Scrap		
S00402	Used and secondhand goods	S183	Used And Secondhand Goods		
S00500	General government industry	S184	General Government Industry		
S00600	Rest of the world adjustment to final uses	S185	RTW Adjustment		
S00700	Inventory valuation adjustment	S186	Inventory Valuation Adjustment		
S00800	Owner-occupied dwellings	S187	Owner-Occupied Dwellings		



## Appendix D. Concordance from BLS to 187 Sectors

NAICS Sectors used by BLS	SEADS Sector and Title	
111110 Soybean farming	1	Crop Farming
111120 Oilseed, except soybean, farming	1	Crop Farming
111130 Dry pea and bean farming	1	Crop Farming
111140 Wheat farming	1	Crop Farming
111150 Corn farming	1	Crop Farming
111160 Rice farming	1	Crop Farming
111191 Oilseed and grain combination farming	1	Crop Farming
111199 All other grain farming	1	Crop Farming
111211 Potato farming	1	Crop Farming
111219 Other vegetable and melon farming	1	Crop Farming
111310 Orange groves	1	Crop Farming
111320 Citrus, except orange, groves	1	Crop Farming
111331 Apple orchards	1	Crop Farming
111332 Grape vineyards	1	Crop Farming
111333 Strawberry farming	1	Crop Farming
111334 Berry, except strawberry, farming	1	Crop Farming
111335 Tree nut farming	1	Crop Farming
111336 Fruit and tree nut combination farming	1	Crop Farming
111339 Other noncitrus fruit farming	1	Crop Farming
111411 Mushroom production	1	Crop Farming
111419 Other food crops grown under cover	1	Crop Farming
111421 Nursery and tree production	1	Crop Farming
111422 Floriculture production	1	Crop Farming
111910 Tobacco farming	1	Crop Farming
111920 Cotton farming	1	Crop Farming
111930 Sugarcane farming	1	Crop Farming
111940 Hay farming	1	Crop Farming
111991 Sugar beet farming	1	Crop Farming
111992 Peanut farming	1	Crop Farming
111998 All other miscellaneous crop farming	1	Crop Farming
112111 Beef cattle ranching and farming	2	Animal Farming
112112 Cattle feedlots	2	Animal Farming
112120 Dairy cattle and milk production	2	Animal Farming
112210 Hog and pig farming	2	Animal Farming
112310 Chicken egg production	2	Animal Farming
112320 Broilers and meat type chicken production	2	Animal Farming
112330 Turkey production	2	Animal Farming
112340 Poultry hatcheries	2	Animal Farming
112390 Other poultry production	2	Animal Farming
112410 Sheep farming	2	Animal Farming
112420 Goat farming	2	Animal Farming
112511 Finfish farming and fish hatcheries	2	Animal Farming
112512 Shellfish farming	2	Animal Farming
112519 Other animal aquaculture	2	Animal Farming
112910 Apiculture	2	Animal Farming

112920 Horses and other equine production	2	Animal Farming
112930 Fur-bearing animal and rabbit production	2	Animal Farming
112990 All other animal production	2	Animal Farming
113110 Timber tract operations	3	Forest Products
113210 Forest nursery and gathering forest products	3	Forest Products
113310 Logging	3	Forest Products
114111 Finfish fishing	4	Fish/Hunt/Ag Support
114112 Shellfish fishing	4	Fish/Hunt/Ag Support
114119 Other marine fishing	4	Fish/Hunt/Ag Support
114210 Hunting and trapping	4	Fish/Hunt/Ag Support
115111 Cotton ginning	4	Fish/Hunt/Ag Support
115112 Soil preparation, planting, and cultivating	4	Fish/Hunt/Ag Support
115113 Crop harvesting, primarily by machine	4	Fish/Hunt/Ag Support
115114 Other postharvest crop activities	4	Fish/Hunt/Ag Support
115115 Farm labor contractors and crew leaders	4	Fish/Hunt/Ag Support
115116 Farm management services	4	Fish/Hunt/Ag Support
115210 Support activities for animal production	4	Fish/Hunt/Ag Support
115310 Support activities for forestry	4	Fish/Hunt/Ag Support
211111 Crude petroleum and natural gas extraction	5	Oil and Gas Extraction
211112 Natural gas liquid extraction	5	Oil and Gas Extraction
212111 Bituminous coal and lignite surface mining	6	Coal Mining
212112 Bituminous coal underground mining	6	Coal Mining
212113 Anthracite mining	6	Coal Mining
212210 Iron ore mining	7	Metal Mining
212221 Gold ore mining	7	Metal Mining
212222 Silver ore mining	7	Metal Mining
212231 Lead ore and zinc ore mining	7	Metal Mining
212234 Copper ore and nickel ore mining	7	Metal Mining
212291 Uranium-radium-vanadium ore mining	7	Metal Mining
212299 All other metal ore mining	7	Metal Mining
212311 Dimension stone mining and quarrying	8	Nonmetallic Mineral Mining
212312 Crushed and broken limestone mining	8	Nonmetallic Mineral Mining
212313 Crushed and broken granite mining	8	Nonmetallic Mineral Mining
212319 Other crushed and broken stone mining	8	Nonmetallic Mineral Mining
212321 Construction sand and gravel mining	8	Nonmetallic Mineral Mining
212322 Industrial sand mining	8	Nonmetallic Mineral Mining
212324 Kaolin and ball clay mining	8	Nonmetallic Mineral Mining
212325 Clay, ceramic, and refractory minerals mining	8	Nonmetallic Mineral Mining
212391 Potash, soda, and borate mineral mining	8	Nonmetallic Mineral Mining
212392 Phosphate rock mining	8	Nonmetallic Mineral Mining
212393 Other chemical and fertilizer mineral mining	8	Nonmetallic Mineral Mining
212399 All other nonmetallic mineral mining	8	Nonmetallic Mineral Mining
213111 Drilling oil and gas wells	9	Oil and Gas Drilling
213112 Support activities for oil and gas operations	10	Oil and Gas Support
213113 Support activities for coal mining	11	Other Mining Support
213114 Support activities for metal mining	11	Other Mining Support
213115 Support activities for nonmetallic minerals	11	Other Mining Support
221111 Hydroelectric power generation	12	Electricity Gen. and Trans.

221112 Fossil fuel electric power generation	12	Electricity Gen. and Trans.
221113 Nuclear electric power generation	12	Electricity Gen. and Trans.
221119 Other electric power generation	12	Electricity Gen. and Trans.
221121 Electric bulk power transmission and control	12	Electricity Gen. and Trans.
221122 Electric power distribution	12	Electricity Gen. and Trans.
221210 Natural gas distribution	13	Natural Gas Distribution
221310 Water supply and irrigation systems	14	Water/Sewer, Other Systems
221320 Sewage treatment facilities	14	Water/Sewer, Other Systems
221330 Steam and air-conditioning supply	14	Water/Sewer, Other Systems
236115 New single-family general contractors	15	New Single-Family Const.
236116 New multifamily general contractors	16	New Multifamily Const.
236117 New housing operative builders	16	New Multifamily Const.
236118 Residential remodelers	17	New Residential Remodeling Const.
236210 Industrial building construction	19	Industrial Building Construction
236220 Commercial building construction	20	Commercial Building Construction
237110 Water and sewer system construction	21	Road Construction
237120 Oil and gas pipeline construction	21	Road Construction
237130 Power and communication system construction	22	Other New Construction
237210 Land subdivision	22	Other New Construction
237310 Highway, street, and bridge construction	21	Road Construction
237990 Other heavy construction	22	Other New Construction
238111 Residential poured foundation contractors	15	New Single-Family Const.
238112 Nonresidential poured foundation contractors	20	Commercial Building Construction
238121 Residential structural steel contractors	18	New Farm Housing
238122 Nonresidential structural steel contractors	20	Commercial Building Construction
238131 Residential framing contractors	15	New Single-Family Const.
238132 Nonresidential framing contractors	20	Commercial Building Construction
238141 Residential masonry contractors	15	New Single-Family Const.
238142 Nonresidential masonry contractors	20	Commercial Building Construction
238151 Residential glass and glazing contractors	15	New Single-Family Const.
238152 Nonresidential glass and glazing contractors	20	Commercial Building Construction
238161 Residential roofing contractors	15	New Single-Family Const.
238162 Nonresidential roofing contractors	20	Commercial Building Construction
238171 Residential siding contractors	15	New Single-Family Const.
238172 Nonresidential siding contractors	20	Commercial Building Construction
238191 Other residential exterior contractors	15	New Single-Family Const.
238192 Other nonresidential exterior contractors	20	Commercial Building Construction
238211 Residential electrical contractors	15	New Single-Family Const.
238212 Nonresidential electrical contractors	20	Commercial Building Construction
238221 Residential plumbing and HVAC contractors	15	New Single-Family Const.
238222 Nonresidential plumbing and HVAC contractors	20	Commercial Building Construction
238291 Other residential equipment contractors	15	New Single-Family Const.
238292 Other nonresidential equipment contractors	20	Commercial Building Construction
238311 Residential drywall contractors	15	New Single-Family Const.
238312 Nonresidential drywall contractors	20	Commercial Building Construction
238321 Residential painting contractors	15	New Single-Family Const.
238322 Nonresidential painting contractors	20	Commercial Building Construction
238331 Residential flooring contractors	15	New Single-Family Const.

