THE IMPACTS OF CLEANER ENERGY POLICIES ON COAL-DEPENDENT APPALACHIA AND OUR RESPONSE OPTIONS

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Submitted to the Integrated Design and Management program in partial fulfillment of the requirements for the degree of

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ABSTRACT

Through conducting an extensive literature review of current policies, interviewing Appalachian residents, and surveying the energy and employment landscapes both regionally and nationally, this thesis aims to shed light on the effect cleaner energy policies have on employment in the Appalachian region. Most importantly, it aims to explain how we as a nation can help support policies that promote employment in sectors other than coal, which has perpetuated poverty and financial insecurity. Understanding past trends and potential future forecasts, while also establishing clear communication with the community in order to ensure proper integration of their needs, will help guide the creation of successful public policy. This work will explain how and which industries we as a nation moving forward should support in order to promote employment in the region in more diverse, sustainable, and healthy ways. Furthermore, there is a growing local entrepreneurial spirit among Appalachia’s residents. This passion could be utilized to bolster support moving forward for policies that encourage diversified sources of income such as abandoned land mine reclamation, agriculture, manufacturing the parts for renewable energy technology, and more. This thesis outlines the necessary steps and suggests methods to take for that to happen, such as taking into account the local needs of each county, integrating their feedback from the beginning and at every stage of the development cycle, and ultimately connecting the somewhat isolated region with the rest of the national and global market.

Thesis Supervisor:
Nicholas Ashford
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“There is nothing on this Earth more to be prized than true friendship.” -Aquinas

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To my mamma, you have always said that education is the one thing that no one can ever take from me. It is by of your example that I am not shy to ask for 100 percent of what I want, and can bounce back from every rejection I hear. I am proud to call you my mother and I will never forget the continuous sacrifice you have made in order for me to attend school for as long as I have. I will pay it forward in all ways possible.

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This thesis is written in loving memory of my Grandpa John and Monsignor Sanchez to most but always Father “Ul” to me. Great examples of the distinction between being wise and being educated.
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Chapter 1: Introduction

“All of our knowledge has its origin in our perceptions.” - Leonardo Da Vinci

In recent years, United States legislators have pushed to mitigate the adverse impact of the coal industry in an effort to help combat Climate Change and the role our nation has as a contributor. Measures such as instituting new cleaner energy policies, increasing the efficiency requirements of appliances, and increases in affordable residential and industrial onsite renewable electrification are all efforts to help lower our carbon footprint. However, in 2015 alone, the coal industry in Appalachia saw record low numbers for employment-- the lowest since the Energy Information Agency (EIA) started collecting data in 1978. As America gradually relies less on the coal industry, miners and mining towns across the poorest regions of the United States-- especially Appalachia where the poverty rate in 2015 was over 17%, 2% higher than the national average-- are left without jobs, local economies, or hope of recovering their former place of prestige. Recently, scholars and statesmen alike have joined together to address this issue. This Thesis explores both the political decisions that lead to this issue for Appalachia as well as possible solutions moving forward and how lessons learned from Wales’ transition, another region of similar demographics, may provide insight and recommendations as to how to make the transition as beneficial to local communities as possible.

1.1 Part of a Bigger Dialogue

The narrative of the challenges associated with the energy transition from coal to clean energy in America is ongoing and often heated with many opinions. Of particular note is the region known as Appalachia-- an area that once supplied much of America’s energy source during the past century.

There is a natural progression of arguments one must learn from and form an opinion about before moving onto the next. A rough outline in order of said arguments could be:

1. Does climate change exist, and do humans have an influence on it?
2. If it does and we do, what are the consequences and timelines of climate change?
3. What are potential solutions to said consequences?
4. What are the negative results of implementing the various solutions?
5. What is the role of the government in promoting the solutions previously mentioned?
6. How can stakeholders maximize the benefits of implementing the solutions while minimizing the resulting negative actions?

To get the full picture, a student should go through the many published papers in support of various perspectives, enroll in a variety of relevant climate change and energy policy classes, engage in hours of discussions, all with an open mind that perhaps one’s preconceived notions are a product of their upbringing and therefore potentially erroneous. However, in lieu of that, listed below are some arguments and sources that defend the assumptions made in this thesis so as to focus on the primary point: that is, the role of stakeholder-centered design thinking in policy creation around the energy transition from coal to clean energy and said policy’s effect on Appalachia. Refer to the bibliography for more information.

This thesis accepts certain arguments to be true and therefore jumps into the middle of the story. Specifically:

1. Global Climate Change exists and is accelerated by human consumption of many products and services. In America, our contribution is in large part due to consumption of fossil fuels.\(^1\)
2. The impact of Climate Change is negative and severe.\(^2\)

\(^1\) With large gas companies sending mixed signals (see: "The Climate Accountability Scorecard: Ranking Major Fossil Fuel Companies on Climate Deception, Disclosure, and Action (2016)" on the Union of Concerned Scientists’, UCS, website), or sometimes promoting false information about Climate Change (CC), it is reasonable that those outside the field of environmental justice do not know who or what to believe. Those wishing to understand the social implications of supporting CC, should look into the work of Katharine Hayhoe, Director of the Climate Science Center from Texas Tech University, particularly the article Busting the Climate Change Myth UCS website and a YouTube mini-series "Global Weirding."

\(^2\) It is possible that majority of Americans alive today will not feel memorably different weather conditions, i.e. increasingly extreme weather such as superstorm Sandy will occur, but in a frequency that the public’s memory can not connect as unnatural. However, it is our responsibility to ensure the livelihoods
3. There are several ways that help reduce the rate of climate change, all of which in some form or another aim to reduce greenhouse gas emissions.³

4. It follows that in reducing consumption of coal, you reduce demand which reduces the jobs in that industry.⁴ ⁵ ⁶

1.2 Cultural Aspects

In an effort to better understand the reality behind what it is like to come from Appalachia, nine interviews were conducted with a variety of stakeholders in Appalachia. All nine participants interviewed are current inhabitants of Appalachia and have education levels ranging from high school graduate to doctorate. Employment also of generations to come. Generations as early as the next will grow up with a drastically different understanding of the world due to CC. To incite public involvement, methods used to combat previous environmental dangers could prove effective. First, a sense of urgency must exist. Second, any uncertainty must be used to strengthen the cause and evoke a precautionary response so people will be inclined to act. Bert Bolin, "On strategies for reducing greenhouse gas emissions," Proceedings of the National Academy of Sciences, , accessed April 13, 2017, http://www.pnas.org/content/98/9/4850.full. CC faces the challenge that the perceived risk is relatively low. P. Slovic, "Perception of risk," Science, April 17, 1987, , accessed April 13, 2017, http://science.sciencemag.org/content/236/4799/280. Understanding a way to relate the real fears, e.g. putting food on the table, of those who work in the coal industry to the less obvious threats to humanity from climate change, will be critical to garner the support of those who resist the energy transition. The way in which the public is educated is not the focus of this thesis, but the fact that there is a need to educate and the barriers that prevent that from happening, influences the acceptance of this thesis.

³ A recent review of the role of fossil fuels in the US from the American Petroleum Institute said, "Modern life as we know it would be impossible without the fuels and products derived from oil and natural gas." Statements like these degrade the beauty of science and the ingenuity of human intellect. As the common adage goes “necessity is the motherhood of invention,” so too, once we come together as a nation, and realize the necessity of switching from fossil fuels, can we create a new path, a new “modern life” that is not only just as capable, advanced, and enjoyable, but even more so, knowing that our existence isn’t at the expense of future generations. This thesis will focus on the efforts of the US to reduce its consumption of coal (which when burned emits CO₂, a greenhouse gas, into the atmosphere) and switch to cleaner, more renewable forms of energy.


varied from former coal miner, to professor, to local, small business owner and librarian. The following section reflects the opinions of the quoted interviewees.

1.2.1 The Introduction of Coal

Appalachia has a long and colorful history, dating back to the first time the term “Appalachia” was found on the map of a conquistador from 1540. According to Shane Barton, director of the Center for Appalachian Studies of the University of Kentucky, the region has had a long history with mineral extraction, such as gold rushes and timber floating down rivers, since the 19th century. However the more extreme industrial potential of Appalachia began with the arrival of the railway in the late 19th century. With the dawn of the railroad came the possibility to extract coal in quantities never previously imagined, and the region entered the “Golden Age of Coal” from roughly 1900-1930. Coal went from being sold by the bushel to the ton.

In preparation for the rise in demand, entrepreneur William Kane bought thousands of homesteads starting in 1880 to later develop what would be call “coal camps.” In these camps people lived in segregated parts of town based on not only skin color, but also ethnicity and, frequently, language. As long as the coal company kept its inhabitants separate and unable to communicate with each other, it limited its liability of the formation of unions. Coal companies, such as Fordson Coal, commonly owned large portions of counties all over the region. Slowly, the region which was originally comprised of homesteads and diversified backgrounds grew to be identified by a single factor: coal. By 1920, nearly 800,000 people were working in the coal mines. According to Barton, coal companies could get away with poor housing or paying wages

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9 Dr. Shauna Scott, a professor of Sociology at the University of Kentucky and past president of the Appalachian Studies Center there, remarked in an interview that these camps fostered extremism by the very nature of their operations. Inhabitants were paid in scrip that was accepted only at the services provided in the coal camp, they lived in assigned housing, their preacher was told what to preach, etc. This environment allowed for no personal opinions and any attempt to unionize resulted in immediate expulsion.

that permanently enslaved miners because that was all the miner knew. Furthermore, as is a common theme among all interviews, there was a great sense of devotion to one's family clan. So while the miner may not have been paid well, the company appeased him in other ways such as schooling or a playground, etc. for his children.

It is important to note that external perceptions of diversity, especially when creating policy, may not align with what is the norm within Appalachia. For instance, in 1967, Tom Ford in a review for the Appalachian Regional Commission (ARC) wrote that number of African American individuals in the region was so small that their presence was insignificant. However in reality, only 45 years prior to his review, half of the population in coal camps, deaths in mines, shared sacrifice among the community was borne by African Americans.

1.3 Cleaner Energy Policies Affecting Appalachia

There are several factors pertaining to energy that all contribute to the effect of cleaner energy on Appalachia. Namely:

1. The use of “clean coal"
2. The shift to Natural Gas
3. The introduction of clean energy policies
4. The innovation and increase in renewables.

There are also other matters to consider, such as national security, international climate change agreements, etc., but those fall beyond the direct influence of energy and involve many tangentially related topics of national interest. However, the prospect of exporting coal has raised interest in further exploitation of this energy source.

1.3.1 Clean(er) Coal

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**11** Similar to Appalachia, it was common in Wales for coal companies to pay miners $2-3 per day, fostering an environment that was ready to unionize. Also similarly, those unions, which once were to protect the miner, slowed progress away from coal as they are doing so in Appalachia today. From its inception, the coal industry in Wales has shared many similar traits as Appalachia and will provide potential opportunities of what to do moving forward.
There has been a steady shift over the past 20 years to procure most of America’s coal from the Western region, meaning West of the Mississippi River, specifically the Powder River Basin (PBR) of Wyoming and Montana.¹²

![Coal Production by region, 2000-2015](image)

Figure 1.1: Coal production by region. For the past approximately 20 years the Western region, has surpassed production rates of coal from Appalachia. Source: U.S. Energy Information Administration, Annual Coal Reports 2010-2015.

This is due to two factors: 1) the production cost is lower in the West and 2) the cost associated with burning coal from the Western region is less expensive. The reason production costs are higher in the Appalachian region is in part because they have slowly been exhausting the easily accessible reserves of coal.¹³ Miners now must conduct the difficult “thinner-seam mining” which requires them to cut into rock, often filled with toxic silica. This leads to more health problems for the miners and financial


problems for the companies. In contrast, production is less expensive in the Western regions as they have more readily available coal, closer to the surface.

As for costs associated with the burning of coal, this is where the industry cleverly, albeit misleadingly, introduced and promoted the term “clean coal.” It is a misnomer because coal can never be considered fully “clean;” it simply releases fewer chemicals that accelerate climate change, such as sulfur (SO2) and carbon dioxide (CO2). In 2011, the Mercury and Air Toxics Standards (MATS) was passed. This federal mandate requires that fewer toxins which contribute to air pollution and climate change, such as SO2, be released from power plants, such as those which burn coal to generate electricity. This can be achieved through either burning coal with a lower sulfur content or using technology installed at the plant, such as scrubbers and other carbon capturing technologies. The latter option oftentimes can be more expensive than buying the PBR/Western coal which naturally contains less sulfur and therefore gives off less SO2 when burned than Appalachian coal. Even though Eastern coal has a higher ratio of Btu per pound (it is more energy dense) than that of the West, the process for retrofitting a power plant often outweighs any added expense from purchasing more Western coal.

1.3.2 Shift to Natural Gas

Since approximately 1990, the annual share of natural gas for electricity generation in the US has grown considerably. In fact, it is estimated to have surpassed coal for 2016 as shown in Figure 1.2. This is partially the result of a fracking boom

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over the past few years which has provided the market large quantities of natural gas therefore lowering gas prices.

**Annual share of total U.S. electricity generation by source (1950-2016)**

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<tr>
<td>Natural gas</td>
<td>60%</td>
<td>50%</td>
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<td>30%</td>
<td>20%</td>
<td>10%</td>
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<tr>
<td>Coal</td>
<td>40%</td>
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<td>80%</td>
<td>90%</td>
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<td>60%</td>
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<td>Nonhydro renewables</td>
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<td>Hydro</td>
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*Figure 1.2: Annual share of total U.S. electricity generation by source over the past 65 years. 2016 is the first year that natural gas, in percent of electricity generation for the US, is supposed to have surpassed coal. U.S. Source: EIA Short-Term Energy Outlook 2016*

Although the share of US electricity generated by natural gas is forecasted to fall for the next few years, regardless of the acceptance or rejection of the Clean Power Plan (CPP), natural gas is expected to exceed coal for electricity generation eventually.\(^\text{19}\) If the CPP survives, it is projected to come into effect by 2024, and if it does not, then in 2029, as shown in Figure 1.3.\(^\text{20}\) Another element that helps the switch to natural gas is the expectation of the rise of renewables. Intermittency is a large obstacle to wide-scale adoption of renewable energy. (What happens when the sun doesn't shine on a solar grid?) The ability for natural gas plants to quickly ramp up

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\(^{19}\) For more information on the plan, see "Clean Power Plan" below under the Clean Energy Policies section.

production and shut off production, relative to the time required for coal burning plants, is highly advantageous for an electric grid that favors renewables.\(^{21}\)

![Graph showing U.S. net electricity generation by fuel (1990-2040)](image)

Figure 1.3: The left forecast assumes the adoption of the Clean Power Plan, in which coal declines rapidly over the next 20 years. Regardless of the CPP, natural gas and renewables are projected to increase dramatically. Source EIA, Annual Energy Outlook 2016

1.3.3 Increase and Innovation of Renewables

Where the increase in consumption of natural gas has been largely market driven (fracking boom leads to cheaper supply), the increase of renewables has been supported mostly by federal and state initiatives.\(^{22}\) Renewables, specifically wind and solar, have enjoyed recent growth primarily due to “state renewable portfolio standards and federal tax credits.”\(^{23}\) As with any emerging technology, the more it is researched, the faster the advances and, as follows, the faster production costs decline. For example, the average cost for a solar system installation in 2001 was approximately


\(^{22}\) Ibid, 15.

$10/W. In 2016 the average system cost only about $1.75/W. Photovoltaic installations since 2007 have grown by nearly 25 fold (originally ~300 annually to over 7000 in 2015).  

