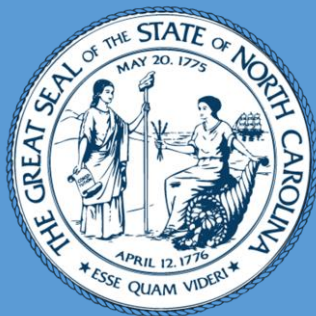


ASSESSMENT OF WESTERN NORTH CAROLINA COMMUNITIES FOR POTENTIAL COAL IMPACTS

Prepared for the North Carolina Department of Commerce
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March 2017



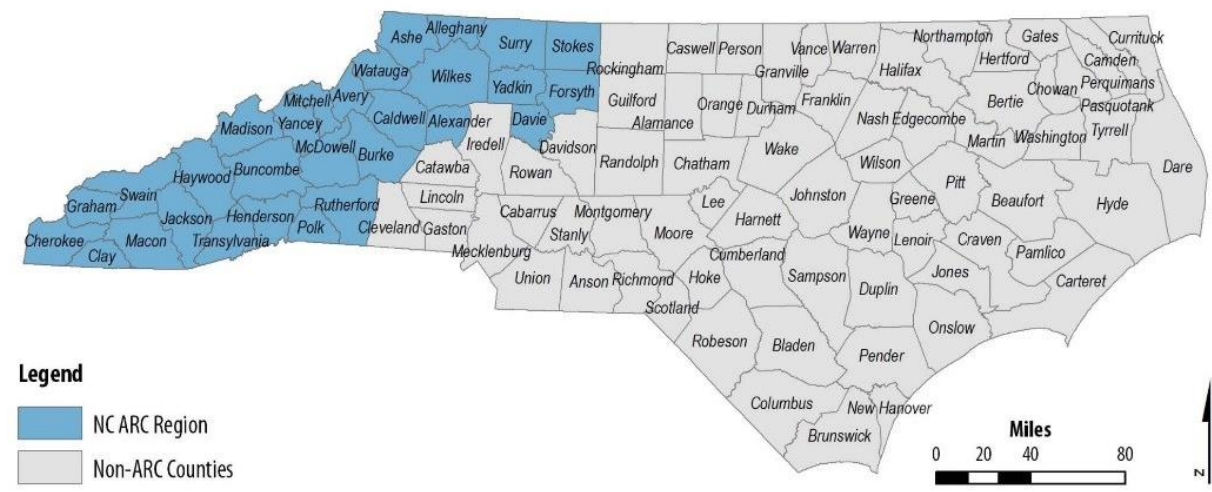
I. Introduction

Recognizing the significant economic challenges facing parts of the U.S. due to the continued and accelerated decline of coal industry production and power generation, the federal government initiated the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative.¹ Western North Carolina (see Figure 1) lies within the federally-designated definition of Appalachia and thus, parts of North Carolina could apply for POWER funds through the Appalachian Regional Commission (ARC) which were over \$45 million in 2016.²

That said, North Carolina does not have an active coal mining industry, so assessing “coal reliant communities” in the state is not as straight-forward as it might be for other states. To assist North Carolina and its communities in exploring and estimating potential communities (at the county-level) that might have experienced impacts due to the decline in the coal industry, Hodge Economic Consulting focused on analyzing:

- Coal-fired power plants – either current ones that may be planning to close or have already been shut down or converted to other uses;
- Supply chain impacts – examining businesses in North Carolina that are suppliers to coal-related companies and activities;
- Transportation impacts – coal has traditionally been one of the largest (by tonnage) commodities moved by rail and barge but recent declines are impacting transportation service firms; and
- North Carolina workers affected by coal declines – it’s possible that declines in coal may impact businesses near North Carolina, resulting in job losses for North Carolina workers commuting to neighboring states.

Figure 1. Western North Carolina – Appalachian Regional Commission Counties

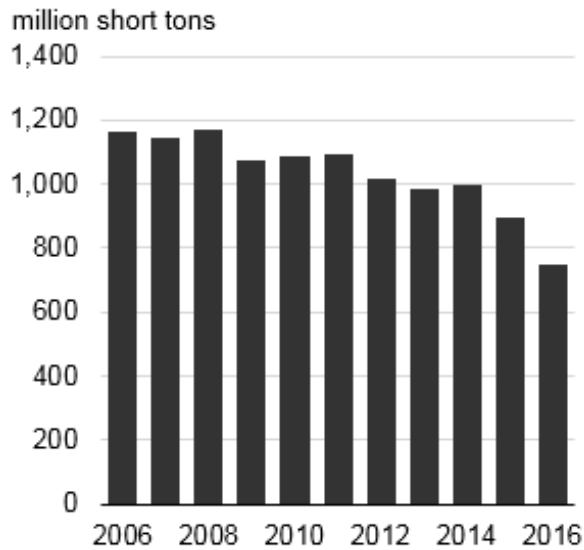


¹ <https://www.whitehouse.gov/the-press-office/2015/03/27/fact-sheet-partnerships-opportunity-and-workforce-and-economic-revitaliz>

