



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION

## **Comprehensive Energy Analysis**

### **PA State Energy Program**

**Applications Open 7-1-2012**

**Application Deadline 8-3-2012**

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# **Comprehensive Energy Analysis Introduction**

## **Development of a Comprehensive Energy Analysis for the State of Pennsylvania**

The Commonwealth of Pennsylvania, through the Pennsylvania Department of Environmental Protection (“DEP”) is offering a one-time grant for the preparation of a comprehensive energy analysis. Pennsylvania is offering a grant with funding provided from United States Department of Energy (DOE) State Energy Program (SEP). SEP provides grants to states and directs funding to state energy offices from programs in DOE’s Office of Energy Efficiency and Renewable Energy. States use grants to address their energy priorities and planning. DEP will make one award for the preparation of the comprehensive Energy Analysis in an amount not to exceed \$100,000. The analysis must be completed by Dec. 31, 2012.

The Comprehensive Energy Analysis will demand significant research and analysis of Pennsylvania specific data to allow DEP’s Pollution Prevention and Energy Assistance Office to invest policy efforts and future energy funding in a manner that has the greatest immediate return on investment for Pennsylvanians. The outcomes of the analysis and the eventual projects supported by DEP will demonstrate that sound energy acquisition, use and conservation are tools to promote economic development in Pennsylvania and cost-effective energy choices for the citizens of the commonwealth.

The deliverables for this Comprehensive Energy Analysis Project are as follows:

- An assessment of and a report on the availability, use and transport of all indigenous energy resources in the commonwealth, including:
  - coal
  - oil
  - natural gas
  - water
  - nuclear
  - renewables
  - energy efficiency
  - energy conservation
  - others energy resources as appropriate
- An assessment of and a report on the economic development opportunities including employment opportunities for new and existing occupations when obtaining and utilizing indigenous energy resources as well as delivery of indigenous energy resources for various markets in Pennsylvania including:
  - transportation
  - electricity production
  - industry sectors
  - commercial sectors
  - institutional
  - government
- An assessment of and a report on the environmental costs and benefits, including job creation, of developing all indigenous energy resources and implementing current and new use opportunities.
- An assessment of and a report on the use of and the costs, harms and benefits of all foreign energy resources being used in Pennsylvania.
- The development of a final report summarizing all resources and energy use, direct and tertiary benefits economic and environmental benefits in a manner such that energy use and economic planning can be accomplished with the most up-to-date and best information.

## APPLICATION SUBMISSION

The application acceptance period will open on July 1, 2012. The deadline for submitting applications, which must be in hard copy format, is the close of business Aug. 3, 2012. Applications will be reviewed and evaluated based on criteria outlined in the Application Evaluation Criteria section of this guidance document. Applications received after the due date will not be reviewed and will not be eligible for funding.

### PART I

#### General Information

- The Pennsylvania Comprehensive Energy Analysis project is a one-time competitive grant opportunity to engage a qualified professional entity or university (“applicant”) for research, analysis and preparation of a Pennsylvania Comprehensive Energy Analysis Report. Applications will be competitively reviewed and evaluated based on criteria outlined in the **Application Evaluation Criteria** section of this guidance document. DEP reserves the right to decline applications based on technical deficiencies, lack of financial or professional assurance, or other reasons impacting the eligibility of the project at the discretion of the agency.
- Subject to the availability of funds and the compliance with the terms and conditions of a fully executed grant agreement, DEP will provide payments to the applicant on a reimbursement basis for work performed in the research, analysis and production of a Comprehensive Energy Analysis Report as per a schedule determined by DEP and the applicant. The Applicant will be required to abide by specific conditions in the grant agreement related to the scope of work, provisions of drafts of the report to DEP as well as final approval of final content of the report.
- The applicant’s work must result in the final deliverable, an approved Comprehensive Energy Analysis report within the period of performance.
- The applicant must adhere to all general application conditions and all general grant award and contract conditions described in this document;
- All work on the project must be completed and funds must be fully expended by Dec. 31, 2012, state applicants shall certify, in the application, a project schedule in accordance with these time constraints.
- The applicant, as well as all subcontractors, must be at all times in compliance with all applicable laws and must not have any outstanding obligations to the commonwealth or unresolved compliance issues with DEP. If obligations or compliance issues exist, a resolution plan to satisfy any obligations and compliance issues will be required prior to the grant being awarded.
- All applications made under these guidelines are public documents and subject to disclosure to the public upon request. Any information included in the grant proposal that the applicant wishes the commonwealth to consider as proprietary must be on a separate sheet of paper and must be clearly marked as proprietary.
- All funding provided by the commonwealth for this program is federal funding provided through the Energy Policy Act of 2005. The Department of Energy administers the SEP and provides awards to the state in accordance with applicable law including regulations contained in 10 CFR Part 420.

## Eligibility – Comprehensive Energy Analysis

An eligible Comprehensive Energy Analysis application is a proposal that establishes the qualifications of the applicant to accomplish the energy analysis and that demonstrates how the applicant will provide resources in the form of expertise to accomplish the analysis and preparation of the report. Funds shall be used for only costs associated in the research, analysis and preparation of the report as approved by DEP.

- **Eligible applicants include:**
  - **Business** – corporations, partnerships, sole proprietorship, limited liability company, business trust or other legal business entities.
  - **Non-Profit Corporations** – incorporated not for profit organizations that maintain 501(c)(3) status with the U.S. Internal Revenue Service and is that is also registered with the Pennsylvania Bureau of Charitable Organizations, where necessary.
  - **Universities** – colleges or universities located within Pennsylvania.
  - **An Economic Development Organization** – a nonprofit corporation or association whose purpose is the enhancement of economic conditions in their community.
- **Funding provided by the Department may not be used for:**
  - For non-energy-related research or analysis;
  - To purchase land, a building or structure or any interest therein;
  - Rent; or
  - To purchase equipment, computers copy machines etc.

## Program Requirements – Comprehensive Energy Analysis

The Comprehensive Energy Analysis will assess all of the indigenous energy resources in the commonwealth, including coal, oil, water, natural gas, nuclear, renewables as well as energy efficiency, energy conservation and other energy resources. The analysis will assess and consider the economic opportunities for developing and using these resources for the transportation, electricity, industrial, commercial, government, and building sectors. The analysis will assess the environmental costs and benefits of implementing these opportunities.

The individual report and analysis will be summarized into a final report inclusive of the resources and opportunities identified. This report will allow for further energy use and economic planning to be accomplished with the most up-to-date and best information available.

The reports and the data used during the analysis to generate any and all reports will be provided to DEP in both in paper copy and electronically in open native format, nonproprietary form. Where possible, the data should be provided in Microsoft-compatible formats, as well as suitable for posting to the internet. Reports should include resource maps where appropriate.

The use of mapping tools and display of data, using mapping tools is highly encouraged. DEP may look to coordinate any display of data and mapping with resources already developed or in use for other applications within the state.

The raw data used to provide the information in Exhibit A. may be used as a starting point for the Comprehensive Energy Analysis. Additional data from the state energy office as it becomes available will be provided.

The questions/topics to be addressed in the analysis and summary report, at a minimum, shall include:

*Please answer the following questions for each of the sectors listed: conservation, energy efficiency, demand response, wind, solar, biomass (including biofuels), coal, oil, natural gas, including Marcellus Shale, nuclear, hydropower, "Opportunity Fuels" and other:*

- What are the available types of indigenous energy resources in Pennsylvania?
- In what proportions are each of these resources imported into Pennsylvania?
- In what portions are these resources available in Pennsylvania?
- What is the current demand vs. supply of these resources?
- What are the environmental and economic impacts of this energy extraction and use?
- Where are these indigenous resources located geographically?

*Please answer the following questions for each of the sectors listed: electricity generation, transportation, commercial, industrial, residential, other, export:*

- Provide volume of and locations where energy resources, individually and collectively are currently being used by each market sector.
- What are the costs of energy consumption in each sector in Pennsylvania, and how do these compare regionally and nationally?
- What are trends and future projections regarding costs for acquisition and use in each sector?
- What are current and potential plans and opportunities for conservation in each sector?

*Please answer the following questions for each of the sectors listed: electric power generating plants, electric transmission lines, natural gas wells, natural gas pipelines, natural gas storage, oil refineries, liquid fuel pipelines, liquid fuel storage terminals, liquid fuel supply routes, other fuels:*

- What and where is the infrastructure to utilize, manage and transport energy resources?
- What is the status of the current infrastructure, for example, age and performance or adequacy of pipelines?
- What is the proposed infrastructure for delivery of energy, including power lines, natural gas pipeline and liquid fuel pipelines.
- What are the least environmentally impactful and most economically viable ways to develop new infrastructure?
- What unique energy resources exist (including, at a minimum, Marcellus Shale, energy efficiency and conservation, and liquid fuels derived from indigenous resources) that may provide economic development and environmental benefits specifically to Pennsylvania and in what amounts?

*Please answer the following questions for each of the sectors listed: commercial, industrial, government, institutional and residential as well as state-owned lands and brownfields:*

- What opportunities exist for technologies such as combined heat and power, distributed generation, load shifting such that conservation and opportunity fuels could turn environmental problems into energy solutions?

*General Overall Information:*

- What policies, programs or actions have other states enacted in their energy plans to optimize the use of energy resources so that energy remains, in the long term, available, affordable and least impactful to the environment while providing the most economic benefit?
  - Which of these policies, programs or actions have potential to be implemented in Pennsylvania?
- What are the comparative environmental and economic costs and benefits of implementing policies already in place in other states or countries?
- What energy legislation is currently in effect both in Pennsylvania and other states that could help to achieve long term available least impactful and affordable energy supply?
- What federal and state laws, regulations and policies impact the deployment of indigenous energy resources?
- What are the tertiary industries involved with Pennsylvania's indigenous energy industry including end use manufacturing?

## PART II

### Application Requirements

Applications will be evaluated based solely on the data and information provided; therefore, each application must be complete and accurate. Applications that do not meet the requirements set forth in these guidelines will not be reviewed and are not eligible for funding.

- The application and project description must:
  - Be submitted along with all required attachments. An original hard copy, signature page, signed in black ink, must be provided on the application.
  - Be complete, including: a description of the scope of work to be performed and all items contained in the application instructions.
  - Include documentation supporting the applicants' qualifications, shall include examples of the applicant's work products or activities that demonstrate its ability to perform the tasks necessary to complete the analysis and prepare a summary report.
  - Describe a project timeline that at a minimum meets these benchmarks.

Kick-off meeting	Within 15 days of executing contract
Periodic status updates	Weekly
First draft report	Nov. 15, 2012
Revised draft report	Dec. 15, 2012
Final report	Dec. 31, 2012

- Provide a budget for the project including salaries, fringe, contractual, travel and supplies.
  - Detail should be provided which explains how these figures were computed, including, for example, hourly rates and the number of hours each person is expected to spend on the project.
- Describe any leveraged funds or cost share. This application does not require a cost share, however, provision of in kind, pro-bono or other leveraged funds shall be accurately described and will be considered in the application evaluation.