1.3.4 Clean Energy Policies

There are several domestic and global policies the US is currently endorsing that all are to help combat the effect of humans on climate change. While the specific sector or implementation methods may vary, the end result is the same-- how can we as a society continue to advance and reduce our carbon emissions? The policies that will be discussed at length in Chapter 2 are:

1. 2015 Paris Climate Conference (COP21)
2. The Clean Power Plan (CPP)
3. Solar Investment and Tax Credit (ITC)
4. California bill SB 32
5. California Zero-Emissions Vehicle (ZEV) regulations
6. And other state energy efficiency resources standards and goals

1.4 Employment Impact Over the Last Ten Years

With both federal and state incentives and initiatives increasing the use of renewable energy coupled with the switch to natural gas due to lower prices as a transitional source of electricity, the phase out of coal is real and poses serious complications to those communities who have been built entirely around it. It should come as no surprise that the US saw a 12% drop in employment in the coal industry in 2015 nationwide. Appalachia alone was among the hardest hit at nearly 16% loss. The total number of miners in 2015, 65,971, is the lowest recorded number since 1978 when the EIA began collecting data on the coal industry. Over the years, production per

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25 Ibid.
miner has increased while employment numbers have steadily decreased. This suggests that like all industries, as technology advances, miners become more redundant, requiring fewer bodies to fulfill production demands. While the rate of decrease in employment over the past decade may not have been as extreme as over the 20 years previous to that, according to the residents interviewed for this thesis, most believe they have witnessed the last "boom" of coal in Appalachia.

Appalachia has consistently been about 2% higher than the rest of the nation for rates of poverty. In 2000 it was at about 13.5% and has steadily grown to 17.2% (data from 2010-2014 averages, with a US average of 15.6%). Part of the problem of coal is that its production is highly volatile. While the community prospers during the boom of coal mining, it is impossible for them to save enough to survive during the busts. Furthermore, as the data earlier suggests, the booms are less frequent, require less manpower, and are less prosperous as the price of Appalachian coal must compete with the Western region and shale gas prices. This region does not need any data or "outsider" to tell it what it already knows: it needs jobs, now.

1.5 Welfare Impacts Over the Last Ten Years

When considering the future impact of policy, we can not forget to consider the livelihoods of the target population of this thesis. To consider this, it is more than employment that must inform policy, but rather also any relevant medical, social, or other factors that affect the community. In the case of Appalachia, there are two significant aspects to life, the presence of black lung and drug abuse, that are unusually prevalent and set this community apart from others of equal unemployment strife.

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In recent years, the standard mining shift has extended from 8 hours to 12 hours. It is speculated that as a result of this change, there has been a rise in black lung cases in the Appalachian region. This is in part because miners are not as frequently as before able to go above ground to cough out the dust they inhale. Furthermore, the thinner-seam mining that is now necessary in Appalachia is far more toxic because it requires them to cut into rock, which contains silica, which is far more toxic and now recognized as carcinogenic. Making matters worse, because the symptoms of black lung can be argued in court as other ailments, miners have to fight their former coal employers to prove that it is in fact black lung from working in the mines and they, therefore, are entitled to financial assistance to cover their medical bills.\textsuperscript{31}

Not only are there health problems directly linked with working in the mine, but there is now another epidemic associated with being near the mine. Recently a drug epidemic has broken out in Appalachia that is speculated to be a result of the joblessness that is plaguing the region. West Virginia had the highest drug overdose rate in the nation in 2014, with Kentucky having the third highest.\textsuperscript{32} Coal mines have high likelihoods of being hotspots for addictions due to the painful nature of the work and high unemployment rates.\textsuperscript{33} People are looking for other ways to make a living. Though not the only route for the transport of drugs, a smuggling route has formed between Appalachia and Florida known as the “Oxycontin Express.” Smugglers travel to Florida’s “prescription-happy” doctors to get pills, take an inexpensive flight back to West Virginia, and sell them for much more in Appalachia.\textsuperscript{34} When asked in an interview what her biggest fear was for the future of her community, Kateena Haynes, the director of the local Girls and Boys club of Harlan County, responded with, “drugs... we had 13 kids in our Boys and Girls club lose parents over the course of 6 weeks one winter.”

When considering a piece of policy targeted for communities affected by the decline of

\textsuperscript{31} Ibid, 14.
\textsuperscript{34} Mariana Van Zeller, YouTube, February 26, 2014, accessed April 10, 2017, https://www.youtube.com/watch?v=wGZEvXNqzkM.
coal, it is critical to remember that the decline, and the resulting unemployment, low morale, poverty, etc. has a far-reaching effect which is literally destroying families.

1.6 Political Events and Influences

There has been much debate around the CPP and whether or not it does enough to help the coal mining societies whose coal-dependent livelihoods are quickly ending. In a recent study from the Economic Policy Institute, it is estimated that there will be an initial net gain of 350,000 jobs due to the CPP in 2020 but that the rate will quickly fall until in 2030, with a net gain of approximately 15,000 jobs. What is particularly important is the classification of the jobs created. Direct jobs are those working directly in the industry, such as in the mine. The numbers from this study however also include induced jobs (re-spending) and public-sector jobs. The industries which are losing jobs tend to have a higher employment multiplier, which follows as the communities of Appalachia were literally built around the mine in many instances, so local economies depend nearly entirely on the mine, and therefore the miner, as a source of trickle down cash flow. It does acknowledge that there is a disproportionate burden placed on the states who have a stronger reliance on coal for employment than those who do not. An estimated 24,000 jobs will be lost by 2020 in the coal-fired electricity generation field.

For communities that are hit hardest by the decline in coal, the POWER+ Plan, a subpart of the CPP, will allot $10 billion to fund initiatives that help grow and diversify their new economies. There are four fundamental pillars of the program:

1. RECLAIM Act: "$1 billion to create long-term economic opportunities in agriculture, energy, recreational tourism, and more all on reclaimed coal mines."

2. Ensure proper care for the greater than 100,000 retired United Mine Workers of America (UMWA) miners and their families

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36 Ibid.

3. Promote economic diversification and job creation, funded by at least $55 million towards retraining and development programs and distributed through a variety of federal agencies.

4. Deploy carbon capture and sequestration technologies through $2 billion in tax credits to power generators to encourage adoption.

As the CPP is currently stayed in the Supreme Court, the POWER+ Plan cannot be issued. However, as a “downpayment” on the plan, the Obama administration proposed the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative. This bill granted $28-38 million in FY 2015 to help communities that will be or are already affected by the decline in the coal industry. The bill has a two track plan that will help those communities plan how to use, and therefore maximize, their readiness and efficient use of the coming funds from the POWER+ Plan. Specifically, the Departments of Commerce (DOC), Department of Labor (DOL), Small Business Administration (SBA), and the Appalachian Regional Commission (ARC) will be used in this process. The DOL and DOC will award communities to create comprehensive and integrated economic development strategies through the use of analyzing current community assets, evaluating needs and resources, and organizing community stakeholders. As a second track, the DOC, DOL, SBA, and ARC will award implementation grants for communities who have already developed the previously mentioned strategies. It is critical that we pass this bill soon while the national fervor for clean energy is high.

While it is too soon to tell what the current administration will advocate for with regards to the COP21, Paris Climate Change convention of 2015, the international law of the agreement is such that any party couldn’t leave the agreement without first

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39 Ibid.

undergoing a four-year withdrawal process. Unfortunately, there are plenty of other ways other than formally exiting the agreement which would slow, if not halt the progress towards a greener economy and world, such as America refusing to pay the pledged $2.5 billion it owes to the U.N. Green Climate Fund. Regardless of whether or not the US abandons its role in the Paris agreement to hold onto a few more mining jobs for another 5 to 10 years, the point still stands that a transition will happen for the people of Appalachia.

America is considered one of, if not the most, developed nation in the world. Much of our current success as a nation, from machinery built and used in WWII, to steel used in our infrastructure, to electricity powering our cities, for the past century has in some form been the result of the coal that comes from the hard work and sacrifice of the mining communities of Appalachia. It is our turn now to, as a nation, help our neighbor transition its way into the future with as much ease as is possible.

### 1.7 Outline of Thesis

There exists a solution, yet to be identified, that will bring our nation together over the necessity to switch to renewable energy. However, it will involve change. Change naturally is frightening because it means the end of a chapter. That change however, does not mean the end to Appalachia nor the warm, colorful, people that call it home— it simply means a new beginning for an economy that badly needs it. When constructing policy through the use of data and figures, it is often easy to forget that people's lives, their heritage, and their very identities, can be either preserved or destroyed by the effects of its passage into law. To ensure the solution incorporates the stakeholders' needs, active involvement with the target community will be essential at every step.

In Chapter 2 we explored the current landscape of energy in America. While it may be a contentious subject about when coal will end, especially given the political

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climate America will have for the next four years, it is an irrefutable fact that coal is a finite resource that will never come back to its original glory days of the first half of the last century. The question then becomes just how close to the end of coal is our nation? While forecasts are subject to many variables, and associated with each variable is an element of risk and uncertainty, all forecasts show two important facts:

1) America will continue to need energy
2) Coal for electrification will decline and end eventually.

The reality for the people of Appalachia is dire and residents don’t need potentially erroneous forecasts to tell them what they already know: people need jobs, and they need them now.

In Chapter 3 we learned that poverty in the area has risen to just over 17% and the number of jobs in coal mines is the lowest on record since the EIA started recording data. While previous generations of coal miners may have prided themselves on being the backbone of American industry and helped our nation become the world leader of innovation and manufacturing, modern day residents have more pressing matters to consider such as how to pay the bills and put food on the table. Gone are the days where communities lived, breathed, and consumed the coal mine company goods. Now residents face the necessity to shape their own future.

As discussed in Chapter 4, options for re-industrialization should be considered carefully. It is easy to jump to the conclusion that manufacturing will solve all problems as jobs in that field perhaps make the most obvious employment option for former minders given their skill set. However, an over-dependence of any one industry is a problem, as can be seen by other regions of the nation such as the textile industry in the South. Moving forward, any programs or policies created should promote local, diversified economies. Excellent examples of programs promoting local economies are Grow Appalachia and the Mountain Association for Community Economic Development.
Chapter 5 stressed the importance of any future program to never require the residents to leave. Appalachian communities have strong ties to the land and their family “clans” have been there for generations. Necessitating departure from this region would greatly negatively impact their cultural identity.

Remedial policy options related to employment enhancement were discussed in Chapter 6. There are a variety of unemployment insurance programs that vary by state as funded through the US Department of Labor. Chapter 6 also discussed the barriers to a national and international market that any resident of Appalachia faces due to cottage food laws that limit what local, agricultural business ventures can sell, via what means they can sell it, and how much they can make annually. These must be changed in order for agriculture to reach its potential to be a successful global venture for the local economies of Appalachia.

Chapter 7 discussed the various forms of national and state assistance promoting different sectors of employment. If the recent Executive Order to defund the Appalachian Regional Commission (ARC) does not come to fruition, the ARC would provide valuable insight and research into which American Recovery and REinvestment Act (ARRA) programs are applicable to Appalachia. Through these programs, startups and new local businesses could find assistance, financially and otherwise. The Department of Housing and Urban Development also funds several programs to help homeowners.

In Chapter 8 I presented some key points that must be considered in moving forward with policy and program design. As policies are formed, it is not only advantageous but necessary that Appalachian residents be part of the solution from the beginning and their needs listened to so they can both claim some ownership in the process and learn of ways others have solved similar problems. Appalachia has many counties all with similar and yet still different problems to solve. Policy makers should be prepared to work county by county. As solutions are shared to a larger network, future counties, after identifying their own needs, will be able to learn what was successful and
what was not. Specifically, Wales in the UK will offer good insight on how to make this transition as smooth as possible and what to avoid.
Chapter 2: The Energy Landscape of America

"Change is the law of life. And those who only look the past or present are certain to miss the future." - JFK

In order to better understand the current climate of employment and coal in Appalachia it is necessary to first know the status of energy in America. As much of the society of Appalachia is dependent on a single source of energy that is slowly lessening in demand, it is important to look ahead to see which sectors are more promising for future employment opportunities and what policies affect those forecasts.

2.1 Past Trends

For the first half of the 20th century, America ran on coal. However, as seen in the Figure 2.1 below, coal was quickly surpassed by natural gas as consumption of both rose quickly in the latter half of the last century.

Figure 2.1: Historical trends of energy consumption in the United States since 1900. Source: U.S. EIA - Annual Energy Review 2009
America has been making a large shift to renewable and clean energy for the last decade. Reports have projected, however, even as recently as the EIA Annual Energy Outlook (AEO) for 2011, that the majority of the energy consumed by the US will continue to come from fossil fuels -- coal, natural gas, and petroleum -- through 2035. The AEO 2016 report verifies that projection. It forecasts that if the Clean Power Plan (CPP) does not survive, natural gas and coal will fuel 34% and 26% respectively, for a total of 60%, of the US electricity generation in 2040.

While US electricity generation may not be totally free of fossil fuels in the near future, its generation by sector is slowly moving away from coal, as shown in Figure 2.2. For the first time in history, natural gas is thought (data is still being compiled) to have surpassed coal in amount of US electricity generated. Furthermore, in the past 9 years the share of electricity due to non-hydroelectric renewables has nearly tripled. This is largely due to the advances in technology and decreases in cost.

Changes in US Electricity Generation by Sector

Figure 2.2: Changes in US electricity by sector. Natural gas now accounts for roughly equal electricity generation as coal and is thought to have surpassed coal in 2016. Graph personally generated. Data source: EIA Annual Report

2.1.1 Imports and Exports

Traditionally America has been a net importer of energy, as shown in Figure 2.3. This has been particularly true during periods of high economic growth, with low oil prices and therefore low domestic production. However very recently due to the shale boom and advances in technology leading to energy efficiency, America has become a net exporter of energy. Specifically, in 2015 the Netherlands was the country to which the US exported the most coal (17 percent), however, this is a common transshipment port, so it is possible that ultimate consumption of the coal was in other European countries. Globally from 2015 to 2016 there was a drop of 30 percent in

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44 One potential benefit of being a net exporter is the national security concern associated with depending on foreign oil becomes irrelevant.

exports with the Asian and European markets experiencing the greatest decrease at 34.3 and 35 percent respectively.\textsuperscript{46} The one region that experienced a gain in exports was Africa with 57.1 percent increase.\textsuperscript{47} However the total for that market is considerably smaller at approximately 831,000 short tons, compared to the Asian and European markets at 9,703,000 and 19,307,000 short tons respectively.\textsuperscript{48}

![Primary Energy Exports and Total Net Imports](image)

**Figure 2.3:** Historical trends of energy imports and exports for the U.S. Source: U.S. EIA

### 2.2 Fossil Fuels

It would be negligent to promote a future that relied solely on natural gas, as natural gas is still a fossil fuel. It has become popular lately due to the increase in hydraulic fracturing ("fracking") which flooded the market with shale gas and therefore lowered the price. However, there are many hazards associated with depending entirely on natural gas, such as price volatility, climate risks, and environmental and public health risks. Price volatility is particularly threatening with an energy system heavily dependent on a substance that is susceptible to extreme weather, as well as one that is


\textsuperscript{47} Ibid.

\textsuperscript{48} Ibid.
subject to the challenges associated with production, transportation, and storage. Climate risks posed by natural gas are much more than just the CO2 emitted at the plant, but also the methane released in extraction, distribution, and storage. (Methane is 34 times as potent as CO2 in trapping heat over 100 years.) While natural gas is much cleaner to burn at the plant, CO2 emissions from natural gas were forecasted in 2015 to surpass those from coal consumed as fuel. This is a result of the decrease of coal consumption and an increased reliance on natural gas which was consumed about twice as much in 2016, as seen in Figure 2.4.

![Energy-related CO2 Emissions from Natural Gas Surpass Coal](image)

Figure 2.4 Natural gas surpasses coal in CO2 emissions due to our increased reliance on it and decreased consumption of coal. Source: U.S. EIA Short-term Energy Outlook 2016

Lastly, the public and environmental health risks include such consequences as water table contamination from the chemicals used in fracking as well as air pollution from natural gas operations as previously mentioned.


