

*Utility Usage Report  
for Fiscal Year  
2008–2009*



PENNSSTATE



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*Utility Usage Report*  
*for Fiscal Year*  
*2008–2009*

prepared for the

Pennsylvania State System  
of  
Higher Education

**This report was prepared**  
**by the**  
**Penn State Facilities Engineering Institute**

**Our Vision**

Penn State Facilities Engineering Institute will impart significant value to the services provided to their customers, thereby earning their respect and enhancing Penn State's tradition of excellence.

**Our Mission**

To merit the public trust by meeting customer facility needs through engineering, information management, education, and applied research while exploring new and innovative ways to exceed customer expectations.

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# Table of Contents

A Message from the Director	
Introduction .....	1
Collective Services .....	1
Educational Services .....	7
Services to Individual Universities .....	8
System Utility Data, Related Costs, and Illustrations .....	15
Fuel and Energy Consumption and Costs .....	15
Table 1 – System Fuel and Energy Consumption and Costs .....	15
Five Year Trend – Energy Consumption and Costs .....	16
Table 2 – Energy Consumption and Costs 2008–2009 .....	17
Table 3 – Central Boiler Plant 2008–2009 .....	19
Table 3A – Boiler Performance 2008–2009 .....	19
Table 4 – Electricity Consumption and Costs 2008–2009 .....	20
Table 5 – Water, Sewage, Miscellaneous Utilities, and Costs 2008–2009 .....	21
System Energy, Water, and Sewage Costs 2008–2009 vs. 2007–2008 .....	22
Chart 1. Total Energy Costs .....	22
Chart 2. Energy Costs per sq-ft .....	22
Chart 3. Energy Utilization Index .....	23
Chart 4. Energy Costs per mmBtu .....	23
Chart 5. Total Electric Costs .....	24
Chart 6. Electric Costs per sq-ft .....	24
Chart 7. Electric Costs per kwh .....	25
Chart 8. Total Central Plant Fuel Costs .....	25
Chart 9. Water and Sewage Costs .....	26

Five-Year University Utility Data, Costs, and Illustrations.....	27
Bloomsburg University.....	27
California University.....	28
Cheyney University.....	29
Clarion University .....	30
Clarion University – Venango Campus.....	31
Dixon University Center .....	32
East Stroudsburg University .....	33
Edinboro University .....	34
Indiana University .....	35
Kutztown University .....	36
Lock Haven University.....	37
Lock Haven University – Clearfield Campus.....	38
Mansfield University .....	39
Millersville University .....	40
Shippensburg University.....	41
Slippery Rock University.....	42
West Chester University .....	43
Glossary.....	44



## **A MESSAGE FROM THE DIRECTOR**

To: The Chancellor's Office and PASSHE Universities

The Penn State Facilities Engineering Institute is proud to present this report to assist you in reviewing your facility's historic energy use and costs and in planning for the future. While energy prices dropped in the past year, this is still a time of uncertainty as we look ahead to removal of rate caps on electricity and the possibility of significant taxation on nearly all of our energy sources with cap-and-trade legislation.

This report also provides helpful information for the efficient operation of your facility. The Five Year Trend – Energy Consumption and Costs section compares energy costs and consumption for the combined PASSHE facilities for the past five years. The Five-Year University Utility Data, Costs, and Illustrations section provides tables and graphs to compare these trends for the individual universities. The Services to Individual Universities section includes an historical summary of the engineering and energy services that were provided to each University. Information provided in this report is also available on the PSFEI (Penn State Facilities Engineering Institute) website at <https://fei.psu.edu>.

We sincerely appreciate your cooperation in providing accurate information in a timely manner for this report.

We at PSFEI consider it an honor to have served you, our customers, for the past 62 years. We eagerly anticipate another year of working with you to provide efficient, reliable, cost-effective operation of the PASSHE universities. Our talented, knowledgeable staff is ready to serve your needs and assist you when requested.

Sincerely,

James Myers, P.E., Director  
Penn State Facilities Engineering Institute

## **INTRODUCTION**

This Utility Usage Report includes two major components: a Summary of Services and a review of Utility Usage Data for Fiscal Year 2008–2009. The Summary of Services is a brief description of services, provided both collectively and by individual facility. The Utility Usage Data tables, graphs, and charts identify fuel consumption and energy costs for the past five years. The EUI (Energy Utilization Index), defined as Btu/sq-ft, remains the primary index of a facility's use of all forms of energy relative to the area conditioned. Identification of the EUI and other parameters in this report establish baseline data for past and future measurement and comparison. Additionally, the data reflect a five-year history for student population and a variety of energy, space, water, and sewage information.

PSFEI (Penn State Facilities Engineering Institute) maintains the web-accessible Utility Usage Report data viewer. This data viewer allows individuals, who have permission from PASSHE (Pennsylvania State System of Higher Education) facilities, to see their current utility and central plant energy-consumption data on the internet. The data are displayed at the yearly summary level in the same format as the PSFEI Annual Report. Drilldowns enable the data to be viewed at the monthly level.

PSFEI provided professional and technical services for boiler plant, electrical, HVAC (Heating, Ventilation, and Air Conditioning), water treatment, and energy. These services covered a broad array of completed and continuing projects that have resulted in avoided costs, improved reliability, and increased operating efficiency. A brief description of services to PASSHE universities is presented later in this report. Specific boiler plant and energy data for the fiscal year are also provided.

## **COLLECTIVE SERVICES**

### **Boiler Plant**

Central heating plant services from PSFEI are provided by Wayne Macafee. Wayne specializes in all aspects of boiler plant operations and provides support for a broad range of issues including system troubleshooting, specification document review for capital projects, ESCO (Energy Services Company) project support for central heating plant ECMs (energy conservation measures), and air-quality permitting and reporting. Other related services involve boiler plant control-system assessments, annual training classes, and on-site training when it is requested. Wayne also serves as the PASSHE representative on the Coal Committee.

Support to the DGS (Department of General Services) Coal Committee included the typical activities of coal specification reviews, actions to maintain desired coal quality, attendance at vendor meetings, and assistance in the development of contract language to reflect changes to the program. PSFEI also assisted Procurement and Quality Assurance in establishing the scope of services for a new coal analysis laboratory contract, updated the lab reporting spreadsheet to reflect changes in PCID 1069 (Pennsylvania Commercial Item Description) coal specifications, and provided guidance to the new analysis laboratory on the use of the reporting spreadsheet. PSFEI conducted a study for DGS examining utilization of coal in state facilities. The study concluded that the best way to maintain coal-firing in the Commonwealth is to maintain and upgrade existing plants that utilize reliable, long-lasting technology. An infusion of capital is needed to keep these plants running and make or keep them in compliance. The study also pointed out that, given the lack of engineering expertise in the market and limited industrial capacity, the design for such projects should not go to general selection but that alternative project delivery methods should be strongly considered.

## **Electrical**

Scott McCall and Benjamin (Ben) Bidelspach provided the PSFEI electrical services. Scott concentrated on medium-voltage electrical distribution systems; arc flash and the NFPA (National Fire Protection Association) Standard 70E evaluations; reviewed capital projects; conducted coordination studies; and made recommendations on operations, maintenance, and replacement of electrical equipment. Ben provided infrared surveys and maintenance recommendations as well as specializing in field engineering services including on-site testing and troubleshooting.

Scott coordinated the three-day Electrical Short Course at the Penn Stater Conference Center. The course content included training on electrical market updates and deregulation, general elevator training, frequency drive basics, and protective relays. Ben and Scott taught several sessions during the program.

Ben and Scott conducted five one-day electrical workshops at various locations throughout the Commonwealth. The workshop content was basic frequency drive operation and PLC (programmable logic controller) overview. In addition, they taught several facility-specific workshops on medium-voltage safety, NFPA Standard 70E, and arc flash. Specialized training is provided when requested by the facility.

One ESG (Electrical Services Group) meeting was held during the year. Scott developed and presented hands-on, medium-voltage cable termination training at the meeting. All participants were given classroom training and the components to complete a sample termination.

## **Heating, Ventilation, and Air Conditioning**

Mi A Kim provides HVAC services to the PASSHE universities. He planned, developed, and served as the conference host and as a presenter for the PASSHE Mechanical and Utilities Supervisors Conference held at the Lock Haven University Sieg Conference Center on April 1 and 2, 2009. Mi A also presented an Introduction to Automatic Temperature Control and Building Automation Systems Workshop in five locations across the Commonwealth: Allentown State Hospital, Danville State Hospital, Polk Center, Quehanna Boot Camp, and Torrance Center. These workshops were open to PASSHE universities and several Commonwealth agencies.

Mi A corroborated in the planning and development of the 2008 HVAC Short Course. Mr. Kim also provided a one-day presentation on HVAC Fundamentals at the Effective Facility Management short course. This included basic concepts in refrigeration, thermodynamics, HVAC/IAQ (indoor air quality) controls, and boilers. These short courses are available without charge to PASSHE employees.

In addition, Mr. Kim also provided support to the panel for selecting preferred commissioning contractors. Mi A advised on matters concerning commission processes and procedures to help the panel review the contractor proposals and work through the selection process. He presented a Commissioning Basics Presentation to PASSHE personnel for the Orientation and Training for Commissioning Contracts Conference. The Conference was held at Lock Haven University's Durrwachter Alumni Conference Center.

## **Water Treatment**

Robert (Bob) Bruce provided water treatment and related advisory services to PASSHE. Available services included technical evaluations and advice relative to boiler water, cooling towers, potable water, and wastewater. Bob conducted on-site training presentations as requested. He provided several services common to all universities including review of daily boiler water chemistry logs and review of utility usage data.

Bob prepared the PASSHE 2008–2009 Annual Utility Usage Report. This report provided valuable information for Commonwealth and PASSHE officials, facility directors, managers, and

operations personnel for better planning, budgeting, and operation of PASSHE facilities. The report presents a five-year comparison of utilities for PASSHE facilities, both individually and collectively. These utilities include water, wastewater, electric, natural gas, propane, fuel oil, and coal. The report illustrates energy growth, consumption, and costs and provides detailed usage data by facility and fuel type which enables PSFEI to monitor energy costs and better assist PASSHE facilities during energy procurement events and energy-savings projects.

