

State Energy Data System 2007: Prices and Expenditures

Introduction to the Technical Notes

The State Energy Data System (SEDS) provides annual energy price and expenditure estimates for all energy sources by major economic sectors for the 50 States and the District of Columbia and in aggregate for the United States. These data are available on Energy Information Administration's (EIA) website at <http://www.eia.doe.gov/emeu/states/seds.html>. Companion tables containing State-level consumption data can also be found at the same website. In addition, tables showing State-level consumption, price, and expenditure estimates by energy source as they are updated for the most current year can be found at <http://www.eia.doe.gov/emeu/states/seds.html>.

These Technical Notes contain information on the data sources, estimation procedures and assumptions for the State-level price and expenditure estimates. Technical Notes for State-level consumption also are available at http://www.eia.doe.gov/emeu/states/seds_tech_notes.html.

Purpose

SEDS was developed and is maintained and operated by EIA. The goal in maintaining SEDS is to create historical time series of energy consumption, prices and expenditures by State that are defined as consistently as possible over time and across sectors. SEDS exists for two principal reasons: (1) to provide State energy consumption, price and expenditure estimates to Members of Congress, Federal and State

agencies, and the general public and (2) to provide the historical series necessary for EIA's energy models.

Data System

Due to page-size constraints, the SEDS Portable Document Format (PDF) tables show data for selected years from 1970 through 1995; thereafter, data are shown consecutively through 2006. However, data for all years from 1970 forward are maintained in SEDS, and are included in the HTML versions of the tables and in the CSV data files available via EIA's website. All years are covered by the documentation in this report.

Expenditures are calculated by multiplying the price estimates by the consumption estimates found in SEDS. In some cases, consumption is adjusted to remove process fuel; intermediate petroleum products; other consumption that has no direct fuel costs, i.e., hydroelectric, geothermal, wind, solar, and photovoltaic energy sources; and wood and waste obtained at no cost. (See the discussion in Section 7, "Consumption Adjustments for Calculating Expenditures," at http://www.eia.doe.gov/emeu/states/seds_tech_notes.html.)

All prices and expenditures are in nominal dollars that have not been adjusted to reflect changes in the purchasing power of the dollar. All expenditures are consumer expenditures; that is, they represent estimates of money spent directly by consumers to purchase energy, generally including taxes. (See box below.)

Note: Throughout this report, the term "State" includes the District of Columbia.

The following Technical Notes describe how the price estimates are developed, including sources of data, methods of estimation, and conversion factors applied.

Appendix A provides metric and other physical conversion factors for measures used in energy analyses. Appendix B presents the nominal gross domestic product (GDP) by State used to calculate energy

Taxes in the Price and Expenditure Data

The objective in developing State energy prices is to provide estimates that include all taxes, but data sources often do not treat taxes uniformly. Where taxes are included in the source data, they are included in the price and expenditure tables. Where taxes are not included but can be separately estimated, they are added, with some exceptions listed below. In many cases, States and some localities provide tax exemptions for various kinds of activities or classes of end users. These complex exemptions are not incorporated into the State energy prices. The Energy Information Administration (EIA) is continuing to analyze these cases to see if a better representation can be made. A comprehensive and detailed study of taxes in EIA data is available in the report *End-Use Taxes: Current EIA Practices*, DOE/EIA-0583 (Washington, DC, August 1994). The report is available from EIA's Internet site at <http://tonto.eia.doe.gov/FTPROOT/financial/0583.pdf>.

The status of tax data in this year's price and expenditure tables is summarized below and described more fully in the sections for each energy source and sector.

End-Use Sectors

Coal. All steam coal and coking coal prices include taxes in all years. Appropriately, coal imports and exports in the industrial sector do not include end-user taxes.

Natural Gas. Natural gas prices are intended to include all Federal, State, and local taxes, surcharges, and adjustments billed to consumers. Although the EIA data collection form states that taxes are to be included in the reported gross revenues, it is most likely that respondents would not consider sales taxes as part of their company's gross revenues, and some may not be reporting them. As a result, consumer sales taxes may not be covered in full. For more information

see *End-Use Taxes: Current EIA Practices*, page 23 of 134 in the pdf file, <http://tonto.eia.doe.gov/FTPROOT/financial/0583.pdf>.

Petroleum. Prices of motor gasoline, diesel fuel, and liquefied petroleum gases used for transportation include excise and other per-gallon taxes but do not include general sales taxes due to wide variation at the local level. Other liquefied petroleum gases, distillate fuel oil, kerosene, and residual fuel oil prices include sales taxes in all years. Jet fuel, aviation gasoline, asphalt and road oil, lubricants and other petroleum products do not include taxes. Other petroleum products are miscellaneous products, petrochemical feedstocks (naphtha, other oils, and still gas), industrial petroleum coke, special naphthas, and waxes.

Wood and Waste. Wood and waste prices for the residential, commercial, and industrial sectors include taxes.

Electricity. Taxes paid directly by the electric power sector (rather than end users) are considered operating costs and are passed on to the end users as part of the price. Sales and other use taxes are included in the prices.

