

U.S. Coal Exports: National and State Economic Contributions

Prepared for the National Mining Association

May 2013



Contents

- Executive summary i
- Introduction 1
- Study methodology 5
- Economic contributions to the U.S. economy of exports of domestically-produced coal in 2011 8
 - Employment contributions from coal export-related activity* 8
 - Labor income contributions from coal export-related activity*..... 10
 - Gross value added contributions from coal export-related activity* 11
- Study limitations 15
- Conclusion 16
- Appendix A. Technical description of data and modeling approach 17
 - Economic contribution model using IMPLAN*..... 17
 - Economic contributions from transportation and port activities* 19
- Appendix B. Individual state estimates 20

Executive summary

In 2011, U.S. coal exports totaled 107 million short tons, the highest level in over 20 years.¹ Coal exports accounted for nearly ten percent of total U.S. coal production and supported the employment of thousands of U.S. workers. The economic contribution of coal exports extends well beyond the activities conducted at mine sites and includes employment related to downstream transportation providers that move coal from mines to ports, as well as the port services that prepare and load the coal for shipment abroad, and other businesses that are supported by coal export activity. Each step in this process contributes economic activity to the U.S. economy.

Ernst & Young LLP was commissioned by the National Mining Association (NMA) to estimate the economic contributions of coal exports in the United States in 2011, the most recent year for which complete data were available at the time of the analysis. The analysis considers the current economic contribution of coal exports to the U.S. economy and provides estimates for each state.

Key findings:

- ▶ **Each million short tons of U.S. coal exported in 2011 contributed an estimated 1,320 total jobs to the U.S. economy:** In 2011, 107 million short tons of coal exports contributed 141,270 total direct, indirect, and induced jobs to the U.S. economy, equivalent to approximately 1,320 jobs for every million short tons of coal exported. Each million tons of exported metallurgical coal supported 1,460 employees compared to 1,050 employees per million short tons of exported steam coal in 2011.
- ▶ **Direct employees in coal export-related industries earned nearly 50 percent more than the national average in wages and benefits in 2011:** In 2011, employees employed directly at coal-export related businesses (employees at coal mines, transportation companies, port and port services firms, and coal-exporting ships) earned an annual average of \$96,100 in wages in benefits, compared to the U.S. average for all employees of \$64,500 in 2011.
- ▶ **U.S. coal exports have increased since 2007:** In 2011, the United States produced nearly 1.1 billion short tons of coal, of which 974 million short tons were used domestically and 107 million (ten percent of total production) were exported abroad. This marks an increase in both the level of exports and the share of total U.S. production that is exported compared with five years prior in 2007, when exports totaled 55 million short tons of coal (five percent of total production). In 2011, U.S. coal exports accounted for 8.4 percent of world seaborne coal shipments, up from 5.7 percent in 2007.²

¹ Throughout this study, coal production and exports are reported in terms of short tons, which are equivalent to 0.9 metric tons.

² The lowest level of exports since 1949 (earliest available data) was in 2002, when exports comprised 3.6 percent of total U.S. coal production. Current coal exports are similar to levels in the 1980s and early 1990s when, from 1980 through 1995, coal exports averaged 10 percent of total U.S. coal production. See: EIA, *Historical Coal Export data*. 2013.

- ▶ **Coal export activity varies significantly across states, affecting the level of economic activity related to coal exports:** Some states export a larger share of their coal than others. Wyoming, the largest coal producing state, exported around one percent of its coal production to purchasers outside the U.S. in 2011. In contrast, West Virginia, the nation's second largest coal producer, exported 35 million short tons of coal abroad in 2011, equal to 27 percent of its total coal production. The state-to-state variation in the share of coal production that is exported abroad is related to two primary factors: (1) the type of coal produced by the state, and (2) the proximity and connectivity of the state to international ports with coal shipping capacity.
- ▶ **Regional differences in mine configuration and type of coal affect economic contributions:** The total estimated employment contribution per million short tons of coal varies by type of coal being exported. Coal is mined using underground mines and surface mines. In general, surface mining is more common in the western states, while underground mining is more common in the eastern half of the country, where the majority of metallurgical coal for export is produced. Surface mining is generally the less labor-intensive operation, employing fewer mining workers per ton of coal produced. The average direct coal mine and contractor employment per million short tons of coal produced is six workers in states west of the Mississippi River and 79 workers in states to the east (36 workers per short ton for the United States overall), contributing to higher overall estimated employment contributions per ton of metallurgical coal.³
- ▶ **There were 25,130 direct U.S. jobs at coal mines related to coal production for export in 2011:** In 2011, an estimated 25,130 (18 percent) of the total 143,440 U.S. coal mining jobs were related to coal export production. These employees earned an estimated \$2.6 billion in labor income in 2011 and supported \$5.4 billion in total gross value added. While the total employment includes full- and part-time employees, in 2011, U.S. coal mine employees worked an average of 50 hours per week, according to data published by the U.S. Bureau of Labor Statistics.⁴
- ▶ **Expenditures on downstream transportation services related to coal exports supported 8,850 jobs at transportation companies:** U.S. transportation companies (including deep sea freight shipping) generated an estimated \$3.1 billion in revenue from coal exports in 2011, employing 8,850 workers who earned an estimated total of \$832 million of labor income in that year. Of the total \$3.1 billion of revenue, an estimated \$2.4 billion was related to transportation from the mine to ports (\$22 per short ton of coal) with approximately 65 percent (\$1.5 billion) related to exports of metallurgical coal. The remaining \$700 million of the estimated transportation spending is due to deep sea freight shipping, employing 810 U.S. workers. Of total direct transportation spending, the majority (81 percent) of the employment impact is from rail transportation, the predominant mode of transportation for shipments of coal from U.S. mines to U.S. ports.

³ Based on coal production information published by EIA and coal mine and contractor employee data published by MSHA.

⁴ U.S. Bureau of Labor Statistics. *Employment, hours, and earnings – National*. 2013.

- ▶ **U.S. port and cargo handling activity related to coal exports employed 5,370 workers:** In 2011, shipments of U.S. coal for export comprised 16 percent of the total vessel weight of all exported goods passing through U.S. ports, up from 12 percent in 2007.⁵ Port operators and service providers generated an estimated \$1.0 billion of revenue from coal exports, supporting 5,370 direct full- and part-time jobs at ports and cargo handling companies and \$328 million in labor income. Export activity was highest in Virginia, which accounted for 38 percent of U.S. coal export shipments and 22 percent of port operations and cargo handling employment related to coal export shipments in 2011. In 2011, shipments of coal comprised 77 percent of the total weight of all exported goods passing through the Norfolk, Virginia port.⁶
- ▶ **Supplier purchases and employee spending support additional economic activity:** In addition to the 39,350 direct jobs at mines, port and port services firms, and downstream transportation providers, coal exports supported an estimated 101,920 jobs in other industries, including employment at suppliers (the indirect economic contribution) and at companies that sell to employees (the induced economic contribution). Including all of these economic contributions, the total employment contribution of coal exports was more than 141,270 part-time and full-time jobs in 2011. These jobs provided U.S. workers with an estimated \$9.3 billion of labor income in 2011.

Table ES-1. Summary of estimated 2011 current U.S. economic contributions of domestically-produced coal exports

Millions of 2011 dollars; Number of full- and part-time employees

	Direct	Indirect & induced	Total
Employment			
Export coal production	25,130	63,290	88,420
Downstream transportation	8,850	31,070	39,920
Port operations & cargo handling	5,370	7,560	12,930
Total employment	39,350	101,920	141,270
Labor income			
Export coal production	\$2,622	\$3,633	\$6,255
Downstream transportation	832	1,508	2,340
Port operations & cargo handling	328	353	681
Total labor income	\$3,781	\$5,494	\$9,275
Gross value added			
Export coal production	\$5,410	\$6,313	\$11,723
Downstream transportation	1,424	2,460	3,884
Port operations & cargo handling	366	593	959
Total gross value added	\$7,200	\$9,366	\$16,566

Source: Ernst & Young LLP analysis.

⁵ U.S. Census Bureau, Foreign Trade Division. *Foreign trade statistics: port-level exports*. 2013.

⁶ *Ibid.*

Economic contributions to the U.S. economy of exports of domestically-produced coal

Introduction

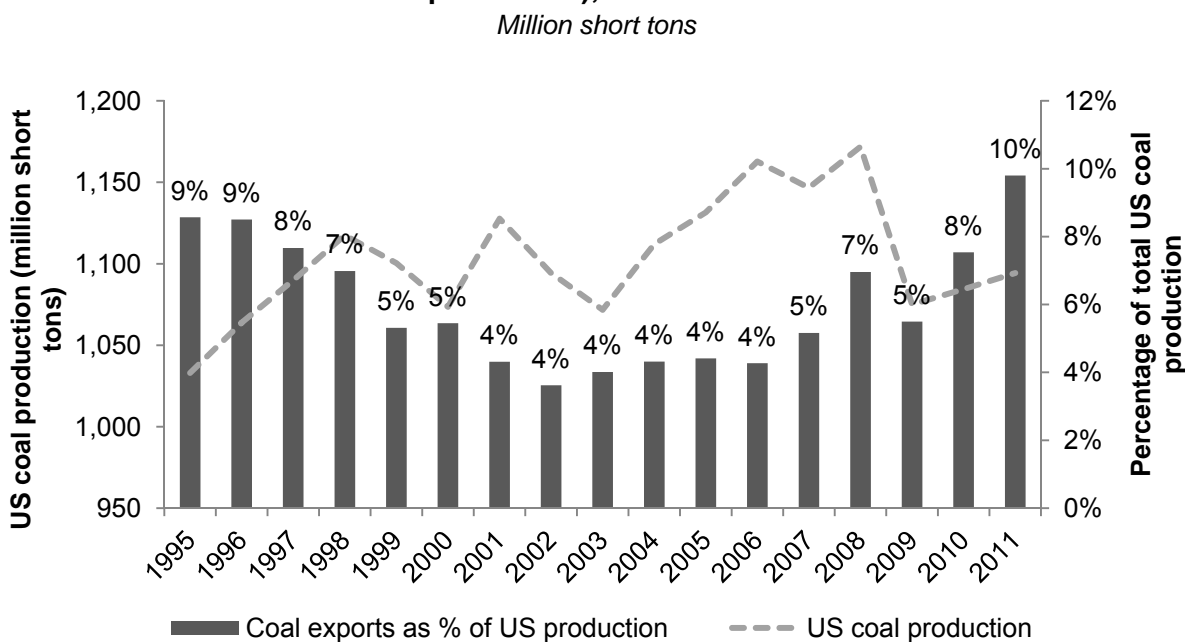
The production and export of domestic coal impacts many sectors of the U.S. economy. In 2011, there were 143,440 employees working at coal mines in the United States. Of this total, an estimated 25,130 employees were related to coal that was eventually exported abroad. However, the economic impact of coal exports in the United States extends far beyond the mine's gate. Ernst & Young LLP was commissioned by the National Mining Association (NMA) to estimate the economic contributions of coal exports in the United States. The analysis considers the current state of coal exports and estimates the economic contributions in the U.S. separately for each state, as well as the combined contributions for the U.S. overall. This study finds that, in 2011:

- ▶ There were 39,350 employees directly related to coal exports employed by coal mines, transportation companies, and port operations and cargo handling firms.
- ▶ Direct employees earned a combined total of \$3.8 billion in labor income in 2011, averaging approximately \$96,100 annually in total wages and benefits.
- ▶ An additional 101,920 employees were employed through indirect and induced economic activity, generated by purchases from domestic suppliers and employees' consumer spending.
- ▶ Total direct, indirect, and induced economic activity was related to an estimated \$16.6 billion of gross value added in the U.S. economy, an approximate measure of GDP.

The share of domestically-mined coal that is exported abroad has been increasing in recent years, generating renewed interest in the total economic contributions of coal exports and increasing the focus on the activity supported by the transportation of coal throughout the U.S. and through domestic ports. As shown in Figure 1, between 2000 and 2010, an average of five percent of the domestic coal production in the U.S. was exported. Due to a combination of reduced domestic demand for coal and increased international demand, U.S. coal exports climbed to ten percent of total U.S. domestic production in 2011.⁷ Of the total U.S. coal exports in 2011, 65 percent was metallurgical coal and 35 percent was steam coal.

⁷ In 2012, coal exports rose to 12 percent of total U.S. coal production, increasing from 107 million short tons of coal exported in 2011 to 126 million short tons in 2012. At the time of this analysis, comprehensive 2012 coal production, export, and employment data was not available. See: EIA, *Quarterly Coal Report*. 29 March 2013.

Figure 1. U.S. coal production (million short tons) and exports (percentage of total coal production), 1995 - 2011



Source: EIA, *Annual Energy Outlook 2012*.

States export significantly different shares of their coal production due to their distance from ports, the availability of transportation infrastructure, and differences in demand in world regions served efficiently from different geographic regions of the United States. For example, while Wyoming produced 40 percent of U.S. coal in 2011 (438 million short tons), the state accounted for only four percent of U.S. coal export production because only one percent of Wyoming coal is sold to customers outside the United States. In contrast, West Virginia produced 12 percent of U.S. coal in 2011 (131 million short tons), of which 27 percent was sold to customers outside of the United States.⁸

⁸ EIA, *Annual Energy Outlook 2012*.

Table 1. Coal production and production of coal for foreign export (2011)

Production state	Production	Exports		
	Millions of short tons	Millions of short tons	Share of total production	Share of total U.S. exports
WY	437.8	4.5	1%	4%
WV	131.2	35.0	27%	33%
KY	103.3	7.1	7%	7%
PA	57.4	14.6	25%	14%
TX	46.7	--	--	--
MT	38.5	13.2	34%	12%
IN	37.3	0.6	2%	1%
IL	37.2	5.5	15%	5%
ND	28.1	--	--	--
OH	27.0	--	--	--
CO	25.9	3.0	12%	3%
VA	25.2	10.8	43%	10%
NM	24.9	--	--	--
AL	19.4	10.2	52%	9%
UT	19.0	1.1	6%	1%
AZ	7.9	--	--	--
LA	3.9	--	--	--
MD	2.7	0.5	18%	0%
MS	2.7	--	--	--
AK	2.2	1.1	48%	1%
Other states	2.6	--	--	--
United States	1,080.8	107.3	10%	100%

Note: Other states include TN, OK, MO, AR, and KS (in rank order). Figures may not sum due to rounding.

A “--” indicates that there were no exports.

Source: Ernst & Young LLP analysis based on EIA production and export data.

Shipments of coal from U.S. ports also support economic activity in the states where the ports are located. In 2011, shipments of coal comprised 16 percent of the total vessel weight of exported goods passing through U.S. ports, up from 12 percent in 2007.⁹ Table 2 shows the distribution of coal export shipments, by port state. In 2011, Virginia ports accounted for 38 percent of total U.S. coal exports and coal comprised 77 percent of the total vessel weight of exported goods passing through the Norfolk, Virginia port.¹⁰ The vast majority of the coal shipments from Virginia (82 percent) were metallurgical coal due to the state’s proximity to metallurgical coal reserves in the Appalachian region and shipping routes to European countries. In 2011, 50 percent of U.S. coal exports were shipped to Europe, with nearly half shipped from Virginia.¹¹ Coal shipped through Maryland comprised 18 percent of total U.S. exports in 2011 and 81 percent of the total vessel weight of all goods exported through the Port of Baltimore.¹² Similar to Virginia shipments, coal exported through Maryland (Baltimore) was primarily metallurgical coal from the East Coast of the United States.

⁹ U.S. Census Bureau, Foreign Trade Division. *Foreign trade statistics: port-level exports*. 2013.

¹⁰ *Ibid.*

¹¹ EIA, *Annual Energy Review*. 27 September 2012.

¹² U.S. Census Bureau, Foreign Trade Division. *Foreign trade statistics: port-level exports*. 2013.

Louisiana, which accounts for approximately 20 percent of U.S. coal exports, exports mostly (70 percent) steam coal due to its location at the intersection of Mississippi barge routes serving Midwestern states with large steam coal deposits and gulf shipping routes serving Europe and Latin America. In 2011, nearly 12 percent of total coal exports through Louisiana were shipped to meet demand in Asia.¹³ Of the top five states through which coal is exported abroad, Louisiana and Washington State are the only two that ship primarily steam coal.

While Asia is the second largest export market for U.S. coal, the majority of coal shipments to Asia are from the East Coast – primarily Virginia and Maryland – due to the proximity of these ports to U.S. metallurgical coal production. Coal shipments from Washington State are typically routed by rail to Canada through the Seattle customs district and are then shipped from Canada to Asia.¹⁴ Shipping capacity restraints and the cost of transporting U.S. metallurgical coal from the East Coast limits the share of Asia’s import demand that is met by coal exports through Washington State.

Table 2. U.S. coal export shipments (2011), by port state
Millions of short tons

State of export	Steam	Metallurgical	Total	Share of total U.S. exports
VA	7.5	33.5	41.0	38%
LA	15.0	6.5	21.5	20%
MD	3.9	15.4	19.3	18%
AL	0.9	9.3	10.1	9%
WA	4.9	0.0	4.9	5%
OH	0.1	2.7	2.8	3%
MI	1.6	0.1	1.7	2%
NY	0.3	1.4	1.7	2%
CA	1.5	0.0	1.5	1%
TX	0.4	0.6	1.1	1%
AK	1.1	0.0	1.1	1%
MN	0.4	0.0	0.4	< 1%
PA	0.2	0.1	0.2	< 1%
Other states	0.0	0.0	0.0	< 1%
United States	37.7	69.5	107.3	100%

Note: Other states include (in rank order): MT, FL, ND, VT, GA, SC, IL, AZ, and MA. Figures may not sum due to rounding.
Source: Ernst & Young LLP analysis based on EIA export data.

