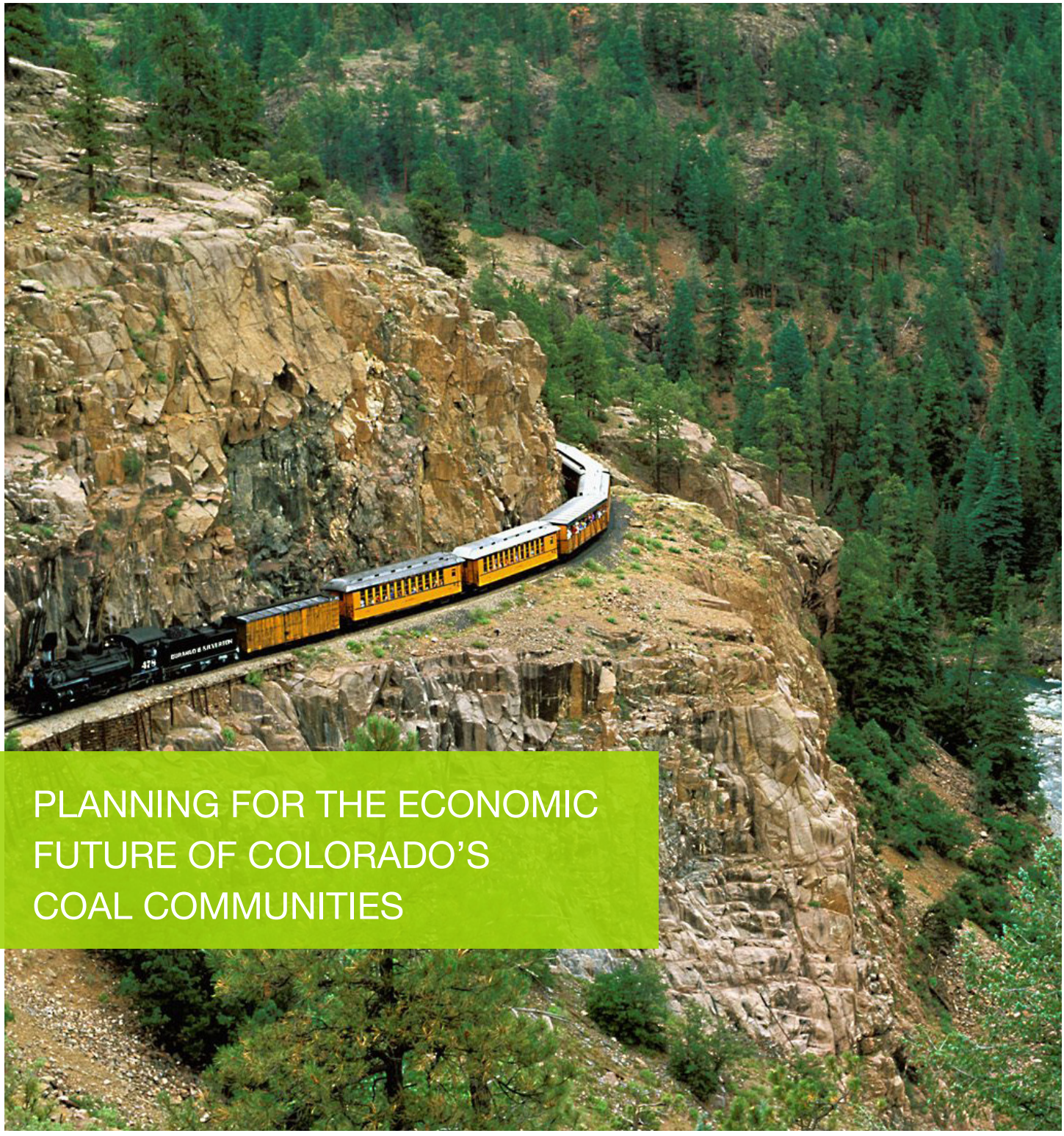

PLANNING FOR THE ECONOMIC FUTURE OF COLORADO'S COAL COMMUNITIES

Co-Authors:

Sustainable Development Strategies Group:
Sarah Wilhelm PhD, Luke Danielson,
Kristi Disney Bruckner, Andrew Gulley,
Chris Nutgrass, Diana Madson

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The economic benefits of the coal industry are widely felt. People in large parts of the United States turn on their lights or heat their homes with electricity generated by coal, or benefit from steel or concrete made with coal. Colorado even has two of the few remaining coal-fired railroads, the Durango & Silverton and the Cumbres & Toltec.

While the economic benefits of coal mining are widely shared, many of the impacts of coal production tend to be felt very intensely in the specific regions where coal is produced. Some of these impacts are positive, such as well-paid jobs or revenues to local government during coal production. Other impacts are very challenging to manage, such as the "boom town" effects when coal development first starts, or the collapse in mine employment and tax revenues at the end of the mine life. The experience of most resource-dependent local economies is of good times and hard times, and unpredictable ups and downs.

Facing these challenges on a local level can be extremely difficult. The abrupt economic transitions can impose serious hardship on individuals and families, pose immense challenges to local government, and generate economic and political instability. It can divide communities rather than lead them to work together. In order to achieve the full benefits of exploiting nonrenewable resource endowments, economists recommend planning for the future, at all levels, from federal coal policy, to state management of revenues, to local planning for a post-coal transition when the resource runs out. Individuals, families, companies, advocacy groups, and governments all have a role in planning viable long-term options. To achieve the best economic and social results, this process should start at the outset, before resource extraction begins, and continue throughout the mine life. This opens up the widest array of options. Regardless of the timing, the best path forward for communities is to plan for economic diversification at the earliest possible stage.

The report focuses on two key questions:

- First, to the extent that we do use coal, what federal, state and local policies can ensure that the benefits of coal production are maximized, and the negative impacts minimized?

- Second, what are the options for a sustainable, positive future for coal dependent communities?

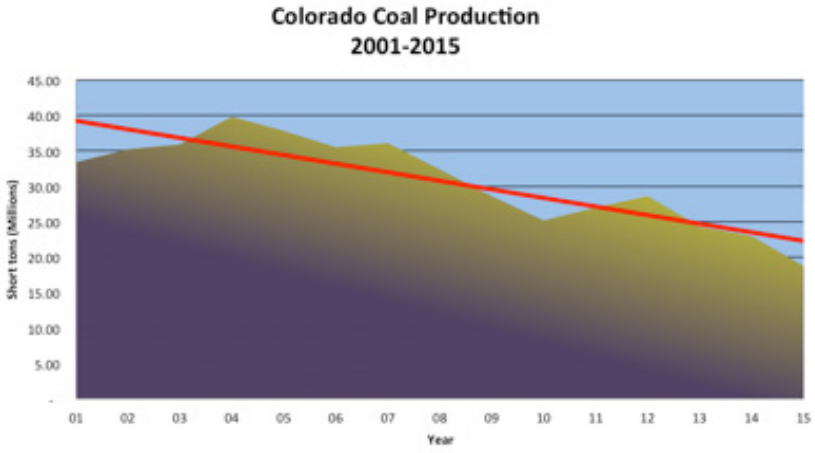
I. A Challenging Time for Stakeholders Worldwide

The coal industry is currently in a period of transition that is characteristic of resource industries. It is facing a perfect storm of aging infrastructure, [1] environmental concerns, and cheaper energy alternatives. Coal production is down across the globe, primarily due to diminishing coal use for electric generation. This has profound effects on communities that have been economically dependent on the coal industry, including the loss of high paying jobs, revenue for localities, and the way of life that has been embraced by residents.

