Ohio River Valley Institute

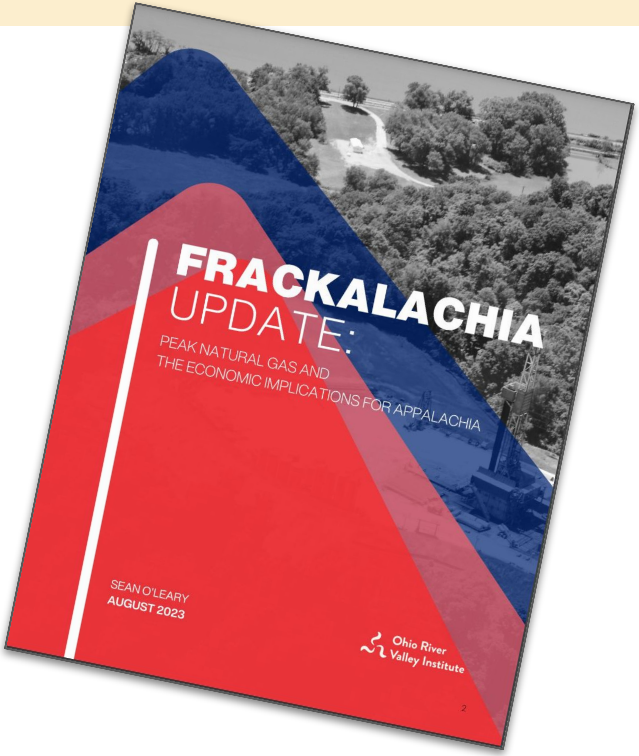
August 22, 2023

Frackalachia Update

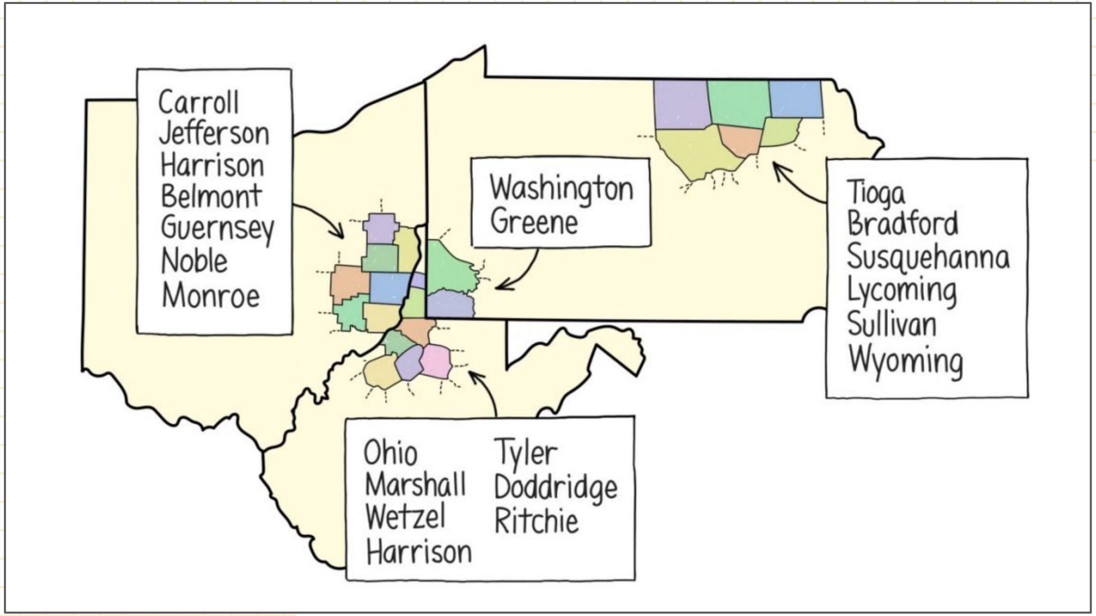
Peak Natural Gas & What it Means for The Future

Key take-aways from the Frackalachia Update

- As measured by jobs, population, and income, Appalachia's principal shale gas producing counties have done worse economically than the region and the nation since the dawn of the Appalachian boom.
- Since ORVI's last report, the number of jobs in the region has fallen into absolute decline relative to the start of the boom, joining population, which was already in negative territory.
- In all, Frackalachian counties have 10,339 fewer jobs than they had at the start of the boom in 2008 and they have 47,652 fewer residents.
- Any hope that natural gas development can turn this trend around is undermined by the fact that Appalachian gas development either has or will soon plateau.
- These facts demonstrate a need for local and regional policymakers to explore new economic development strategies, particularly strategies associated with clean energy transition.



Welcome to Frackalachia



These 22 counties in Ohio, Pennsylvania, and West Virginia produce over 90% of Appalachian natural gas.

If the Appalachian natural gas boom's promise as an "economic game-changer" were to be realized, it would be in these counties.