51 Ibid.
2.3 Renewables

The potential for renewable energy to gain complete control of America’s power generation is tremendous. In fact, the total human energy demand is only about 0.01% the total solar energy that reaches the Earth.\textsuperscript{52} Similarly abundant, the entire global potential for wind power is 35 times the global electricity use, and is considered a cheaper technology to solar even.\textsuperscript{53} \textsuperscript{54} Critics often argue that renewable energy must be captured far from the region where it will be used; however according to Steven Ferrey of the Virginia Law Journal, there does not exist a country whose energy demands are greater than the solar energy that falls on its currently existing buildings.\textsuperscript{55} The notion that solar is not affordable is simply outdated. The average rooftop cost in 2005 was approximately $42,000, however in 2013 that cost had fallen to about $21,000 and with additional local and federal tax incentives that number could be less than $10,000.\textsuperscript{56} In 2006 approximately 30,000 homes installed rooftop solar power generation.\textsuperscript{57} In 2013, that number grew by over 1000 percent to 400,000 homes, and the trajectory continues with an estimated 900,000-3.8million home rooftop installations in 2020. By 2017, it’s possible that more than half of the US could have rooftop solar that is as cheap as local electricity.\textsuperscript{58} Some benefits to pursuing renewable energy technologies are: no climate change emissions, improved public and environmental health, inexhaustible energy supply, jobs and other economic benefits, stable prices for the consumer, and more reliable and resilient energy system.\textsuperscript{59} \textsuperscript{60} According a study

\textsuperscript{53} South Wales now operates the largest on-shore wind farm in the UK. With the land publicly owned, the community is guaranteed a fund of $1.8 million paid annually for 25 years-- while the community wasn’t supportive of the initiative initially, the creation of the long-term, significant community fund changed that. http://www.power-technology.com/projects/pen-y-cymoedd-wind-farm-south-wales/
\textsuperscript{55} Ibid, 30.
\textsuperscript{57} Ibid.
\textsuperscript{58} Ibid.
\textsuperscript{59} To learn more about the benefits of renewable energy, please read the article by the Union of Concerned Scientists titled Benefits of Renewable Energy Use. http://www.ucsusa.org/clean-energy/renewable-energy/public-benefits-of-renewable-power
released by the National Renewable Energy Laboratory, using renewable electricity
generation from technologies readily available today, the US could power 80 percent of
its electricity needs by 2050 from renewable sources and provide hourly service to
every region of the nation. As a consequence less environmentally-sound energy
sources may increase globally through exports to regions that need them.

2.4 Relevant Legislation and Regulation Considerations

2015 Paris Climate Conference (COP21):

Climate change is a threat the entire world is taking seriously. The first-ever truly
global effort to combat climate change took place in 2015 at the Paris Climate
Conference (COP21). Much of America’s recent fervor around preventing a 2 degree
Celsius increase in global warming is in accordance with this agreement to attempt to
minimize our carbon footprint. As a result of this agreement, the US has pledged to
reduce, if not eliminate, our emissions of greenhouse gases through energy efficiency
programs and policies limiting what is allowed to be released into the atmosphere.
Whatever of these pledges will materialize under the current Republican administration
is open to question.

Heavy Vehicle Standards:

Under the previous administration in August of 2016, the White House finalized a
fuel-consumption standards for heavy-duty vehicles, large trucks, and buses in an effort
to reduce greenhouse gas emissions. While previous measures had been passed to
help reduce transportation’s contribution to carbon emissions, this established percent
decrees expected by vehicle type with an associated timeline for incremental

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improved efficiencies. Although this sector is not directly related to the coal industry, aside from increasing transportation costs for moving coal in haul-trucks as that those trucks would need to be updated, this is a sign that America is starting to require innovation in all sectors regarding carbon emissions. It is important to note that these measures are subject to change given the current Republican administration and therefore potential annulment under the enforcement by the new head of the EPA and similar regulatory agencies.

Clean Power Plan:

The Clean Power Plan (CPP) is perhaps the most publicized federal policy that promotes the transition to cleaner energy and places requirements on existing and future power plants. A brief synopsis of the plan is that it sets state-by-state goals for lowering greenhouse gas emissions due to electricity generation. Similar to a cap-and-trade program’s flexibility, this plan allows for some flexibility for each state to design its own plan of how to meet its goal as outlined by the CPP. Obviously, certain areas of the nation depend on coal, a primary cause of greenhouse gas emissions in power generation, and so the flexibility of CPP is designed to help alleviate the perceived unequal burden. Ultimately however, the CPP allows for an immense market opportunity for renewable growth. This policy was stayed by the Supreme Court in March of 2016 and is expected to remain as such for approximately 18 months. The purpose of this thesis is to examine what is happening in one particular region, Appalachia, and give some guidance about how policy can move forward and accommodate the well-being of the community there.

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64 Wales, in 2012, proposed their own energy transition policy called Energy Wales: A Low Carbon Transition. In it, they too invest in energy-efficient programs for in-home appliances, as well as large scale renewable sources of electricity generation. Wales also acknowledges that natural gas will serve as an important transition fuel but can not be relied on as a permanent alternate source of energy than coal. "Energy Wales: A low carbon transition," Welsh Government, October 20, 2016, accessed April 13, 2017, http://gov.wales/topics/environmentcountryside/energy/energywales/?lang=en.

Solar Investment and Tax Credit:

Since 2006, the Solar Investment and Tax Credit (ITC) has helped the solar industry blossom incredibly. Under this federal policy, consumers receive a 30 percent, dollar-for-dollar income tax credit on both residential and commercial properties.66 For individuals, the tax credit reduces to 26 percent for projects started in 2020, and 22 percent in 2021.67 Utility and commercial projects may qualify for tax credit rates of 30, 26, or 22 percent provided they start construction before December 31, 2021 and are in service before the end of 2023. This policy has been so successful that the annual solar installation for both residential and industrial has grown by 1,600 percent, or a 76 percent compounded annual growth rate. The extension of this policy through 2021 has helped provide more stability to companies in the field, which in turn helps technology advance, and translates to lower costs to the customer.

California bill SB 32:

Clean energy policies are becoming more popular not only federally but also at the state level. In this regard, California has led the nation for the most aggressive goals yet. California bill SB 32, is the most recent and notable measure, which sets the goal of achieving 40% below 1990 greenhouse gas emissions by 2030.68 This will require tax breaks for electric car purchases, infrastructure to support electric cars, advances in technology, planning for new communities and how they will commute to work, and more.

California Zero-Emission Vehicle (ZEV) regulations for model years 2018 and beyond:

The ZEVs industry is growing and is only helped with policies like those of California, which have also been adopted by nine other states. Established in July of 2014, California will require a certain percent of total car sales from a manufacturer to

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67 Ibid.
be ZEV and TZEV cars (hybrids sold as “transitional” ZEVs) starting with model years 2018 and beyond. Projected requirements are to achieve 22 percent by 2025.69

State energy efficiency resources standards and goals through January 2016:

   In an effort to promote energy efficiency, 32 states had current or pending efficiency targets established, called renewable portfolio standards (RPS).70 Twenty-two of these states required electric, natural gas, or both, utilities to meet energy reduction targets over time. These policies are an upstream effort made to complement greater efficiencies achieved for appliances and structural improvements across America. West Virginia, in 2009, passed what they called the Alternative and Renewable Energy Portfolio Act AREPA, which had a potentially useful element of trading credits for different types of electricity generation. Each credit was equivalent to MWh, with one given for alternative energy generation, two for renewable, and three for renewable from a reclaimed surface mine-- all electricity generation was required to be in state.71 Unfortunately, in 2015 West Virginia repealed AREPA; a clear sign that the change, regardless of how successful elsewhere, will continue to be challenged by local government in Appalachia.72

2.5 Future Forecasts

   The greatest source of uncertainty for future forecasts regarding domestic energy consumption or production by sector is whether or not the Supreme Court will allow the Clean Power Plan to pass. The EIA in its 2016 Annual Report conducted forecasts for electricity generation based on sector with both the acceptance and rejection of the

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70 Ibid, 34.
Regardless of the passage, it projects that natural gas and renewables will continue to grow rapidly due to extended tax credit laws and advances in technology such as photovoltaics, making it more affordable to consumers to purchase renewable means of electricity generation. Due to an increase in onsite generation and adoption of photovoltaic technology, electricity demand growth slows as more residential and industrial sites are adopting solar power for their electrification needs. As shown in Figure 2.5, natural gas will experience a short decline but will resume growth in approximately 2020 and ultimately end in 2040 with generating about 150% of the kWh it currently does. For renewables, the growth is even more promising, as it is only positive. Regardless the passage of the CPP, renewables are projected to produce by 2040 anywhere between 140 and 180 percent of what they did in 2015. This is important because it shows that while the legislation may be uncertain, investing in renewable energy is only projected to do well in the next several decades.

Without the passage of the CPP, coal declines from producing 33% in 2015 of US electricity to 26% in 2040. Furthermore, the coal from Appalachia will continue to be a large source of metallurgical coal, a type of coal whose markets are not directly affected by the CPP as other coal consumers. This is important to note because frequently when discussing the future of the region, it is thought that clean energy policies cause the demise of the community. In reality however, the decrease in coal employment is much more complex than just clean energy policy and is due to many other factors such as higher productivity per miner, a lessening demand in general, etc.


74 Ibid.

75 Ibid.
2.5.1 Imports and Exports

Unlike the future projections for domestic energy consumption and generation, in considering future projections for US energy exports and imports, the status of the CPP has little effect. As shown in Figure 2.6, the US is expected to become a net exporter of energy regardless of the presence of the CPP in most cases simulated.\footnote{The EIA, in an effort to consider all potential outcomes and acknowledge the uncertainty of forecasting, uses a "reference case" whose parameters reflect the current central opinions of top economic forecasters and demographers today. In general, this case assumed current laws and regulations are unchanged during this period and factors into account sunset dates for those which have phase out deadlines. To learn more, visit \url{http://www.eia.gov/outlooks/aeo/}.}
Figure 2.6: Forecasts for US energy exports and imports. Note there is little difference anticipated between the passage or rejection of the CPP under reference case parameters. Source: US EIA

However, the status of oil pricing and production has a greater influence over the accuracy of future forecasts. In the Low Oil Price case, the US remains a net energy importer. Given the High Oil and Gas Resource and Technology case however, the US quickly becomes an accelerated net exporter of energy, as seen in Figure 2.7. This could also benefit not only the nation in the security of being a net energy exporter, but could also provide a source of employment within the US in the technology industry.
Figure 2.7 Forecasts for the US energy exports and imports. In most cases, regardless of the CPP passage, the US becomes an net energy exporter. This is determined more by the status of the economic growth than any other factor.

Moving forward it is critical that Appalachia, and those in positions to pass legislation that affect the region, realize that there is a growing wave of renewable potential for the country. Coal will never completely go away, as it is used in products that America will continue to need such as steel. However, coal will never return to what it was in its prime in terms of numbers employed in the industry nor productivity. Once this source of power generation is accepted to be on the decline, permanently, hopefully investors can see that it will be advantageous to provide employment opportunities in renewable energy for the hard working people of Appalachia. Not only will it provide a cleaner form of energy, but the future of the American economy will be built on a very low-maintenance-cost form of power generation, which only leads to more profit for utilities. In the next chapter we will explore the state of employment.
Chapter 3: The Employment Landscape of Appalachia

"If you fail to plan, you are planning to fail." - Benjamin Franklin

While coal mining only employs a small percent of the workforce in Appalachia, it is the primary source of income on which many towns and communities depend. Frequently, the contribution by miners to the total county’s income is many times their representation as laborers. For example, in Leslie county of Eastern Kentucky, miners only comprise 14.9 percent of the workforce but contribute 39.8 percent to the total county wages.77 While the transition may seem small on paper -- some counties only have single-digit percent values for workforce employed in the mine -- the ripple effect is significant, as Appalachia’s economy has yet to diversify.78

3.1 The Decline of Mining

It is often argued that the coal industry is coming back or will never die in Appalachia because of its superior quality of coal. The low-sulfur, bituminous coal that comes from Appalachia is of a higher quality than that of the Western Region, so it can be sold at a higher premium. Additionally, it is the only region from which anthracite coal -- the oldest and rarest form of coal -- can be mined. However, regardless of the quality, national demand for coal for industrial, coke, and commercial consumption has decreased by 5.8% from 2014 to 2015.79 West Virginia and Kentucky were the hardest hit regions facing a decline in the employment in coal with decreases of 15.5 percent and 17 percent respectively.

78 In the 1960s and 1970s Wales saw a large exodus from the mining communities as jobs became scarce. As a result, and after the historic coal strike of 1974, the Welsh found themselves in a similar position to Appalachians today-- abandoned mines and fewer, albeit still able, residents with plenty of need for work. For more on potential solutions and details for future employment opportunities, please read Chapter 4.
Two explanations for the decrease in employment are that (1) coal used for power generation can more affordably be accessed in the Interior and Western regions and (2) each miner can mine more coal per capita.\(^{80}\) While coal production since 2010 has seen a national decrease and there has been an increase in mountaintop removal in Appalachia, coal production in the Western region has been nearly triple that of Appalachian production largely due to the easy access of surface mines--as opposed to the underground mines popular in the East.\(^{81}\) In 2015, while the national industry saw a decrease in employment of 12 percent leading to a total of 65,971 miners -- the lowest number in recorded history since the EIA started collecting data in 1978 -- the national average of production per employee increased 5.4 percent.

In Appalachia, however, coal production saw a 17.3 percent drop from 2014 to 2015, setting another historic low since 1978.\(^{82}\) The Appalachian production and employment drops are due to a variety of reasons. First, production from the region has higher costs, as it is an old region from which coal has been mined making it harder to reach and requiring more capital intensive means. Also, higher energy efficiency programs create lower national demands for thermal coal. Regardless of the source, the trajectory is the same with fewer men employed in the mines each year since 2011 and historically low numbers as of 2015. While the cause for the decline of employment in the Appalachian coal industry may be varied and complicated, the result is not. People need jobs, and they need them now.

\(^{81}\) Ibid, 13.
\(^{82}\) Ibid, 40.
3.2 Effects of the Clean Power Plan (CPP)

Although the coal workforce is decreasing in all parts of America, the CPP is likely to have little direct impact on job loss in the coal industry from Appalachia. The type of coal mined is high-quality, metallurgical coal used more for steel production than power generation. Coupled with being the only US source of anthracite, Appalachia is not subject to the more aggressive aspects of the plan targeted for coal destined for CO2-emitting power plants.\(^3\)

However, the CPP could affect the region in its potential to promote new jobs. The Economic Policy Institute (EPI) did an in-depth analysis of the effects of the CPP on the coal industry and produced several promising findings relevant to Appalachia. It is estimated that there will be a net gain of 360,000 direct and indirect jobs due to the CPP in 2020 but the annual net gain of jobs will quickly fall until 2030, with an estimated net

\(^3\) Ibid, 40.
gain of 24,000 jobs that year. The workforce displaced by the plan has a similar demographic -- predominantly male, high-school educated, with few other options for employment that pay as well as mining does -- to the workforce that is dying in Appalachia. Those losing their jobs will come from a heavily unionized background and are likely to make significantly higher wages as belt operators, coal extractors, etc. (averages above $45,000 per year, with room for career growth) than other jobs outside of the mine that require only a high school education.

One source of indirect employment spurred by the passage of the CPP would be in the in-demand sector of energy efficiency. Another is the increase in construction jobs necessary for natural gas electricity generation units (EGU), although this is a short term source of potential employment, leading to an increase of natural gas power plants operators and personnel in 2020 through 2025 with a slight decrease in 2030.

3.3 A Shifting Economy

With the increase in laid off miners and the associated trickle down effects of a dwindling source of capital, there has been an increase in supply of willing and skilled workers. Increasingly former miners are finding themselves traveling west to Wyoming to look for employment in the mines there. Else, they join the growing commuting workforce and work for a “local” industrial plant, such as the Toyota plant that recently opened in Georgetown, Kentucky--several hours away from Central Appalachia. A recent study by the National Employment Law Project showed that manufacturing jobs are continuing to decrease in wages and are not even keeping up with inflation, with 25

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54 Ibid, 20.
57 Ibid, 20.
59 According to several of the residents interviewed, what used to be two-parent households essentially become single-parent households during the workweek.
percent of all manufacturing workers making $11.91 or less per hour. Specifically new hires in the automotive manufacturing industry in Kentucky were paid 18 percent less than similar workers in the state.

