**Data Dictionary for RuFaS Economic Module Inputs**

*Files:*

* crops\_corn-grain-price-recieved\_dollar-per-bushel.csv
* crops\_hay-alfalfa-price-recieved\_dollar-per-ton.csv
* crops\_hay-excluding-alfalfa-price-recieved\_dollar-per-ton.csv
* crops\_hay-price-recieved\_dollar-per-ton.csv
* crops\_rye-price-recieved\_dollar-per-bushel.csv
* crops\_soybean-price-recieved\_dollar-per-bushel.csv
* crops\_winter-wheat-price-recieved\_dollar-per-bushel.csv
* diesel\_retail\_dollar-per-gallon.csv
* electricity\_commercial\_dollar-per-kwh.csv
* electricity\_industrial\_dollar-per-kwh.csv
* electricity\_residential\_dollar-per-kwh.csv
* fertilizer\_ammonium-nitrate\_dollar-per-shortton.csv
* fertilizer\_anhydrous-ammonia\_dollar-per-shortton.csv
* fertilizer\_diammonium-phosphate-18-46-0\_dollar-per-shortton.csv
* fertilizer\_nitrogen\_dollar-per-shortton.csv
* fertilizer\_nitrogen-solutions-30pct\_dollar-per-shortton.csv
* fertilizer\_phosphorus\_dollar-per-shortton.csv
* fertilizer\_potassium\_dollar-per-shortton.csv
* fertilizer\_potassium-chloride-60pct-potassium\_dollar-per-shortton.csv
* fertilizer\_sulfate-of-ammonium\_dollar-per-shortton.csv
* fertilizer\_super-phosphate-20pct-phosphate\_dollar-per-shortton.csv
* fertilizer\_super-phosphate-44to46pct-phosphate\_dollar-per-shortton.csv
* fertilizer\_urea-44to46pct-nitrogen\_dollar-per-shortton.csv
* gasoline\_retail\_dollar-per-gallon.csv
* natural-gas\_commercial\_dollar-per-mcf.csv
* natural-gas\_industrial\_dollar-per-mcf.csv
* natural-gas\_residential\_dollar-per-mcf.csv
* propane\_retail\_dollar-per-gallon.csv
* propane\_wholesale\_dollar-per-gallon.csv
* water\_irrigation\_dollar-per-acre-foot.csv
* water\_retail\_dollar-per-kgal.csv

CONTEXT:

The data included in this data dictionary includes the input data used for the RuFaS Economic Module developed by Sustainability Science.

All csv input files use the following format {data type}\_{data subtype}\_{units}.csv

* {data type} represents the primary data category (electricity, fertilizer, natural gas, etc.)
* {data subtype} represents the subcategory that the data falls into or the specific name of the input represented (retail, commercial, industrial, etc.)
* {units} represents the units used for the data. Typically, US dollar per functional unit for the data type.

Each input file follows the same format. The first column “fips” represents the Federal Information Processing Standard code which is a numeric code that uniquely identifies individual counties in the United States. The first row (fips = 01) is used to represent the U.S. mean value. Subsequent columns represent the years which the data represents (“2021” contains the prices for each county in the year 2021).

Details about the specific input files and their original data source is provided in the following sections.

FILE DESCRIPTIONS:

File: ‘crops\_corn-grain-price-recieved\_dollar-per-bushel.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Corn grain price received by farmers
* **Units** – U.S. dollars per bushel of corn grain
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Corn, Category: Price Received, Data Item: Corn, Grain – Price Received, Measured in $ / BU, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.
* **Data Conversions -**