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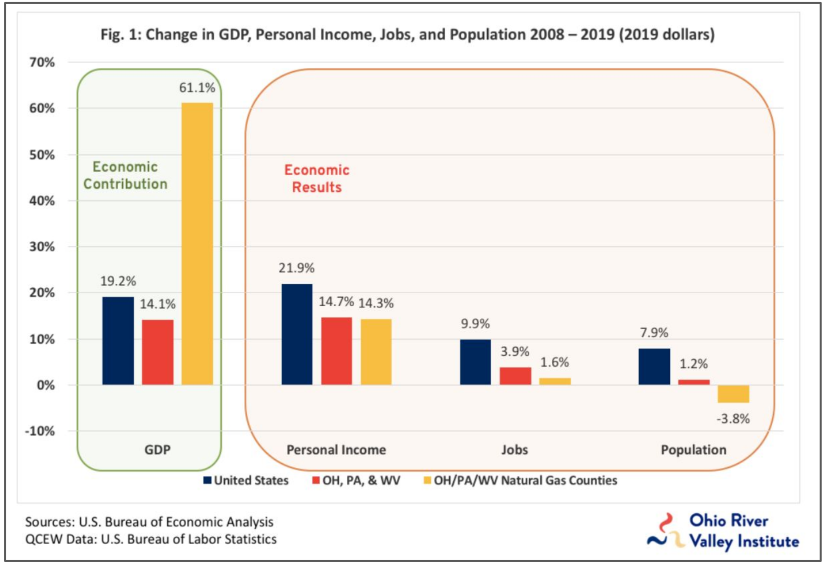
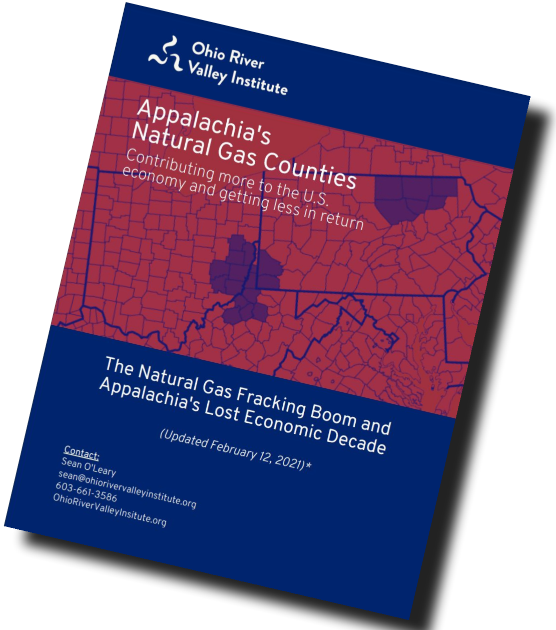
Frackalachia contributes heavily economically but receives little in return

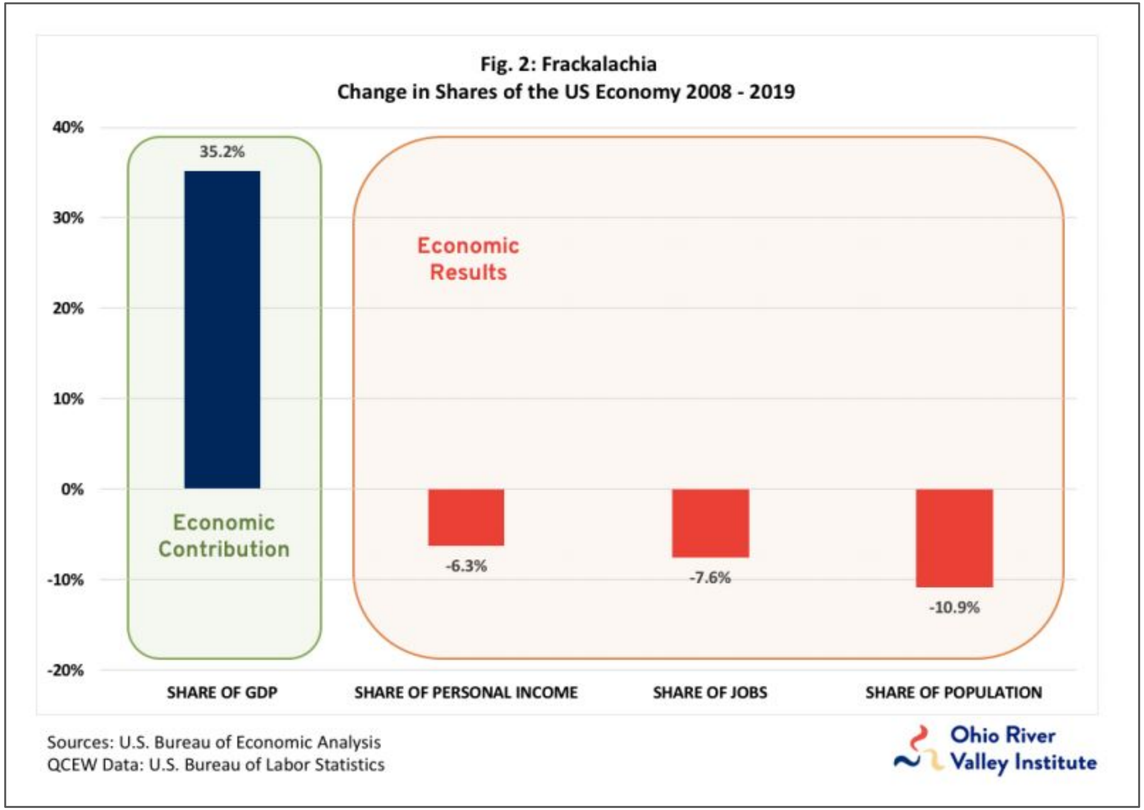
- ORVI's 2021 report found that, while natural gas production exceeded predictions and. . .
- GDP grew at three times the rate of the nation . . .
- Income growth was below average, jobs barely budged, and population was in absolute decline





As output grew, Frackalachia's share of American prosperity declined

The region's shares of the nation's jobs, income, and population all declined, the latter by more than 10%, even as Frackalachia's contribution to output grew by more than a third.