238332 Nonresidential flooring contractors	20	Commercial Building Construction
238341 Residential tile and terrazzo contractors	15	New Single-Family Const.
238342 Nonresidential tile and terrazzo contractors	20	Commercial Building Construction
238351 Residential finish carpentry contractors	15	New Single-Family Const.
238352 Nonresidential finish carpentry contractors	20	Commercial Building Construction
238391 Other residential finishing contractors	15	New Single-Family Const.
238392 Other nonresidential finishing contractors	20	Commercial Building Construction
238911 Residential site preparation contractors	15	New Single-Family Const.
238912 Nonresidential site preparation contractors	20	Commercial Building Construction
238991 All other residential trade contractors	18	New Farm Housing
238992 All other nonresidential trade contractors	20	Commercial Building Construction
311111 Dog and cat food manufacturing	24	Food Processing
311119 Other animal food manufacturing	24	Food Processing
311211 Flour milling	24	Food Processing
311212 Rice milling	24	Food Processing
311213 Malt manufacturing	24	Food Processing
311221 Wet corn milling	24	Food Processing
311222 Soybean processing	24	Food Processing
311223 Other oilseed processing	24	Food Processing
311225 Fats and oils refining and blending	24	Food Processing
311230 Breakfast cereal manufacturing	24	Food Processing
311311 Sugarcane mills	24	Food Processing
311312 Cane sugar refining	24	Food Processing
311313 Beet sugar manufacturing	24	Food Processing
311320 Confectionery manufacturing from cacao beans	24	Food Processing
311330 Confectionery mfg. from purchased chocolate	24	Food Processing
311340 Nonchocolate confectionery manufacturing	24	Food Processing
311411 Frozen fruit and vegetable manufacturing	24	Food Processing
311412 Frozen specialty food manufacturing	24	Food Processing
311421 Fruit and vegetable canning	24	Food Processing
311422 Specialty canning	24	Food Processing
311423 Dried and dehydrated food manufacturing	24	Food Processing
311511 Fluid milk manufacturing	24	Food Processing
311512 Creamery butter manufacturing	24	Food Processing
311513 Cheese manufacturing	24	Food Processing
311514 Dry, condensed, and evaporated dairy products	24	Food Processing
311520 Ice cream and frozen dessert manufacturing	24	Food Processing
311611 Animal, except poultry, slaughtering	24	Food Processing
311612 Meat processed from carcasses	24	Food Processing
311613 Rendering and meat byproduct processing	24	Food Processing
311615 Poultry processing	24	Food Processing
311711 Seafood canning	24	Food Processing
311712 Fresh and frozen seafood processing	24	Food Processing
311811 Retail bakeries	24	Food Processing
311812 Commercial bakeries	24	Food Processing
311813 Frozen cakes and other pastries manufacturing	24	Food Processing
311821 Cookie and cracker manufacturing	24	Food Processing
311822 Mixes and dough made from purchased flour	24	Food Processing

311823 Dry pasta manufacturing	24	Food Processing
311830 Tortilla manufacturing	24	Food Processing
311911 Roasted nuts and peanut butter manufacturing	24	Food Processing
311919 Other snack food manufacturing	24	Food Processing
311920 Coffee and tea manufacturing	24	Food Processing
311930 Flavoring syrup and concentrate manufacturing	24	Food Processing
311941 Mayonnaise, dressing, and sauce manufacturing	24	Food Processing
311942 Spice and extract manufacturing	24	Food Processing
311991 Perishable prepared food manufacturing	24	Food Processing
311999 All other miscellaneous food manufacturing	24	Food Processing
312111 Soft drink manufacturing	24	Food Processing
312112 Bottled water manufacturing	24	Food Processing
312113 Ice manufacturing	24	Food Processing
312120 Breweries	25	Alcoholic Beverage Processing
312130 Wineries	25	Alcoholic Beverage Processing
312140 Distilleries	25	Alcoholic Beverage Processing
312210 Tobacco stemming and redrying	26	Tobacco Processing
312221 Cigarette manufacturing	26	Tobacco Processing
312229 Other tobacco product manufacturing	26	Tobacco Processing
313111 Yarn spinning mills	27	Textile Mills
313112 Yarn texturizing and twisting mills	27	Textile Mills
313113 Thread mills	27	Textile Mills
313210 Broadwoven fabric mills	27	Textile Mills
313221 Narrow fabric mills	27	Textile Mills
313222 Schiffli machine embroidery	27	Textile Mills
313230 Nonwoven fabric mills	27	Textile Mills
313241 Weft knit fabric mills	27	Textile Mills
313249 Other knit fabric and lace mills	27	Textile Mills
313311 Broadwoven fabric finishing mills	27	Textile Mills
313312 Other textile and fabric finishing mills	27	Textile Mills
313320 Fabric coating mills	27	Textile Mills
314110 Carpet and rug mills	28	Textile Product Mills
314121 Curtain and drapery mills	28	Textile Product Mills
314129 Other household textile product mills	28	Textile Product Mills
314911 Textile bag mills	28	Textile Product Mills
314912 Canvas and related product mills	28	Textile Product Mills
314991 Rope, cordage, and twine mills	28	Textile Product Mills
314992 Tire cord and tire fabric mills	28	Textile Product Mills
314999 All other miscellaneous textile product mills	28	Textile Product Mills
315111 Sheer hosiery mills	29	Apparel Manufacturing
315119 Other hosiery and sock mills	29	Apparel Manufacturing
315191 Outerwear knitting mills	29	Apparel Manufacturing
315192 Underwear and nightwear knitting mills	29	Apparel Manufacturing
315211 Men's cut and sew apparel contractors	29	Apparel Manufacturing
315212 Women's cut and sew apparel contractors	29	Apparel Manufacturing
315221 Men's underwear and nightwear manufacturing	29	Apparel Manufacturing
315222 Men's suit, coat, and overcoat manufacturing	29	Apparel Manufacturing
315223 Men's shirt, except work shirt, manufacturing	29	Apparel Manufacturing

315224 Men's pants, except work pants, manufacturing	29	Apparel Manufacturing
315225 Men's work clothing manufacturing	29	Apparel Manufacturing
315228 Other men's outerwear manufacturing	29	Apparel Manufacturing
315231 Women's lingerie and nightwear manufacturing	29	Apparel Manufacturing
315232 Women's blouse and shirt manufacturing	29	Apparel Manufacturing
315233 Women's dress manufacturing	29	Apparel Manufacturing
315234 Women's suit, coat, jacket, and skirt mfg.	29	Apparel Manufacturing
315239 Other women's outerwear manufacturing	29	Apparel Manufacturing
315291 Infants' cut and sew apparel manufacturing	29	Apparel Manufacturing
315292 Fur and leather apparel manufacturing	29	Apparel Manufacturing
315299 All other cut and sew apparel manufacturing	29	Apparel Manufacturing
315991 Hat, cap, and millinery manufacturing	29	Apparel Manufacturing
315992 Glove and mitten manufacturing	29	Apparel Manufacturing
315993 Men's and boys' neckwear manufacturing	29	Apparel Manufacturing
315999 All other accessory and apparel manufacturing	29	Apparel Manufacturing
316110 Leather and hide tanning and finishing	30	Leather Products Mfg.
316211 Rubber and plastics footwear manufacturing	30	Leather Products Mfg.
316212 House slipper manufacturing	30	Leather Products Mfg.
316213 Men's nonathletic footwear manufacturing	30	Leather Products Mfg.
316214 Women's nonathletic footwear manufacturing	30	Leather Products Mfg.
316219 Other footwear manufacturing	30	Leather Products Mfg.
316991 Luggage manufacturing	30	Leather Products Mfg.
316992 Women's handbag and purse manufacturing	30	Leather Products Mfg.
316993 Other personal leather good manufacturing	30	Leather Products Mfg.
316999 All other leather good manufacturing	30	Leather Products Mfg.
321113 Sawmills	31	Lumber Mills
321114 Wood preservation	31	Lumber Mills
321211 Hardwood veneer and plywood manufacturing	31	Lumber Mills
321212 Softwood veneer and plywood manufacturing	31	Lumber Mills
321213 Engineered wood member manufacturing	31	Lumber Mills
321214 Truss manufacturing	31	Lumber Mills
321219 Reconstituted wood product manufacturing	31	Lumber Mills
321911 Wood window and door manufacturing	32	Specialized Wood Product Mfg.
321912 Cut stock, resawing lumber, and planing	32	Specialized Wood Product Mfg.
321918 Other millwork, including flooring	32	Specialized Wood Product Mfg.
321920 Wood container and pallet manufacturing	33	Misc. Wood Product Mfg.
321991 Manufactured home, mobile home, manufacturing	33	Misc. Wood Product Mfg.
321992 Prefabricated wood building manufacturing	34	Manufactured Buildings
321999 Miscellaneous wood product manufacturing	34	Manufactured Buildings
322110 Pulp mills	35	Pulp Mills
322121 Paper, except newsprint, mills	36	Paper And Paperboard Mills
322122 Newsprint mills	36	Paper And Paperboard Mills
322130 Paperboard mills	36	Paper And Paperboard Mills
322211 Corrugated and solid fiber box manufacturing	37	Paperboard Container Mfg.
322212 Folding paperboard box manufacturing	37	Paperboard Container Mfg.
322213 Setup paperboard box manufacturing	37	Paperboard Container Mfg.
322214 Fiber can, tube, and drum manufacturing	37	Paperboard Container Mfg.
322215 Nonfolding sanitary food container mfg.	37	Paperboard Container Mfg.