Coal Production is Down in Colorado, the US, and the World

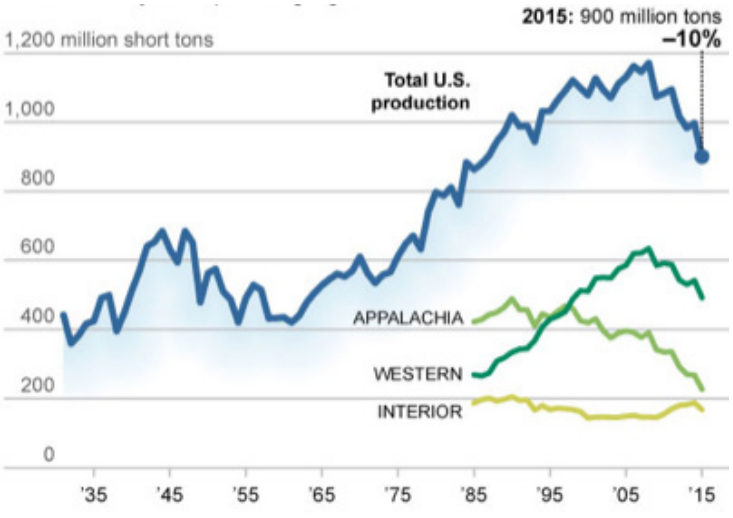
Colorado coal production has dropped from 33,411,127 tons in 2001 to 18,726,445 tons today, [2] with a peak in 2004 (Figure 1). [3]

Figure 1 - Colorado Coal Production [4]



These trends are hardly unique to Colorado, as they have been experienced across the U.S., as shown in Figure 2. Coal production has in recent years fallen in Colorado, in the U.S., and globally. [5]

Figure 2 U.S. Domestic Coal Production



2015 and 2014 figures based on EIA estimates and reports for the 52-week periods ended Jan. 2, 2016, and Jan. 3, 2015.

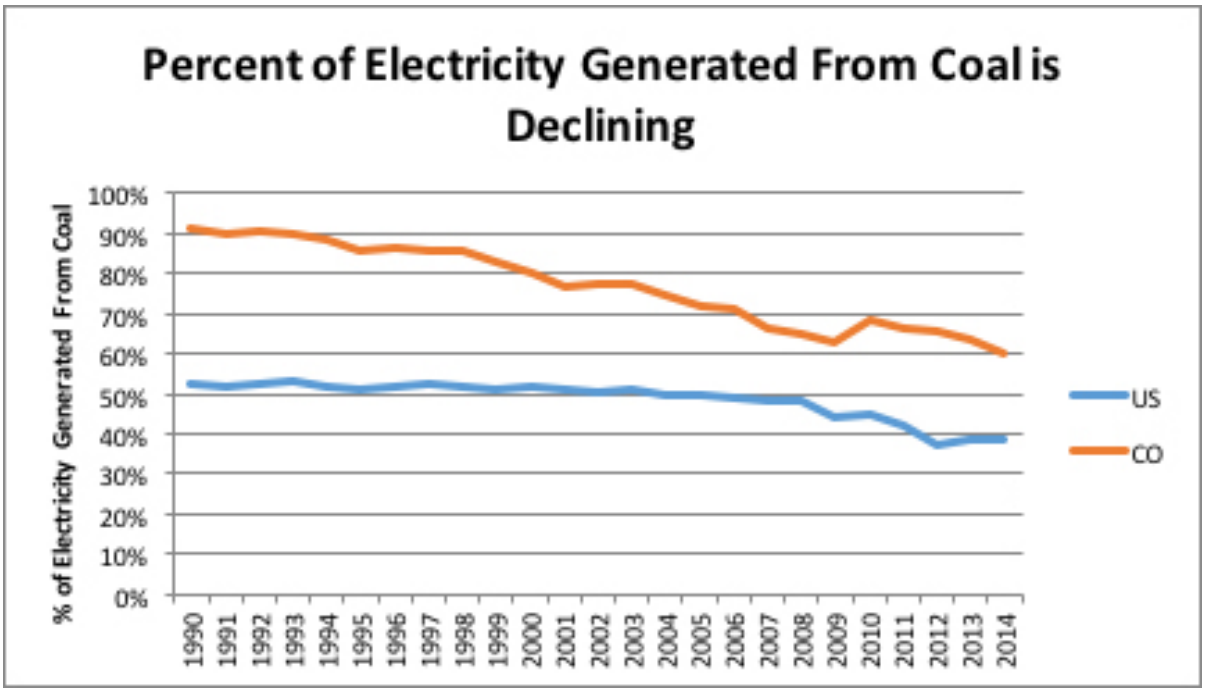
Sources: Mine Safety and Health Administration; Energy Information Administration

Institute for Energy Economics and Financial Analysis
IEEFA.org

Coal is Losing Ground in Colorado as a Leading Fuel in Electricity Generation

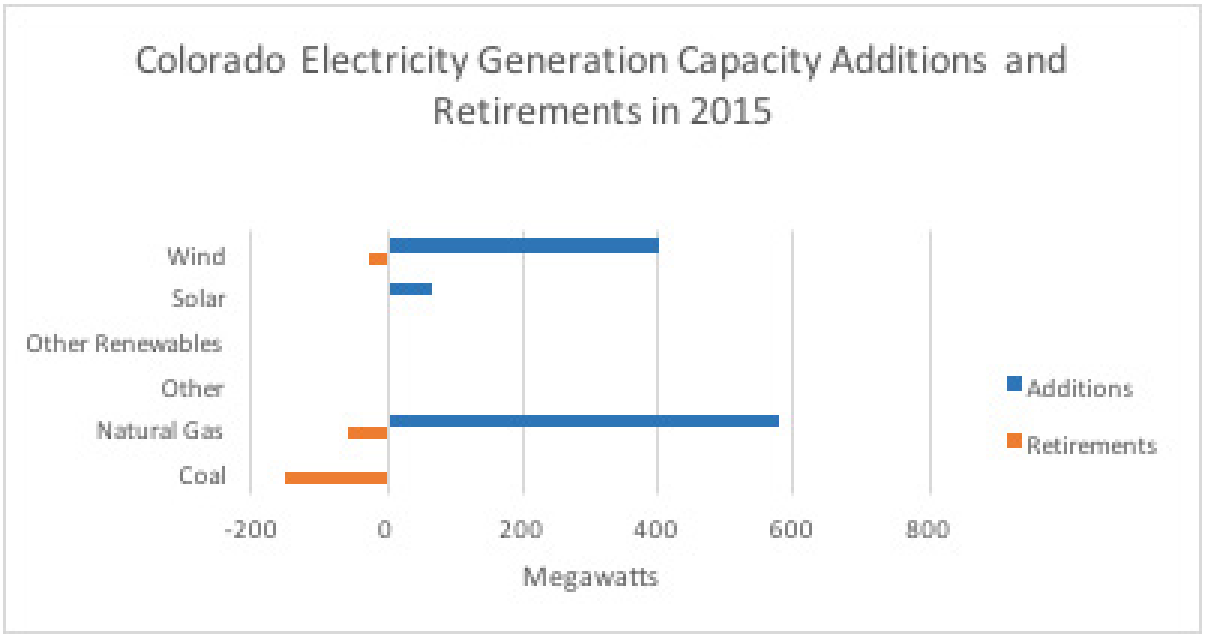
Most coal is used for electricity generation, in Colorado and elsewhere. Coal from Colorado is also used for manufacturing iron and steel, home heating, cement making, and other industrial uses. However, there has been a steep drop within the state and nationwide in the percent of electricity produced with coal. In 1990, coal was used for over 90% of Colorado's electricity generation; in 2014, coal made up just 60% (Figure 3). [6] The decline in demand from the energy industry is the primary driver of the reduction in coal mining.