² <http://www.arc.gov/funding/POWER.asp>

Underpinning this work and the POWER program is the measurable decline in coal production and consumption in the United States. As shown in Figure 2, U.S. coal production has been steadily declining since a peak in 2008, dropping by about 36 percent overall to 2016, and contracting 17 percent since 2015. Coal production is at its lowest point since 1978 according to the Energy Information Administration (EIA) and natural gas electricity generation exceeded coal for the first time ever.

Figure 2. U.S. Coal Production 2006 to 2016



Source: Energy Information Administration

The remainder of this report is organized around the data findings, research and identification of possible coal impacts centered on: 1) coal-fired power plants; 2) supply chain impacts; 3) transportation impacts; and 4) North Carolina workers affected by coal industry. The report concludes with a summary of findings of the most significant coal-related impacts in Western North Carolina.

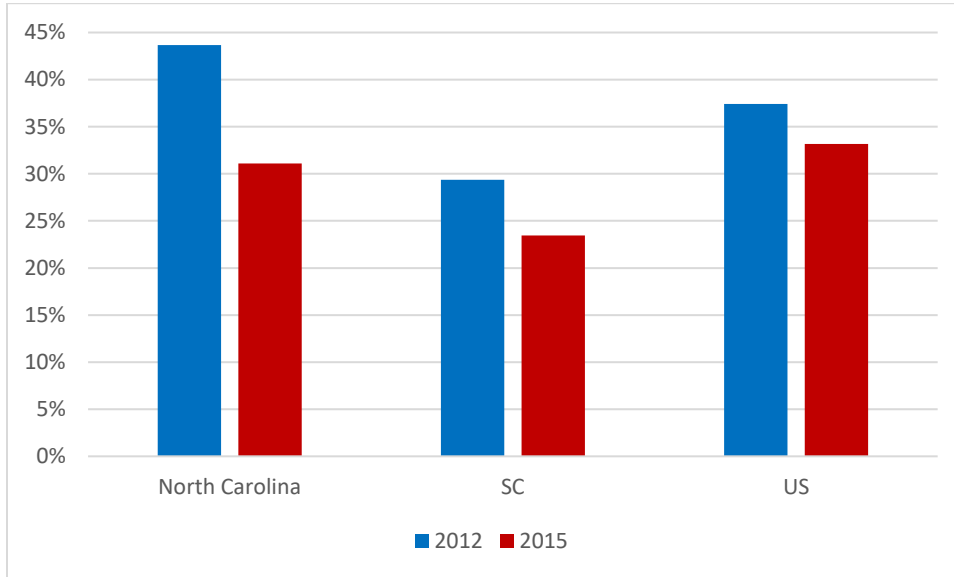
II. Coal-Fired Power Plants

While North Carolina lacks a coal mining industry, it has had a significant number of coal-fired power plants. Yet, North Carolina has seen a more precipitous decline in electricity generation from coal as shown in Figure 3. In just a few years, North Carolina went from having 44 percent of its electricity generated by coal in 2012, down to 31 percent in 2015. In terms of energy production in thousands of megawatt hours, coal-fired generation was 39,922 in 2015, down from almost 51,000 in 2012 (and likely even lower given the large drop in US production in 2016).

At the U.S. level, this decline was not quite as steep, dropping from over 37 percent in 2012 to 33 percent in 2015. Also shown is the coal share of electricity in neighboring South Carolina which saw a decline from 29 percent to 23 percent over this time period. These statewide declines in coal-fired electricity generation are relevant to Western North

Carolina as they are indicative of the overall decreases in coal shipments, many of which have traditionally traveled by CSX and Norfolk Southern rail corridors in the region.

Figure 3. Coal Share of Net Electricity Generation



Source: Energy Information Administration

A number of coal-fired power plants have been retired or converted to natural gas in North Carolina over the past decade. These facilities have been located in other parts of the state (not Western North Carolina) and many are Duke Energy facilities.³ According to the EIA, retired or cancelled coal power plants in North Carolina between 2001 and 2013 totaled 3,759 MW of nameplate power generation.