Bob also developed the 2008-2009 “Green House Gas” and fuel-combustion emissions data for each PASSHE facility. This application was developed for internal information purposes. The data provided represents general emissions data for various direct fuels usage and that consumed by electric utility suppliers. Bob also prepared “Clean Air-Cool Planet” Carbon Calculator requirements for PASSHE facilities that require more detailed carbon footprint data.

## Energy

PSFEI’s Energy Team, consisting of Ken Davidson, Paul Meister, Kurt Homan, Richard Brubaker, Scott Harford, and Devin Pennebaker furnished services vital to PASSHE in the following areas:

- Energy procurement
- Energy database development and management
- Guaranteed Energy Savings Act program support for ESCO services
- Assistance with strategic energy planning
- Energy education
- Energy markets research
- Assistance with utility and supplier issues

### **General Information for Energy**

The PUC (Public Utility Commission) and the Commonwealth’s four largest electric utilities are bracing their customers for rate shock when electric generation rate caps expire. Several utilities have already migrated to market-based rates. Pike Light and Power customers experienced a 70% increase while Penn Power rate hikes ranged 35–55%. All PASSHE universities are served by utilities whose rate caps are scheduled to end within the next two years. The table below lists the remaining utilities, their rate-cap expiration date, and the affected PASSHE universities.

**Generation Rate Caps  
Expiration Status**

Utility	Expiration Date	Universities
PPL	12/31/2009	Bloomsburg, East Stroudsburg, Millersville, Lock Haven
PECO	12/31/2010	Cheyney, West Chester
Met Ed	12/31/2010	Kutztown
Penelec	12/31/2010	Edinboro, Mansfield, Shippensburg, Indiana
Allegheny	12/31/2010	Clarion, California, Slippery Rock

As rate caps expire, ratepayers will pay market-based prices. The three-year average Western Hub PJM Locational Marginal Pricing during the peak daily hours between June and August has been \$119/mW (megawatt). That rate prevented competitive shopping by PASSHE universities in the open marketplace. During spring 2009 PJM West electric wholesale prices were in the \$40 to \$50 per megawatt-hour range. Even with the drop in wholesale electric prices, electric generation charges remain above those set by the rate caps. Thus, all electric accounts remain on tariff with the local EDC (electric distribution company). The five utilities whose rate caps will end within the next two years have predicted possible overall rate increases, currently estimated at 5–40%. When generation rate caps expire, universities should be able to offset some of the anticipated price increases by shopping.

The PUC continues to consider ways to mitigate rate shock and provide adequate generation to meet demand. One example of this is Act 129 which amends the Public Utility Code. Act 129 includes an EE&C (energy efficiency and conservation) program requiring the seven major EDCs in Pennsylvania to adopt a plan that reduces energy demand and consumption within its service territory. Each EDC will hire conservation service providers for program administration and implementation. Current program plans include incentives for energy-efficient equipment upgrades, smart-meter technology, time-of-use rates, real-time pricing plans with conservation components, and alternative energy sources. The costs for this program will be paid by the ratepayers. Each EDC's program is currently being reviewed by the PUC.

The high energy prices that peaked in early July 2008 were driven downward by the economic recession to levels not seen since 2002. Natural gas prices on NYMEX (New York Mercantile Exchange) fell from a forward-month high of almost \$13.60 per dekatherm in July 2008 to a low of approximately \$3.95 per dekatherm in June 2009, a drop of 71%.

### ***Procurement***

In 2008–2009, PSFEI developed a web-based natural gas commodity procurement shopping platform. The platform allows pre-qualified energy commodity suppliers to submit a diverse mix of price and term bids on multiple accounts. The automated system enables the user to easily compare, select, and award contracts then send out award notifications electronically. Ease of use allows suppliers to submit bids and receive award notifications in a short time period, resulting in aggressive price competition. As part of procurement services, PSFEI compiles billing histories, assists suppliers in registering accounts, analyzes tariff information, and follows through on supplier-utility issues.

PASSHE and PSFEI compiled natural gas consumption histories for University accounts and released an RFQ (Request for Quote) in early March 2009. The procurement event resulted in avoided costs of over \$1.1 million when compared to the local utility's tariff prices. Information relative to natural gas purchases and avoided costs are shown in the table on the next page.

## Natural Gas Procurement Summary

University	Account Number	Awarded Supplier	Bid Type	Term Begin	Term End	Bid Price (DTH)	Annual Avoided Costs (Burner Tip)
Clarion	366038005	Compass Energy Gas Services, LLC	Nymex+	7/1/2009	6/30/2011	\$0.47	\$599,183
Edinboro	369969407	Compass Energy Gas Services, LLC	Nymex+	5/1/2009	4/30/2011	\$0.48	\$264,936
Lock Haven	406	PPL EnergyPlus, LLC	Nymex+	1/1/2010	12/31/2012	\$1.46	\$215,171
Lock Haven	7460991	PPL EnergyPlus, LLC	Nymex+	1/1/2010	12/31/2012	\$1.70	\$7,707
Lock Haven	7652530	PPL EnergyPlus, LLC	Nymex+	1/1/2010	12/31/2012	\$1.61	\$25,264
Millersville	317134987507	Compass Energy Gas Services, LLC	Nymex+	11/1/2009	10/31/2010	\$1.38	\$2,320
Millersville	318134136403	Compass Energy Gas Services, LLC	Nymex+	11/1/2009	10/31/2010	\$1.38	\$4,875
Millersville	318134152504	Compass Energy Gas Services, LLC	Nymex+	11/1/2009	10/31/2010	\$1.38	\$4,126
Millersville	318134227508	Compass Energy Gas Services, LLC	Nymex+	11/1/2009	10/31/2010	\$1.38	\$10,884
Millersville	318134458004	Compass Energy Gas Services, LLC	Nymex+	11/1/2009	10/31/2010	\$1.38	\$9,340
<b>Total Avoided Costs</b>							<b>\$1,143,806</b>

### ***Energy Highlights***

The PSFEI energy section focused on the following energy-related initiatives to help PASSHE control costs and improve operational efficiency:

- Attended PUC meetings to keep abreast of energy market trends and regulations which can impact PASSHE interests. Communicated PASSHE concerns on electric rate hikes, wholesale market pricing mechanisms, and other energy issues to the PUC Commissioners and staff.
- Investigated an electric utility's PJM load-response service proposal for two PASSHE universities in Allegheny Power territory. PSFEI recommended enrollment after review and discussions with Allegheny Power on revenue sharing, non-performance penalties, and other terms of the agreement.
- Monitored energy markets and provided consultation on natural-gas hedging strategies to reduce gas commodity price exposure by recommending the locking-in of percentage volumes of total gas loads.
- Began modification of the RFQ document for electric procurement in preparation for an electric procurement event scheduled for October 2009. The document modifications will provide PASSHE with multiple pricing options (i.e. fixed and block and index products).
- Assisted PASSHE clients to prepare for the removal of electric rate caps which will take place January 1, 2010, for PPL Electric clients. Services include the enrollment of large accounts into a utility-sponsored energy auction. Participation in the auction provides a fixed electric pricing option. PSFEI will conduct an electric procurement event scheduled for October 2009. This event should generate lower electric pricing options as compared to the utility-sponsored auction pricing. PSFEI has developed the electric RFQ (Request for Quote) and a web-based platform to conduct the electric procurement event.

- Acquired electric and natural gas billing information to ensure the most competitive prices during procurement events.
- Assisted with estimates for electricity, natural gas, coal, and oil escalation factors for the PASSHE energy projections for upcoming fiscal years.
- Provided natural gas and electric market updates at PASSHE and Directors' meetings.
- Reviewed electric and natural gas bills when available and as needed. Bills were examined for proper rate, demand charges, contract conformance, penalties, and potential tariff savings.
- Provided consultations and recommendations to individual universities on natural gas price-hedging strategies based on market conditions and risk tolerance.

### ***Guaranteed Energy Savings Act***

- The 14 PASSHE universities are currently engaged in the Commonwealth's GESA (Guaranteed Energy Savings Act) Program. The Universities are in various stages of GESA project completion, from IGA (investment grade audit) to repayment phases. PSFEI was involved in all 14 projects, having provided training, technical reviews, and administrative advice and remain in a consultative position to respond to arising issues. Details for PSFEI's services for individual universities pertaining to the GESA Program are further described in the specific university listings with this report.

## EDUCATIONAL SERVICES

PSFEI provided educational opportunities as a valuable service to PASSHE. Multiple-day short courses were held at University Park. One-day workshops were held regionally throughout the Commonwealth as well as for individual universities when requested.

PSFEI reviews its course offerings and revises content and instruction to remain current with PASSHE needs and new developments in technology. Seventy PASSHE staff members improved their engineering, maintenance, and operational skills during fiscal year 2008–2009 at PSFEI’s annual short courses and workshops. An additional 115 staff members attended special workshops planned for specific groups or universities.