Figure 3 Percent of Electricity Generated from Coal is Declining [7]



Coal generation has been replaced primarily by natural gas, but also to some extent by wind and solar. In Colorado, coal generating capacity decreased by 152 megawatts in 2015. Meanwhile, natural gas generating capacity has increased by 516 megawatts. In addition, new wind and solar capacity has increased by 375 and 66 megawatts, respectively (see Figure 4 below). The largest renewable energy additions are planned in Adams County, El Paso County, and Kit Carson County. [8]

Figure 4 Additions in Wind, Solar, and Natural Gas Have Outpaced Retirements in Coal [9]



The Effects of the Decline on Coal Communities in Colorado

Coal mining is not a large part of the overall Colorado economy. But it is an important base for local economies in several regions, principally on the Western Slope. It is important for direct employment, and also generates indirect employment. It also is a major part of the revenue base for local government.

In 2001, Colorado had 12 coal mines. Today, as shown in the table below, only nine of these mines remain, with only seven of the remaining mines producing. The coal mines in Colorado are concentrated on the Western Slope.

Table 1 - Operating Coal Mines in Colorado as of April 2016 [10]

Mine Name	County	Status
Bowie- No. 2 Mine	Delta	Idle
Colowyo Coal Mine	Moffat	Producing
Deserado	Rio Blanco	Producing
Foidel Creek Mine	Routt	Producing
King II Mine	La Plata	Producing
New Elk Mine	Las Animas	Idle
New Horizon North	Montrose	Producing
Trapper Strip	Moffat	Producing
West Elk Mine	Gunnison	Producing

With increased mechanization, coal employment has fallen faster than coal production. Coal mining employment in West Virginia fell from 130,000 in 1941 to 20,000 today. [11] China plans to close 1,000 coal mines in 2016. [12] In Ukraine, coal mine closures are a major element in the country's violent political conflict. [13] There is no end in sight to the downward trend in coal employment; even if coal production somehow stabilizes, all indications are that the employment level will continue to fall due to increased mechanization and other factors.

Figure 5 Decline in U.S. Coal Mining Employment

Colorado's nine coal mines are in eight counties, employing approximately 1,326 miners. [14] Not all mines are open year round; the full year equivalent employment is 1,308 miners. Statewide, employment in coal mining accounts for less than one tenth of one percent of employment in Colorado. [15] In most counties with coal mines, coal mining makes up about 2% of private employment. But this should not obscure the fact that coal mining is very important to these counties, and particularly to the individuals and families that rely on coal mining income. As noted in the table below, which considers only direct employment, coal mining makes up 9% of private employment in Moffat County, and 5% of private employment in Gunnison and Rio Blanco Counties.

Table 2 - Coal Production and Employment by County [16]

County	2015 production in tons	Number of miners In Dec. 2015	Average Days worked	Full Year Equivalent	% of County total Private Employment
Delta	1,587,976.00	109	365	109.0	2%
Gunnison	5,172,878.00	296	311	291.9	5%
La Plata	813,677.00	115	357	112.5	1%
Las Animas	107.00	3	254	2.1	0%
Moffat	4,439,479.00	326	360.5	322.0	9%
Montrose	238,094.00	20	261	14.3	0%
Rio Blanco	2,353,043.00	158	365	158.0	5%
Routt	4,121,191.00	299	364	298.2	2%
Grand Total	18,726,445.00	1326	330.9	1307.9	2%

In these counties in Colorado, revenue from coal mining is an extremely important part of the tax base. Coal companies pay property, production, sales, and other taxes to local communities. These taxes are typically put into the county's general fund to supplement or enact programs or pay employees, though there is a growing realization that this may not be the best way to manage a nonrenewable endowment that may only be utilized once.

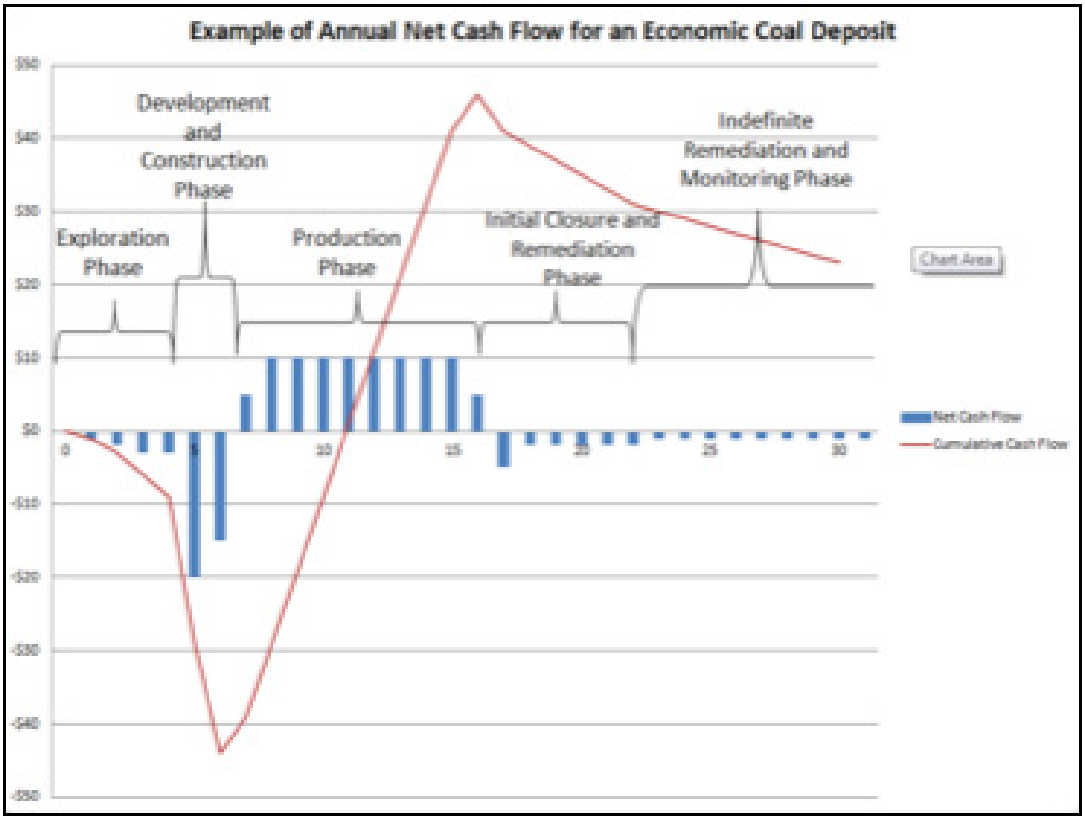
In general, local revenues pass through phases, as shown in Figure 6. During the exploration and construction phases, the costs to local government of managing influx of population, expansion of services, and dealing with other impacts will likely exceed any revenues, since there is no production to generate royalties, and many local taxes have yet to kick in. [17]