Electric Power Sector

Coal, natural gas, petroleum coke, nuclear, and wood and waste prices include all taxes, transportation, and handling costs. There are no direct fuel costs (or taxes) for hydroelectric, geothermal, centralized solar, or wind energy. Capital, operation, and maintenance costs and related taxes associated with these energy sources are included indirectly because electricity prices reflect their presence in the rate base.

expenditures as share of GDP. Appendix C summarizes the changes in SEDS content made since the last complete release of data, which was in November 2008. All data revised since the previous release that are large enough to be seen in the PDF tables' level of rounding are marked with an "R" in the table.

Reliable data for State-level prices rarely exist, especially as series that are consistent over a long period. Estimates and assumptions are applied to fill data gaps and to maintain consistent definitions in the data series over time. SEDS incorporates the most consistent series and procedures possible. Users should recognize the limitations imposed on the system due to changing and inadequate data sources. Estimates often are based on a variety of surrogate measures that are selected on the basis of availability, applicability as indicators, continuity over time, and consistency among the various energy commodities. Original source documents for data used in SEDS (cited in this documentation) include descriptions of collection methodologies, universes, imputation or adjustment techniques (if any), and errors associated with the individual processes. Due to the numerous collection forms and procedures associated with these reports, it is not possible to develop a meaningful numerical estimate of the overall statistical errors of the material published in the SEDS price and expenditure tables.

It is also important to note that, even within a State, a single average price may have limited meaning in that it represents a consumption-weighted average over a whole State. For example, urban and rural electricity prices can vary significantly from a State's weighted average, and prices in one region of a State may differ from those in another because of access to less expensive hydroelectricity. Differences within a State may also be greater than differences among adjacent States. Thus, the principal value of the estimates in these tables lies in general comparisons among the States, interstate comparisons for a given year, and the analysis of trends over several years.

The five economic sectors used in the SEDS price and expenditure tables correspond to those used in the consumption tables as follows:

- **Residential Sector:** An energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a vari-

ety of other appliances. The residential sector excludes institutional living quarters.

- **Commercial Sector:** An energy-consuming sector that consists of service-providing facilities and equipment of: businesses; Federal, State, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters. It also includes sewage treatment facilities. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.
- **Industrial Sector:** An energy-consuming sector that consists of all facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing (NAICS codes 31–33); agriculture, forestry, fishing and hunting (NAICS code 11); mining, including oil and gas extraction (NAICS code 21); and construction (NAICS code 23). Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. *Note:* This sector includes generators that produce electricity and/or useful thermal output primarily to support the above-mentioned industrial activities.
- **Transportation Sector:** An energy-consuming sector that consists of all vehicles whose primary purpose is transporting people and/or goods from one physical location to another. Included are automobiles; trucks; buses; motorcycles; trains, subways, and other rail vehicles; aircraft; and ships, barges, and other waterborne vehicles. Vehicles whose primary purpose is not transportation (e.g., construction cranes and bulldozers, farming vehicles, and warehouse tractors and forklifts) are classified in the sector of their primary use. In this report, natural gas used in the operation of natural gas pipelines is included in the transportation sector.

- **Electric Power Sector:** An energy-consuming sector that consists of electricity-only and combined-heat-and-power plants within the NAICS (North American Industry Classification System) 22 category whose primary business is to sell electricity, or electricity and heat, to the public. *Note:* This sector includes electric utilities and independent power producers.

Although end-use allocations of energy consumption and expenditures follow those guidelines as closely as possible, some data are collected by using different classifications. For example, electric utilities often classify commercial and industrial users by the quantity of electricity purchases rather than by the business activity of the purchaser. Agricultural use of natural gas is collected and reported in the commercial sector through 1995 and in the industrial sector for 1996 forward. Since agricultural use of natural gas cannot be identified separately, the discrepancy cannot be reconciled. Another example is master-metered condominiums, apartments, and buildings with a combination of residential and commercial units. In many cases, billing and metering practices cause residential energy usage of electricity, natural gas, or fuel oil to be included in the commercial sector. In those cases, there is no basis for separating residential from commercial use. Readers are advised to consult the consumption Technical Notes for specific assumptions regarding the consumption estimates.

Where prices for an energy source and sector are not available, comparable prices are substituted. For example, the transportation sector

motor gasoline prices are applied to the commercial and industrial sectors. In some cases, the average of adjacent States' prices is assigned to a missing State price. The documentation elaborates on these price assumptions.

Except where specified, it is generally not possible to describe the prices in these tables as entirely "wholesale" or "retail." The prices paid in each consuming sector are usually a combination of both sets of prices, depending on a number of closely interrelated factors. Almost all residential sector prices are close to retail prices, reflecting the relatively small quantities of individual purchases and the increased costs of extensive, multilayered distribution systems. Similarly, in the transportation sector almost everyone pays the same retail-like price for motor gasoline, regardless of volume purchased or location of purchase. Conversely, residual fuel oil prices in the transportation sector are certainly more wholesale-like as a result of large deliveries to bulk facilities in major ports. In the same manner, most large industrial and many large commercial expenditures can be thought of as near wholesale, frequently involving direct access to a producer or bulk distribution facility for very large quantities. Many smaller industrial and commercial facilities pay something much closer to retail prices as a result of the small quantities involved and their institutional distance from primary suppliers. Notable exceptions to these relationships include natural gas and electricity suppliers, which typically establish fixed rates for each of several classes of service, depending on representative quantities, service factors, and distribution expenses.