



Oil and Natural Gas Fiscal Best Practices: Lessons for State and Local Governments

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Introduction: Why is Fiscal Policy Important?

Drilling for oil and natural gas is a high-impact economic activity that presents opportunities and challenges for state and local governments seeking to reconcile the benefits of job and revenue growth with the impacts of rapid industrialization and population growth. The rush to develop unconventional oil and natural gas resources—underway in many parts of the nation and on the horizon in others—requires more wells compared to conventional oil and natural gas, meaning higher costs, more jobs, and greater impacts to extract an equivalent amount of oil or natural gas.

This brief focuses on fiscal challenges specific to oil and natural gas development (Section I) and on the policy mechanisms that address them (Section II). The goal is to inform discussions in states considering fiscal policy reform and to encourage more detailed analysis.

How oil and gas resources are taxed and how the revenue is distributed and invested are the cornerstones of balancing positive and negative impacts of energy development. Across the country, there are various approaches to taxing oil and natural gas activity, and to spending, sharing, and saving these revenues. In no case has any single state put together a complete package of fiscal “best practices.” Yet each state employs part of a viable fiscal solution and can learn from what others are doing.

Note: This report shares lessons learned through ongoing research on economic impacts of energy development in the West. Detailed references to the original sources are in the endnotes.

Section I. Fiscal Challenges Specific to Oil and Natural Gas Extraction

This report focuses on the four main challenges that any successful oil and natural gas fiscal policy must address, and provides examples of those challenges and a model set of corresponding fiscal practices. The challenges include:

Amount: The costs of addressing energy impacts often exceed tax revenues. Studies and regional examples show that governments could remove incentives or raise tax rates without harming production.

Timing: Tax policies can introduce major time-lags between impacts associated with the build-up of oil and natural gas activities and the arrival of revenues to address those impacts.

Distribution: Energy revenue accrues to local governments where production takes place, while related impacts often occur in adjacent communities where workers live but no wells are drilled.

Volatility: Price fluctuations and drilling activity can accelerate or end quickly, making it difficult for communities to meet financial commitments, conduct multi-year projects, and anticipate impacts.

Many states last updated their energy fiscal policies in the 1990s. At that time, conventional models of field development informed the design of tax structures, incentives, and distribution strategies.

The conventional model of oil development involved a relatively brief, high-impact drilling phase followed by a long production phase with lower, stable employment, and decades of significant tax collections.

In comparison to the conventional cycle, emerging unconventional plays are characterized by an extended, more intense development phase and less predictable production phases. Community impacts often are more intense and extend over a longer period of time, heightening the importance of collecting revenue in adequate amounts, distributing it effectively, and saving and investing for the future. As a consequence of this difference, many tax policies are out of date and ineffective in the current oil and natural gas development model.

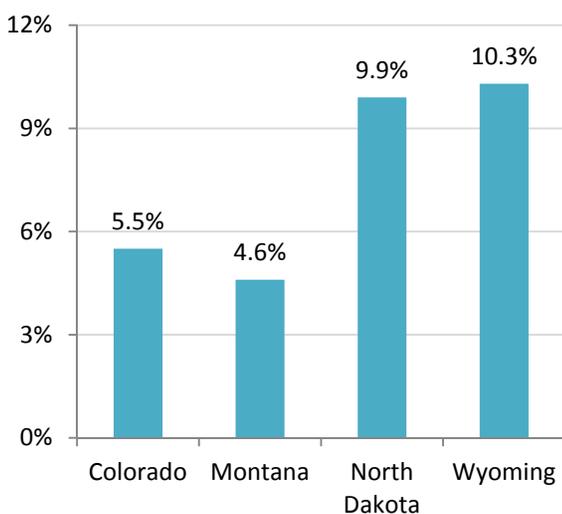
The following discussion describes each of the four challenges associated with oil and natural gas development in more detail.

Revenue Amount:

Infrastructure and service costs often exceed tax revenues, leaving communities with budget gaps and declining levels of service.¹ States tax oil and natural gas production at remarkably different rates, with no demonstrated effect on industry investment or production, but with significant differences in available resources to fund infrastructure and services.² States could remove incentives or raise tax rates to ensure effective mitigation and long-term fiscal benefits (see sidebar below).