¹³ *Ibid.*

¹⁴ EIA, *Europe and Asia are the leading destinations for U.S. coal exports in 2012*. 15 November 2012.

Study methodology

The economic contribution of mining coal for export includes transportation and port activity that occurs once the coal leaves the mine, as well as activity related to supplier industries and spending by employees. This section of the report examines each of these channels of economic contribution.

The overall economic contribution of U.S. coal exports is measured as the sum of direct, indirect, and induced economic contributions, described below and summarized in Figure 2.

- ▶ **Direct contribution of coal export-related activities.** The direct economic contribution of coal exports results from the operations of U.S. coal mines and the transportation of coal to U.S. ports where it is exported abroad via deep sea freight vessels. Mine-site employment includes employees of mines as well as contract employees that work on-site providing construction and other services. The direct contribution also includes the downstream spending on transportation services to transport coal from the mine to export facilities and abroad as well as spending on port, cargo handling, and shipping services.
- ▶ **Indirect contribution related to suppliers.** The indirect contribution of coal exports is the supplier-related economic activity that results from purchases of goods and services by coal mines and other companies included in the direct economic contribution. Purchases by mining and transportation companies from other U.S. businesses providing engineering services, utilities, telecommunications, information services, and other operating inputs support employment in these industries. In turn, these suppliers purchase operating inputs, which support additional rounds of indirect economic contributions.
- ▶ **Induced contribution related to consumer spending.** The induced economic contribution reflects the economic contribution from employee spending. Employees of coal mines, transportation companies, and other businesses directly and indirectly affected by coal exports use a portion of their incomes to purchase goods and services from U.S. businesses. These transactions support employment at businesses such as retailers, restaurants, and service companies.

As described above, the direct economic activity related to coal exports included in this report includes several activities related to the mine-to-port coal export process:¹⁵

- ▶ **Coal production.** Coal mines employ workers directly and contractors working at the mine site. In the estimates presented in the next section, coal mine contractors providing on-site construction, mining, and support activity services are included in the direct coal production contribution of coal exports. Data on coal mine and contractor employees used in this analysis is from the U.S. Department of Labor Mine Safety and Health Administration (MSHA) data. MSHA defines coal contractor activities as those related directly to the mine,

¹⁵ A detailed listing of each industry, by NAICS code and IMPLAN industry is included in Appendix A.

or contractors providing services including construction of mine facilities, equipment installation, and direct material handling within the mine.¹⁶

- ▶ **Downstream transportation activities.** Transportation expenditures occur after the coal is mined and are distributed along the transportation route. Transportation expenditures on conveying the coal to the port are modeled as expenditures on railroad, barge, and truck transportation. The majority of these expenditures (67 percent) are assumed to be distributed between the coal production state and the state from which the coal exported. The remaining 33 percent of transportation expenditures are distributed among states through which the coal passes on its way to export. Downstream transportation activities also include the related employment for deep sea vessel shipment, as the vessel is loaded and fueled at U.S. ports. The estimated number of employees and associated output (sales) per worker for the deep sea freight industry using employment and trade data published by the U.S. Census.
- ▶ **Port operations and cargo handling.** The spending by coal exporters on stevedorage, wharfing, and other port services is included as a direct impact. Spending is estimated based on the average port charges for 15 U.S. ports included in the InfoMine USA, Inc. 2011 *Coal Cost Guide*.¹⁷

The economic contributions of these three activities are measured in terms of employment, labor income, and gross value added (GDP):

- ▶ **Employment.** Employment reflects the total number (headcount) of full- and part-time employees that are directly involved in the production of coal for export (including direct mine employees and contract employees), as well as the estimated employees related to the levels of downstream transportation and port services spending.
- ▶ **Labor income.** Labor income is a component of gross value added and includes employee compensation and proprietor income. Compensation of employees consists of wages, salaries, bonuses, and employers' social insurance contributions.
- ▶ **Gross value added.** Gross value added is measured as the payments to labor and capital and includes (1) employee compensation, (2) proprietor income, (3) other property income (which includes depreciation and interest), and (4) indirect business taxes. Gross value added can also be described as total revenue (sales), less intermediate input purchases. The sum of gross value added across all industries is equivalent to national GDP.

Figure 2 shows the three components of the total economic contribution. The left-hand side of the diagram shows the components of the direct contribution, coal mines (including contractors); downstream rail, barge, and truck transportation activities (including shipping); and port activities. Each of these types of coal export-related activity creates additional economic impacts through two primary channels: (1) domestic input purchases and (2) payments to

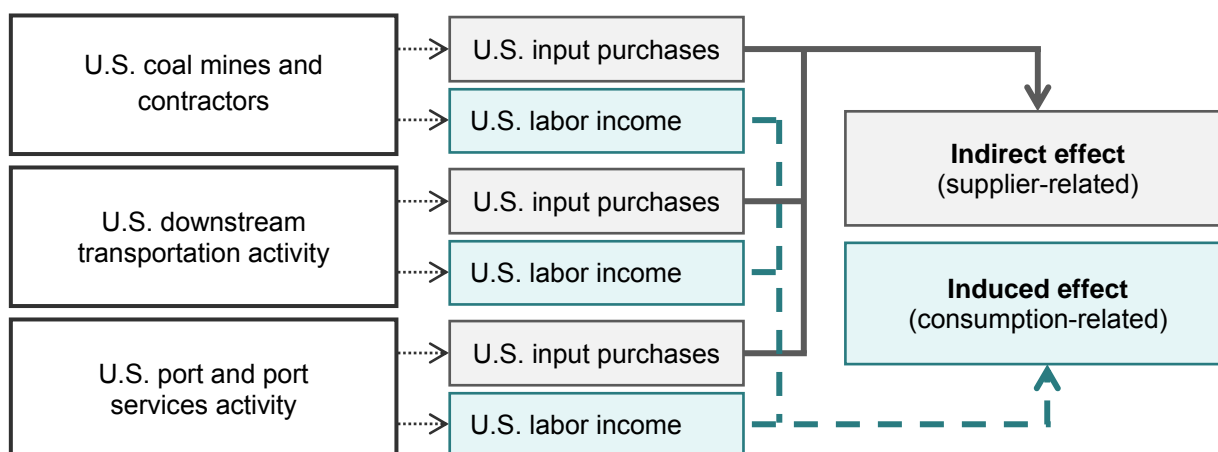
¹⁶ MSHA Policy Memorandum 82-6MM, May 26, 1982. A complete list of contractor activities covered in the MSHA data is included in Appendix A.

¹⁷ CostMine. *Mining Cost Service: Coal Cost Guide*. InfoMine USA, Inc., 2011.

employees and proprietor income (labor income). Domestic input purchases support additional indirect economic contributions as coal mines, contractors, downstream transportation providers, and port services firms purchase goods and services from U.S. businesses. The labor income earned by coal export-related employees creates induced effects resulting from consumer spending.

The magnitude of each type of economic contribution (direct, indirect, and induced) is based on the presence of industries in each state, supplier relationships, and household consumption patterns. To estimate the induced impacts, the IMPLAN model estimates the spending of direct and indirect employees, reflecting typical consumption expenditure profiles and the estimated proportion of consumption goods and services that are imported from outside of the United States.

Figure 2. Overview of the economic contribution of U.S. coal exports



These purchasing relationships of businesses and households can be translated into employment, labor income, and gross value added multipliers that reflect the overall contribution to the U.S. economy. The economic multipliers in this study were estimated using the 2010 IMPLAN input-output model of all 50 states and the District of Columbia, and the national economic model of the United States.¹⁸

For each industry, the IMPLAN model contains data describing payments made from companies in that industry to other industries and households. The model tracks these payments as they flow through the U.S. economy or leave the U.S. economy when a good or service is purchased from abroad. In this way, the model calculates the economic “multiplier” effect that occurs when each dollar of direct economic activity creates additional dollars of total economic activity through these subsequent rounds of re-spending.¹⁹

¹⁸ For more information on the IMPLAN model and technical details on the economic impact modeling used in this study, see Appendix A.

¹⁹ For a description of the treatment of individual state models and state linkages within the U.S. IMPLAN model, see Appendix A.

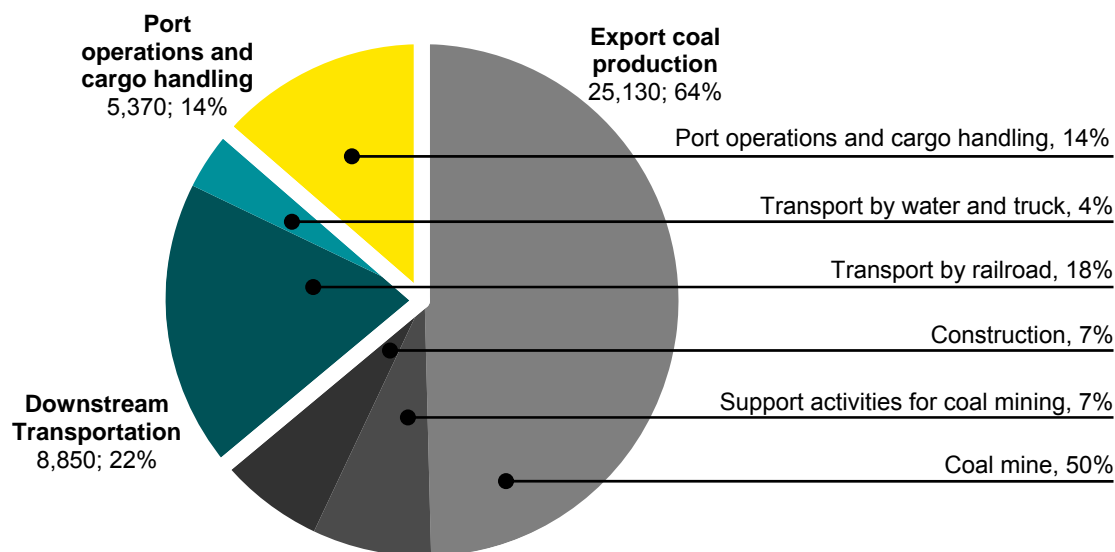
Economic contributions to the U.S. economy of exports of domestically-produced coal in 2011

Employment contributions from coal export-related activity

In 2011, there were a total of 143,440 full- and part-time coal mine and contractor employees in the United States. Of this amount, an estimated 25,130 employees (18 percent) were related to coal exports. Although coal exports in the United States comprised ten percent of total U.S. coal production, the share of production that was exported varied significantly between production states in 2011. For each state, the analysis assumes that the percentage of direct coal mining employment related to coal exports is equal to the percentage of that state's production that is exported abroad.

As shown in Figure 3, coal mining employment comprised the largest share of direct coal export-related employment, with 25,130 employees (64 percent of total direct employment, including coal mine and contractor employees performing support activities and construction at the mine).

Figure 3. Distribution of direct U.S. coal export-related employment (2011), by sector
Number of full- and part-time employees; percentage of total direct employment



Note: Figures may not sum due to rounding.

Source: Ernst & Young LLP analysis using on MSHA and EIA employment data.

Each of the three main industries included in this analysis (described in Figures 2 and in Appendix A) has a different impact on the state economy, based on the presence of suppliers and the operating profile of the industry. Table 3 shows the estimated overall employment multiplier for each coal export-related industry included in the direct contribution of coal exports. For example, the U.S. coal mining industry has a multiplier of 3.6, meaning that, for every ten direct jobs, an additional 26 jobs are supported in the United States through indirect and induced economic activity. Industries with higher output per worker (more capital intensive

industries) generally have higher employment multipliers because they purchase more inputs per employee than average. These input purchases create indirect employment. The overall employment multiplier for all U.S. coal export-related industries is 3.6.

Table 3. Comparison of IMPLAN U.S. employment headcount multipliers for each coal-export related industry

Coal export-related industry	U.S. employment multiplier
Export coal production	
Coal mine	3.6
Support activities for coal mining	4.7
Construction	2.6
Downstream transportation	
Transport by water (barge and deep sea vessel)	5.4
Transport by railroad	4.6
Transport by truck	2.4
Port operations and cargo handling	2.4
All coal export-related industries	3.6

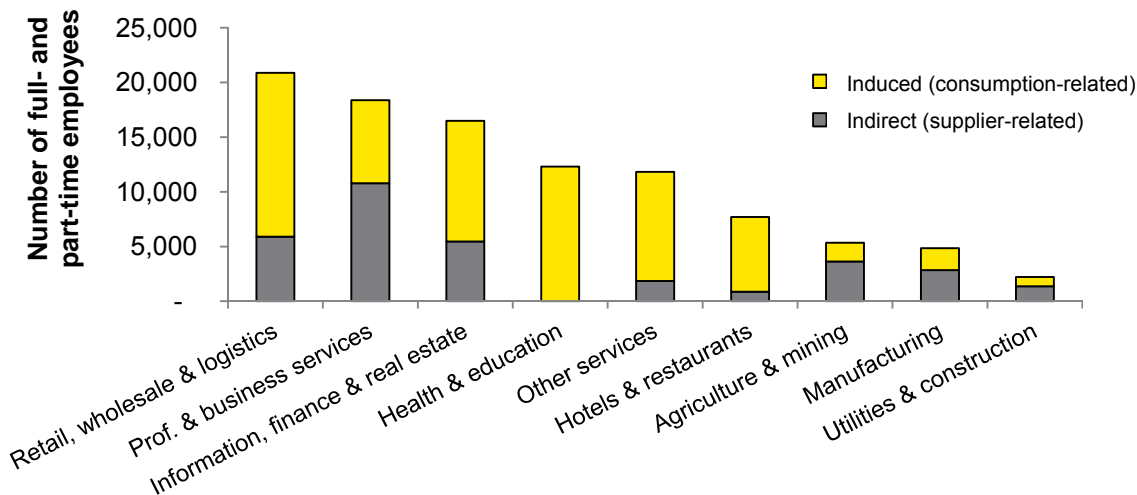
Source: Ernst & Young LLP analysis based on the 2010 U.S. IMPLAN model.

Figure 4 illustrates the distribution of the estimated indirect and induced employment impact, by major industry sector. The distribution of the indirect employment contribution is based on (1) the industries from which each direct coal export-related activity purchases inputs and (2) the presence of each of these supplier industries in the United States. For example, nearly 30 percent of the total indirect employment impact related to purchases by coal support service contractors is in the professional services industry, mostly in engineering services.

Because the induced impacts are generated by local spending by direct and indirect employees, they are concentrated in sectors such as retail, financial and real estate services, healthcare, and other services (including personal services).

Overall, total there were an estimated total of 1,320 direct, indirect, and induced employees for each million short tons of exported coal in 2011.

Figure 4. Distribution of estimated indirect and induced employment in the United States (2011), by sector



Source: Ernst & Young LLP analysis based on the IMPLAN model.

States that do not have direct coal export-related employment may have employment contributions due to indirect and induced economic activity. Direct coal export-related activity in other states purchase goods and services from firms or businesses in states that do not have any direct coal export production or do not directly supply transportation services. While these purchases are not captured by the IMPLAN model when economic contributions are estimated separately for each state, they are included in the overall U.S. contribution. To account for this difference, the estimated residual between the U.S. model and the sum of the 50 states was allocated to each state based on its share of U.S. employment, personal income, or GDP in 2011. This estimation and allocation method is described in detail in Appendix A.

Tables 4, 5, and 6 present the economic contributions of coal exports on U.S. employment, labor income, and gross value added, respectively.

Labor income contributions from coal export-related activity

In 2011, 39,350 direct coal export-related employees earned \$3.8 billion of labor income, averaging \$96,100 annually per worker. The majority of direct income (\$2.6 billion) was earned by coal mine workers and contractors involved in the production of exported coal. Coal mining and contractor employees in West Virginia earned an estimated \$937 million in labor income in 2011 (comprising 36 percent of direct labor income earned by coal mining and contractor employees in the U.S.). The estimated 8,850 direct transportation employees shown in Table 4 earned an estimated total of \$832 million in income shown in Table 5. Of this amount, \$188 million of income (23 percent) was earned by employees in Virginia.

Additional economic activity related to suppliers and businesses that sell to employees contributed an additional \$5.5 billion of indirect and induced labor income. Combining the direct,

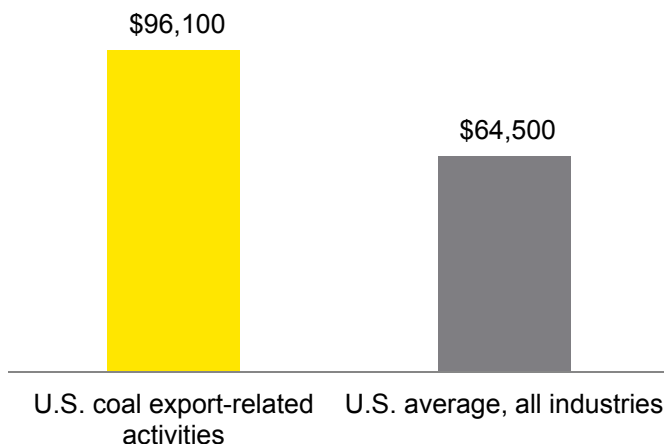
indirect, and induced economic contributions, the total contribution to labor income was an estimated \$9.3 billion in 2011.