File: ‘crops\_hay-alfalfa-price-recieved\_dollar-per-ton.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Alfalfa hay price received by farmers
* **Units** – U.S. dollars per ton of alfalfa hay
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Hay, Category: Price Received, Data Item: Hay, Alfalfa – Price Received, Measured in $ / Ton, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘crops\_hay-excluding-alfalfa-price-recieved\_dollar-per-ton.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Hay excluding alfalfa price received by farmers
* **Units** – U.S. dollars per ton of hay which excludes alfalfa
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Hay, Category: Price Received, Data Item: Hay, (Excl Alfalfa) – Price Received, Measured in $ / Ton, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘crops\_hay-price-recieved\_dollar-per-ton.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Hay price received by farmers
* **Units** – U.S. dollars per ton of hay
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Hay, Category: Price Received, Data Item: Hay – Price Received, Measured in $ / Ton, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘crops\_rye-price-recieved\_dollar-per-bushel.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Rye price received by farmers
* **Units** – U.S. dollars per bushel of rye
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Rye, Category: Price Received, Data Item: Rye – Price Received, Measured in $ / BU, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘crops\_soybean-price-recieved\_dollar-per-bushel.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Soybean price received by farmers
* **Units** – U.S. dollars per bushel of soybeans
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Soybeans, Category: Price Received, Data Item: Soybeans – Price Received, Measured in $ / BU, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘crops\_winter-wheat-price-recieved\_dollar-per-bushel.csv’

* **Primary Data Type** – Crops
* **Data Subtype** – Winter wheat price received by farmers
* **Units** – U.S. dollars per bushel of winter wheat
* **Data source** – Crop prices were gathered from the United States Department of Agriculture’s (USDA’s) [National Agricultural Statistics Service Quickstats web portal](https://quickstats.nass.usda.gov/). This data can be obtained by selecting Group: Field Crops, Commodity: Wheat, Category: Price Received, Data Item: Wheat, Winter – Price Received, Measured in $ / BU, Geographic Level: National + State, Year: All, Period Type: Annual, Period: Marketing Year. State level values were then assigned uniformly to each county within the state. When state or data was unavailable, the U.S. mean value was used.

File: ‘diesel\_retail\_dollar-per-gallon.csv’

* **Primary Data Type** – Diesel fuel
* **Data Subtype** – Retail prices
* **Units** – U.S. dollars per gallon of diesel fuel
* **Data source** - Diesel prices were used from the U.S. Energy Information Administration at the state level when available and the Petroleum Administration for Defense District (PADD) region level when state level data was unavailable. [[Original Data](https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_a.htm)] PADD region values were uniformly assigned to each state within that region based on the [definition of PADD regions](https://www.eia.gov/tools/glossary/index.php) from the U.S. Energy Information Administration. State level values were then assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘electricity\_commercial\_dollar-per-kwh.csv’

* **Primary Data Type** – Electricity prices
* **Data Subtype** – Commercial rates
* **Units** – U.S. dollars per kilowatt of electricity
* **Data source** - Historical state level electricity prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/electricity/data/browser/#/topic/7?agg=1,0&geo=vvvvvvvvvvvvo&endsec=4&freq=M&start=200101&ctype=linechart&ltype=pin&rtype=s&pin=&rse=0&maptype=0)] State level electricity prices were assigned uniformly to each county within the state. When state data was unavailable, the U.S. mean value was used.

File: ‘electricity\_industrial\_dollar-per-kwh.csv’

* **Primary Data Type** – Electricity prices
* **Data Subtype** – Industrial rates
* **Units** – U.S. dollars per kilowatt of electricity
* **Data source** - Historical state level electricity prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/electricity/data/browser/#/topic/7?agg=1,0&geo=vvvvvvvvvvvvo&endsec=2&freq=M&start=200101&ctype=linechart&ltype=pin&rtype=s&maptype=0&rse=0&pin=)] State level electricity prices were assigned uniformly to each county within the state. When state data was unavailable, the U.S. mean value was used.

File: ‘electricity\_residential\_dollar-per-kwh.csv’

* **Primary Data Type** – Electricity prices
* **Data Subtype** – Residential rates
* **Units** – U.S. dollars per kilowatt of electricity
* **Data source** - Historical state level electricity prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/electricity/data/browser/#/topic/7?agg=1,0&geo=vvvvvvvvvvvvo&endsec=8&freq=M&start=200101&ctype=linechart&ltype=pin&rtype=s&pin=&rse=0&maptype=0)] State level electricity prices were assigned uniformly to each county within the state. When state data was unavailable, the U.S. mean value was used.