Example: Wyoming maintains a high effective tax rate for all state and local government production taxes combined relative to its peers (Figure 1), yet is a regional and national leader in production. In 1999, the state offered a two-thirds reduction in the severance tax rate from six to two percent, but rescinded it a year later when prices rose and the oil and natural gas industry showed renewed interest in Wyoming.³ Wyoming's oil and natural gas production subsequently boomed—emphasizing that energy prices, more than incentives, are a driver of industry activity.

Figure 1. Oil and Natural Gas Effective Tax Rate on New Unconventional Wells, FY 2011⁴



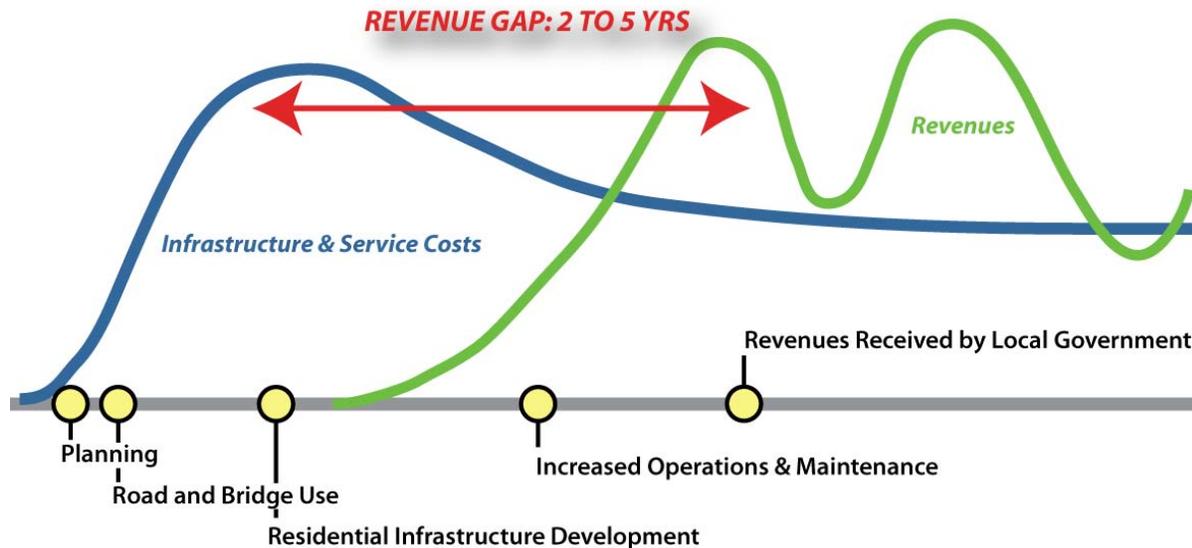
Effective Tax Rates Vary Widely

The effective tax rate is a measure of production taxes actually received after the application of various incentives, deductions, and other provisions in a state's tax code. For example, Montana's single production tax rate is between nine and 12.6 percent, depending on the type of well ownership. North Dakota's tax rate is 11.5 percent for two production taxes combined. Wyoming levies a six percent state severance tax and local ad valorem production taxes. After incentives kick in, the oil and natural gas industry pays only 4.6 percent in Montana, 9.9 percent in North Dakota, and 10.3 percent in Wyoming, illustrating the higher value of incentives offered by Montana, and the need to account for both state and local production taxes when calculating effective rates. Each new well will pay \$800,000 less in taxes in Montana over the first three years of production compared to an identical well drilled across the border in North Dakota or Wyoming.⁵

Revenue Timing:

The impact of drilling activities and population growth occurs during the drilling phase of development (as indicated in blue in Figure 2), but the largest source of revenue (green line) from production taxes does not accrue until after the well is completed and production begins. Different tax policies will minimize or exacerbate this inherent time-lag.