Directly relevant to Western NC, Duke Energy has a major coal-fired power plant in Asheville (Buncombe County) that is scheduled to be converted to natural gas in 2019. Those facilities represent 413 MW of nameplate electricity generation, a major provider for the region. Based on estimates provided by Duke Energy, the conversion of that facility to natural gas will result in a reduced on-site workforce – a decline from roughly 100 jobs to 40 jobs once operational and converted. That conversion will also result in greatly reduced coal shipments by rail as the natural gas facilities will be served by pipeline.

III. Supply Chain and Broader Economic Impacts

Like any major commodity production, the coal mining industry requires a wide-range of equipment, materials, and specialty services. And reductions in the coal mining industry

³ For example, this site has information on current and retired/converted facilities in North Carolina: http://www.bredl.org/air/coal-fired_powerplants/North_Carolina.asp

can have broader (less obvious) “multiplier” impacts as lower levels of mining revenue and labor income mean less demand for a wide-range of products and services. To examine these potential impacts in North Carolina, we employed a mix of:

- 1) Data-driven analysis of the supplier industries to the coal industry;
- 2) Estimates of the total (multiplier) effects in western North Carolina of reductions in the coal industry; and
- 3) Research to identify and interview actual coal mining supplier companies in western North Carolina to determine their impacts.

Data Analysis of Potential Coal Mining Supplier Industries in Western NC

To try to identify and assess the presence of companies in Western NC that are suppliers to the coal mining industry, it’s important to understand the detailed industry sectors that are most critical to coal mining production. Table 1 ranks the top supplier industries based on the input value per \$ 1 million of output (sales) in coal mining. In other words, this table quantifies how much input (intermediate goods or services) are needed by industry for coal mining production based on input-output data from U.S. Bureau of Economic Analysis. As is fairly common, the largest input industry to coal mining is coal mining, which doesn’t mean very much in North Carolina since we already know that industry is not present in the state. Other key industries include petroleum refineries, rail transportation (e.g., to ship coal to electric utilities), wholesale trade, specialty machinery for mining, and other mining and support services to mining.

Table 1. Key Coal Mining Supplier Industries (dollars per \$ 1 million of output)

Code	Commodity Description	Input per \$ Output
212100	Coal mining	\$ 159,140
324110	Petroleum refineries	\$ 62,775
482000	Rail transportation	\$ 57,385
420000	Wholesale trade	\$ 36,200
333130	Mining and oil and gas field machinery manufacturing	\$ 33,570
550000	Management of companies and enterprises	\$ 19,965
532400	Commercial and industrial machin & equip rental & leasing	\$ 17,178
212310	Stone mining and quarrying	\$ 15,809
21311A	Other support activities for mining	\$ 14,745
230301	Nonresidential maintenance and repair	\$ 13,738
333120	Construction machinery manufacturing	\$ 10,827
541300	Architectural, engineering, and related services	\$ 10,353
523900	Other financial investment activities	\$ 10,184
333920	Material handling equipment manufacturing	\$ 9,081
3259A0	All other chemical product and preparation manufacturing	\$ 8,582
221100	Electric power generation, transmission, and distribution	\$ 7,755

Source: U.S. Bureau of Economic Analysis, Input-Output Tables (Direct Requirements)

While this is a useful starting point, most of these industries supply to many other industries other than coal mining. This means that simply identifying and measuring the presence of these supplier industries in Western NC is not sufficient to understand coal suppliers. For example, architectural, engineering and related services is an important input to coal

mining but this sector supplies its services to a huge range of projects and industries, most of them unrelated to coal. On the other hand, other support activities for mining is more likely to be an input to coal mining, so the presence of this industry would be more telling. In general, this challenge is what necessitates a more detailed identification of actual companies that supply to the coal mining industry (see below).

As a next step, it is possible to estimate the number of business establishments and employment from key supplier industries present in Western North Carolina. The data shown in Table 2 covers the entire 29-county Western NC region and was pulled from North Carolina's Labor and Economic Analysis Division from 2015. In many cases, there might be additional establishments not quantified here as they were not disclosed due to company confidentiality rules governing industry data. For example, eleven (11) of the Western NC counties may have at least one business establishment in the Support Activities for Mining industry. But unfortunately, this data is not available for viewing or publication.

