

Methods Documentation: Colorado

Appendix of Working Paper 24-01 by **Daniel Raimi, Elena Davert, Haley Neuenfeldt, Amy Van Zanen, and Zach Whitlock**

1. Table of Contents

This document details our methods for collecting and estimating amounts from those taxes, royalties, fees and payments that are **distributed to the local level** in Colorado.

Federal Collections

Federal Mineral Lease Revenue distributed via formulaic distribution and discretionary grants.

State Collections

Severance Revenue distributed via formulaic distribution and discretionary grants.

Local Collections

Property Taxes levied on oil, gas, and coal property, Power Plants, Renewable Facilities, Refineries and Natural Gas Processing and Distribution systems, Electric Companies, and Pipelines

2. Revenue from Production on Federal Lands

2.1. Policy

40% of federal mineral lease revenue and 50% of bonus payments received by the State of Colorado are deposited into the Local Government Mineral Impact Fund, which is managed by Colorado's Department of Local Affairs (DOLA). DOLA distributes 50% of this revenue through discretionary grant awards and 50% through formulaic direct distribution to counties, local governments, and school districts.

For grant awards, DOLA prioritizes communities "most directly and substantially impacted by production of energy resources on federal mineral lands." For the formulaic direct distribution, DOLA allocates funds to counties based on the proportion of total federal revenue derived from energy production in each county, as well as the proportion of employees of mines or facilities related to energy production who reside within the county. DOLA allocates funds to municipalities, school districts, and counties' unincorporated areas based on the proportion of employees (all industries) reported as residents; the proportion of the population compared to the state; and the proportion of road miles compared to the state total. The exact formulas used to calculate the distribution are not included in statute (Colorado Revised Statutes, 2§ 34-63-102).

2.2. Data Inputs

| Unique ID | Source | Data Name | Description |
|-----------|--------------------------------------|--|---|
| CO_2 | Colorado Department of Local Affairs | Federal Mineral Lease Distribution and Grant Reports | Reports include direct distribution of Federal Mineral Lease revenue to local jurisdictions (county, municipal, school districts), and summary of discretionary grants. Data is not disaggregated by energy type. |
| CO_6 | Colorado Department of Local Affairs | Active Colorado Municipalities | Record of all active Municipalities in Colorado, including “Home Rule Municipalities”, “Statutory Cities,” “Statutory Towns,” and “Territorial Charter Municipalities.” |
| CO_7 | Colorado Department of Education | CDE School District Data | “All Colorado Schools.XLS”, provided on the School and District Data page, lists all school districts and principle counties. Note that the spreadsheet does not explicitly list districts that extend into multiple jurisdictions. |

2.3. Calculations and Assumptions

1) Estimate Federal Mineral Lease Revenue Proportions by Commodity:

Using ONRR Revenue data, we estimated the proportion of federal mineral lease revenue by State, Fiscal Year, and Commodity. See the ONRR Methods Documentation for more details. Note that because ONRR revenue data was not available for 2022, we used an average of the last 5 years.

Formulaic Distribution

2) Compile Distribution Data

Using DOLA’s Direct Distribution Reports, we downloaded revenue distribution data for Federal Mineral Lease Revenue. We determined the “umbrella county” for each receiving jurisdiction using Municipalities Data from the Department of Local Affairs and School District Data from the Colorado Department of Education.

3) Calculate funding distribution ratios for municipalities spanning multiple Counties:

According to the DOLA Municipalities data, some municipalities span multiple counties. However, in the Direct Distribution Reports for 2012-2021, DOLA provided only the lump sum of revenue distributed to each of these municipalities. In 2022, they began providing disaggregated data showing the revenue that was distributed to each portion of the municipality in each county. Using this 2022 data, we calculated the percent of revenue distributed to each county, and retroactively applied those percentages to the data from 2012-2021.