Figure 2. Time-Lag in Revenue Availability in Typical Oil and natural gas Development Scenario⁶



Example: Montana has an 18-month “holiday” tax rate of 0.5 percent on newly completed horizontal wells. After the incentive ends, the state collects the production tax quarterly, and makes distributions to local governments in the following quarter. The incentive combined with the basic tax collection and distribution policy delays significant tax revenue to local governments by about two years after each well begins producing.

How Much Should States Tax Oil and Natural Gas Production?

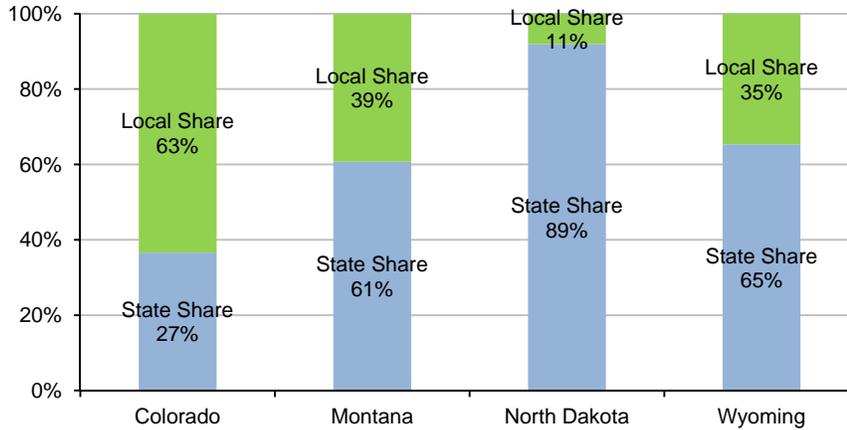
There is no firm answer to how much states can tax oil and natural gas production without affecting the timing, amount, and location of production. Research suggests states can collect more revenue than they do currently without impacting drilling or production activity. Market conditions (price), technology, and geology largely determine when it is profitable to develop a resource in a particular location. Alaska and Wyoming, the Western states with the greatest share of their economy devoted to energy extraction, tax oil and natural gas production at the highest rates and remain leaders in production. North Dakota claims the lion’s share of the Bakken oil boom, despite Montana having a tax policy designed to attract industry. While higher tax rates do not deter oil and natural gas production, they are important to meet short-term needs and to save for the future.*

*The research supporting this point is summarized and cited in Headwaters Economics, 2011. Fossil Fuel Extraction and Western Economies. See page 38. http://headwaterseconomics.org/wphw/wp-content/uploads/Fossilfuel_West_Report.pdf.

Revenue Distribution:

There are two typical failings of existing revenue distribution approaches. One failing involves the state not distributing enough funding to help communities deal with impacts. The other involves the inability of certain types of communities to access revenue due to the uneven nature of tax revenue relative to energy impacts. For example, the share of total tax and royalty revenue available to local governments varies widely from state to state, as shown in Figure 3.

Figure 3. State vs. Local Share of Oil and Natural Gas Tax and Royalty Revenue Distributions, FY 2011⁷

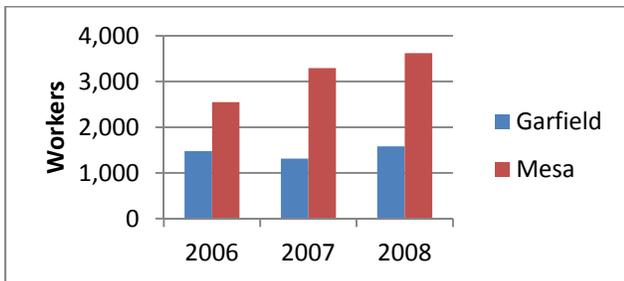


Example: North Dakota levies two taxes on oil and natural gas: the oil extraction tax accrues to the state government and the oil and natural gas gross production tax is intended to be in lieu of local property taxes and accrues to impacted cities and counties. Although the gross production tax is levied on behalf of local governments, the distribution formula favors the state, particularly as tax collections rise. Local governments receive only 11 percent of total collections from the two taxes.