Of the industries and locations where data is available, we can see the number of establishments and jobs for key supplier industries in Western NC. In terms of employment, the largest potential coal supplier industries in the region are: 1) management of companies and enterprises; 2) architectural, engineering and related services; 3) machinery equipment and supplies merchant wholesalers; 4) agriculture, construction and mining machinery manufacturing (e.g., Caterpillar); and electric power generation transmission and distribution (e.g., Duke Energy). The jobs per establishment varies greatly in the region – for example, there are about five employees per architecture/engineering firm compared to 185 workers per business in machinery manufacturing. As noted above, this table does not directly represent coal mining suppliers but rather is an indication of the presence of industries that *may* supply to coal mining (but undoubtedly captures suppliers to many other industries too).

Table 2. Western NC – Employment and Establishments in Coal Mining Supplier Industries (2015)

Industry	Establishments	Employment
Nonmetallic Mineral Mining and Quarrying	11	262
Electric Power Generation Transmission and Distribution	19	665
Petroleum and Coal Products Manufacturing	3	31
Other Chemical Product and Preparation Manufacturing	3	29
Agriculture Construction and Mining Machinery Manufacturing	6	1,110
Other General Purpose Machinery Manufacturing	7	373
Metal and Mineral (except Petroleum) Merchant Wholesalers	10	47
Machinery Equipment and Supplies Merchant Wholesalers	193	1,379
Petroleum and Petroleum Products Merchant Wholesalers	13	119
Commercial and Industrial Machinery & Equip Rental & Leasing	28	131
Architectural Engineering and Related Services	555	2,721
Management of Companies and Enterprises	187	7,996

Source: North Carolina Department of Commerce, Labor and Economic Analysis Division, ES-202

Additional data available from the state's Labor and Economic Analysis Division includes business-specific establishment information generated by Infogroup.⁴ Based on these key supplier industries, data queries were run to generate lists of businesses in Western North Carolina counties. Scanning through these lists of businesses did not produce any obvious coal mining supplier firms. To help assess these business lists, HEC forwarded the compiled data to North Carolina's program manager for the Appalachian region. However, only a few of the businesses seemed potentially relevant and additional research (such as online searches or checking with local economic development officials) did not yield further examples of coal-impacted supplier companies.

Economic Effects of Coal Mining Reductions in Western NC

Beyond data-driven attempts at identifying Western NC coal mining supplier firms, it's possible to use input-output models to estimate the indirect, induced and total economic effects of changes in the coal mining industry on the region. **Indirect effects** essentially refer to coal mining suppliers using comprehensive input-output data from the U.S. Bureau of Economic Analysis (BEA). Put another way, indirect effects track the input (or intermediate) purchases of goods and services that are required for coal mining production. **Induced effects** represent the economic impact of consumer spending when direct (coal mining) and indirect (suppliers) industry workers and labor income change. Or said differently, when labor income is decreased due to a reduction in coal mining workers and suppliers, that results in reductions in consumer spending.

Total effects represent the combination of direct, indirect and induced effects (often called total multiplier effects). In the case of Western NC where there is no coal mining industry present, there are no measurable direct effects. And simulating the indirect and induced effects in Western NC requires some creative analysis and interpretation. To approximate these effects, a Regional Input-Output Modeling System (RIMS II) data set⁵ was obtained for the 29-county Western North Carolina region. While there is no coal mining in this region, RIMS II does allow for analysis of the indirect and induced effects that would result if the region lost (or gained) economic activity in that industry.

To estimate the economic impacts on the Western NC region, a hypothetical loss of \$159 million in coal mining production was simulated (representing a typical loss in annual coal mining production of 50 million short tons and sales revenue over the past few years in the broader Appalachian region). Table 3 presents a summary of economic impacts in Western NC of this change in coal mining with direct impacts included in the table for context, but not relevant since the industry is not present in the region (you can think of this reduction happening in nearby Tennessee or Virginia which still have coal mining). In terms of job impacts, the indirect effect (suppliers) is relatively modest with about 125 estimated job losses stemming from a coal mining reduction of over 500 jobs. The

⁴ See: <https://www.nccommerce.com/lead/data-tools/industry/business-information>

⁵ RIMS II is a product of the U.S. Bureau of Economic Analysis and can be customized to any set of U.S. counties. It provides a detailed series of input-output "multipliers" for business output, employment and wages. For more information, see: <https://www.bea.gov/regional/rims/rimsii/>

induced effects based on lower consumer spending is a bit larger at 255 jobs for a total of about 380 job losses in Western NC when the coal industry is reduced in Appalachia.

The \$159 million drop in coal mining production (output) could result in up to \$25 million in lost sales for Western NC coal mining suppliers and another \$27 million from induced effects for a total of almost \$53 million. Examining the impact to earnings (labor income for workers), the total impact in Western NC between indirect and induced effects is estimated to be just under \$15 million.