## **Application Evaluation Criteria**

### **Evaluation Considerations**

- The applicant's experience in conducting energy analysis and energy planning.
- The applicant's ability to cost effectively use the funding for achieving the identified work products.
- The applicant's readiness to begin research, analysis and begin drafting the report.
- Whether the applicant has demonstrated that it can complete the scope of work by Dec. 31, 2012.
- The applicant's ability to:
  - Provide energy supply and use analysis.
  - Identify and report on the environmental and economics benefits.
  - Provide the economic cost per unit of energy per lifetime.
  - Assess the energy industry including tertiary suppliers.
  - Prepare written reports.

## Application Submission and Deadline

Applications will be received anytime after the grant opening date until the application deadline of August 8, 2012 at 4 p.m. Applications must be submitted along with three copies, containing all required attachments to the DEP Grants Center. An original black ink signature page must be submitted.

- Applications must be in hard copy mailed or delivered to the address below.
- E-mails and faxes will not be accepted.
- Applications submitted after the closing date will not be considered.
- **Incomplete applications will not be considered.**

Do not submit separate attachments other than those specifically called for in the instructions.

Please submit applications to:

DEP Grants Center – Comprehensive Energy Analysis  
15th Floor, Rachel Carson State Office Building  
400 Market Street  
P.O. Box 8776  
Harrisburg, PA 17105-8776

## Grant Award and Contract Conditions

- The proposal that is selected for funding will receive a letter from the DEP Secretary or designee, addressed to the contact person specified in the application.
- Disbursement of grant funding is contingent upon availability and release of funds.
- Grant recipient will be assigned a DEP project advisor.
- Grant recipient will execute a grant agreement acceptable to the department.
- If the spending plan or any other grant condition is not adhered to, **DEP reserves the right to terminate the project and/or recover funding from a grant recipient that is not properly managing the funding in accordance with the conditions of the program and the grant agreement.**
- Time extensions for the term of the grant recipient will not be approved.
- All changes to the scope of this grant must be approved by the project advisor.
- A grant recipient that has not had previous contracts or grant agreements with the commonwealth will be required to submit a Form W-9, Request for Taxpayer Identification Number and Certification.
- Fund activities and payment requests may begin after the grant recipient and the commonwealth have signed the grant agreement.
- Grant recipients must comply with all local, state and federal requirements in the implementation of the fund.
- The grant recipient will receive reimbursement for funds expended only during the period of performance.
- The grant recipient must provide weekly status updates to DEP, and meet with DEP at all other times at the discretion of DEP, to review and discuss current progress.
- DEP reserves the right to inspect and obtain any materials created with funds provided by this grant and to audit or require a third-party audit of any financial transactions or compliance with any agreement terms.
- Grant recipient must provide to DEP a first draft, a final draft and a final Comprehensive Energy Analysis report as well as any and all data and information developed during the course of the project. The final report must be submitted in a format required by DEP. Failure to submit final report in an appropriate format may result in loss of grant funding.
- Grant recipients must properly manage and account for funding received. A complete spending record for all expenditures will be required, including invoice receipts, logs of record and other properly certified documents. Documentation will be required for matching funds as well as DEP funds. The funding must be spent in accordance with the spending plan included in the application. **DEP reserves the right to terminate the project and/or recover funding from grant recipients not properly managing the funding in accordance with the conditions of the program and the grant.**
- **Failure to comply with the spending plan, reporting requirements or other requirements of the grant may result in immediate termination of the grant and full recovery of any and all grant funds.**

**PART III**  
**DEP CONTACTS**

**Applicants are encouraged to contact the appropriate DEP staff to discuss the application before submittal.**

**Grants Processing, Application Submission and Deadlines:**

DEP Grants Center – 717-705-5400

**Project-Related Inquiries (Central Office):**

David Althoff – 717-783-0542

Kerry Campbell – 717-772-5985

## **Comprehensive Energy Analysis Grant Application Instructions**

The instructions on the following pages describe the information required to complete the application. The application form must be typed or printed neatly and all applicable parts completed. The information **MUST** be complete. **Incomplete applications will not be considered.** Do not submit separate attachments other than those specifically called for in the instructions.

**Please be sure to indicate your organization and sign the application.** The authorized representative signing this section must be authorized by a board of directors, governing entity, etc., as the legal signatory for the applicant and the person capable of entering into a contract with the commonwealth. The original signature **MUST** be dated.

1. **Project Title:** Please give the proposal a descriptive title of fewer than 10 words. Please use this title for all correspondence regarding this project.

2. **Applicant Information:**

- The applicant organization's legal formation documents, tax EIN documents and legal name must be provided.
- Applicant shall state whether it has any outstanding obligations to the commonwealth, or unresolved compliance issues with DEP.
- The "DUNS Number field" is a mandatory field on the application. The federal government requires Pennsylvania to provide the DUNS number for grantees to whom federal grant funds are awarded. For information on how to get a DUNS number, visit <http://www.dnb.com.us>. The Dun & Bradstreet toll free customer service number is 800-234-3867.

3. **Project Duration:** Applicants shall indicate that they understand that the project must be completed and all funding expended by Dec. 31, 2012.

4. **Leverage Funds Table:** Please complete the Leverage Funds Table on the application form. Leveraged funds as well as the partner or contributor are to be identified in the table. Please provide the current status of the funding as identified on the table. Any funds that are pledged or in hand must be accompanied by a letter of commitment verifying that the funds are in place and are able to be expended during the period of performance. Leverage may not include funds or in-kind services provided by DEP. All leveraged funds must be expended during the grant period. Funds expended prior to the grant period of performance cannot be claimed as leverage.

5. **Budget Summary:** Please complete the budget data requested on the form. The bold black box will contain the amount of money you are requesting. A detailed budget worksheet must also be completed and submitted with the application. The budget worksheet is intended to support and provide detail to the budget summary. Please provide sufficiently detailed budget information to illustrate the cost effectiveness of the proposal. The included sheets must be used.

6. **Attachments A-C, Instructions:**

Attachment A - Executive Summary: Provide an abstract of the proposal that briefly describes how the applicant is qualified and can complete the scope of work as described in the Program Requirements. It should be clear, concise, specific and no longer than 200 words.

Attachment B - Detailed Project Description: Provide a detailed project description focusing on the following items

- a. Goals and Objectives: Describe the goals and objectives of Comprehensive Energy Analysis and Report, including but not limited to the expected content of the report.

- b. Partnerships: Applicants should identify any other organizations that will participate in ensuring the success of the preparation of the Comprehensive Energy Analysis and Report for Pennsylvania. The nature of their participation and contributions should be specified.
- c. Work Plan with Schedule: Applicants should provide an implementation schedule identifying sub-tasks, schedule for delivering the first draft, the revised draft and final report. Also describe corresponding parties who will be responsible for the accomplishment of the analysis and report writing.
- d. Energy and economic information: Explain how the applicant will obtain the energy analysis and economic analysis information. Explain the qualification of staff who will contribute to and verify the information contained in the work product documents. Please refer to the information provided in Exhibit A as a starting point for energy and economic information that will be provided.

Attachment C - Letters of Commitment: Attach any letters of financial commitment. The proposal will not be accepted unless all of the leveraged funds have been confirmed. Letters of financial commitment from outside entities should clearly state the nature of their participation with dollar amounts, work tasks, etc. in addition to the amounts identified.

7. **Detailed Budget Worksheet**: Please complete the detailed Budget Worksheet included with the application form. The worksheet included as part of the application form must be used. Please include sheets that provide additional clarification. The worksheet must be completed in full; and, the data must match the information provided in the Budget Summary Table. The Budget Worksheet is intended to support and provide detail to the budget summary. Please provide sufficiently detailed budget information to illustrate the cost effectiveness of the proposal. The included sheets must be used.

Only monies being requested are included under the heading of "Grant Request" on the budget summary and items one to three on the Budget Worksheet. Matching funds are to be placed in the second column of the budget summary and the source of any matching funds identified on part four of the Budget Worksheet. All in-kind and cash match contributions must be substantiated by commitment letters. Match cannot include funds or in-kind services provided by DEP. All match must be expended during the grant period. Funds expended prior to the grant period of performance cannot be claimed as match.

All costs incurred directly should be identified on the Budget Worksheet in items one and two. All costs incurred by the applicant's contractor and then billed to the applicant go under budget worksheet item three.

Any of the following costs are allowable if the necessity to the project can be clearly demonstrated, and are allowed by the specific funding source:

- Regular or supplementary staff salaries and wages and associated employee benefits.
- Administrative fees directly related to the project.
- Other costs which can be clearly identified as necessary for the conduct of the project.

The following costs are not allowed under any circumstances:

- Costs associated with lobbying,
- Entertainment,
- Food not associated with approved travel; and
- Clothing such as hats, or tee shirts.



## COMPREHENSIVE ENERGY ANALYSIS GRANT PROJECT APPLICATION

*This form is to be used to apply to the Department of Environmental Protection for a Comprehensive Energy Analysis Grant. Projects will be supported through Federal funds. See instructions and grant program conditions.*

**Applicant:** I certify that the information in this application is true and correct to the best of my knowledge.

Submitted By:	
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(Applicant Organization)

Date Submitted:	
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Printed Name:	Signature:
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Title:

1. Proposal Title (ten word maximum):

2. Applicant Name: \_\_\_\_\_

Address: \_\_\_\_\_

Address 2: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Contact's Phone: \_\_\_\_\_ Contact's Fax: \_\_\_\_\_

Contact's e-mail: \_\_\_\_\_

Organization type: (specify LLC, "S" Corp, "C" Corp, etc.): \_\_\_\_\_

Applicant's Federal Employer Identification Number (FEIN) or Tax Number: \_\_\_\_\_

Does applicant have any outstanding obligations to the Commonwealth?  Yes  No

Does applicant have any unresolved compliance issues with DEP?  Yes  No

Organizational DUNS: \_\_\_\_\_

3. Will the project be completed by Dec. 31, 2012?  Yes  No

**4. Leverage In-Hand**

Please use the following table to show leveraged funds. All items listed must be accompanied by a letter of commitment.

Partner/Contributor	Description	Status (applied for, pledged or in-hand)	Value in Dollars

5. Budget Summary (Must be consistent with the attached Detailed Budget Worksheet)

<b>Category</b>	<b>Grant Request (from DEP)</b>	<b>+</b>	<b>Match (from Applicant)</b>	<b>=</b>	<b>Project Cost (Total)</b>
Salaries/Benefits		+		=	
Administration		+		=	
Other		+		=	
<b>Total for each column:</b>					

6. Attachments – Provide Attachments A – C as described in the application instructions. Be sure to include all necessary elements as presented in the guidelines

- A. Executive Summary
- B. Detailed Project Description
- C. Letters of Commitment

7. Please complete the detailed budget worksheet attached.



## Pennsylvania Comprehensive Energy Analysis Budget Worksheet

This worksheet must be submitted with the application.