322221 Coated and laminated packaging materials mfg.	38	Converted Paper Product Mfg.
322222 Coated and laminated paper manufacturing	38	Converted Paper Product Mfg.
322223 Plastics, foil, and coated paper bag mfg.	38	Converted Paper Product Mfg.
322224 Uncoated paper and multiwall bag mfg.	38	Converted Paper Product Mfg.
322225 Flexible packaging foil manufacturing	38	Converted Paper Product Mfg.
322226 Surface-coated paperboard manufacturing	38	Converted Paper Product Mfg.
322231 Die-cut paper office supplies manufacturing	38	Converted Paper Product Mfg.
322232 Envelope manufacturing	38	Converted Paper Product Mfg.
322233 Stationery and related product manufacturing	38	Converted Paper Product Mfg.
322291 Sanitary paper product manufacturing	38	Converted Paper Product Mfg.
322299 All other converted paper product mfg.	38	Converted Paper Product Mfg.
323110 Commercial lithographic printing	39	Commercial Printing
323111 Commercial gravure printing	39	Commercial Printing
323112 Commercial flexographic printing	39	Commercial Printing
323113 Commercial screen printing	39	Commercial Printing
323114 Quick printing	39	Commercial Printing
323115 Digital printing	39	Commercial Printing
323116 Manifold business forms printing	39	Commercial Printing
323117 Books printing	39	Commercial Printing
323118 Blankbook and looseleaf binder manufacturing	39	Commercial Printing
323119 Other commercial printing	39	Commercial Printing
323121 Tradebinding and related work	39	Commercial Printing
323122 Prepress services	39	Commercial Printing
324110 Petroleum refineries	40	Petroleum Refineries
324121 Asphalt paving mixture and block mfg.	41	Oth. Petroleum/Coal Prod. Mfg.
324122 Asphalt shingle and coating materials mfg.	41	Oth. Petroleum/Coal Prod. Mfg.
324191 Petroleum lubricating oil and grease mfg.	41	Oth. Petroleum/Coal Prod. Mfg.
324199 All other petroleum and coal products mfg.	41	Oth. Petroleum/Coal Prod. Mfg.
325110 Petrochemical manufacturing	42	Inorganic Chemical Mfg.
325120 Industrial gas manufacturing	42	Inorganic Chemical Mfg.
325131 Inorganic dye and pigment manufacturing	42	Inorganic Chemical Mfg.
325132 Synthetic organic dye and pigment mfg.	42	Inorganic Chemical Mfg.
325181 Alkalies and chlorine manufacturing	42	Inorganic Chemical Mfg.
325182 Carbon black manufacturing	42	Inorganic Chemical Mfg.
325188 All other basic inorganic chemical mfg.	42	Inorganic Chemical Mfg.
325191 Gum and wood chemical manufacturing	43	Organic Chemical Mfg.
325192 Cyclic crude and intermediate manufacturing	43	Organic Chemical Mfg.
325193 Ethyl alcohol manufacturing	43	Organic Chemical Mfg.
325199 All other basic organic chemical mfg.	43	Organic Chemical Mfg.
325211 Plastics material and resin manufacturing	44	Plastics Material & Resin Mfg.
325212 Synthetic rubber manufacturing	45	Synthetic Rubber Mfg.
325221 Cellulosic organic fiber manufacturing	46	Organic Fiber Mfg.
325222 Noncellulosic organic fiber manufacturing	46	Organic Fiber Mfg.
325311 Nitrogenous fertilizer manufacturing	47	Fertilizer & Pesticide Mfg.
325312 Phosphatic fertilizer manufacturing	47	Fertilizer & Pesticide Mfg.
325314 Fertilizer, mixing only, manufacturing	47	Fertilizer & Pesticide Mfg.
325320 Pesticide and other ag. chemical mfg.	47	Fertilizer & Pesticide Mfg.
325411 Medicinal and botanical manufacturing	48	Pharmaceutical & Medicine Mfg.

325412 Pharmaceutical preparation manufacturing	48	Pharmaceutical & Medicine Mfg.
325413 In-vitro diagnostic substance manufacturing	48	Pharmaceutical & Medicine Mfg.
325414 Other biological product manufacturing	48	Pharmaceutical & Medicine Mfg.
325510 Paint and coating manufacturing	49	Misc. Chemical Prod. Mfg.
325520 Adhesive manufacturing	49	Misc. Chemical Prod. Mfg.
325611 Soap and other detergent manufacturing	49	Misc. Chemical Prod. Mfg.
325612 Polish and other sanitation good mfg.	49	Misc. Chemical Prod. Mfg.
325613 Surface active agent manufacturing	49	Misc. Chemical Prod. Mfg.
325620 Toilet preparation manufacturing	49	Misc. Chemical Prod. Mfg.
325910 Printing ink manufacturing	49	Misc. Chemical Prod. Mfg.
325920 Explosives manufacturing	49	Misc. Chemical Prod. Mfg.
325991 Custom compounding of purchased resins	49	Misc. Chemical Prod. Mfg.
325992 Photographic film and chemical manufacturing	49	Misc. Chemical Prod. Mfg.
325998 Other miscellaneous chemical product mfg.	49	Misc. Chemical Prod. Mfg.
326111 Plastics bag manufacturing	50	Plastics & Related Prod. Mfg.
326112 Plastics packaging film and sheet mfg.	50	Plastics & Related Prod. Mfg.
326113 Nonpackaging plastics film and sheet mfg.	50	Plastics & Related Prod. Mfg.
326121 Unlaminated plastics profile shape mfg.	50	Plastics & Related Prod. Mfg.
326122 Plastics pipe and pipe fitting manufacturing	50	Plastics & Related Prod. Mfg.
326130 Laminated plastics plate, sheet, and shapes	50	Plastics & Related Prod. Mfg.
326140 Polystyrene foam product manufacturing	50	Plastics & Related Prod. Mfg.
326150 Urethane and other foam product manufacturing	50	Plastics & Related Prod. Mfg.
326160 Plastics bottle manufacturing	50	Plastics & Related Prod. Mfg.
326191 Plastics plumbing fixture manufacturing	50	Plastics & Related Prod. Mfg.
326192 Resilient floor covering manufacturing	50	Plastics & Related Prod. Mfg.
326199 All other plastics product manufacturing	50	Plastics & Related Prod. Mfg.
326211 Tire manufacturing, except retreading	51	Rubber Products Mfg.
326212 Tire retreading	51	Rubber Products Mfg.
326220 Rubber and plastics hose and belting mfg.	51	Rubber Products Mfg.
326291 Rubber product mfg. for mechanical use	51	Rubber Products Mfg.
326299 All other rubber product manufacturing	51	Rubber Products Mfg.
327111 Vitreous china plumbing fixture manufacturing	52	China & Porcelain Prod. Mfg.
327112 Vitreous china and earthenware articles mfg.	52	China & Porcelain Prod. Mfg.
327113 Porcelain electrical supply manufacturing	52	China & Porcelain Prod. Mfg.
327121 Brick and structural clay tile manufacturing	53	Clay Products Mfg.
327122 Ceramic wall and floor tile manufacturing	53	Clay Products Mfg.
327123 Other structural clay product manufacturing	53	Clay Products Mfg.
327124 Clay refractory manufacturing	53	Clay Products Mfg.
327125 Nonclay refractory manufacturing	53	Clay Products Mfg.
327211 Flat glass manufacturing	55	Glass and Glass Products Mfg.
327212 Other pressed and blown glass and glassware	55	Glass and Glass Products Mfg.
327213 Glass container manufacturing	54	Glass Container Mfg.
327215 Glass product mfg. made of purchased glass	55	Glass and Glass Products Mfg.
327310 Cement manufacturing	56	Cement Manufacturing
327320 Ready-mix concrete manufacturing	57	Concrete Products Mfg.
327331 Concrete block and brick manufacturing	57	Concrete Products Mfg.
327332 Concrete pipe manufacturing	57	Concrete Products Mfg.
327390 Other concrete product manufacturing	57	Concrete Products Mfg.



327410 Lime manufacturing	58	Lime Manufacturing
327420 Gypsum product manufacturing	59	Gypsum Product Manufacturing
327910 Abrasive product manufacturing	60	Oth. Nonmetallic Mineral Prod.
327991 Cut stone and stone product manufacturing	60	Oth. Nonmetallic Mineral Prod.
327992 Ground or treated minerals and earths mfg.	60	Oth. Nonmetallic Mineral Prod.
327993 Mineral wool manufacturing	60	Oth. Nonmetallic Mineral Prod.
327999 Miscellaneous nonmetallic mineral products	61	Mineral Wool Manufacturing
331111 Iron and steel mills	62	Iron And Steel Mills
331112 Ferroalloy and related product manufacturing	63	Ferroalloy Product Mfg.
331210 Iron, steel pipe and tube from purchase steel	64	Steel Shape Mfg.
331221 Rolled steel shape manufacturing	64	Steel Shape Mfg.
331222 Steel wire drawing	64	Steel Shape Mfg.
331311 Alumina refining	65	Aluminium Mills
331312 Primary aluminum production	65	Aluminium Mills
331314 Secondary smelting and alloying of aluminum	65	Aluminium Mills
331315 Aluminum sheet, plate, and foil manufacturing	66	Aluminum Product Mfg.
331316 Aluminum extruded product manufacturing	66	Aluminum Product Mfg.
331319 Other aluminum rolling and drawing	66	Aluminum Product Mfg.
331411 Primary smelting and refining of copper	67	Nonferrous Metals Mfg.
331419 Primary nonferrous metal, except CU and AL	67	Nonferrous Metals Mfg.
331421 Copper rolling, drawing, and extruding	67	Nonferrous Metals Mfg.
331422 Copper wire, except mechanical, drawing	67	Nonferrous Metals Mfg.
331423 Secondary processing of copper	67	Nonferrous Metals Mfg.
331491 Nonferrous metal, except CU and AL, shaping	67	Nonferrous Metals Mfg.
331492 Secondary processing of other nonferrous	67	Nonferrous Metals Mfg.
331511 Iron foundries	68	Ferrous Metal Foundaries
331512 Steel investment foundries	68	Ferrous Metal Foundaries
331513 Steel foundries, except investment	68	Ferrous Metal Foundaries
331521 Aluminum die-casting foundries	69	Aluminum and Nonferrous Foundries
331522 Nonferrous, except AL, die-casting foundries	69	Aluminum and Nonferrous Foundries
331524 Aluminum foundries, except die-casting	69	Aluminum and Nonferrous Foundries
331525 Copper foundries, except die-casting	69	Aluminum and Nonferrous Foundries
331528 Other nonferrous foundries, exc. die-casting	69	Aluminum and Nonferrous Foundries
332111 Iron and steel forging	70	Iron And Steel Forging
332112 Nonferrous forging	71	Other Forging and Stamping
332114 Custom roll forming	71	Other Forging and Stamping
332115 Crown and closure manufacturing	71	Other Forging and Stamping
332116 Metal stamping	71	Other Forging and Stamping
332117 Powder metallurgy part manufacturing	71	Other Forging and Stamping
332211 Cutlery and flatware, except precious, mfg.	72	Tool and Utensil Mfg.
332212 Hand and edge tool manufacturing	72	Tool and Utensil Mfg.
332213 Saw blade and handsaw manufacturing	72	Tool and Utensil Mfg.
332214 Kitchen utensil, pot, and pan manufacturing	72	Tool and Utensil Mfg.
332311 Prefabricated metal buildings and components	73	Fabricated Metal Mfg.
332312 Fabricated structural metal manufacturing	73	Fabricated Metal Mfg.
332313 Plate work manufacturing	74	Plate Work Manufacturing
332321 Metal window and door manufacturing	75	Metal Window & Door Mfg.
332322 Sheet metal work manufacturing	76	Other Metal Work Mfg.