Figure 5 compares the estimated overall average labor income per worker earned by direct coal export-related employees for all coal export-related industries, compared to the U.S. average of all employees in 2011.

Figure 5. Average annual labor income per worker for direct coal export-related industries, compared to the U.S. average (2011)

Note: The average labor income amounts shown in the chart are based on employee compensation, including all wage and salary payments, fringe benefits, commissions, bonuses, and other non-wage compensation and includes proprietor's income. The employee count used to calculate the average is the headcount of full- and part-time workers, including self-employed individuals.

Source: Ernst & Young LLP estimates based on EIA/MSHA data, the IMPLAN model, and the U.S. BEA.



Gross value added contributions from coal export-related activity

Gross value added is a broad measure of economic activity that includes payments to labor and capital, comparable to GDP. The estimates of gross value added are based on employment in each state, multiplied by the amount of value added per employee for each coal export-related industry reported by the IMPLAN model for each state. Table 5 presents the estimated 2011 contribution of coal exports to U.S. gross value added. In 2011, export coal production supported an estimated \$5.4 billion of direct gross value added, which includes \$2.6 billion of direct labor income plus payments to owners of coal export-related businesses and capital used in those businesses. This level of gross value added due to the production of coal for export equates to more than \$215,000 of gross value added per direct export coal production employee.

As shown in Table 6, 20 percent of the \$5.4 billion gross value added contribution of coal production for export is in Virginia. Virginia has among the highest gross value added per direct coal mine employee, at over \$275,000 per worker, compared to \$215,000 nationwide. This is due, in part, to the type of mining done in Virginia. A greater percentage of Virginia mines are underground mines and produce a higher-than-average share of metallurgical coal for export. The underground mines in the eastern United States are more labor intensive than the surface mines found in western states, and they generate more value added per worker.

Table 4. U.S. employment contribution of domestically-produced coal for export (2011)*Number of full- and part-time employees*

State	Direct employment contribution				Indirect & induced employment contribution	Total employment contribution
	Export coal production	Downstream transport	Port & cargo services	Total, all activities		
AL	3,360	640	530	4,530	7,800	12,330
AK	70	90	40	200	270	470
AZ	--	--	--	--	890	890
AR	--	60	--	60	530	590
CA	10	120	50	180	5,910	6,090
CO	430	120	--	550	1,680	2,230
CT	--	--	--	--	620	620
DE	--	--	--	--	140	140
FL	30	--	--	30	2,820	2,850
GA	10	--	--	10	1,500	1,510
HI	--	--	--	--	230	230
ID	--	50	--	50	340	390
IL	860	40	--	900	3,300	4,200
IN	110	20	--	130	1,200	1,330
IA	--	20	--	20	590	610
KS	--	30	--	30	570	600
KY	1,760	40	--	1,800	2,750	4,550
LA	--	430	340	770	1,950	2,720
ME	--	--	--	--	220	220
MD	340	1,370	2,920	4,630	6,650	11,280
MA	--	--	--	--	1,160	1,160
MI	10	50	50	110	1,640	1,750
MN	40	20	10	70	1,070	1,140
MS	--	10	--	10	430	440
MO	--	60	--	60	1,100	1,160
MT	500	480	--	980	1,520	2,500
NE	10	40	--	50	460	510
NV	--	30	--	30	480	510
NH	--	--	--	--	220	220
NJ	--	--	--	--	1,390	1,390
NM	--	10	--	10	320	330
NY	--	110	70	180	3,340	3,520
NC	20	--	--	20	1,490	1,510
ND	--	10	--	10	160	170
OH	--	130	90	220	2,210	2,430
OK	--	20	--	20	650	670
OR	--	--	--	--	630	630
PA	3,540	660	10	4,210	8,280	12,490
RI	--	--	--	--	160	160
SC	10	--	--	10	700	710
SD	--	40	--	40	220	260
TN	--	10	--	10	1,010	1,020
TX	--	40	20	60	4,180	4,240
UT	200	80	--	280	1,010	1,290
VT	--	--	--	--	120	120
VA	3,940	2,050	1,160	7,150	12,110	19,260
WA	--	200	80	280	1,580	1,860
WV	9,760	1,530	--	11,290	12,610	23,900
WI	20	10	--	30	990	1,020
WY	100	230	--	330	490	820
DC	--	--	--	--	230	230
U.S.	25,130	8,850	5,370	39,350	101,920	141,270

Source: Ernst & Young LLP analysis based on U.S. EIA data and the IMPLAN model.

Table 5. U.S. labor income contribution of domestically-produced coal for export (2011)*Millions of 2011 dollars*

State	Direct labor income contribution				Indirect & induced labor income contribution	Total labor income contribution
	Export coal production	Downstream transport	Port & cargo services	Total, all activities		
AL	\$434	\$53	\$31	\$517	\$337	\$855
AK	5	3	2	11	15	26
AZ	--	0	--	0	54	54
AR	--	5	--	5	27	33
CA	1	12	4	17	410	427
CO	46	13	--	59	91	150
CT	0	0	--	0	49	49
DE	--	--	--	--	9	9
FL	1	0	0	1	181	183
GA	0	0	0	0	84	84
HI	--	--	--	--	14	14
ID	0	5	--	5	16	21
IL	77	3	0	80	201	281
IN	12	2	--	15	64	78
IA	0	2	--	2	31	33
KS	--	3	--	3	30	34
KY	159	4	--	163	124	287
LA	--	44	26	70	95	165
ME	--	--	--	--	12	12
MD	27	133	176	336	346	682
MA	0	0	0	0	83	83
MI	1	5	3	9	94	104
MN	1	2	1	4	62	66
MS	--	1	--	1	23	24
MO	--	6	--	6	60	66
MT	44	47	--	90	57	147
NE	1	5	--	6	23	29
NV	0	3	--	3	26	29
NH	--	--	--	--	14	14
NJ	0	0	--	0	110	110
NM	--	1	--	1	17	18
NY	0	11	5	16	251	267
NC	1	0	--	1	84	85
ND	--	1	--	1	8	9
OH	--	13	5	18	120	138
OK	--	2	--	2	35	38
OR	0	--	--	0	35	35
PA	317	60	0	378	449	828
RI	--	--	--	--	11	11
SC	0	0	0	0	38	38
SD	0	4	--	4	11	15
TN	--	1	--	1	56	57
TX	--	4	1	6	250	256
UT	19	9	--	27	43	71
VT	--	0	--	0	6	6
VA	527	188	68	782	631	1,413
WA	0	22	6	28	96	124
WV	937	140	--	1,077	520	1,597
WI	0	1	--	1	55	56
WY	11	25	--	36	22	58
DC	--	--	--	--	11	11
U.S.	\$2,622	\$832	\$328	\$3,781	\$5,494	\$9,275

Source: Ernst & Young LLP analysis based on the IMPLAN model.

Table 6. U.S. gross value added contribution of domestically-produced coal for export (2011)*Millions of 2011 dollars*

State	Direct gross value added (GVA) contribution				Indirect & induced GVA contribution	Total GVA contribution
	Export coal production	Downstream transport	Port & cargo services	Total, all activities		
AL	\$907	\$90	\$34	\$1,031	\$568	\$1,600
AK	12	5	2	19	30	49
AZ	--	0	--	0	90	90
AR	--	9	--	9	43	52
CA	1	21	4	27	727	754
CO	94	22	--	116	159	275
CT	0	0	--	0	84	84
DE	--	--	--	--	24	24
FL	3	0	0	3	267	269
GA	0	0	0	0	145	145
HI	--	--	--	--	20	20
ID	0	9	--	9	25	34
IL	159	6	0	166	358	524
IN	25	4	--	29	115	144
IA	0	3	--	3	55	59
KS	--	6	--	6	48	54
KY	333	7	--	340	209	549
LA	--	78	29	108	175	282
ME	--	--	--	--	18	18
MD	52	246	196	494	553	1,047
MA	0	0	0	0	142	142
MI	2	9	3	14	151	166
MN	2	4	1	7	111	117
MS	--	1	--	1	33	34
MO	--	10	--	10	96	106
MT	92	79	--	171	95	266
NE	1	8	--	10	40	50
NV	0	5	--	5	51	56
NH	--	--	--	--	23	23
NJ	0	0	--	0	173	174
NM	--	2	--	2	27	28
NY	0	18	5	24	438	462
NC	2	0	--	2	152	154
ND	--	2	--	2	15	17
OH	--	22	6	28	198	226
OK	--	3	--	3	54	58
OR	0	--	--	0	69	69
PA	647	100	0	748	750	1,498
RI	--	--	--	--	17	17
SC	1	0	0	1	55	56
SD	0	6	--	7	18	24
TN	--	1	--	1	95	96
TX	--	8	2	9	475	484
UT	37	15	--	53	79	131
VT	--	0	--	0	9	9
VA	1,082	305	76	1,463	1,068	2,531
WA	0	37	7	44	163	207
WV	1,933	236	--	2,169	897	3,066
WI	0	1	--	1	94	95
WY	22	43	--	65	39	104
DC	--	--	--	--	28	28
U.S.	\$5,410	\$1,424	\$366	\$7,200	\$9,366	\$16,566

Source: Ernst & Young LLP analysis based on the IMPLAN model.

Study limitations

The estimates of the economic contribution of U.S. coal exports are based on standard methodologies and publicly available information. However, the reader should be aware of certain limitations with respect to the analysis:

- ▶ The economic contribution of coal exports is estimated assuming that the share of total coal industry employment attributable to coal exports in each state is equal to the share of that state's coal production that is exported. This implies that each ton of coal produced requires the same amount of labor and other inputs, regardless of whether or not it is exported.
- ▶ Estimates are based on static production relationships that do not incorporate potential changes in the composition of intermediate inputs, the use of labor and capital, or other production characteristics.
- ▶ Certain data used in the analysis are not available at the state level and had to be estimated based on available information. For example, transportation spending related to coal exports is not available by state.

Conclusion

In 2011, the United States produced nearly 1.1 billion short tons of coal, of which 974 million short tons were used domestically and 107 million (ten percent of total production) were exported abroad. This marks an increase in both the level of exports and the share of total U.S. production that is exported compared with 2007, when exports totaled 55 million short tons of coal (five percent of total production).

In 2011, coal exports contributed an estimated 141,270 jobs to the U.S. economy, including 39,350 direct jobs at mines, transportation companies, and ports plus more than 100,000 jobs at businesses in a wide range of industries. While this activity is concentrated in states that produce coal for export or ship coal abroad from their ports, coal exports contribute to economies in other states through employment by suppliers of machinery and operating inputs.

Appendix A. Technical description of data and modeling approach

Economic contribution model using IMPLAN

This analysis uses an input-output model to estimate the economic contributions of U.S. coal exports. The regional economic multipliers in this study were estimated using the 2010 Minnesota IMPLAN Group, Inc. Impacts for Planning (IMPLAN) input-output model of the United States and 51 state-level models, including the District of Columbia.

To model the economic contributions of coal export-related activity in each state and in the United States, the analysis mapped each activity to a specific NAICS industry and industry within the IMPLAN model, shown in Table A-1 below.

Table A-1. IMPLAN industries used to model direct coal export contributions

Type of activity	IMPLAN Code	IMPLAN Description
1. Export coal production		
Coal mine workers and contractors	21	Coal mining
Coal mining support service contractors	30	Support activities for other mining
Mine construction contractors	36	Other new nonresidential construction
2. Downstream transportation		
Barge & deep sea freight transportation	334	Water transportation
Rail transportation	333	Rail transportation
Truck transportation	335	Truck transportation
3. Port operations and cargo handling		
Support activities for water transportation	338	Support activities for transportation

Source: Ernst and Young LLP analysis.

The direct coal mining employment data relies on employment reported by MSHA in their quarterly Part 50 dataset. Part 50 of the Department of Labor Code of Federal Regulations (CFR) implements sections of the Federal Coal Mine Health and Safety Act of 1969, as well as the Federal Metal and Nonmetallic Mine Safety Health, and implements MSHA's authority to obtain information pertaining to accidents, injuries, and illnesses occurring or originating in mines. In accordance with Part 50, mine operators report employment information to MSHA for each quarter of operation at the mine. In the 2011 MSHA employment data, coal mine contractors comprised approximately one-third of total on-site coal mine employment. Based on MSHA Part 50 documentation, these on-site contractors included in the dataset performed the following functions related to coal mining:

1. Mine development, including shaft and slope sinking;
2. Construction or reconstruction of mine facilities; including building or rebuilding preparation plants and mining equipment, and building additions to existing facilities;
3. Demolition of mine facilities;
4. Construction of dams;

5. Excavation or earthmoving activities involving mobile equipment;
6. Equipment installation, such as crushers and mills;
7. Equipment service or repair of equipment on mine property for a period exceeding five consecutive days at a particular mine;
8. Material handling within mine property; including haulage of coal, ore, refuse, etc., unless for the sole purpose of direct removal from or delivery to mine property unless the majority of time is spend on mine property;
9. Drilling and blasting.²⁰

Based on these descriptions of contractor employees included in the MSHA Part 50 data, contractors were evenly distributed between IMPLAN codes 21, 30, and 36, shown in Table A-1 above.

Total contributions presented in this report include direct, indirect, and induced effects. Direct effects include employment and spending by each activity (export coal production, transportation services, and ports) in each state individually and in the United States overall. Indirect effects are attributable to input purchases from state and U.S. suppliers. Induced effects are attributable to spending by mine, transportation, port, and supplier employees, based on regional household spending patterns for nine brackets of household income contained within the IMPLAN model for each state and the United States overall.

Indirect and induced effects are driven by (1) input purchases by coal mines, transportation firms, and ports and their suppliers; (2) the percentage of each type of commodity that is purchased from within each state and the United States overall; and (3) household consumption profiles for employees.

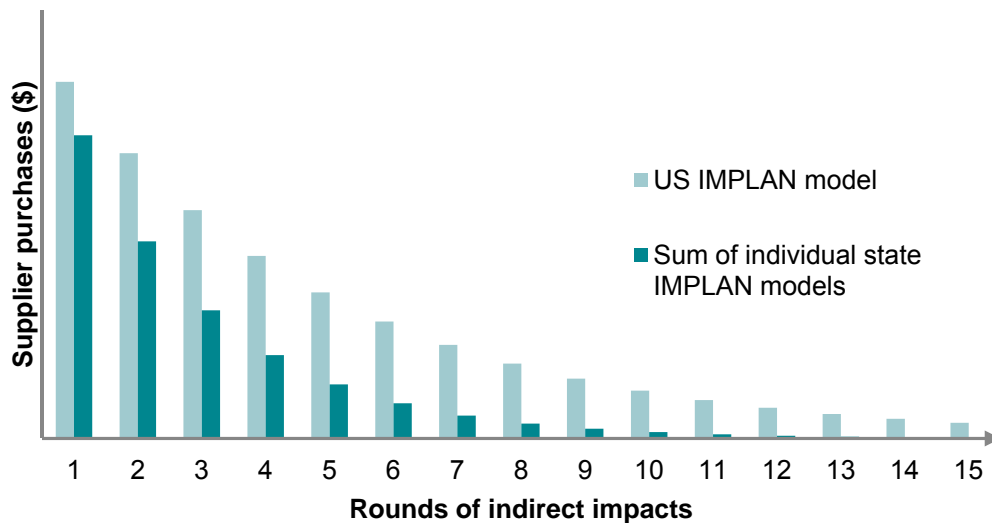
Figure A-1 illustrates the difference in estimating indirect economic contribution for the U.S., using (1) aggregated individual state results and (2) the IMPLAN model of the United States. In the figure below, the first (tallest) set of bars illustrates the total value of domestic inputs purchased by direct coal export-related activities. Only the value of domestically-supplied goods and services are included in the estimated indirect economic contribution. The ratio of domestic inputs to total inputs is called the regional purchase coefficient (RPC). Larger RPCs indicate that direct activities purchase larger shares of their total operating inputs from other U.S. firms. In the subsequent rounds of indirect contribution, supplier purchases are higher for each round of contributions in the linked U.S. model due to the capture of purchases between and among states. In the individual state models, once a purchase has left the state, it does not create additional contributions. For example, if California purchases goods and services from Oregon in round 1, that money would not create indirect contributions for California in the individual state model. However, in the linked U.S. model, California's purchases would create economic contributions in Oregon and any purchases by Oregon suppliers from suppliers in California would create similar contributions in California.

In this analysis, the residual between the U.S., linked states estimates and the estimates of each individual state is distributed to each state based on the overall distribution of total

²⁰ MSHA. *Policy Memorandum 82-6MM*, May 26, 1982.

employment, personal income, and GDP in 2011. The total residual for each metric averaged approximately one-third of the total estimated impact.

Figure A-1. Economic contribution methodology, modeling indirect contributions using individual state models and the U.S.-wide model



Economic contributions from downstream transportation and port services activities

Transportation and port activities related to coal exports in the United States were modeled using domestic transportation patterns and export information from EIA, transportation rates and port charges from EIA and InfoMine USA, Inc, and trade data published by the U.S. Census. Included in the downstream transportation costs are expenditures for coal transportation from the mine to the port by rail, truck, and barge, estimated using shipping rate data published by EIA and InfoMine USA. Downstream transportation also includes the U.S. expenditures and employment for deep sea freight vessels, exporting the coal overseas. Estimated port expenditures include spending on port and cargo services, including loading and unloading, stevedorage, and wharfage charges for dry bulk cargo, based on average port charges published by InfoMine USA in their 2010 Coal Cost Guide.