### Education Table

University	Short Courses 2008–2009				Workshops 2008–2009			Special Workshops 2008–2009			Total Attendees	
	Boiler	Electric	HVAC	Effective Mgmt.	Boiler	Electric	HVAC	Mechanical Conference	ESG, Other Electrical	Lockout Tagout	Short Courses	Workshops
Bloomsburg						3	2		8	16		29
California							4			64		68
Cheyney												
Clarion		5		1		3		4	1		6	8
Dixon Center		1	1	1					1		3	1
East Stroudsburg	3					2	2				3	4
Edinboro		1				2	2	5			1	9
Indiana				2			4	3			2	7
Kutztown	5	2			6			3	1		7	10
Lock Haven		1	2					1	2		3	3
Mansfield						1			2			3
Millersville				1		2			2		1	4
Shippensburg			1		5				2		1	7
Slippery Rock		1				3					1	3
West Chester				1							1	
<b>Total</b>	<b>8</b>	<b>11</b>	<b>4</b>	<b>6</b>	<b>11</b>	<b>16</b>	<b>14</b>	<b>16</b>	<b>19</b>	<b>80</b>	<b>29</b>	<b>156</b>

## **SERVICES TO INDIVIDUAL UNIVERSITIES**

### **Bloomsburg University**

- Provided ESCO project support services which included visits to the facility in July 2008 to attend an ECM review meeting with Siemens. ECMs for overfire air and an economizer were eliminated. The University elected to internally pursue PSFEI's previous suggestion of installing oxygen/combustibles sensors as an alternative to overfire air. Also, visited the site in April 2009 to review existing steam piping and assist the Utility Plant Supervisor in identifying where new isolation valves should be placed to support installation of the new boilers. We also reviewed the existing steam-flow orifice plates and their suitability for application to the new boilers. PSFEI issued Report MR 08/09–11 to document our findings and recommendations.
- Visited the facility in September and November of 2008 to review ECMs the University is pursuing internally and to discuss technical considerations with the Utility Plant Supervisor.
- Provided input relative to stack testing requirements listed in the University's Title V permit.
- Provided input and assistance in the development of specifications for new soot blowers.
- Reviewed coal sampling history and noted increased ash levels following notification that the University had received a Notice of Violation for opacity. Recommended to the Utility Plant Supervisor that the boilers be cleaned as soon as possible. Also, worked with DGS procurement to obtain commitment from the vendor to provide a lower-ash coal.
- Assisted University staff after they received notification that preliminary reports from the stack-testing company indicated that SO<sub>x</sub> levels were significantly higher than permit limits. We advised waiting until the actual draft report was received and reviewed. Ultimately, the stack testing company determined that they were using the wrong SO<sub>x</sub> permit limit in their database. Use of the correct permit limit eliminated the problem.
- Reviewed the draft stack-test report and noted high stack oxygen and low flue-gas flow for the gas boiler. PSFEI recommended that a burner tune-up be performed.
- Provided a recommendation for a research topic that could be pursued to assist in grant funding for a bio-mass boiler. This was discussed with the Penn State School of Forestry, resulting in the suggestion to study the long-term availability and economics of woody fuels. This topic would be appropriate and valuable to such a project.
- Developed and provided on-site training sessions for facility managers and maintenance personnel on Lockout/Tagout compliance and general medium-voltage safety training.
- Inspected and tested Switch #1 on the Bloomsburg University Upper Campus for loose connections and hot spots. The inspection was completed using an infrared camera. The switch was operating at ambient temperature and appeared to be functioning properly. During the test, two concerns were noted. The results and recommendations were documented in Report ER 08/09–7.
- Installed metering equipment to detect or verify the existence of power-quality abnormalities in the Hartline Building. The results and recommendations were documented in Report ER 08/09–28.
- Investigated the potential for aggregating the 31 small natural gas accounts to promote competitive shopping for gas supply for the University. Held discussions with the local gas utility to ascertain aggregation potential, but tariff constraints do not allow for

aggregation at this time. PSFEI will continue to seek methods to competitively procure natural gas supply for the University.

### **California University**

- Developed and provided on-site training sessions for facility managers and maintenance personnel on Lockout/Tagout compliance and general medium-voltage safety training.
- Provided Arc Flash Compliance Training for newly-hired maintenance managers and personnel as well as for the entire custodial crew. This training included the hazards of arc flash and attendees were given the necessary information to achieve compliance with NFPA 70E. They were also provided with recommendations of the types of PPE (personal protective equipment) that should be available to employees who may be subject to arc flash.
- Met with the Director of the Physical Plant to discuss the new Convocation Center and possible electrical-feed circuits. Recommendations were reported via email in January 2009.
- Provided standard NFPA Level 1/Level 2 generator testing requirements as requested by the Director of the Physical Plant.

### **Cheyney University**

- Assisted with preparation of a wastewater treatment facility project RFP (request for proposal) for design and construction of a new biological nutrient-removal process.

### **Clarion University**

- Provided assistance (document review and recommendations) in the development of specifications for upgraded boiler controls and feedwater pumps. Visited the facility in November 2008 and January 2009 in support of this process. Met with representatives of AutoFlame to discuss their boiler-control system and determine whether it was applicable. The current assessment is that it would be suboptimal due to the requirement for a significant amount of plant monitoring and the inability of the AutoFlame system to properly handle non-boiler information.
- Conducted HiPot cable testing of new medium-voltage cables prior to energizing as requested by the Facilities Planning Engineer. The testing indicated that the cables were suitable for energizing and documentation was completed in Report ER 08/09-2.

### **Dixon University Center**

- Provided a response to the Director of Facilities Operations and Maintenance regarding the electrical cost of operating a proposed dishwasher. The cost of operation was calculated based on the estimated operating hours and current electricity costs
- Assisted in the evaluation of the Emergency Preparedness Plan. In the event of a power loss to the Dixon University Center Complex due to flooding, a back-up location would perform the sensitive information technology services. It was determined that the back-up location would not be affected by flooding since it is served from a PPL substation located out of the flood plain.
- Reviewed ESCO project HVAC plans for Duncan Hall and provided input during discussions with Dixon facility personnel.
- Provided cooling load calculations as well as system configuration and control recommendations for installation of cooling units for the Administrative Building and Duncan Hall server rooms 133 and 125 respectively. Prepared Report HR 08/09-8 as documentation for this information.

## **East Stroudsburg University**

- Responded to a request from the Director of Facilities Management regarding a complete campus electrical outage. The outage was the result of a main power-breaker trip due to a minor component failure on a feeder circuit. This incident emphasized the need to adjust the CTs (current transducers) on the feeder circuits to allow the relays to control the feeder breakers. The proposed recommendations were included in Report ER 09/10–4.
- Provided information and technical advice on the steam-piping installation on an expansion loop for a new installation in a manhole.

## **Edinboro University**

- Discussed changing tap settings to stabilize system voltage in response to a request by University personnel.
- Provided consultation and investigative research for the conceptual use of a natural-gas-fired micro turbine or a combustion-engine electric generator for cogeneration at the Cooper Science Building. PSFEI determined that the differential between anticipated electric rates and fuel costs did not support the use of cogeneration. Additionally, PSFEI did not recommend the cogeneration system in conjunction with the geothermal heat-pump system recently installed for the Cooper Building since the proposed cogeneration contradicts the purpose and value of the geothermal system.

## **Indiana University of Pennsylvania**

- Reviewed a proposal to upgrade controls on the auxiliary boilers using a system from AutoFlame. PSFEI recommended that the University pursue the project on the basis of the potential fuel savings from improved combustion control.
- Discussed changing tap settings to stabilize system voltage at the request of University staff.
- Assisted the University with the interpretation of complex proposals from two natural gas utilities to supply gas to the Kovalchick Convention and Athletic Center. PSFEI presented a detailed comparison of the proposals and made recommendations for follow-up actions including requests for additional information from the two proposers. Based on new information, IUP did not accept either proposal and is currently working with PSFEI to develop a more beneficial gas-supply strategy for this facility.
- Participated in an IUP (Indiana University of Pennsylvania) energy strategy meeting in April 2009. The purpose of the meeting was to discuss comprehensive approaches for electric and natural gas service for the S.W. Jack Cogeneration Plant, the Robertshaw Building, and the Kovalchick Convention and Athletic Center. Discussions covered electric rate-cap expiration consequences, gas-utility tariff structures, and energy commodity shopping as they relate to the aforementioned buildings. This meeting, also attended by PASSHE legal counsel, served as a catalyst for identifying energy challenges and preliminary solutions to those challenges. PSFEI continues to work with IUP on these issues.
- Assisted maintenance personnel with a process-chiller malfunction at the Northpointe Campus. Provided technical advice on troubleshooting the cooling system for the Northpointe Laser Lab served by the process chiller.
- Met with maintenance personnel to discuss options for the Pearce Building chiller replacement. Reviewed vendor specifications for replacement chillers.
- Met with IUP maintenance personnel to discuss the economizer/free cooling for the central chilled water plant and to find solutions to current control problems. Discussion

included housing facility personnel, maintenance personnel, and an engineer from H.F. Lenz Company.

- Assisted IUP in determining options for improving the control of the air handling system for the Weyandt Hall animal research lab and animal rooms. Winter operation and temperature-control options were discussed to improve the air handler performance.

### **Kutztown University**

- Discussed the issue of tube/tubesheet interface leakage in the new gas boilers with University personnel. PSFEI recommended identifying the leaking tubes, hand rolling those tubes identified, and inspecting again after the heating season.
- Provided assistance to increase the protective relay settings to reduce the number of nuisance trips. The recommendations and settings are contained in Report ER 08/09–8.
- Participated in ongoing investigations with Kutztown University facility managers on the most advantageous approach to expand electric service capacity for the University. Consultations included substation location and sizing issues. In response to an offer from Kutztown Borough to serve the University as a sub-customer, PSFEI arranged and attended a meeting with University facility managers and the PUC to discuss electric service from Kutztown Borough. The meeting with the PUC confirmed that the Borough may not be able to provide reliable service (current and future) and maintenance. Further investigation by the University has resulted in a commitment to remain with Met-Ed electric utility and construct a new 69kV substation. The new substation will provide the highest degree of reliability and future electric service growth potential for the University.
- Met with maintenance personnel to address chronic water hammer issues in three steam tunnels. PSFEI's recommendations to correct and prevent recurrence of the problem were presented in Report HR 08/09–7.

### **Lock Haven University**

- Continued to participate in the final stages of the IGA development for the University's GESA project, specifically providing review and commentary of the GESA agreement between the ESCO and the University. PSFEI also attended initial construction meetings to provide consultation on development of pipeline-quality landfill gas via the ESCO.
- Evaluated the Sieg Conference Center long-term site improvement requirements relative to wastewater, water, and the footbridge. Issued Report WR 08/09–2 which established recommendations for wastewater treatment and disposal, water supply and treatment, and restoration of the bridge that crosses Fishing Creek. Cost estimates were also included.
- Assisted with troubleshooting a Carrier Unit air-cooled, condenser-unit compressor issue and also an air-handler system automatic-temperature-control sequencing. Report HR 08/09–1 details the conclusions and recommendations provided to University maintenance personnel. Provided follow-up support as needed.
- Assisted maintenance personnel with troubleshooting the cooling-tower, pump-overload issue. Made repair and replacement recommendations during discussion at the site.