332323 Ornamental and architectural metal work mfg.	76	Other Metal Work Mfg.
332410 Power boiler and heat exchanger manufacturing	77	Power Boilers & Heat Exchangers
332420 Metal tank, heavy gauge, manufacturing	78	Metal Tank Manufacturing
332431 Metal can manufacturing	79	Other Fabricated Metal Mfg.
332439 Other metal container manufacturing	79	Other Fabricated Metal Mfg.
332510 Hardware manufacturing	79	Other Fabricated Metal Mfg.
332611 Spring, heavy gauge, manufacturing	79	Other Fabricated Metal Mfg.
332612 Spring, light gauge, manufacturing	79	Other Fabricated Metal Mfg.
332618 Other fabricated wire product manufacturing	79	Other Fabricated Metal Mfg.
332710 Machine shops	79	Other Fabricated Metal Mfg.
332721 Precision turned product manufacturing	79	Other Fabricated Metal Mfg.
332722 Bolt, nut, screw, rivet, and washer mfg.	79	Other Fabricated Metal Mfg.
332811 Metal heat treating	79	Other Fabricated Metal Mfg.
332812 Metal coating and nonprecious engraving	79	Other Fabricated Metal Mfg.
332813 Electroplating, anodizing, and coloring metal	79	Other Fabricated Metal Mfg.
332911 Industrial valve manufacturing	79	Other Fabricated Metal Mfg.
332912 Fluid power valve and hose fitting mfg.	79	Other Fabricated Metal Mfg.
332913 Plumbing fixture fitting and trim mfg.	79	Other Fabricated Metal Mfg.
332919 Other metal valve and pipe fitting mfg.	79	Other Fabricated Metal Mfg.
332991 Ball and roller bearing manufacturing	79	Other Fabricated Metal Mfg.
332992 Small arms ammunition manufacturing	80	Ordinance and Ammunition Mfg.
332993 Ammunition, except small arms, manufacturing	80	Ordinance and Ammunition Mfg.
332994 Small arms manufacturing	79	Other Fabricated Metal Mfg.
332995 Other ordnance and accessories manufacturing	79	Other Fabricated Metal Mfg.
332996 Fabricated pipe and pipe fitting mfg.	79	Other Fabricated Metal Mfg.
332997 Industrial pattern manufacturing	79	Other Fabricated Metal Mfg.
332998 Enameled iron and metal sanitary ware mfg.	80	Ordinance and Ammunition Mfg.
332999 Miscellaneous fabricated metal product mfg.	80	Ordinance and Ammunition Mfg.
333111 Farm machinery and equipment manufacturing	81	Heavy Machinery Mfg.
333112 Lawn and garden equipment manufacturing	81	Heavy Machinery Mfg.
333120 Construction machinery manufacturing	81	Heavy Machinery Mfg.
333131 Mining machinery and equipment manufacturing	81	Heavy Machinery Mfg.
333132 Oil and gas field machinery and equipment	82	Lawn & Garden Eq. Mfg.
333210 Sawmill and woodworking machinery	83	Wood Processing Machinery Mfg.
333220 Plastics and rubber industry machinery	84	Plastics & Rubber Machinery Mfg.
333291 Paper industry machinery manufacturing	85	Paper Industry Machinery Mfg.
333292 Textile machinery manufacturing	86	Textile Machinery Mfg.
333293 Printing machinery and equipment mfg.	87	Printing Industry Machinery Mfg.
333294 Food product machinery manufacturing	88	Misc. Industrial Machinery Mfg.
333295 Semiconductor machinery manufacturing	88	Misc. Industrial Machinery Mfg.
333298 All other industrial machinery manufacturing	88	Misc. Industrial Machinery Mfg.
333311 Automatic vending machine manufacturing	89	Commercial Service Machinery Mfg.
333312 Commercial laundry and drycleaning machinery	89	Commercial Service Machinery Mfg.
333313 Office machinery manufacturing	89	Commercial Service Machinery Mfg.
333314 Optical instrument and lens manufacturing	89	Commercial Service Machinery Mfg.
333315 Photographic and photocopying equipment mfg.	89	Commercial Service Machinery Mfg.
333319 Other commercial and service machinery mfg.	89	Commercial Service Machinery Mfg.
333411 Air purification equipment manufacturing	90	Air Purification Eq. Mfg.

333412 Industrial and commercial fan and blower mfg.	91	Com/Ind Fan & Blower Mfg.
333414 Heating equipment, except warm air furnaces	92	Nonfurnace Heating Eq. Mfg.
333415 AC, refrigeration, and forced air heating	93	AC, Ref., Heat Pumps & Forced Air
333511 Industrial mold manufacturing	94	Industrial Mold Manufacturing
333512 Metal cutting machine tool manufacturing	94	Industrial Mold Manufacturing
333513 Metal forming machine tool manufacturing	94	Industrial Mold Manufacturing
333514 Special tool, die, jig, and fixture mfg.	94	Industrial Mold Manufacturing
333515 Cutting tool and machine tool accessory mfg.	94	Industrial Mold Manufacturing
333516 Rolling mill machinery and equipment mfg.	95	Metalworking Machinery Mfg.
333518 Other metalworking machinery manufacturing	95	Metalworking Machinery Mfg.
333611 Turbine and turbine generator set units mfg.	96	Turbines and Related Mfg.
333612 Speed changer, drive, and gear manufacturing	98	Power Transmission Equipment Mfg.
333613 Mechanical power transmission equipment mfg.	98	Power Transmission Equipment Mfg.
333618 Other engine equipment manufacturing	97	Other Engine Eq. Manufacturing
333911 Pump and pumping equipment manufacturing	99	Pumps and Related Eq. Mfg.
333912 Air and gas compressor manufacturing	100	Air And Gas Compressor Mfg.
333913 Measuring and dispensing pump manufacturing	101	Measuring And Dispensing Pump Mfg.
333921 Elevator and moving stairway manufacturing	102	Other Electric Machinery Mfg.
333922 Conveyor and conveying equipment mfg.	102	Other Electric Machinery Mfg.
333923 Overhead cranes, hoists, and monorail systems	102	Other Electric Machinery Mfg.
333924 Industrial truck, trailer, and stacker mfg.	102	Other Electric Machinery Mfg.
333991 Power-driven handtool manufacturing	102	Other Electric Machinery Mfg.
333992 Welding and soldering equipment manufacturing	102	Other Electric Machinery Mfg.
333993 Packaging machinery manufacturing	102	Other Electric Machinery Mfg.
333994 Industrial process furnace and oven mfg.	103	Ind. Process Furnace & Oven Mfg.
333995 Fluid power cylinder and actuator mfg.	104	Misc. Machinery Mfg.
333996 Fluid power pump and motor manufacturing	104	Misc. Machinery Mfg.
333997 Scale and balance, except laboratory, mfg.	104	Misc. Machinery Mfg.
333999 Miscellaneous general purpose machinery mfg.	104	Misc. Machinery Mfg.
334111 Electronic computer manufacturing	105	Computer Products Mfg.
334112 Computer storage device manufacturing	105	Computer Products Mfg.
334113 Computer terminal manufacturing	105	Computer Products Mfg.
334119 Other computer peripheral equipment mfg.	105	Computer Products Mfg.
334210 Telephone apparatus manufacturing	106	Communications Eq. Mfg.
334220 Broadcast and wireless communications equip.	106	Communications Eq. Mfg.
334290 Other communications equipment manufacturing	106	Communications Eq. Mfg.
334310 Audio and video equipment manufacturing	107	Electronic Components Mfg.
334411 Electron tube manufacturing	107	Electronic Components Mfg.
334412 Bare printed circuit board manufacturing	107	Electronic Components Mfg.
334413 Semiconductors and related device mfg.	107	Electronic Components Mfg.
334414 Electronic capacitor manufacturing	107	Electronic Components Mfg.
334415 Electronic resistor manufacturing	107	Electronic Components Mfg.
334416 Electronic coils, transformers, and inductors	107	Electronic Components Mfg.
334417 Electronic connector manufacturing	107	Electronic Components Mfg.
334418 Printed circuit assembly manufacturing	107	Electronic Components Mfg.
334419 Other electronic component manufacturing	107	Electronic Components Mfg.
334510 Electromedical apparatus manufacturing	108	Instruments Manufacturing
334511 Search, detection, and navigation instruments	108	Instruments Manufacturing