During the production phase, counties and towns will benefit from coal-based revenues. The principal question is whether these revenues are spent on current needs, as opposed to being saved to cushion the inevitable shock when production ends—due to the resource being exhausted or for other reasons. The process of economic diversification should be planned early in the life of the mining project, and begin during the production phase, when revenue is high.

Finally, in the closure and remediation phases, the situation is again reversed. The cost to local government of managing outflow of population and dealing with other impacts will likely exceed any revenues. Again, plans must be made early in the life of the mine to respond to these circumstances.

For example, in Colorado, nearly 50% of the Federal Mining Lease revenue distributed by the Department of Local Affairs goes to the State Public School Fund. Other money is distributed to locally impacted communities

Figure 6 Example of Annual Net Cash Flow for an Economic Coal Deposit [18]



for infrastructure maintenance, community development, and discretionary spending. Managing changes in revenue are important both during the life of a mine as well as through mine closure and transition to a post-mining economy, as further discussed below.

Debate has focused on whether current trends in coal prices and production levels are temporary or long term. But the coal industry would need to overcome tremendous challenges to remain “king coal.” This does not mean the coal industry will disappear from Colorado or the U.S. in the short-term. Coal is likely to remain a part of the energy portfolio in the U.S. for some time, particularly for uses other than energy production.

It is not the purpose of this paper to try to predict the future, or to speculate about how much coal we will use, or for how long. We note that world leaders have pledged to phase out all coal use by the end of this century, [19] but the end of the century is a long way off, and only time will tell how fast, or whether, coal is completely phased out. Rather, the purpose of this paper is to help communities create an environment where their livelihood is not dependent on the coal market, which is largely out of their domain of influence.

II. How to Promote Economic Diversification

What do we do where a mine is closing? Particularly where previous attention to planning and economic diversification has been limited, there is just no "silver bullet." Communities must try a variety of strategies to diversify their economies. These can include a wide range of activities such as traditional business recruitment, retention and expansion, workforce development, entrepreneurial development, promoting tourism, leveraging university capabilities, investing in infrastructure, and many others. These strategies should attempt to satisfy one or more of the following five goals:

1. Create collaborative regional planning and implementation systems;
2. Build an environment capable of supporting a diverse array of economic activities;
3. Connect local and regional assets to external markets;
4. Develop skills and talent needed in a wide range of industries; and
5. Encourage local reinvestment of wealth. [20]

Like relying on one industry for local employment, relying on one strategy leaves a community too vulnerable to market and external factors. In addition, local economic strategies should be built around decisions that can be made locally. For example, the decision to expand a local manufacturing company would be made by the resident business owner. While, a decision about where to locate a factory of a large multi-national company would be made far away at the company headquarters. Thus, local business owners, community leaders, and other local stakeholders are more likely to make a difference in the long run when decisions must be made regarding the economic health of a local community. [21]

How does a community pursue the five goals listed above? What does this look like on the ground? The next section illustrates how several communities are working to diversify their economies through collaboration, policy changes, and creativity.

III. Case Studies: Diversifying Local Economies and Planning for Transition

Case studies are useful tools to help imagine what is possible. These case studies are not intended to be prescriptive, but rather to generate ideas and help start the brainstorming process. There are many more examples in addition to those listed here—readers are encouraged to further research the many possibilities by reviewing the references provided in this paper; seeking out additional resources; and speaking with other stakeholders in your region, as well as in other regions that have had similar experiences. The recurrent themes from the case studies are listed in the side bar "Lessons from the Field." The following case studies include success stories, communities with a long way to go, and a few in between.

Regional Collaboration with "PEP" in Upshur County, West Virginia

Upshur County in West Virginia has a population of 24,000 people and has an array of natural resource extraction industries including timber, natural gas, and coal. The Sago mine was the scene of a mine explosion that took the lives of 12 miners in 2006. About two years later the mine closed permanently. Yet, the county has seen above average growth from 2009–2012 and its economy is relatively diverse. Regional collaboration has been one of the primary tools used by Upshur County along with its neighbors Randolph and Lewis Counties.

Upshur has focused its diversification efforts on agriculture, hardwood products, and tourism. But the core project is creation of a major interstate between this region and the Washington D.C. area, "Corridor H." When completed, driving time to D.C. will be reduced from about five hours to three—helping to facilitate the community's effort to attract new residents, tourists, and businesses. Tom Smith, West Virginia Division Administrator for the Federal Highway Administration, said it takes "PEP" to build roads like Corridor H.

"The first P stands for partnership," Smith said. "The E stands for enthusiasm. It certainly takes persistence and enthusiasm to stay the course and get a project like this built. The final P stands for persistence. You have to take it one step at a time and eventually you have roads built." [22]

One county alone could not have built the political will to create this transportation project. Likewise, the tourism and value-added hardwood products development efforts have been regional and linked to Corridor H. The three counties did not think they had enough destinations individually to attract tourists, but as a region they certainly did. The new collaborative marketing strategy, "33 Things To Do Along Route 33," has boosted tourism for the region.

Likewise, the regional approach has been used to expand value-added hardwood product production. The regional Harwood Alliance Zone concentrates on marketing and building the infrastructure necessary to attract value-added hardwood companies to the region.

Using a Federal Rural Jobs Accelerator Grant, Upshur County has also expanded local food production. The grant supported expanding local food chains, helping local organic growers produce for homes and restaurants, and also start a farmers' market.

Upshur County exemplifies the need for regional collaboration and avoiding the "beggar thy neighbor" [23] strategies that often occur when communities get desperate and fail to take the long-run view. The County has avoided competing with neighboring communities for businesses that are basing their location decisions on tax breaks. Such businesses are rarely stabilizing forces in an economy.