How things changed in the two years following ORVI's original report

The Covid Epidemic starting in 2020

The 2020 Presidential Election

A Directional Shift in Energy Policy & Development

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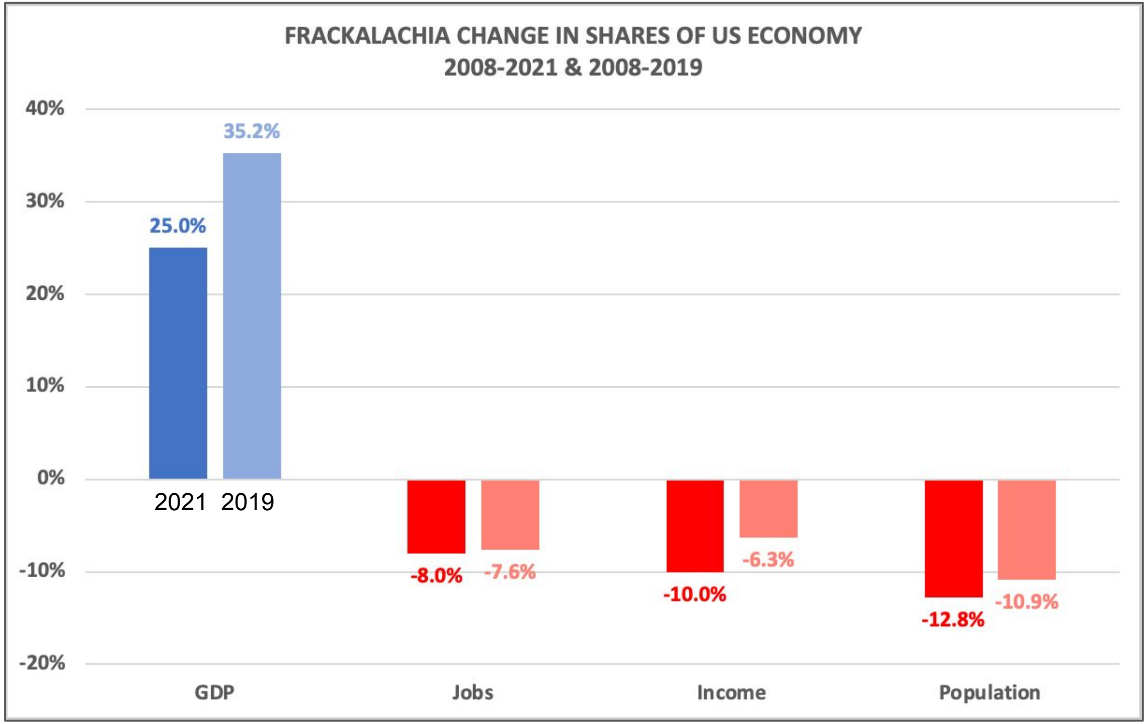
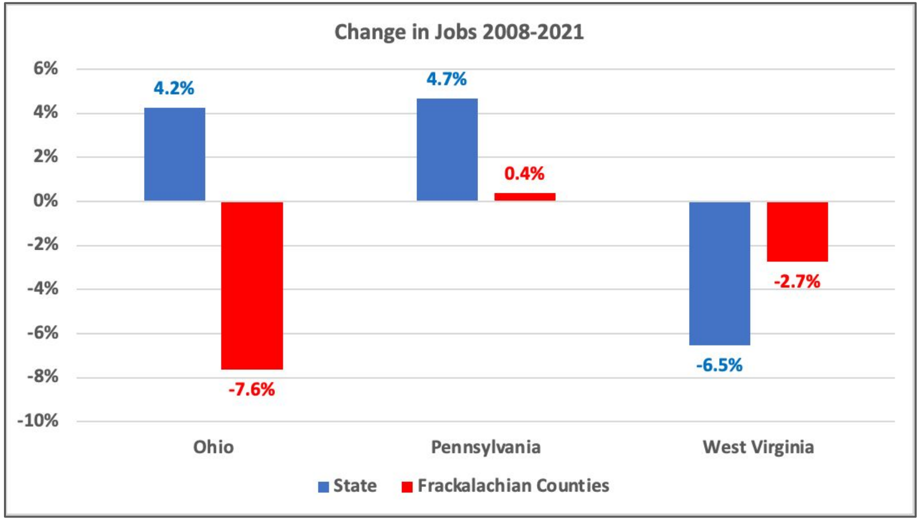
GDP, Jobs, Income, & Population in Frackalachia 2008 - 2021

Change in shares of the US economy since ORVI's first report

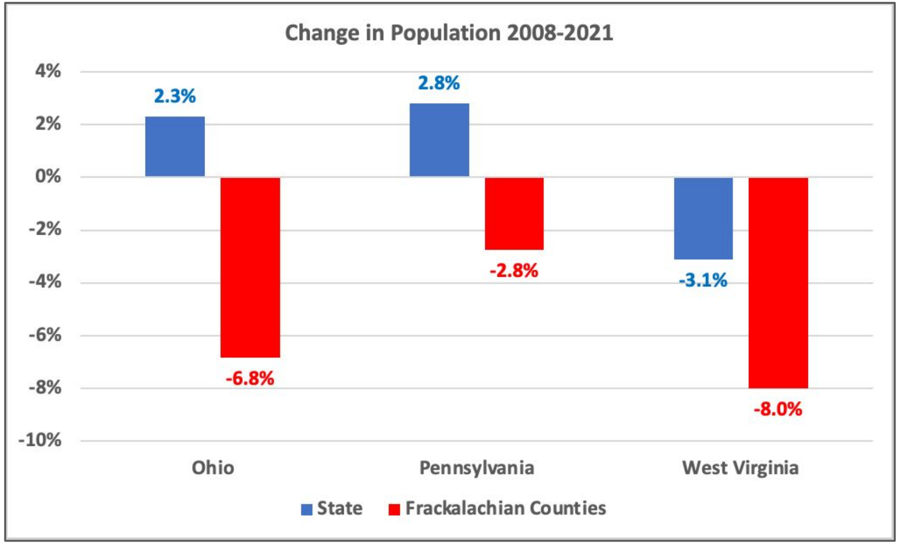


- Although Frackalachia's GDP growth remained higher than the nation's, the margin declined from 35.2% to 25% between 2019 and 2021.
- Frackalachia's share of jobs declined by 8%, which is worse than 2019 when the decline was only 7.6%.
- Frackalachia's share of income declined by 10%, which is worse than 2019's decline of 6.3%.
- Frackalachia's share of population declined by 12.8%, which is worse than the 10.9% decline in 2019.

