RESOURCES
for the **FUTURE**

Methods Documentation: Ohio

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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 Ohio.

Local Collections

Property Taxes levied on mineral reserves, Power Plants, Renewable Facilities, Refineries and Natural Gas Processing systems. – Final values can be found in the "Prop_Final" tab.

PILOT (Payment in Lieu of Taxes) Revenue from wind and solar facilities. – Final values can be found in the "PILOT_Final" tab.

2. Property Tax Data

2.1. Policy

Ohio's real property tax is an ad valorem tax based on 35% of the true market value. The real property tax applies to Public Utility, Commercial, Industrial, & Mineral property, including oil and gas reserves (OH_18 and OH_19). Public utilities including electric, rural electric, energy, natural gas, pipeline, and heating companies are also subject to taxation on their tangible personal property. Personal property includes all plant and equipment either owned or leased by the utility. Tax rates for utilities' personal property are defined by the state in the Ohio Revised Codes 5727.111.

2.2. Data Inputs

Unique ID	Source	Data Name, Shorthand	Description
OH_1	Ohio Department of Taxation	Real Estate & Public Utility Property Taxes-Gross Taxes Levied, Taxes Charged and Value of Property by Class of Property and County (PD23 Data Series), "Counties"	Data summarize Taxable Property Values, Gross Taxes Levied, and Net Taxes Levied by County and Property Class. Data is disaggregated to high-level categories of Real and Personal Property: • Agricultural and Residental Real Property • Public Utility, Commercial, Industrial, & Mineral Property • Public Utility Tangible Personal Property County data is inclusive of city and school districts that fall within the county.
OH_2	Ohio Department of Taxation	Real Estate & Public Utility Property Taxes-Gross Taxes Levied, Taxes Charged and Value of Property by Class of Property and City (PD27 Data Series), "Cities"	Data summarize Taxable Property Values, Gross Taxes Levied, and Net Taxes Levied by City and Property Class. Data is disaggregated to high-level categories of Real and Personal Property: • Agricultural and Residential Real Property • Public Utility, Commercial, Industrial, & Mineral Real Property • Public Utility Tangible Personal Property Staff from the Ohio Department of Taxation confirmed that this data product was discontinued after 2018.
OH_3	Ohio Department of Taxation	Taxable Property Values by School District (SD1 Data Series), "School Districts"	Data summarizes Taxable Property Values, Taxes Levied, and Millage rates by School District. Data is disaggregated to subcategories of Real Property including "Public Utility, Commercial, Industrial, and Mineral."
OH_4	Ohio Department of Natural Resources, Division of Geological Survey	Ohio Industrial Minerals, "Reports on Ohio Mineral Industries"	Data summarizes the state's annual total production and dollar value of all commodity minerals by year (includes production of coal, oil, and gas).
OH_16	Ohio Department of Natural Resources, Division of Geological Survey	Historical Commodity Data	Data summarizes all mineral production and dollar value (in most cases) by county, year, and well/mine for Coal, Clay/shale, Limestone/dolomite, Salt, Sand/gravel, and Sandstone/conglomerate.
OH_17	Ohio Department of Natural Resources, Division of Oil and Gas Resources	Oil and Gas Production, Annual Production Reports	Data summarizes annual total oil and gas production by well and county.

OH_5	Clermont County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_6	Gallia County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_7	Harrison County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_8	Jefferson County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_9	Lucas County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_10	Monroe County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_12	Van Wert County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
OH_15	Washington County Auditor	Property Tax Receipts	Property tax receipts and assessment information for 2022.
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. Method of locating natural gas processing facilities for the sake of cross checking with tax receipts.
Fed_11	U.S. Energy Information Administration	Petroleum Refineries	Record of operating crude oil refineries.

2.3. Calculations and Assumptions

In order to estimate property tax data from mineral resources – oil, coal, and gas – we downloaded summary reports from the Ohio Department of Taxation and disaggregated data using Industrial Mineral Reports and Oil and Gas Production data from the Department of Natural Resources' Division of Geological Survey and Division of Oil and Gas Resources.

1) Compile Data

We downloaded the "Counties" and "School Districts" property tax data series for years 2012-2021. The "Cities" data series was discontinued after 2018, so we downloaded available data from 2012-2018.

Note: See the "Prop_PD23_Raw", "Prop_PD27_Raw", and "Prop_SD1_Raw" tabs.

We included some additional interim steps of converting data out of "thousands" where needed and standardizing the names of school districts across multiple years.