Totals for each category should be entered on the application budget summary, item 5.

**1. SALARIES/BENEFITS**

INDIVIDUAL	POSITION	HOURLY RATE	HOURS	BENEFITS	TOTAL COST

**2. ADMINISTRATION**

TASK	COST
<b>TOTAL ADMINISTRATION</b>	

**3. OTHER**

TASK	COST
<b>TOTAL OTHER</b>	

**4. MATCH**

Please use the following table to calculate matching contributions of cash, goods and services to be entered on the application form. Do not include other DEP provided funds or in-kind services. All items listed must be accompanied by a letter of commitment.

CONTRIBUTOR	BUDGET CATEGORY	DESCRIPTION	STATUS (applied for, pledged or in- hand)	VALUE in DOLLARS

Exhibit A



*Transforming America's Energy Future*

# Pennsylvania Energy Profile

Developed by





# Summary

The first edition of Pennsylvania Energy Profile is offered by the National Association for State Energy Officials (NASEO) and the Kentucky Department for Energy Development and Independence (DEDI) to function as a quick reference for energy information particular to the Commonwealth of Pennsylvania. Data has been collected for the most-recent year available from a variety of sources such as the Energy Information Administration (EIA), the U.S. Environmental Protection Agency (EPA), the Bureau for Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), and the U.S. Census. This document provides data on the dynamics of energy expenditures, energy consumption, energy production, and electricity generation that describe the economy of Pennsylvania. Summary state-level statistics are provided in aggregate, as well as for specific sectors of the economy and individual commodities. Overall, Pennsylvania was net importer of energy in 2009, maintained an industrial sector that was the leading consumer of energy resources, and had electricity prices higher than most other states.

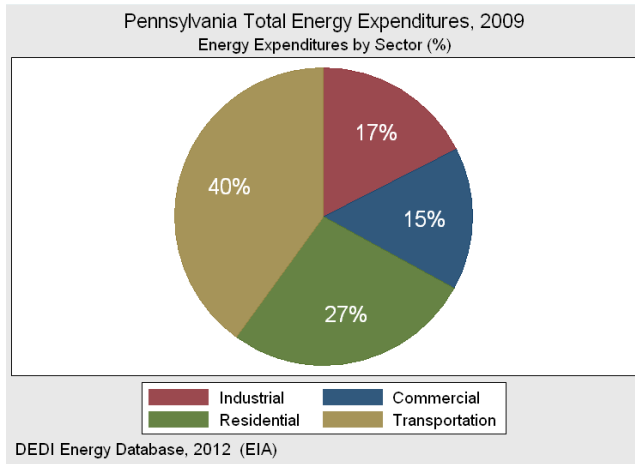


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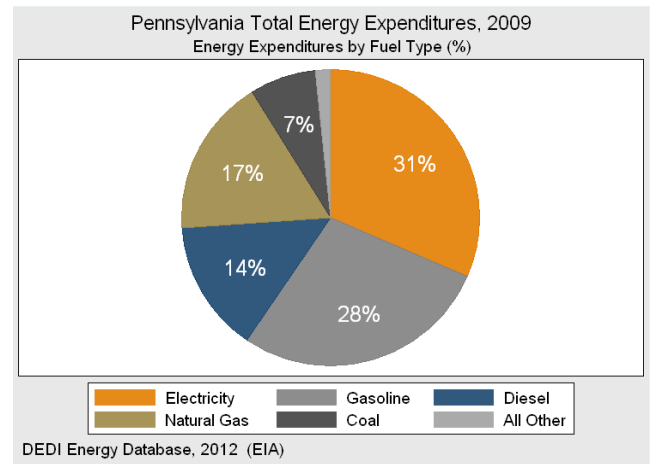
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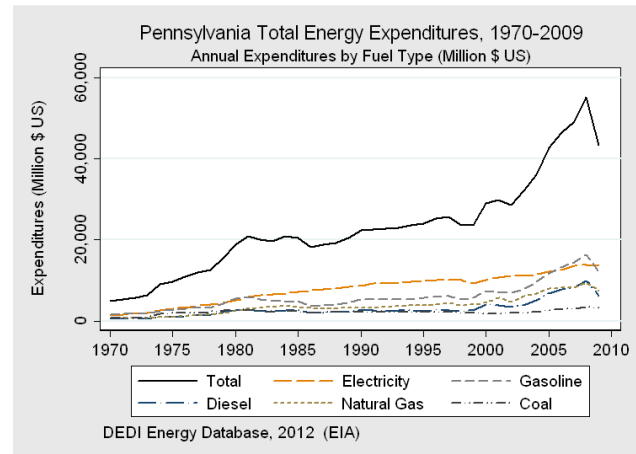
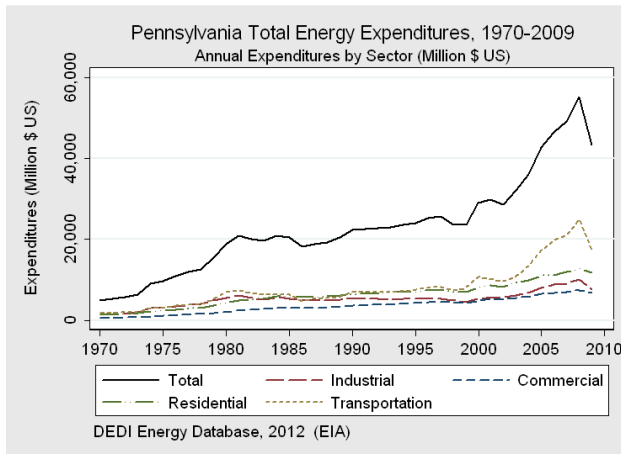
# Pennsylvania Energy Expenditures



Sector	Million (\$ US)	Percentage
Total	43,319	100%
Transportation	17,361	40%
Residential	11,674	27%
Industrial	7,574	17%
Commercial	6,710	15%



Fuel Type	Million (\$ US)	Percentage
Total	43,319	100%
Electricity	13,638	31%
Gasoline	12,159	28%
Natural Gas	7,480	17%
Diesel	6,221	14%
Coal	3,125	7%

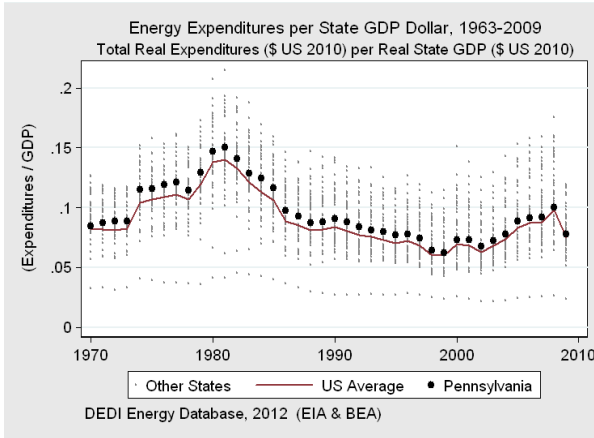


In 2009, total energy expenditures in Pennsylvania were 43.3 billion dollars, a decrease of 22% from 2008. Dividing these costs by economic sector, the transportation sector accounted for the largest amount of energy expenditures in 2009.

Analyzing energy expenditures by fuel type, the purchase of electricity was the highest concentration of expenditures in Pennsylvania in 2009. Compared with 2008, total electricity expenditures displayed a decrease of 2% in 2009.

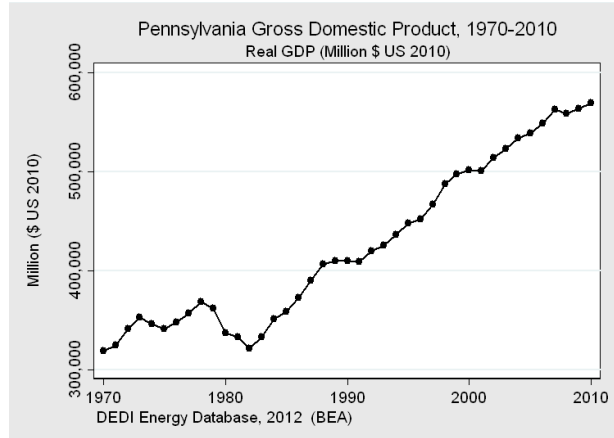


# Pennsylvania Energy Expenditures



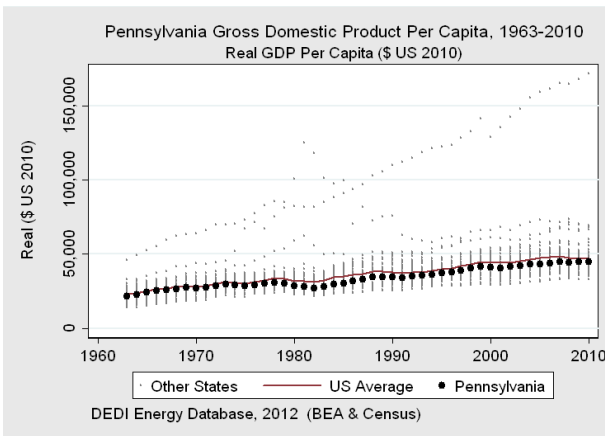
## Energy Expenditures & GDP

In 2009, citizens, institutions, and firms in Pennsylvania on average spent \$0.078 on energy commodities and/or energy consumption to produce \$1 of state gross domestic product. This energy expenditure level per dollar of economic output fell by 22% compared with 2008.



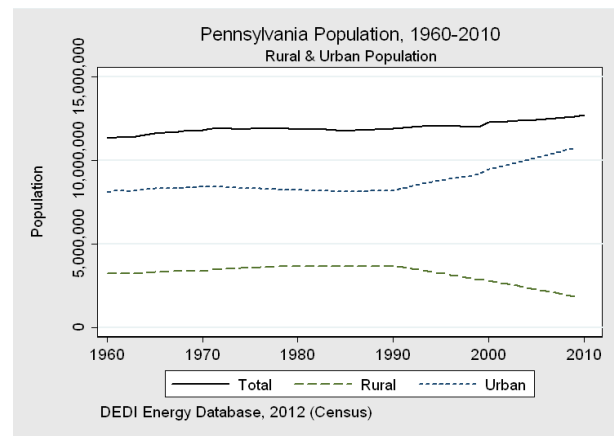
## Gross Domestic Product

The state gross domestic product of Pennsylvania was \$569.7 billion in 2010. In that year, the state GDP of Pennsylvania rose by 1% in inflation-adjusted 2010 dollars. Since the year 2000, the state gross domestic product of Pennsylvania has risen by 14%.