Table 3. Western NC – Economic Impacts of Reduction in \$159 Million Coal Mining Production – Jobs, Output, and Earnings (millions of dollars)

	Direct (not in Western NC)	Indirect	Induced	TOTAL in Western NC
Jobs	509	127	255	382
Output	\$ 159.15	\$ 25.20	\$ 27.40	\$ 52.60
Earnings	\$ 24.49	\$ 6.65	\$ 8.12	\$ 14.77

Source: U.S. BEA RIMS II for Western NC, Hodge Economic Consulting Analysis

In reality, it is likely that the ongoing coal mining contractions throughout Appalachia would occur in nearby states and therefore would likely lower these economic impacts in Western NC a bit. In other words, the impacts presented in Table 3 likely represent the upper end range of impacts (per dollar of coal mining reduction). On the other hand, the steep reduction in coal mining experienced during 2016 likely resulted in losses greater than this for the region overall, including Western NC. Any future use of these estimates should carefully describe their assumptions about the magnitude and location of coal mining reductions and how that would adjust these estimates.

Research on Individual Company Coal-related Impacts in Western NC

As demonstrated in the sections above, quantitative analysis of secondary (published) data can help estimate the overall impacts of coal mining changes on the Western North Carolina economy. But the analysis can feel a bit abstract at the industry-level and as described earlier, it is nearly impossible to identify actual coal industry suppliers and companies impacted by changes in the coal industry purely based on this data. Consequently, considerable effort was allocated to try to identify individual companies that in some way are impacted by changes in the coal industry. This could include, most directly, firms that are actual suppliers of mining-related equipment, products or services that are used in coal production. It also could include businesses that are impacted more indirectly such as when reduced coal shipments by rail (see below) result in reduced freight rail service for the region.

The examples that follow provide tangible instances of Western North Carolina companies impacted by changes in the coal mining industry.

Caterpillar (multiple locations in Western NC). Caterpillar is a very large manufacturer of machinery and equipment, including a significant presence as a supplier to the mining industry. In very recent years, Caterpillar has announced various plant closures and restructuring that is at least partially due to lower sales volumes in mining. For example, a corporate announcement in 2015 stated that “mining equipment sales are far below the prior peak and are substantially below what we could consider a reasonable replacement level.”⁶ An interview with a corporate representative in real estate and economic development agreed that recent reductions in coal mining activity have contributed to overall restructuring at Caterpillar but stressed that a relatively small share of their equipment is specifically sold for coal mining. Looking more closely at Caterpillar manufacturing facilities in Western NC:

- Winston-Salem: The most direct and significant economic loss in the region is the Caterpillar plant in Winston-Salem (Forsyth County) that is in the process of transforming from being a dedicated mining support operation to primarily supplying equipment for rail locomotives (Progress Rail). This is reducing the share of mining-related activity from 100% to just 20% of their operation. While company officials don't know the exact percentage of mining support that was coal mining, the transition is due to much lower demand forecasts for mining equipment worldwide. Company officials stated that this transition has caused a reduction in staff at the plant of 75 jobs. The majority of their workforce comes from Forsyth County (part of Appalachia), with lower amounts of workforce coming from Davidson, Gilford, and Stokes (part of Appalachia) counties. The mining equipment produced in Winston-Salem are known as “lower powertrain components” – essentially axels and wheels for mining trucks.
- Franklin (Macon County): In 2015, Caterpillar announced that they were closing a plant in Franklin that manufactured seals for heavy equipment. That closure resulted in up to 150 jobs lost in Appalachia.⁷ Though efforts were made, it was not determined if/how this precision sealing plant was a supplier to coal mining, though it is very possible given that coal requires heavy equipment.
- Morganton (Burke County): In April 2016, Caterpillar announced that they will be closing the Morganton plant that manufactures engine and undercarriage components. That closure will result in 110 jobs lost when they close in 2017.⁸ The announcement was part of larger global restructuring, and similar to the plant in Franklin, it was not confirmed how much of this production was directly to the coal mining industry but it is possible, for example, that some share of engine and undercarriage parts would be part of mining trucks.