334512 Automatic environmental control manufacturing	109	Automatic Environmental Controls
334513 Industrial process variable instruments	110	Ind. Process Variable Instruments
334514 Totalizing fluid meters and counting devices	111	Fluid Meters & Counting Devices
334515 Electricity and signal testing instruments	112	Electricity & Signal Testing Inst.
334516 Analytical laboratory instrument mfg.	113	Other Lab & Related Instruments
334517 Irradiation apparatus manufacturing	113	Other Lab & Related Instruments
334518 Watch, clock, and part manufacturing	113	Other Lab & Related Instruments
334519 Other measuring and controlling device mfg.	113	Other Lab & Related Instruments
334611 Software reproducing	114	Electronic Media Processing
334612 Audio and video media reproduction	114	Electronic Media Processing
334613 Magnetic and optical recording media mfg.	114	Electronic Media Processing
335110 Electric lamp bulb and part manufacturing	115	Electric Lamp Bulb And Part Mfg.
335121 Residential electric lighting fixture mfg.	116	Lighting Fixture Manufacturing
335122 Nonresidential electric lighting fixture mfg.	116	Lighting Fixture Manufacturing
335129 Other lighting equipment manufacturing	116	Lighting Fixture Manufacturing
335211 Electric housewares and household fan mfg.	117	Household Eq. Mfg.
335212 Household vacuum cleaner manufacturing	117	Household Eq. Mfg.
335221 Household cooking appliance manufacturing	118	Household Cooking Appliance Mfg.
335222 Household refrigerator and home freezer mfg.	119	HH Refrigerator & Freezer Mfg.
335224 Household laundry equipment manufacturing	120	Household Laundry Equipment Mfg.
335228 Other major household appliance manufacturing	121	Other Major HH Appliance Mfg.
335311 Electric power and specialty transformer mfg.	122	Electric Power, Etc. Transformers
335312 Motor and generator manufacturing	123	Motor And Generator Manufacturing
335313 Switchgear and switchboard apparatus mfg.	124	Industrial Controls
335314 Relay and industrial control manufacturing	124	Industrial Controls
335911 Storage battery manufacturing	125	Battery Manufacturing
335912 Primary battery manufacturing	125	Battery Manufacturing
335921 Fiber optic cable manufacturing	126	Misc. Electric Eq. Mfg.
335929 Other communication and energy wire mfg.	126	Misc. Electric Eq. Mfg.
335931 Current-carrying wiring device manufacturing	126	Misc. Electric Eq. Mfg.
335932 Noncurrent-carrying wiring device mfg.	126	Misc. Electric Eq. Mfg.
335991 Carbon and graphite product manufacturing	126	Misc. Electric Eq. Mfg.
335999 Miscellaneous electrical equipment mfg.	126	Misc. Electric Eq. Mfg.
336111 Automobile manufacturing	127	Car and Light Truck Mfg.
336112 Light truck and utility vehicle manufacturing	127	Car and Light Truck Mfg.
336120 Heavy duty truck manufacturing	127	Car and Light Truck Mfg.
336211 Motor vehicle body manufacturing	128	Truck Manufacturing
336212 Truck trailer manufacturing	128	Truck Manufacturing
336213 Motor home manufacturing	129	RV Manufacturing
336214 Travel trailer and camper manufacturing	129	RV Manufacturing
336311 Carburetor, piston, ring, and valve mfg.	130	Motor Vehicle Parts Manufacturing
336312 Gasoline engine and engine parts mfg.	130	Motor Vehicle Parts Manufacturing
336321 Vehicular lighting equipment manufacturing	130	Motor Vehicle Parts Manufacturing
336322 Other motor vehicle electric equipment mfg.	130	Motor Vehicle Parts Manufacturing
336330 Motor vehicle steering and suspension parts	130	Motor Vehicle Parts Manufacturing
336340 Motor vehicle brake system manufacturing	130	Motor Vehicle Parts Manufacturing
336350 Motor vehicle power train components mfg.	130	Motor Vehicle Parts Manufacturing
336360 Motor vehicle seating and interior trim mfg.	130	Motor Vehicle Parts Manufacturing

336370 Motor vehicle metal stamping	130	Motor Vehicle Parts Manufacturing
336391 Motor vehicle air-conditioning manufacturing	130	Motor Vehicle Parts Manufacturing
336399 All other motor vehicle parts manufacturing	130	Motor Vehicle Parts Manufacturing
336411 Aircraft manufacturing	131	Aerospace Product Manufacturing
336412 Aircraft engine and engine parts mfg.	131	Aerospace Product Manufacturing
336413 Other aircraft parts and equipment	131	Aerospace Product Manufacturing
336414 Guided missile and space vehicle mfg.	131	Aerospace Product Manufacturing
336415 Space vehicle propulsion units and parts mfg.	131	Aerospace Product Manufacturing
336419 Other guided missile and space vehicle parts	131	Aerospace Product Manufacturing
336510 Railroad rolling stock manufacturing	132	Railroad Rolling Stock Mfg.
336611 Ship building and repairing	133	Ship Building And Repairing
336612 Boat building	133	Ship Building And Repairing
336991 Motorcycle, bicycle, and parts manufacturing	134	Boat/Cycle & Parts Mfg.
336992 Military armored vehicles and tank parts mfg.	135	Other Transportation Eq.
336999 All other transportation equipment mfg.	135	Other Transportation Eq.
337110 Wood kitchen cabinet and countertop mfg.	136	HH & Institutional Furniture
337121 Upholstered household furniture manufacturing	136	HH & Institutional Furniture
337122 Nonupholstered wood household furniture mfg.	136	HH & Institutional Furniture
337124 Metal household furniture manufacturing	136	HH & Institutional Furniture
337125 Household furniture, exc. wood or metal, mfg.	137	Office Furniture Mfg.
337127 Institutional furniture manufacturing	136	HH & Institutional Furniture
337129 Wood TV, radio, and sewing machine housings	137	Office Furniture Mfg.
337211 Wood office furniture manufacturing	137	Office Furniture Mfg.
337212 Custom architectural woodwork and millwork	137	Office Furniture Mfg.
337214 Office furniture, except wood, manufacturing	137	Office Furniture Mfg.
337215 Showcases, partitions, shelving, and lockers	138	Custom Woodwork And Millwork
337910 Mattress manufacturing	139	Misc. Furniture Mfg.
337920 Blind and shade manufacturing	139	Misc. Furniture Mfg.
339111 Laboratory apparatus and furniture mfg.	140	Laboratory Instruments & Eq.
339112 Surgical and medical instrument manufacturing	140	Laboratory Instruments & Eq.
339113 Surgical appliance and supplies manufacturing	140	Laboratory Instruments & Eq.
339114 Dental equipment and supplies manufacturing	140	Laboratory Instruments & Eq.
339115 Ophthalmic goods manufacturing	140	Laboratory Instruments & Eq.
339116 Dental laboratories	140	Laboratory Instruments & Eq.
339911 Jewelry, except costume, manufacturing	140	Laboratory Instruments & Eq.
339912 Silverware and hollowware manufacturing	140	Laboratory Instruments & Eq.
339913 Jewelers' material and lapidary work mfg.	140	Laboratory Instruments & Eq.
339914 Costume jewelry and novelty manufacturing	140	Laboratory Instruments & Eq.
339920 Sporting and athletic goods manufacturing	141	Misc. Manufacturing
339931 Doll and stuffed toy manufacturing	141	Misc. Manufacturing
339932 Game, toy, and children's vehicle mfg.	141	Misc. Manufacturing
339941 Pen and mechanical pencil manufacturing	141	Misc. Manufacturing
339942 Lead pencil and art good manufacturing	141	Misc. Manufacturing
339943 Marking device manufacturing	141	Misc. Manufacturing
339944 Carbon paper and inked ribbon manufacturing	141	Misc. Manufacturing
339950 Sign manufacturing	141	Misc. Manufacturing
339991 Gasket, packing, and sealing device mfg.	141	Misc. Manufacturing
339992 Musical instrument manufacturing	141	Misc. Manufacturing

339993 Fastener, button, needle, and pin mfg.	141	Misc. Manufacturing
339994 Broom, brush, and mop manufacturing	141	Misc. Manufacturing
339995 Burial casket manufacturing	141	Misc. Manufacturing
339999 All other miscellaneous manufacturing	141	Misc. Manufacturing
423110 Motor vehicle merchant wholesalers	142	Wholesale Trade
423120 New motor vehicle parts merchant wholesalers	142	Wholesale Trade
423130 Tire and tube merchant wholesalers	142	Wholesale Trade
423140 Used motor vehicle parts merchant wholesalers	142	Wholesale Trade
423210 Furniture merchant wholesalers	142	Wholesale Trade
423220 Home furnishing merchant wholesalers	142	Wholesale Trade
423310 Lumber and wood merchant wholesalers	142	Wholesale Trade
423320 Masonry material merchant wholesalers	142	Wholesale Trade
423330 Roofing and siding merchant wholesalers	142	Wholesale Trade
423390 Other const. material merchant wholesalers	142	Wholesale Trade
423410 Photographic equip. merchant wholesalers	142	Wholesale Trade
423420 Office equipment merchant wholesalers	142	Wholesale Trade
423430 Computer and software merchant wholesalers	142	Wholesale Trade
423440 Other commercial equip. merchant wholesalers	142	Wholesale Trade
423450 Medical equipment merchant wholesalers	142	Wholesale Trade
423460 Ophthalmic goods merchant wholesalers	142	Wholesale Trade
423490 Other professional equip. merchant wholesalers	142	Wholesale Trade
423510 Metal merchant wholesalers	142	Wholesale Trade
423520 Coal and other mineral merchant wholesalers	142	Wholesale Trade
423610 Elec. equip. and wiring merchant wholesalers	142	Wholesale Trade
423620 Electric appliance merchant wholesalers	142	Wholesale Trade
423690 Other electronic parts merchant wholesalers	142	Wholesale Trade
423710 Hardware merchant wholesalers	142	Wholesale Trade
423720 Plumbing equip. merchant wholesalers	142	Wholesale Trade
423730 HVAC equip. merchant wholesalers	142	Wholesale Trade
423740 Refrigeration equip. merchant wholesalers	142	Wholesale Trade
423810 Construction equipment merchant wholesalers	142	Wholesale Trade
423820 Farm and garden equip. merchant wholesalers	142	Wholesale Trade
423830 Industrial machinery merchant wholesalers	142	Wholesale Trade
423840 Industrial supplies merchant wholesalers	142	Wholesale Trade
423850 Service estab. equip. merchant wholesalers	142	Wholesale Trade
423860 Other transport. goods merchant wholesalers	142	Wholesale Trade
423910 Sporting goods merchant wholesalers	142	Wholesale Trade
423920 Toy and hobby goods merchant wholesalers	142	Wholesale Trade
423930 Recyclable material merchant wholesalers	142	Wholesale Trade
423940 Jewelry merchant wholesalers	142	Wholesale Trade
423990 All other durable goods merchant wholesalers	142	Wholesale Trade
424110 Printing and writing paper merch. whls.	142	Wholesale Trade
424120 Office supplies merchant wholesalers	142	Wholesale Trade
424130 Industrial paper merchant wholesalers	142	Wholesale Trade
424210 Druggists' goods merchant wholesalers	142	Wholesale Trade
424310 Piece goods merchant wholesalers	142	Wholesale Trade
424320 Men's and boys' clothing merchant wholesalers	142	Wholesale Trade
424330 Women's and children's clothing merch. whls.	142	Wholesale Trade