### **Lock Haven – Clearfield Campus**

- Assisted the Director of Facilities Management and Operations regarding a compressor problem with AHU 001 (Air Handling Unit 001) in the Founders Building at the Clearfield Campus. Facility Staff indicated that the installation contractor for the new compressor

recommended suction pressure unloaders and wanted verification that this was acceptable with PSFEI. Due to a lack of sufficient information, PSFEI recommended not installing the unloaders at that time. We made a site visit and provided our recommendations concerning operational and ATC (automatic temperature control) monitoring. Also, during the process of evaluating the system, we verified operating conditions of the equipment and determined that the equipment was running correctly. Our comments and recommendations were provided in Report HR 08/09–1.

### **Mansfield University**

- Provided drinking water treatment facility support to University staff regarding the necessity to upgrade the existing facility in order to meet short and long-term regulatory agency requirements. Discussed upgrade alternatives which included membrane filtration technologies. Provided guidance regarding project and engineering requirements for a membrane filtration drinking water project as part of Report WR 08/09–6.
- Prepared Report HR 08/09–9 in response to a priority project for replacing underground steam and condensate lines that had significant failure of the protective covering and insulation.
- Reviewed ESCO plans and specifications for Steadman Hall, Brooks Hall, Maple Hall, and Decker Hall. Discussed concerns and discrepancies with Mansfield maintenance personnel. PSFEI is providing ongoing support and technical advisory services.

### **Millersville University**

- Provided ongoing support to the University regarding Millersville Borough’s wastewater surcharge policy and practice. Attended meetings between University and Borough representatives and provided recommendations for resolution in a “fair and reasonable” manner.
- Prepared a report on a six-month extensive pollutant data-collection effort and the impact of the data on wastewater surcharges with mixed flow (weighted average) calculations.
- Participated in several meetings with Millersville University and Millersville Borough regarding sewer surcharge alternatives and presentation of wastewater surcharge proposals.
- Provided assistance in determining data-center cooling alternatives for the Boyer Building Data Center and addressing current and future cooling needs.
- Recommended retrofitting a cooling system for the Pucillo Gymnasium storeroom located on the second level. Various alternatives were also discussed on how to provide comfort cooling for use as a classroom.
- Participated in a meeting with the commissioning contractor as an advisor on behalf of Millersville University.

### **Shippensburg University**

- Conducted an independent analysis and reviewed a study done by Entech Engineers regarding central plant systems at Shippensburg University. Entech recommended replacing the central coal-fired steam plant with a gas-fired hot water plant and electric central-chiller plant. PSFEI recommended that consideration be given to keeping the existing plant and investing approximately \$4 million in the plant on pollution control equipment and other plant improvements. This maintains a valuable capital asset and keeps operating costs down with the use of coal. This work included attending a

meeting on-site with Entech and the Shippensburg Administration, a subsequent on-site investigation, and research into costs and possible alternatives.

- Provided an estimate for the complete replacement of the electrical gear, wiring, and backup generator for the campus boiler plant in response to a request from the Assistant Director for Energy Management.
- Recommended standard voltages that should be used for the upgrade to the Huber Building. This information was provided in response to a request from the Associate Director of Facilities Maintenance and Operations. Recommendations were presented in Report ER 08/09–11.
- Provided assistance and recommendations to the Electrical Foreman regarding the evaluation of the Heiges Fieldhouse 600-volt switchgear. The recommendations are contained in Report ER 08/09–19.
- Prepared several wastewater surcharge calculation scenarios to incorporate “revised” surcharge fees for various pollutants and determined the most cost-effective method for the University to pursue. Recommended the University pursue separate surcharge calculations for each meter source (discharge). Participated in extensive discussions with staff and legal counsel regarding this concept and attended meetings, as requested.
- Prepared Report HR 08/09–4 for the Franklin Science Building chiller system. This report details recommendations for upgrades to the chilled-water system for better operational sequences and energy savings.

### **Slippery Rock University**

- Participated on the team dealing with Boiler #1 stack-test failure and Notice of Violations from the USEPA and PADEP. These services provided by PSFEI included provision of technical support in preparation for retesting of Boiler #1. Also provided review and comment on draft letters to the USEPA and on the proposed consent decree provided by the USEPA.
- Visited the facility in November 2008 to conduct base-load testing on Boiler #1. PSFEI issued Report MR 08/09–6 to document the results of the test. In summary, base loading would not remove opacity issues during ash-dumping and soot-blowing events. PSFEI recommended that the University pursue installation of a baghouse.
- Assisted the University and DGS in locating engineering firms experienced in the design of baghouses and in developing the project scope and AE (architectural engineer) qualifications document. In addition, PSFEI held discussions with the AE regarding the baghouse design, filter bag thermal protection methods, and dual induced-draft fans.
- Assisted the University in the Title V permit-renewal process including review and comment on the initial draft permit. These services included review and comment on the initial draft permit. PSFEI issued comments in Report MR 08/09–5.
- Provided review of the Revision 2 Draft Permit and obtained the original plan approval application package that PADEP continued to reference as reasons not to change certain items. Several items were identified as being misinterpreted, including the requirement for gas-burner excess air. The requirement in the permit could not physically be met over the entire range of burner operation nor could it be verified by measurement. PSFEI assisted the University in developing a follow-up comment letter to PADEP.
- Provided Arc Flash Compliance Training for newly-hired maintenance personnel at the request of the Director of Maintenance Services. The personnel have been trained on the hazards of arc flash and given the necessary tools to achieve compliance with NFPA

70E. PSFEI also provided recommendations on the types of PPE that should be available to the affected workers.

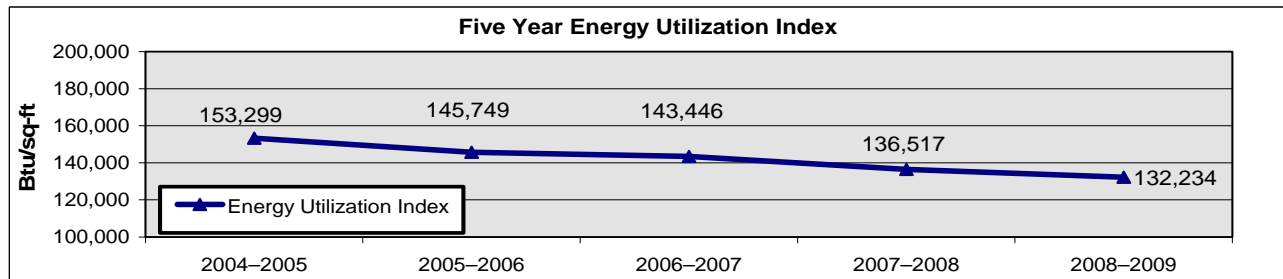
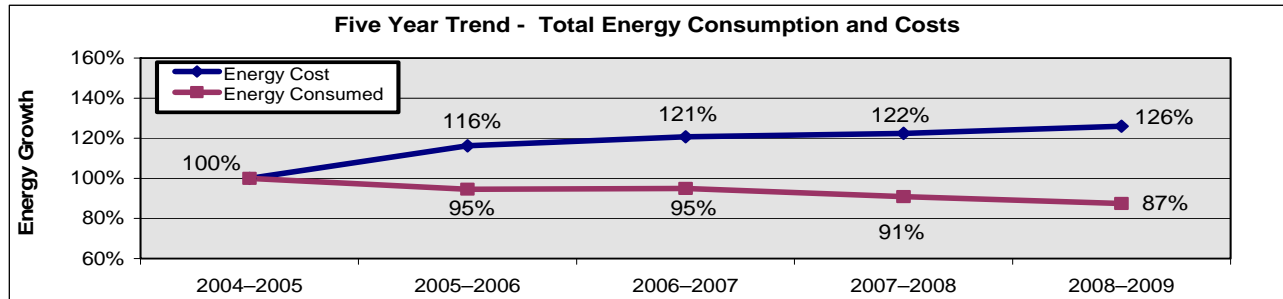
- Reviewed and approved the load-shedding calculations completed by the Director of Maintenance Services.
- Reviewed and provided comments on final IGA development and the GESA agreement for the University's GESA project including measurement and verification of ECMs, contract financial bonding, emissions reporting requirements, and contract administration.
- Provided technical support for laboratory hood safety and procedure for maintenance personnel. Discussed benchmarking with Penn State University and provided documentation for guidance in formulating a documented procedure for University personnel.
- Facilitated two visible emissions training sessions for Slippery Rock University personnel to be certified as part of the regulatory requirements for operating the central boiler plant. The training is administered through PSFEI and was conducted by the Penn State College of Engineering.

### **West Chester University**

- Continued to provide assistance related to failed stack testing for particulates on Boilers #3 and #4. Testing in the stack versus in-the-breeching lowered the emission levels detected but Boilers #3 and #4 still failed. Boiler #1 was able to be tested for the first time and passed.
- Made facility visits in July 2008 as well as February and March 2009 to attend meetings (including one with PADEP) and examine boiler systems for potential sources of tramp air. PSFEI recommended that boiler outlet oxygen levels and temperatures be obtained during the March/April stack testing to compare them to levels in the stack.
- Reviewed stack-test data and performed a comparative analysis that indicated stack-flow measurement may have provided incorrect information. One last testing set will be completed in fiscal year 2009–10.
- Assisted in Title V permit-renewal process including review and comments on draft permits. PSFEI also developed proposed methodology for calculating lbs/mmbtu emission rates as required in the permit and submitted it to PADEP for evaluation and approval.
- Assisted with a DGS-led effort to develop participation in the PJM curtailment program using a CSP (curtailment service provider). PSFEI was a key contributor in developing the Commonwealth's initial approach, contributed to and reviewed the RFP, served on the Selection Committee for a CSP, and suggested West Chester as a participant in the pilot phase.