## Gross Domestic Product per Capita

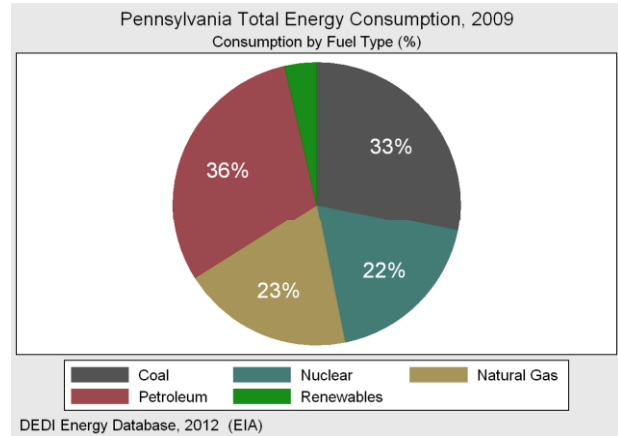
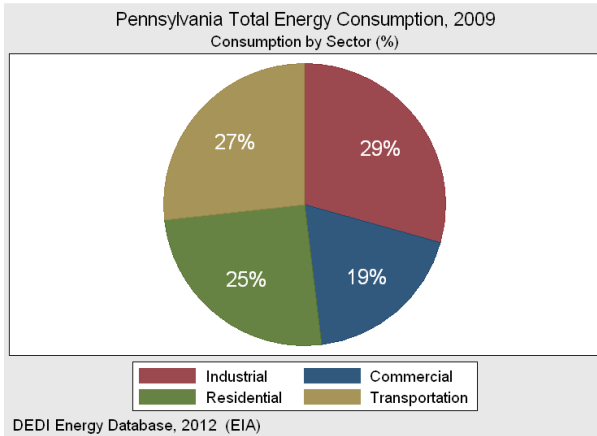
The state gross domestic product per capita of Pennsylvania in 2010 was \$44,848. Compared with 2009, state gross domestic product per capita rose by 1%. This statistic utilizes nominal income data adjusted for inflation to 2010 dollars.



## Rural & Urban Population

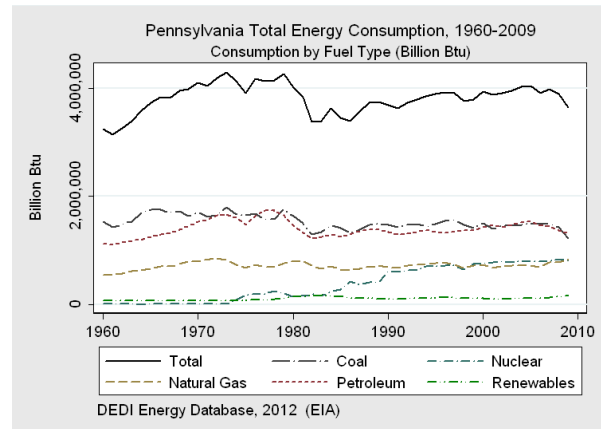
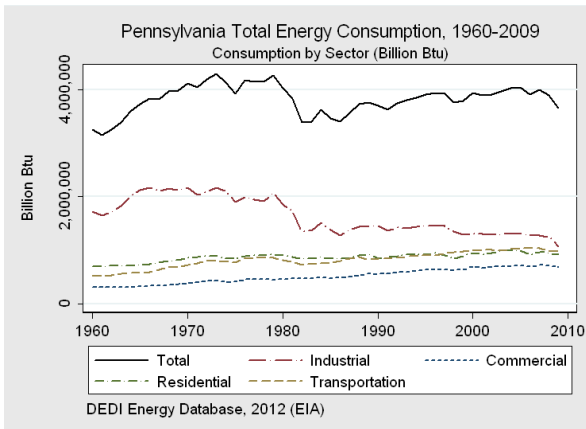
In 2010, the population of Pennsylvania was estimated to be around 12 million. Displaying a trend of increasing urbanization, the population of Pennsylvania has risen by 3% since the year 2000.

# Pennsylvania Energy Consumption



Sector	Billion Btu	Percentage
Total	3,654,106	100%
Industrial	1,071,772	29%
Transportation	978,534	27%
Residential	918,637	25%
Commercial	685,165	19%

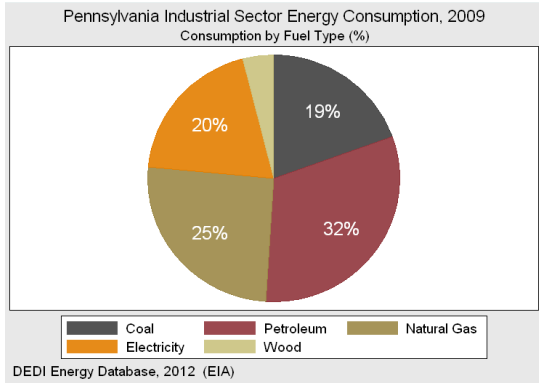
Fuel Type	Billion Btu	Percentage
Total	3,654,106	100%
Petroleum	1,317,719	36%
Coal	1,223,937	33%
Natural Gas	833,826	23%
Nuclear	808,848	22%
Renewables	155,398	4%



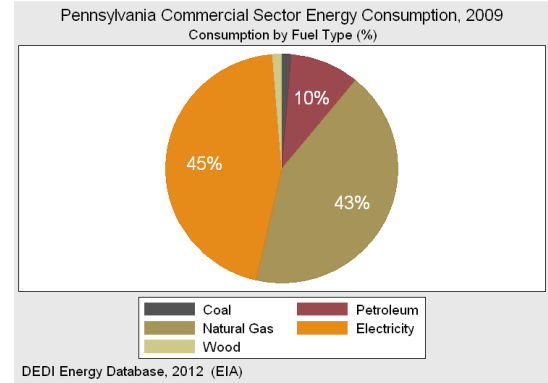
In 2009, total energy consumption in Pennsylvania was 3.65 quadrillion Btu, a decrease of 6% from 2008. Dividing this consumption by economic sector, the industrial sector accounted for the largest amount of energy consumption in 2009.

Characterizing energy consumption by fuel type or commodity, the use of petroleum was the highest concentration of energy consumption in Pennsylvania in 2009. Compared with 2008, the consumption of petroleum products displayed a decrease of 4% in 2009. Additionally, net electricity exports are included in energy consumption, and can explain the difference in the summed value and stated value for total energy consumption.

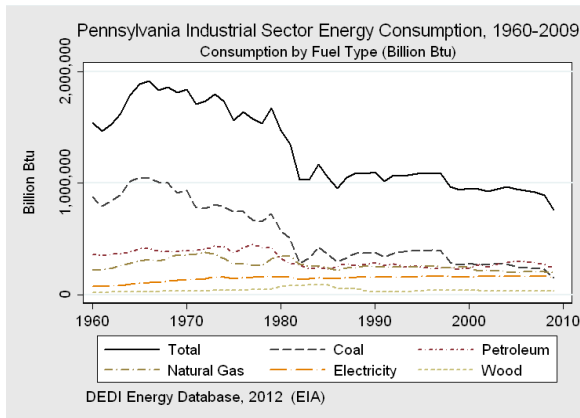
# Pennsylvania Energy Consumption



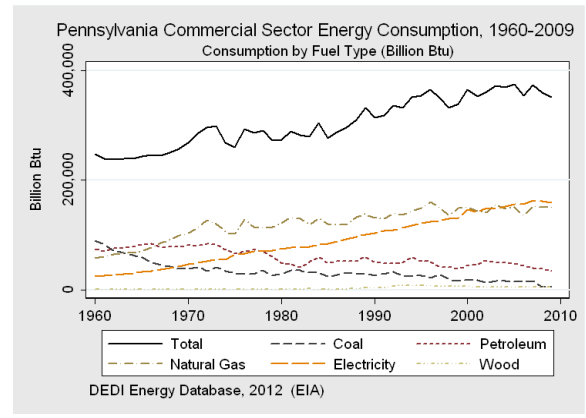
Fuel Type	Billion Btu	Percentage
Total	759,073	100%
Petroleum	239,480	32%
Natural Gas	193,074	25%
Electricity	148,599	20%
Coal	147,854	19%
Wood Products	30,091	4%



Fuel Type	Billion Btu	Percentage
Total	351,936	100%
Electricity	158,355	45%
Natural Gas	149,834	43%
Petroleum	33,982	10%
Wood Products	4,623	1%
Coal	4,523	1%



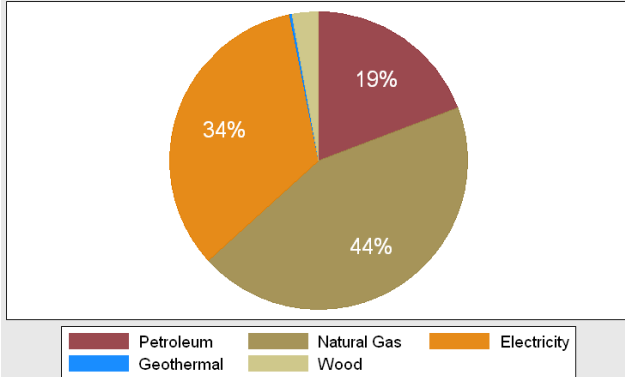
In 2009, industrial energy consumption in Pennsylvania was 759,073 billion Btu, a decrease of 15% from 2008. Accounting for energy use across fuels or resources, petroleum represented the largest amount of industrial energy consumption in 2009.



Commercial energy consumption in Pennsylvania fell by -2% in 2009 to over 351,936 billion Btu. During 2009, electricity constituted the largest portion of commercial energy consumption and displayed a decrease of 2% compared with 2008.