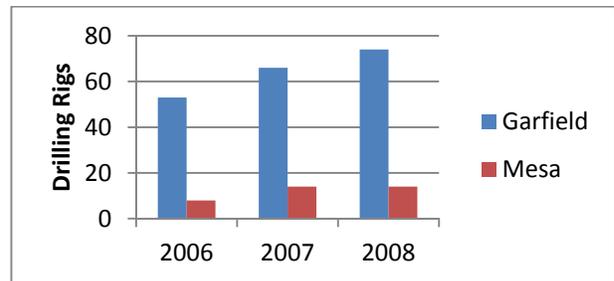
In addition, revenue often accrues to local jurisdictions where production is located (typically a county), which can leave out the municipalities or adjacent counties that act as housing and service centers. Those places may actually experience the fastest population growth and related government service impacts. This is illustrated by the example of Garfield and Mesa counties in Colorado, shown in Figure 4. Mesa County absorbed workers (and struggled to adjust to increased service demands) while Garfield County collected the majority of production tax revenue.

Figure 4. Oil and natural gas Workers and Drilling Activity in Two Neighboring Counties in Colorado, 2006-2008⁸

Oil and natural gas Workers by Place of Residence



Drilling Activity by County

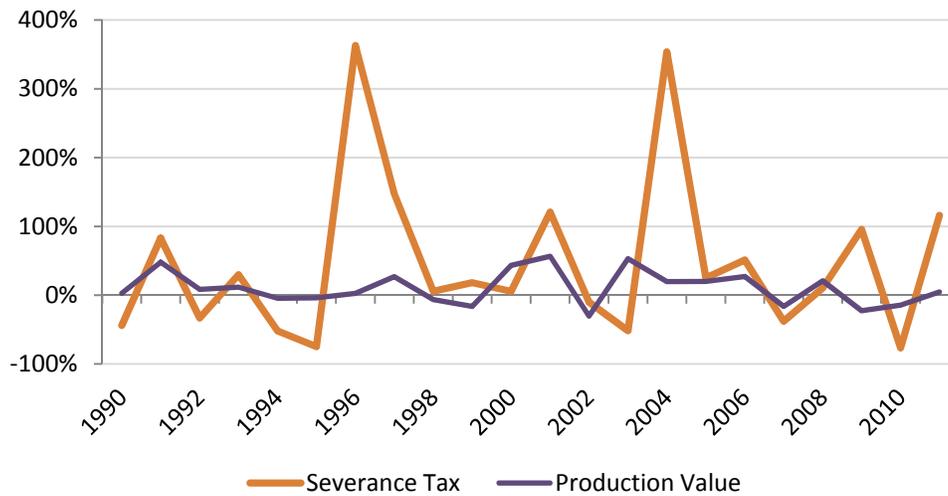


Revenue Volatility:

Most production taxes are determined by the market value of oil and natural gas extracted, and energy prices have historically been highly volatile.⁹ When prices fluctuate, revenue collections respond accordingly. Fiscal policy can exacerbate or dampen the price-driven volatility of severance tax collections.

Example: Figure 5 shows that gains and losses in severance tax collections in Colorado from year to year have actually exceeded the volatility of natural gas prices. Production value is inherently volatile, rising and falling by up to 60 percent from one year to the next. Volatility in severance taxes in Colorado over the last twenty years is nearly ten times as great. The Colorado Department of Local Affairs notes that the “extra” price volatility in tax collections results from a unique tax subsidy in the state that allows producers to deduct local property taxes from their state severance tax liability.¹⁰

Figure 5. Annual Percent Change in Natural Gas Severance Tax Collections and Production Value, Colorado, 1990–2011¹¹



Section II. Best Practices are Needed to Address Fiscal Challenges

Fiscal policies are government revenue and spending policies. At the national level, they are designed to counter economic cycles, manage inflation, and support measured growth. At the state and local levels, and specifically related to oil and natural gas development, fiscal policies have two main goals that address (1) current needs and (2) future competitiveness.

- (1.) Sound fiscal policies provide state and local governments the means to address the immediate challenges of energy development: revenues are collected at amounts necessary to mitigate the impacts of rapid industrial development and in a timely manner, and revenues are directed where they are needed.
- (2.) Sound fiscal policies also allow states and communities to capture a portion of wealth extracted from the ground and invest these revenues in long-term competitive strengths. Revenues also are managed to minimize risk associated with long-term volatility in energy prices and production.