# SYSTEM UTILITY DATA, RELATED COSTS, AND ILLUSTRATIONS

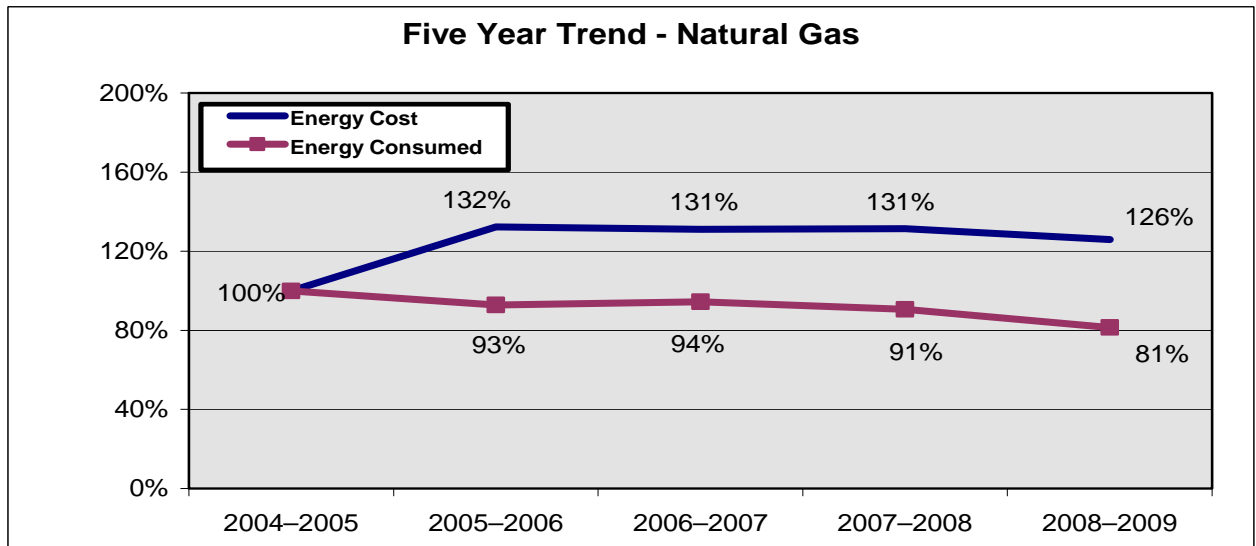
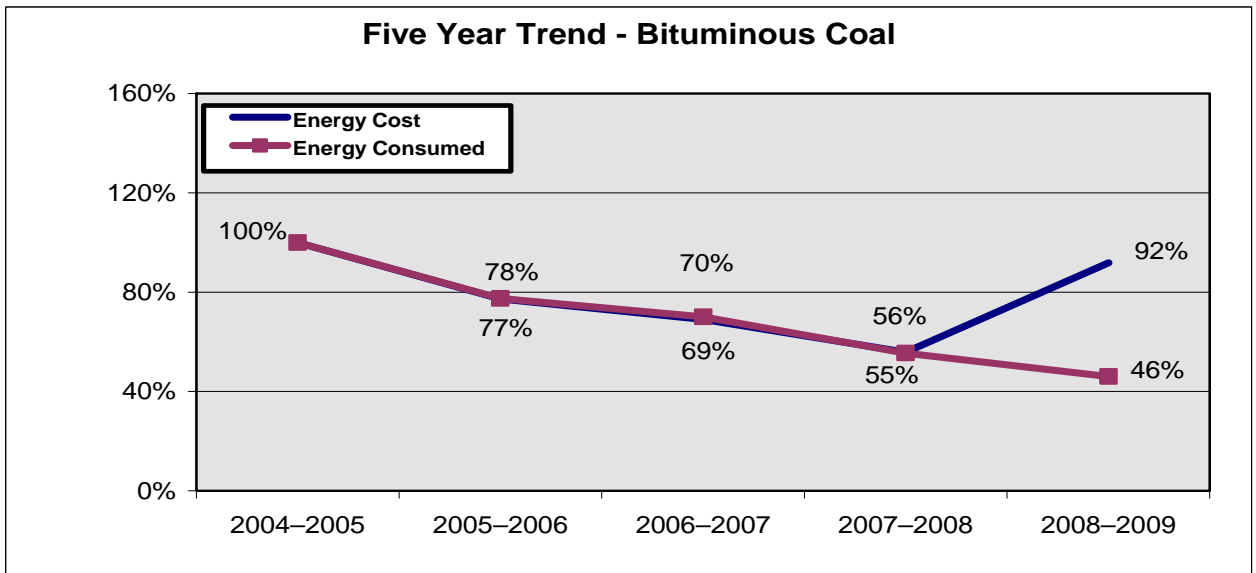
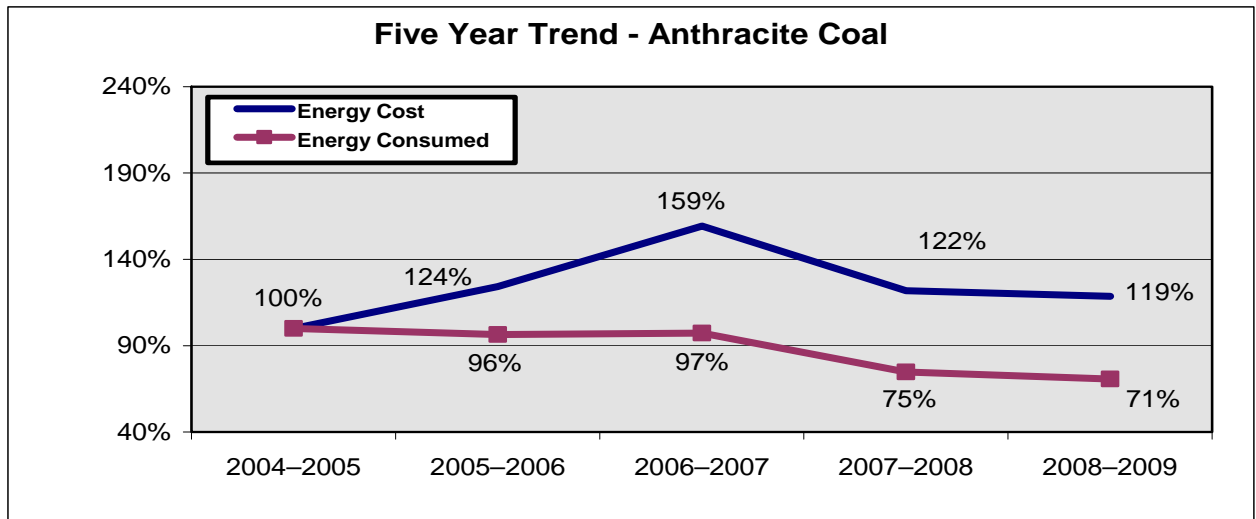
## Table 1 – System Fuel and Energy Consumption and Costs



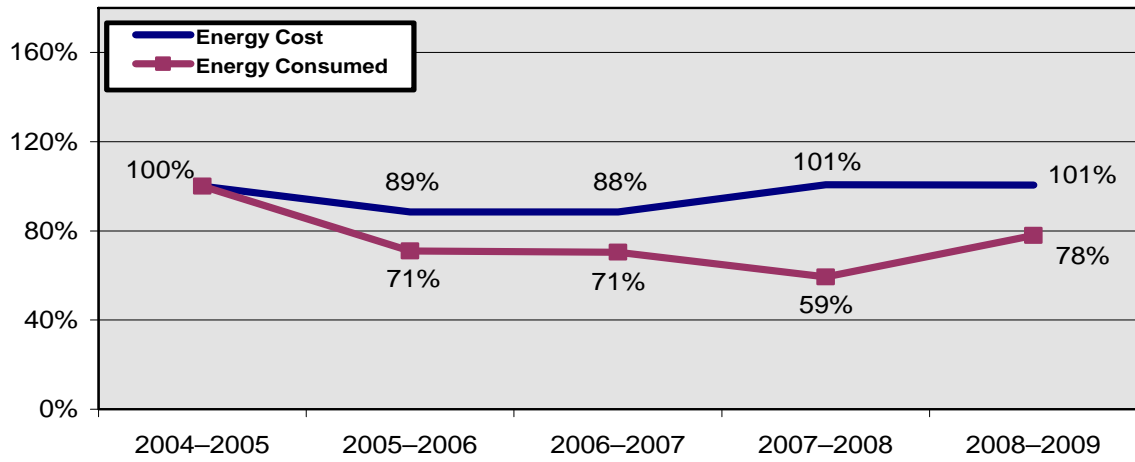
**Table 1**  
**System Fuel and Energy Consumption and Costs**  
**Pennsylvania State System of Higher Education**  
**Five Year Comparison: 2004-2005 to 2008-2009**