# Pennsylvania Energy Consumption

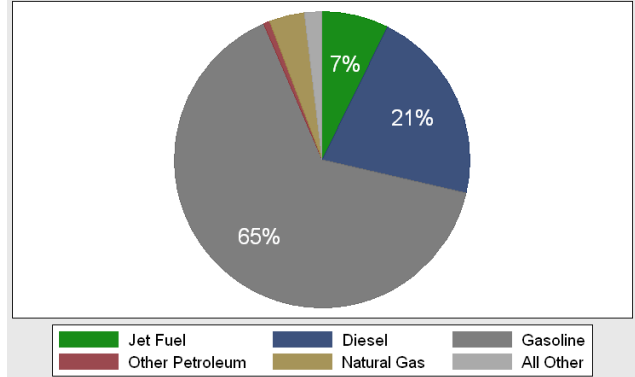
Pennsylvania Residential Sector Energy Consumption, 2009  
Consumption by Fuel Type (%)



DEDI Energy Database, 2012 (EIA)

Fuel Type	Billion Btu	Percentage
Total	538,776	100%
Natural Gas	236,783	44%
Electricity	180,515	34%
Petroleum	103,350	19%
Wood	15,480	3%
Geothermal	1,150	<1%

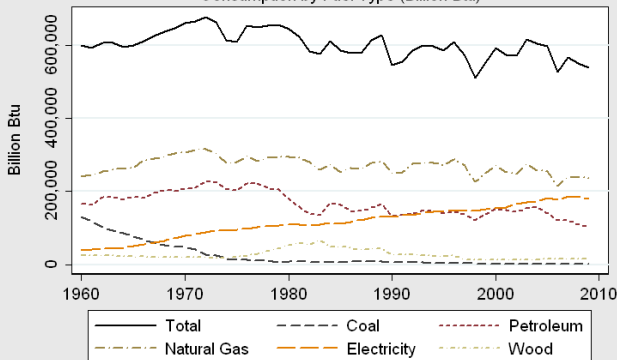
Pennsylvania Transportation Sector Energy Consumption, 2009  
Consumption by Fuel Type (%)



DEDI Energy Database, 2012 (EIA)

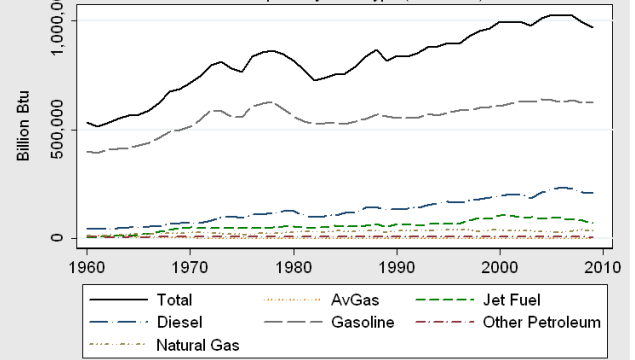
Fuel Type	Billion Btu	Percentage
Total	972,226	100%
Gasoline	630,906	65%
Diesel	207,510	21%
Jet Fuel	70,738	7%
Natural Gas	37,494	4%
Other Petroleum	6,630	1%

Pennsylvania Residential Sector Energy Consumption, 1960-2009  
Consumption by Fuel Type (Billion Btu)



DEDI Energy Database, 2012 (EIA)

Pennsylvania Transportation Sector Energy Consumption, 1960-2009  
Consumption by Fuel Type (Billion Btu)

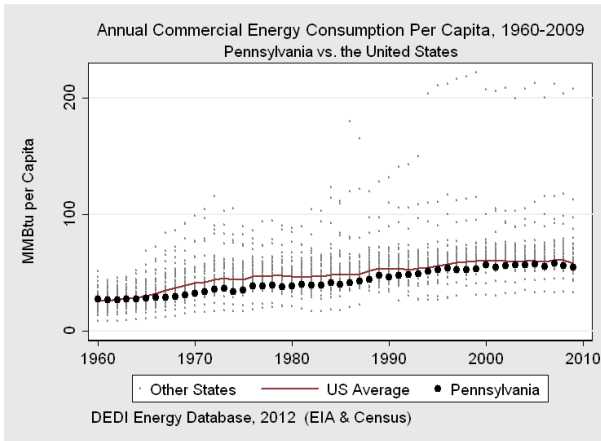


DEDI Energy Database, 2012 (EIA)

Residential sector energy consumption was 538,776 billion Btu in Pennsylvania in 2009. This amount was a decrease of 2% compared with 2008. Overall, residential energy consumption was led by natural gas consumption in 2009.

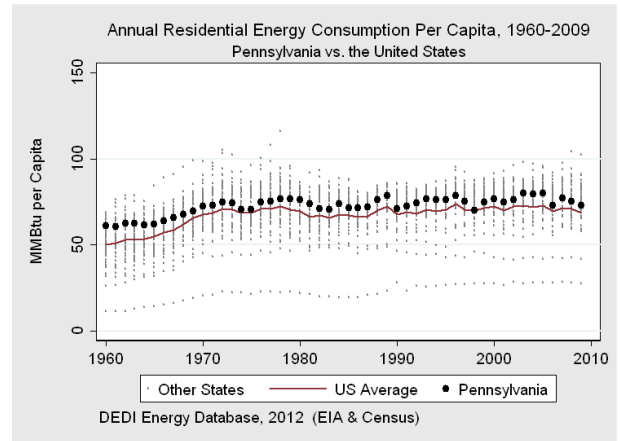
In 2009, the transportation sector of Pennsylvania consumed 972,226 billion Btu of energy commodities. This total reflected a decrease of 2% in transportation energy consumption compared with the previous year. Unsurprisingly, gasoline was the largest source of transportation sector energy consumption in 2009.

# Pennsylvania Energy Intensity



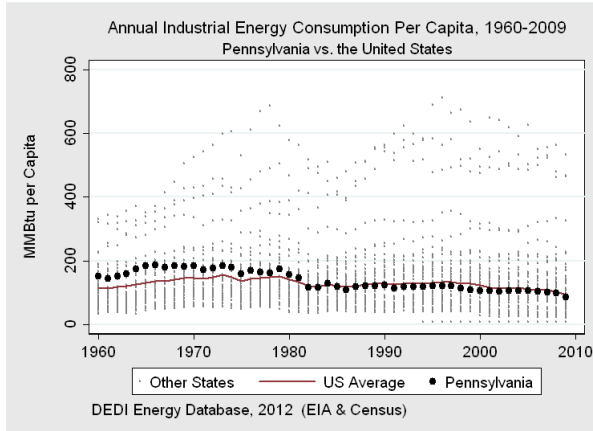
State	MMBtu per Capita	Rank
Wyoming	113	1st
Pennsylvania	54	42nd
Hawaii	32	50th

Pennsylvania ranked 42nd lowest nationally for commercial energy consumption per capita in 2009, a decrease of 3% compared with 2008.



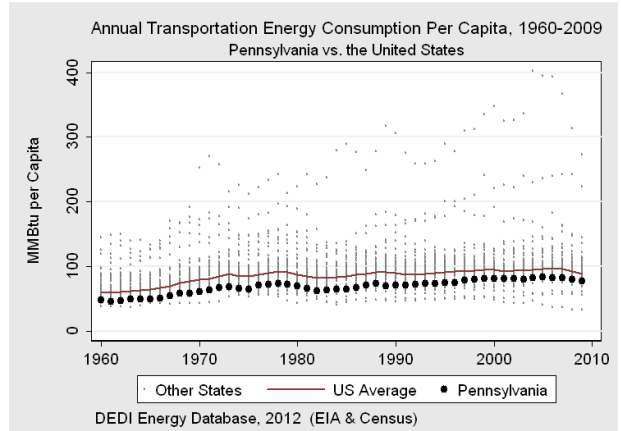
State	MMBtu per Capita	Rank
North Dakota	102	1st
Pennsylvania	73	32nd
Hawaii	28	50th

Pennsylvania's residential sector consumed 73 MMBtu of energy per capita in 2009, a decrease of 3% from 2008. Pennsylvania ranked 32nd lowest by state.



State	MMBtu per Capita	Rank
Wyoming	533	1st
Pennsylvania	85	27th
New York	19	50th

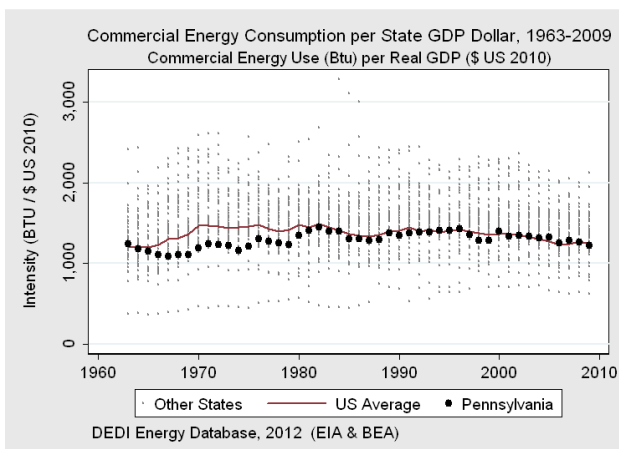
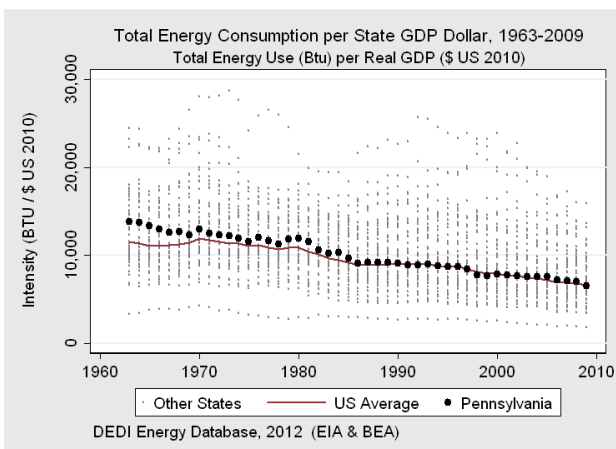
Industrial energy consumption per capita in Pennsylvania was 27th lowest in the country in 2009. Compared with 2008, industrial energy use per capita fell by 14%.



State	MMBtu per Capita	Rank
Alaska	273	1st
Pennsylvania	78	41st
New York	56	50th

Transportation energy consumption per capita in Pennsylvania fell by 2% in 2009. Overall, Pennsylvania ranked 41st lowest in the country for this metric.

# Pennsylvania Energy Intensity

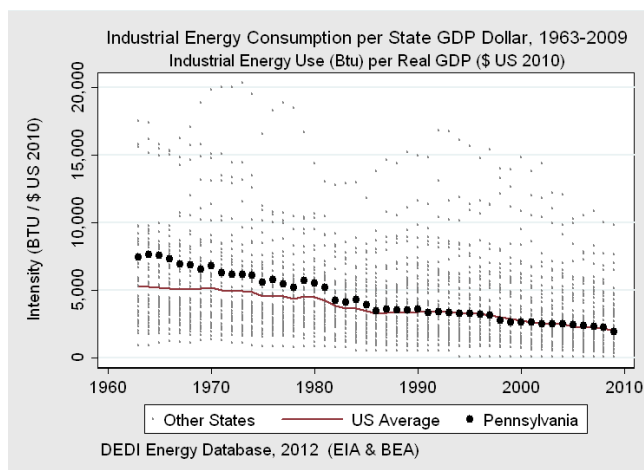


State	MMBtu per Capita	Rank
Louisiana	15,894	1st
Pennsylvania	6,480	30th
Connecticut	3,411	50th

Pennsylvania ranked 30th lowest for energy consumption used to produce one dollar of state GDP in 2009. This measurement fell by less than 1% compared with 2008.