State and local governments have a variety of tools to manage and benefit from oil and natural gas extraction. Today, no state or local government uses all of these tools to its best advantage. Applied together and adapted to the particular needs of each state or community, however, these practices can constitute a model fiscal policy that incentivizes oil and natural gas drilling, mitigates impacts, and ensures long-term benefits to states and communities after the drilling and production phase.

This section offers twelve fiscal recommendations, organized by the four challenges described in Section I.

Revenue Amount

1. Maintain A High Effective Tax Rate

The effective tax rate is a measure of how much money is actually paid in taxes after accounting for various loopholes in each state's tax code. States that maintain higher effective tax rates have more resources to mitigate the impacts of industrial development and population growth, and can invest revenue in permanent funds for long-term economic development. Experience suggests that the state competition for industry activity through low tax rates and tax incentives is largely ineffective, meaning states can set fiscal policy to meet community needs and state priorities without deterring industry investments (see sidebar "How Much Should States Tax Oil and Natural Gas Production?" on page 4).

Example: Montana's effective tax rate on oil and natural gas production was 4.6 percent in 2011. In neighboring North Dakota, the effective tax rate was nearly double at 9.9 percent. Each new well will pay \$800,000 less in Montana over the first three years of production compared to an identical well drilled across the border in North Dakota. Even with the disparity, drilling activity and production is booming in North Dakota relative to Montana, suggesting that the higher tax rate is not affecting industry investment decisions. The State of Montana estimates that the tax holiday on newly completed horizontal wells resulted in over \$60 million in uncollected taxes in 2010.¹²

2. Adjust Tax Rates to Share in Windfalls

Tax rates that rise with the price of oil or natural gas at specified price thresholds capture a share of windfall profits at high prices that can be saved to ensure long-term fiscal stability. This approach differs from most production and severance taxes that set the base rate as the maximum rate and provide incentives and deductions, often tiered to minimum price thresholds.

Example: Alaska assesses a base production tax rate of 25 percent, and assesses an additional levy on the value of production above certain threshold prices. The highest marginal tax rate for a barrel of oil when the price is more than \$110 is 70 percent.

Revenue Timing

3. Assess Production Taxes Monthly

A production tax is any tax levied against the value of oil or natural gas extracted from the ground. State severance taxes and local government property taxes levied against the value of production are each examples of production taxes, but they vary dramatically in the timing of revenue collections. Severance taxes collected by the state are typically levied on monthly or quarterly production value. By comparison, property taxes are assessed annually and can be paid in installments the following year—meaning the lag between drilling activity and property tax collections can extend to nearly two years.

Example: North Dakota collects production taxes monthly, capturing value early in the life of a well.

4. Remove “Holiday” Incentives

Tax incentives centered on “holidays” from tax collections for early periods in the production cycle extend the lag between impacts and revenue availability. A number of states implement holidays as incentives to drill new horizontal wells, including Montana, Oklahoma, and North Dakota—although North Dakota’s incentive rate is tied to a price trigger and is currently ineffective. The steep production decline curves associated with unconventional shale oil wells exacerbates the size of the revenue impact associated with tax holidays as production typically peaks in the first year of production and declines by half in the second year.

Example: North Dakota’s monthly production tax collections, in the absence of an incentive rate for newly completed wells, illustrates the benefits of avoiding tax holidays, particularly when compared to Montana.

5. Levy Specific Sales Taxes on Production and Drilling Activity

Among various revenue sources, monthly local sales taxes are the fastest way for local governments to collect money from oil and natural gas development activity. Sales taxes are levied against oil field services and purchases of equipment used to drill and hydraulically fracture oil and natural gas wells. Some states levy sales taxes directly against production. Sales taxes can be important because they accrue concurrently with exploration and drilling activity. Although smaller in volume than production tax collections (e.g., sales taxes are about 10 percent of total oil tax collections in North Dakota), sales taxes can help address immediate concerns like increases in local government services such as public safety, housing, and social work. However, over-reliance on general sales taxes is cautioned as general sales taxes apply to all sales, not only those associated with the oil and natural gas industry. A specific sales tax can be applied to avoid taxing other sectors.