4) Calculate funding distribution ratios for school districts spanning multiple Counties:

In the 2022 Direct Distribution Reports, DOLA also began providing school district revenue disaggregated by county. (Note that the CO Department of Education’s downloadable school district data does not identify any school districts as spanning multiple counties, but PDF maps on the website confirm the overlap). We identified 19 school districts that partially overlapped our counties of interest, but determined all but one of the district payments to be *de minimis*. For the St. Vrain Valley RE 1J School District, we found that although 2012-2021 payments were fully

attributed to Boulder County, Weld County received 95% of the school district's federal mineral lease revenue in 2022. We used this percentage to retroactively allocate revenue to Weld County for years 2012-2021.

5) Estimate Distributions by Commodity

We then multiplied the annual distributions for each county, municipality, and school district by the annual commodity proportions estimated using the ONRR Revenue Data.

Discretionary Grants

6) Compile Grant Data

Using DOLA's Direct Distribution Reports, we downloaded grant award data for Federal Mineral Lease Revenue. For the grants, none of the awards were made to jurisdictions that spanned multiple counties.

7) Estimate Distributions by Commodity

We then multiplied the annual distributions for each county, municipality, and school district by the annual commodity proportions estimated using the ONRR Revenue Data.

2.4. Output

Estimations of revenue grant and formulaic distributions for all Colorado counties, municipalities, and school districts, disaggregated by fiscal year and commodity type.

3. State Severance Tax Data

3.1. Policy

Severance taxes are collected by the Colorado Department of Revenue, 50% of which is deposited into the Department of Local Affairs' Government Severance Tax Fund. Of the funds received by DOLA, 70% is available for discretionary loans and grants to local governments socially or economically impacted by the mineral extraction industry, while the remaining 30% is distributed directly to local governments based on the geographic location of energy industry employees, mine and well permits, and overall mineral production. The exact formulas used to calculate the distribution are not included in statute (Colorado Revised Statutes, § 39-29-1109).

3.2. Data Inputs

| Unique ID | Source | Data Name, Shorthand | Description |
|-----------|--------------------------------------|--|---|
| CO_4 | Colorado General Assembly | Severance Tax Data | Summary of State Severance Tax policy includes a data visualization that shows the breakdown of revenue by mineral type (coal, oil and gas, molybdenum and metallics). |
| CO_3 | Colorado Department of Local Affairs | State Severance Distribution and Grant Reports | Reports include direct distribution of Severance revenue to local jurisdictions (counties and municipalities), and summary of discretionary grants. Data is not disaggregated by energy type. |
| CO_6 | Colorado Department of Local Affairs | DOLA Municipalities Data | Record of all active Municipalities in Colorado, including “Home Rule Municipalities,” “Statutory Cities,” “Statutory Towns,” and “Territorial Charter Municipalities.” |

3.3. Calculations and Assumptions

1) Estimate severance revenue percentage by mineral type

All severance revenue is deposited into the Severance Tax Fund managed by DOLA. Though the funds are distributed based on the presence of energy industry employees, mine and well permits, and overall mineral production, the funds from each fossil fuel commodity are not accounted for separately. Therefore, we are assuming uniform distribution of all severance tax revenue across all counties. To estimate this, we used summary data provided by the Colorado General Assembly and calculated the total percentage of revenue derived from coal vs. oil and gas. Note that because severance revenue data was not available for 2022, we used an average of the last 5 years.

Formulaic Distribution

2) Compile Distribution Data

Using DOLA’s Direct Distribution Reports, we downloaded revenue distribution data for the State’s Severance Revenue. We determined the “umbrella county” for each receiving jurisdiction using Municipalities Data from the Department of Local Affairs. Note that in 2020, the Department of Local Affairs issued a second “expedited” round of Severance Revenue distribution. As a result, our raw data includes two distribution points for each municipality in 2020, and it appears that the distributions for 2021 are lower than average.

3) Calculate funding distribution ratios for municipalities spanning multiple Counties:

According to the DOLA Municipalities data, several municipalities in our counties of interest span multiple counties. However, in the Direct Distribution Reports for 2012-2021, DOLA provided only the lump sum of revenue distributed to each of these municipalities. In 2022, they began providing disaggregated data showing the revenue that was distributed to each portion of the municipality in each county. Using this 2022 data, we calculated the percent of revenue distributed to each county, and retroactively applied those percentages to the data from 2012-2021.