Recent years have seen a growing pride in local entrepreneurship. Shane Barton, Director of the Appalachian Studies Center at the University of Kentucky, recommends that there be more options than simply “skill transfer” employment opportunities. When greeted with a new audience, he is quick to mention Bit Source, a startup out of Pikeville, Kentucky that hires former miners and trains them to become computer coders. While they only had spots for 10 new employees, they received nearly 1,000 responses to the ads with interest.

Appalachia does not yet possess the infrastructure required for a modern company such as well-maintained roads and internet access. However, the cost of living in many Appalachian counties, with a national average of 100, is 83 compared to nearby Lexington’s score of 92. In a more extreme comparison, the cost of living in San Jose, California (Silicon Valley) is 222 -- 91 percent higher than Harlan County. New companies could find it financially advantageous to build a large campus when land and overhead costs are extremely competitive. There are many possibilities for employment when the limit of “transferable skill,” as it is conventionally defined, is eliminated. Additionally, there is a recent rise in citizens who want to open a small business to become local business owners.

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93 Ibid.
94 For more information on specific options and prospects for re-industrialization and alternative forms of growing a local, diverse economy, see Chapter 5.
When asked how he views coal mining for his children, Pennington Sr., a former miner, said that “no father wants his son or daughter to go into the mines.” He also remarked that many of his friends have expressed similar feelings, showing how there is a growing generation that not only wants to do something else, but is encouraged to do so by their families. When his son was asked what brought him back to Harlan County after leaving to attend university, he said that he wanted to see his community grow in economically, environmentally, and socially responsible ways. He believes that Harlan County, with its incredible land and warm people, has much to offer to tourists from all over. As head of the Tourism Department for the county, he has seen the growing efforts to reclaim surface mine land and introduce new attractions, all of which provide new, non-mining forms of employment.

Appalachia finds itself in an unusual, advantageous position of having a surplus of incredibly hard-working95, highly skilled laborers ready and willing to embrace a new career path. Additionally, the cost of living is low compared to places like Silicon Valley, further decreasing the cost of overhead for local enterprises. The challenge is simple, albeit difficult: convince outside sources of employment to bring their companies to Appalachia and help continue to foster the growing entrepreneurial spirit of current residents. Chapter 5 will discuss specific examples of potential local enterprises.

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95 According to Pennington, they knowingly and willingly entered mines understanding the likelihood that, as a repercussion of the nature of mining, their lifespans would be shorten by years. This is a workforce willing to trade years of their lives in order to provide for their family.
Chapter 4: Options and Prospects for Re-industrialization of Appalachia

“Sustainable development requires human ingenuity. People are the most important resource.” -Dan Shechtman

Chapter 3 discussed the current status of employment for Appalachia. Briefly summarized, trends suggest that the future coal industry will no longer provide the amount of revenue and employment it did in the 20th century. This leaves the region of Appalachia with numerous industrious workers, many of whom are willing to learn new skills. Former miners not only are accustomed to working in highly dangerous and difficult environments but also are very skilled with specialized jobs that involve more than just digging. From electricians to operators for extraction machinery and rail-track laying, these men are trained in a variety of technical fields. Often they are required to think on their feet to improvise a solution deep in a mine, according to Pennington, recalling memories from his greater than 27 years as a miner. “Pig,” the name his friends gave him and what he insisted being called during the interview, has held a variety of positions over the course of his career such as: shuttle car driver, roof-bolter, scooper, boss, safety team member, captain and benchman, alternate gas man, and alternate rear captain. This “quick-on-their-feet” habit of creating solutions when problems arise is extremely useful on both the manufacturing floor as well as in an emerging startup trying to achieve profitability.

As this chapter will explore, there are many emerging industries that could provide employment growth. From areas of employment that would be labeled as “skill transferable” such as manufacturing in the automotive industry, to ventures requiring

96 To learn more about the background of Pig and other Appalachian residents interviewed, please see Appendix A.
completely new skills, like farming or computer coding. The future can be bright for Appalachia with the right mindset and sufficient policy to support.97

4.1 Manufacturing Potential

Frequently, in response to the closure of Appalachian mines, local constituents and elected officials advocate for the creation of local manufacturing jobs--an industry that requires similar industrial traits. Given the growing number of unemployed looking for work, the default solution is for residents and local policymakers to try to bring the manufacturing plants of automotive companies, as car manufactures are large and require a high number of employees, to their community. However, the growing renewable energy technology industry could also provide a great source of employment in manufacturing potential.

4.1.1 Automotive:

In 1988 Toyota opened its largest manufacturing plant globally in Georgetown, Kentucky.98 It employs nearly 8,000 people and sits on approximately 1,300 acres of land. Toyota is the closest sizeable manufacturing plant to Central Appalachia. At a three hour drive from Harlan County, this makes for a difficult daily commute. In an interview with the local Boys and Girls Club, Director Kateena Hayes said that she had a family member who made the commute to the Toyota plant but was only able to return home on the weekends. Such long commutes for limited positions are shifting the parental and family dynamics of the region from two-parent to part-time single-parent households.

However, as the skills needed in a manufacturing plant transfer easily from those needed in a coal mine, new automotive companies would find a surplus of employees if they were to open in Appalachia. During past periods of economic boom in the Appalachia, companies frequently built large, industrial parks only to later abandon

97 Please see Chapter 6 Remedial Policy Options Related to Employment Enhancement and Chapter 7 State and Federal Assistance for a deeper dive into the policies affecting employment possibilities in this region.
them when funds ran out. Many of these still remain empty today and ready to host future companies.99

4.1.2 Renewable Energy Technologies:

As we saw in the chapter 2, if America wants to become a net energy exporter, which some regard as beneficial, then it would be advantageous to invest in technology that can further advance the energy industry domestically. This could provide many options for employment in Appalachia, both in the manufacturing and production of renewable technologies but also in the installation and maintenance service sectors.

Solar panel production:

According to Professor You of Northwestern University, panels produced in China have nearly double the carbon footprint of panels produced and consumed locally in Europe.100 101 Additionally harmful, the production process for solar panels is chemically intensive and hazardous to both the employees and the environment. The process begins with the extraction of silica from mines. This silica powder puts the miners at risk for silicosis—a disease of the lung like black lung. The silica is then refined in a process that involves hydrochloric acid and releases tetrachloride, a very toxic compound. After the creation of the polysilicon, there are more hazardous steps involved to create the wafers necessary for the final product. These steps require high-energy consumption and the use of hydrofluoric acid—which is incredibly dangerous for employees.102 In 2011, China, where most photovoltaic (PV) panels come from, instituted a policy that requires proper recycling of silicon tetrachloride waste—this was a critical step towards ensuring safer processing of the chemicals used in PV

99 According to Shane Barton, almost all counties have several abandoned warehouses sometimes called shell or prospect buildings, rented out by the city for private occasions in order to generate income from buildings that would otherwise remain untouched.
100 To learn more about the life-cycle analyses, please read the paper in Solar Energy, Vol. 105, July 2014
While the production of polysilicon panels poses great health and environmental concerns, and therefore is not a healthy option for long-term employment in Appalachia, if the panels were produced and consumed domestically at least the associated carbon footprint would decrease. If the carbon footprint of European manufacturing and domestic consumption is any indication of US emissions, the carbon footprint could decrease by as much as a factor of two, or 35 grams per kWh. This could help motivate federal support for domestic producers.

Although polysilicon PV panels held about 90% of the market share in 2014, it is expected that the less energy intensive and less chemically dangerous counter option, thin-film solar panels, will become increasingly popular over the next decade. There are currently three types of thin-film technologies: amorphous silicon (a-Si), cadmium telluride (CdTe), and copper indium gallium selenide (CIGS). While Appalachia may immediately see the potential to ramp up production for the more standard, polysilicon based PVs due to their mining nature, it would not be the best choice given the likelihood that that process will be just as harmful as mining coal, and also likely to fade out as technology advances leading to thin-film panels slowly growing in market share. According to a survey done by Global Market Insights, thin-film PV panels are expected to grow by 16% from 2016 through 2024 with CdTe option leading the growth within the thin-film industry at 17% and over 50% of the market share. Appalachia instead could benefit for a longer period of time from the solar panel industry by either producing for companies that manufacture in the US, such as SunPower or First Solar, or encouraging emerging, thin-film PV startups to bring their manufacturing to Appalachia. When deciding which companies to pursue, representatives of the region should consult the Solar Scorecard produced by the Silicon Valley Toxics Coalition, a group dedicated

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103 Companies are now required to reclaim 98.5 percent of silica from the waste, which is feasible with proper recycling equipment. But as that equipment is expensive, it’s unclear what policies exist to enforce this requirement.
104 Ibid, 46.
to ensuring that the PV sector is safe for the environment, its employees, and the communities it affects. ¹⁰⁷

Wind turbine production¹⁰⁸:

Unlike the solar panel production process, the process to create wind turbines does not require highly dangerous chemicals. Wind turbines use more than 8,000 components—providing great potential for manufacturing.¹⁰⁹ With industrial parks already built in many counties in Appalachia, the low cost of living compared to other regions of the US, and a surplus of industrial workers looking for employment, a company could start an enterprise to create the parts needed in the assembly of wind turbines with more ease than starting the company elsewhere. A rather high amount, 88 percent, of total wind power installed in the US in 2015 used a manufacturer with at least one plant in the US.¹¹⁰

Specifically, a study for the Department of Energy found that for a manufacturer to break even the demand necessary for a company that builds a single component only requires about 300 MW per year—compared to a company that generates the entire wind turbine which requires 500 to 800 MW per year.¹¹¹ In 2015, General Electric alone, a company that holds only 42.5% of the US market share, received orders for 5.9 GW of

¹⁰⁸ In South Wales the largest on-shore wind farm was recently finished as of March 2017. Initially the residents of the region resisted, unsure how the presence of the farm would affect the local life and tourism. However, after the company funding the project allotted approximately one million dollars annually for the lifetime of the farm, 25 years, to community for local economic development, the town agreed. Appalachia has a different role in this sector, as many residents have expressed similar dislike of the idea of the presence of wind turbines. Instead, Appalachia can reap the financial benefits of manufacturing without the potentially unwanted effect of hosting said turbines. Furthermore, a study released by the Welsh government when considering the tourism impact of onshore wind farms, there is negligible effect on tourism due to the wind farm presence.
¹¹⁰ Ibid.
new capacity.\textsuperscript{112} The study also found that other considerations such as regional competition and geographic constraints would be considered before a manufacturer would commit.

Furthermore, the distance from Central Appalachia to the regions of the US with the highest potential for wind energy generation\textsuperscript{113} is about equidistant from Texas, where some of the current manufacturing for American wind turbines are produced.\textsuperscript{114} In fact, Central Appalachia is closer to Maine, a top contender for future wind energy generation, by about half the total distance from Texas. As the greatest cost associated with transportation is fuel, this could translate into large financial savings for companies. Although in 2015 General Electric was surpassed by a Chinese company as the world’s leader of manufacturing wind turbines, the American company still ranks as third globally in an industry where electricity generation due to renewables in America is expected to increase by 250 percent by 2050.\textsuperscript{115} Moving forward, it would be beneficial for potential investors to know the potential return on investment (ROI) of wind farms. As a recent paper published by Stanford Law pointed out, academia is lacking in providing literature for the perspective of an investor.\textsuperscript{116} However, that is beyond the scope of a manufacturer concerned with producing a part for a wind farm that could be bought by any wind turbine producer.

4.2 Non-manufacturing Ways to Grow Local Economies

Much of the dialogue external to Appalachia assumes that former miners are both limited transferable skills and do not want to learn a new craft. From interviews with local residents and former miners, however, it becomes clear that their primary objective

\begin{itemize}
  \item \textsuperscript{113} Though much of the midwest has potential, Montana, North and South Dakota, Minnesota and Wisconsin and Maine, foster the highest.
\end{itemize}
is to have a job that pays well enough to provide for their families and other financial responsibilities. Specifically, the notion of the “stubborn pride” that was once seen among miners has faded away with the recent economic recession. There is growing acceptance that coal will no longer provide the number of jobs and economic prosperity it once did during former booms. Furthermore, many expressed the desire to not have to work under such dangerous and grueling circumstances and welcome a career shift provided it pays well enough—approximately $20-25 per hour. Many also expressed that they would be willing to negotiate salary assuming that the new position wouldn’t pose similar, life-threatening side-effects—such as black lung—and would allow them to remain in Appalachia with their families and on the land they associate with their identity. When exploring the potential for employment for this region, both Joshua Bills of Mountain Association for Community Economic Development (MACED) and Shane Barton of the Appalachian Studies Center at the University of Kentucky stress the importance of growing a local economy. A recent study in the American Journal of Public Health found that the Appalachian region, because of its constant low socioeconomic standing inherent with coal-dependent areas, was subject to greater health risks and suggested that diversification of the economy would actually help the public health.

4.2.1 Non-profits Promoting Renewables:

Non-profits that promote renewable energy could gain a lot from hosting their business in Appalachia due to federal funding, low cost of local living, and high projected demand for the future. Those promoting solar power stand to potentially gain the most as employment in the solar industry has grown by 86 percent in the past five years—adding workers 20 times faster than the overall economy. Specifically the

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117 Interestingly, several interviewees remarked that it is commonly accepted that coal is a boom and bust industry, however when thinking of the past, some coal supporters don’t recall the periods of economic “bust.” There is an apparent disconnect between acknowledging the behavior of the industry and realizing the consequences of it, among some believers that coal is healthy for the community.

118 Ibid, 43.


installation workforce remains the largest domestic employment growth with its more than double growth since 2010. Some examples for future startups or companies that Appalachian representatives may want to contact are programs such as GRID Alternatives which trains and supplies solar installers where there is need across America.\textsuperscript{121} The Department of Energy has a new program, SunShot, which is designed to help reduce the cost of solar development and therefore increase its adoption.\textsuperscript{122} Through that program, 13 solar-oriented programs have received up to 30 million dollars in funding to help with mass adoption of solar energy.

Programs that help promote local economic development could be of particular help in fostering entrepreneurship at the individual level. Once such program which provides small loans and technical support is MACED. This group partners with local residents to help them best utilize the local strengths and resources of Kentucky and Central Appalachia to help make their communities better places to live.\textsuperscript{123} In particular, MACED has found it useful to focus on community investment, demonstration initiatives, and research and communications for policy change, and believe that the key sectors to strengthen are both energy\textsuperscript{124} and forestry\textsuperscript{125}.

4.2.2 Agriculture:

Another skill transferable option for former miners could be farming. Driving and maintaining farm equipment, thinking on their feet, and working with their hands are all traits that are necessary to run a farm effectively. In states like Kentucky where agricultural products such as bourbon and hemp are already highly valuable, the rich land of Appalachia could provide fertile ground for growing. Hemp production, which

\textsuperscript{124} MACED helps promote energy development through programs such as Energy Efficient Enterprises, which helps enterprises become more energy efficient, How$martKY, which works with electric cooperatives to retrofit businesses and homes for energy efficiency, and with Kentucky Sustainable Energy Alliance, which advances state policy regarding renewables and energy efficiency.  
\textsuperscript{125} MACED supports forestry programs such as Appalachian Carbon Partnership, which promotes sustainable forest practices through education, new income options from carbon credit sales, and financial assistance.
was made legal in 2014, started with an initial 33 acres and has rapidly grown to 2,350 acres in 2016. However, relative to tobacco with its 72,900 acres planted annually, the hemp production is small with much room to grow. Especially with the nationally growing acceptance of the consumption and sale of marijuana, the sale and acceptance of hemp could grow even more. The artisan, locally grown and roasted coffee scene has also gained attention, though less contentiously, and could provide another product for future development especially with the ability to sell products on the Internet through distributors such as Etsy, a local farmer can take his or her products globally.