The analysis mapped transportation relationships between coal-producing (origin) states and coal consumption (destination) states were developed using EIA’s *2011 Annual Coal Distribution Report (ACDR)* and *2011 Quarterly Coal Report*.²¹ Although the EIA reports only show the origin-destination pairs for domestic use, the data do include the types of transportation used to ship coal between the origin and destination states. The analysis assumes that coal that is eventually exported from the U.S. will exit through a destination state that the coal producing state already has a transportation or supplier relationship with.

²¹ U.S. Energy Information Administration, *Annual Coal Distribution Report 2011*. U.S. Department of Energy, November 2012.

Appendix B. Individual state estimates

This section contains more detailed information for the 50 states and the District of Columbia. Each state summary contains the estimated 2011 direct, indirect, and induced economic contributions related to exports of U.S. coal.

States fall into three primary categories related to coal export economic contributions:

- 1. States with significant mining and/or port operations.** These states have significant levels of coal exports being produced within the state and/or being exported through the state's ports. Examples include West Virginia, Virginia, Kentucky, and Louisiana.
- 2. States with mining and ports, but low export-related activity.** While some states may have significant mining operations or large ports, little of this activity is exported or related to coal. For example, a small share (one percent) of Wyoming's total coal production is exported abroad. Further, although California has several major ports, a minor share of U.S. coal exports leave through California.
- 3. States with no direct mining, transportation, or port operations, but indirect and induced activity related to coal exports.** Some states without mining operations or ports are estimated to have indirect and induced economic activity. Indirect contributions in states without direct impacts may result from suppliers providing goods and services to mining, transportation, and port and cargo services firms. For example, a coal mine may purchase operating inputs from a neighboring state that does not produce coal, creating indirect impacts. Further, direct and indirect employees may purchase goods and services from providers outside of their state of residence. These purchases create induced economic impacts in states that may not have direct coal export-related activity.

Alabama

In 2011, Alabama ranked 14th in the U.S. in total coal production, producing 19.4 million short tons (mmst) of coal and employing 6,417 workers in coal mining operations. Of total coal production, 52 percent (10.2 mmst) was exported abroad and accounted for 3,360 (52 percent) of the total 6,417 coal mining jobs. Economic contributions also result from shipments of exported coal from Alabama. In 2011, 10.1 mmst were exported through Alabama ports, generating \$97 million of spending at ports and \$178 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Alabama.

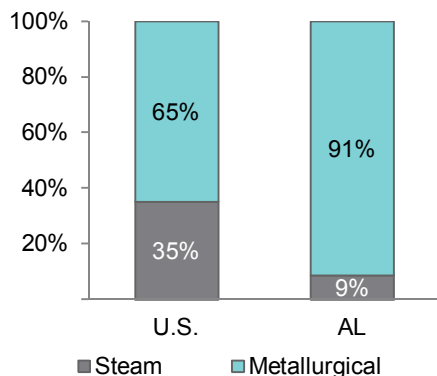
- ▶ In 2011, there were 3,360 workers directly employed in the production of coal for export, earning \$434m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 640 and 530 direct employees, respectively, earning a combined \$83m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Alabama restaurants, retail establishments, and personal services firms supported an estimated 7,810 workers with earnings of \$337m, and gross value added (GDP) totaling \$568m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 12,340 jobs, \$855m of labor income, and \$1.6bn of gross value added.

Estimated economic contributions related to coal exports

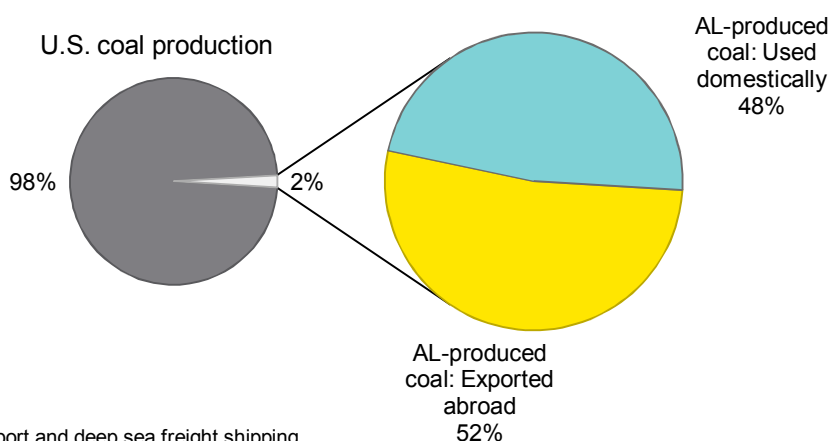
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	3,360	5,960	9,320
Downstream transportation	640	1,360	2,000
Port operations & cargo handling	530	490	1,020
Total	4,530	7,810	12,340
Labor income			
Export coal production	\$434	\$262	\$696
Downstream transportation	53	57	109
Port operations & cargo handling	31	19	49
Total	\$517	\$337	\$855
Gross value added			
Export coal production	\$907	\$451	\$1,358
Downstream transportation	90	87	177
Port operations & cargo handling	34	30	65
Total	\$1,031	\$568	\$1,600

2011 composition of U.S. and Alabama-produced coal exports



Alabama coal production and exports as a share of U.S. production



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

AL

Alaska

In 2011, Alaska ranked 20th in the U.S. in total coal production, producing 2.2 million short tons (mmst) of coal and employing 138 workers in coal mining operations. Of total coal production, 48 percent (1.1 mmst) was exported abroad and accounted for 70 (51 percent) of the total 138 coal mining jobs. Economic contributions also result from shipments of exported coal from Alaska. In 2011, 1.1 mmst were exported through Alaska ports, generating \$7 million of spending at ports and \$15 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Alaska.

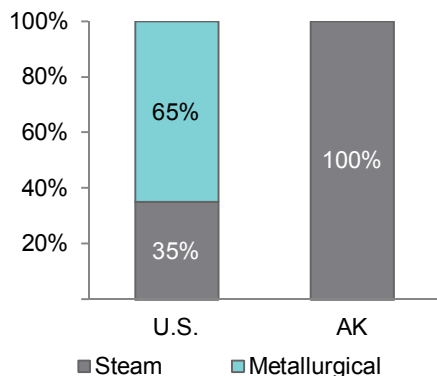
- ▶ In 2011, there were 70 workers directly employed in the production of coal for export, earning \$5m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 90 and 40 direct employees, respectively, earning a combined \$5m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Alaska restaurants, retail establishments, and personal services firms supported an estimated 280 workers with earnings of \$15m, and gross value added (GDP) totaling \$30m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 480 jobs, \$26m of labor income, and \$49m of gross value added.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	70	130	200
Downstream transportation	90	120	210
Port operations & cargo handling	40	30	70
Total	200	280	480
Labor income			
Export coal production	\$5	\$8	\$13
Downstream transportation	3	6	9
Port operations & cargo handling	2	1	3
Total	\$11	\$15	\$26
Gross value added			
Export coal production	\$12	\$16	\$28
Downstream transportation	5	11	16
Port operations & cargo handling	2	3	5
Total	\$19	\$30	\$49

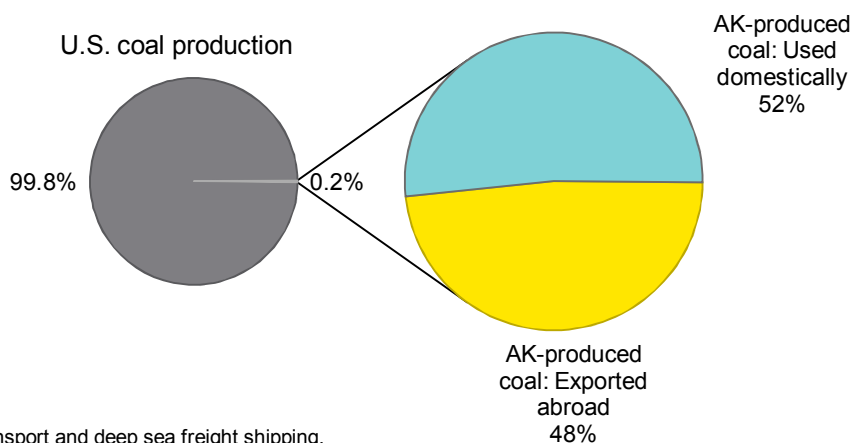
2011 composition of U.S. and Alaska-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Alaska coal production and exports as a share of U.S. production



Source: Ernst & Young LLP analysis.

Arizona

The table illustrates the estimated economic contributions related to coal exports in Arizona, nearly all of which are due to indirect and induced effects.

- ▶ Arizona produced 7.9 million short tons (mmst) of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 890 jobs, \$54m of labor income, and \$90m of gross value added.
- ▶ Indirect economic contributions result from Arizona suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Arizona and other states.
- ▶ 4 short tons of coal were exported abroad through Arizona.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	570	570
Downstream transportation	--	270	270
Port operations & cargo handling	--	50	50
Total	--	890	890
Labor income			
Export coal production	--	\$38	\$38
Downstream transportation	--	13	13
Port operations & cargo handling	--	3	3
Total	--	\$54	\$54
Gross value added			
Export coal production	--	\$64	\$64
Downstream transportation	--	22	22
Port operations & cargo handling	--	4	4
Total	--	\$90	\$90

Arkansas

The table illustrates the estimated economic contributions related to coal exports in Arkansas, nearly all of which are due to indirect and induced effects.

- ▶ Arkansas produced 7,200 short tons of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 590 jobs, \$33m of labor income, and \$52m of gross value added.
- ▶ Indirect economic contributions result from Arkansas suppliers who sell to coal mines, transportation services firms, and ports operating in Arkansas and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Arkansas and other states.
- ▶ No coal was exported abroad through Arkansas.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	270	270
Downstream transportation	60	230	290
Port operations & cargo handling	--	30	30
Total	60	530	590
Labor income			
Export coal production	--	\$16	\$16
Downstream transportation	5	10	15
Port operations & cargo handling	--	1	1
Total	\$5	\$27	\$33
Gross value added			
Export coal production	--	\$26	\$26
Downstream transportation	9	15	24
Port operations & cargo handling	--	2	2
Total	\$9	\$43	\$52

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

California

In 2011, California ranked ninth in the U.S. in coal exported through state ports, shipping 1.5 million short tons (mmst) of coal abroad. While 88 workers were employed in coal mining operations, no coal produced in California was exported abroad. Shipments of exported coal resulted in 440 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$11 million of spending at ports and \$39 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in California.

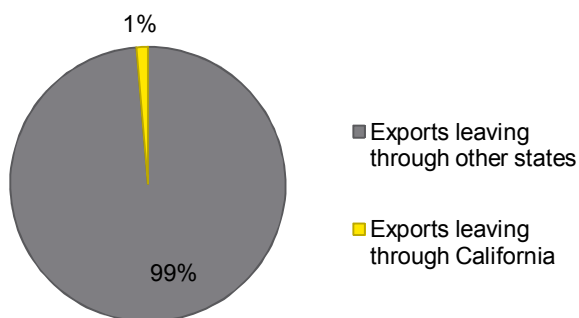
- ▶ Coal exported through California ports in 2011 accounted for 1.4 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 120 and 50 workers, respectively, earning a combined \$16m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at California restaurants, retail establishments, and personal services firms supported an estimated 5,920 workers with income of \$410m, and gross value added (GDP) totaling \$727m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 6,100 jobs, \$427m of labor income, and \$754m of gross value added.

Estimated economic contributions related to coal exports

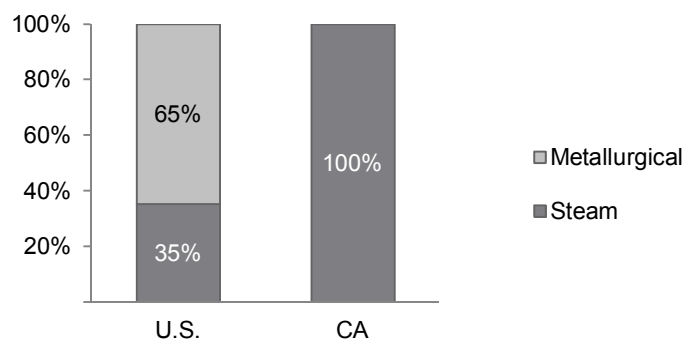
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	10	3,540	3,550
Downstream transportation	120	1,990	2,110
Port operations & cargo handling	50	390	440
Total	180	5,920	6,100
Labor income			
Export coal production	\$1	\$275	\$276
Downstream transportation	12	114	126
Port operations & cargo handling	4	21	25
Total	\$17	\$410	\$427
Gross value added			
Export coal production	\$1	\$495	\$496
Downstream transportation	21	195	216
Port operations & cargo handling	4	38	41
Total	\$27	\$727	\$754

Coal exports leaving through California as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving California



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.
Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

CA

Colorado

In 2011, Colorado ranked 11th in the U.S. in total coal production, producing 25.9 million short tons (mmst) of coal and employing 3,753 workers in coal mining operations. Of total coal production, 12 percent (3.0 mmst) was exported abroad and accounted for 430 (11 percent) of the total 3,753 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Colorado.

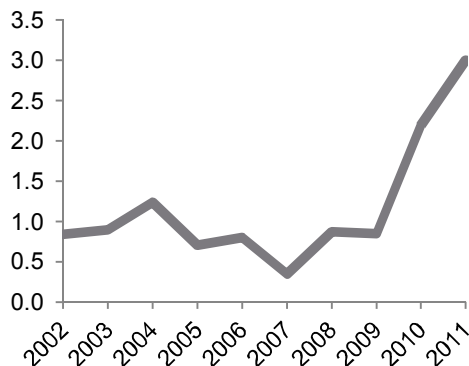
- ▶ In 2011, there were 430 workers directly employed in the production of coal for export, earning \$46m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 120 and direct employees, respectively, earning a combined \$13m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Colorado restaurants, retail establishments, and personal services firms supported an estimated 1,670 workers with earnings of \$91m, and gross value added (GDP) totaling \$159m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 2,220 jobs, \$150m of labor income, and \$275m of gross value added.

Estimated economic contributions related to coal exports

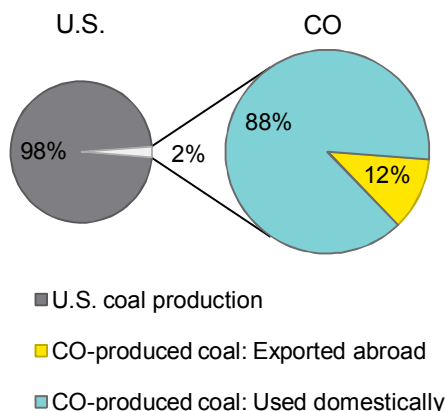
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	430	1,110	1,540
Downstream transportation	120	510	630
Port operations & cargo handling	--	50	50
Total	550	1,670	2,220
Labor income			
Export coal production	\$46	\$64	\$110
Downstream transportation	13	25	38
Port operations & cargo handling	--	3	3
Total	\$59	\$91	\$150
Gross value added			
Export coal production	\$94	\$114	\$207
Downstream transportation	22	41	63
Port operations & cargo handling	--	4	4
Total	\$116	\$159	\$275

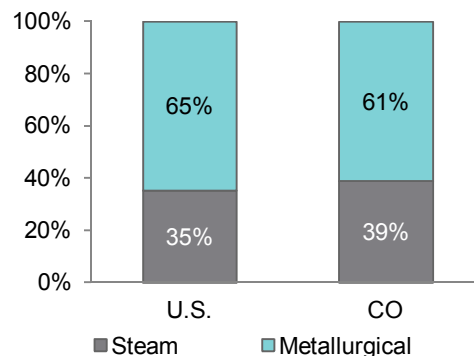
Colorado-produced coal exported abroad (mmst)



Colorado coal production and exports as a share of U.S.



2011 composition of U.S. and Colorado-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Connecticut

The table illustrates the estimated economic contributions related to coal exports in Connecticut, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Connecticut produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 620 jobs, \$49m of labor income, and \$84m of gross value added.
- ▶ Indirect economic contributions result from Connecticut suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Connecticut and other states.
- ▶ No coal was exported abroad through Connecticut.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	390	390
Downstream transportation	--	190	190
Port operations & cargo handling	--	40	40
Total	--	620	620
Labor income			
Export coal production	--	\$35	\$35
Downstream transportation	--	12	12
Port operations & cargo handling	--	2	2
Total	--	\$49	\$49
Gross value added			
Export coal production	--	\$60	\$60
Downstream transportation	--	20	20
Port operations & cargo handling	--	4	4
Total	--	\$84	\$84

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Delaware

The table illustrates the estimated economic contributions related to coal exports in Delaware, nearly all of which are due to indirect and induced effects.

- ▶ Delaware produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 140 jobs, \$9m of labor income, and \$24m of gross value added.
- ▶ Indirect economic contributions result from Delaware suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Delaware and other states.
- ▶ No coal was exported abroad through Delaware.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	90	90
Downstream transportation	--	40	40
Port operations & cargo handling	--	10	10
Total	--	140	140
Labor income			
Export coal production	--	\$6	\$6
Downstream transportation	--	2	2
Port operations & cargo handling	--	0	0
Total	--	\$9	\$9
Gross value added			
Export coal production	--	\$17	\$17
Downstream transportation	--	6	6
Port operations & cargo handling	--	1	1
Total	--	\$24	\$24

D.C.

The table illustrates the estimated economic contributions related to coal exports in the District of Columbia, nearly all of which are due to indirect and induced effects.