In some states, state sales tax revenue accrues to the place of activity. However, most states redistribute sales tax collections according to population-based equalization formulae. When this is the case, local-option sales taxes are important ways for energy-impacted areas to realize direct and immediate revenue from energy development.

States that do not have local sales taxes can provide local jurisdictions with the authority to levy specific sales taxes on hotels and lodging, restaurant food services, and other services associated with a transient workforce population. For example, Montana has no sales tax, but allows “resort communities” to levy a tax on tourist services.¹³ The same model could be applied to “resource communities” providing services to oil and natural gas workers. The Montana League of Cities has recommended the legislature consider a surcharge on transient lodging in resource communities along these lines.¹⁴

Because oil and natural gas equipment is highly specialized, sales tax policy should include some kind of “use” provision that allows areas to collect sales taxes on materials purchased out of state for specific use in state.

Example: North Dakota communities retain sales tax revenue locally. Because of the state’s relatively low production tax distributions, local sales taxes are an important source of revenue to meet the large demands associated with population growth and industrial activity.

Example: During the natural gas boom of 2003-2008 in Wyoming, local option sales taxes provided key revenue opportunities for municipalities that were attracting rapid influxes of workers.¹⁵

6. Impose Impact Fees for Specific Needs

An impact fee is levied when drilling permits are issued and are tied directly to a specific cost associated with well drilling. This approach benefits local governments and industry by providing up-front funding for necessary infrastructure improvements.

Example: Rio Blanco County in Colorado imposes an impact fee for road construction and maintenance costs associated with well drilling and hydraulic fracturing activity. The impact fee has allowed the county government to facilitate development and ensure adequate funding to maintain safe roads for industry and the public.

Revenue Distribution

7. Guarantee Adequate Local Share in Revenue Collections

Drilling for oil and natural gas is a high-impact economic activity with significant industrial and population growth related challenges and costs that are mostly felt at the local level. The first goal of fiscal policy is to ensure local governments have the resources they need in the amount necessary to provide adequate infrastructure and services to facilitate activity and mitigate impacts. Distribution should ensure local governments receive a large share of energy revenue to ensure adequate resources are available.

Example: North Dakota levies two production taxes: the oil extraction tax accrues to the state government and the oil production tax is intended to be in lieu of local property taxes and to accrue to impacted cities and counties. The distribution formula for the oil production tax favors the state, particularly as tax collections rise. As a result, local governments receive only 11 percent of total collections from the two taxes combined, leaving most revenue with the state. By comparison, Colorado distributes about 50 percent of the state severance tax directly back to local governments, along with local property taxes, meaning Colorado communities retain about 63 percent of total production tax revenue.

8. Base State Distributions on Location of Production and Worker Residency

Most states deliver a portion of state-collected production taxes directly back to the jurisdictions where they were collected (where producing wells are located). Direct distributions should be made to the location of production *and* population impacts to ensure revenue is received where the broad range of impacts and needs are found.

Example: Colorado’s Department of Local Affairs partners with industry to keep an accurate tally of the residency of oil and natural gas workers in the state. The “Colorado Employee Residency Reports” provide data used in the formula determining direct redistribution of state severance taxes, ensuring that non-producing, but energy industry-impacted areas have access to energy revenue.¹⁶

9. Tie State Grants and Industry Support to Long-Term Goals

Particularly with unconventional or tight oil and natural gas resources, the location of impacts will move from place to place as technology changes and secondary production phases continue. This means communities need to respond quickly to unpredictable and punctuated development surges, nearly always before revenue can be generated from production tax revenue. State grant programs and one-time donations from industry should not be overlooked as important components of support for energy-impacted communities.

Often these occasional funds are critical opportunities for communities to make investments that go above and beyond immediate impacts from energy development. Investing in assets like educational or recreational facilities or business parks can be beneficial to the energy industry and are components of a long-term economic diversification approach.