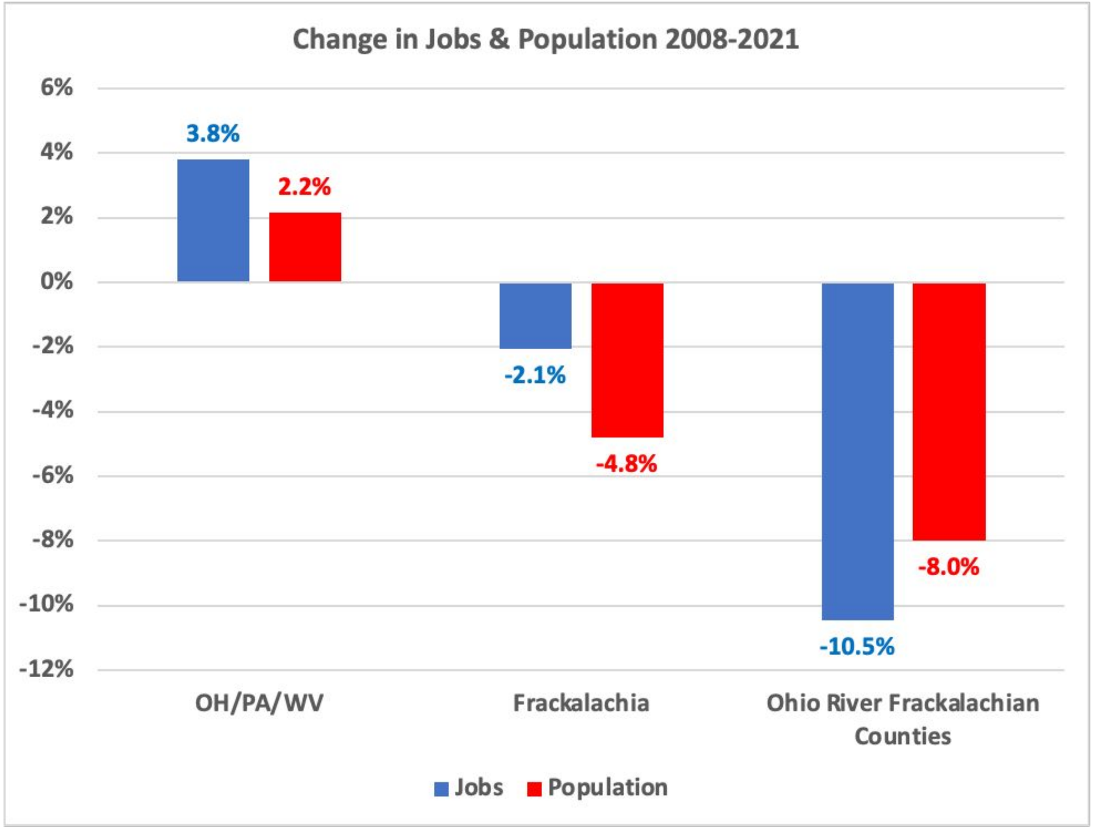
Drilldown on Jobs & Population: States of Decline



Far from buoying their states' economies, the Frackalachian counties are generally a drag, with the sole exception of jobs in West Virginia's Frackalachian counties, which are down, just not as far down as the rest of the state.



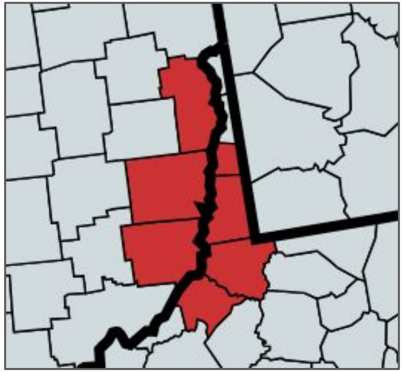
River of Pain



Belmont, Jefferson, and Monroe counties in Ohio lie along the Ohio River as do Marshall, Ohio, Tyler, and Wetzel Counties in West Virginia

Job loss and population loss are especially severe along the river.

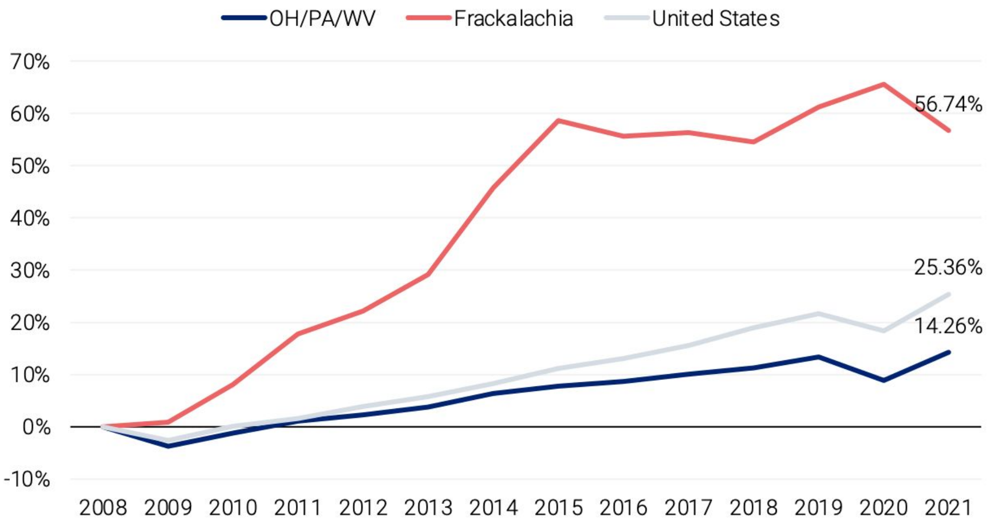
These are not peripheral gas-producing counties. Belmont is the biggest producing county in Ohio and Marshall is the biggest in West Virginia.



GDP growth in Frackalachia largely stalled between 2019 and 2021

GDP growth in Frackalachia since 2008 is still quite high compared to the nation and the region. However, in the period 20019 - 2021, Frackalachia's lead began shrinking.

Figure 11: Cumulative Change in Real GDP, 2008-2021 (2012 dollars)



Source: Bureau of Economic Analysis, CAGDP9 Real GDP by county and metropolitan area

Frackalachian GDP growth had flattened by 2016 only to see a spurt between 2018 and 2020, which took place despite the onset of the Covid epidemic. But growth stalled again in 2021.