4) Estimate Distributions by Commodity

We then multiplied the annual distributions for each county, municipality, and school district by the severance revenue percentage by mineral type estimated using the data from the Colorado General Assembly.

Discretionary Grants

5) Compile Grant Data

Using DOLA's Direct Distribution Reports, we downloaded grant award data.

6) Distribute Grant Awards for municipalities spanning multiple Counties:

We used the "Sev_Dist Proportions" to adjust grant awards for municipalities that spanned multiple counties. For grants awarded to other special districts or Associations of Governments that spanned multiple counties, we split the grant awards evenly across all counties. For example, if an Association of Governments was listed as the grant recipient, and the DOLA report listed 5 counties, we allocated 20% of the grant award to each county.

7) Estimate Distributions by Commodity

We then multiplied the annual distributions for each county, municipality, and school district by the annual commodity proportions estimated using the ONRR Revenue Data.

3.4. Output

Estimations of severance tax revenue distributions for all Colorado counties and municipalities disaggregated by fiscal year and commodity type.

4. Property Tax

4.1. Policy

In Colorado, oil, gas, and coal reserves are all subject to property taxes. Oil and natural gas production/real property are assessed at 87.5% of its value, while associated personal property are assessed at the nonresidential assessment rate of 29%. Coal reserves are also assessed at 29% of their value. Public Utilities and renewable facilities (wind and solar) with nameplate capacities larger than 2 MW are assessed by the State. Renewable facilities less than 2 MW are assessed locally.

4.2. Data Inputs

| Unique ID | Source | Data Name, Shorthand | Description |
|-----------|--|-----------------------------------|--|
| CO_1 | Colorado Department of Local Affairs | DOLA Annual Reports | The Annual Report to the Governor and the General Assembly provides annual statistical and summary property tax information for the state of Colorado. It includes summaries of total property tax revenue received by local governments and special districts each year and detailed assessed values by county. |
| CO_8 | Colorado Energy Office | CO Electric Utilities | Lists Investor-Owned, Rural/Cooperative, and Public/Municipal Utilities. |
| Fed_4 | U.S. Energy Information Administration | Form EIA-860 | These spreadsheets identify utilities, power plants, generators, wind facilities, and solar facilities by county. |
| Fed_10 | U.S. Energy Information Administration | Natural Gas Processing Facilities | Includes Natural Gas Processing Facilities across the US by county. |
| Fed_11 | U.S. Energy Information Administration | Petroleum Refineries | Record of operating crude oil refineries. |

4.3. Calculations and Assumptions

1) Compile Total Taxable Values For Relevant Property Classifications

First we collected total taxable data from the following sections and property class categories of interest.

Section V. Public Utilities Assessed by the State by County includes the categories below. We reached out to DOLA staff for definitions of each category and received the following information (in quotes):

- EG Generation Group Electric: “The EG group covers all renewable energy generation property placed into service on or after January 1, 2001 as well as:
 - All wind energy facilities placed into service on or after January 1, 2006;
 - All solar energy facilities placed into service after January 1, 2009;
 - All biomass, geothermal, and small or low impact hydroelectric facilities placed into service on or after January 1, 2010;
 - Statutorily defined clean energy resources and energy storage facilities.”
- Major Electric: “These are the traditional monopoly investor-owned utilities. There are some exceptions to this (a few co-ops are included in this category for valuation reasons).”
- EN Generation Group Electric: “This group is made up of independent power producers. Most of these are traditional fossil fuel facilities but there are a small number of older renewable energy facilities included in this group as well.”

- Rural Electric: “These are rural cooperatives (owned by the customers) performing the distribution outside of the IOU territories.”
- Gas Pipeline Distribution: “Categorized by business service provided. Pipelines delivering gas to other distribution providers or to end users.”
- Fluid Pipelines: “Categorized by business structure. Fluid pipelines are categorized as Master Limited Partnerships (MLP).”
- Gas Transmission Pipelines: “Categorized by business structure. Transmission pipelines are categorized as Non- Master Limited Partnerships (Non-MLP).”