- ▶ D.C. produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 230 jobs, \$11m of labor income, and \$28m of gross value added.
- ▶ Indirect economic contributions result from D.C. suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in D.C. and other states.
- ▶ No coal was exported abroad through D.C.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	150	150
Downstream transportation	--	70	70
Port operations & cargo handling	--	10	10
Total	--	230	230
Labor income			
Export coal production	--	\$8	\$8
Downstream transportation	--	3	3
Port operations & cargo handling	--	1	1
Total	--	\$11	\$11
Gross value added			
Export coal production	--	\$20	\$20
Downstream transportation	--	7	7
Port operations & cargo handling	--	1	1
Total	--	\$28	\$28

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Florida

The table illustrates the estimated economic contributions related to coal exports in Florida, nearly all of which are due to indirect and induced effects.

- ▶ Florida produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 2,860 jobs, \$183m of labor income, and \$269m of gross value added.
- ▶ Indirect economic contributions result from Florida suppliers who sell to coal mines, transportation services firms, and ports operating in Florida and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Florida and other states.
- ▶ 3,772 short tons of coal were exported abroad through Florida.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	30	1,820	1,850
Downstream transportation	--	840	840
Port operations & cargo handling	--	170	170
Total	30	2,830	2,860
Labor income			
Export coal production	\$1	\$128	\$130
Downstream transportation	--	44	44
Port operations & cargo handling	--	9	9
Total	\$1	\$181	\$183
Gross value added			
Export coal production	\$3	\$191	\$194
Downstream transportation	--	63	63
Port operations & cargo handling	--	12	12
Total	\$3	\$267	\$269

Georgia

The table illustrates the estimated economic contributions related to coal exports in Georgia, nearly all of which are due to indirect and induced effects.

- ▶ Georgia produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,510 jobs, \$84m of labor income, and \$145m of gross value added.
- ▶ Indirect economic contributions result from Georgia suppliers who sell to coal mines, transportation services firms, and ports operating in Georgia and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Georgia and other states.
- ▶ 329 short tons of coal were exported abroad through Georgia.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	10	960	970
Downstream transportation	--	450	450
Port operations & cargo handling	--	90	90
Total	10	1,500	1,510
Labor income			
Export coal production	\$0	\$60	\$60
Downstream transportation	--	21	21
Port operations & cargo handling	--	4	4
Total	\$0	\$84	\$84
Gross value added			
Export coal production	\$0	\$104	\$104
Downstream transportation	--	35	35
Port operations & cargo handling	--	7	7
Total	\$0	\$145	\$145

Hawaii

The table illustrates the estimated economic contributions related to coal exports in Hawaii, nearly all of which are due to indirect and induced effects.

- ▶ Hawaii produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 230 jobs, \$14m of labor income, and \$20m of gross value added.
- ▶ Indirect economic contributions result from Hawaii suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Hawaii and other states.
- ▶ No coal was exported abroad through Hawaii.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	150	150
Downstream transportation	--	70	70
Port operations & cargo handling	--	10	10
Total	--	230	230
Labor income			
Export coal production	--	\$10	\$10
Downstream transportation	--	3	3
Port operations & cargo handling	--	1	1
Total	--	\$14	\$14
Gross value added			
Export coal production	--	\$14	\$14
Downstream transportation	--	5	5
Port operations & cargo handling	--	1	1
Total	--	\$20	\$20

Idaho

The table illustrates the estimated economic contributions related to coal exports in Idaho, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Idaho produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 390 jobs, \$21m of labor income, and \$34m of gross value added.
- ▶ Indirect economic contributions result from Idaho suppliers who sell to coal mines, transportation services firms, and ports operating in Idaho and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Idaho and other states.
- ▶ No coal was exported abroad through Idaho.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	160	160
Downstream transportation	50	170	220
Port operations & cargo handling	--	10	10
Total	50	340	390
Labor income			
Export coal production	--	\$9	\$9
Downstream transportation	5	6	11
Port operations & cargo handling	--	1	1
Total	\$5	\$16	\$21
Gross value added			
Export coal production	--	\$14	\$14
Downstream transportation	9	10	19
Port operations & cargo handling	--	1	1
Total	\$9	\$25	\$34

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Illinois

In 2011, Illinois ranked eighth in the U.S. in total coal production, producing 37.2 million short tons (mmst) of coal and employing 5,868 workers in coal mining operations. Of total coal production, 15 percent (5.5 mmst) was exported abroad and accounted for 860 (15 percent) of the total 5,868 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Illinois.

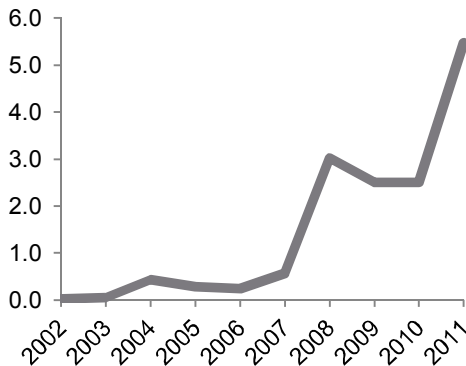
- ▶ In 2011, there were 860 workers directly employed in the production of coal for export, earning \$77m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 40 and direct employees, respectively, earning a combined \$3m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Illinois restaurants, retail establishments, and personal services firms supported an estimated 3,290 workers with earnings of \$201m, and gross value added (GDP) totaling \$358m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 4,190 jobs, \$281m of labor income, and \$524m of gross value added.

Estimated economic contributions related to coal exports

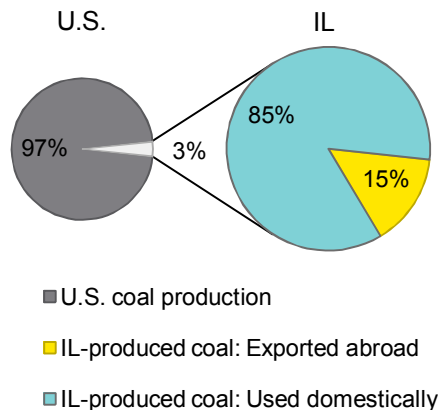
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	860	2,460	3,320
Downstream transportation	40	710	750
Port operations & cargo handling	--	120	120
Total	900	3,290	4,190
Labor income			
Export coal production	\$77	\$157	\$233
Downstream transportation	3	38	41
Port operations & cargo handling	--	6	6
Total	\$80	\$201	\$281
Gross value added			
Export coal production	\$159	\$280	\$439
Downstream transportation	6	66	73
Port operations & cargo handling	--	11	11
Total	\$166	\$358	\$524

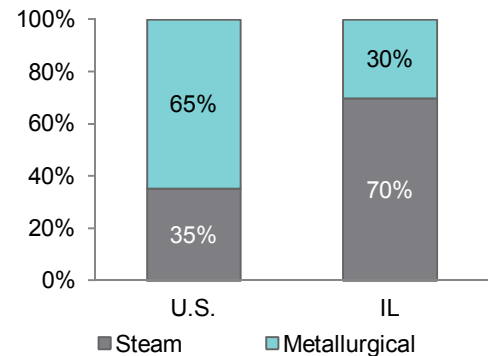
Illinois-produced coal exported abroad (mmst)



Illinois coal production and exports as a share of U.S.



2011 composition of U.S. and Illinois-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Indiana

The table illustrates the estimated economic contributions related to coal exports in Indiana, nearly all of which are due to indirect and induced effects.

- ▶ Indiana produced 37.3 million short tons (mmst) of coal, of which 642,200 was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,330 jobs, \$78m of labor income, and \$144m of gross value added.
- ▶ Indirect economic contributions result from Indiana suppliers who sell to coal mines, transportation services firms, and ports operating in Indiana and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Indiana and other states.
- ▶ No coal was exported abroad through Indiana.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	110	790	900
Downstream transportation	20	350	370
Port operations & cargo handling	--	60	60
Total	130	1,200	1,330
Labor income			
Export coal production	\$12	\$45	\$58
Downstream transportation	2	16	18
Port operations & cargo handling	--	3	3
Total	\$15	\$64	\$78
Gross value added			
Export coal production	\$25	\$83	\$108
Downstream transportation	4	27	31
Port operations & cargo handling	--	5	5
Total	\$29	\$115	\$144

Iowa

The table illustrates the estimated economic contributions related to coal exports in Iowa, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Iowa produced no coal.

- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 600 jobs, \$33m of labor income, and \$58m of gross value added.
- ▶ Indirect economic contributions result from Iowa suppliers who sell to coal mines, transportation services firms, and ports operating in Iowa and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Iowa and other states.
- ▶ No coal was exported abroad through Iowa.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	350	350
Downstream transportation	20	200	220
Port operations & cargo handling	--	30	30
Total	20	580	600
Labor income			
Export coal production	--	\$21	\$21
Downstream transportation	2	9	10
Port operations & cargo handling	--	1	1
Total	\$2	\$31	\$33
Gross value added			
Export coal production	--	\$38	\$38
Downstream transportation	3	15	18
Port operations & cargo handling	--	3	3
Total	\$3	\$55	\$58

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Kansas

The table illustrates the estimated economic contributions related to coal exports in Kansas, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Kansas produced 31,100 short tons of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 600 jobs, \$34m of labor income, and \$54m of gross value added.
- ▶ Indirect economic contributions result from Kansas suppliers who sell to coal mines, transportation services firms, and ports operating in Kansas and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Kansas and other states.
- ▶ No coal was exported abroad through Kansas.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	320	320
Downstream transportation	30	220	250
Port operations & cargo handling	--	30	30
Total	30	570	600
Labor income			
Export coal production	--	\$20	\$20
Downstream transportation	3	9	13
Port operations & cargo handling	--	1	1
Total	\$3	\$30	\$34
Gross value added			
Export coal production	--	\$32	\$32
Downstream transportation	6	15	20
Port operations & cargo handling	--	2	2
Total	\$6	\$48	\$54

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Kentucky

In 2011, Kentucky ranked third in the U.S. in total coal production, producing 103.3 million short tons (mmst) of coal and employing 25,429 workers in coal mining operations. Of total coal production, 7 percent (7.1 mmst) was exported abroad and accounted for 1,760 (7 percent) of the total 25,429 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Kentucky.

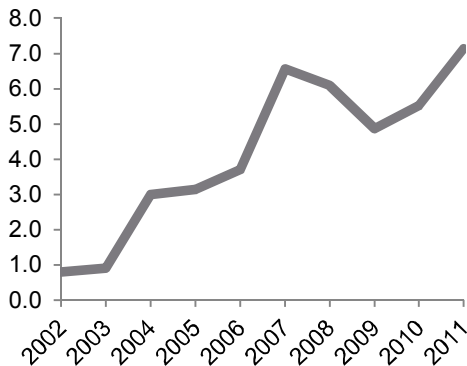
- ▶ In 2011, there were 1,760 workers directly employed in the production of coal for export, earning \$159m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 40 and direct employees, respectively, earning a combined \$4m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Kentucky restaurants, retail establishments, and personal services firms supported an estimated 2,750 workers with earnings of \$124m, and gross value added (GDP) totaling \$209m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 4,550 jobs, \$287m of labor income, and \$549m of gross value added.

Estimated economic contributions related to coal exports

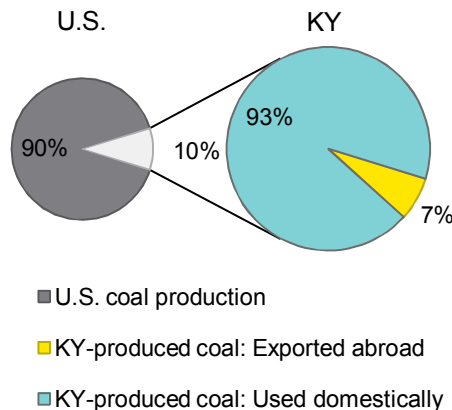
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	1,760	2,430	4,190
Downstream transportation	40	280	320
Port operations & cargo handling	--	40	40
Total	1,800	2,750	4,550
Labor income			
Export coal production	\$159	\$110	\$269
Downstream transportation	4	12	16
Port operations & cargo handling	--	2	2
Total	\$163	\$124	\$287
Gross value added			
Export coal production	\$333	\$188	\$521
Downstream transportation	7	19	26
Port operations & cargo handling	--	3	3
Total	\$340	\$209	\$549

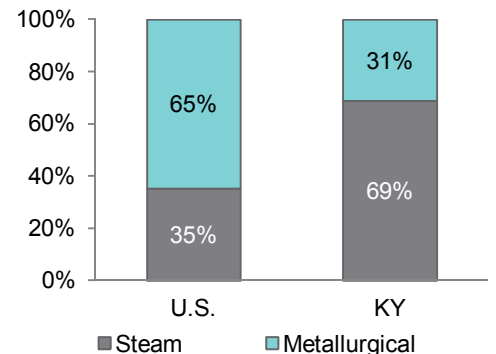
Kentucky-produced coal exported abroad (mmst)



Kentucky coal production and exports as a share of U.S.



2011 composition of U.S. and Kentucky-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.
 Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Louisiana

In 2011, Louisiana ranked second in the U.S. in coal exported through state ports, shipping 21.5 million short tons (mmst) of coal abroad. While 464 workers were employed in coal mining operations, no coal produced in Louisiana was exported abroad. Shipments of exported coal resulted in 720 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$78 million of spending at ports and \$150 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Louisiana.

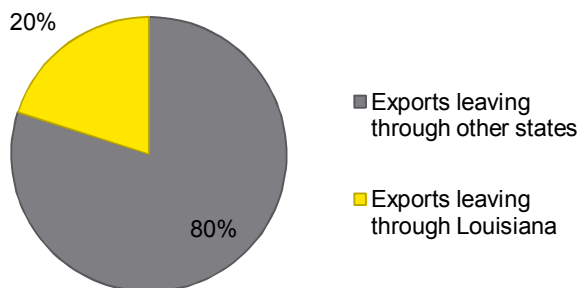
- ▶ Coal exported through Louisiana ports in 2011 accounted for 20.0 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 430 and 340 workers, respectively, earning a combined \$70m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Louisiana restaurants, retail establishments, and personal services firms supported an estimated 1,960 workers with income of \$95m, and gross value added (GDP) totaling \$175m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 2,730 jobs, \$165m of labor income, and \$282m of gross value added.

Estimated economic contributions related to coal exports

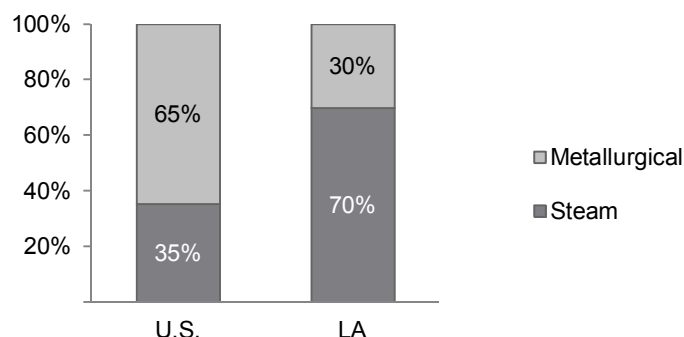
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	--	460	460
Downstream transportation	430	1,120	1,550
Port operations & cargo handling	340	380	720
Total	770	1,960	2,730
Labor income			
Export coal production	--	\$29	\$29
Downstream transportation	44	50	94
Port operations & cargo handling	26	16	42
Total	\$70	\$95	\$165
Gross value added			
Export coal production	--	\$63	\$63
Downstream transportation	78	85	163
Port operations & cargo handling	29	27	56
Total	\$108	\$175	\$282

Coal exports leaving through Louisiana as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving Louisiana



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Maine

The table illustrates the estimated economic contributions related to coal exports in Maine, nearly all of which are due to indirect and induced effects.

- ▶ Maine produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 220 jobs, \$12m of labor income, and \$18m of gross value added.
- ▶ Indirect economic contributions result from Maine suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Maine and other states.
- ▶ No coal was exported abroad through Maine.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	140	140
Downstream transportation	--	70	70
Port operations & cargo handling	--	10	10
Total	--	220	220
Labor income			
Export coal production	--	\$8	\$8
Downstream transportation	--	3	3
Port operations & cargo handling	--	1	1
Total	--	\$12	\$12
Gross value added			
Export coal production	--	\$13	\$13
Downstream transportation	--	4	4
Port operations & cargo handling	--	1	1
Total	--	\$18	\$18

Maryland

In 2011, Maryland ranked 18th in the U.S. in total coal production, producing 2.7 million short tons (mmst) of coal and employing 1,852 workers in coal mining operations. Of total coal production, 18 percent (499,100 short tons) was exported abroad and accounted for 340 (18 percent) of the total 1,852 coal mining jobs. Economic contributions also result from shipments of exported coal from Maryland. In 2011, 19.3 mmst were exported through Maryland ports, generating \$555 million of spending at ports and \$486 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Maryland.

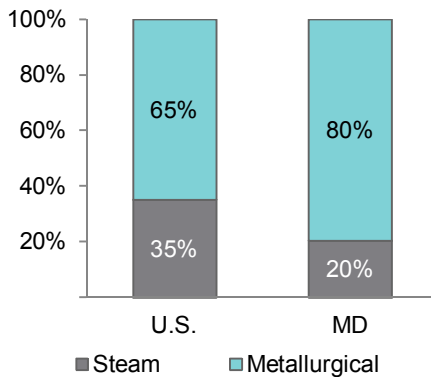
- ▶ In 2011, there were 340 workers directly employed in the production of coal for export, earning \$27m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 1,370 and 2,920 direct employees, respectively, earning a combined \$309m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Maryland restaurants, retail establishments, and personal services firms supported an estimated 6,650 workers with earnings of \$346m, and gross value added (GDP) totaling \$553m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 11,280 jobs, \$682m of labor income, and \$1.0bn of gross value added.