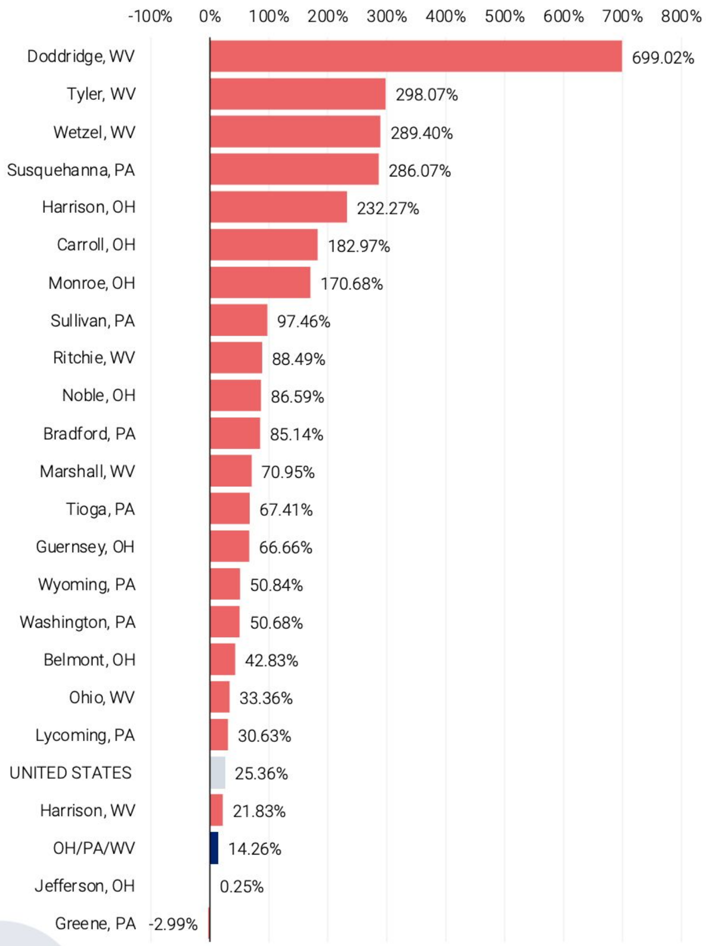
If GDP=Prosperity, Frackalachia would be rich

19 of the 22 Frackalachian counties exceeded the nation for the rate of GDP growth between 2008 and 2021.

Half of Frackalachian counties had GDP growth rates that were at least three times that of the nation.

Growth was greatest in some of Frackalachia's least populated and least developed counties.

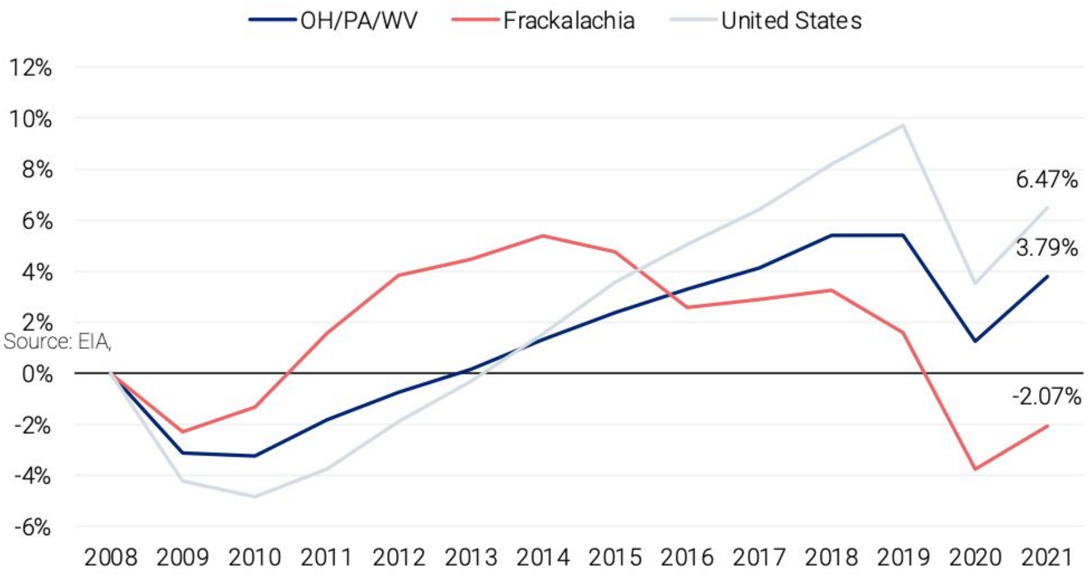
Figure 12: Cumulative Change in Real GDP by County, 2008-2021



Source: Bureau of Economic Analysis, CAGDP9 Real GDP by county and metropolitan area

Frackalachia has fewer jobs now than before the shale boom began

Figure 13: Cumulative Change in Total Employment, 2008-2021



Source: Bureau of Economic Analysis, CAEMP25N Total full-time and part-time employment by NAICS industry

Frackalachia did somewhat better than the nation during the Great Recession and experienced a brief surge in jobs that lasted until 2014, before the downturn began.

Since 2014 jobs have been in decline and are bouncing back more slowly than in the nation as a whole in the aftermath of the Covid epidemic.

In all, a net 10,339 jobs have been lost since the start of the shale boom

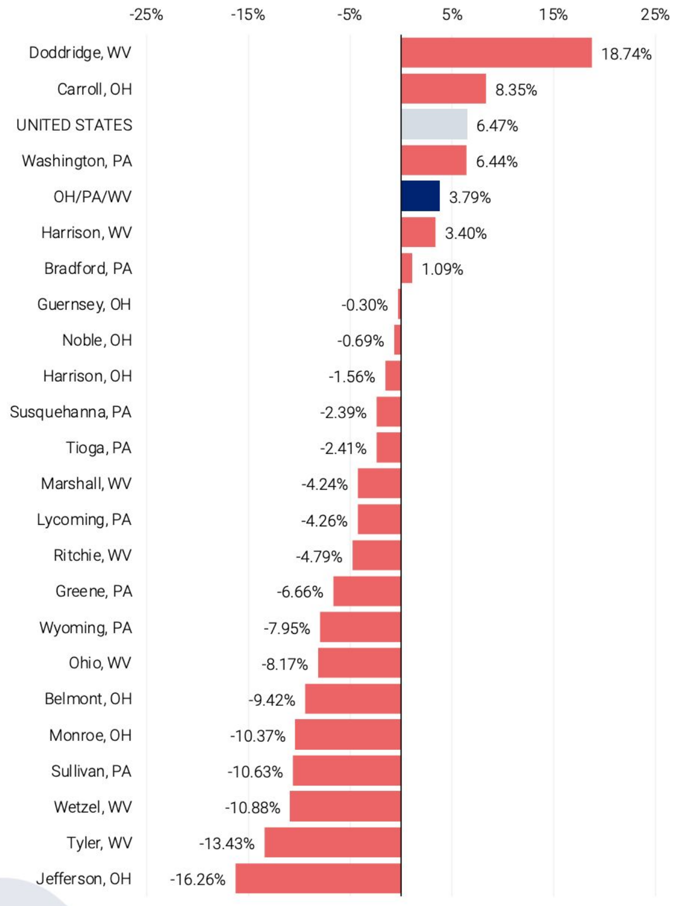
Job loss is especially bad in the Ohio Valley

20 of 22 Frackalachian counties have experienced below-average job growth since the start of the shale boom.