Grow Appalachia, funded through Berea college by John Paul DeJoria, helps to solve issues of food insecurity in the region that was historically very rich in agriculture production and still fosters a great sense of connection to the land in current residents. Future startups or other individuals looking to create programs that help with food insecurity or education of healthy living could model their business after this program. Specifically Grow Appalachia helps the foster a better community by:

- Creating gardening grants
- Educating and integrating what it learns from the communities it interacts with to guide future interactions
- Providing technical and physical assistance
- Donating a portion of their produce to local food banks and sources of need
- Encouraging participants to become independent entrepreneurs

In 2010, the first year, Grow Appalachia had participants at four sites and grew 120,000 pounds of food for 2,800 local residents. Over the years it expanded to four states, or 50 counties, with a grand total of 54 participating sites run by 2,900 families.


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In 2015, the program grew 580,000 pounds of produce worth $780,000 through leveraging by their site partners, shared 61,091 pounds with those in need, and created 120 jobs. Additionally, participants in at least one location are turning home grown herbs and honey into skin care products—further showing the ingenuity of people if given the chance to become local business owners.

4.2.3 Reclaiming Abandoned Coal Mines:

Funded through policies like the RECLAIM Act described in Chapter 7, programs that aim to return the land that was once a mine or offices once staffed by mine companies could provide a needed boost for employment in the short term. While initially land restoration would require more employees than would be necessary long-term, there could still be room for some permanent employment through positions such as groundskeeping, etc. Creating community centers out of previous mine offices that foster adult education and life-skill development, could also prove useful. This could also help bolster the local eco-tourism scene of Appalachia. Recently Harlan County has expanded what it has to offer to routes for ATVs, zip-lines, and mountain biking.

There has been some discussion in the Eastern Kentucky region of opening a federal prison on the reclaimed land of a mine. However, there is a danger posed to the incarcerated individuals, prison staff, and locals nearby as there could be remaining gas and other elements released in the construction of the prison. It is therefore

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129 In Banwen, Wales, UK, a group of women founded a workshop, DOVE, in a building that was previously a coal mine's office. This group helps with educating local adults and regeneration of the previously economically depressed region after the coal mines closed in several decades ago. Specifically, this program offers life-skill classes, arts and crafts classes, a nursery for 20 children, and can even offer a humanities degree through their partnership with a local college. It also has a cafe as a source of income and employment. For more information, please visit: http://www.doveworkshop.org.uk/

130 Similar to Harlan County, South Wales has made a large effort to reclaim the land of former mines for the purpose of eco-tourism. Specifically, the program "Call of the Wild" offers an escape for companies wishing to host a retreat that fosters team building, leadership, talent management, compliance and funded training, change management, strategy planning, and performance management. It is also land that is known for its mountain bike paths and beauty, so while it might appear as solely eco-tourism, it also gains the attention of industry-minded companies wishing to provide a useful retreat for their employees. For more information, please see: http://www.callofthewild.co.uk/


regarded as dangerous and not advised.\textsuperscript{133} Regardless the decision of what to build, the American Journal of Public Health found that cardiovascular disease is found at higher rate and that the general health is lower for the populations that live near mountaintop removal sites compared to mining and non-mining areas.\textsuperscript{134}

4.3 Summary

The manufacturing potential for Appalachia is high in terms of able employees and abandoned industrial parks ready for rent. However, an over-dependence on manufacturing is just as troublesome as the current state of coal in the area. Just as the textile industry of the South or manufacturing industry of the North left the communities living in poverty, so too could an over dependence on a new, single industry continue Appalachia’s economic strife. Moving forward though, manufacturing parts for wind turbines specifically, though renewable energy technologies at large as they all are markets that have been growing rapidly in the last decade roughly, could provide part of the employment demand without problem. In producing solar panels, the type of panel should be carefully chosen based on toxicity of the process and access to proper disposal methods.

Non-manufacturing forms of employment provide the most promise for future stable employment. Furthermore, the health and safety for employee increases due to a lack of other workplace hazards. A good example for a local company promoting agriculture entrepreneurship is Grow Appalachia which in five years created 120 jobs and in 2015 its farmers grew $780,000 worth of produce. In addition to agriculture, eco-tourism poses great potential for employment and land restoration projects. Specifically abandoned mine reclamation projects provide a great win-win situation for the

\textsuperscript{133} In a recent article published by the North Western University Law Review, it is even argued to be unconstitutional and a violation of the eighth Amendment which prohibits cruel and unusual punishment. Please read more at: http://scholarlycommons.law.northwestern.edu/cqi/viewcontent.cgi?article=1239&context=nulr

community with both land restored and people employed restoring and upkeeping the land.

Appalachia is at a critical point in its history. It can switch its focus to a single, new industry, such as car manufacturing, or it can diversify its economy and ensure better survival in the future as industries ebb and flow. Diversification can provide a variety of jobs that are much healthier for the employees, the environment, and their community. From the interviews conducted, one can see the great source of pride Appalachians have in the land from which they come. While coal has largely defined the identity of the region, with its camaraderie and bonds among miners. Emerging local business can equally bond over their love for the hills they call home and take pride that their daily operations are helping ensure those mountains will still stand for generations to come.
Chapter 5: Relocation Options and Community Resistance

“There are no strangers, only friends you haven’t yet met.” -William Yeats

When discussing the future of the coal mining industry, and specifically the employment of the miner, the option of relocation comes into play. Simply put: relocation is not an option. It seems to be neither feasible nor desirable in many cases. This chapter will discuss the considerations involved with that suggestion and the common response from the Appalachian communities when presented with it.

5.1 Relocation Options

The conversation around providing for coal miners and their families sometimes raises the suggestion that they should relocate and simply start again elsewhere, such as in Wyoming, where there is more coal. In considering this, there are three key points to explore: (1) what are the employment opportunities (2) what are the costs associated with moving, and (3) is relocation a long-term solution?

The families who are moving in order to find more positions in coal will eventually find the same problems in their new location they encountered in Appalachia. As stated in previous chapters, due to technological advances the productivity of each miner is increasing and therefore there are fewer people needed for the job. That said, miners have been known to leave Appalachia and start mining in the Powder River Basin. However that doesn’t solve the problem of a lack of economic diversification, nor does it guarantee employment until retirement let alone a pension. It instead it kicks the metaphorical can down the road to solve.

As previously described in Chapter Three, the employment landscape for Appalachia has the potential to become very diverse. However historically it has been comprised of average working class citizens. There has been a small exodus of former

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miners looking to work in new coal mines elsewhere, and they can do so because of their unique field of expertise. However the rest of Appalachia’s working population -- those in fields\textsuperscript{136} that have no special qualifications to make them marketable such as miners do in other mining regions -- remains without a solution. Because life in Appalachia has been centered around mining for so long, it is easy to forget that mining only supplies jobs for less than one tenth of the population in many areas of Appalachia. Eastern Kentucky provides a representative sample where the mining industry accounts for only 8.5 percent of employment and generally contribute twice that amount to the county’s total income.\textsuperscript{137} Jobs in sectors with unskilled laborers, such as the service industry, are likely to fill easily, especially with the national surplus of unemployed workers. It is also important to acknowledge there is a stigma associated with the accent of the people from this region, further making their integration elsewhere difficult.\textsuperscript{138} For this group of people, there is especially no incentive nor program to provide employment elsewhere and hence moving does not pose any advantage, and certainly not long-term.

Another aspect to consider is the associated cost of moving which includes things such as packing materials, transportation, fuel, etc. The average cost of moving to a different state in the US can vary from $5,630 to $12,459.\textsuperscript{139} Regardless, this is not a cheap nor free endeavor should a family of four want to move and not have to leave behind their possessions. Furthermore, a recent study suggests that 76 percent of Americans live paycheck-to-paycheck.\textsuperscript{140} Add the further financial instability due to the boom and bust nature of coal, and suddenly the option to relocate stops being feasible.

\textsuperscript{136} According to the Appalachian Regional Commission, Appalachia’s employment sectors can be dissected into: farm + natural resources, mining, utilities, construction, manufacturing, trade + transportation, professional services, health + education, personal services, public administration. (https://www.arc.gov/images/programs/ardi/EconomicAssessmentofAppalachiaJune201O.pdf)
\textsuperscript{137} Ibid, 40.
5.2 Strong Tie to the Land and Clan

It should come as no surprise that as there are no formal options for relocation, there is great community resistance to the concept of moving. However, that resistance stems from more than a lack of opportunity elsewhere. Perhaps the primary reason people are not leaving Appalachia in a mass exodus is their passionate bond with the mountains they call home. From the interviews, it became readily apparent how loyal each individual was to their home and how strongly they want to remain there and fight to preserve it for years to come.

When asked what they most enjoyed about growing up in Appalachia, every participant interviewed responded with an activity that involved spending time outside in nature. Laura Adkisson, a seventh generation Harlan County native and local librarian, said that growing up there she came to view her surroundings as a “magical...ethereal place.” The way she described the mountains, the streams, and the wildlife, with meticulous care was as though she were writing a love letter to someone who had never seen a sunset. She’s not the only one. Brandon Pennington, the Director of Tourism for the county, said that he was eager to leave for college but as soon as he graduated the “siren song of the mountains” called him back. Part of the allure of the area is the uncertainty of what the day will bring. One could leave the house and see things as different as a bear on the front porch or a crew filming a movie in the street.

Another key element to the culture that should be considered when designing policy, is the love of one’s family— or as nearly everyone described it, “clan.” Adkisson put it well when she said that they “inherit each other” as family friendships and alliances are formed over generations. So strong are these clans that given a last name, a native could tell you which part of town they lived in. Shane Barton, Director of the Appalachian Studies Center at UK, whose parents were each one of fifteen siblings, said that while you may not always agree with each other, the protective kinship that comes with these large clans is how the community has survived through the extreme cycles of boom and bust in the coal industry. Harkening back to the inception of coal
towns, Appalachian residents have a strong sense of community which fosters an equally strong skepticism of government or outside assistance. According to Kateena Haynes, Director of the Boys and Girls Club for Harlan County, this apprehension of outsiders is the result of years of exploitation from “the company man.” This cultural bias will have to account for when designing policy to help the region.

Given the strong sense of community and inter-dependence between clans, future policy could explore the potential for a communitarian economy as suggested in Marjorie Kelly’s work “The Ownership Society.” According to Adkisson, the stubborn sentiment that coal is the only job for skilled laborers in the region, a sentiment that has been common for decades, has lessened in the past five to six years as desperation for employment has increased.141 This is important, she says, because it means miners are amenable to other employment opportunities which allow them to remain on the land they call home. Time is pressing though, as local author and business owner, Darla Jackson, put it: “The fear is now. It’s reality. There is no fear of the future, it’s happening.” And yet, by choice or otherwise, this community remains in Appalachia ready to fight its way into economic success. So while others may suggest relocation as an option, there is no discussion for the inhabitants. They are staying, and they are going to ensure that generations to come will be able to as well.

141 This aligns with data from the EIA documenting the fall in employment starting in 2011.
Chapter 6: Remedial Policy Options Related to Employment Enhancement

“Only then will a nation be truly great, when a leader inspires and produces citizens worthy of becoming future leaders.” - Suzy Kassem

In Chapter 4 we discussed potential new avenues for local manufacturing and entrepreneurship. From interviews with local residents and references to how Wales has fostered economic development, it is apparent that diversification and fostering local business ventures have potential for high impact on economic stability. Furthermore, community buy-in and a sense of self-pride from the newly employed worker are high when they are given the opportunity to run their own business or work for a local company.

In considering how the future of Appalachia’s economy will take shape, it is important to note what current policies are in play that affect potential new forms of employment. Below I will discuss what current policies are in place to help, such as unemployment insurance, and which potentially hinder moving forward.

6.1 Unemployment Insurance Benefits

In the event that qualified workers find themselves without work for reasons beyond their control, they can request “unemployment insurance benefits” which are federally and state funded. Each state has its own requirements for eligibility; however in most states the worker is required to have worked the first four of the past five calendar quarters. So depending on which Appalachian state the unemployed miner is in, he/she may qualify for financial assistance. In order to continue receiving these benefits, the unemployed must file every week or two weeks depending on the state; verifying his or her effort to find a job and any offers they have rejected in the process. In most states, benefits can be paid for a maximum of 26 weeks, although during periods of high unemployment, individuals may request to have benefits extended.
These benefits are also subject to federal income tax. These benefits are not intended to be a long term solution, but rather to help with any job transition period.

WorkForce West Virginia, the US Department of Labor's recommended resource for job seekers in the state, provides an organized web and mobile interface for those looking for employment. They also provide a poster to explain the benefits and qualifications for unemployment insurance. An often overlooked detail is that Internet access is not always a guarantee in this region. Therefore ensuring a usable and easily understood mobile platform that residents can access on their phone would be highly advantageous for any program targeting the area.

6.2 Obstacles to Agriculture Ventures

As discussed previously, perhaps the most economically viable and environmentally responsible future for Appalachia is to grow local economies rather than shifting to manufacturing jobs exclusively. Grow Appalachia provides an excellent example of how future agriculture ventures could expand and help foster an environment where local entrepreneurs can thrive. Through funding both from the federal and state governments, programs such as the Kentucky Center for Agriculture and Rural Development (KCARD) exist to help facilitate agriculture and business development. However, many agriculture entrepreneurs encounter laws that act as obstacles prohibiting interstate commerce and requiring only direct points of sale.

While each state has their own laws, according to Forrager, a company which surveys state-enforced policies around the sale of homegrown and homemade goods, the only Appalachian state to be rated as “good” is Pennsylvania. They are the only Appalachian state which allows for sales online and transportation via mail. Other

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143 For more information, please see Chapter 4.2.2 Agriculture.
146 States are rated as one of the following: Great, Good, Okay, Poor, Restricted, Pending. Virginia and Tennessee are rated as “Good,” West Virginia as “Okay,” and Kentucky as “Restricted.” Even these
states, such as Kentucky which is rated as “restricted,” are only allowed to sell via direct venues such as registered farmers markets and roadside stalls. This significantly increases competition in an already economically depressed local market, therefore making it hard to find demand for premium products that could be sold elsewhere for much more. Additionally, it also prevents other entrepreneurs from thriving due to a saturated market.

Additionally, Kentucky farmers can not mail any goods and there is a cap of $35,000 per year in sales of acidified foods which are produced via home-based processors, though no maximum of sales of other qualified goods. While this point may seem insignificant, it makes it very difficult to mass produce and sell preserves such as jams, jellies, and other pepper-based salsas--common goods to make if you are a local entrepreneur looking to ship a product that requires a longer shelf-life and is transportation friendly. It would be negligent to promote an agriculture future for Appalachia and restrict not only what they could produce but also the means by which goods can be sold. Especially given the current market for boutique items, online third-party vendors such as Etsy could significantly change the financial prospects for an Appalachian resident starting their own business.

6.3 Local Organizations

Organizations such as the Mountain Association for Community Economic Development (MACED) and Grow Appalachia are great examples of how local programs can not only employ directly, but also help encourage other small business owners to grow and therefore employ even more. Over time, with the help of

"Good" states however are limited to direct venues of home and farmers markets-- essentially keeping farmers in the 20th century and preventing them from reaching their fullest potential.


148 In Virginia, the cap is even more limiting and is $3,000. While this is placed only on the sale of pickles and other acidified foods, it is those types of goods that would do well to be sold online and via other means that require a longer shelf-life.


150 Ibid, 53.

151 Ibid, 54.
programs such as these, small business ownership would become a more popular option for employment. As the popularity grows so does the support network encouraging local entrepreneurship--establishing a positive feedback loop.\textsuperscript{152}

Simply put, there hasn’t been a lot of progress in passing remedial policy specifically targeted for the employment of Appalachian miners. The current administration’s recent repeal of many policies pertaining to clean energy and environmental care, and therefore employment that could come from that, has made it clear that the contentious issue of coal and employment will not be resolved any time soon. A key takeaway to consider when designing policy and business opportunities moving forward should be to focus on economic diversification via local business sectors that have high job multipliers. Chapter 7 will discuss the many policies, either proposed or already passed, that could benefit the region and provide alternative sectors for employment.

\textsuperscript{152} Chapter 8: Roadmap for Action will discuss the ways in which local organizations can increase the job multiplier, the effect to which industries can encourage job growth, in greater detail.
Chapter 7: State and Federal Assistance

“Do what you can, with what you have, where are you.” -Theodore Roosevelt

The breadth of the problem facing Appalachia is wide and far reaching-- from individual fears about financial insecurity to community skepticism of outsiders. This chapter explains the role the government, both federal and state or local, has thus far played in promoting policies that could directly help or hinder this region as it moves away from coal.