Example: In 2008, Colorado disbursed \$10 million in severance tax revenue to 14 projects designed to support clean energy economic initiatives in the state.

Example: In southwestern Wyoming, the energy giant BP has long-term plans for the development of oil and natural gas in the Wamsutter field. Since 2005, the company has provided millions of dollars to build and endow operations of vital community facilities, including a town park, daycare, and an economic development office.¹⁷

Revenue Volatility

10. Remove Production Incentives that Exacerbate Revenue Volatility

Production tax incentives are responsible for exacerbating volatility if they are tied to price, or when they create conflicts between local and state taxes.

Example: Figure 5 (page 5) shows that gains and losses in severance tax collections in Colorado from year to year have exceeded the volatility of natural gas prices. Production value is inherently volatile, rising and falling by up to 60 percent from one year to the next. Volatility in severance taxes over the last twenty years is nearly ten times as great. The Colorado Department of Local Affairs notes that the “extra” price volatility in tax collections results from a unique tax subsidy in the state that allows producers to deduct local property taxes from their state severance tax liability.¹⁸

11. Invest Revenue to Provide Stable Long-Term Income

It is impossible to avoid volatility in tax collections that are based directly on the production value of oil and natural gas. Instead, stabilizing revenue streams to fund state and local services can be accomplished by investing a portion of annual revenue into funds that can disburse consistent amounts of money over time.

Example: New Mexico has a large permanent fund that distributes an amount equal to five percent of the principal balance annually. If deposits and interest earnings exceed five percent in a given year, the principal balance will grow, but even when annual revenue and interest earnings decline, the fund will still distribute a stable revenue stream.

12. Fund Basic Services with Annual Production Tax Revenue and Avoid Revenue Switching or Bonding Against Future Revenue

States that spend oil and natural gas revenue on an annual basis to support basic government services are more exposed to volatility. For example, Montana deposits the state share of production taxes directly into the general fund, and underwrites public safety, education, and other ongoing services with these revenues. If price and/or production falls, basic services are exposed to tremendous revenue volatility.

Other states have proposed to reduce relatively stable sources of income from property and income taxes with relatively volatile production tax revenue during booms. Particularly if the tax reduction is based on annual production tax collections (as opposed to distributions from a permanent fund, for example), this is a high-risk tax policy that can expose government services to additional volatility. Finally, state and local governments should avoid funding large infrastructure projects with the expectation of future production tax revenue.

Example: New Mexico invests a significant portion of annual severance tax collections into a permanent fund that is used to service infrastructure bonds. This allows the state to apply production tax revenue in a relatively stable fashion to fix and advance the state's infrastructure, including roads, bridges, and public buildings such as schools.

Example: Wyoming funds education from energy revenue to ensure its residents will be competitive in the new services economy. By investing in long-term funds and in universities and scholarships, the state is taking a long-term view to build its economy and increase its resilience in the face of resource volatility.

Summary

State and local fiscal policy—how oil and natural gas resources are taxed and how the revenue is distributed and invested—is the cornerstone of balancing positive and negative impacts of energy development. The nature of oil and natural gas development, particularly unconventional resource extraction, poses challenges to the pursuit of balanced economic development. Fiscal policies that collect too little revenue and at the wrong time, fail to distribute it to the communities experiencing significant impacts, or pursue risky spending and saving strategies all contribute to problems associated with oil and natural gas development.

Fortunately, fiscal policy can be improved and this brief overviews some of the key practices needed to avoid the aforementioned pitfalls. These policies allow energy development to pay its way in terms of mitigating impacts, replace the value of non-renewable resources removed from a place, and provide tools to invest for a secure economic future. They should be pursued as part of a broad energy and economic development strategy that also includes technical and planning assistance to state and local governments and agencies as well as robust monitoring of the outcomes of energy development.

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About Headwaters Economics

Headwaters Economics is an independent, nonprofit research group that assists the public and elected officials in making informed choices about land management and community development decisions in the West, <http://headwaterseconomics.org/>.