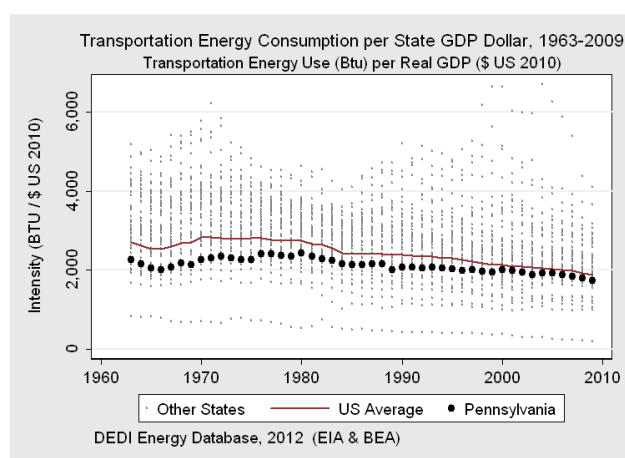
State	MMBtu per Capita	Rank
Montana	2,124	1st
Pennsylvania	1,215	38th
Hawaii	623	50th

Pennsylvania's commercial sector ranked 38th lowest for the ratio of energy use to state GDP dollar in 2009, a decrease of 4% from 2008.



State	MMBtu per Capita	Rank
Louisiana	9,817	1st
Pennsylvania	1,901	26th
New York	329	50th

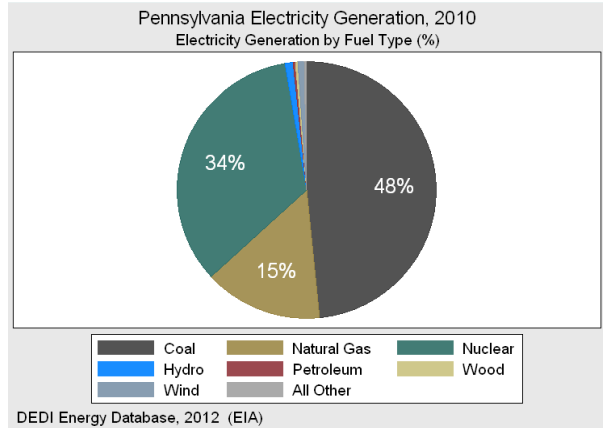
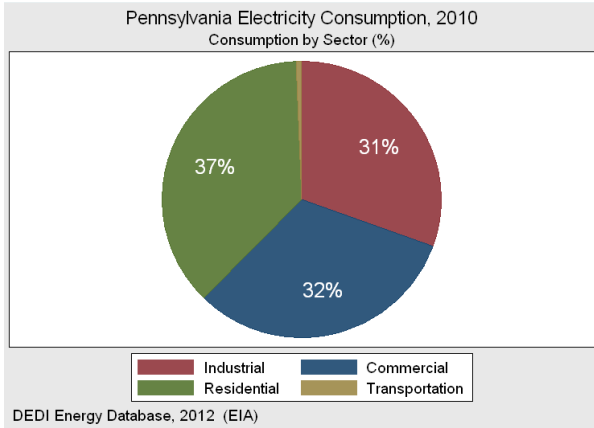
Industrial energy consumption per dollar of state GDP in Pennsylvania was 26th lowest in 2009. Compared with 2008, industrial energy intensity fell by 15%.



State	MMBtu per Capita	Rank
Alaska	4,103	1st
Pennsylvania	1,735	39th
New York	982	50th

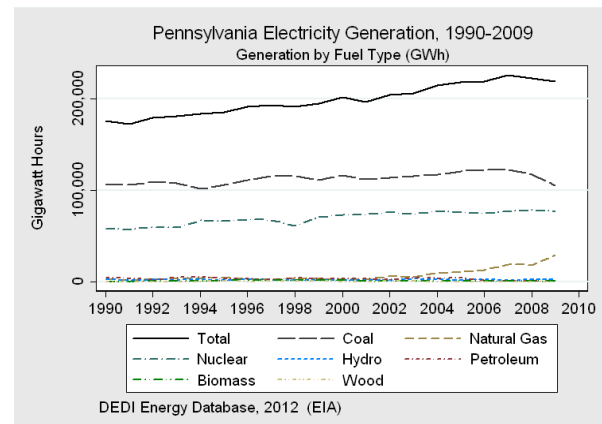
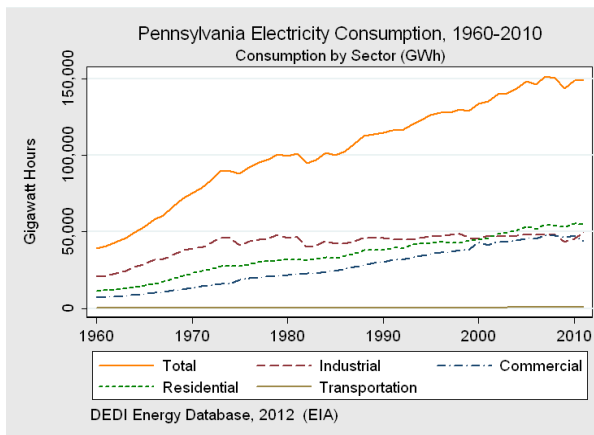
Transportation sector energy intensity per state GDP dollar in Pennsylvania fell by 3% in 2009. Overall, Pennsylvania ranked 39th lowest in the country for this metric.

# Pennsylvania Electricity



Sector	Gigawatt Hours	Percentage
Total	148,964	100%
Residential	55,253	37%
Commercial	47,366	32%
Industrial	45,458	31%

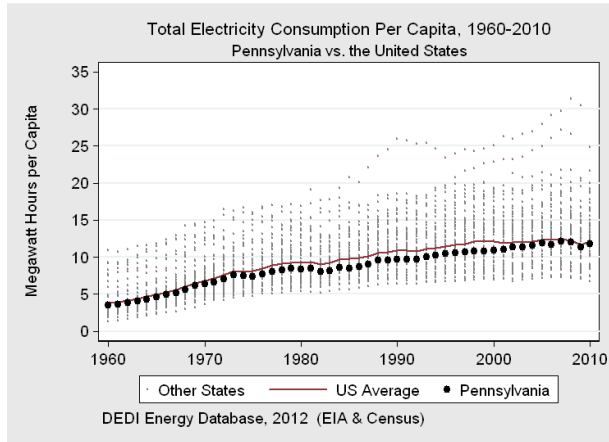
Fuel Type	Gigawatt Hours	Percentage
Total	229,752	100%
Coal	110,369	48%
Nuclear	77,828	34%
Natural Gas	33,718	15%
Hydro	2,332	1%
Wind	1,854	1%



In 2010, citizens, institutions, and firms in Pennsylvania consumed 148,964 gigawatt-hours of electricity. Compared with 2009, total electricity consumption rose by 4%. Dividing electricity consumption by economic sector, residential customers were the largest consumers of electricity in Pennsylvania in 2010.

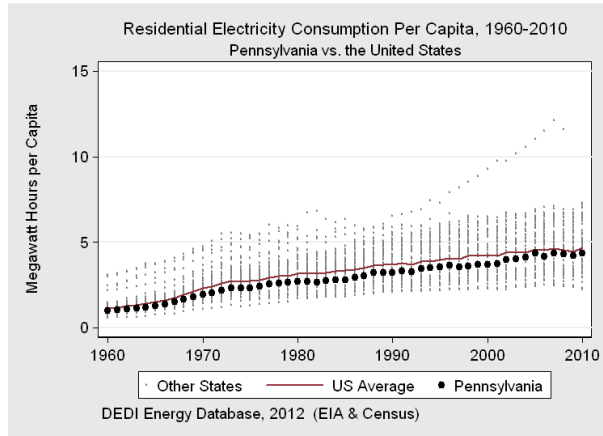
Electric power facilities in Pennsylvania generated over 229,752 gigawatt-hours of electricity in 2010. The use of coal represented the largest portion of this electricity, accounting for 110,369 gigawatt-hours. Overall, electricity generation rose by 5% versus the previous year.

# Pennsylvania Electricity Intensity



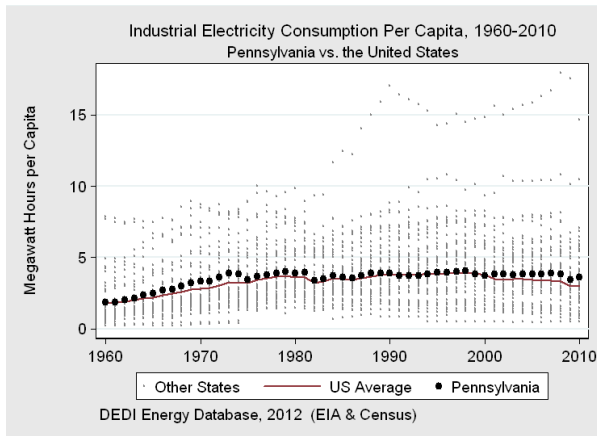
State	MWh per Capita	Rank
Wyoming	24.9	1st
Pennsylvania	11.8	32nd
California	6.7	50th

At 11.8 MWh, Pennsylvania ranked 32nd lowest nationally for total electricity consumption per capita in 2010, an increase of 3% from 2009.



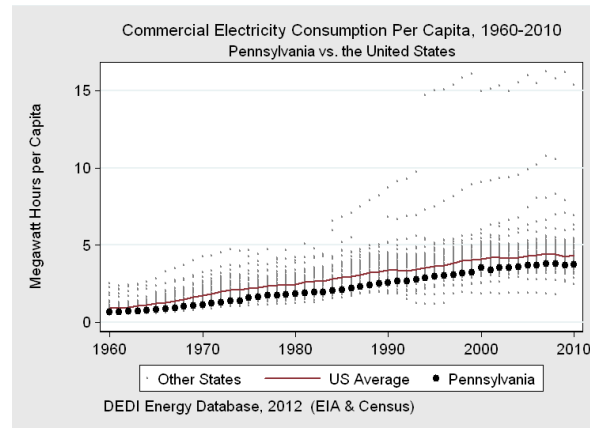
State	MWh per Capita	Rank
Alabama	7.3	1st
Pennsylvania	4.4	31st
Hawaii	2.2	50th

Residents of Pennsylvania used on average 4.4 MWh of electricity in 2010. Representing an increase of 4%, this amount ranked Pennsylvania 31st lowest by state.



State	MWh per Capita	Rank
Wyoming	14.7	1st
Pennsylvania	3.6	24th
New York	0.7	50th

Industrial electricity consumption per capita in Pennsylvania was 24th highest in 2010. Versus 2009, industrial electricity consumption per capita rose by 4%.