Delta and Gunnison County, Colorado Conduct Research for Economic Diversification

In response to the recent decline in coal mining employment, the closure of Oxbow coal mine in Gunnison County, Colorado, and the related out-migration of miners, Delta and Gunnison Counties, through a non-profit organization called Region 10, hired a consulting firm called Better City to aid them in identifying economic development solutions. Region 10 utilized a U.S. Economic Development Administration Economic Adjustment Assistance Grant for the Counties, to "improve and enhance the economic resiliency and sustainability" of the Counties. [24]

Better Cities worked with the State Demographers Offices to compile and analyze economic indicators; conduct market analysis; create a report with recommendations and an action plan; conduct a feasibility study analysis; and monitor results. [25] The analysis fed into proposals focused on "leveraging local assets, building upon the communities' natural strengths, and developing vision for a variety of potential economic development projects." [26] They held several open houses in communities to discuss a development vision, and utilized the www.region10.net website to collect public feedback.

In Gunnison County, the consultants proposed that the high-altitude county become the "altitude training center of the country," leveraging the market for endurance sports. The study recommended that Gunnison become the "Endurance Sports National Center of Excellence," with strategic investments in business recruitment, hosting well-marketed competitions and training seminars. The county's higher education resources also position it to focus on technological innovation. [27]

Stakeholders in Delta County identified strengths in the county as outdoor recreation, general agriculture, organic agriculture, scenic beauty, hunting, and quality of life. [28] The study identified Delta County as the hub of organic agriculture in Colorado, and proposed that it leverage this strength by developing an "Organic Industry National Center of Excellence" to engage in the market state-wide. The study proposed strategies for marketing, infrastructure, and distribution, coupled with downtown revitalization, to factor into an equation for success of the organic market. [29]

LESSONS FROM THE FIELD

Avoiding wasteful "beggar thy neighbor" strategies—instead focus on regional collaboration.

Partnering with nearby institutions of higher education, investing in programs that are most likely to boost economic development in the region.

An honest assessment of the community's strengths, weaknesses, opportunities, and threats.

All hands on deck, breaking down silos—collaboration must include public, private, and government sectors.

Staying in touch with local business needs and crafting strategies to overcome their impediments to growth.

Frequent updating of planning strategies and goals—ensuring that the plan continues to meet short and long-term local needs.

Maintaining focus on diversity and not being seduced by another potential single employer.

Patience and commitment to diversification efforts that may require years of work.

Use data to inform all stages of planning.

Create trusts or funds to smooth funding streams over the long run.

The study also identified a strong manufacturing sector in Delta County compared to Colorado as a whole, and suggested an innovation center to aid entrepreneurs in prototyping concepts for manufactured goods. It recommended technical support for new startups, and access to regional and national markets. [30]

Following public comment on these and several other concepts, Delta County ultimately decided to conduct feasibility studies on three of eight proposed projects: development of a hotel and conference center, riverfront "activation" (development of recreation activities, retail activity, and office space along the county's riverfront property), and specialty food manufacturing. The county is currently developing implementation plans for the three projects, and has obtained a Colorado Department of Local Affairs Rural Economic Development Initiative Grant to begin waterfront engineering. [31]

Trusted Community Leaders Start the Conversation in Eastern Kentucky Coalfields

A five-county region of eastern Kentucky has lost 8,500 jobs since 2008. Communities have seen declining tax revenues, population declines, and home foreclosures.

One of the key components of the development strategy in the region is collaboration: an "all hands on deck" strategy including businesses, nonprofits, government at all levels and, of course, residents. Unusual allies must come together and work side by side to push for economic diversification and stability.

This strategy requires leadership and spokespeople who can inspire residents across the spectrum. One example is the creation of Shaping Our Appalachian Region (SOAR), a bipartisan effort led by Congressman Hal Rogers and Governor Matt Bevin. These leaders were able to begin the conversation around "what do we do next?," [32] a conversation that many in the region were not willing to have, because they did not want to let go of the bounty of the coal mines.

During this process, several priorities were identified by local communities. One priority is providing broadband access throughout Eastern Kentucky. Kentucky Wired has been funded by a public-private partnership. Local institutions of higher education are providing training for high-tech occupations in industries that will utilize the broadband. In addition, a private group is working on retraining coal miners to be coders.

The health care sector is the primary source of employment growth in the region. The higher education community is also training workers to meet the growing demand for employees in this sector.

A Different Look at Manufacturing in New Mexico

The Northwest New Mexico Council of Governments (NNMCOG) covers three counties in Northwestern New Mexico and includes part of the Navajo nation. Coal mining and power plants created much needed employment in this area, which has high levels of poverty. Fifty-one percent of the Navajo Nation's annual budget is derived from coal. [33] In 2015, this area saw the largest increase in unemployment in the nation.

In October 2015 San Juan College and the NNMCOG applied for and received a $1.4 million federal Partnership for Opportunity and Workforce and Economic Revitalization (POWER) grant. The POWER program is funded through a collaboration of the Department of Commerce's Economic Development Administration, the Department of Labor, and the Small Business Administration.

"We're helping to bridge [students] into high-demand, high-growth sectors like other forms of energy, information technology and health care," College President Dr. Toni Pendergrass said. "This will help diversify our economy and transition workers to areas [that don't have] such a strong dependence on fossil fuel, mainly coal." [34] The college is also hosting job fairs to help laid-off workers find new jobs.

The area has decided to focus on three sectors in which it has a competitive advantage: energy, logistics, and manufacturing. While the energy economy has driven the boom and bust cycles that have upset the economic stability of the region, area leaders feel that the energy sector cannot be ignored. In addition, the transportation infrastructure that the energy economy has created (particularly railroads) leaves the region with a competitive advantage in the logistics industry. The area has a unique environment for manufacturing. The area is also the Native American Jewelry capitol of the nation. Thus, helping very small scale manufactures succeed is a primary focus, including removing barriers to expansion. David Hinkle, NNMCOG Program Manager, highlighted two important strategies:

1. Utilizing data-driven strategies and making sure they have the best information on the situation.
2. Realizing the importance of having a long-term plan and not losing sight of the importance of diversification during boom times. [35]

Long Term Planning in Sánchez Ramírez, Dominican Republic

Sánchez Ramírez is a region of the Dominican Republic where the economy is based primarily on a major gold mine. Revenue from the mine began to flow to Sánchez Ramírez in the 1970's, and was originally managed by municipal governments. However, in response to community demands for greater participation in decision-making and increased benefits from the mine, in 1979, Sánchez Ramírez enacted a decree calling for more efficient management of the funds. The decree established a Board charged with managing the funds in a way that would meet the objectives of social and economic development of the region.

The funds were used to create public markets and schools, as well as to invest in improving infrastructure such as sewers and health care facilities. The largest investment was creation of a university focused on technical skills-building programs.

In 1991, gold and silver prices fell. The mine stopped producing and ultimately was abandoned by its original owner. As a result, the Board stopped receiving funds, but continued to use a reserve of existing funds to strengthen the university and continue other beneficial activities. This reserve helped the region manage impacts for almost a decade without revenue from the mine.