17 of 22 have experienced an absolute loss in the number of jobs.

The problem of job loss is most pronounced in Frackalachia's rural and micropolitan counties, which are the ones that policymakers have argued benefit most from natural gas development.

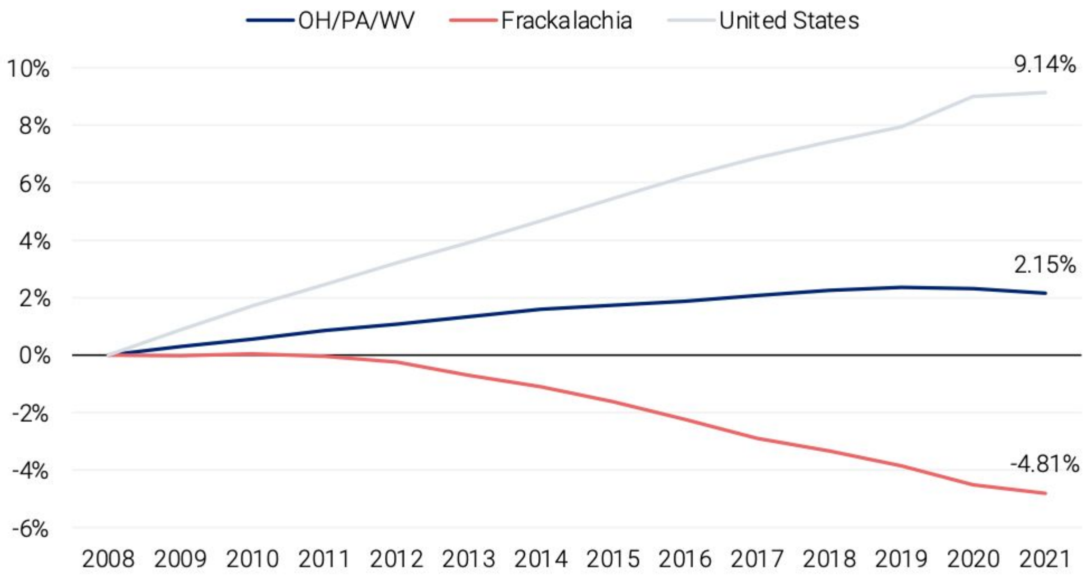
Figure 14: Cumulative Change in Total Employment by County, 2008-2021



Source: Bureau of Economic Analysis, CAEMP25N Total full-time and part-time employment by NAICS industry

Population in Frackalachia is dropping faster than jobs

Figure 15: Cumulative Population Change, 2008-2021



Source: Bureau of Economic Analysis, CAINC1 County and MSA personal income summary: personal income, population, and per capita personal income

Population loss was a problem in Frackalachia before the shale boom began and as the natural gas industry expanded, the problem has worsened.

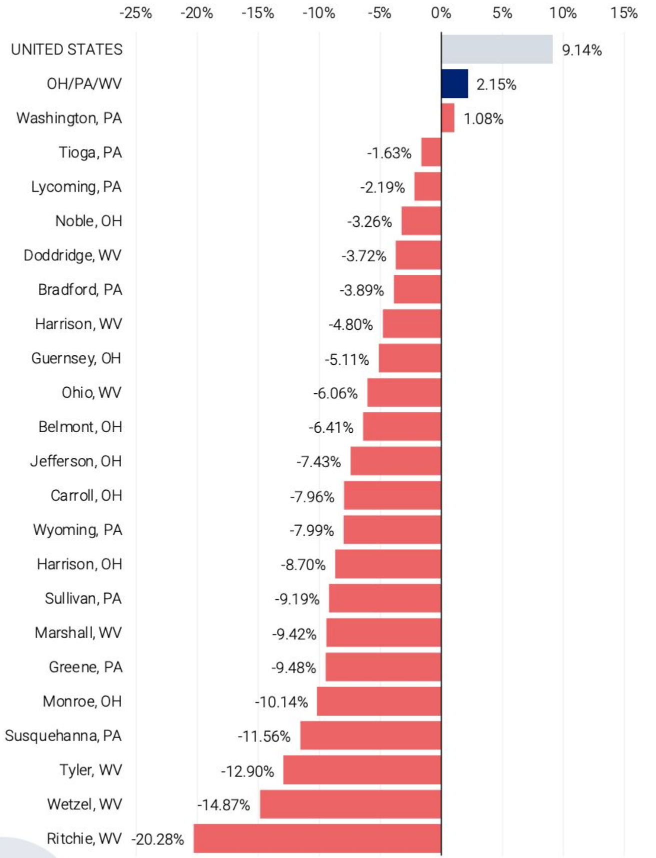
The net population loss in Frackalachia since the start of the shale boom is 47,652, nearly 5% of all residents.

Population loss is pervasive in Frackalachia

During a period when the nation's population grew by over 9%, only one Frackalachian county experienced growth and it was just 1%.

The counties suffering the most extreme population loss - Ritchie, Wetzel, Tyler, Susquehanna, and Monroe - also happen to be among the counties that have seen the most GDP growth.