Note: See the "Prop_PD23_Interim1", "Prop_PD27_Interim1", and "Prop_SD1_Interim1" tabs.

2) Estimate City-Level Taxes Levied for 2019-2021

Using 2018 data for "Public Utility, Commercial, Industrial, & Mineral Real Property Net Taxes Charged" and "Public Utility Tangible Personal Property Taxes Levied & Charged," we calculated ratios to demonstrate the relative volume of taxes levied by Counties versus the Cities within their jurisdiction.

Note: See the "Prop_City Ratios" tab.

We then used these ratios, combined with actual taxes levied by Counties, to estimate taxes levied at the City level for the years 2019, 2020, and 2021.

Note: See the "Prop_PD27_Interim1" tab. We copy and pasted these values into the "Prop_PD2_Interim2" tab.

3) Estimating Net Taxes Charged on Mineral Real Property

In the School District Data, the Department of Taxation provides a breakdown of Mineral vs. Industrial, Commercial, and Utility Real Property, defined as "Class II Real Property Taxable Values." However, for the County and Cities data, they only provide a lump sum of "Public Utility, Commercial, Industrial, and Mineral Real Property." We used the School District data to calculate the ratio of Mineral taxable values to the total Class II Taxable values, and then applied these ratios for each County and Year to estimate the Mineral Taxable value for the County and City datasets.

Note: See the "Prop_Mineral Ratios" tab, and the "Prop_PD23_Interim2" and "Prop_PD27_Interim2" tabs.

4) Estimating Value of by Mineral Type by County

The Department of Taxation does not provide a breakdown of mineral types for the "Mineral" taxable values. In order to estimate this on a county by county basis, we used three main sources from the Ohio Department of Natural Resources:

- Historical commodity data, to calculate the total dollar value of coal, clay/shale, limestone, and sand in each of our counties (our counties of interest contained no salt or sandstone mines).
- Oil and gas production reports, to calculate the total oil and gas production in our counties of interest.
- Industrial Mineral Reports, to find the total statewide value of oil and gas for each year.

For Clay/shale, Coal values for 2016-2021, Limestone, and Sand/gravel, we used PIVOT tables to calculate the total dollar value provided in the historical commodity data.

Note: See the "Clay Shale", "Coal 2016-2021", "Limestone" and "SandGravel" tabs.

For Coal values for 2012-2015 and for Oil and Gas, we used historical commodity data and oil and gas production reports to estimate the percent of statewide mineral production attributed to each of our counties of interest, and then multiplied that by the total annual value of each mineral provided by the Industrial Mineral Reports.

Note: See the "Coal 2012-2015" and "Oil and Gas" tabs, as well as the "Mineral Values_State" tab.

5) Estimating Net Taxes Charged for Each Mineral Type

We then combined all the mineral values together to estimate the proportion attributed to minerals for each county and each year.

Note: See the "Mineral Values_Counties" tab.

We multiplied those ratios by the estimated total taxes levied on all minerals to estimate the property taxes derived from our minerals of interest: coal, oil and gas.

Note: See the "Prop_PD23_Interim3", "Prop_PD27_Interim3" and "Prop_SD1_Interim3" tabs.

Generators, Natural Gas Processing, and Oil Refineries

For discrete generation, natural gas processing, and refinery facilities, we pulled individual property tax receipts on a county by county basis and assigned the appropriate energy type using EIA generator data.

6) Collection of Tax Receipts

First, we used data from the U.S. Energy Information Administration to identify the facilities in our counties of interest. Then we used county-level parcel databases and GIS map viewers to identify the parcels associated with each facility.

Note: See the "Prop_FacilitiesNotes", "Prop_Gen_Raw", and "Prop_Proc+Refin_Raw" tabs.

Note that we omitted the following generators: generators outside the scope of our energy types of interest (landfill gas and battery sites); and generators with nameplate capacities less than 10 MW (the exception being some of the facilities that we received PILOT data for, as well as some of the small generators that were included in the same plant as larger generators for which we had already collected parcel data. We also created records for one wind facility and 2 small solar facilities for Paulding County, based on PILOT data that we received.

Note: See the "EIA_Generators" tab.

7) Disaggregating data by MW Capacity

For one property tax receipt – for Walleye Power in Lucas County – we used nameplate capacity to disaggregate the revenue between petroleum coke and petroleum liquids. For all other facilities we were able to identify a single energy type using EIA data.

Note: See the "Prop_Gen_Interim", "Prop_Gen_Interim2", and "Prop_Proc+Refin_Interim" tabs.