In 2000, the Dominican Republic enacted a law providing that municipalities in which non-renewable natural resources are exploited must receive 5% of the net profits generated from the exploitation. When the mine in Sánchez Ramírez came under new ownership on 2001 and began to produce again, the profits to Sánchez Ramírez under the new law were extremely high in comparison with those the government had managed in the past. Concerns of corruption emerged, and in 2005 a more diverse Board was established under a new law aimed at transparent management of funds.

The 2005 law established the current "Regional Council for the Administration of Mining Funds in Sánchez Ramírez," abbreviated as "FOMISAR" in Spanish. The mission of FOMISAR is to promote sustainable development of Sánchez Ramírez through the identification and implementation of projects that promote the key values of integration, transparency, equity, participation, and commitment.

FOMISAR is a multi-sector network including the Lions Club, Chamber of Commerce, Rotary Club, ecological and trade associations, university representatives, leaders of religious congregations, the city councils of each municipality, the Governor of Sánchez Ramírez, mining company representatives, and others. The General Assembly of the Council holds regular public meetings each December to discuss budgets, operations, progress on a five-year plan, and renewing members of the Board. The Board membership reflects FOMISAR's multi-sector network, including government, community organizations, and company representatives.

FOMISAR's short and long-term work plans are based on meetings among diverse stakeholders across the region, sub-regional assemblies, and regional seminars, all with the objective to better understand the needs and aspirations of the people of Sánchez Ramírez at present and in a post-mining economy, and to reflect these in the use of the funds.

The major themes of the long-term plan are governance, social inclusion, economy and employment, and land use and environment. Major activities are focused on education; small business and "micro-enterprise" development, improvements to infrastructure and health care, culture, and sports.

FOMISAR regularly provides leadership and capacity building programs for its Board and General Assembly, and continually works to build public and private alliances. Only a portion of the funds may be used for current programs, with a portion reserved for continuing activity during periods when the mine is not producing and, importantly, for supporting future generations after the mine has closed.

Revenue Management in Royal Bafokeng Nation, South Africa

One interesting model for the capture of mineral revenues, with the explicit goal of diversifying local economies and funding social development, is an example from the Royal Bafokeng Nation in South Africa.

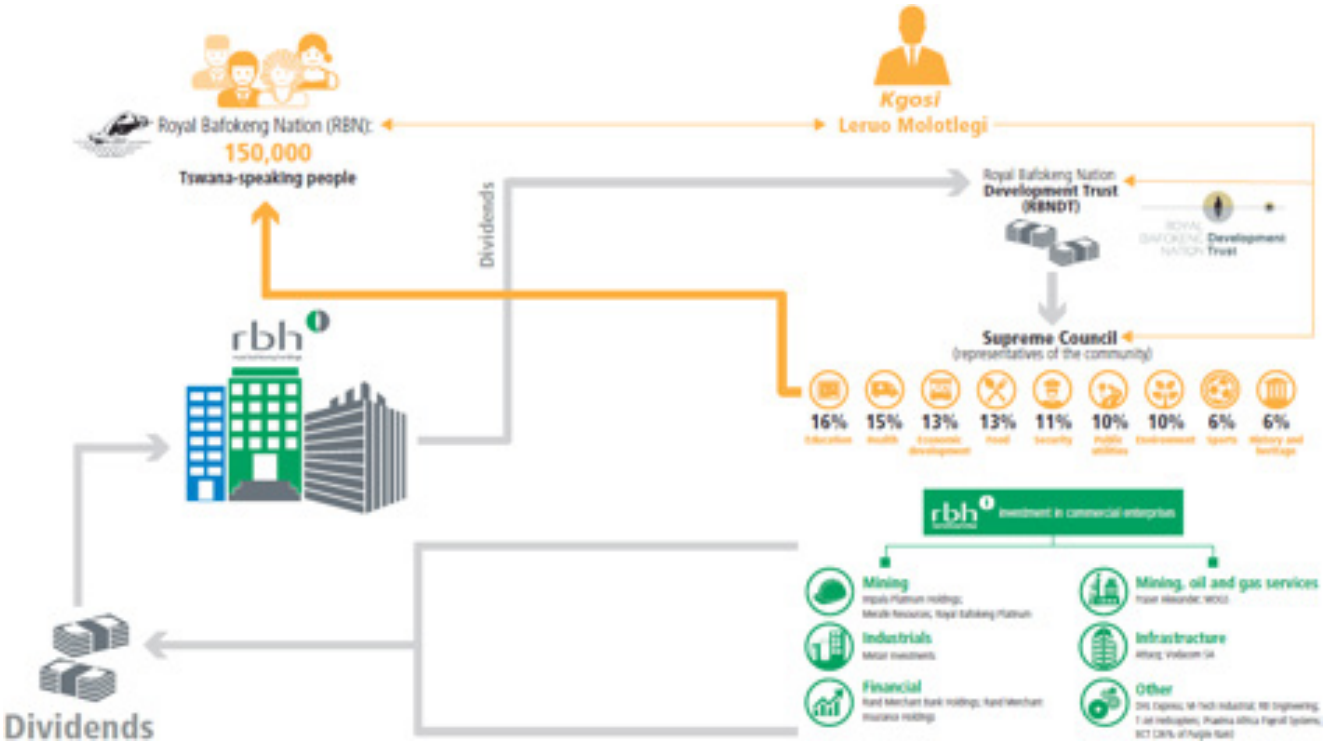
The Royal Bafokeng Nation is led by the Bafokeng Supreme Council, [36] which was able to secure private surface and mineral rights to its ancestral lands in what became one of the richest platinum districts in the world. The Royal Bafokeng Nation successfully negotiated profitable agreements with some of the largest platinum mining companies in the world.

Initially, mineral revenues were directly used for the benefit of the surrounding community. In 2002, Royal Bafokeng Resources was established to manage the community's mining interests. Two years later, Royal Bafokeng Finance was established to develop a diversified investment portfolio from the mineral revenues of Royal Bafokeng Resources, with the goal of maximizing financial return. In 2006, these two entities merged to form Royal Bafokeng Holdings (RBH), which functions like a private company and has the same profit motive. The people of the Royal Bafokeng Nation were to be the beneficiaries of this structure through a specific set of objectives known as "Vision 2020." The Royal Bafokeng Nation Development Trust (RBNDT) was set up to receive distributions from RBH for this purpose.

In this system, the Nation is represented by the Bafokeng Supreme Council, which provides the mandates for RBH and is "responsible for identification, prioritization, and delivery of social needs to the community." [37] Key expenditures are in infrastructure development, social programs, education, and health care. Every three years, a household survey is conducted to determine attitudes about how the RBNDT should update its saving, spending, and allocation of expenditure shares.

Importantly, this model of revenue management works because annual revenues are not spent every year, but a portion is saved and reinvested. When funds are spent, expenditures are focused on projects that will strengthen and diversify the economy. Also, expenditures were not ad hoc; a collective vision was laid out by the community and is consistently updated.

Figure 12 Royal Bafokeng Nation Development Trust Organizational Chart [38]



IV. Policy Recommendations

We believe that there are a number of actions that federal, state, and local governments can take to help strengthen the economic future for coal dependent communities. In general, local decisions should be made at the local level, by those most affected by policy changes. At the same time, it is evident that coal development can pose challenges that local governments lack sufficient resources to resolve. Therefore, the appropriate federal role is to be a source of information, advice, ideas, and financial resources at key points in the development process, especially as markets shift more rapidly than communities can adjust.