Endnotes

¹ BBC Research and Consulting, 2008. “Northwest Colorado Socioeconomic Analysis and Forecasts,” Report prepared for Associated Governments of Northwest Colorado. http://www.agnc.org/reports/08-socioeconomic/agnc_final_mail_report_4-07-08.pdf. Upper Great Plains Transportation Institute, North Dakota State University, 2012. “An Assessment of County and Local Road Infrastructure Needs in North Dakota.” Report to the North Dakota Legislature. http://www.ugpti.org/downloads/2012_road_investment_needs.php

² Gerking, S. et. al. “Mineral Tax Incentives, Mineral Production and the Wyoming Economy.” December, 2000. <http://eadiv.state.wy.us/mtim/StateReport.pdf>

³ Equality State Policy Center, 1999. “Legislative Accountability Project Daily LAP Book, 1999-2000 Session:” p. 192. Excerpt provided on request by Equality State Policy Center, <http://equalitystate.org/>.

⁴ Headwaters Economics, 2012. “Benefiting from Unconventional Oil.” <http://headwaterseconomics.org/energy/western/unconventional-oil-and-north-dakota-communities/>.

⁵ Ibid.

⁶ Headwaters Economics, after Exhibit ES-13, “Public Investment and Timing Issue” in BBC Research and Consulting, 2008: Executive Summary p. 13.

⁷ Headwaters Economics, 2012. “Benefiting from Unconventional Oil”: p.16.

⁸ Headwaters Economics, 2011. “Fossil Fuel Extraction and Western Economies.” See pp. 57-58. http://headwaterseconomics.org/wphw/wp-content/uploads/Fossilfuel_West_Report.pdf

⁹ Some states levy a tax against production volume. For example, North Dakota levies a tax of \$0.04 per mcf of natural gas extracted, subject to an adjustment.

¹⁰ Colorado Department of Local Affairs (DOLA), Division of Local Government: Energy and Mineral Impact Assistance, 2008. “Why is the state severance tax revenue so variable?” Slide show, Background Papers on Public Revenue from Mineral Production in Colorado, March 14, 2008. <http://cogcc.state.co.us/Library/Presentations/NW%20Colorado%20Oil%20and%20Gas%20Forum%202012-7-06/Department%20of%20Local%20Affairs%20Presentation.pdf>

¹¹ U.S. Energy Information Administration, Annual U.S. Natural Gas Wellhead Price. <http://www.eia.gov/dnav/ng/hist/n9190us3a.htm>. Colorado Department of Revenue Annual Reports, Severance Tax. <http://www.colorado.gov/cs/Satellite/Revenue-Main/XRM/1213867975035>

¹² Montana Department of Revenue, “Biennial Report, July 1, 2008 – June 30, 2010: p. 270. http://revenue.mt.gov/content/publications/biennial_reports/2008-2010/BiennialReport.pdf

¹³ Resort taxes in Montana serve the function of creating a funding source for some communities and resort areas to finance a variety of services. They are collected in certain Montana communities and areas that meet specific population and economic conditions. The fundamental idea behind resort taxes is to allow places with high numbers of visitors, but relatively few residents, to manage the wear and tear on local infrastructure without overburdening local citizens. For reference, see the Montana Department of Revenue web site.

http://revenue.mt.gov/forindividuals/taxes_licenses_fees_permits/Miscellaneous_Taxes_and_Fees/resort.mcp.x.

¹⁴ Montana League of Cities and Towns. 2012 District Legislative Meetings. Briefing paper.

¹⁵ Headwaters Economics, 2011. “Fossil Fuel Extraction and Western Economies”: 76.

http://headwaterseconomics.org/wphw/wp-content/uploads/Fossilfuel_West_Report.pdf.

¹⁶ See Colorado Department of Local Affairs web site: <http://www.colorado.gov/cs/Satellite/DOLA-Main/CBON/1251593244436>.

¹⁷ BP website, 2012. <http://www.bp.com/sectiongenericarticle.do?categoryId=9030253&contentId=7055772>

¹⁸ Colorado Department of Local Affairs (DOLA), Division of Local Government: Energy and Mineral Impact Assistance, 2008. “Why is the state severance tax revenue so variable?”