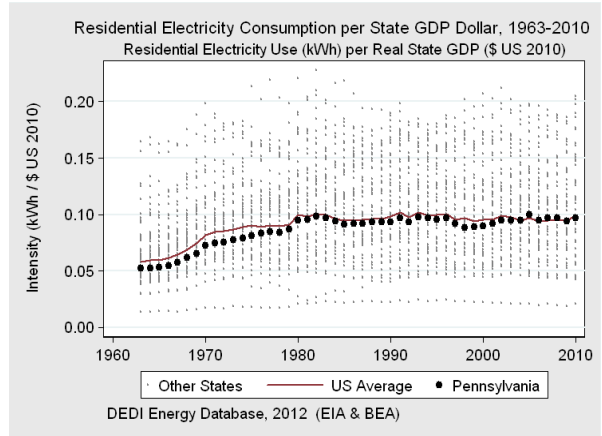
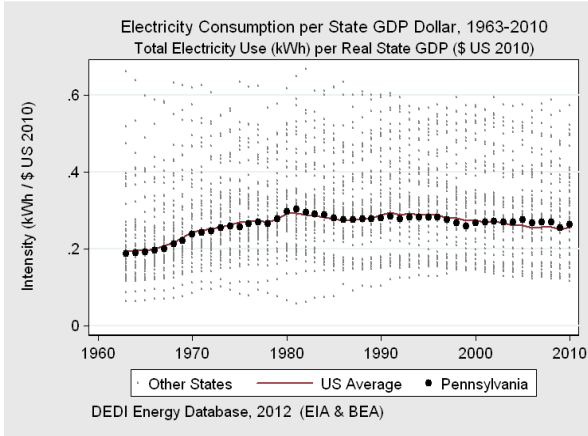


State	MMBtu per Capita	Rank
North Dakota	6.9	1st
Pennsylvania	3.7	40th
Hawaii	2.5	50th

Pennsylvania's commercial electricity consumption per capita rose by 2% in 2010 to 3.7 MWh. Overall, Pennsylvania ranked 40th lowest in the country for this metric.



# Pennsylvania Electricity Intensity

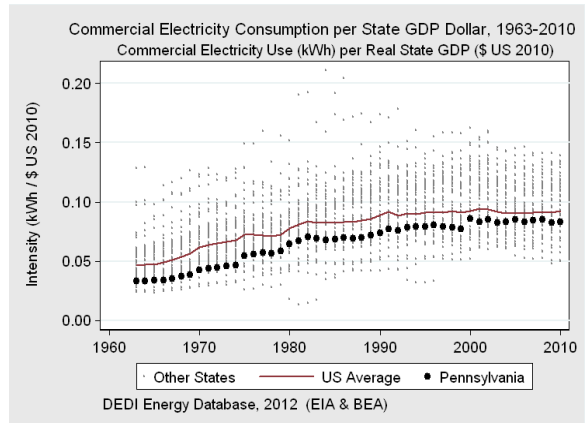
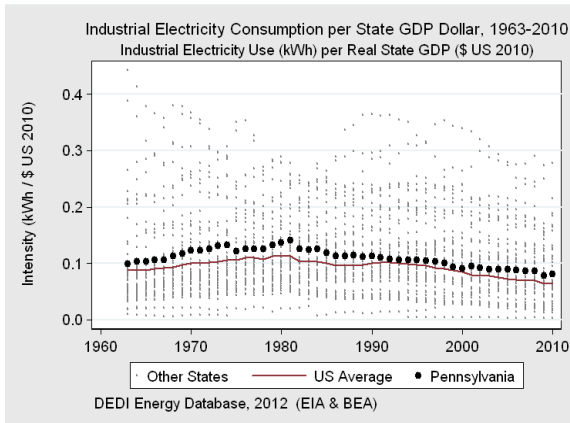


State	kWh / \$ US GDP	Rank
Kentucky	0.57	1st
Pennsylvania	0.26	33rd
New York	0.13	50th

Pennsylvania ranked 33rd lowest nationally for total electricity consumption per state GDP dollar in 2010. This amount rose by 3% to 0.26 kWh per dollar for the year.

State	kWh / \$ US GDP	Rank
Mississippi	0.20	1st
Pennsylvania	0.10	29th
Alaska	0.04	50th

In 2010, Pennsylvania ranked 29th lowest for residential electricity use relative to one dollar of state GDP. This metric rose by 3% compared to 2009.



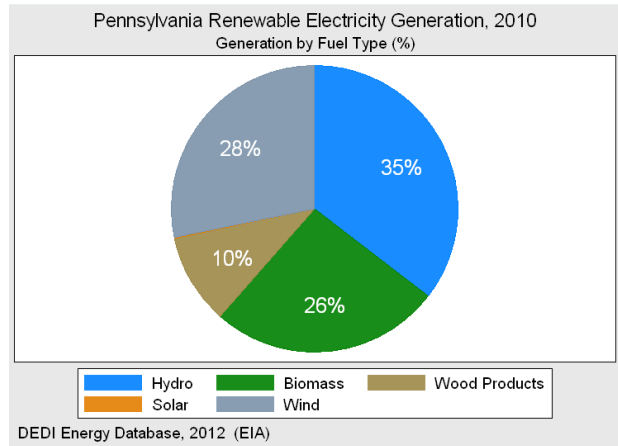
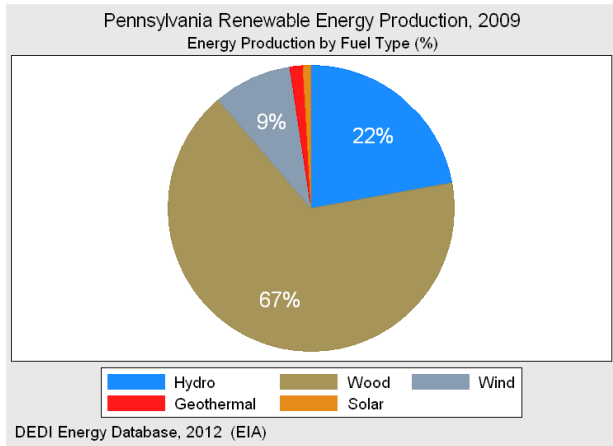
State	kWh / \$ US GDP	Rank
Kentucky	0.28	1st
Pennsylvania	0.08	24th
New York	0.01	50th

Industrial electricity consumption per state GDP dollar in Pennsylvania was 24th highest in the country 2010. Versus 2009, industrial electricity intensity rose by 4%.

State	kWh / \$ US GDP	Rank
Mississippi	0.14	1st
Pennsylvania	0.08	35th
Massachusetts	0.05	50th

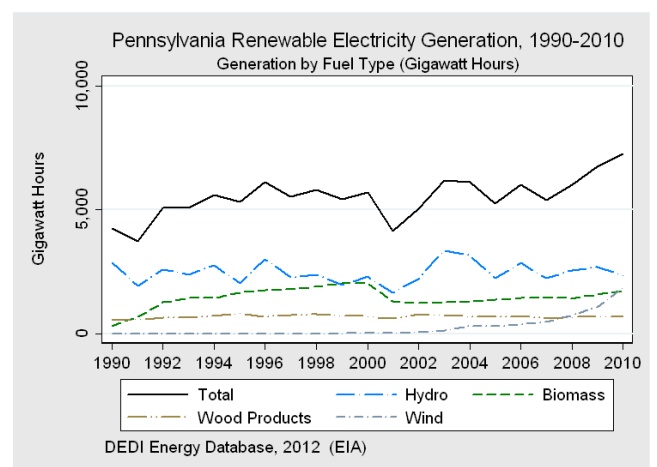
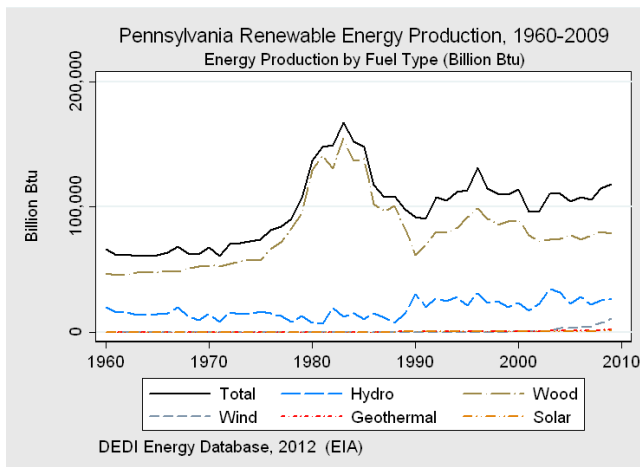
Pennsylvania's commercial sector used 0.08 kWh of electricity to generate one dollar of economic output. A increase of 1%, this ratio ranked the state 35th lowest.

# Pennsylvania Renewable Energy



Fuel Type	Billion Btu	Percentage
Total	118,269	100%
Wood & Biomass	78,742	67%
Hydro	26,185	22%
Wind	10,490	9%
Geothermal	1,790	2%
Solar	1,062	1%

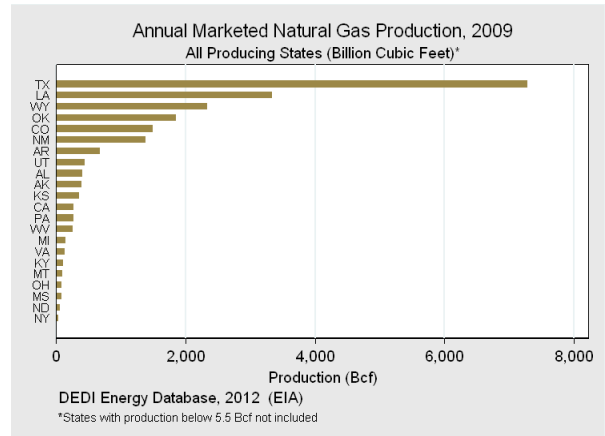
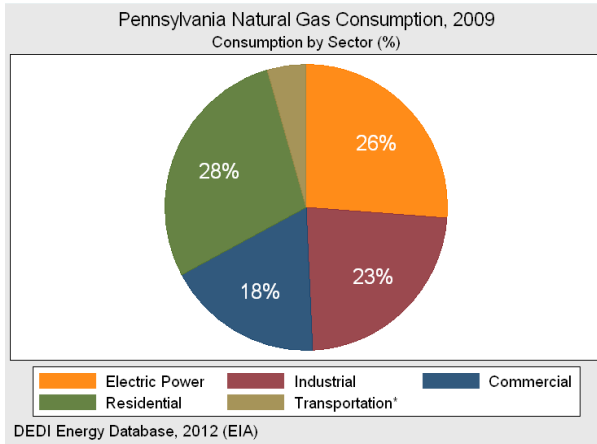
Fuel Type	Gigawatt Hours	Percentage
Total	6,577	100%
Hydro	2,332	35%
Wind	1,854	28%
Biomass	1,708	26%
Wood	675	10%
Solar	8	<1%



In 2009, renewable energy production in Pennsylvania was 118,269 billion Btu, an increase of 3% from 2008. Dividing this production by fuel type, wood & biomass resources accounted for the largest amount of energy production in 2009.