When considering where funds will come from to pay for policies that support alternative options to coal for Appalachia, both local and federal agencies should consider the costs associated with coal. Additionally, the current $1.10 per ton excise tax on coal mined from underground mines, like those in Appalachia, could be used. It is estimated that fossil fuel consumption for electricity generation costs in the US health care system between 350 and 880 billion dollars annually. This comprises about six percent of the US’s total GDP and over 10 percent of our total healthcare costs. Also, the fact that coal is a finite resource that is going to wane with time means that this is an issue that must be resolved. As previous chapters assessing the energy and employment landscapes of America suggest, it is only a matter of when we choose to do so. This all suggests two things: (1) there are hidden costs associated with coal that could be used as incentive for the government to switch from coal and sources of revenue for future programs and (2) coal is a diminishing good which makes it is more fiscally responsible to look further down the road than the end of the election cycle and support programs that encourage economic diversification.

7.1 State and Local Support

154 This is due to premature death, health endpoints, work days lost, and other direct costs to the health care system.
While federal policies tend to get more of the spotlight regarding the national discussion around the future for Appalachia, there is much that can be aided through local support. Unlike federal support, one benefit that policies have at the local level is that representatives normally have a better sense of the community needs, and there is a clear dialogue between resident and lawmaker. As Adkisson made clear in her interview, residents will not hesitate to speak with local elected-officials and will even pull them aside at church or in a grocery store to voice their opinions. Unlike being on the city council for a large city where that is their only job with office doors they can close to unhappy constituents, these officials hold other jobs in the community. This allows them to have a pulse on the community’s needs.

7.1.1 Kentucky Agriculture Development Fund (KADF)\footnote{Adkisson adds a unique perspective as her personal phone number is one number off from the local county magistrate and therefore receives a lot of calls from very vocal citizens. Her mother also served on City Council and experienced first hand encounters in the unconventional settings such as a place of worship and grocery store.}

The purpose of this fund, which is delegated by the Kentucky Agriculture Development Board, is to support innovation in agriculture that produces greater net farm income across the state by stimulating markets for Kentucky agriculture goods. Similar to the economy of Appalachia and its dependence on coal, other regions of Kentucky have experienced economic strife due to their over-dependence on tobacco. This policy aims to help farmers of all products by encouraging economic diversification in order to provide a healthier future for farming in the state.


In 1964, as a result of the Economic Opportunity Act (EOA), these programs were created to offer support to families in need through short-term financial assistance. Anything from paying the bills to finding housing is under the purview of these programs. The CAA is a network that is funded federally. However the funds are given directly to the state, which is required to forward 90 percent along to the selected local

programs that help families in need. In this way, the CAA network helps disseminate funding down to the city and town level across the nation.

7.2 Federal Assistance

7.2.1 POWER+ Plan

The POWER+ Plan is the component of the Clean Power Plan (CPP) targeted to aid in relief and help increase employment within the coal mining society as coal slowly becomes obsolete. The plan will allot $10 billion to fund initiatives that help grow and diversify their new economies. There are four fundamental pillars of the program:

1. RECLAIM Act: “$1 billion to create long-term economic opportunities in agriculture, energy, recreational tourism, and more all on reclaimed coal mines.”
2. Ensure proper care for the greater than 100,000 retired United Mine Workers of America (UMWA) miners and their families.
3. Promote economic diversification and job creation, funded by at least $55 million towards retraining and development programs and distributed through a variety of federal agencies.
4. Deploy carbon capture and sequestration technologies through $2 billion in tax credits to power generators to encourage adoption.

Unfortunately, the greatest unknown with moving forward with this policy is the current head of the EPA is vehemently against regulations such as those proposed under the CPP. As a result, the administration has already repealed policies that would have helped promote the passage of the CPP. Furthermore, it is unclear whether or not the new Supreme Court would approve the CPP, which is necessary for the dissemination of the funds outlined above.

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159 In March 2017, President Trump released an executive order that resulted in the Department of Justice requesting that the DC Circuit Court stay their decision on the CPP until the EPA could present a revised policy. It’s unknown at this time if the court will agree to that.
160 ibid, 21.
161 ibid, 21.
162 ibid, 21.
163 ibid, 21.
7.2.2 POWER Initiative

As the CPP is currently stayed in the DC Circuit Court, the POWER+ Plan cannot be issued. However, as a “downpayment” on the plan, the Obama administration proposed the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative.164 This bill granted $28-38 million in FY 2015 to help communities that will be or are already affected by the decline in the coal industry. The bill has a two track plan that will help those communities plan how to use, and therefore maximize, their readiness and efficient use of the coming funds from the POWER+ Plan. Specifically, the Departments of Commerce (DOC), Department of Labor (DOL), Small Business Administration (SBA), and the Appalachian Regional Commission (ARC) will be used in this process. The DOL and DOC will award communities to create comprehensive and integrated economic development strategies through the use of analyzing current community assets, evaluating needs and resources, and organizing community stakeholders.165 As a second track, the DOC, DOL, SBA, and ARC will award implementation grants for communities who have already developed the previously mentioned strategies.

In 2015 through funding from the POWER Initiative, Kentucky was awarded three million dollars to help lay the badly needed infrastructure for high-speed Internet access for Eastern Kentucky. Additionally, this program awarded:

1) 500,000 dollars to the Kentucky Center for Agricultural and Rural Development (KCARD) to help create markets for farmers166

2) 275,000 dollars to Appalshop, an Appalachian program used to highlight the culture of the people in Appalachia and rural America, for their information-technology certification program167


165 Ibid.

166 Ibid, 63.

3) 1.2 million dollars to WestCare, a program to help with substance abuse in Pike County, Appalachia\textsuperscript{168}

4) And 100,000 dollars to Perry County to create a plan for economic development.

In moving forward, it could prove useful to see how the funds granted for FY 2015 have helped produce economic growth two or three years later. It is critical that we pass the CPP soon while the national fervor for clean energy is high\textsuperscript{169}. With each passing day the current administration continues to misrepresent the needs of the region and distorts the reality of the future for coal in America\textsuperscript{170}.

7.2.3 \textit{RECLAIM Act} \textsuperscript{171}

This act was created to provide an immediate economic boost in areas left with abandoned mines. Former miners not only are incredibly hard-working and used to getting dirty, but they frequently also possess a strong appreciation for the land they come from. As such, they provide a willing and able workforce to help with the reclamation. The Office of Surface Mining Reclamation and Enforcement (OSMRE) estimates that it will create 4,500 jobs across the nation.

In an effort to let individuals see how the act would affect their specific region, the act has broken down by state which districts have how much to gain. The act would distribute one billion dollars to the existing federal Abandoned Mine and Land (AML) Fund across the nation. The AML would then distribute it at the local level in an effort to provide swift financial assistance to boost employment in not only the act of reclaiming the land, but also the potential that land holds in hosting future companies. They

\textsuperscript{170} See Chapter 8: \textit{Roadmap for Action} for a clarification of the terms “friend of coal” and “coal country” frequently used in press releases from the White House.
estimate that the Appalachian states have the following amounts remaining in abandoned mines. ¹⁷²

<table>
<thead>
<tr>
<th>State</th>
<th>Value remaining in unclaimed mines</th>
<th>Amount to be distributed through act over 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pennsylvania</td>
<td>$5 billion</td>
<td>$330+ million</td>
</tr>
<tr>
<td>Ohio</td>
<td>$300+ million</td>
<td>$64 million</td>
</tr>
<tr>
<td>West Virginia</td>
<td>$1.5 billion</td>
<td>$194 million</td>
</tr>
<tr>
<td>Virginia</td>
<td>$420+ million</td>
<td>$30+ million</td>
</tr>
<tr>
<td>Kentucky</td>
<td>$460+ million</td>
<td>$100+ million</td>
</tr>
<tr>
<td>Tennessee</td>
<td>$43 million</td>
<td>$12 million</td>
</tr>
<tr>
<td>Alabama</td>
<td>$200 million</td>
<td>$28 million</td>
</tr>
</tbody>
</table>

In creating programs for the reclamation of mine lands, the Wales Metal Mine Strategy proved very successful in stakeholder engagement. This is largely due to program developers and policymakers who made a conscious effort to include them from the beginning. ¹⁷³ Another Welsh program that could serve as a model for site assessment and selection of future land rehabilitation programs is the Derelict Mine Program. ¹⁷⁴ The Derelict Mine Program specifically selects mines to reduce health risks to the public and environment while ensuring items of significant heritage are conserved and benefits of reuse are optimized.

7.2.4 American Recovery and Reinvestment Act (ARRA) Grants

Appalachia is rich with opportunity to claim several grants, funded by the American Recovery and Reinvestment Act (ARRA), that are aimed to promote renewable energy, energy efficiency and savings programs, and weatherization

¹⁷² Ibid, 68.
programs. Below is an outline of several such programs, however ARC provides a thorough outline of all possibilities.\footnote{175}

**State Energy Efficiency Programs\footnote{176}**

<table>
<thead>
<tr>
<th>Amount</th>
<th>$3.1 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Grants-- a formula is used to determine state funding</td>
</tr>
<tr>
<td>Description</td>
<td>States are to use these grants to encourage and adopt emerging renewable energy and energy efficiency technologies.</td>
</tr>
<tr>
<td>Contact</td>
<td>State Energy Office</td>
</tr>
<tr>
<td>Employment</td>
<td>It is estimated that efficiency programs employ 3 in 4, or 1.9 million, jobs in clean energy in America. In 2016 this sector experienced a 13% growth rate.</td>
</tr>
</tbody>
</table>

**Weatherization Assistance Program**

<table>
<thead>
<tr>
<th>Amount</th>
<th>$5 billion, provisions are also included for low-income households where funding is increased from $2,500 to $6,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Grants-- a formula is used to determine state funding</td>
</tr>
<tr>
<td>Description</td>
<td>For homeowners who qualify, provides energy-efficiency measures</td>
</tr>
<tr>
<td>Purpose</td>
<td>Help low-income families save money by reducing energy bills</td>
</tr>
<tr>
<td>Contact</td>
<td>State Energy Office</td>
</tr>
<tr>
<td>Employment</td>
<td>It is estimated that efficiency programs employ 3 in 4, or 1.9 million, jobs in clean energy in America. In 2016 this sector experienced a 13% growth rate.</td>
</tr>
</tbody>
</table>

**Energy Efficiency and Conservation Block Grant (EECBG)**

<table>
<thead>
<tr>
<th>Amount</th>
<th>$3.2 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Competitive grants to government entities</td>
</tr>
<tr>
<td>Description</td>
<td>To help state and local government implement methods for reducing</td>
</tr>
</tbody>
</table>

\footnote{175}{"Energy ARRA Grant Information," Energy ARRA Grant Information - Appalachian Regional Commission, accessed April 13, 2017, https://www.arc.gov/funding/EnergyARRAGrantInformation.asp.}

\footnote{176}{https://www.e2.org/wp-content/uploads/2016/12/EnergyEfficiencyJobsInAmerica_FINAL.pdf}
fossil fuel emissions via means such as: commercial and residential energy audits, grants to non-profits to perform energy efficiency retrofits, installation of LEDs, promoting government building on-site renewable energy sources

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Reduce fossil fuel emissions, decrease overall energy consumption, and improve energy efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact, Agency</td>
<td>State Energy Office, US Deptartment of Energy (DoE)</td>
</tr>
</tbody>
</table>

### Energy Efficiency and Renewable Energy (EERE)

<table>
<thead>
<tr>
<th>Amount</th>
<th>$16.8 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Competitive grants to private sector, state and local governments, national labs, and universities</td>
</tr>
<tr>
<td>Description</td>
<td>Ten specific programs all promoting renewable technology development such as Biomass Program, Solar Energy Technologies Program, Geothermal Technologies Program, and more.</td>
</tr>
<tr>
<td>Agency</td>
<td>State Energy Office, US DoE</td>
</tr>
</tbody>
</table>

### Advanced Battery Manufacturing

<table>
<thead>
<tr>
<th>Amount</th>
<th>$2 billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Competitive grants to domestic manufacturing plants</td>
</tr>
<tr>
<td>Description</td>
<td>Encourage manufacturing of advanced battery and component technology for automobile use</td>
</tr>
<tr>
<td>Office, Agency</td>
<td>EERE, US DoE</td>
</tr>
</tbody>
</table>

### Advanced Research Projects Agency (ARPA-E)

<table>
<thead>
<tr>
<th>Amount</th>
<th>$400 million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Grants-- given to universities, research institutions, companies and consortia of similar entities</td>
</tr>
<tr>
<td>Purpose</td>
<td>Encourage high-payoff, high-risk research that accelerates innovation for traditional and alternative energy sources</td>
</tr>
</tbody>
</table>
One survey from December 2016, estimated that efficiency programs employ 3 in 4, or 1.9 million, jobs in clean energy in America.\textsuperscript{177} In 2016 this sector experienced a 13\% growth rate. Another study, from 2010 and therefore subject to less accuracy, projected more modest growth but nonetheless projected that by 2020, the employment numbers for the energy efficiency sector would be double or triple their 2008 numbers of 118,000.

The greatest unknown in relying on the policies outlined in sections 7.2.1 through 7.2.4 is the current administration's willingness to look beyond coal as a source of livelihoods for the mining society of Appalachia. Since I started to write this thesis, the Trump administration has pledged to defund entities such as the Appalachian Regional Commission (ARC), in what is being labeled the "skinny" budget.\textsuperscript{178,179} These organizations have aided in the research and formation of educated policies that would be best for future generations who wish to rely on more than only coal for the prosperity of their communities. As such, the scope and effect on employment the previously outlined policies will have is up to debate.

7.2.5 Department of Housing and Urban Development

The Department of Housing and Urban Development (HUD) funds several homeownership assistance programs. From those looking to buy a home that has been foreclosed, there is a program with grant money, Community Development Block Grants (CDBG), designated to assist those who qualify. Conversely, for those who are at risk of foreclosure or need assistance with counseling and budgeting for homeownership, HUD

\textsuperscript{178} The ARC, a bi-partisan research group that is frequently referenced by both Democrat and Republican parties, is one of the, if not the, greatest resources Appalachia has to make sure its voice is heard in DC.
can meet with local residents to inform them of their options and can even provide legal counsel when necessary.

7.2.6 Federal Appalachian Housing Enterprise (FAHE)\textsuperscript{180}

This federally funded program aims to eliminate poverty in Appalachia. It provides financial assistance through partnership with 50+ local-to-Appalachia non-profits. Focusing on issues of matters of leadership, housing, education, social and health services, FAHE helps empower local residents to lead more successful lives. So successful, that they have a 100 percent payback history with every investor in their history.

7.3 Summary

Perhaps the most exciting and infuriating aspect to writing a thesis on a current event is the ever-changing nature of the content this thesis holds to be true. While writing this thesis, the current administration has:

1) Overturned coal mining safety standards
2) Repealed some of the previous policies used to help the US achieve the goals it agreed to in the Paris Climate Conference and
3) Stalled a bill that would help ensure that retired miners continue to receive benefits which many were informed would stop in April 2017
4) Begun the process to potentially roll back the Clean Power Plan.

The key conclusion to draw from this chapter, and the ever-changing political climate, is that policies that are directly related to clean energy or coal are highly volatile and subject to change. It would be advantageous for the region to focus on ways to diversify its economy and to support policies that endorse local entrepreneurship and access to a national and global markets.\textsuperscript{181} Chapter 8 will suggest how to move forward


\textsuperscript{181} As stated in Chapter 3: Employment Landscape and Chapter 6: Remedial Policy for Employment Enhancement, consistent and high-speed access to the Internet plays a crucial role in the ability for
given a full understanding of the problem and will assume responsibility that the issue
should be solved now and not with Band-Aid solutions leaving the matter for future
generations.

residents of the region to reach a national, if not global, market thus increasing their ability to become
financially successful via local business opportunities.
Chapter 8: Roadmap for Action

“The greatest problem with communication is we don’t listen to understand. We listen to reply.” - Roy T. Bennett

When I outlined what to write for this chapter, originally I envisioned that it would result in a long, complicated, taxing and otherwise confusing, situation. But after the multiple interviews and extensive literature review, the solution seems, though not easy, rather simple. Namely, two elements are critical in moving forward: (1) understanding the values and fears of the residents of Appalachia and (2) pushing for public policy and industry initiatives that promote economic diversification and address said fears.