The loss of employment that comes with closing coal mines has created political challenges around the world, and has led some governments to resist the trend by subsidizing the coal industry. But the lesson everywhere is that the appropriate response is not to look to government to prop up coal mine employment, swimming upstream against the trends of mechanization of mining and lower energy prices. **Where government can assist is:**

- **Targeting workers with transition assistance and skills retraining;**
- **Targeting impacted communities with resources for planning diversification of local economies; and**
- **Providing transitional assistance to communities to deal with the range of problems from declining school enrollment, falling real estate values, unemployment, and lower tax collections.**

Specifically we recommend the following policies to support communities that have become dependent on coal (or extraction of any finite resource).

Recommendation 1. Local Stabilization Funds. Local governments in areas that are heavily dependent on natural resource extraction should consider establishing stabilization funds, in which revenues are saved when resource prices are high, and disbursed at times of very low mineral prices, in order to smooth out the fluctuation in government receipts and spending.

The Chilean Copper Stabilization Fund (CSF) is one of the older and more widely known examples. [39] This fund, created in 1985 in response to a 1982 financial crash, requires deposits (or withdrawals) once the price of copper goes above (or below) predetermined trigger prices. [40] It has been successful in mitigating volatility, and has even provided a valuable rainy day fund for catastrophes like the 2010 earthquake. [41]

Stabilization funds have been tried in countries as diverse as Norway and Azerbaijan, and the experiences with the funds have been equally diverse. [42] While these are examples of this sort of mechanism at the national level, there are also similar ideas at state and local levels. In the U.S. they are sometimes referred to as “rainy day funds.” [43]

Recommendation 2. Permanent Trusts. Many jurisdictions have benefited from creating permanent trust funds, in which a portion of resource revenues is placed in trust for future generations. In principle, income from such funds is then available to support education, health, economic development, and other local priorities even after mines have closed.

Trusts have been established in the U.S. and around the world on national, regional, and local levels. Financed by natural resource revenues, this reserve may be utilized to transparently manage revenue to benefit sustainable local and economic development for current and future generations. [44]

In the U.S., state governments have established trusts in Alabama, Alaska, Louisiana, Montana, New Mexico, North Dakota, Texas, and Wyoming. [45] Colorado does not have such a trust. On an international level, over $4 trillion has been invested in natural resource trusts. [46]

Recommendation 3. Technical Assistance. Federal agencies should stand ready to support regions where federal resources such as coal play an important part in local revenues. Agencies can provide technical assistance in the design and management of stabilization funds, where these are desired, either by grants to state government or by working directly with local government.

Recommendation 4. Employment and Skills Training. There is an obvious decline in the number of coal mining jobs in Colorado. Many miners who have built their careers in highly skilled mining jobs may have to transition to other forms of employment. In regions where federal coal production is a dominant part of the economic mix, there needs to be federal support—likely from dedicating a fraction of federal coal revenues—for this purpose. These programs need to be up and running while mining is still operating robustly, as they take considerable time to be effective and their impact is less if they are not in place until after closures have occurred.

Recommendation 5. Planning for Economic Diversification. Planning for economic diversification of communities dependent upon mineral revenues is primarily a local function. However, federal and state governments can help provide resources that are important for diversification. A perfect example is the process undertaken by Gunnison and Delta Counties discussed above, where communities were able to turn their initiative into action utilizing state and federal funding. Planning for diversification is an essential part of making the transition from mining to post-mining economies. Where diversification is delayed until closure is occurring, it is far too often unsuccessful.

Recommendation 6. Reclamation Bonding. A fundamental part of the public's trust in mining is the understanding that mining will not occur unless there is a plan for reclamation of the mine site, backed by a real financial guarantee that the closure costs will be funded when the mine eventually closes, as all mines do. Allowing "self-guarantees" or "self-bonding" of reclamation bonds understandably undermines public trust in the industry, and recent events demonstrate—not for the first time—that the option of a "self guarantee" of reclamation obligations should simply be prohibited. [47]

Resources for Transitioning Economies

The National Association of Counties and the National Association of Development Organizations recently held a Coal-Reliant Communities Innovation Challenge to support "county and regional leaders in coal-reliant communities with retooling their economies to become more resilient to changing conditions." See the Diversifying Economies website, http://DiversifyingEconomies.org,for information on the Challenge, including numerous workshop materials from their recent Grand Junction, Colorado workshop, available at http://DiversifyEconomies.org/grand-junction-colo/. Teams representing Moffat County, Delta and Montrose County, Rio Blanco County, and Routt County, Colorado participated in the Grand Junction workshop. The Diversifying Economies website also has links to guides and toolkits for downtown revitalization, strengthening rural-urban connections, cultivating a competitive advantage through regional partnerships, workforce development, and economic development.

V. Planning is the Right Choice for Our Communities

While no one can predict with certainty what the future may hold for coal production in Colorado or across the globe, the one thing that is certain is that every coal mine will eventually close. Communities, states, and the federal government all must work to implement policies and strategies that help mitigate the social, economic, and environmental impacts of the boom and bust cycles of coal development.

Our hope is that this report serves as a resource for communities and governments at all levels to support communities that have borne a disproportionate burden of the decline in the coal economy. Many examples exist of communities doing the work necessary to diversify their economies. These communities are all unique in their assets and history, but can provide inspiration, information, and support to other communities working to diversify their economies. The lessons learned from the case studies will save time and resources for communities just embarking on a diversification project.

But communities should not have to go it alone—federal and state governments must work to support coal mining communities, communities whose work and sacrifices have benefitted the public for decades. The state and federal government must ensure that local communities have the resources to recover on their own.

Adding more tools to your community's economic toolbox can only help to improve the way of life for this generation and those to come. This would be true even if coal started to boom again. Communities have the opportunity to begin planning and diversifying their economies now. Resources and information are available to help Colorado's coal communities take the next step (see Appendix). Diverse local economies are resilient enough to withstand any changes that are beyond our control. Planning will make our communities great places to live now and for many generations to come.

Sarah Wilhelm, has a PhD in Economics from the University of Utah and a BBA from the University of Michigan. For the last 12 years, she has worked providing public policy analysis and lobbying for shared prosperity, fair taxation and adequate revenue generation. Ms. Wilhelm has conducted research on a range of economic issues including wages, policy impacts and economic development. This research has resulted in academic journal articles, book chapters, policy reports and presentations. Ms. Wilhelm is an independent economist residing in Durango, Colorado.

Luke Danielson, President and Co-Founder of Sustainable Development Strategies Group, is an attorney, professor, and consultant. He has over 30 years of worldwide experience on minerals policy, development strategies, and environmental management with over a dozen governments, including the United States, Sierra Leone, Guinea, Mongolia, and Mozambique. He was previously the Executive Director of the groundbreaking global Mining Minerals and Sustainable Development Project, a multi-year project involving hundreds of stakeholders, forums, conferences, and reports. He resides in Gunnison, Colorado.