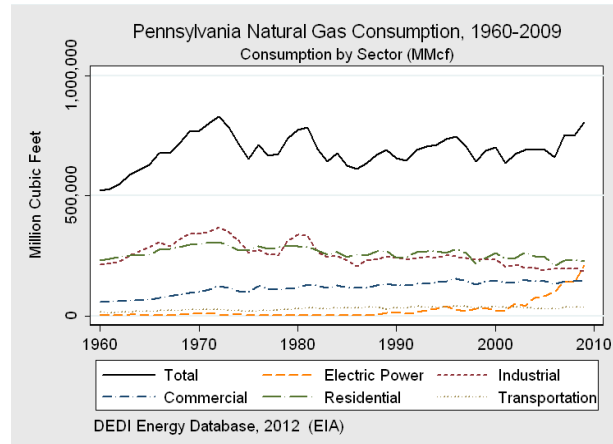
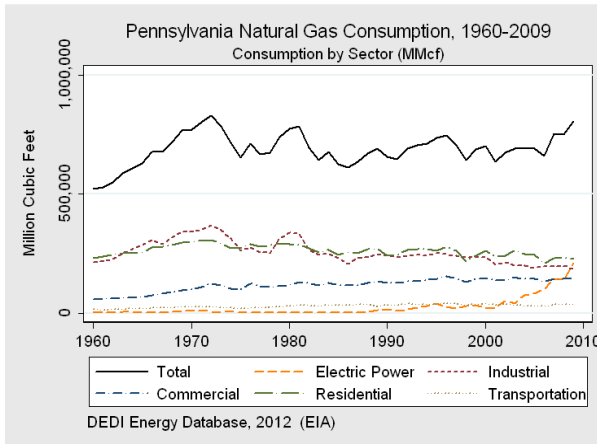
Describing renewable electricity generation by fuel type or commodity, the production from hydroelectric facilities represented the largest portion of renewable electricity generation in Pennsylvania in 2010. Compared with 2009, the electrical output of hydroelectric facilities displayed a decrease of 13% in 2010.

# Pennsylvania Natural Gas



Sector	Million Cubic Feet	Percentage
Total	804,076	100%
Residential	227,709	28%
Electric Power	210,543	26%
Industrial	185,675	23%
Commercial	144,092	18%
Transportation	36,057	4%

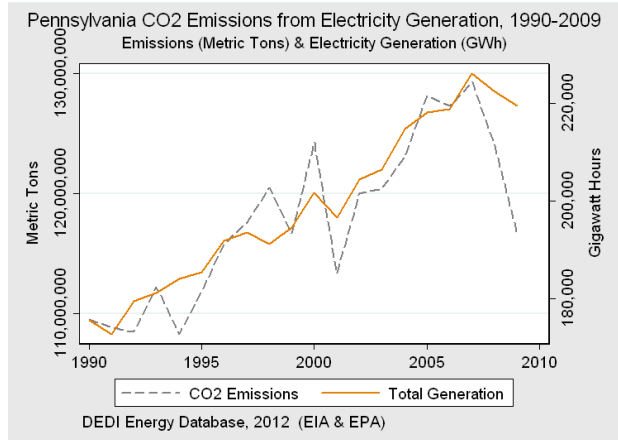
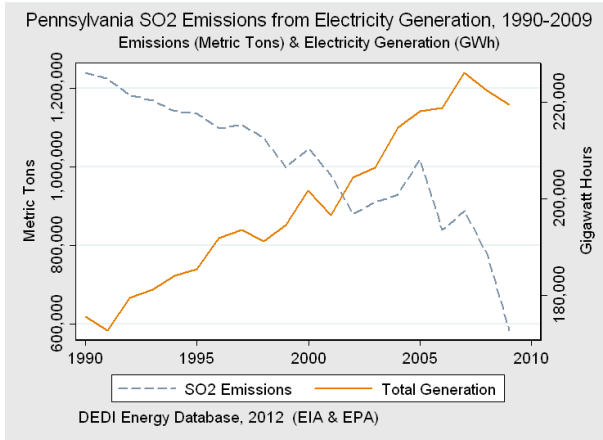
Pennsylvania registered 273.9 billion cubic feet of marketed natural gas production in 2009. Versus 2008, natural gas production in the state rose by 38% through 2009. Comparing in-state production levels with in-state consumption levels, Pennsylvania was a net importer of natural gas for the year.



In 2009, natural gas consumption in Pennsylvania was 804,076 million cubic feet. Compared with 2008, total natural gas consumption rose by 7% on the year. Dividing natural gas use by economic sector, the residential sector was the largest consumer of natural gas in Pennsylvania in 2009. (Natural gas consumption by the Transportation Sector is the summation of direct, vehicle fuel use and natural gas used by transmission and distribution pipelines).

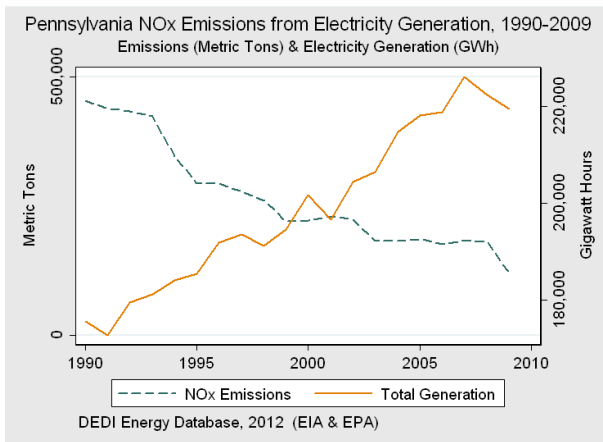
The average city gate price of natural gas in Pennsylvania was \$9.80 per thousand cubic feet in 2009. Versus the previous year, this average annual price fell by 25%. The city gate price of natural gas is typically reported at the connection where a natural gas distribution company or utility takes control of natural gas delivered by a pipeline or transmission company.

# Pennsylvania Power Plant Emissions



Emission	Metric Tons	Since 1990
Carbon Dioxide	116,621,094	7%
Sulfur Dioxide	584,624	-53%
Nitrogen Oxides	120,366	-73%

Sulfur dioxide is a highly reactive gas and major pollutant that is monitored and regulated at the State and Federal level. In 2009, the electric power sector of Pennsylvania emitted 584,624 metric tons of sulfur dioxide, representing a decrease of 25% compared with 2008. Overall, the electric power sector of Pennsylvania has decreased sulfur dioxide emissions by 53% since 1990.

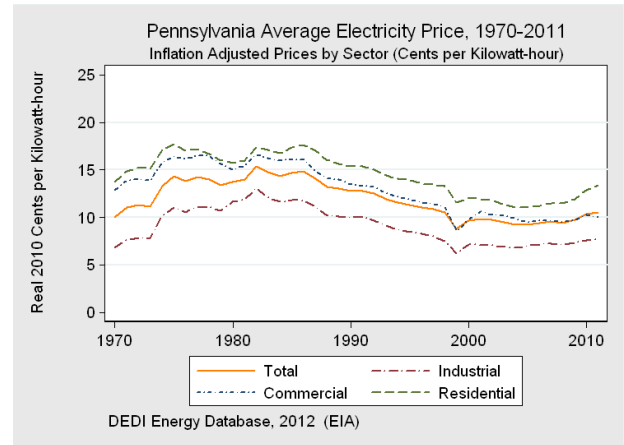
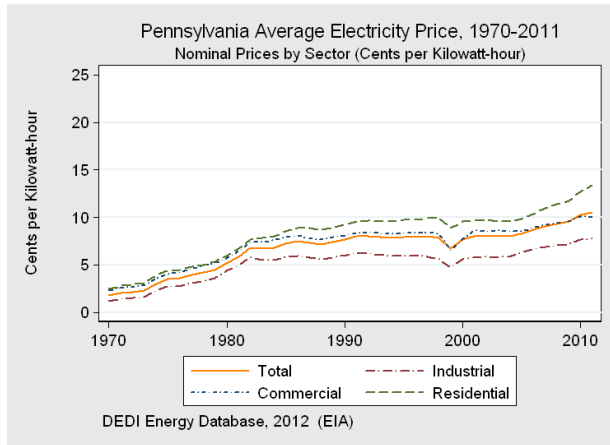


Nitrogen oxides are a group of highly reactive regulated pollutants. In 2009, the electric power sector of Pennsylvania emitted 120,366 metric tons of nitrogen oxides, representing a decrease of 34% compared with 2008. Overall, the electric power sector of Pennsylvania has decreased nitrogen oxides emissions by 73% since 1990.

Carbon dioxide emissions from fossil fuel power plants have been monitored over time at the State and Federal level. In 2009, the electric power sector of Pennsylvania emitted 116,621,094 metric tons of carbon dioxide, representing a decrease of 6% compared with 2008.

The last major amendments to the Clean Air Act were implemented in 1990. These amendments focused on National Ambient Air Quality Standards and the mechanisms which would ensure attainment and compliance with emission reduction targets. Subsequently, the emission of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>) from electric generating plants were regulated and scheduled for reduction. The dual display of electricity generation and regulated emissions indicates that over time, though electricity demand and generation have increased, the release of targeted pollutants has actually decreased. Therefore, both the aggregate emission as well as intensity of emission per gigawatt-hour of criteria pollutants, such as sulfur dioxide and nitrogen oxides, have been decreasing nationally since 1990. The reductions have been made by a combination of fuel switching and the installation of pollution mitigation systems at power plants.

# Pennsylvania Electricity Prices



Sector	Cents / kWh	Since 2000
Average	10.31	35%
Industrial	7.66	36%
Commercial	10.10	31%
Residential	12.70	33%

Prices and percent changes above are displayed and calculated in terms of nominal prices (\$ US) for the period 1970-2010.

Fuel Type	Real Cents / kWh	Since 2000
Average	10.38	7%
Industrial	7.60	7%
Commercial	10.25	5%
Residential	12.90	7%

Prices and percent changes above are displayed and calculated in terms of real, inflation-adjusted dollars (Real \$ US 2010) for the period 1970-2010.

Electricity usage in Pennsylvania is billed in terms of cents per kilowatt-hour of electricity consumed. Due to the variations between economic sectors, electric utilities, and electric power producers, the price of electricity is not uniform across Pennsylvania. As a result, each economic sector in Pennsylvania pays a different average price for the consumption of electricity.

In 2010, the average price of electricity across economic sectors in Pennsylvania was 10.31¢ per kilowatt-hour. With an increase of 7% versus 2009, this overall, weighted-average price ranked Pennsylvania 15th highest in the country in terms of electricity. Since 2000, the average price of electricity in Pennsylvania has risen by 35%.

Adjusting for inflation over time, the trends in the real cost of electricity in Pennsylvania between 1970 and 2010 can be placed in context to the adjacent, nominal graphic. Resetting historical price data to inflation-adjusted 2010 values, the price of electricity in real economic terms in Pennsylvania has risen by 7% since the year 2000. Additionally, in 2010 Pennsylvania ranked 15th highest in the nation for the real price of electricity.

Since 1990, the two most influential factors explaining the changes in both nominal and real electricity prices have been the type of generation portfolio developed within a state, and the price of fossil fuel inputs for the electric power sector. Specifically, these factors involve the type of generation technology (i.e. coal, gas, nuclear) used within a state, the share of each technology in supplying baseload electricity, and the price of the primary fossil fuels.

For more information, visit [www.dep.state.pa.us](http://www.dep.state.pa.us), keyword: Energy.

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