424340 Footwear merchant wholesalers	142	Wholesale Trade
424410 General line grocery merchant wholesalers	142	Wholesale Trade
424420 Packaged frozen food merchant wholesalers	142	Wholesale Trade
424430 Dairy product merchant wholesalers	142	Wholesale Trade
424440 Poultry product merchant wholesalers	142	Wholesale Trade
424450 Confectionery merchant wholesalers	142	Wholesale Trade
424460 Fish and seafood merchant wholesalers	142	Wholesale Trade
424470 Meat and meat product merchant wholesalers	142	Wholesale Trade
424480 Fruit and vegetable merchant wholesalers	142	Wholesale Trade
424490 Other grocery product merchant wholesalers	142	Wholesale Trade
424510 Grain and field bean merchant wholesalers	142	Wholesale Trade
424520 Livestock merchant wholesalers	142	Wholesale Trade
424590 Other farm product raw material merch. whls.	142	Wholesale Trade
424610 Plastics materials merchant wholesalers	142	Wholesale Trade
424690 Other chemicals merchant wholesalers	142	Wholesale Trade
424710 Petroleum bulk stations and terminals	142	Wholesale Trade
424720 Other petroleum merchant wholesalers	142	Wholesale Trade
424810 Beer and ale merchant wholesalers	142	Wholesale Trade
424820 Wine and spirit merchant wholesalers	142	Wholesale Trade
424910 Farm supplies merchant wholesalers	142	Wholesale Trade
424920 Book and periodical merchant wholesalers	142	Wholesale Trade
424930 Nursery and florist merchant wholesalers	142	Wholesale Trade
424940 Tobacco and tobacco product merch. whls.	142	Wholesale Trade
424950 Paint and supplies merchant wholesalers	142	Wholesale Trade
424990 Other nondurable goods merchant wholesalers	142	Wholesale Trade
425110 Business to business electronic markets	142	Wholesale Trade
425120 Wholesale trade agents and brokers	142	Wholesale Trade
441110 New car dealers	152	Retail Trade
441120 Used car dealers	152	Retail Trade
441210 Recreational vehicle dealers	152	Retail Trade
441221 Motorcycle dealers	152	Retail Trade
441222 Boat dealers	152	Retail Trade
441229 All other motor vehicle dealers	152	Retail Trade
441310 Automotive parts and accessories stores	152	Retail Trade
441320 Tire dealers	152	Retail Trade
442110 Furniture stores	152	Retail Trade
442210 Floor covering stores	152	Retail Trade
442291 Window treatment stores	152	Retail Trade
442299 All other home furnishings stores	152	Retail Trade
443111 Household appliance stores	152	Retail Trade
443112 Radio, TV, and other electronics stores	152	Retail Trade
443120 Computer and software stores	152	Retail Trade
443130 Camera and photographic supplies stores	152	Retail Trade
444110 Home centers	152	Retail Trade
444120 Paint and wallpaper stores	152	Retail Trade
444130 Hardware stores	152	Retail Trade
444190 Other building material dealers	152	Retail Trade
444210 Outdoor power equipment stores	152	Retail Trade

444220 Nursery, garden, and farm supply stores	152	Retail Trade
445110 Supermarkets and other grocery stores	152	Retail Trade
445120 Convenience stores	152	Retail Trade
445210 Meat markets	152	Retail Trade
445220 Fish and seafood markets	152	Retail Trade
445230 Fruit and vegetable markets	152	Retail Trade
445291 Baked goods stores	152	Retail Trade
445292 Confectionery and nut stores	152	Retail Trade
445299 All other specialty food stores	152	Retail Trade
445310 Beer, wine, and liquor stores	152	Retail Trade
446110 Pharmacies and drug stores	152	Retail Trade
446120 Cosmetic and beauty supply stores	152	Retail Trade
446130 Optical goods stores	152	Retail Trade
446191 Food, health, supplement stores	152	Retail Trade
446199 All other health and personal care stores	152	Retail Trade
447110 Gasoline stations with convenience stores	152	Retail Trade
447190 Other gasoline stations	152	Retail Trade
448110 Men's clothing stores	152	Retail Trade
448120 Women's clothing stores	152	Retail Trade
448130 Children's and infants' clothing stores	152	Retail Trade
448140 Family clothing stores	152	Retail Trade
448150 Clothing accessories stores	152	Retail Trade
448190 Other clothing stores	152	Retail Trade
448210 Shoe stores	152	Retail Trade
448310 Jewelry stores	152	Retail Trade
448320 Luggage and leather goods stores	152	Retail Trade
451110 Sporting goods stores	152	Retail Trade
451120 Hobby, toy, and game stores	152	Retail Trade
451130 Sewing, needlework, and piece goods stores	152	Retail Trade
451140 Musical instrument and supplies stores	152	Retail Trade
451211 Book stores	152	Retail Trade
451212 News dealers and newsstands	152	Retail Trade
451220 Precoded tape, CD, and record stores	152	Retail Trade
452111 Department stores, except discount	152	Retail Trade
452112 Discount department stores	152	Retail Trade
452910 Warehouse clubs and supercenters	152	Retail Trade
452990 All other general merchandise stores	152	Retail Trade
453110 Florists	152	Retail Trade
453210 Office supplies and stationery stores	152	Retail Trade
453220 Gift, novelty, and souvenir stores	152	Retail Trade
453310 Used merchandise stores	152	Retail Trade
453910 Pet and pet supplies stores	152	Retail Trade
453920 Art dealers	152	Retail Trade
453930 Manufactured, mobile, home dealers	152	Retail Trade
453991 Tobacco stores	152	Retail Trade
453998 Store retailers not specified elsewhere	152	Retail Trade
454111 Electronic shopping	152	Retail Trade
454112 Electronic auctions	152	Retail Trade



454113 Mail-order houses	152	Retail Trade
454210 Vending machine operators	152	Retail Trade
454311 Heating oil dealers	152	Retail Trade
454312 Liquefied petroleum gas, bottled gas, dealers	152	Retail Trade
454319 Other fuel dealers	152	Retail Trade
454390 Other direct selling establishments	152	Retail Trade
481111 Scheduled passenger air transportation	143	Air Transportation
481112 Scheduled freight air transportation	143	Air Transportation
481211 Nonscheduled air passenger chartering	143	Air Transportation
481212 Nonscheduled air freight chartering	143	Air Transportation
481219 Other nonscheduled air transportation	143	Air Transportation
482111 Line-haul railroads	144	Rail Transportation
482112 Short line railroads	144	Rail Transportation
483111 Deep sea freight transportation	145	Water Transportation
483112 Deep sea passenger transportation	145	Water Transportation
483113 Coastal and Great Lakes freight transport.	145	Water Transportation
483114 Coastal and Great Lakes passenger transport.	145	Water Transportation
483211 Inland water freight transportation	145	Water Transportation
483212 Inland water passenger transportation	145	Water Transportation
484110 General freight trucking, local	146	Truck Transportation
484121 General freight trucking, long-distance TL	146	Truck Transportation
484122 General freight trucking, long-distance LTL	146	Truck Transportation
484210 Used household and office goods moving	146	Truck Transportation
484220 Other specialized trucking, local	146	Truck Transportation
484230 Other specialized trucking, long-distance	146	Truck Transportation
485111 Mixed mode transit systems	147	Transit & Related Services
485112 Commuter rail systems	147	Transit & Related Services
485113 Bus and other motor vehicle transit systems	147	Transit & Related Services
485119 Other urban transit systems	147	Transit & Related Services
485210 Interurban and rural bus transportation	147	Transit & Related Services
485310 Taxi service	147	Transit & Related Services
485320 Limousine service	147	Transit & Related Services
485410 School and employee bus transportation	147	Transit & Related Services
485510 Charter bus industry	147	Transit & Related Services
485991 Special needs transportation	147	Transit & Related Services
485999 All other ground passenger transportation	147	Transit & Related Services
486110 Pipeline transportation of crude oil	148	Pipeline Transportation
486210 Pipeline transportation of natural gas	148	Pipeline Transportation
486910 Refined petroleum product pipeline transport.	148	Pipeline Transportation
486990 All other pipeline transportation	148	Pipeline Transportation
487110 Scenic and sightseeing transportation, land	149	Sightseeing Transportation
487210 Scenic and sightseeing transportation, water	149	Sightseeing Transportation
487990 Scenic and sightseeing transportation, other	149	Sightseeing Transportation
488111 Air traffic control	149	Sightseeing Transportation
488119 Other airport operations	149	Sightseeing Transportation
488190 Other support activities for air transport.	149	Sightseeing Transportation
488210 Support activities for rail transportation	149	Sightseeing Transportation
488310 Port and harbor operations	149	Sightseeing Transportation