Kristi Disney Bruckner is an attorney specializing in environmental law and policy, and international resources transactions law and policy. She is the Executive Director of Sustainable Development Strategies Group (SDSG), where she develops and implements programs focused on sustainable development and extractive industries. Ms. Bruckner is an adjunct professor at the University of Denver Sturm College of law. She lives in Conifer, Colorado.

Andrew Gulley recently received his PhD in Mineral Economics from the Colorado School of Mines and is a fellow with Sustainable Development Strategies Group. While pursuing his doctoral degree, he worked for Newmont Mining. His prior academic research, as a law and economics undergraduate student at the University of Chicago, focused on environmental valuation of acid mine drainage. Mr. Gulley resides in Denver, Colorado.

Chris Nutgrass is currently completing his master's degree in Environmental Management at Western State Colorado University in the Sustainable and Resilient Communities track. His research focuses on western communities and their economic, social, and environmental transitions post mining. He lives in Gunnison, Colorado.

Diana Madson is the Executive Director of the Mountain Pact. She founded the Mountain Pact from her graduate research, where she explored how climate change has transformed mountain communities with outdoor recreation-based economies. Over the course of her research, including interviews with local governments, businesses and nonprofit groups, she identified essential gaps in knowledge and obstacles preventing action on climate mitigation and adaptation. Ms. Madson received her Master of Environmental Management from the Yale School of Forestry & Environmental Studies and graduated from the University of California, Berkeley with a B.S. in Society & Environment and a B.A. in Rhetoric. She lives in South Lake Tahoe, California.

Sustainable Development Strategies Group is a non-profit 501(c)(3) organization based in Colorado, USA. We operate on local, national, and international levels to develop collaborative policy and legal frameworks that address the enormous challenge of using natural resource endowments to reduce poverty while protecting human rights and safeguarding the integrity of ecosystems. Learn more about us at www.SDSG.org.

The Mountain Pact educates, empowers and mobilizes mountain communities in the American West that are experiencing extreme economic loss and environmental degradation as a result of climate change. The Mountain Pact unites these vulnerable communities around their common challenges and elevates their shared voice on federal policy. Learn more at www.TheMountainPact.org

Appendix - Resources for Transitioning Communities

A. Data Resources

Successful strategies are data driven. A multitude of data resources are available on current economic conditions and projections for the future. A few places to start are:

Economic Profile System - Headwaters Economics

http://headwaterseconomics.org/tools/economic-profile-system/about

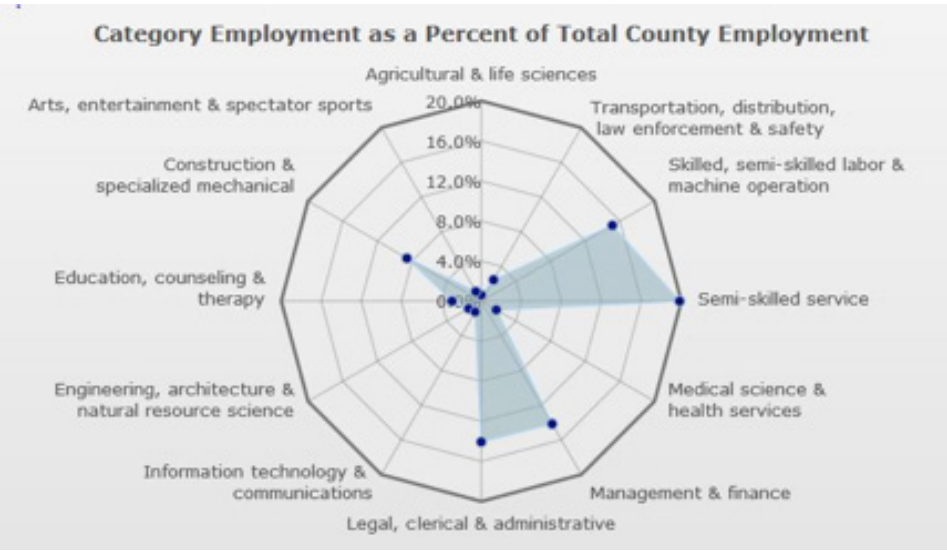
This resource allows researchers to access data on social and economic measures and allows for comparisons and compilations across regions, states, and c ounties.

Economic Diversity in Appalachia -Appalachian Regional Commission

http://economicdiversityinappalachia.creconline.org

This tool for guiding diversification efforts has a multitude of data on all counties in the U.S. (not just Appalachia) including three measures of diversification, knowledge, commuting sheds, etc. For example, see the figure below on knowledge clusters in Gunnison County. This is a great place to start to understand key parts of a county's economy.

Knowledge Clusters in Gunnison County



B. Funding Resources

A variety of funding sources are available to communities looking to diversify their economies after relying on coal. In particular, federal resources have been mobilized to start to address impacts of federal policy on communities. The most prominent is the recent announcement of the Partnership for Opportunity and Workforce and Economic Revitalization (POWER) Grants for communities negatively impacted by changes in the coal economy.

Resources for Transitioning Economies

http://diversifyeconomies.org/funding

This resource keeps an updated list of government and private funding opportunities for communities that want to diversify.

Other grant resources include:

- Power Initiative https://www.eda.gov/power
- Just Transition Grants (created to help small communities apply for Power grants not just in Appalachia) http://www.appalachiafunders.org/jtf
- Rural Jobs and Innovation Accelerator http://www.rd.usda.gov/about-rd/initiatives/rural-jobs-and-innovation-accelerator
- Energy/Mineral Impact Assistance Fund (EIAF) https://www.colorado.gov/pacific/dola/energymineral-impact-assistance-fund-eiaf
- Other Colorado Department of Local Affairs Financial Assistance Programs https://www.colorado.gov/pacific/dola/financial-assistance-0
- Colorado Office of Economic Development and International Trade Programs http://www.advancecolorado.com/funding-incentives/financing

Endnotes

[1] The 1980s was the big coal boom, and much of Colorado's coal mine infrastructure dates back to that era. According to the Colorado Division of Reclamation Mining & Safety data, first permits for Colorado mines were issued between 1977-1997: Trapper Mine in 1977, West Elk Mine in 1981, Deserado Mine in 1981, Colowyo Coal Mine in 1982, Foidel Creek in 1983, New Elk in 1984, King II in 1987, New Horizon North in 1988, Bowie #2 Mine in 1997. See www.mining.state.co.us.

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[3] The 1980s was the big coal boom, and much of Colorado's coal mine infrastructure dates back to that era. According to the Colorado Division of Reclamation Mining & Safety data, first permits for most existing Colorado coal mines were issued between 1977-1988: Trapper Mine in 1977, West Elk Mine in 1981, Deserado Mine in 1981, Colowyo Coal Mine in 1982, Foidel Creek in 1983, New Elk in 1984, King II in 1987, New Horizon North in 1988. Bowie #2 Mine came later in 1997. See www.mining.state.co.us.

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