A Note about Transmission and Power Companies

We did not include property tax receipts for transmission, power, and pipeline companies in this project because of our inconsistent results using parcel search tools for each county. However, we found Jefferson County's parcel database to be the most complete, where searching by the "utility" land use yielded the following owner profiles:

- AEP Ohio Transmission
- American Transmission System
- Columbia Gas Transmission
- Eastern Gas Transmission
- Texas Eastern Transmission Co
- Carroll Electric Coop
- Columbia Gas of Ohio Inc
- Ohio Edison Company
- Ohio Power Co
- Rover Pipeline
- Southern Central Power Co

2.4. Output

Property tax mineral data disaggregated by County, jurisdiction type, and mineral type, for years 2012-2021. Property tax data for generators, natural gas processing, and oil refineries disaggregated by county, jurisdiction type, and energy type for 2022.

Note: Final values can be found in the "Prop_Final" tab

3. PILOT Data — Wind and Solar

3.1. Policy

In 2010, the Ohio General Assembly passed Senate Bill 232, permissive legislation that allows counties to accept payments in lieu of taxation (PILOT) for renewable energy developments. PILOT payments are based on nameplate capacity of the development.

Under the statute, wind developers pay $6,000 – $8,000 per MW annually, depending on the percentage of Ohioans employed during construction—which must be at least 50%. (The higher the ratio of Ohio-domiciled employees, the lower a project's tax liability). For solar projects, developers pay $7,000 per MW and must employ at least 80% Ohio residents during construction. County commissioners may negotiate additional service payments, not to exceed $9,000 per MW in total when combined with the PILOT.

According the EIA-860m data, three of our counties of interest have renewable energy generation: Lucas, Paulding, and Van Wert. We collected PILOT revenue data from Paulding County but were unable to confirm PILOT revenue for Lucas or Van Wert counties. Based on the installed nameplate capacities in these counties, it appears that the Lucas renewable payments would be de minimis, but it is our understanding Van Wert receives significant revenue from the Blue Creek Wind Farm.

3.2. Data Inputs

Unique ID	Source	Data Name, Shorthand	Description
OH_11	Paulding County Auditor	Paulding PILOT Data	Data includes payments by wind development and distribution to local jurisdictions.
OH_13	BusinessWire	Van Wert PILOT Data Reporting	PILOT Information for Van Wert County
OH_14	Cleveland.com	Van Wert PILOT Data Reporting	PILOT Information for Van Wert County
Fed_4	U.S. Energy Information Administration	Form EIA-860	These spreadsheets identify utilities, power plants, generators, wind facilities, and solar facilities by county.

3.3. Calculations and Assumptions

1) Compile PILOT Revenue Data

We collected PILOT payment data directly from the Paulding County Auditor for 4 wind developments and 2 solar developments. We also cross-referenced PILOT with EIA-860m data of wind and solar facilities located in the county to confirm project names.

Note: Raw payment data reported in "PILOT_Wind_Raw" and "PILOT_Solar_Raw" tabs. Comparison notes can be found in the "PILOT_Notes" tab.

2) Consolidate Wind PILOT Revenue

We then consolidated the Wind PILOT revenue across all developments, years, and local revenue recipients.

Note: See "PILOT_Wind_Pivot" tab.

A Note about Van Wert County

We were unable to obtain PILOT data from Van Wert County, but it is our understanding that the County receives approximately $2 million annually from the Blue Creek Wind Farm, which began operation in 2012 (OH_14). As of 2016, a majority was distributed to local school districts, per local reporting (OH_13):

- Crestview School District: $852,108
- Lincolnview School District: $401,809
- Vantage Joint Vocational School: $144,916
- Hoaglin Township: $32,752
- Union Township: $124,169
- Tully township: $6,320
- Tully-Convoy Park District: $430
- Van Wert County-General Fund: $73,999
- Other: $433,497

3.4. Output

PILOT data disaggregated by County, renewable energy generation type, and year.

Note: See "PILOT_Final" tab.