File: ‘fertilizer\_ammonium-nitrate\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Ammonium Nitrate prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_anhydrous-ammonia\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Anhydrous Ammonia prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_diammonium-phosphate-18-46-0\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Diammonium Phosphate 18-46-0 prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Phosphatic Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325312325312A)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_nitrogen\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Nitrogen prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since data was not provided for pure nitrogen, the mean price of nitrogen was gathered from all of the fertilizers which were nitrogen based (Anhydrous ammonia, Nitrogen solutions (30%), Urea 44-46% nitrogen, Ammonium nitrate, Sulfate of ammonium) by dividing the price of the nitrogen-based fertilizer by the percent nitrogen in the fertilizer. Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_nitrogen-solutions-30pct\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Nitrogen Solutions (30% nitrogen) prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_phosphorus\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Phosphorus prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since data was not provided for pure phosphorus, the mean price of phosphorus was gathered from all of the fertilizers which were phosphorus based (Super-phosphate 20% phosphate, Super-phosphate 44-46% phosphate, Diammonium phosphate [18-46-0]) by dividing the price of the phosphorus-based fertilizer by the percent phosphorus in the fertilizer. Since historical fertilizer prices were only provided up until 2014, the price index for “[Phosphatic Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325312325312A)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_potassium\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Potassium prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since data was not provided for pure potassium, the mean price of potassium was gathered from all of the fertilizers which were potassium based (Potassium chloride 60% potassium) by dividing the price of the potassium-based fertilizer by the percent potassium in the fertilizer. Since historical fertilizer prices were only provided up until 2014, the price index for “[Potash, Soda, and Borate Mineral Mining](https://fred.stlouisfed.org/series/PCU212391212391)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_potassium-chloride-60pct-potassium\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Potassium Chloride (60pct potassium) prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Potash, Soda, and Borate Mineral Mining](https://fred.stlouisfed.org/series/PCU212391212391)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_sulfate-of-ammonium\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Sulfate of Ammonium prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_super-phosphate-20pct-phosphate\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Super Phosphate (20% phosphate) prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Phosphatic Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325312325312A)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_super-phosphate-44to46pct-phosphate\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Super Phosphate (44-46% phosphate) prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Phosphatic Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325312325312A)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘fertilizer\_urea-44to46pct-nitrogen\_dollar-per-shortton.csv’

* **Primary Data Type** – Fertilizer
* **Data Subtype** – Urea (44-46% nitrogen) prices
* **Units** – U.S. dollars per short ton of fertilizer
* **Data source** – National average fertilizer prices were gathered from historical fertilizer prices as reported by the USDA’s Economic Research Service on table 7 of their data product titled “Fertilizer Use and Price”. [[Original Data](https://www.ers.usda.gov/data-products/fertilizer-use-and-price.aspx)] Since historical fertilizer prices were only provided up until 2014, the price index for “[Nitrogenous Fertilizer Manufacturing](https://fred.stlouisfed.org/series/PCU325311325311)” as provided by the U.S. Bureau of Labor Statistics via FRED from the Federal Reserve Bank of St. Louis was used to expand pricing data to years after 2014.

File: ‘gasoline\_retail\_dollar-per-gallon.csv’

* **Primary Data Type** – Gasoline fuel
* **Data Subtype** – Retail prices
* **Units** – U.S. dollars per gallon of gasoline fuel
* **Data source** - Gasoline prices were used from the U.S. Energy Information Administration at the state level when available and the Petroleum Administration for Defense District (PADD) region level when state level data was unavailable. [[Original Data](https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_a.htm)] PADD region values were uniformly assigned to each state within that region based on the [definition of PADD regions](https://www.eia.gov/tools/glossary/index.php) from the U.S. Energy Information Administration. State level values were then assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘natural-gas\_commercial\_dollar-per-mcf.csv’