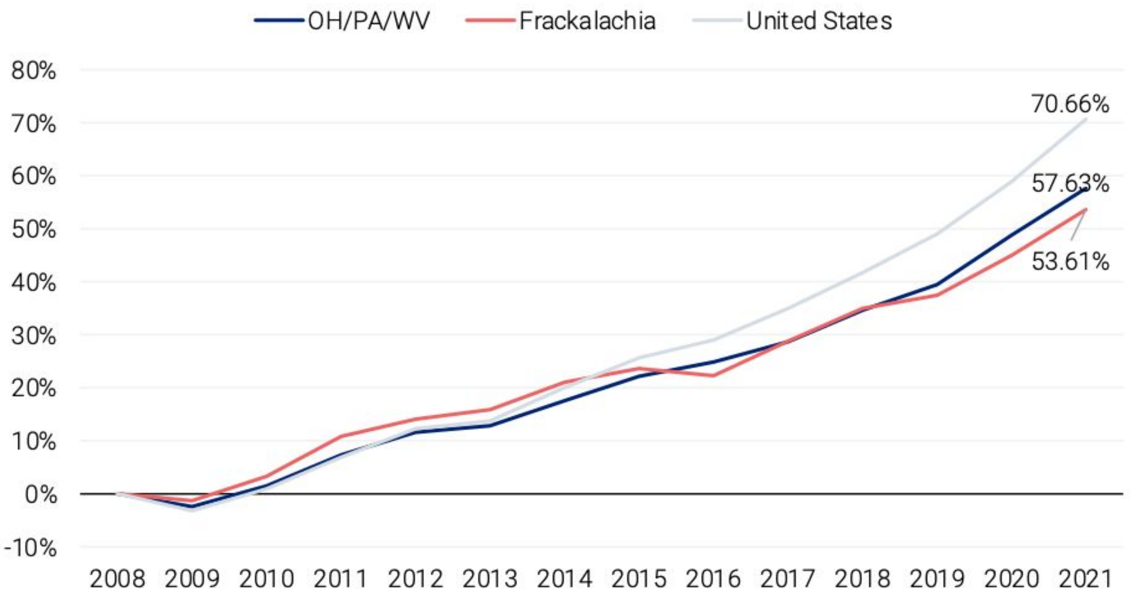
Figure 16: Cumulative Population Change by County, 2008-2021



Source: Bureau of Economic Analysis, CAINC1 County and MSA personal income summary: personal income, population, and per capita personal income

Income growth in Frackalachia trails both the US and the region

Figure 17: Cumulative Change in Aggregate Income, 2008-2021



Source: Bureau of Economic Analysis, CAINC1 County and MSA personal income summary: personal income, population, and per capita personal income

Although Frackalachia saw a brief surge early in the shale boom, it never translated into significant incremental income growth.

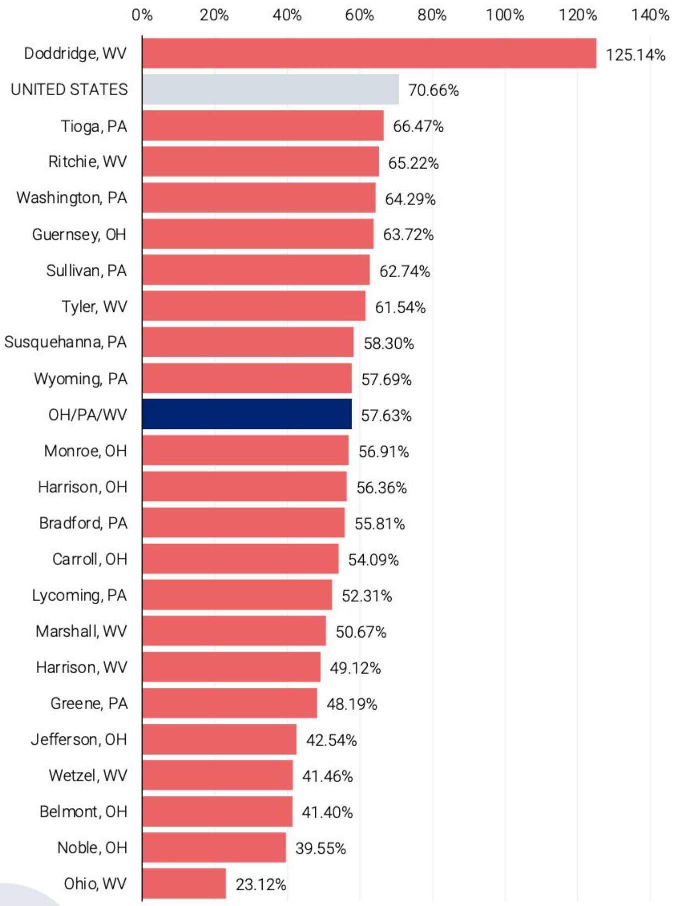
Aggregate income growth in Frackalachia is hobbled by population declines, which means that, even if wages and other forms of income keep up on a per capita basis, the total amount of money being collected and injected into local economies continues to decline.

Income is influenced by population loss

21 of 22 Frackalachian counties trail the national average for income growth, although almost half do as well or better than the combined states of Ohio, Pennsylvania, and West Virginia.

The counties that perform best are comparatively rural counties that were not heavily developed prior to the shale boom or, in the case of Washington County, PA, a place that benefits from a comparatively diverse economy and participation in the Pittsburgh metropolitan area.

Figure 18: Cumulative Change in Nominal Income by County, 2008-2021



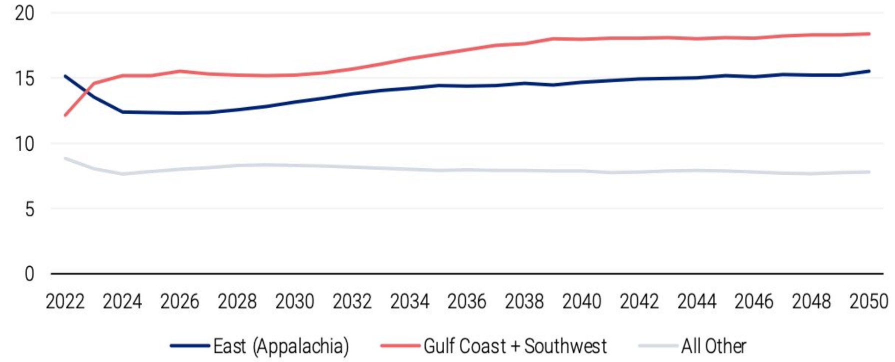
Source: Bureau of Economic Analysis, CAINC1 County and MSA personal income summary: personal income, population, and per capita personal income