⁶ <http://www.caterpillar.com/en/news/corporate-press-releases/h/building-for-a-stronger-future-caterpillar-announces-restructuring-and-cost-reduction-plans.html>

⁷ <http://www.citizen-times.com/story/news/local/2015/01/16/caterpillar-close-franklin-plant-costing-jobs/21856075/> and <http://www.bizjournals.com/triangle/news/2015/10/30/caterpillar-franklin-north-carolina-layoffs.html>

⁸ http://www.mcdowellnews.com/news/caterpillar-to-close-morganton-facility-impacts-positions/article_2eccc97c-0d7e-11e6-8b41-234d6fba77e9.html

Mitchell Welding (Mitchell County). Based in Spruce Pine, NC (Mitchell County), Mitchell Welding closed in July 2016 and was a direct supplier to the coal mining industry. This company closure resulted in a loss of about 35 jobs (their workforce fluctuated between 30-40 jobs). Mitchell Welding was a 35-year old company that supplied to mining companies and the company's top executive provided detailed information on the context behind this closure, stating that the reduction in demand for coal mining-related equipment was the biggest factor in the company's demise. They specifically produced coal clarifiers and float sales which were box devices to help clean the coal as part of the processing process. On average, they would build and sell 4 to 6 of these large boxes to mining companies but after 2008 (when natural gas prices plummeted and environmental policies shifted towards cleaner energy), they only built 16 boxes total over the next 8 years. They had customers in West Virginia, Kentucky and Pennsylvania. Of the roughly 35 workers who lost jobs, most were located in Mitchell County and annual salaries ranged from about \$40,000 to \$70,000.

Franklin Tubular Products (Macon County). Franklin Tubular Products employs 75 people in Franklin, NC (Macon County), manufacturing specialized tubing parts for equipment manufacturing companies like Caterpillar, Volvo, John Deere, Eaton, and Navistar. In recent years, the total employees at the plant has been reduced from about 120 jobs to 75, though much of that job reduction was due to efforts to improve productivity. They do sell to the mining industry (about 10% of total business) and they estimate that the contraction in the coal industry has had a roughly five (5) employee impact in terms of layoffs and lost opportunities to grow.

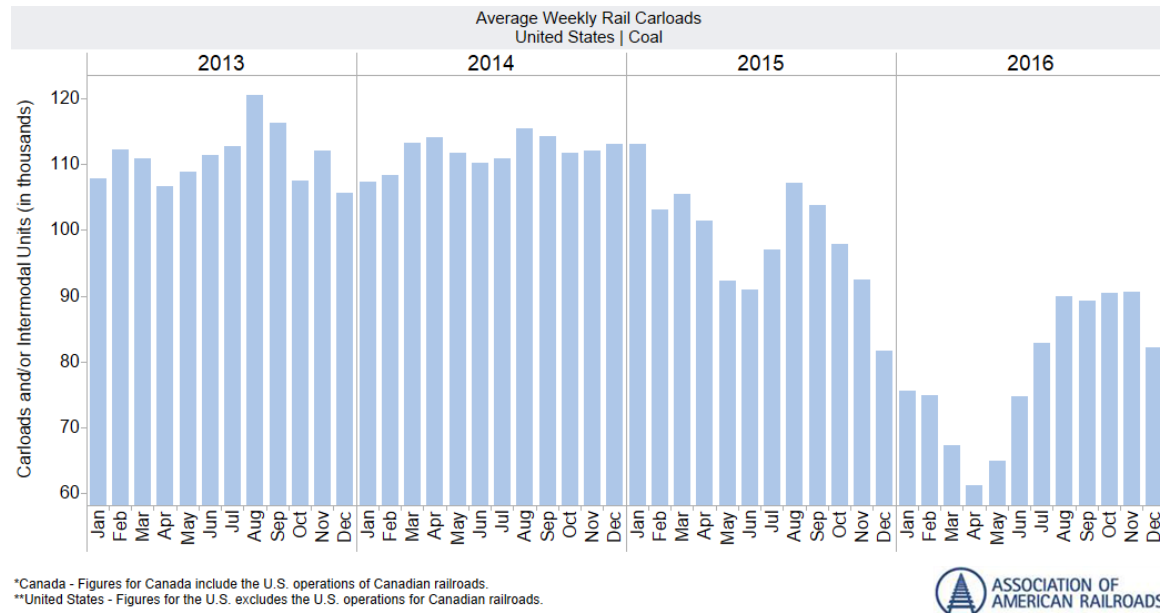
Unimin and Quartz Corporations (Mitchell County). Unimin and Quartz Corporation are two of the larger private sector employers in Mitchell County, and they each mine, process and sell high quality quartz for use in semi-conductors, solar panels, fiber optics, and high-intensity lighting. Feldspar (a mining byproduct for ceramics) and Hydrofluorosilic Acid (for fluoride treatments) are two major commodities related to their quartz mining operations that have used a mix of freight rail and trucking for shipments. According to company officials from Unimin, they used to use rail for feldspar shipments (but no longer do) and there are times when they are seeking new business deals where shipments by rail are an important component for new clients. But, the greatly reduced volume of CSX freight rail trains to Mitchell County (see below) has led to deals falling through and lost business opportunity. Quartz Corporation still uses the CSX line for feldspar shipments but the reduced service on the CSX line could have negative implications on their business.