Estimated economic contributions related to coal exports

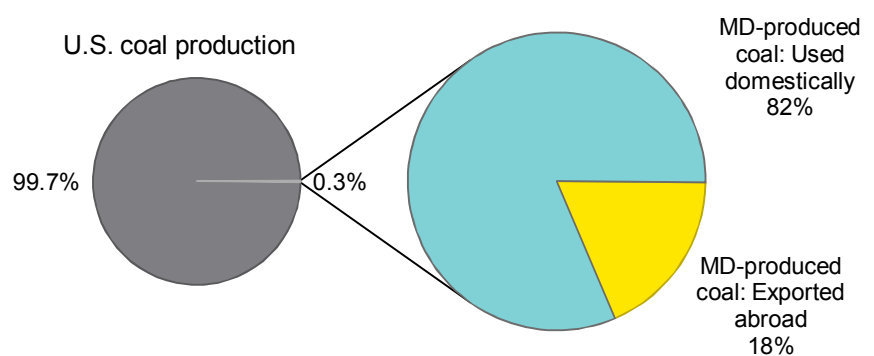
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	340	1,000	1,340
Downstream transportation	1,370	3,120	4,490
Port operations & cargo handling	2,920	2,530	5,450
Total	4,630	6,650	11,280
Labor income			
Export coal production	\$27	\$70	\$97
Downstream transportation	133	157	291
Port operations & cargo handling	176	119	294
Total	\$336	\$346	\$682
Gross value added			
Export coal production	\$52	\$105	\$157
Downstream transportation	246	251	497
Port operations & cargo handling	196	197	393
Total	\$494	\$553	\$1,047

2011 composition of U.S. and Maryland-produced coal exports



Maryland coal production and exports as a share of U.S. production



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Massachusetts

The table illustrates the estimated economic contributions related to coal exports in Massachusetts, nearly all of which are due to indirect and induced effects.

- ▶ Massachusetts produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,160 jobs, \$83m of labor income, and \$142m of gross value added.
- ▶ Indirect economic contributions result from Massachusetts suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Massachusetts and other states.
- ▶ 4 short tons of coal were exported abroad through Massachusetts.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	740	740
Downstream transportation	--	350	350
Port operations & cargo handling	--	70	70
Total	--	1,160	1,160
Labor income			
Export coal production	--	\$59	\$59
Downstream transportation	--	21	21
Port operations & cargo handling	--	4	4
Total	--	\$83	\$83
Gross value added			
Export coal production	--	\$101	\$101
Downstream transportation	--	34	34
Port operations & cargo handling	--	7	7
Total	--	\$142	\$142

Michigan

In 2011, Michigan ranked seventh in the U.S. in coal exported through state ports, shipping 1.7 million short tons (mmst) of coal abroad. While 118 workers were employed in coal mining operations, no coal produced in Michigan was exported abroad. Shipments of exported coal resulted in 190 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$10 million of spending at ports and \$17 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Michigan.

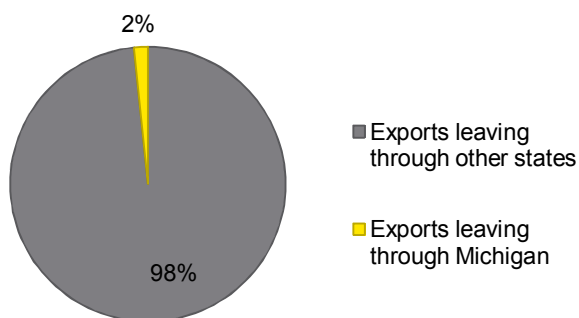
- ▶ Coal exported through Michigan ports in 2011 accounted for 1.6 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 50 and 50 workers, respectively, earning a combined \$8m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Michigan restaurants, retail establishments, and personal services firms supported an estimated 1,630 workers with income of \$94m, and gross value added (GDP) totaling \$151m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 1,740 jobs, \$104m of labor income, and \$166m of gross value added.

Estimated economic contributions related to coal exports

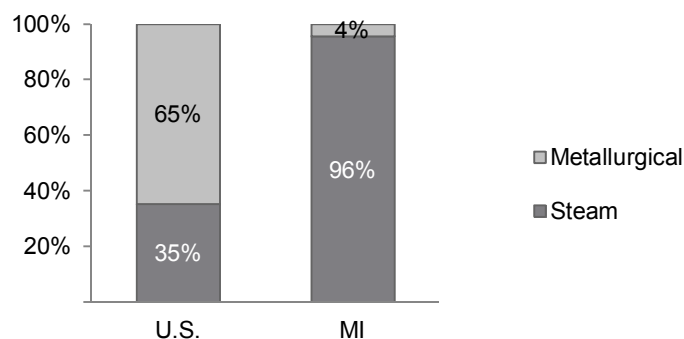
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	10	930	940
Downstream transportation	50	560	610
Port operations & cargo handling	50	140	190
Total	110	1,630	1,740
Labor income			
Export coal production	\$1	\$61	\$62
Downstream transportation	5	27	32
Port operations & cargo handling	3	6	9
Total	\$9	\$94	\$104
Gross value added			
Export coal production	\$2	\$99	\$100
Downstream transportation	9	43	52
Port operations & cargo handling	3	10	14
Total	\$14	\$151	\$166

Coal exports leaving through Michigan as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving Michigan



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

MI

Minnesota

The table illustrates the estimated economic contributions related to coal exports in Minnesota, nearly all of which are due to indirect and induced effects.

- ▶ Minnesota produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,140 jobs, \$66m of labor income, and \$117m of gross value added.
- ▶ Indirect economic contributions result from Minnesota suppliers who sell to coal mines, transportation services firms, and ports operating in Minnesota and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Minnesota and other states.
- ▶ 371,364 short tons of coal were exported abroad through Minnesota. Port operations and cargo handling directly employed 10 workers, who were paid about \$660,000.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	40	660	700
Downstream transportation	20	340	360
Port operations & cargo handling	10	70	80
Total	70	1,070	1,140
Labor income			
Export coal production	\$1	\$42	\$43
Downstream transportation	2	17	19
Port operations & cargo handling	1	3	4
Total	\$4	\$62	\$66
Gross value added			
Export coal production	\$2	\$77	\$79
Downstream transportation	4	29	33
Port operations & cargo handling	1	6	6
Total	\$7	\$111	\$117

Mississippi

The table illustrates the estimated economic contributions related to coal exports in Mississippi, nearly all of which are due to indirect and induced effects.

- ▶ Mississippi produced 2.7 million short tons (mmst) of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 440 jobs, \$24m of labor income, and \$34m of gross value added.
- ▶ Indirect economic contributions result from Mississippi suppliers who sell to coal mines, transportation services firms, and ports operating in Mississippi and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Mississippi and other states.
- ▶ No coal was exported abroad through Mississippi.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	260	260
Downstream transportation	10	140	150
Port operations & cargo handling	--	30	30
Total	10	430	440
Labor income			
Export coal production	--	\$16	\$16
Downstream transportation	1	6	7
Port operations & cargo handling	--	1	1
Total	\$1	\$23	\$24
Gross value added			
Export coal production	--	\$23	\$23
Downstream transportation	1	9	10
Port operations & cargo handling	--	2	2
Total	\$1	\$33	\$34

Missouri

The table illustrates the estimated economic contributions related to coal exports in Missouri, nearly all of which are due to indirect and induced effects.

- ▶ Missouri produced 350,300 short tons of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,170 jobs, \$66m of labor income, and \$106m of gross value added.
- ▶ Indirect economic contributions result from Missouri suppliers who sell to coal mines, transportation services firms, and ports operating in Missouri and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Missouri and other states.
- ▶ No coal was exported abroad through Missouri.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	620	620
Downstream transportation	60	430	490
Port operations & cargo handling	--	60	60
Total	60	1,110	1,170
Labor income			
Export coal production	--	\$38	\$38
Downstream transportation	6	19	25
Port operations & cargo handling	--	3	3
Total	\$6	\$60	\$66
Gross value added			
Export coal production	--	\$62	\$62
Downstream transportation	10	30	40
Port operations & cargo handling	--	4	4
Total	\$10	\$96	\$106

Montana

In 2011, Montana ranked sixth in the U.S. in total coal production, producing 38.5 million short tons (mmst) of coal and employing 1,470 workers in coal mining operations. Of total coal production, 34 percent (13.2 mmst) was exported abroad and accounted for 500 (34 percent) of the total 1,470 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Montana.

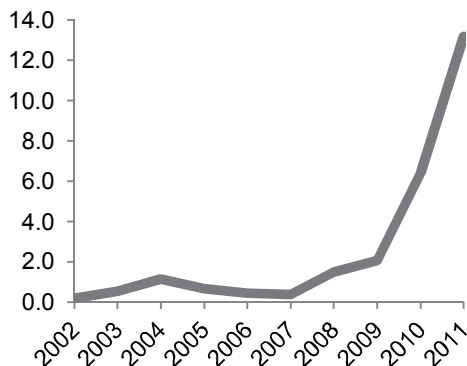
- ▶ In 2011, there were 500 workers directly employed in the production of coal for export, earning \$44m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 480 and direct employees, respectively, earning a combined \$47m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Montana restaurants, retail establishments, and personal services firms supported an estimated 1,520 workers with earnings of \$57m, and gross value added (GDP) totaling \$95m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 2,500 jobs, \$147m of labor income, and \$266m of gross value added.

Estimated economic contributions related to coal exports

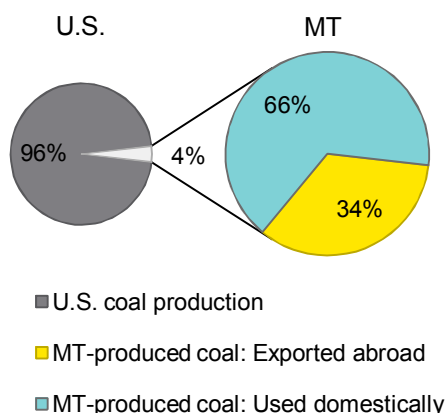
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	500	590	1,090
Downstream transportation	480	920	1,400
Port operations & cargo handling	--	10	10
Total	980	1,520	2,500
Labor income			
Export coal production	\$44	\$24	\$67
Downstream transportation	47	33	79
Port operations & cargo handling	--	0	0
Total	\$90	\$57	\$147
Gross value added			
Export coal production	\$92	\$42	\$134
Downstream transportation	79	53	132
Port operations & cargo handling	--	1	1
Total	\$171	\$95	\$266

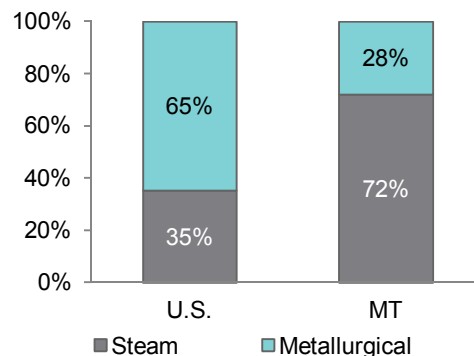
Montana-produced coal exported abroad (mmst)



Montana coal production and exports as a share of U.S.



2011 composition of U.S. and Montana-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

MT

Nebraska

The table illustrates the estimated economic contributions related to coal exports in Nebraska, nearly all of which are due to indirect and induced effects.

- ▶ Nebraska produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 500 jobs, \$29m of labor income, and \$50m of gross value added.
- ▶ Indirect economic contributions result from Nebraska suppliers who sell to coal mines, transportation services firms, and ports operating in Nebraska and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Nebraska and other states.
- ▶ No coal was exported abroad through Nebraska.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	10	230	240
Downstream transportation	40	200	240
Port operations & cargo handling	--	20	20
Total	50	450	500
Labor income			
Export coal production	\$1	\$14	\$15
Downstream transportation	5	8	13
Port operations & cargo handling	--	1	1
Total	\$6	\$23	\$29
Gross value added			
Export coal production	\$1	\$25	\$26
Downstream transportation	8	14	22
Port operations & cargo handling	--	2	2
Total	\$10	\$40	\$50

Nevada

The table illustrates the estimated economic contributions related to coal exports in Nevada, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Nevada produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 510 jobs, \$29m of labor income, and \$56m of gross value added.
- ▶ Indirect economic contributions result from Nevada suppliers who sell to coal mines, transportation services firms, and ports operating in Nevada and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Nevada and other states.
- ▶ No coal was exported abroad through Nevada.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	270	270
Downstream transportation	30	180	210
Port operations & cargo handling	--	30	30
Total	30	480	510
Labor income			
Export coal production	--	\$17	\$17
Downstream transportation	3	8	11
Port operations & cargo handling	--	1	1
Total	\$3	\$26	\$29
Gross value added			
Export coal production	--	\$33	\$33
Downstream transportation	5	15	20
Port operations & cargo handling	--	2	2
Total	\$5	\$51	\$56

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

New Hampshire

The table illustrates the estimated economic contributions related to coal exports in New Hampshire, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ New Hampshire produced no coal.

- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 220 jobs, \$14m of labor income, and \$23m of gross value added.
- ▶ Indirect economic contributions result from New Hampshire suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in New Hampshire and other states.
- ▶ No coal was exported abroad through New Hampshire.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	140	140
Downstream transportation	--	70	70
Port operations & cargo handling	--	10	10
Total	--	220	220
Labor income			
Export coal production	--	\$10	\$10
Downstream transportation	--	4	4
Port operations & cargo handling	--	1	1
Total	--	\$14	\$14
Gross value added			
Export coal production	--	\$16	\$16
Downstream transportation	--	5	5
Port operations & cargo handling	--	1	1
Total	--	\$23	\$23

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

New Jersey

The table illustrates the estimated economic contributions related to coal exports in New Jersey, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ New Jersey produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,380 jobs, \$110m of labor income, and \$173m of gross value added.
- ▶ Indirect economic contributions result from New Jersey suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in New Jersey and other states.
- ▶ No coal was exported abroad through New Jersey.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	880	880
Downstream transportation	--	420	420
Port operations & cargo handling	--	80	80
Total	--	1,380	1,380
Labor income			
Export coal production	--	\$77	\$77
Downstream transportation	--	27	27
Port operations & cargo handling	--	5	5
Total	--	\$110	\$110
Gross value added			
Export coal production	--	\$123	\$123
Downstream transportation	--	42	42
Port operations & cargo handling	--	8	8
Total	--	\$173	\$173

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

New Mexico

The table illustrates the estimated economic contributions related to coal exports in New Mexico, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ New Mexico produced 24.9 million short tons (mmst) of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 330 jobs, \$18m of labor income, and \$28m of gross value added.
- ▶ Indirect economic contributions result from New Mexico suppliers who sell to coal mines, transportation services firms, and ports operating in New Mexico and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in New Mexico and other states.
- ▶ No coal was exported abroad through New Mexico.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	190	190
Downstream transportation	10	110	120
Port operations & cargo handling	--	20	20
Total	10	320	330
Labor income			
Export coal production	--	\$12	\$12
Downstream transportation	1	5	6
Port operations & cargo handling	--	1	1
Total	\$1	\$17	\$18
Gross value added			
Export coal production	--	\$18	\$18
Downstream transportation	2	7	9
Port operations & cargo handling	--	1	1
Total	\$2	\$27	\$28

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

New York

In 2011, New York ranked eighth in the U.S. in coal exported through state ports, shipping 1.7 million short tons (mmst) of coal abroad. While 26 workers were employed in coal mining operations, no coal produced in New York was exported abroad. Shipments of exported coal resulted in 320 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$15 million of spending at ports and \$33 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in New York.

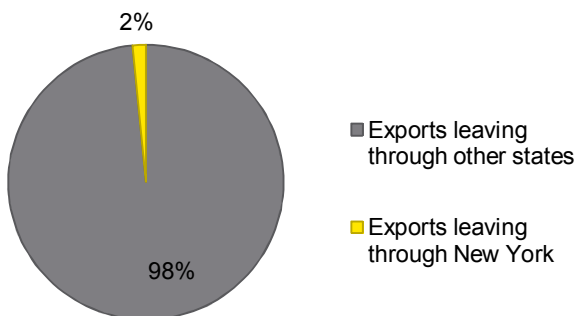
- ▶ Coal exported through New York ports in 2011 accounted for 1.6 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 110 and 70 workers, respectively, earning a combined \$15m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at New York restaurants, retail establishments, and personal services firms supported an estimated 3,350 workers with income of \$251m, and gross value added (GDP) totaling \$438m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 3,530 jobs, \$267m of labor income, and \$461m of gross value added.