From my interviews, I found three key barriers that must be solved in the creation of any future policy or program. I have also surveyed current political discourse and found certain unconstructive rhetoric trends used to evoke strong emotion with no other productive purpose. This chapter will present the potential future complications learned from the interviews, a brief history of the detrimental rhetoric that must be first understood in order to correct them and avoid, and conclude with my suggestions on how to move forward with this region productively.

8.1 Obstacles from Interviews

From the interviews, I learned of three key obstacles that any future policy will need to address. Interestingly, all three obstacles have been noted as avoidable if proper attention was given to the development process in seeking local input and participation. What is encouraging from the feedback however, is the resounding interest and passion each resident has to help make their homeland a better place.

First, interviewees believe that policies have failed so far because they have failed to consult local residents from the beginning. This sentiment verifies the necessity to be sure to take steps to hear from individuals at all stages of the development process, but especially in the beginning. Often outsiders come with an idea of what the
problem is, but never verify their perceptions, let alone demonstrate to others that their solution will solve the root issue.

Second, interviewees feel as though they are not trusted to make their own decisions. This harkens back to the stereotype that much of the nation, Washington DC included, has of this region of “uneducated hillbillies.” While they may not be able to see the whole picture of how their ecosystem can fit into a larger economic landscape, they certainly can provide invaluable insight as to what would be helpful in the transition, and to preserve their culture moving forward.

Third, interviewees would like to see the dialogue changed from “what outside group can come in and save us” to “who is already here that can help us.” Claiming ownership, and therefore having pride in the end result will be not only critical for the wellbeing of the program, but also will help encourage future, local enterprises.

8.2 Current Political Influence

In 2015, the West Virginia House repealed an act that would have helped make smoother the inevitable transition to renewable energy. In an interview, Kateena Haynes perhaps said it best when speaking of those who still believe coal is coming back when she said, “as long as you have this hope, you are stalling us.” That false hope was further propagated by representatives such as Del. John Shott, R-Mercer who said that if in repealing the act they “[saved] one coal miner’s job, it [was] well worth it.” What he did not acknowledge is that his short-sighted action, perpetuated poverty for thousands of others which could be helped by promoting economic diversification. Similarly, Kentucky Senator Mitch McConnell has continually blocked legislation that could help provide pension funds to former miners. According to a local resident, actions such as these are done to “blindly stop” anything that comes from the other side

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182 Ibid, 36.
of the aisle. But if these elected officials are acting in a way that leaves their constituents feeling frustrated and unlistened to; who then are they representing?

At the end of the day, politicians must be ready to set aside their personal agendas and embrace the fact that at times they will need to represent their people and at other times, lead. They must represent their constituents’ fears in Congress, and lead their communities to a healthier, economically prosperous, and more sustainable future. It is easier said than done, but it can be done. In order to prevent this unproductive cycle from continuing, policy makers should look to really connect with the Appalachian communities they represent. Below are 12 steps to consider to help improve the quality of insight from which policy is created.

8.3 12-Step Recovery Program for Rebuilding Communities

Helen Lewis, former director of the Highlander Center, sociologist, and community organizer, published the following 12 steps as a means of rebuilding communities in the Appalachian Journal. While these steps were generated for the purpose of a local group helping rebuild its community from within, I believe the program could be applied to the act of creating policy for the region as well-- a process generally viewed as performed by outsiders to locals with little ownership.

8.3.1 Stakeholder Needs Identification

Steps one through four could be categorized as stakeholder needs identification.

1. **Understand the past and share memories.**
2. **Mobilize, organize, and revive community.**

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184 Similarly, the user-centered design approach for needs identification in product development incorporates many common practices. Please see Appendix B for more information on the role design can play in policy.


186 Create a bond with the people for whom the policy and program is being designed and genuinely care to know their history. As a bond is formed, so is trust.

187 Frequently in small towns across Appalachia the only common place may be a one room post office. Find a common meeting place and establish the freedom to exchange thoughts there.
3. Profile and assess your local community.\textsuperscript{188}

4. Use the common meeting space to plan together.\textsuperscript{189}

This establishes a bond between the group making the policy and the community. Ideally, if done properly, much more will be gathered from how the participants speak than what they say directly. According to Laura Adkisson, fortunately people in this region are not shy to express their opinion and have even been known to pull local officials aside at church to “talk with them.” There is an adage in product development that “users want what they know, they don’t know what they want” -- the same can be applied to policy and programs as well.\textsuperscript{190} That is, when engaging in community involvement it is important to (1) listen to how they respond and (2) to help foster brainstorming so that they may create their own solutions.

\textit{8.3.2 Implementation}

Steps five through seven could be considered the implementation phase.

5. \textit{Educate the community.}\textsuperscript{191}

6. \textit{Build confidence and pride.}\textsuperscript{192}

7. \textit{Develop local projects.}\textsuperscript{193}

\textsuperscript{188} Specifically, it is recommended to survey people and land resources. Both sets of needs will be helpful in future project development.

\textsuperscript{189} Make sure that stakeholders are involved from the beginning. Allow them to claim ownership of some part of the project development.

\textsuperscript{190} The Environmental Agency of Wales, through funding from the National Assembly, surveyed how to solve the problem of water contamination from abandoned mines through what they called the Metal Mines Strategy. They sent out 587 questionnaires to 46 individuals representing 20 distinct stakeholder organizations. The group received back 582 responses, an over 99 percent response rate. From this feedback, they integrated the needs of the respondents into policy moving for how to reclaim mines.

\textsuperscript{191} In order to keep the community moving forward, establishing a means by which residents can learn leadership and rethink ways to incorporate more democratic participation into community involvement will be key. Lewis also advocates to do this by encouraging increasing the overall level of education of the region by offering classes such as GED or local community college classes.

\textsuperscript{192} As this community has largely relied on the single industry of coal, a social shift is necessary for welcoming a diversified economy. Fortunately, as gathered from interviews, the general attitude is open to a new direction provided they can earn roughly similar salaries. Allowing for the influence of community history through performance art such as theater and music allows for a sense of heritage pride to grow.

\textsuperscript{193} Projects that involve both small-groups and whole communities can increase participation and can ensure that constantly new people are involved. This can help link needs with resources and proper placement.
Here the policy or program is tested to see how residents respond to the initial solution created jointly from the “outside experts” who know the big picture and local residents who provide the needs that should be incorporated in order for the program to be received enthusiastically. Direct communication should be established at all times through common meeting areas, phone calls, and any other forms of communication to which they have access.

8.3.3 Iteration

Lastly the steps eight through twelve could be considered the iteration phase.

8. Strengthen community organizations.\textsuperscript{194}

9. Collaborate and build local alliances.\textsuperscript{195}

10. Maximize political power.\textsuperscript{196}

11. Initiate economic growth.\textsuperscript{197}

12. Join larger planning processes.\textsuperscript{198}

After testing the initial solutions generated from the needs identification phase, it would be necessary to collect more feedback from stakeholders in order to improve the system. In-person dialogue is always best in the needs identification and iteration phases as the observer can perceive the auditory and visual body responses. Several iterations of this process should be conducted until desired outcomes have been achieved to a satisfactory level. At that point, the program or policy could both benefit

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\textsuperscript{194} Each community group needs several leaders, not just a leader. The risk with just one is it is easier to burn out. However, with several, they can feed off of each other’s enthusiasm and keep the momentum going. Similar to step 5, it is important to teach leadership and training for adequate staff within the organization, not just in the community at large.

\textsuperscript{195} In order to grow and become more impactful, community organizations need to connect with other community organizations to gain insight, strength, and to learn from each other’s successes and failure. This step is analogous to the last step of the scientific method in the academic community.

\textsuperscript{196} In order to bring resources to the community for further development, organizational political involvement is necessary. Community groups can play many roles in the political process from educating the public about civic duties such as voting to encouraging its own members to run for office.

\textsuperscript{197} Community groups have the pivotal role of also encouraging local economic growth in the form of entrepreneurship. Its members can encourage other members of the community at large by providing the necessary assistance such as establishing a revolving loan program or teaching the required skills to manage a business.

\textsuperscript{198} Community organizations can help bridge the divide that local entrepreneurs and businesses often feel in rural settings with the rest of the regional, national, and global markets.
other communities by sharing their process as an example process to be modeled. Obviously, a “one size fits all” approach to policy for coal communities would be naive and likely fail. But there are some shared principles that would likely prove useful to other counties in Appalachia.

8.3.4 Literature on Contaminated Communities

A recent study of public participation in contaminated communities found several similar results.\(^{199}\) Namely, factors they found particularly helpful were: agency clarity and accountability, interaction, deployment of responsibility, broad representation and diversity of views, and efforts to build trust and mutual respect.\(^{200}\)

The importance of agency clarity is to make sure the community is clear on how and if the outside agency is going to actually listen to their needs and incorporate them. Specifically, with respect to interaction, it found that involving stakeholders from the beginning and continuous involvement throughout the process was crucial for successfully gaining public buy-in. They also found that community members want access to agency members who have the power to make changes and influence the process, therefore, ensuring that community members also have access to sufficiently powerful members of the agency is critical to encouraging community involvement.

Finally, the paper found that interagency coordination must not be forgotten. Similar to Step 12 above, connecting this community to other resources and communities who have successfully recovered will not only help the success of the community in question, but also help future endeavors. Dissemination of what worked and didn’t work helps improve future processes.

8.4 The Oppressive Origins of Coal


\(^{200}\) For more information, please read the entire paper which goes into detail of seven communities which were monitored and whose data was collected to form these assertions.
The first step in identifying the values and concerns of any stakeholder is to understand their past. Any outside actor wishing to be heard should first listen. At its inception, the coal industry of Appalachia in the 1910s and ‘20s employed nearly 800,000 people who were paid approximately $2 per hour. Now it employs less than a tenth of that and averages around $25 per hour. Because of this, while the coal industry only supplies approximately 5-10 percent of the employment of a given county, those employed often represent 10-20 percent, and in some cases more, of the total county wages.

Coal companies recruited immigrants from a variety of nationalities and backgrounds, and, as previously mentioned in Chapter 1, would keep them in segregated camps to prevent unionization. Companies required all new recruits to go through English language courses that, in reality, heavily stressed “Americanization” and the dangers of unionization. Within the mines, a militant, incredibly loyal populace was created that was also very distrusting of management or “the man”. It is from this origin of abuse and militant workforce that the skepticism of outsiders grew, which is still present today.

From the creation of coal camps, to deadly strikes such as the West Virginia or Harlan County coal wars, this community learned to rely completely on each other, and to rally together when deemed necessary. Appalachia, specifically the Highlander Center, became known for its stance on civil disobedience. Prominent figures such as Rosa Parks and Dr. Martin Luther King Jr. visited the center to study civil disobedience. Remembering his childhood, Barton reports that for decades the narrative of the area was that the miner, management, and the company were always at odds with each other. Over the 1980s and 1990s, that transformed from the miner “against” the coal operator, to instead be if anyone critiques coal, at large, they are now “against” the

\[201\] This is one reason why it is hard for the region to transition to alternative forms of employment, given jobs that require similarly low level of formal education pay generally half that per hour.

\[202\] According to Dr. Scott, the coal industry in particular, of all industrial development, created an extreme vacuum for any other economic development and also very sharp class divides between the “haves” and “have nots.” This culture has become less obvious over the generations internal to the community, but is still present today.
miner and his family, thereby removing the company from the criticism. The group "Friends of Coal" group was formed by the coal industry in 2002 to cleverly promote any attack on the industry as a personal attack on the miner-- thus increasing the polarization of the issue.

8.5 The Influence of the Land

Any solution, governmentally or privately created, should remember the importance that land has always played in the lives of Appalachian residents. Dangerous strikes over mining happened, and they happened on Appalachian soil. Economic boom and busts, the direct results of "big coal" and the influence of an outside oppressor, all happened in the heart of America's energy backbone. Rivers and streams were filled and mountaintops were destroyed with their ecosystems ruined for decades to come. Yet, the people stayed. Coal has been like an abusive lover to the Appalachian mountains and people, promising to be good once again only to bring further destruction and pain. But still, the community remains. Life has never been easy for this population. Why then would they choose to remain in such poverty and some without guaranteed access to what America considers the basic amenities of life such as clean drinking water, adequate roads and infrastructure, let alone Internet and the education that comes with it? Simply put: the land.203

Generations have grown up together and "inherited each other as friends" as one resident put it. Last names have lived in certain areas of town long enough that an outsider could know nothing more than a name and the town of residence, and locals would point them to their host. The close knit, incredibly protective nature of this community should be respected. Once a bond of trust and clear line of communication has been established between policy maker and stakeholders, this close knit nature could be incredibly useful in helping ensure active engagement by the community, just as Wales did with its Metal Mines Strategy program. Under no circumstances however, 203 Even though there is a unanimous adoration for the land among those I interviewed, it was remarked by a few that the specific term "sustainable" evokes the image of a liberal, tree-hugger type of person who is less likely to care about the wellbeing of "dirty coal people." Therefore, it was suggested to refrain from using that specific term, but instead relate it to things the residents care about such as preservation of the hills for ATV use or cleaning the streams to ensure the ability to fish, etc.

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should policy ever expect the residents to relocate, thereby disrupting the culture. Instead, it should do its best to make sure the cultural identity is maintained, letting the community define it from the beginning.

### 8.6 Increasing the Reach of Local Enterprises

As suggested in the Step 11 in the program above, a critical part of economic growth, is encouraging local entrepreneurship. Programs such as Grow Appalachia and MACED are prime examples of this strategy. These organizations have a greater social and economic impact than those who they employ directly, and by their very nature, help others to grow their own local businesses.

One method to increase employment in economically distressed areas and to ensure the health of local businesses is to provide the following three key elements:

1) Businesses should provide customized training by partnering with state programs to provide on-the-job training.\(^{204}\)

2) The Manufacturing Extension Program (MEP) should be federally subsidized to help small to medium sized businesses improve their manufacturing processes, increase efficiency, and reach a larger market.\(^{205}\)

3) Grants should be made available to companies who wish to grow within Empowerment Zones--the most economically distressed areas--in the form of tax cuts and an increase in public service offerings.\(^{206}\)

While I don’t advise a long-term over-dependence on any energy-related sector -- as energy policies seem to be volatile under the current administration -- manufacturing parts for renewable technologies could prove to be a useful transitional source of employment or one of many, diverse long-term job options for residents. Additionally, there already exist many industrial parks left abandoned in the area which could be used as housing for emerging startups. In combination with tax cuts for

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\(^{205}\) Ibid.

\(^{206}\) Ibid.
creating business in economically distressed areas, point three from above, low overhead costs\textsuperscript{207}, and a surplus of labor, these enterprises could find it advantageous to begin in Appalachia. Furthermore, policy should follow to incentivize domestic production of renewable technologies, as opposed to sourcing solar PV panels from China for instance. Fossil fuels fail to account for several externality categories and therefore because of this citizens should be willing to pay two to four times retail costs of emission free energy.\textsuperscript{208}

8.7 The Use of Charged Language

As with most contentious subjects, charged vernacular has been adopted by the public facing officials involved with the coal industry and used to bolster support and condemn dissent. Moving forward in policy creation, it will be necessary to be aware of these terms, the inaccurate ways they are used, and use them to change the dialogue. Specifically the terms “coal country,” “friend of coal,” and “war on coal” have all been buzzwords used to evoke strong emotions. As previously stated, the historical dialogue of the region, until the past 3 decades approximately, had always been one of the miner against the company. Then in a clever sleight of hand it transformed into any opposition was a direct affront to the hard working American who provided the energy and level of modernization we have come to expect as non-rural American citizens. This completely removes any blame placed on the company. It is in understanding what these terms represent however, that we can actually use them for the betterment of all and move together as a nation to a brighter future.