Note: It's possible that other companies in Western NC have been or will be impacted by changes in the coal industry and the related reduction in freight rail service. And research conducted as part of this project included outreach to many more companies than what is shown in this section. However, as of now (March 2017), those efforts did not reveal additional coal-impacted companies.

IV. Transportation Impacts – Reduced Freight Rail Service

As noted earlier in the report, US coal mining production and consumption has fallen significantly in recent years, with a particularly severe drop estimated for 2016. One of the direct implications is that rail carloads for coal (the largest commodity shipped by rail in the U.S.) are also down. Figure 4 depicts this reduction in coal rail traffic which was acute in 2015 and fell even further for 2016, consistent with the annual reduction shown in Energy Information Administration data (above).

Figure 4. US Rail Carloads – Coal



Source: Association of American Railroads

Although data specific for North Carolina coal rail traffic was not readily available for 2015 and 2016, data obtained from the North Carolina Department of Transportation highlight how the gradual retirement of more and more coal-fired power plants has already slowed coal rail traffic. For example, as recently as 2010 coal rail volumes terminating in North Carolina (in tons) were over 26.2 million, almost equal to all other commodities at 27 million. In just four years, the coal traffic was down to 19.7 million tons in 2014, a decrease of 25% compared to just a 3% decrease for all other freight rail traffic. And that data doesn't even reflect the steeper declines in coal consumption for energy generation in 2015 and 2016 that likely dropped rail volumes even further.

To examine the implications to Western NC, it's helpful to start with an understanding of some of the key freight rail corridors in the region. The two major Class 1 railroads operating in North Carolina are CSX and Norfolk Southern (NS), with short line railroads like Blue Ridge Southern Railroad (BLU) taking over some rail lines formerly run by NS (see Figure 5). For example, BLU operates a 46 mile rail line from Asheville traveling west to Canton and Dillsborough, as well as a 26 mile rail corridor heading southeast from Asheville to Flat Rock. The primary NS main line route travels from Tennessee into North Carolina through Madison County on its way to Asheville before connecting with an

eastbound route to the rest of the state. The primary CSX rail corridor in Western NC enters North Carolina near Erwin, TN traveling north-south through the heart of the region bound for Spartanburg, SC.

Figure 5. Western North Carolina Rail System – Area Impacted by Reduction in Coal Traffic



Source: North Carolina Department of Transportation, Rail Division

Coal-Related Impacts on Freight Rail Service and Volumes

The reductions in coal consumption in North Carolina and the broader southeastern region are directly changing the volume and routing of freight rail service in Western NC with impacts just starting to be experienced for both rail companies and freight rail customers.

Impacts related to CSX rail service. The reduction in coal rail volumes have directly impacted CSX rail service from Erwin, TN through Western NC to the Bostic railyard (in Rutherford County) and on to Spartanburg, SC. Estimates from local experts indicate that the number of daily trains on this corridor have fallen from 20 trains to just 2 trains per day. CSX officials confirm that they have altered their routing of coal trains so that very few of them run on this corridor as they now use a route in the eastern part of North Carolina. One of the reasons for this change is that CSX used to serve coal-fired power plants in Cleveland County (just east of the Appalachian region) that have been retired in recent years. Current and future implications of this reduced rail service include:

- The railyard in Erwin, TN was closed primarily due to reduced volumes of coal carloads (see below) impacting some workers based in North Carolina.

- According to CSX, there are 14 rail customers on the corridor in Western NC. They are still receiving service but have fewer options given the drastically reduced volume of trains on that corridor.
- The rail corridor travels through mountainous terrain and does not have double-stack capacity. This means that it will be difficult to grow intermodal (container) rail service on this line to make up for the lost coal volumes. This places the rail line at high-risk of being further downgraded or possibly converted to a short line rail service (as there is generally no growth in commodity rail shipments).
- CSX is one of the largest industrial taxpayers in the region but the assessed value is dropping steadily, meaning lower property tax revenue for Western NC. For example, in Mitchell County, CSX property was valued at \$34.8 million in 2016.
- The reduced rail service may limit the ability of companies and economic development officials to use this Class 1 railroad corridor as an “asset” that could help companies grow and attract new business opportunities. On the other hand, the coal trains traveling through the region were largely long “unit trains” that did not stop in Western NC. Without those trains, there could be an opportunity to seek new industrial customers in the area would benefit from rail service.