* **Primary Data Type** – Natural Gas
* **Data Subtype** – Commercial prices
* **Units** – U.S. dollars per thousand cubic feet of natural gas
* **Data source** - Historical state-level natural gas prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/dnav/ng/ng_sum_lsum_a_EPG0_PCS_DMcf_a.htm)] State level natural gas costs were assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘natural-gas\_industrial\_dollar-per-mcf.csv’

* **Primary Data Type** – Natural Gas
* **Data Subtype** – Industrial prices
* **Units** – U.S. dollars per thousand cubic feet of natural gas
* **Data source** - Historical state-level natural gas prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/dnav/ng/ng_sum_lsum_a_EPG0_PIN_DMcf_a.htm)] State level natural gas costs were assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘natural-gas\_residential\_dollar-per-mcf.csv’

* **Primary Data Type** – Natural Gas
* **Data Subtype** – Residential prices
* **Units** – U.S. dollars per thousand cubic feet of natural gas
* **Data source** - Historical state-level natural gas prices were used from the U.S. Energy Information Administration. [[Original Data](https://www.eia.gov/dnav/ng/ng_sum_lsum_a_EPG0_PRS_DMcf_a.htm)] State level natural gas costs were assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘propane\_residential\_dollar-per-gallon.csv’

* **Primary Data Type** – Propane
* **Data Subtype** – Residential prices
* **Units** – U.S. dollars per gallon of propane
* **Data source** - Historical propane prices were used from the U.S. Energy Information Administration at the state level when available and the PADD region level when state level data was unavailable. [[Original Data](https://www.eia.gov/dnav/pet/pet_pri_wfr_a_EPLLPA_PRS_dpgal_m.htm)] PADD region values were uniformly assigned to each state within that region based on the [definition of PADD regions](https://www.eia.gov/tools/glossary/index.php) from the U.S. Energy Information Administration. State level values were then assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘propane\_wholesale\_dollar-per-gallon.csv’

* **Primary Data Type** – Propane
* **Data Subtype** – Wholesale prices
* **Units** – U.S. dollars per gallon of propane
* **Data source** - Historical propane prices were used from the U.S. Energy Information Administration at the state level when available and the PADD region level when state level data was unavailable. [[Original Data](https://www.eia.gov/dnav/pet/pet_pri_wfr_a_EPLLPA_PWR_dpgal_m.htm)] PADD region values were uniformly assigned to each state within that region based on the [definition of PADD regions](https://www.eia.gov/tools/glossary/index.php) from the U.S. Energy Information Administration. State level values were then assigned uniformly to each county within the state. When state or PADD region data was unavailable, the U.S. mean value was used.

File: ‘water\_irrigation\_dollar-per-acre-foot.csv’

* **Primary Data Type** – Water
* **Data Subtype** – Irrigation prices
* **Units** – U.S. dollars per acre foot of water
* **Data source** – State-level historical irrigation rates provided by USDA census data was used for irrigation water. [[Original Data](https://quickstats.nass.usda.gov/#5140700B-188C-320D-A302-F621608AFCC1)] State level values were then assigned uniformly to each county within the state. When state data was unavailable, the U.S. mean value was used.

File: ‘water\_retail\_dollar-per-kgal.csv’

* **Primary Data Type** – Water
* **Data Subtype** – Retail prices
* **Units** – U.S. dollars per thousand gallons of water
* **Data source** – Historical retail water rates were obtained from a [2023 report by Unger et al. at Pacific Northwest National Laboratory](https://www.osti.gov/biblio/1975260/). This report provided retail water prices from water utilities across the U.S with a first year rate, final year rate, and escalation rate found in their survey. Therefore, annual water prices were obtained for each year between 2008 and 2023 using the provided water rates and associated escalation rate for price scaling. Counties were assigned the prices of the utility within their county if available. If a utility did not fall within a county, the mean price of water utilities in the state was used for that county. If no utilities provided data within a state, the mean price from all the utilities within the water region were used for the county.