We developed the following crosswalks to categorize each utility class by energy type:

| DOLA Categories | Our Energy Type Categories |
|------------------------------|--|
| EG Generation Group Electric | Use EIA data to disaggregate between energy types based on nameplate capacity and what is present in each county (see crosswalk in step 6). |
| Major Electric | Unable to disaggregate between generation, transmission, and distribution. Categorize as “Downstream_GenTransDist”. |
| EN Generation Group Electric | Use EIA data to disaggregate between energy types based on nameplate capacity and what is present in each county (see crosswalk in step 6). |
| Rural Electric | Unable to disaggregate between generation, transmission, and distribution. Categorize as “Downstream_GenTransDist”. |
| Gas Pipeline Distribution | NG downstream |
| Fluid Pipelines | Oil midstream |
| Gas Transmission Pipelines | NG midstream |

Section VI. Taxable Real and Personal Property Assessed by Counties summarizes taxable values for the following categories of interest. We referred to EIA-860 generator data to determine which counties’ renewable energy revenue could be attributed to wind, solar, or both. We also confirmed using EIA-757 and -820 data that all “Industrial - Refining/Petroleum” revenue in our counties of interest comes from natural gas processing, as opposed to petroleum liquids.

| DOLA Categories | Our Energy Phase and Type Categories |
|--|---|
| Commercial - Renewable Energy Personal | Use EIA data to disaggregate between wind and solar based on nameplate capacity and what is present in each county (see crosswalk in step 6) . |
| Industrial - Refining/Petroleum | Midstream Processing NG |
| Natural Resources - Coal | Upstream Coal |
| Producing mines - Oil/shale | Upstream Oil |
| Oil and Gas - Oil Primary | Upstream Oil |
| Oil and Gas - Oil Secondary | Upstream Oil |
| Oil and Gas - Gas Primary | Upstream NG |
| Oil and Gas - Gas Secondary | Upstream NG |
| Oil and Gas - Shale | Upstream Oil |
| Oil and Gas - Natural Gas Liquids and Condensate | Upstream NG |
| Oil and Gas - Pipeline Gathering System | Midstream Oil and Gas |
| Oil and Gas - Rotary Drill Rigs | Upstream Oil and Gas |

2) Estimate Taxable Value Ratios by County

Using the data described above, as well as the Total Taxable values reported by county in Section VIII. “Summary of Assessments for All Properties”, we calculated the proportions of total taxable value in each county by each property class and fiscal year.

3) Compile Historic Revenue Data

We then collected historic tax revenue data from Section XII. Revenue and Levy. We created the following crosswalk to translate from the jurisdictions defined in the DOLA Annual Reports and our project:

| DOLA Jurisdictions | Our Jurisdiction Categories |
|-------------------------|-----------------------------|
| County | County |
| Cities and Towns | Municipal |
| School Districts | School District |
| Local College Districts | Other |
| Special Districts | Other |

4) Estimate revenue ratios

Using the revenue data we calculated the proportions of revenue collected by each jurisdiction, in each county, in each fiscal year.

5) Estimate property tax revenue by property class, county, and jurisdiction

We then multiplied the total revenue for each county in each fiscal year by the property class ratios to estimate how much revenue is received by each county from each type of property class.

6) Disaggregate revenue by Energy Type and Phase

We then disaggregated the revenue estimates by energy type. We did this by creating a pivot table of the assessed values for our three property classifications and comparing it to EIA-860 generator data and the Colorado Energy Office’s categorization of investor-owned, rural/cooperative, and public/municipal utilities. We also supplemented this by looking up company websites for independent power producers where applicable.

With this information, we were able to classify generators in each county, which we used to either determine the sole energy type associated with the revenue, or to determine which energy types we should use to disaggregate by MW of nameplate capacity.

Ultimately, we only needed to disaggregate the Commercial Renewable Energy, EG Generation, and EN Generation categories for Logan, Pueblo, and Weld counties. We used the ratios from the “Generators_PIVOT” tab to split the estimated revenue where needed.

4.4. Output

Property tax revenue, estimated for each county, jurisdiction, and property class.