Sources

Unique ID	Source	Data Name	Description	Access	Type	Years	Original Source link
OH_01	Ohio Department of Taxation	Real Estate & Public Utility Property Taxes-Gross Taxes Levied, Taxes Charged and Value of Property by Class of Property and County (PD23 Data Series), "Counties"	Data summarize Taxable Property Values, Gross Taxes Levied, and Net Taxes Levied by County and Property Class.	Public	Property	1983-2021	**https://tax.ohio.gov/researcher/tax-analysis/tax-data-series/property+tax+-+all+property+taxes**
OH_02	Ohio Department of Taxation	Real Estate & Public Utility Property Taxes-Gross Taxes Levied, Taxes Charged and Value of Property by Class of Property and City (PD27 Data Series), "Cities"	Data summarize Taxable Property Values, Gross Taxes Levied, and Net Taxes Levied by City and Property Class. Data is disaggregated to high-level categories of Real and Personal Property:	Public	Property	1983-2016	**https://tax.ohio.gov/researcher/tax-data-series/other-tax-statistics-archive/TDS-Archives-Property**

OH_03	Ohio Department of Taxation	Taxable Property Values by School District (SD1 Data Series), "School Districts"	Data summarizes Taxable Property Values, Taxes Levied, and Millage rates by School District. Data is disaggregated to subcategories of Real Property including "Public Utility, Commercial, Industrial, and Mineral."	Public	Property	1986-2021	**https://tax.ohio.gov/researcher/tax-analysis/tax-data-series/property+tax+-+all+property+taxes**
OH_04	Ohio Department of Natural Resources, Division of Geological Survey	Ohio Industrial Minerals, "Reports on Ohio Mineral Industries"	Data summarizes annual total production and value of all commodity minerals by mine and county including coal, oil, and gas.	Public	Mineral Production	1996-2021	**https://ohiodnr.gov/discover-and-learn/safety-conservation/about-odnr/geologic-survey/industrial-minerals/industrial-minerals**
OH_05	Clermont County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://www.clermontauditorrealestate.org/_web/search/commonsearch.aspx?mode=owner**
OH_06	Gallia County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://galliaoh-auditor.ddti.net/** **https://gallia-oh.bhamaps.com/**
OH_07	Harrison County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**http://74.219.43.74/reaweb/re-search.php**
OH_08	Jefferson County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://jeffersoncountyoh.com/auditor/real-estate**

OH_09	Lucas County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://icare.co.lucas.oh.us/LucasCare/search/commonsearch.aspx?mode=parid**
OH_10	Monroe County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://monroecountyrealestatesearch.monroecountyohio.com/**
OH_11	Paulding County Auditor	PILOT Data	PILOT data for Wind and Solar developments.	Direct Sent	PILOT	2013-2022	**https://www.pauldingcountyauditor.com/Search**
OH_12	Van Wert County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**http://www.co.vanwert.oh.us/re/re-search.php**
OH_13	BusinessWire	PILOT Data Reporting	PILOT Information for Van Wert County	Public	Property	2016	**https://www.cleveland.com/metro/2016/09/ohios_largest_wind_farm_sprout.html**
OH_14	Cleveland.com	PILOT Data Reporting	PILOT Information for Van Wert County	Public	Property	2014	**https://www.businesswire.com/news/home/20140206006000/en/Blue-Creek-Wind-Farm-Presents-Checks-Worth**
OH_15	Washington County Auditor	Property Tax Receipts	Property Tax Receipts for FY 2022.	Public	Property	2022	**https://auditorwashingtoncountyohio.gov/Search**
OH_16	Ohio Department of Natural Resources, Division of Geological Survey	Historical Commodity Data	Data summarizes all mineral production by county, year, and well/mine for Coal, Clay/shale, Limestone/dolomite, Salt, Sand/gravel, and Sandstone/conglomerate.	Public	Mineral Production	1996-2021	**https://ohiodnr.gov/discover-and-learn/safety-conservation/about-odnr/geologic-survey/industrial-minerals/industrial-minerals**

OH_17	Ohio Department of Natural Resources, Division of Oil and Gas Resources	Oil and Gas Production, Quarterly and Annual Production Reports	Data summarizes annual total oil and gas production and value by well and county.	Public	Mineral Production	1996-2021	**https://ohiodnr.gov/discover-and-learn/safety-conservation/about-ODNR/oil-gas/oil-gas-resources/production**
OH_18	Ohio Department of Taxation	Oil and Gas Real Property Taxation	Description of oil and gas taxation policies, and links to additional regulation and reporting resources.	Public	Policy Information	na	**https://tax.ohio.gov/government/real-state/oilgas**
OH_19	Ohio Department of Taxation	Annual Reports	Annual Reports include descriptions and statutory background for all Ohio Taxes, plus summaries of revenue trends and policy changes.	Public	Policy Information	na	**https://tax.ohio.gov/help-center/communications/publications/annual-reports/2021annualreport**
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, 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. Method of locating natural gas processing facilities for the sake of cross checking with tax receipts. | 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 |