	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	28,136	27,106	27,370	21,026	19,857
Bituminous Coal	tons	7,807	6,051	5,467	4,331	3,595
Gas	mcf	1,874,041	1,738,556	1,768,944	1,698,906	1,526,955
Oil	gal	524,564	372,406	369,874	311,018	408,843
Electric	kwh	325,196,185	329,560,366	327,178,540	358,854,793	380,431,936
<b>Energy Costs</b>						
Anthracite Coal	\$	\$ 2,613,494	\$ 3,245,190	\$ 4,160,872	\$ 3,181,489	\$ 3,097,361
Bituminous Coal	\$	\$ 671,005	\$ 518,331	\$ 463,248	\$ 374,421	\$ 616,331
Gas	\$	\$ 13,939,630	\$ 18,451,279	\$ 18,271,162	\$ 18,325,135	\$ 17,549,666
Oil	\$	\$ 814,588	\$ 721,302	\$ 720,592	\$ 820,311	\$ 819,772
Electric	\$	\$ 19,586,927	\$ 20,784,314	\$ 21,795,526	\$ 23,352,624	\$ 25,341,623
<b>Total</b>	<b>\$</b>	<b>\$ 37,625,644</b>	<b>\$ 43,720,416</b>	<b>\$ 45,411,400</b>	<b>\$ 46,053,980</b>	<b>\$ 47,424,753</b>
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	711,059	685,128	691,886	531,862	502,132
Bituminous Coal	mmBtu	207,666	160,957	145,422	115,204	95,627
Gas	mmBtu	1,911,522	1,773,326	1,804,326	1,732,884	1,557,494
Oil	mmBtu	73,439	52,137	51,782	43,543	57,238
Electric	mmBtu	1,109,895	1,124,787	1,116,658	1,224,771	1,298,413
<b>Total</b>	<b>mmBtu</b>	<b>4,013,581</b>	<b>3,796,335</b>	<b>3,810,074</b>	<b>3,648,264</b>	<b>3,510,905</b>
<b>Energy Utilization Index</b>	<b>Btu/sq-ft</b>	<b>153,299</b>	<b>145,749</b>	<b>143,446</b>	<b>136,517</b>	<b>132,234</b>
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	\$ 92.89	\$ 119.72	\$ 152.02	\$ 151.31	\$ 155.98
Bituminous Coal	\$/ton	\$ 85.95	\$ 85.66	\$ 84.74	\$ 86.45	\$ 171.44
Gas	\$/mcf	\$ 8.77	\$ 10.61	\$ 10.33	\$ 10.79	\$ 11.49
Oil	\$/gal	\$ 1.64	\$ 1.94	\$ 1.95	\$ 2.64	\$ 2.01
Electric	cts/kwh	6.02 ¢	6.31 ¢	6.66 ¢	6.51 ¢	6.66 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	\$ 3.68	\$ 4.74	\$ 6.01	\$ 5.98	\$ 6.17
Bituminous Coal	\$/mmBtu	\$ 3.23	\$ 3.22	\$ 3.19	\$ 3.25	\$ 6.45
Gas	\$/mmBtu	\$ 7.29	\$ 10.40	\$ 10.13	\$ 10.57	\$ 11.27
Oil	\$/mmBtu	\$ 11.09	\$ 13.83	\$ 13.92	\$ 18.84	\$ 14.32
Electric	\$/mmBtu	\$ 17.65	\$ 18.48	\$ 19.52	\$ 19.07	\$ 19.52
<b>Weighted Average</b>	<b>\$/mmBtu</b>	<b>\$ 9.37</b>	<b>\$ 11.52</b>	<b>\$ 11.92</b>	<b>\$ 12.62</b>	<b>\$ 13.51</b>

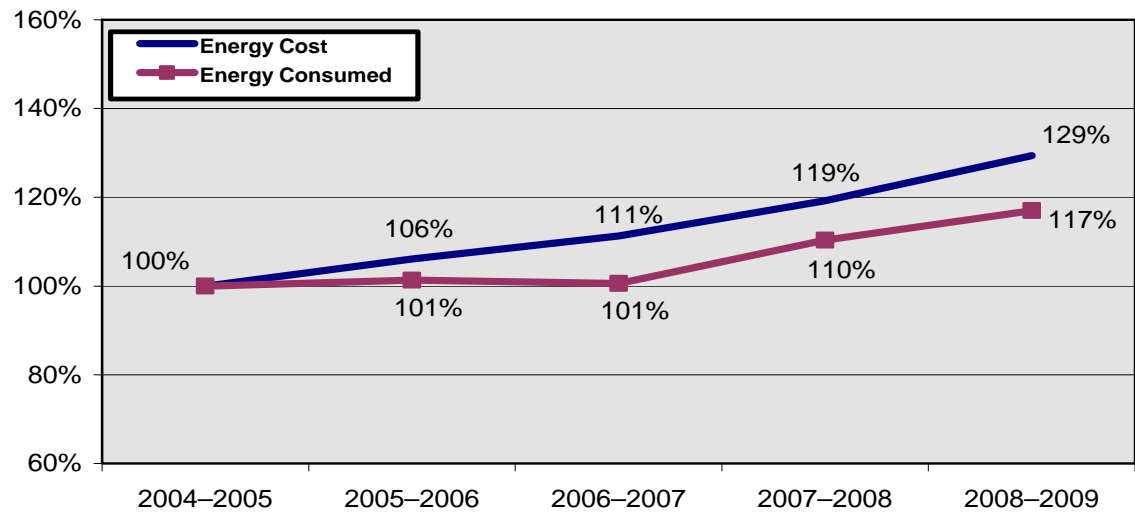
## Five Year Trend – Energy Consumption and Costs



**Five Year Trend - Fuel Oil**



**Five Year Trend - Electricity**



**Table 2 – Energy Consumption and Costs 2008–2009**  
**Pennsylvania State System of Higher Education**

	Energy Sources Utilized					Total Energy	Total Energy Cost	Unit Energy Cost	Total Building Area	Energy Utilization Index
	Anthracite Coal	Bituminous Coal	Gas	Oil	Electric	(mmBtu)	(\$)	(\$/mmBtu)	(sq-ft)	(Btu/sq-ft)
Bloomsburg Lower	x		x		x	312,745	\$3,305,006	\$10.57	1,739,450	179,796
Bloomsburg Upper					x	18,496	\$393,286	\$21.26	295,576	62,577
California			x		x	106,946	\$1,734,066	\$16.21	1,658,269	64,492
Cheyney			x		x	174,685	\$2,224,338	\$12.73	1,003,099	174,146
Clarion			x		x	227,457	\$2,628,642	\$11.56	1,382,686	164,504
Clarion-Venango			x		x	9,651	\$182,460	\$18.91	82,037	117,641
Dixon Center			x		x	13,950	\$269,357	\$19.31	145,734	95,724
East Stroudsburg			x	x	x	224,388	\$3,123,854	\$13.92	1,613,490	139,070
Edinboro			x		x	223,833	\$3,328,950	\$14.87	1,769,688	126,482
Indiana (1)			x	x	x	481,485	\$6,496,686	\$13.49	2,673,968	180,064
Kutztown			x	x	x	280,972	\$4,672,584	\$16.63	2,403,728	116,890
Lock Haven			x	x	x	148,777	\$2,280,603	\$15.33	1,557,462	95,525
Lock Haven Clearfield			x		x	5,006	\$90,472	\$18.07	49,164	101,820
Mansfield			x		x	159,367	\$1,947,105	\$12.22	1,265,991	125,883
Millersville			x	x	x	183,341	\$3,273,191	\$17.85	1,978,189	92,681
Shippensburg	x		x		x	281,473	\$2,843,649	\$10.10	2,087,130	134,861
Slippery Rock		x	x		x	304,547	\$3,291,264	\$10.81	2,270,589	134,127
West Chester	x		x	x	x	353,782	\$5,339,240	\$15.09	2,574,367	137,425
Total						3,510,904	\$47,424,753		26,550,617	
Weighted Average								\$13.51		132,234

(1) Includes energy used to fulfill campus energy needs but not electric energy sales to Penelec.

**Table 3 – Central Boiler Plant 2008–2009**  
**Pennsylvania State System of Higher Education**

	Makeup %	Heating Degree Days	Peak Steam Demand (lbs/hr)	Fuel Cost	Operation & Maintenance Cost	Total Operation Cost	Unit Cost Total Operation (\$/mlb)	Unit Cost Total Operation (\$/mmBtu)	Average Plant Efficiency
Bloomsburg Lower	6%	5,670	41,000	\$1,277,672	\$659,275	\$1,936,947	\$15.75	\$9.53	61%
California	21%	5,746	9,300	\$256,694	\$218,490	\$475,184	\$26.22	\$19.92	76%
Cheyney	81%	4,681	28,000	\$1,046,729	\$702,505	\$1,749,234	\$20.19	\$14.52	72%
Clarion	4%	5,711	35,250	\$1,608,422	\$313,804	\$1,922,226	\$15.18	\$12.07	79%
Dixon Center	---	5,435	---	\$128,729	---	\$128,729	---	\$15.45	---
East Stroudsburg	9%	5,552	42,000	\$1,463,509	\$321,686	\$1,785,195	\$16.38	\$13.29	81%
Indiana (1)	40%	6,176	47,444	\$3,495,010	\$1,187,333	\$4,682,343	\$19.57	\$15.30	78%
Kutztown	12%	5,259	48,000	\$1,552,660	\$376,242	\$1,928,902	\$18.31	\$15.21	83%
Lock Haven (2)	---	5,851	---	---	\$90,650	\$90,650	---	---	---
Lock Haven Clearfield (2)	---	---	---	---	\$45,325	\$45,325	---	---	---
Mansfield	15%	7,201	25,000	\$898,620	\$408,556	\$1,307,177	\$18.72	\$13.68	73%
Shippensburg	23%	5,306	55,600	\$1,294,515	\$556,666	\$1,851,182	\$16.83	\$9.82	58%
Slippery Rock	50%	6,133	55,000	\$1,665,955	\$602,823	\$2,268,778	\$15.47	\$11.52	74%
West Chester	27%	4,712	46,500	\$1,285,766	\$1,052,372	\$2,338,138	\$20.52	\$14.14	69%
<b>Total</b>				\$15,974,282	\$6,535,726	\$22,510,008			

(1) Fuel cost associated with steam production for campus only. Income from electric sales to Penelec is not deducted from O&M.

(2) O&M costs for Lock Haven represent decentralized boilers.