Sources

| Unique ID | Source | Data Name | Description | Accessibility | Type | Years | Original Source link |
|-----------|--------------------------------------|--|--|---------------|---------------|-----------|---|
| CO_1 | Colorado Department of Local Affairs | Annual Reports | The Annual Report to the Governor and the General Assembly provides annual statistical and summary property tax information for the state of Colorado. It includes summaries of total property tax revenue received by local governments and special districts each year and detailed assessed values by county. | Public | Property Tax | 1912-2021 | https://cdola.colorado.gov/publications/annual-reports |
| CO_2 | Colorado Department of Local Affairs | Federal Mineral Lease Distribution and Grant Reports | Reports include direct distribution of Federal Mineral Lease revenue to local jurisdictions (county, municipal, school districts), and summary of discretionary grants. Data is not disaggregated by energy type. | Public | Federal Lands | 2012-2022 | https://cdola.colorado.gov/funding-programs/direct-distribution-severance-tax-federal-mineral-lease |
| CO_3 | Colorado Department of Local Affairs | State Severance Distribution and Grant Reports | Reports include direct distribution of Severance revenue to local jurisdictions (counties and municipalities), and summary of discretionary grants. Data is not disaggregated by energy type. | Public | Severance | 2012-2022 | https://cdola.colorado.gov/funding-programs/direct-distribution-severance-tax-federal-mineral-lease |

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|------|---|--------------------------------|---|--------|-----------|--------------------|---|
| CO_4 | Colorado General Assembly | Severance Tax | Summary of State Severance Tax policy includes a data visualization that shows the breakdown of revenue by mineral type (coal, oil and gas, molybdenum and metallics) | Public | Severance | 1990- 2021 | https://leg.colorado.gov/agencies/legislative-council-staff/severance-tax |
| CO_5 | Colorado Department of Public Health and Environment Open Data Portal | Jurisdiction Boundaries | Shapfiles of County, Municipal, and School District Boundaries | Public | ALL | Current as of 2023 | https://data-cdphe.opendata.arcgis.com/search?tags=Boundaries |
| CO_6 | Colorado Department of Local Affairs | Active Colorado Municipalities | Record of all active Municipalities in Colorado, including “Home Rule Municipalities”, “Statutory Cities,” “Statutory Towns,” and “Territorial Charter Municipalities.” | Public | ALL | Current as of 2023 | https://dola.colorado.gov/lgis/municipalities.jsf |

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|--------|--|---|---|--------|---|--------------------|--|
| CO_7 | Colorado Department of Education | School District Data | "All Colorado Schools.XLS", provided on the School and District Data page, lists all school districts and principle counties. Note that the spreadsheet does not explicitly list districts that extend into multiple jurisdictions. | Public | ALL | Current as of 2023 | https://cde.state.co.us/schoolview |
| CO_8 | Colorado Energy Office | Colorado Electric Utilities Service Territories | Lists Investor-Owned, Rural/Cooperative, and Public/Municipal Utilities. | Public | ALL | Current as of 2023 | https://energyoffice.colorado.gov/climate-energy/energy-in-colorado/electricity/electric-utilities |
| Fed_4 | U.S. Energy Information Administration | Form EIA-860 | These spreadsheets identify utilities, power plants, generators, wind facilities, and solar facilities by county. | Public | Renewable Production, Foil and Power Plants | | https://www.eia.gov/electricity/data/eia860/ |
| Fed_10 | U.S. Energy Information Administration | Natural Gas Processing Facilities | Includes Natural Gas Processing Facilities across the US by county. | Public | Natural Gas Processing | 2012, 2014, 2017 | https://www.eia.gov/naturalgas/ngqs/#?report=RP9&year1=2012&year2=2017&company=Name |
| Fed_11 | U.S. Energy Information Administration | Petroleum Refineries | Record of operating crude oil refineries. | Public | Petroleum Processing | Current as of 2019 | https://www.eia.gov/petroleum/refinerycapacity/ https://atlas.eia.gov/datasets/eia::petroleum-refineries/explore?location=75.117622%2C-126.882310%2C11.54 |