Peak Natural Gas in Appalachia

Appalachian shale gas production is plateauing and unlikely to return to growth

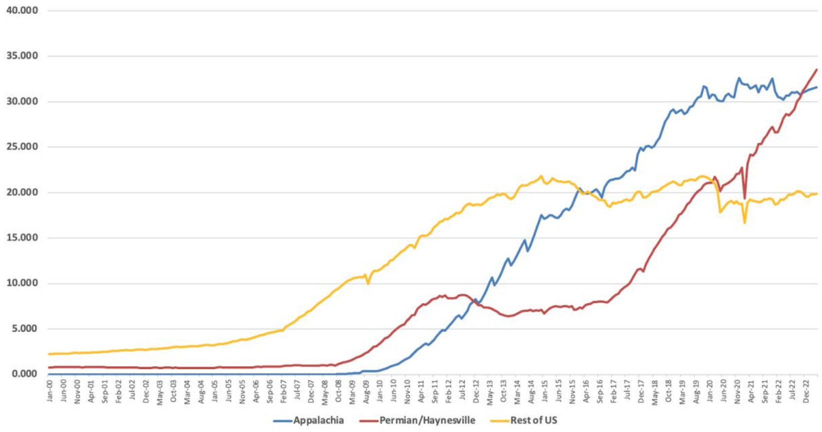
The Energy Information Administration anticipates that, while natural gas production will continue to grow modestly in coming decades, nearly all of that growth will come from other regions.

Figure 2: Natural Gas Production Forecast (Tcf), 2022-2050



Source: EIA

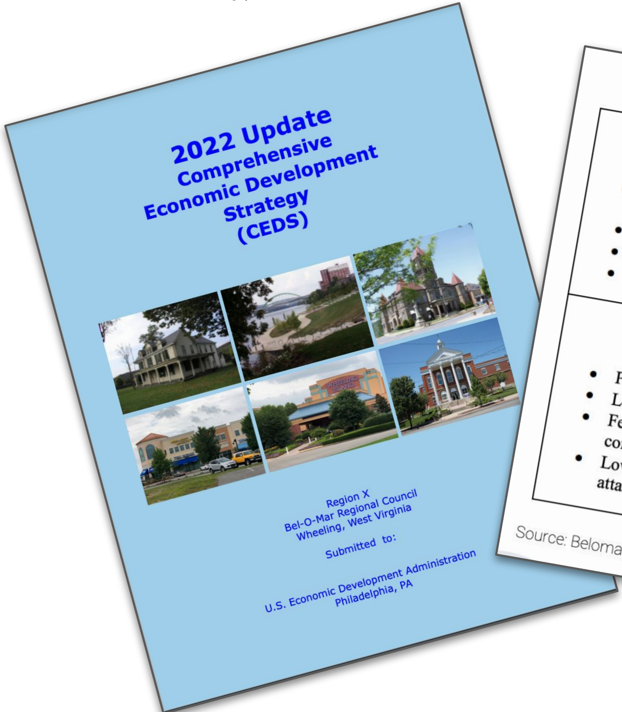
Figure 6: US Shale Dry Natural Gas Production by Region (Mcf), 2000-2023



Source: EIA,

The need for exploring alternative economic development strategies is acute

"The River of Pain" needs to become "The River of Change". Regional policymakers continue to conflate natural gas and petrochemical development with economic development despite the fact that, even if the former occurs (and it often doesn't), the latter doesn't follow.



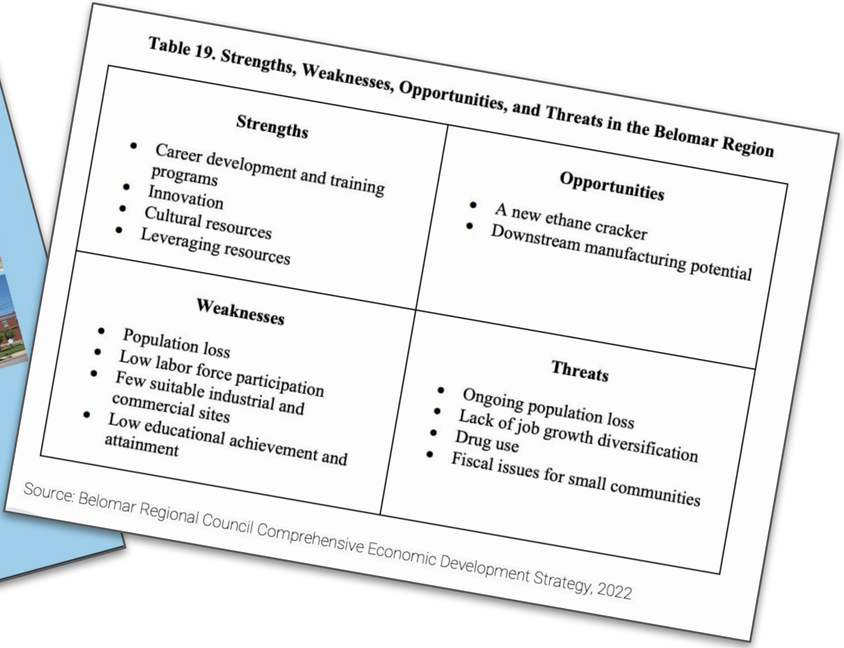


Table 19. Strengths, Weaknesses, Opportunities, and Threats in the Belomar Region

Strengths	Opportunities
• Career development and training programs • Innovation • Cultural resources • Leveraging resources	• A new ethane cracker • Downstream manufacturing potential
Weaknesses	**Threats**
• Population loss • Low labor force participation • Few suitable industrial and commercial sites • Low educational achievement and attainment	• Ongoing population loss • Lack of job growth diversification • Drug use • Fiscal issues for small communities

Source: Belomar Regional Council Comprehensive Economic Development Strategy, 2022

Alternative strategies are available and proven

Effective economic development can be done locally, as exemplified by the Centralia Model. Better yet is doing it regionally as described by Strategen's "A Clean Energy Pathway for Southwestern Pennsylvania".