**Table 3A – Boiler Performance 2008–2009**  
**Pennsylvania State System of Higher Education**

	Fuel Type	Number of Boilers	Steam Capacity (lbs/hr)	Steam Generated (mlbs)	Fuel Consumed		Central Plant		
					Fuel Consumed	Fuel Consumed (mmBtu)	Central Plant Fuel Cost	Central Plant Fuel Cost (\$/mlb)	Boiler Efficiency
Bloomsburg	Anthracite Coal	5	71,000	119,769	7,832 tons	198,150	\$1,213,113	\$10.13	60%
	Gas	1	17,250	3,241	5,038 mcf	5,139	\$64,559	\$19.92	63%
California	Gas	3	45,000	18,124	23,387 mcf	23,855	\$256,694	\$14.16	76%
Cheyney	Gas	3	98,000	86,645	118,141 mcf	120,504	\$1,046,729	\$12.08	72%
Clarion	Gas	3	70,000	126,619	156,152 mcf	159,275	\$1,608,422	\$12.70	79%
Dixon Center (1)	Gas	3	---	---	8,170 mcf	8,333	\$128,729	---	---
East Stroudsburg (2)	Gas	4	95,000	108,747	131,424 mcf	134,052	\$1,463,509	\$13.46	81%
	Oil			213	1,854 gal	260	\$0	\$0.00	82%
Indiana (3)	Gas	3	92,000	268,354	33,949 mcf	340,628	\$3,880,930	\$11.39	79%
	Cogen-Gas	4	44,000	2,986	5,939 mcf	6,057	\$63,103	\$10.42	49%
	Cogen-Oil			242	3,590 gal	503	\$8,372	\$16.66	48%
Kutztown	Gas	2	46,000	103,863	123,288 mcf	125,754	\$1,522,376	\$14.66	83%
Mansfield	Gas	3	64,000	69,835	93,707 mcf	95,581	\$898,620	\$12.87	73%
Shippensburg	Anthracite Coal	4	83,335	106,258	7,268 tons	183,154	\$1,243,719	\$11.70	58%
	Gas	1	15,997	3,759	5,191 mcf	5,295	\$50,796	\$13.51	71%
Slippery Rock	Bituminous Coal	3	120,000	71,527	3,595 tons	95,627	\$616,331	\$8.62	75%
	Gas	1		75,155	99,290 mcf	101,276	\$1,049,624	\$13.97	74%
West Chester	Anthracite Coal	3	53,000	82,539	4,757 tons	120,828	\$640,529	\$7.76	68%
	Oil	2	40,000	31,399	317,859 gal	44,500	\$645,237	\$20.55	71%

(1) No steam produced.

(2) Oil purchased in prior fiscal year.

(3) Includes FIUP (Foundation of Indiana University of Pennsylvania).

**Table 4 – Electricity Consumption and Costs 2008–2009  
Pennsylvania State System of Higher Education**

	Total Building Area (sq-ft)	Heating Degree Days	Cooling Degree Days	Electricity Consumed (kwh)	Electricity Consumed (kwh/sq-ft)	Peak Demand (KW)	Peak Demand (W/sqft)	Load Factor	Electric Cost (cts/kwh)	Total Electric Cost	Electric Cost (\$/sq-ft)
Bloomsburg Lower	1,739,450	5,670	659	24,574,972	14.1	8,123	4.7	0.62	6.87	\$1,687,082	\$0.97
Bloomsburg Upper	295,576			5,419,388	18.3	1,700	5.8	0.49	7.26	\$393,286	\$1.33
California	1,658,269	5,746	672	22,636,589	13.7	5,165	3.1	0.62	6.18	\$1,399,209	\$0.84
Cheyney	1,003,099	4,681	1,124	11,663,587	11.6	2,123	2.1	0.74	8.39	\$979,104	\$0.98
Clarion	1,382,686	5,711	419	18,016,756	13.0	3,776	2.7	0.68	5.10	\$918,305	\$0.66
Clarion-Venango	82,037			1,573,680	19.2	444	5.4	0.52	8.11	\$127,625	\$1.56
Dixon Center	145,734	5,435	1,202	1,645,700	11.3	492	3.4	0.50	8.55	\$140,628	\$0.96
East Stroudsburg	1,613,490	5,552	860	20,133,600	12.5	4,536	2.8	0.64	6.76	\$1,360,397	\$0.84
Edinboro	1,769,688	6,770	370	38,872,172	22.0	8,808	5.0	0.68	5.87	\$2,282,364	\$1.29
Indiana - Gross (1)	3,373,085	6,176	464	48,630,186	14.4	8,328	---	---	6.50	\$3,163,265	\$0.94
Indiana - Net (2)	2,673,968			41,201,733	15.4	---	---	---	6.24	\$2,570,765	\$0.96
Kutztown	2,403,728	5,259	1,339	34,417,134	14.3	8,143	3.4	0.67	7.70	\$2,648,483	\$1.10
Lock Haven	1,557,462	5,851	669	14,816,006	9.5	3,347	2.1	0.60	7.15	\$1,058,682	\$0.68
Lock Haven Clearfield	49,164			599,690	12.2	235	4.8	0.40	8.29	\$49,711	\$1.01
Mansfield	1,265,991	7,201	297	15,403,492	12.2	3,199	2.5	0.75	6.07	\$934,293	\$0.74
Millersville	1,978,189	5,197	981	44,865,446	22.7	10,724	5.4	0.65	6.39	\$2,867,919	\$1.45
Shippensburg	2,087,130	5,306	1,077	22,348,499	10.7	5,032	2.4	0.67	6.14	\$1,373,004	\$0.66
Slippery Rock	2,270,589	6,133	667	27,106,413	11.9	6,050	2.7	0.63	5.25	\$1,422,843	\$0.63
West Chester	2,574,367	4,712	1,274	37,575,268	14.6	6,569	2.6	0.80	8.57	\$3,221,516	\$1.25
Total (3)	26,550,617	85,400	12,074	382,870,125						\$25,435,216	
Weighted Average					14.4			0.63	6.64		\$0.96

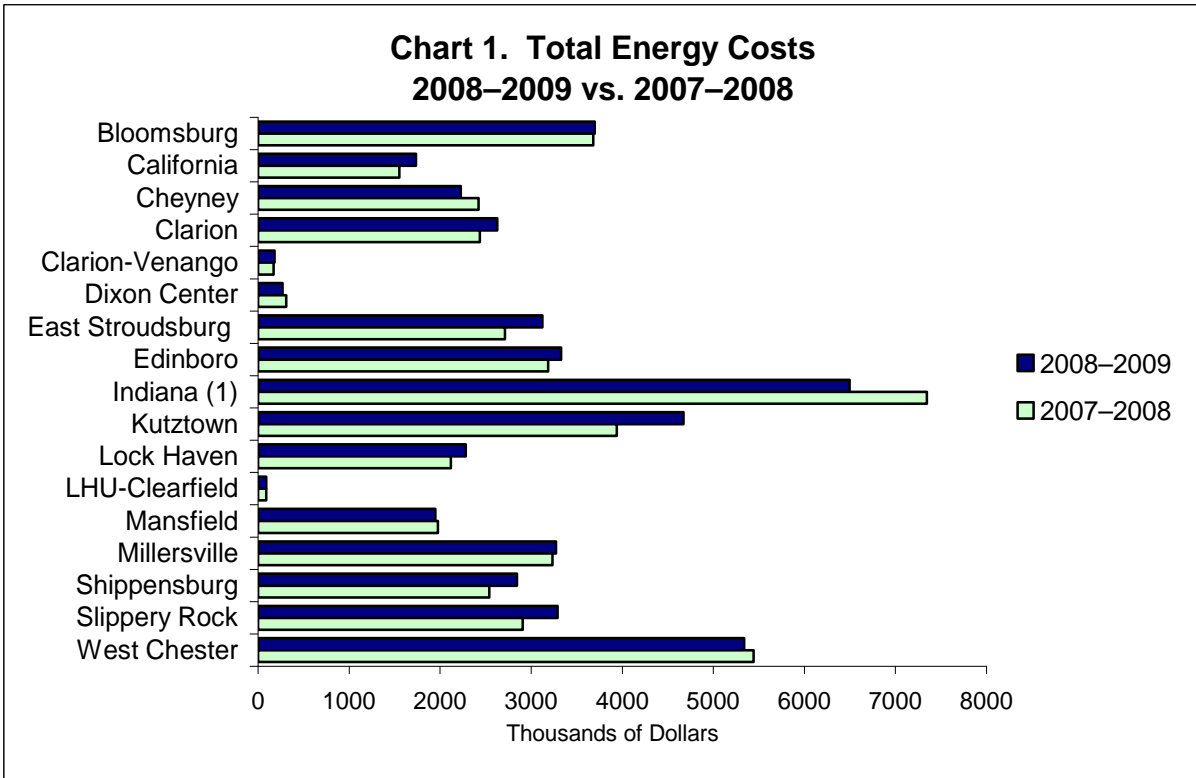
- (1) IUP "Gross" data includes all co-generation electricity production and that purchased from Penelec and redistributed to campus and FIUP.
- (2) IUP "Net" data includes electric produced by co-generation that was consumed by campus and also all electricity purchased from Penelec and redistributed to campus excluding FIUP.
- (3) All data includes kwh and lighting costs, when provided.