488320 Marine cargo handling	149	Sightseeing Transportation
488330 Navigational services to shipping	149	Sightseeing Transportation
488390 Other support activities for water transport.	149	Sightseeing Transportation
488410 Motor vehicle towing	149	Sightseeing Transportation
488490 Other support activities for road transport.	149	Sightseeing Transportation
488510 Freight transportation arrangement	149	Sightseeing Transportation
488991 Packing and crating	149	Sightseeing Transportation
488999 All other support activities for transport.	149	Sightseeing Transportation
491110 Postal service	150	Postal and Courier Services
492110 Couriers	150	Postal and Courier Services
492210 Local messengers and local delivery	150	Postal and Courier Services
493110 General warehousing and storage	151	Warehousing And Storage
493120 Refrigerated warehousing and storage	151	Warehousing And Storage
493130 Farm product warehousing and storage	151	Warehousing And Storage
493190 Other warehousing and storage	151	Warehousing And Storage
511110 Newspaper publishers	153	Publishers
511120 Periodical publishers	153	Publishers
511130 Book publishers	153	Publishers
511140 Directory and mailing list publishers	153	Publishers
511191 Greeting card publishers	153	Publishers
511199 All other publishers	153	Publishers
511210 Software publishers	153	Publishers
512110 Motion picture and video production	154	Telecom & Entertainment
512120 Motion picture and video distribution	154	Telecom & Entertainment
512131 Motion picture theaters, except drive-ins	154	Telecom & Entertainment
512132 Drive-in motion picture theaters	154	Telecom & Entertainment
512191 Teleproduction and postproduction services	154	Telecom & Entertainment
512199 Other motion picture and video industries	154	Telecom & Entertainment
512210 Record production	154	Telecom & Entertainment
512220 Integrated record production and distribution	154	Telecom & Entertainment
512230 Music publishers	154	Telecom & Entertainment
512240 Sound recording studios	154	Telecom & Entertainment
512290 Other sound recording industries	154	Telecom & Entertainment
515111 Radio networks	154	Telecom & Entertainment
515112 Radio stations	154	Telecom & Entertainment
515120 Television broadcasting	154	Telecom & Entertainment
515210 Cable and other subscription programming	154	Telecom & Entertainment
516110 Internet publishing and broadcasting	154	Telecom & Entertainment
517110 Wired telecommunications carriers	154	Telecom & Entertainment
517211 Paging	154	Telecom & Entertainment
517212 Cellular and other wireless carriers	154	Telecom & Entertainment
517310 Telecommunications resellers	154	Telecom & Entertainment
517410 Satellite telecommunications	154	Telecom & Entertainment
517510 Cable and other program distribution	154	Telecom & Entertainment
517910 Other telecommunications	154	Telecom & Entertainment
518111 Internet service providers	154	Telecom & Entertainment
518112 Web search portals	154	Telecom & Entertainment
518210 Data processing and related services	154	Telecom & Entertainment

519110 News syndicates	154	Telecom & Entertainment
519120 Libraries and archives	154	Telecom & Entertainment
519190 All other information services	154	Telecom & Entertainment
521110 Monetary authorities - central bank	159	Monetary Authorities
522110 Commercial banking	159	Monetary Authorities
522120 Savings institutions	159	Monetary Authorities
522130 Credit unions	159	Monetary Authorities
522190 Other depository credit intermediation	159	Monetary Authorities
522210 Credit card issuing	155	Credit Counseling
522220 Sales financing	155	Credit Counseling
522291 Consumer lending	155	Credit Counseling
522292 Real estate credit	155	Credit Counseling
522293 International trade financing	155	Credit Counseling
522294 Secondary market financing	155	Credit Counseling
522298 All other nondepository credit intermediation	155	Credit Counseling
522310 Mortgage and nonmortgage loan brokers	155	Credit Counseling
522320 Financial transaction processing and clearing	155	Credit Counseling
522390 Other credit intermediation activities	155	Credit Counseling
523110 Investment banking and securities dealing	156	Investment Services
523120 Securities brokerage	156	Investment Services
523130 Commodity contracts dealing	156	Investment Services
523140 Commodity contracts brokerage	156	Investment Services
523210 Securities and commodity exchanges	156	Investment Services
523910 Miscellaneous intermediation	156	Investment Services
523920 Portfolio management	156	Investment Services
523930 Investment advice	156	Investment Services
523991 Trust, fiduciary, and custody activities	156	Investment Services
523999 Miscellaneous financial investment activities	156	Investment Services
524113 Direct life insurance carriers	157	Insurance
524114 Direct health and medical insurance carriers	157	Insurance
524126 Direct property and casualty insurers	157	Insurance
524127 Direct title insurance carriers	157	Insurance
524128 Other direct insurance carriers	157	Insurance
524130 Reinsurance carriers	157	Insurance
524210 Insurance agencies and brokerages	157	Insurance
524291 Claims adjusting	157	Insurance
524292 Third party administration of insurance funds	157	Insurance
524298 All other insurance related activities	157	Insurance
525110 Pension funds	158	Fund Management
525120 Health and welfare funds	158	Fund Management
525190 Other insurance funds	158	Fund Management
525910 Open-end investment funds	158	Fund Management
525920 Trusts, estates, and agency accounts	158	Fund Management
525930 Real estate investment trusts	158	Fund Management
525990 Other financial vehicles	158	Fund Management
531110 Lessors of residential buildings	160	Real Estate
531120 Lessors of nonresidential buildings	160	Real Estate
531130 Miniwarehouse and self-storage unit operators	160	Real Estate

531190 Lessors of other real estate property	160	Real Estate
531210 Offices of real estate agents and brokers	160	Real Estate
531311 Residential property managers	160	Real Estate
531312 Nonresidential property managers	160	Real Estate
531320 Offices of real estate appraisers	160	Real Estate
531390 Other activities related to real estate	160	Real Estate
532111 Passenger car rental	161	Car Rental Agencies
532112 Passenger car leasing	161	Car Rental Agencies
532120 Truck, trailer, and RV rental and leasing	161	Car Rental Agencies
532210 Consumer electronics and appliances rental	162	Rental Services
532220 Formal wear and costume rental	162	Rental Services
532230 Video tape and disc rental	162	Rental Services
532291 Home health equipment rental	162	Rental Services
532292 Recreational goods rental	162	Rental Services
532299 All other consumer goods rental	162	Rental Services
532310 General rental centers	162	Rental Services
532411 Transportation equipment rental and leasing	162	Rental Services
532412 Other heavy machinery rental and leasing	162	Rental Services
532420 Office equipment rental and leasing	162	Rental Services
532490 Other machinery rental and leasing	162	Rental Services
533110 Lessors of nonfinancial intangible assets	162	Rental Services
541110 Offices of lawyers	163	Other Professional/Technical Svc.
541191 Title abstract and settlement offices	163	Other Professional/Technical Svc.
541199 All other legal services	163	Other Professional/Technical Svc.
541211 Offices of certified public accountants	163	Other Professional/Technical Svc.
541213 Tax preparation services	163	Other Professional/Technical Svc.
541214 Payroll services	163	Other Professional/Technical Svc.
541219 Other accounting services	163	Other Professional/Technical Svc.
541310 Architectural services	164	Architectural & Engineering Svc.
541320 Landscape architectural services	164	Architectural & Engineering Svc.
541330 Engineering services	164	Architectural & Engineering Svc.
541340 Drafting services	164	Architectural & Engineering Svc.
541350 Building inspection services	164	Architectural & Engineering Svc.
541360 Geophysical surveying and mapping services	164	Architectural & Engineering Svc.
541370 Other surveying and mapping services	164	Architectural & Engineering Svc.
541380 Testing laboratories	164	Architectural & Engineering Svc.
541410 Interior design services	163	Other Professional/Technical Svc.
541420 Industrial design services	163	Other Professional/Technical Svc.
541430 Graphic design services	163	Other Professional/Technical Svc.
541490 Other specialized design services	163	Other Professional/Technical Svc.
541511 Custom computer programming services	163	Other Professional/Technical Svc.
541512 Computer systems design services	163	Other Professional/Technical Svc.
541513 Computer facilities management services	163	Other Professional/Technical Svc.
541519 Other computer related services	163	Other Professional/Technical Svc.
541611 Administrative management consulting services	163	Other Professional/Technical Svc.
541612 Human resource consulting services	163	Other Professional/Technical Svc.
541613 Marketing consulting services	163	Other Professional/Technical Svc.
541614 Process and logistics consulting services	163	Other Professional/Technical Svc.

541618 Other management consulting services	163	Other Professional/Technical Svc.
541620 Environmental consulting services	163	Other Professional/Technical Svc.
541690 Other technical consulting services	163	Other Professional/Technical Svc.
541710 Physical, engineering and biological research	163	Other Professional/Technical Svc.
541720 Social science and humanities research	163	Other Professional/Technical Svc.
541810 Advertising agencies	163	Other Professional/Technical Svc.
541820 Public relations agencies	163	Other Professional/Technical Svc.
541830 Media buying agencies	163	Other Professional/Technical Svc.
541840 Media representatives	163	Other Professional/Technical Svc.
541850 Display advertising	163	Other Professional/Technical Svc.
541860 Direct mail advertising	163	Other Professional/Technical Svc.
541870 Advertising material distribution services	163	Other Professional/Technical Svc.
541890 Other services related to advertising	163	Other Professional/Technical Svc.
541910 Marketing research and public opinion polling	163	Other Professional/Technical Svc.
541921 Photography studios, portrait	163	Other Professional/Technical Svc.
541922 Commercial photography	163	Other Professional/Technical Svc.
541930 Translation and interpretation services	163	Other Professional/Technical Svc.
541940 Veterinary services	163	Other Professional/Technical Svc.
541990 All other professional and technical services	163	Other Professional/Technical Svc.
551111 Offices of bank holding companies	165	Other Business Services
551112 Offices of other holding companies	165	Other Business Services
551114 Managing offices	165	Other Business Services
561110 Office administrative services	165	Other Business Services
561210 Facilities support services	165	Other Business Services
561310 Employment placement agencies	165	Other Business Services
561320 Temporary help services	165	Other Business Services
561330 Professional employer organizations	165	Other Business Services
561410 Document preparation services	165	Other Business Services
561421 Telephone answering services	165	Other Business Services
561422 Telemarketing bureaus	165	Other Business Services
561431 Private mail centers	165	Other Business Services
561439 Other business service centers	165	Other Business Services
561440 Collection agencies	165	Other Business Services
561450 Credit bureaus	165	Other Business Services
561491 Repossession services	165	Other Business Services
561492 Court reporting and stenotype services	165	Other Business Services
561499 All other business support services	165	Other Business Services
561510 Travel agencies	165	Other Business Services
561520 Tour operators	165	Other Business Services
561591 Convention and visitors bureaus	165	Other Business Services
561599 All other travel arrangement services	165	Other Business Services
561611 Investigation services	165	Other Business Services
561612 Security guards and patrol services	165	Other Business Services
561613 Armored car services	165	Other Business Services
561621 Security systems services, except locksmiths	165	Other Business Services
561622 Locksmiths	165	Other Business Services
561710 Exterminating and pest control services	165	Other Business Services
561720 Janitorial services	165	Other Business Services