Coal Impacts on Blue Ridge Southern Railroad. There are two primary coal-related impacts upcoming for the BLU short line rail service⁹:

- The Evergreen paper plant in Canton, NC is the largest rail customer on their east-west rail line but that plant is converting on-site steam coal power generation to natural gas to meet environmental regulations. This will mean a significant reduction in coal shipments to Evergreen, dropping by about 30,000 tons in 2018 with an additional decrease in 2019 of 45,000 tons for a total of 75,000 fewer tons.
- The planned retirement of the Duke Skyland coal-fired power plant near Asheville (and conversion to gas) will have an even larger impact on rail volumes. Starting in 2019, BLU estimates a reduction of 456,000 tons (about 4,800 carloads) per year for the short haul from Asheville to the power plant (7 miles). This will also impact NS as they operate on the rail line that connects with BLU. Company officials estimate a job loss of about two employees (one conductor, one locomotive engineer) due to the reduced coal traffic (out of 35 total employees).

V. North Carolina Workers Affected by Changes in Coal Industry

In addition to the examples of North Carolina business impacts profiled above, it's possible that additional North Carolina workers (and residents) could face coal industry-

⁹ Information on BLU was provided by company officials (officially part of the parent company called Watco Companies).

related impacts. In particular, if North Carolina-based workers are employed by coal-related companies in neighboring states that would be a tangible impact for the state and its residents. Research to date has not found many instances where this has occurred. The most tangible example mentioned by multiple stakeholders was the closure of the Erwin, TN CSX rail yard, not far from the western border of North Carolina. That facility announced about 300 layoffs in late 2015, primarily due to reduced coal traffic volumes in the area.¹⁰

In terms of the impact on North Carolina workers, initial anecdotal estimates were that up to 70 North Carolina-based workers may have been impacted. Subsequent data provided directly by CSX stated that 11 affected employees had a North Carolina home address.

VI. Summary of Findings – Most Significant Coal-Related Impacts in Western North Carolina

This report has analyzed and documented multiple ways in which the Western North Carolina (Appalachian) region has and will continue to be impacted by changes in the coal mining industry. Despite the lack of coal production, this region is impacted through a combination of: a) retirement of coal-fired power plants; b) impacts to coal mining supplier companies; c) reductions in coal rail traffic volumes and service; and d) impacts to North Carolina-based workers. The most significant coal-related impacts that were identified include:

- The planned conversion of a Duke Energy coal-fired power plant in Asheville to natural gas in 2019 is expected to result in a roughly 60 job loss as the workforce will be reduced from about 100 to 40.
- The indirect and induced effects of annual coal mining reductions in Appalachia on the Western North Carolina economy are estimated to be up to 380 jobs, \$52 million in business sales (output), and \$15 million in labor earnings.
- Perhaps the single largest job impact in Western North Carolina is the combination of Caterpillar plant closings (Macon and Burke counties) and restructuring in Winston-Salem (Forsyth County). Combined, these three plants have generated a direct job loss of 335 employees in Appalachian North Carolina. Interviews with company officials indicate that the 75 jobs lost in Winston-Salem is due to changes in the mining industry, and it's likely that some share of the job losses in Macon and Burke counties also relate to broader mining industry contractions.
- Other individual company job losses include about 35 employees affected by the closure of Mitchell Welding in Spruce Pine (Mitchell County), 5 jobs lost at Franklin

¹⁰ <https://www.csx.com/index.cfm/about-us/media/press-releases/csx-to-reduce-operations-in-erwin-tennessee/>

Tubular Products (Macon County) and lost business growth opportunities for quartz mining companies in Mitchell County.

- The drastic reduction in CSX freight rail volumes in the region due to re-routing of coal traffic has multiple impacts on the region in terms of reduced train traffic, potential reductions in property tax revenue as CSX is one of the largest private sector tax payers in the region, and the risk of further downgrades or lease to a short line rail operator.
- Near-term reduced coal rail shipments to Evergreen (paper plant) and Duke Energy's Asheville coal power plant in 2018 and 2019 will result in a reduction of about 530,000 fewer tons and almost 5,600 fewer rail carloads for Blue Ridge Southern's short line railroad.
- The closure of the Erwin, TN CSX railyard due to lower coal shipments by rail is directly affecting at least 11 North Carolina-based workers who lost their job.