Estimated economic contributions related to coal exports

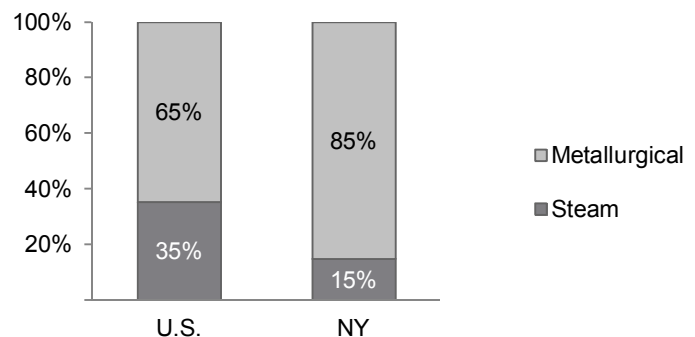
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	--	1,970	1,970
Downstream transportation	110	1,130	1,240
Port operations & cargo handling	70	250	320
Total	180	3,350	3,530
Labor income			
Export coal production	--	\$166	\$166
Downstream transportation	11	71	81
Port operations & cargo handling	5	15	20
Total	\$15	\$251	\$267
Gross value added			
Export coal production	--	\$294	\$294
Downstream transportation	18	119	137
Port operations & cargo handling	5	25	31
Total	\$23	\$438	\$461

Coal exports leaving through New York as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving New York



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

North Carolina

The table illustrates the estimated economic contributions related to coal exports in North Carolina, nearly all of which are due to indirect and induced effects.

- ▶ North Carolina produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,510 jobs, \$85m of labor income, and \$154m of gross value added.
- ▶ Indirect economic contributions result from North Carolina suppliers who sell to coal mines, transportation services firms, and ports operating in North Carolina and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in North Carolina and other states.
- ▶ No coal was exported abroad through North Carolina.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	20	960	980
Downstream transportation	--	440	440
Port operations & cargo handling	--	90	90
Total	20	1,490	1,510
Labor income			
Export coal production	\$1	\$59	\$60
Downstream transportation	--	20	20
Port operations & cargo handling	--	4	4
Total	\$1	\$84	\$85
Gross value added			
Export coal production	\$2	\$109	\$111
Downstream transportation	--	36	36
Port operations & cargo handling	--	7	7
Total	\$2	\$152	\$154

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

North Dakota

The table illustrates the estimated economic contributions related to coal exports in North Dakota, nearly all of which are due to indirect and induced effects.

- ▶ North Dakota produced 28.1 million short tons (mmst) of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 170 jobs, \$9m of labor income, and \$17m of gross value added.
- ▶ Indirect economic contributions result from North Dakota suppliers who sell to coal mines, transportation services firms, and ports operating in North Dakota and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in North Dakota and other states.
- ▶ 2,350 short tons of coal were exported abroad through North Dakota.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	90	90
Downstream transportation	10	60	70
Port operations & cargo handling	--	10	10
Total	10	160	170
Labor income			
Export coal production	--	\$5	\$5
Downstream transportation	1	3	4
Port operations & cargo handling	--	0	0
Total	\$1	\$8	\$9
Gross value added			
Export coal production	--	\$10	\$10
Downstream transportation	2	5	6
Port operations & cargo handling	--	1	1
Total	\$2	\$15	\$17

Ohio

In 2011, Ohio ranked sixth in the U.S. in coal exported through state ports, shipping 2.8 million short tons (mmst) of coal abroad. While 5,119 workers were employed in coal mining operations, no coal produced in Ohio was exported abroad. Shipments of exported coal resulted in 290 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$16 million of spending at ports and \$42 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Ohio.

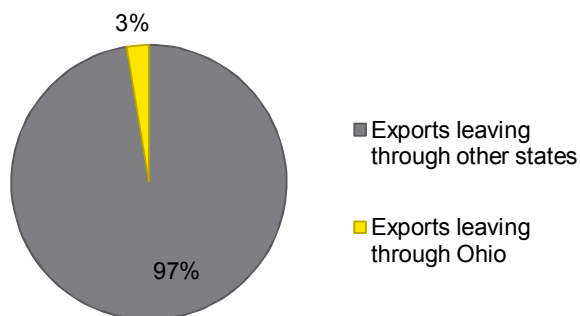
Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

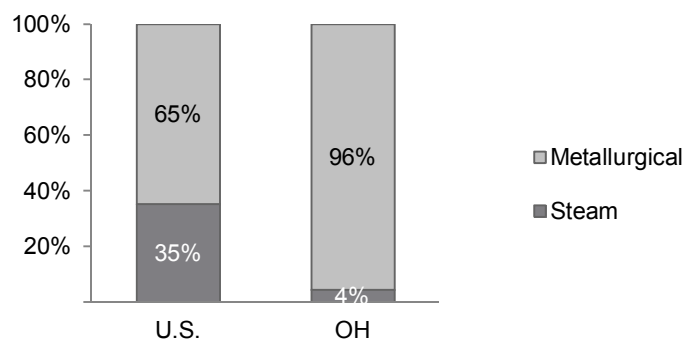
- ▶ Coal exported through Ohio ports in 2011 accounted for 2.6 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 130 and 90 workers, respectively, earning a combined \$18m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Ohio restaurants, retail establishments, and personal services firms supported an estimated 2,210 workers with income of \$120m, and gross value added (GDP) totaling \$198m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 2,430 jobs, \$138m of labor income, and \$226m of gross value added.

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	--	1,150	1,150
Downstream transportation	130	860	990
Port operations & cargo handling	90	200	290
Total	220	2,210	2,430
Labor income			
Export coal production	--	\$73	\$73
Downstream transportation	13	39	52
Port operations & cargo handling	5	8	14
Total	\$18	\$120	\$138
Gross value added			
Export coal production	--	\$122	\$122
Downstream transportation	22	62	84
Port operations & cargo handling	6	14	20
Total	\$28	\$198	\$226

Coal exports leaving through Ohio as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving Ohio



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Oklahoma

The table illustrates the estimated economic contributions related to coal exports in Oklahoma, nearly all of which are due to indirect and induced effects.

- ▶ Oklahoma produced 773,100 short tons of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 660 jobs, \$38m of labor income, and \$58m of gross value added.
- ▶ Indirect economic contributions result from Oklahoma suppliers who sell to coal mines, transportation services firms, and ports operating in Oklahoma and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Oklahoma and other states.
- ▶ No coal was exported abroad through Oklahoma.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	380	380
Downstream transportation	20	220	240
Port operations & cargo handling	--	40	40
Total	20	640	660
Labor income			
Export coal production	--	\$24	\$24
Downstream transportation	2	10	12
Port operations & cargo handling	--	2	2
Total	\$2	\$35	\$38
Gross value added			
Export coal production	--	\$37	\$37
Downstream transportation	3	15	19
Port operations & cargo handling	--	2	2
Total	\$3	\$54	\$58

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Oregon

The table illustrates the estimated economic contributions related to coal exports in Oregon, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Oregon produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 620 jobs, \$35m of labor income, and \$69m of gross value added.
- ▶ Indirect economic contributions result from Oregon suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Oregon and other states.
- ▶ No coal was exported abroad through Oregon.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	390	390
Downstream transportation	--	190	190
Port operations & cargo handling	--	40	40
Total	--	620	620
Labor income			
Export coal production	--	\$24	\$24
Downstream transportation	--	9	9
Port operations & cargo handling	--	2	2
Total	--	\$35	\$35
Gross value added			
Export coal production	--	\$49	\$49
Downstream transportation	--	17	17
Port operations & cargo handling	--	3	3
Total	--	\$69	\$69

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Pennsylvania

In 2011, Pennsylvania ranked fourth in the U.S. in total coal production, producing 57.4 million short tons (mmst) of coal and employing 13,886 workers in coal mining operations. Of total coal production, 25 percent (14.6 mmst) was exported abroad and accounted for 3,540 (25 percent) of the total 13,886 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Pennsylvania.

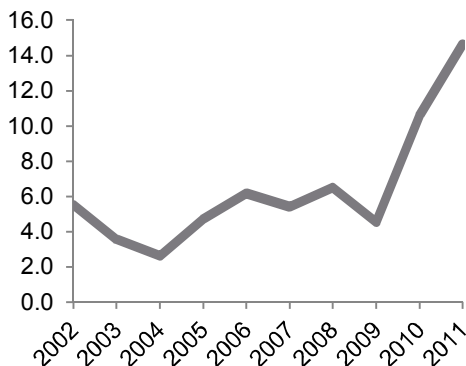
- ▶ In 2011, there were 3,540 workers directly employed in the production of coal for export, earning \$317m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 660 and 10 direct employees, respectively, earning a combined \$61m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Pennsylvania restaurants, retail establishments, and personal services firms supported an estimated 8,300 workers with earnings of \$449m, and gross value added (GDP) totaling \$750m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 12,510 jobs, \$828m of labor income, and \$1.5bn of gross value added.

Estimated economic contributions related to coal exports

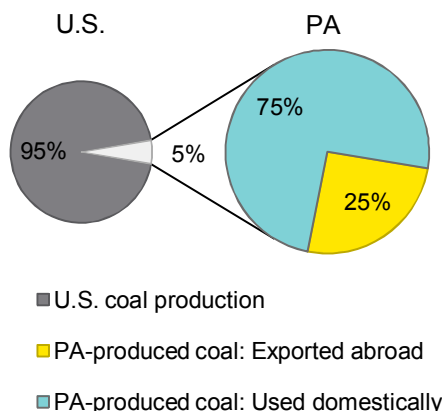
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	3,540	6,180	9,720
Downstream transportation	660	1,990	2,650
Port operations & cargo handling	10	130	140
Total	4,210	8,300	12,510
Labor income			
Export coal production	\$317	\$342	\$659
Downstream transportation	60	101	162
Port operations & cargo handling	0	6	7
Total	\$378	\$449	\$828
Gross value added			
Export coal production	\$647	\$580	\$1,227
Downstream transportation	100	160	260
Port operations & cargo handling	0	10	11
Total	\$748	\$750	\$1,498

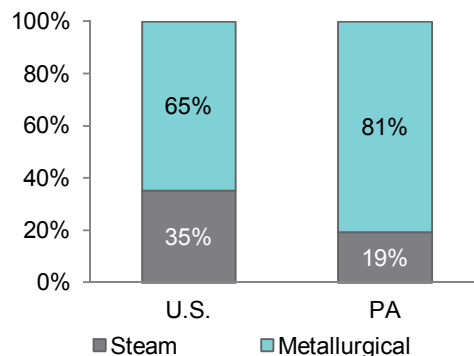
Pennsylvania-produced coal exported abroad (mmst)



Pennsylvania coal production and exports as a share of U.S.



2011 composition of U.S. and Pennsylvania-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.
 Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Rhode Island

The table illustrates the estimated economic contributions related to coal exports in Rhode Island, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ Rhode Island produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 160 jobs, \$11m of labor income, and \$17m of gross value added.
- ▶ Indirect economic contributions result from Rhode Island suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Rhode Island and other states.
- ▶ No coal was exported abroad through Rhode Island.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	100	100
Downstream transportation	--	50	50
Port operations & cargo handling	--	10	10
Total	--	160	160
Labor income			
Export coal production	--	\$8	\$8
Downstream transportation	--	3	3
Port operations & cargo handling	--	1	1
Total	--	\$11	\$11
Gross value added			
Export coal production	--	\$12	\$12
Downstream transportation	--	4	4
Port operations & cargo handling	--	1	1
Total	--	\$17	\$17

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

South Carolina

The table illustrates the estimated economic contributions related to coal exports in South Carolina, nearly all of which are due to indirect and induced effects.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

- ▶ South Carolina produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 710 jobs, \$38m of labor income, and \$56m of gross value added.
- ▶ Indirect economic contributions result from South Carolina suppliers who sell to coal mines, transportation services firms, and ports operating in South Carolina and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in South Carolina and other states.
- ▶ 122 short tons of coal were exported abroad through South Carolina.

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	10	450	460
Downstream transportation	--	210	210
Port operations & cargo handling	--	40	40
Total	10	700	710
Labor income			
Export coal production	\$0	\$27	\$27
Downstream transportation	--	9	9
Port operations & cargo handling	--	2	2
Total	\$0	\$38	\$38
Gross value added			
Export coal production	\$1	\$40	\$40
Downstream transportation	--	13	13
Port operations & cargo handling	--	3	3
Total	\$1	\$55	\$56

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

South Dakota

The table illustrates the estimated economic contributions related to coal exports in South Dakota, nearly all of which are due to indirect and induced effects.

- ▶ South Dakota produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 250 jobs, \$15m of labor income, and \$24m of gross value added.
- ▶ Indirect economic contributions result from South Dakota suppliers who sell to coal mines, transportation services firms, and ports operating in South Dakota and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in South Dakota and other states.
- ▶ No coal was exported abroad through South Dakota.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	100	100
Downstream transportation	40	100	140
Port operations & cargo handling	--	10	10
Total	40	210	250
Labor income			
Export coal production	--	\$6	\$6
Downstream transportation	4	4	8
Port operations & cargo handling	--	0	0
Total	\$4	\$11	\$15
Gross value added			
Export coal production	--	\$10	\$10
Downstream transportation	6	7	13
Port operations & cargo handling	--	1	1
Total	\$6	\$18	\$24

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Tennessee

The table illustrates the estimated economic contributions related to coal exports in Tennessee, nearly all of which are due to indirect and induced effects.

- ▶ Tennessee produced 1.4 million short tons (mmst) of coal, none of which was exported abroad.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,020 jobs, \$57m of labor income, and \$96m of gross value added.
- ▶ Indirect economic contributions result from Tennessee suppliers who sell to coal mines, transportation services firms, and ports operating in Tennessee and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Tennessee and other states.
- ▶ No coal was exported abroad through Tennessee.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	630	630
Downstream transportation	10	320	330
Port operations & cargo handling	--	60	60
Total	10	1,010	1,020
Labor income			
Export coal production	--	\$39	\$39
Downstream transportation	1	15	15
Port operations & cargo handling	--	3	3
Total	\$1	\$56	\$57
Gross value added			
Export coal production	--	\$66	\$66
Downstream transportation	1	24	25
Port operations & cargo handling	--	4	4
Total	\$1	\$95	\$96

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Texas

In 2011, Texas ranked 10th in the U.S. in coal exported through state ports, shipping 1.1 million short tons (mmst) of coal abroad. While 4,957 workers were employed in coal mining operations, no coal produced in Texas was exported abroad. Shipments of exported coal resulted in 290 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$4 million of spending at ports and \$14 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Texas.

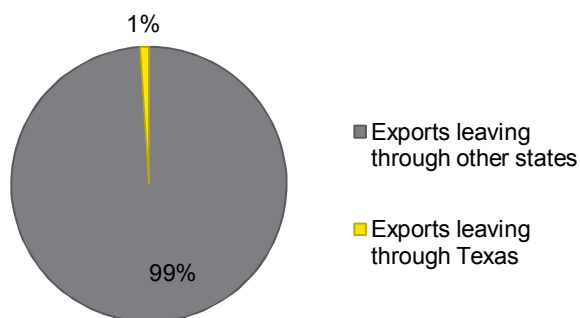
- ▶ Coal exported through Texas ports in 2011 accounted for 1.0 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 40 and 20 workers, respectively, earning a combined \$6m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Texas restaurants, retail establishments, and personal services firms supported an estimated 4,180 workers with income of \$250m, and gross value added (GDP) totaling \$475m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 4,240 jobs, \$256m of labor income, and \$484m of gross value added.

Estimated economic contributions related to coal exports

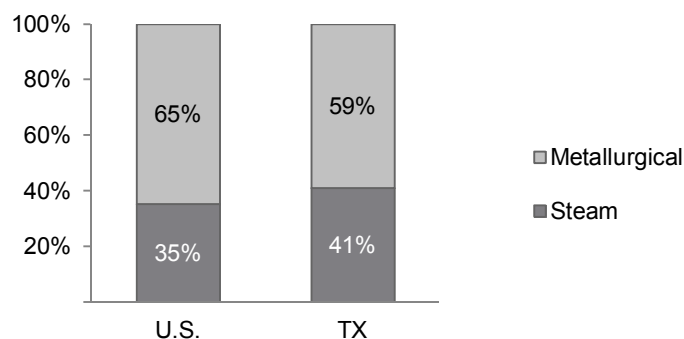
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	--	2,570	2,570
Downstream transportation	40	1,340	1,380
Port operations & cargo handling	20	270	290
Total	60	4,180	4,240
Labor income			
Export coal production	--	\$172	\$172
Downstream transportation	4	66	70
Port operations & cargo handling	1	13	14
Total	\$6	\$250	\$256
Gross value added			
Export coal production	--	\$330	\$330
Downstream transportation	8	121	128
Port operations & cargo handling	2	24	25
Total	\$9	\$475	\$484

Coal exports leaving through Texas as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving Texas



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.
 Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Utah

In 2011, Utah ranked 15th in the U.S. in total coal production, producing 19.0 million short tons (mmst) of coal and employing 3,529 workers in coal mining operations. Of total coal production, 6 percent (1.1 mmst) was exported abroad and accounted for 200 (6 percent) of the total 3,529 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Utah.

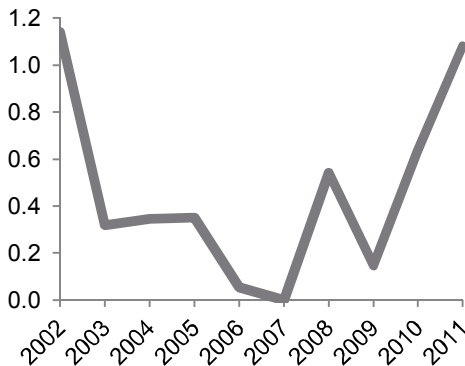
- ▶ In 2011, there were 200 workers directly employed in the production of coal for export, earning \$19m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 80 and direct employees, respectively, earning a combined \$9m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Utah restaurants, retail establishments, and personal services firms supported an estimated 1,010 workers with earnings of \$43m, and gross value added (GDP) totaling \$79m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 1,290 jobs, \$71m of labor income, and \$131m of gross value added.