561730 Landscaping services	165	Other Business Services
561740 Carpet and upholstery cleaning services	165	Other Business Services
561790 Other services to buildings and dwellings	165	Other Business Services
561910 Packaging and labeling services	165	Other Business Services
561920 Convention and trade show organizers	165	Other Business Services
561990 All other support services	165	Other Business Services
562111 Solid waste collection	165	Other Business Services
562112 Hazardous waste collection	165	Other Business Services
562119 Other waste collection	165	Other Business Services
562211 Hazardous waste treatment and disposal	165	Other Business Services
562212 Solid waste landfill	165	Other Business Services
562213 Solid waste combustors and incinerators	165	Other Business Services
562219 Other nonhazardous waste disposal	165	Other Business Services
562910 Remediation services	165	Other Business Services
562920 Materials recovery facilities	165	Other Business Services
562991 Septic tank and related services	165	Other Business Services
562998 Miscellaneous waste management services	165	Other Business Services
611110 Elementary and secondary schools	166	Education
611210 Junior colleges	166	Education
611310 Colleges and universities	166	Education
611410 Business and secretarial schools	166	Education
611420 Computer training	166	Education
611430 Management training	166	Education
611511 Cosmetology and barber schools	166	Education
611512 Flight training	166	Education
611513 Apprenticeship training	166	Education
611519 Other technical and trade schools	166	Education
611610 Fine arts schools	166	Education
611620 Sports and recreation instruction	166	Education
611630 Language schools	166	Education
611691 Exam preparation and tutoring	166	Education
611692 Automobile driving schools	166	Education
611699 Miscellaneous schools and instruction	166	Education
611710 Educational support services	166	Education
621111 Offices of physicians, except mental health	167	Healthcare Providers
621112 Offices of mental health physicians	167	Healthcare Providers
621210 Offices of dentists	167	Healthcare Providers
621310 Offices of chiropractors	167	Healthcare Providers
621320 Offices of optometrists	167	Healthcare Providers
621330 Offices of mental health practitioners	167	Healthcare Providers
621340 Offices of specialty therapists	167	Healthcare Providers
621391 Offices of podiatrists	167	Healthcare Providers
621399 Offices of miscellaneous health practitioners	167	Healthcare Providers
621410 Family planning centers	167	Healthcare Providers
621420 Outpatient mental health centers	167	Healthcare Providers
621491 HMO medical centers	167	Healthcare Providers
621492 Kidney dialysis centers	167	Healthcare Providers
621493 Freestanding emergency medical centers	167	Healthcare Providers

621498 All other outpatient care centers	167	Healthcare Providers
621511 Medical laboratories	167	Healthcare Providers
621512 Diagnostic imaging centers	167	Healthcare Providers
621610 Home health care services	167	Healthcare Providers
621910 Ambulance services	167	Healthcare Providers
621991 Blood and organ banks	167	Healthcare Providers
621999 Miscellaneous ambulatory health care services	167	Healthcare Providers
622110 General medical and surgical hospitals	168	Hospitals and Residential Care
622210 Psychiatric and substance abuse hospitals	168	Hospitals and Residential Care
622310 Other hospitals	168	Hospitals and Residential Care
623110 Nursing care facilities	168	Hospitals and Residential Care
623210 Residential mental retardation facilities	168	Hospitals and Residential Care
623220 Residential mental and substance abuse care	168	Hospitals and Residential Care
623311 Continuing care retirement communities	168	Hospitals and Residential Care
623312 Homes for the elderly	168	Hospitals and Residential Care
623990 Other residential care facilities	168	Hospitals and Residential Care
624110 Child and youth services	169	Day Care and Social Assistance
624120 Services for the elderly and disabled	169	Day Care and Social Assistance
624190 Other individual and family services	169	Day Care and Social Assistance
624210 Community food services	169	Day Care and Social Assistance
624221 Temporary shelters	169	Day Care and Social Assistance
624229 Other community housing services	169	Day Care and Social Assistance
624230 Emergency and other relief services	169	Day Care and Social Assistance
624310 Vocational rehabilitation services	169	Day Care and Social Assistance
624410 Child day care services	169	Day Care and Social Assistance
711110 Theater companies and dinner theaters	170	Amusement & Recreation
711120 Dance companies	170	Amusement & Recreation
711130 Musical groups and artists	170	Amusement & Recreation
711190 Other performing arts companies	170	Amusement & Recreation
711211 Sports teams and clubs	170	Amusement & Recreation
711212 Racetracks	170	Amusement & Recreation
711219 Other spectator sports	170	Amusement & Recreation
711310 Promoters with facilities	170	Amusement & Recreation
711320 Promoters without facilities	170	Amusement & Recreation
711410 Agents and managers for public figures	170	Amusement & Recreation
711510 Independent artists, writers, and performers	170	Amusement & Recreation
712110 Museums	170	Amusement & Recreation
712120 Historical sites	170	Amusement & Recreation
712130 Zoos and botanical gardens	170	Amusement & Recreation
712190 Nature parks and other similar institutions	170	Amusement & Recreation
713110 Amusement and theme parks	170	Amusement & Recreation
713120 Amusement arcades	170	Amusement & Recreation
713210 Casinos, except casino hotels	170	Amusement & Recreation
713290 Other gambling industries	170	Amusement & Recreation
713910 Golf courses and country clubs	170	Amusement & Recreation
713920 Skiing facilities	170	Amusement & Recreation
713930 Marinas	170	Amusement & Recreation
713940 Fitness and recreational sports centers	170	Amusement & Recreation

713950 Bowling centers	170	Amusement & Recreation
713990 All other amusement and recreation industries	170	Amusement & Recreation
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721120 Casino hotels	171	Lodging
721191 Bed-and-breakfast inns	171	Lodging
721199 All other traveler accommodation	171	Lodging
721211 RV parks and campgrounds	171	Lodging
721214 Recreational and vacation camps	171	Lodging
721310 Rooming and boarding houses	171	Lodging
722110 Full-service restaurants	172	Food & Beverage Services
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722212 Cafeterias	172	Food & Beverage Services
722213 Snack and nonalcoholic beverage bars	172	Food & Beverage Services
722310 Food service contractors	172	Food & Beverage Services
722320 Caterers	172	Food & Beverage Services
722330 Mobile food services	172	Food & Beverage Services
722410 Drinking places, alcoholic beverages	172	Food & Beverage Services
811111 General automotive repair	173	Personal Services
811112 Automotive exhaust system repair	173	Personal Services
811113 Automotive transmission repair	173	Personal Services
811118 Other automotive mechanical and elec. repair	173	Personal Services
811121 Automotive body and interior repair	173	Personal Services
811122 Automotive glass replacement shops	173	Personal Services
811191 Automotive oil change and lubrication shops	173	Personal Services
811192 Car washes	173	Personal Services
811198 All other automotive repair and maintenance	173	Personal Services
811211 Consumer electronics repair and maintenance	173	Personal Services
811212 Computer and office machine repair	173	Personal Services
811213 Communication equipment repair	173	Personal Services
811219 Other electronic equipment repair	173	Personal Services
811310 Commercial machinery repair and maintenance	173	Personal Services
811411 Home and garden equipment repair	173	Personal Services
811412 Appliance repair and maintenance	173	Personal Services
811420 Reupholstery and furniture repair	173	Personal Services
811430 Footwear and leather goods repair	173	Personal Services
811490 Other household goods repair and maintenance	173	Personal Services
812111 Barber shops	173	Personal Services
812112 Beauty salons	173	Personal Services
812113 Nail salons	173	Personal Services
812191 Diet and weight reducing centers	173	Personal Services
812199 Other personal care services	173	Personal Services
812210 Funeral homes and funeral services	173	Personal Services
812220 Cemeteries and crematories	173	Personal Services
812310 Coin-operated laundries and drycleaners	173	Personal Services
812320 Drycleaning and laundry services	173	Personal Services
812331 Linen supply	173	Personal Services
812332 Industrial launderers	173	Personal Services
812910 Pet care, except veterinary, services	173	Personal Services



812921 Photofinishing laboratories, except one-hour	173	Personal Services
812922 One-hour photofinishing	173	Personal Services
812930 Parking lots and garages	173	Personal Services
812990 All other personal services	173	Personal Services
813110 Religious organizations	174	Other Services
813211 Grantmaking foundations	174	Other Services
813212 Voluntary health organizations	174	Other Services
813219 Other grantmaking and giving services	174	Other Services
813311 Human rights organizations	174	Other Services
813312 Environment and conservation organizations	174	Other Services
813319 Other social advocacy organizations	174	Other Services
813410 Civic and social organizations	174	Other Services
813910 Business associations	174	Other Services
813920 Professional organizations	174	Other Services
813930 Labor unions and similar labor organizations	174	Other Services
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813990 Other similar organizations	174	Other Services
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921190 Other general government support	184	General Government Industry
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922120 Police protection	180	Other S/L Government Enterprises
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922140 Correctional institutions	180	Other S/L Government Enterprises
922150 Parole offices and probation offices	180	Other S/L Government Enterprises
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923140 Administration of veterans' affairs	177	Other Fed. Gov. Enterprises
924110 Air, water, and waste program administration	177	Other Fed. Gov. Enterprises
924120 Administration of conservation programs	177	Other Fed. Gov. Enterprises
925110 Administration of housing programs	177	Other Fed. Gov. Enterprises
925120 Urban and rural development administration	177	Other Fed. Gov. Enterprises
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