8.7.1 “Coal Country”

The current administration continues to use the term “coal country” loosely. The miner often pictured to represent that term is generally one from an Appalachian state. Politicians, such as Trump during his campaign in West Virginia, often wear a miner’s hat to express their support for “coal country.” However, the Appalachian and Western coal countries are two very different regions whose needs are require different policies.

\textsuperscript{207} For more information, please see Chapter 4.2.1. 
\textsuperscript{208} \textit{Ibid}, 66.
The coal mining industry of Appalachia is dying for reasons beyond the negative reach of the presented cleaner energy policies.\textsuperscript{209} These policies, the ones that the current administration advocated to repeal while in the “coal country” of West Virginia, are estimated to have a much stronger negative impact on employment in the Western region than that of Appalachia.\textsuperscript{210} Without the CPP, the West will experience a decrease of 31 million short tons by 2040 and with the passage will see a decrease five times greater-- 155 million tons. Conversely, Appalachia is the only domestic source of anthracite coal -- which is required for metallurgical purposes -- and therefore will not be affected. However, it would see a small change in production due to the CPP of 79 million tons decrease by 2040, as opposed to the reduction without the plan of 50 million tons.\textsuperscript{211} Clearly, either the administration doesn’t know the difference or doesn’t care to be accurate in pledging their support to a group of individuals whose livelihoods and futures depend on it.

8.7.2 “Friends of Coal”

In proposing the “skinny” budget and other repeals of environmental justice and employment enhancement programs, the current administration claims to be a “friend of coal” and pledges to support the miner by protecting jobs in the mine. The policies however, provide incentives for renewables and other potential forms of employment, such a reclamation of former mines, that would actually help the miners of Appalachia. Additionally, work in the mines has never been safe, but with the recent decrease in the reach and implementation of safety standards, it is questionable what kind of friend would support that. While the term means a specific group funded by the coal industry, the true definition of a friend of coal would be one who puts the miner first. This would

\textsuperscript{209} Reasons such as technology advances increase the productivity per capita, a general decrease of coal exports, and more, all lead experts to believe that Appalachia saw its last boom leading up to 2010 and the ensuing decline. For more please see Chapter 2: Energy Landscape of America and Chapter 3: Employment Landscape.

\textsuperscript{210} This is because the cleaner energy policies affect the demand of coal used for domestic steam production, which is largely procured from the Western Region, whereas the Appalachian region exports its supply. Of course, there will be some decrease due to the CPP and other proposed legislation but the effect

require promoting what is genuinely healthiest for the miner, economically stable for their family, and protects and respects what the community loves: the land.

8.7.3 “War on Coal”

In a press release to West Virginia in March 2017, Vice President Pence said “the war on coal is over.” This is just one of many examples of how politicians evoke emotion from the crowds they are addressing, instead of actually addressing the issue. As long as charged statements like these are used, local organizations will need to be careful to address them with a level head and clear, thoughtful words. To play words games with constituents’ emotions is cruel. The role of any future policy or program should be one to educate and inform, not excite and enrage.

8.8 Moving Forward

“Do real and permanent good in this world.” -Andrew Carnegie

In summary, my suggestions for moving forward can be summarized in the following points:

1. Use the three phases outlined above to ensure the policy adequately integrates the needs of the community, encourages public participation through direct lines of communication, and connects it to other communities for support. One size will not fit all, certainly within “coal country” and even within Appalachia as each county presents its own set of variables.\(^{212}\)

2. Whatever form the program or policy takes, it should not require the residents to move. The land has a strong tie to their cultural identity.

3. When trying to garner public support of the components of the program that address environmental justice, utilize their fervent desire to spend time outdoors. Common buzzwords, such as sustainability, should be

\(^{212}\) Programs that set goals based on local, on a county level, are most likely to succeed given the fidelity of needs identification. With proper sharing of information, as outlined in the 12 steps earlier, it's possible that similar counties could be identified and therefore share similar programs/policies.
avoided as those terms are often still associated with over-zealous environmentalists. Instead, put in terms of increasing access to things they like such as fishing, zip-lining, eco-tourism possibilities, and more.

4. When possible, the creation of employment should be avoided in the volatile industries of energy.\textsuperscript{213} However, if manufacturing parts for renewable technologies -- the specific manufacturing industry I recommend most -- is one of several industries, such as agriculture or education, it could be useful. MACED and Grow Appalachia are two great examples local enterprises that helps locals in dynamic ways.

5. Don't assume jobs that are skill-transferable is the only option for former miners. Present a variety of potential employment options and see in which the community is interested. Bit Source, a coding startup, is a perfect example of a new skill which received a grant from the Department of Labor to provide the necessary training, thus lessening the cost to the new startup.

6. Be mindful of existing policies, tax incentives, and other resources that are currently there to help employment in economically distressed areas and sectors pertaining to renewable energy.\textsuperscript{214}

7. Repeal cottage food laws that prevent national and international agriculture trade of things such as canned or jarred preserves, honey, and other traditional home-produced goods, and which set caps on how much individuals can earn through such sales.

Frequently the passage of legislation to continue the coal industry is hailed by politicians as what is best for the residents. However, we know for a fact that the recent increase of black lung reports and other health problems previously mentioned are a direct result of the coal industry, leading to one conclusion: coal is in no way physically

\textsuperscript{213} It is unknown when clean energy will stop being a contentious issue, though it will probably follow once there is a unanimous support over the issue of global warming and the associated timelines, so until then given the likelihood that policies can get repealed, it is likely best to avoid a dependence on a sector whose businesses are built on uncertain tax incentives beyond the four years an administration is in office.

\textsuperscript{214} If the ARC does not get defunded, as the current administration has slated to do, this organization would provide incredibly detailed and useful information about what counties within Appalachia.
what is best for the community. The argument then becomes one of economics. Comments such as "preserving coal is the best option because it provides jobs and puts food on the table" flood the dialogue. Again, this is not true. It is, however, the easiest solution. It fails to address the reality for future generations and fails to acknowledge the possibility that jobs can be produce, today, via different means. Advocating for employment in non-coal industries doesn’t necessitate poverty. In fact, is likely to promote a more secure, less volatile economy.

This may all seem obvious, so why then is there still a problem? Ultimately politicians and coal companies promote this pro-coal dialogue because for many residents, change presents an uncertain future that can often be frightening. Therefore, the dialogue doesn’t adapt and instead fights progress because it increases chances of re-election, it sounds reassuring to frightened crowds, and it doesn’t upset cash-flow from companies that support coal. But it is not the best option. Rather, economic diversification and development would provide a more stable economy that doesn’t have the boom and bust cycles nor the costs on health care system, let alone miner’s health, associated with coal. Specifically, economic growth in all sectors -- not just transferring employment to manufacturing in a variety of renewable fields, but instead genuine diversification -- avoids an over-dependence on a single source and helps ensure a financially, socially, and environmentally sustainable and bright future for the community.

The fact that this multi-faceted, deeply contentious, and extremely political problem can be put simply does not indicate that road ahead will be easy nor one that does not require hypervigilance. Quite the opposite in fact. But what it also shows is that this is not a forgotten land without future potential. It is not a hopeless cause doomed to be noted in history books in the past tense. It can, with great and purposeful effort, become another shining beacon of American democracy in action. It can renew the faith of citizens everywhere that their government will actually listen to them and help ensure their inalienable rights of the preservation of life, liberty, and the pursuit of happiness.
Appendix A: Backgrounds of Those Interviewed

Jessica Farrell is a Master’s student in Technology and Policy at MIT, studying energy and environmental policy. A 7th generation Appalachian, Jessica was born in Ashland, KY and attended undergraduate at Morehead State University in Morehead, KY. At Morehead, she majored in Mathematics and Physics, and during the summer of 2015, she interned at the Department of Energy in Washington, DC. While there, she worked with the Director of the Office of Government Affairs and Analysis in the Office of Clean Coal and Carbon Management, where she was responsible for conducting an analysis of existing coal-fired power plants and their potential for Carbon Capture technology. She currently works as a Research Assistant at the MIT Joint Program on the Science and Policy of Global Change, where she is determining the cost effectiveness of Carbon Capture systems on coal- and natural gas-fired power plants.

Shaunna Scott is an Associate Professor of Sociology at the University of Kentucky. A past president of the Appalachian Studies Association, she is currently the editor of the *Journal of Appalachian Studies* (JAS) and the Director of Appalachian Studies at the University of Kentucky. JAS seeks to provide a written forum for quality scholarship on Appalachian history, culture, and society. She is also a co-editor of the 2016 Weatherford Award winning volume, *Studying Appalachian Studies: Making the Path by Walking*. Dr. Scott’s work appears in *Rural Sociology*, *Annual Review of Sociology*, *Qualitative Sociology*, *Journal of Appalachian Studies*, *Appalachian Journal*, and *Action Research*.

Shane Barton, Assistant Director of the University of Kentucky Appalachian Center, is a 9th generation Appalachian resident. Barton received two undergraduate degrees; one in Environmental Studies and a second in Urban Studies & Geography before earning a Masters of Urban and Regional Planning at Virginia Commonwealth University’s L. Douglas Wilder School of Government and Public Affairs in Richmond, Virginia. He has a long-term commitment to inclusive education and community development strategies having worked as a Watershed Development Coordinator for
the Upper Tennessee River Roundtable while serving as a member of the Appalachian Coal Country Watershed VISTA team from 2005 to 2007. At the University of Kentucky he has coordinated the Growing Local Economies Program, The Eastern Kentucky Local Motive Alliance and most recently an extensive internship called the UK Tomorrow Corps – a program modeled by his own VISTA experience that places students throughout the 54 county Appalachian region of Kentucky to conduct tutoring in partnership with local libraries and local family resource & youth service center staff. He has presented collaborative work on community/university engagement and development strategies at national and international conferences, co-edits the Coal Camp Documentary Project, coauthored a recent article on “materializing Appalachian Kentucky coal towns” and serves as the board president for the nonprofit Appalachia-Science in the Public Interest. He currently lives in Berea, Kentucky with his wife Adanma Barton.

Joshua Bills joined MACED in March 2008 to develop and coordinate energy assessments and pursue emerging energy efficiency and renewable energy opportunities for client entrepreneurs. Josh assists the Business Development team in developing financing opportunities for energy reduction and renewable energy projects. A former renewable energy installation entrepreneur himself, Josh brings a distinctive perspective to the position, with firsthand knowledge of the needs of, and the demands on energy efficiency and renewable energy installers today. He brings a wealth of knowledge to his role, with a Mechanical Engineering degree from Washington University in St. Louis, and experience with over 100 renewable energy installations throughout Kentucky, Haiti, and as far off as West Africa.

Brandon Pennington was born in the beautiful mountains and coal fields of Harlan, KY. He graduated valedictorian of James A. Cawood High School in 2007 and continued his education at Transylvania University. He graduated with honors in 2011 with a degree in Business Administration focusing in Marketing. While in college, Brandon dabbled in a variety of different topics, clubs, and organizations that ranged from becoming a life member of Delta Sigma Phi to volunteering for the Kentucky
Refugee Ministry. However, it was in college that he began to hear the siren song of the mountains call back to him. Enchanted by their song, he moved home and became one of the youngest tourism directors in the state of Kentucky. During his time as the executive director for the City of Harlan Tourist and Convention Commission, Brandon became the 2013 Rookie of the Year for the Kentucky Travel Industry Association as well as the 2013 Rookie of the Year for TOUR Southeastern Kentucky (TOURSeky). Brandon is the current chairman for the Daniel Boone Country region in Kentucky, he is an active member of the Harlan County Chamber of Commerce, Harlan 2020, a participant in charitable organizations such as Relay for Life, Angel Tree Fund, and others, and he is active in other organizations in Harlan. He is coordinator for the Harlan County Poke Sallet Festival, coordinator for the Festival of the Mountain Masters, founder of the “Our Story” Festival in Harlan, and the founder of the Harlan County Run with Color 5k. Brandon is an active runner, a self-proclaimed TV critic, and an Appalachian enthusiast.

Michael “Pig” Pennington worked in the mines for nearly 27 years. Over the course of his career he held a variety of positions in the mines and therefore can provide valuable insight into the operations at many stages of what goes into running a mine. He was a shuttle car driver for the majority of the 27 years. However he has also been: a roofbolter, a scooper, and a boss when needed. He did about 4 years of dropping car loads of coal and was also was on the mine and safety team for 6 years. He was also captain and benchman for 3 years. Pig, as his friends call him and insisted that I call him that as well, frequently held many positions at once; for instance, when he was benchman, he was also alternate captain, alternate gas man, alternate stretchman, and alternate rear captain. As a miner, he has been interviewed by various news channels, he has appeared on History Channel for his time as a coal miner, and has been featured on the front cover of Coal Age. Outside of the mine, in his younger years he was an avid hunter. He still loves spending time outdoors on his ATV or fishing. However, the stress on his body, made worse by the years of extremely taxing work in the mines, has limited his ability to do these activities. You can usually find him in his
workshop enjoying his new hobby of woodworking, specifically he enjoys crafting wooden chests these days. He is a big family man and he loves being a grandfather.

Laura Adkisson is the seventh generation of her family to call Harlan County home. Her great great grandfather was killed in a Harlan County coal mine in 1922. Her great grandfathers were part of clandestine meetings, held in the forests, to organize the union in Harlan County. Her father worked as an underground coal miner for 38 years before he retired in 2013. He was on strike from the mines the morning Laura was born. Laura attended Oklahoma Baptist University where she received a B.A. in Philosophy in 2004. She worked for one year with the Oklahoma Department of Mental Health and Substance Abuse Services before returning to Harlan to accept a position as Unit Director of the Cawood Ledford Boys & Girls Club where she remained for 7 years. She currently works as Youth Services Librarian for the Harlan County Public Library. Laura refers to this as the work that pays her. Her unpaid work includes volunteering with Reading Camp, Angel Tree, Humans of Central Appalachia, and as a performer with the Higher Ground community theater series. She collects stories, laughs with her family, and aspires to be the kind of Appalachian cook that would make her great grandmothers proud. She envisions an economy in Harlan County that sustains all of her neighbors and exploits none of them.

Kateena Haynes has lived in Harlan County, Kentucky, most of her life. She attended Centre College in Danville, majoring in Psychology. She received a master's degree in mental health counseling from Lindsey Wilson College. Kateena has been with the Boys & Girls Club for thirteen years and has been the CEO since 2006. She is married to Richard, the Executive Director of the Harlan County Public Library System. They have three daughters, ages 14, 16 and 20. Kateena is the youngest child of a mechanic and a beautician and has several family members who have worked in the coal industry. Her grandfather was a lifelong coal miner and passed away from black lung disease in 1973. Her brother is currently employed as a mine engineer. Kateena's parents instilled in her a love of art, community, and nature. She enjoys painting, hiking, camping, and currently serves on the board of directors for several local organizations.
Author, Darla Saylor Jackson, has written four books including the popular “Harlan County Haunts” series. Darla is the owner of Mount Pleasant Funeral Home in Harlan, KY and co-owner of Mountain Gypsy Herbs, Inc., a newly formed bath and body company focusing on herbal, all natural products using locally grown and foraged ingredients. She enjoys making cold process soap, balms, scrubs, creams and many other products. She teaches art and journaling to women inmates in Kentucky prisons, and is a certified community scholar. She has worked with Berea College’s Promise Neighborhood program and was an artist in residence with the Kentucky Arts Council for 10 years in a double genre of Folk Art and Literature. An accomplished Appalachian and Native American dancer, Darla was a performer with the dance ensemble “Everybody Dances,” a multicultural dance performance group. She also was a performer with the Native American performance village, Native Nations. Darla was on the board of the Kentucky Native American Heritage Commission for 2 years and is a state recognized Native American. A lifelong native of Harlan County, Kentucky, Darla has seen firsthand the rise and fall of the coal industry in Appalachia. Her husband’s family was very active in the coal industry during the 1970s and 1980s.