Estimated economic contributions related to coal exports

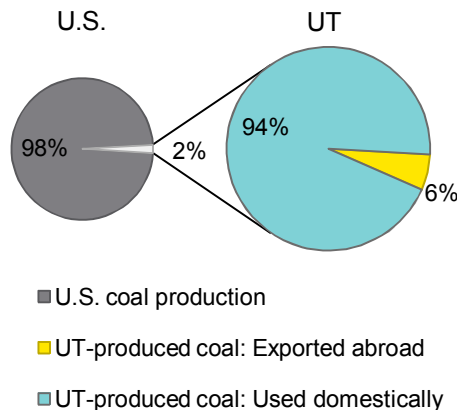
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	200	610	810
Downstream transportation	80	370	450
Port operations & cargo handling	--	30	30
Total	280	1,010	1,290
Labor income			
Export coal production	\$19	\$28	\$47
Downstream transportation	9	14	23
Port operations & cargo handling	--	1	1
Total	\$27	\$43	\$71
Gross value added			
Export coal production	\$37	\$52	\$89
Downstream transportation	15	25	40
Port operations & cargo handling	--	2	2
Total	\$53	\$79	\$131

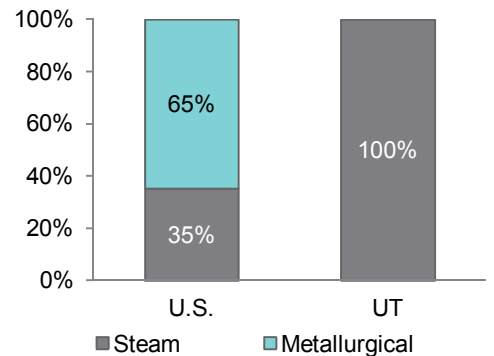
Utah-produced coal exported abroad (mmst)



Utah coal production and exports as a share of U.S. production



2011 composition of U.S. and Utah-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Vermont

The table illustrates the estimated economic contributions related to coal exports in Vermont, nearly all of which are due to indirect and induced effects.

- ▶ Vermont produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 120 jobs, \$6m of labor income, and \$9m of gross value added.
- ▶ Indirect economic contributions result from Vermont suppliers who sell to coal mines, transportation services firms, and ports operating in other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Vermont and other states.
- ▶ 507 short tons of coal were exported abroad through Vermont.

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	--	70	70
Downstream transportation	--	40	40
Port operations & cargo handling	--	10	10
Total	--	120	120
Labor income			
Export coal production	--	\$4	\$4
Downstream transportation	--	2	2
Port operations & cargo handling	--	0	0
Total	--	\$6	\$6
Gross value added			
Export coal production	--	\$6	\$6
Downstream transportation	--	2	2
Port operations & cargo handling	--	0	0
Total	--	\$9	\$9

Virginia

In 2011, Virginia ranked 12th in the U.S. in total coal production, producing 25.2 million short tons (mmst) of coal and employing 9,149 workers in coal mining operations. Of total coal production, 43 percent (10.8 mmst) was exported abroad and accounted for 3,940 (43 percent) of the total 9,149 coal mining jobs. Economic contributions also result from shipments of exported coal from Virginia. In 2011, 41.0 mmst were exported through Virginia ports, generating \$216 million of spending at ports and \$551 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Virginia.

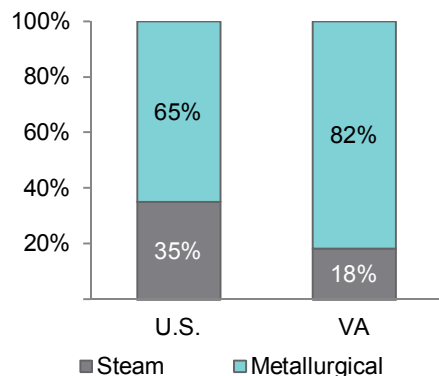
- ▶ In 2011, there were 3,940 workers directly employed in the production of coal for export, earning \$527m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 2,050 and 1,160 direct employees, respectively, earning a combined \$256m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Virginia restaurants, retail establishments, and personal services firms supported an estimated 12,110 workers with earnings of \$631m, and gross value added (GDP) totaling \$1,068m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 19,260 jobs, \$1,413m of labor income, and \$2.5bn of gross value added.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	3,940	7,210	11,150
Downstream transportation	2,050	3,880	5,930
Port operations & cargo handling	1,160	1,020	2,180
Total	7,150	12,110	19,260
Labor income			
Export coal production	\$527	\$388	\$915
Downstream transportation	188	195	383
Port operations & cargo handling	68	47	115
Total	\$782	\$631	\$1,413
Gross value added			
Export coal production	\$1,082	\$677	\$1,759
Downstream transportation	305	313	618
Port operations & cargo handling	76	78	155
Total	\$1,463	\$1,068	\$2,531

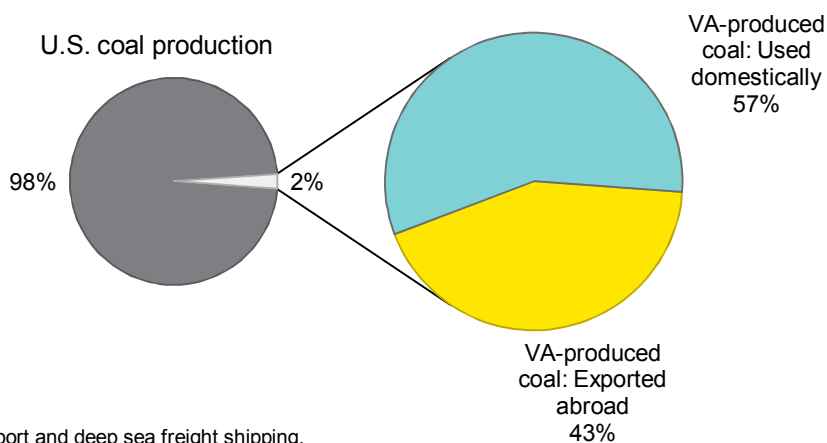
2011 composition of U.S. and Virginia-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.
Values may not appear to sum due to rounding.

Virginia coal production and exports as a share of U.S. production



Source: Ernst & Young LLP analysis.

Washington

In 2011, Washington ranked fifth in the U.S. in coal exported through state ports, shipping 4.9 million short tons (mmst) of coal abroad. While 128 workers were employed in coal mining operations, no coal produced in Washington was exported abroad. Shipments of exported coal resulted in 220 direct, indirect, and induced jobs related to port operations and cargo handling. These exports generated \$18 million of spending at ports and \$68 million of spending on other transportation services.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Washington.

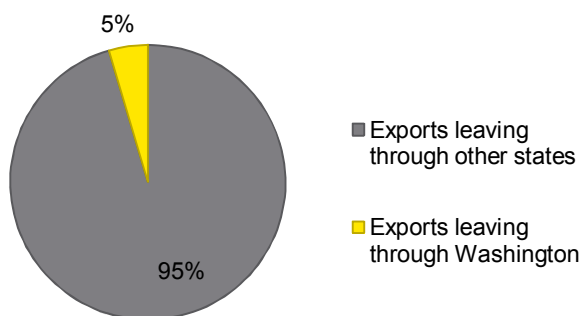
- ▶ Coal exported through Washington ports in 2011 accounted for 4.6 percent of all U.S. exports.
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters directly employed an estimated 200 and 80 workers, respectively, earning a combined \$28m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Washington restaurants, retail establishments, and personal services firms supported an estimated 1,570 workers with income of \$96m, and gross value added (GDP) totaling \$163m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 1,850 jobs, \$124m of labor income, and \$207m of gross value added.

Estimated economic contributions related to coal exports

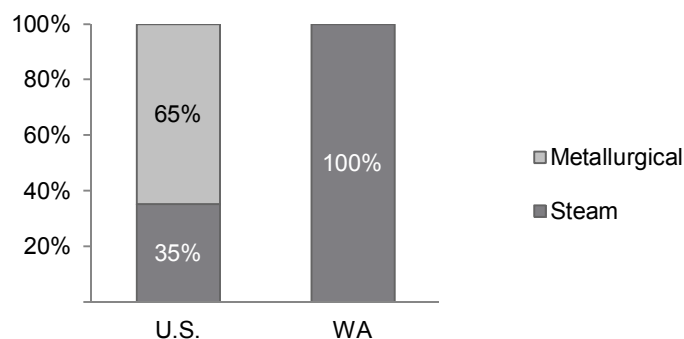
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	--	680	680
Downstream transportation	200	750	950
Port operations & cargo handling	80	140	220
Total	280	1,570	1,850
Labor income			
Export coal production	--	\$50	\$50
Downstream transportation	22	39	61
Port operations & cargo handling	6	7	13
Total	\$28	\$96	\$124
Gross value added			
Export coal production	--	\$86	\$86
Downstream transportation	37	65	102
Port operations & cargo handling	7	12	19
Total	\$44	\$163	\$207

Coal exports leaving through Washington as a share of total U.S. exports



2011 composition of U.S. exports and exports leaving Washington



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

West Virginia

In 2011, West Virginia ranked second in the U.S. in total coal production, producing 131.2 million short tons (mmst) of coal and employing 36,552 workers in coal mining operations. Of total coal production, 27 percent (35.0 mmst) was exported abroad and accounted for 9,760 (27 percent) of the total 36,552 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in West Virginia.

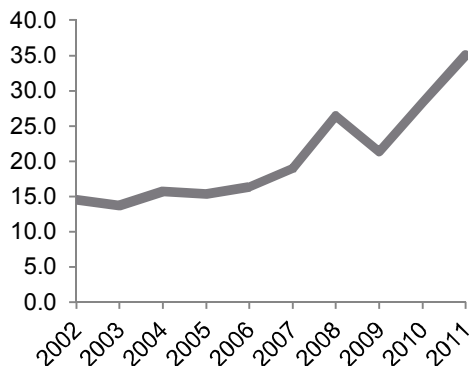
- ▶ In 2011, there were 9,760 workers directly employed in the production of coal for export, earning \$937m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 1,530 direct employees, respectively, earning a combined \$140m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at West Virginia restaurants, retail establishments, and personal services firms supported an estimated 12,600 workers with earnings of \$520m, and gross value added (GDP) totaling \$897m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 23,890 jobs, \$1.6bn of labor income, and \$3.1bn of gross value added.

Estimated economic contributions related to coal exports

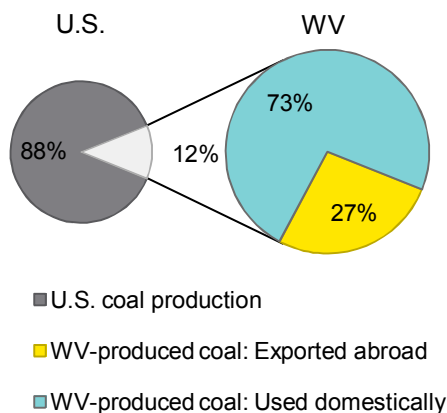
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	9,760	10,210	19,970
Downstream transportation	1,530	2,370	3,900
Port operations & cargo handling	--	20	20
Total	11,290	12,600	23,890
Labor income			
Export coal production	\$937	\$424	\$1,361
Downstream transportation	140	95	235
Port operations & cargo handling	--	1	1
Total	\$1,077	\$520	\$1,597
Gross value added			
Export coal production	\$1,933	\$746	\$2,679
Downstream transportation	236	150	386
Port operations & cargo handling	--	1	1
Total	\$2,169	\$897	\$3,066

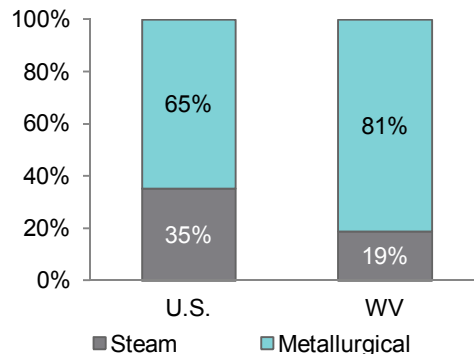
West Virginia-produced coal exported abroad (mmst)



West Virginia coal production and exports as a share of U.S.



2011 composition of U.S. and West Virginia-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.

Wisconsin

The table illustrates the estimated economic contributions related to coal exports in Wisconsin, nearly all of which are due to indirect and induced effects.

- ▶ Wisconsin produced no coal.
- ▶ The total estimated direct, indirect, and induced contribution related to coal exports in 2011 is 1,030 jobs, \$56m of labor income, and \$95m of gross value added.
- ▶ Indirect economic contributions result from Wisconsin suppliers who sell to coal mines, transportation services firms, and ports operating in Wisconsin and other states.
- ▶ Induced economic contributions are due to firms providing goods and services to direct and indirect employees in Wisconsin and other states.
- ▶ No coal was exported abroad through Wisconsin.

Estimated economic contributions related to coal exports

Millions of 2011 dollars; number of full- and part-time employees

	2011		Total
	Direct	Indirect & induced	
Employment			
Export coal production	20	630	650
Downstream transportation	10	310	320
Port operations & cargo handling	--	60	60
Total	30	1,000	1,030
Labor income			
Export coal production	\$0	\$39	\$39
Downstream transportation	1	14	15
Port operations & cargo handling	--	3	3
Total	\$1	\$55	\$56
Gross value added			
Export coal production	\$0	\$66	\$67
Downstream transportation	1	23	24
Port operations & cargo handling	--	4	4
Total	\$1	\$94	\$95

Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping.

Values may not appear to sum due to rounding.

"--" indicates no economic contribution; "\$0" indicates a value less than \$500,000.

Source: Ernst & Young LLP analysis.

Wyoming

In 2011, Wyoming ranked first in the U.S. in total coal production, producing 437.8 million short tons (mmst) of coal and employing 9,578 workers in coal mining operations. Of total coal production, 1 percent (4.5 mmst) was exported abroad and accounted for 100 (1 percent) of the total 9,578 coal mining jobs.

The table illustrates the estimated direct, indirect, and induced economic contributions of coal exports in Wyoming.

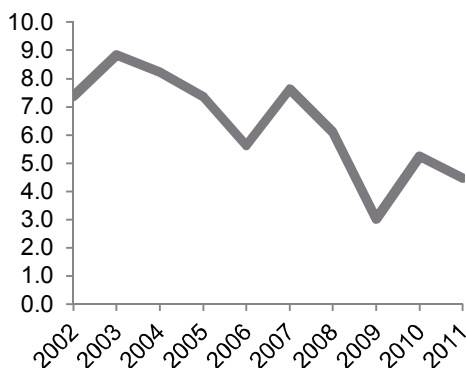
- ▶ In 2011, there were 100 workers directly employed in the production of coal for export, earning \$11m in labor income (wages + benefits).
- ▶ 2011 expenditures on transportation and port and cargo services by coal exporters supported an estimated 230 and direct employees, respectively, earning a combined \$25m.
- ▶ The indirect effects from purchases of operating inputs and the induced effects of consumer spending by direct and indirect employees at Wyoming restaurants, retail establishments, and personal services firms supported an estimated 500 workers with earnings of \$22m, and gross value added (GDP) totaling \$39m.
- ▶ The total estimated direct, indirect, and induced contribution related to exports in 2011 is 830 jobs, \$58m of labor income, and \$104m of gross value added.

Estimated economic contributions related to coal exports

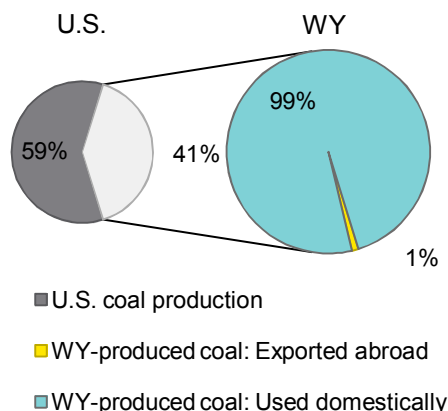
Millions of 2011 dollars; number of full- and part-time employees

	2011		
	Direct	Indirect & induced	Total
Employment			
Export coal production	100	150	250
Downstream transportation	230	340	570
Port operations & cargo handling	--	10	10
Total	330	500	830
Labor income			
Export coal production	\$11	\$8	\$18
Downstream transportation	25	13	39
Port operations & cargo handling	--	0	0
Total	\$36	\$22	\$58
Gross value added			
Export coal production	\$22	\$16	\$38
Downstream transportation	43	23	66
Port operations & cargo handling	--	1	1
Total	\$65	\$39	\$104

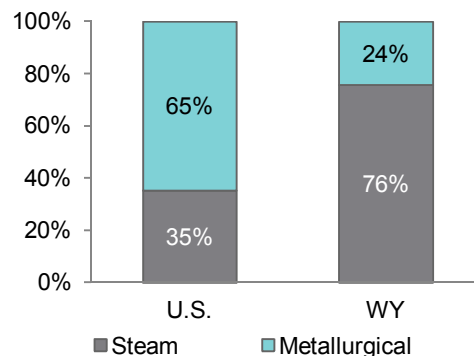
Wyoming-produced coal exported abroad (mmst)



Wyoming coal production and exports as a share of U.S.



2011 composition of U.S. and Wyoming-produced coal exports



Notes:

Downstream transportation includes barge, rail, and truck transport and deep sea freight shipping. Values may not appear to sum due to rounding.

Source: Ernst & Young LLP analysis.