**Table 5 – Water, Sewage, Miscellaneous Utilities, and Costs 2008–2009  
Pennsylvania State System of Higher Education**

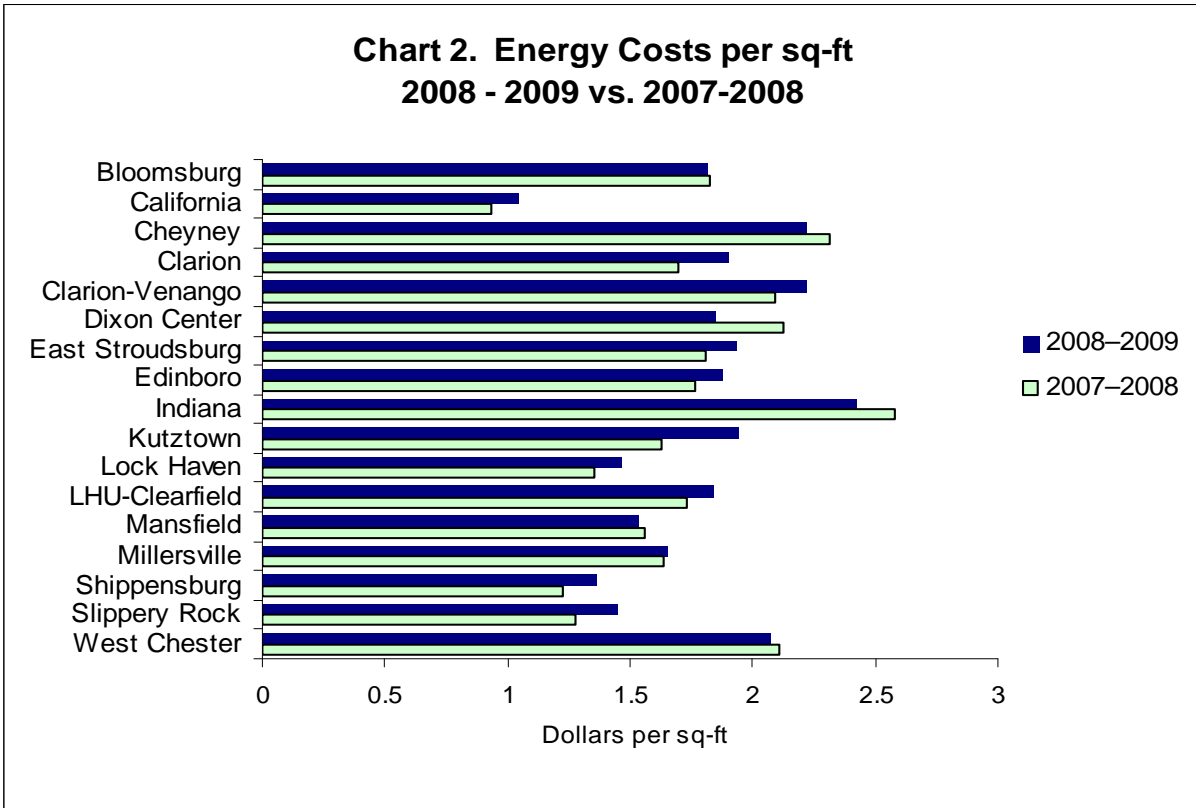
	Water (mgal)	Water Cost	Water Cost (\$/mgal)	Sewage (mgal)	Sewage Cost	Sewage Cost (\$/mgal)	Misc Gas (mcf)	Misc Gas Cost	Misc Gas (\$/mcf)	Misc Oil (gal)	Misc Oil Cost	Misc Oil (\$/gal)
Bloomsburg (1)	120,883	\$431,114	\$ 3.57	---	\$262,695	---	25,081	\$340,252	\$ 13.57	---	---	---
California	48,877	\$294,914	\$ 6.03	---	\$814,000	---	5,718	\$78,163	\$ 13.67	---	---	---
Cheyney	49,738	\$142,038	\$ 2.86	28,540	\$69,796	\$ 2.45	14,092	\$198,505	\$ 14.09	---	---	---
Clarion	48,659	\$288,471	\$ 5.93	47,667	\$179,458	\$ 3.76	6,560	\$101,915	\$ 15.54	---	---	---
Clarion-Venango	512	\$1,988	\$ 3.88	500	\$1,470	\$ 2.94	4,196	\$54,835	\$ 13.07	---	---	---
Dixon Center	2,286	\$28,423	\$ 12.43	---	\$9,278	---	---	---	---	---	---	---
East Stroudsburg	25,036	\$77,556	\$ 3.10	---	\$74,823	---	20,131	\$288,086	\$ 14.31	5,909	\$11,862	\$ 2.01
Edinboro	68,000	\$234,877	\$ 3.45	---	\$433,777	---	89,375	\$1,046,586	\$ 11.71	---	---	---
Indiana	48,600	\$402,804	\$ 8.29	48,600	\$552,869	\$ 11.38	24,940	\$353,895	\$ 14.19	---	---	---
Kutztown	143,317	\$669,530	\$ 4.67	143,657	\$990,130	\$ 6.89	34,215	\$449,941	\$ 13.15	12,810	\$21,500	\$ 1.68
Lock Haven	48,701	\$66,791	\$ 1.37	48,783	\$136,360	\$ 2.80	95,860	\$1,216,434	\$ 12.69	3,093	\$5,487	\$ 1.77
Lock Haven Clearfield	164	\$2,827	\$ 17.24	164	\$1,964	\$ 11.98	2,901	\$40,761	\$ 14.05	---	---	---
Mansfield	25,353	\$64,392	\$ 2.54	---	\$168,500	---	10,994	\$114,192	\$ 10.39	---	---	---
Millersville	65,778	\$103,563	\$ 1.57	71,664	\$390,070	\$ 5.44	24,903	\$345,790	\$ 13.89	34,390	\$59,482	\$ 1.73
Shippensburg	72,032	\$294,827	\$ 4.09	36,794	\$134,828	\$ 3.66	16,421	\$176,130	\$ 10.73	---	---	---
Slippery Rock	60,184	\$181,944	\$ 3.02	---	\$210,916	---	14,833	\$202,466	\$ 13.65	---	---	---
West Chester	60,450	\$561,948	\$ 9.30	40,648	\$238,187	\$ 5.86	57,764	\$814,974	\$ 14.11	9,219	\$16,984	\$ 1.84
Total	888,570	\$3,848,007		467,017	\$4,669,121		447,984	\$5,822,924		65,421	\$115,315	
Weighted Average			\$ 4.33			\$ 10.00			\$ 13.00			\$ 1.76

(1) Bloomsburg Lower and Upper Campuses are combined.

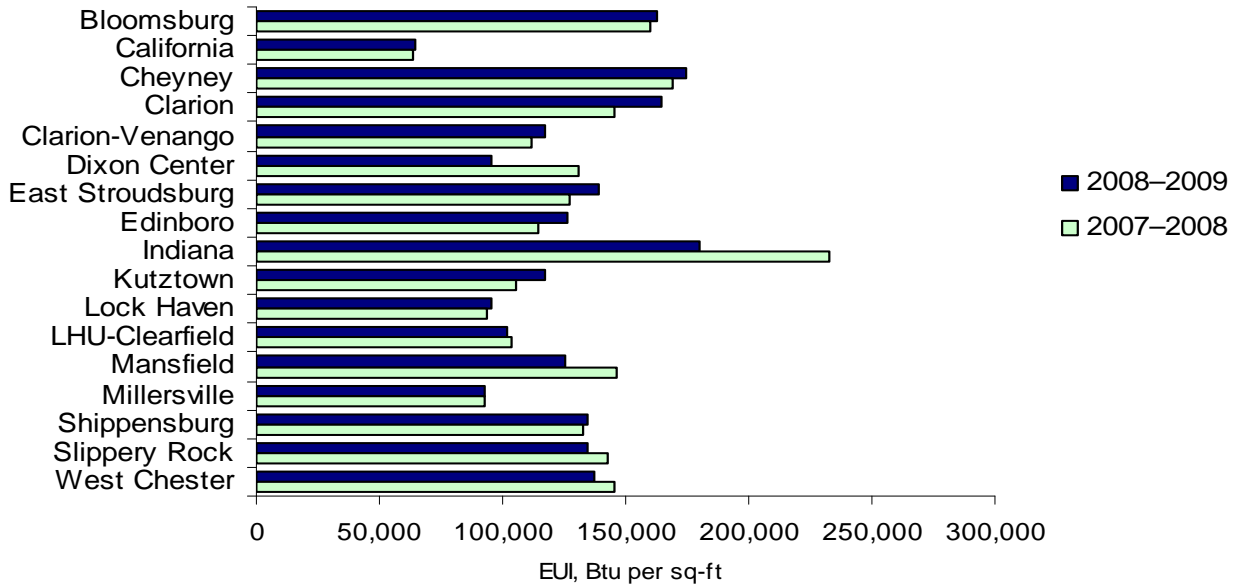
# System Energy, Water, and Sewage Costs 2008–2009 vs. 2007–2008



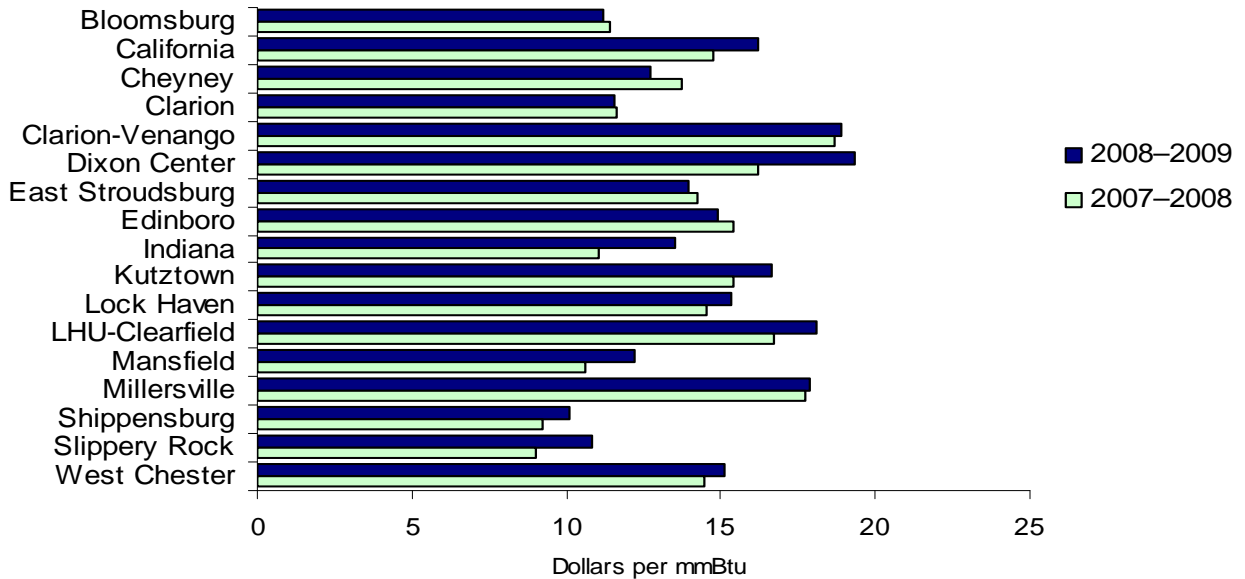
(1) Data reflect campus requirements only, except as noted. This note also applies to Charts 2 through 9.

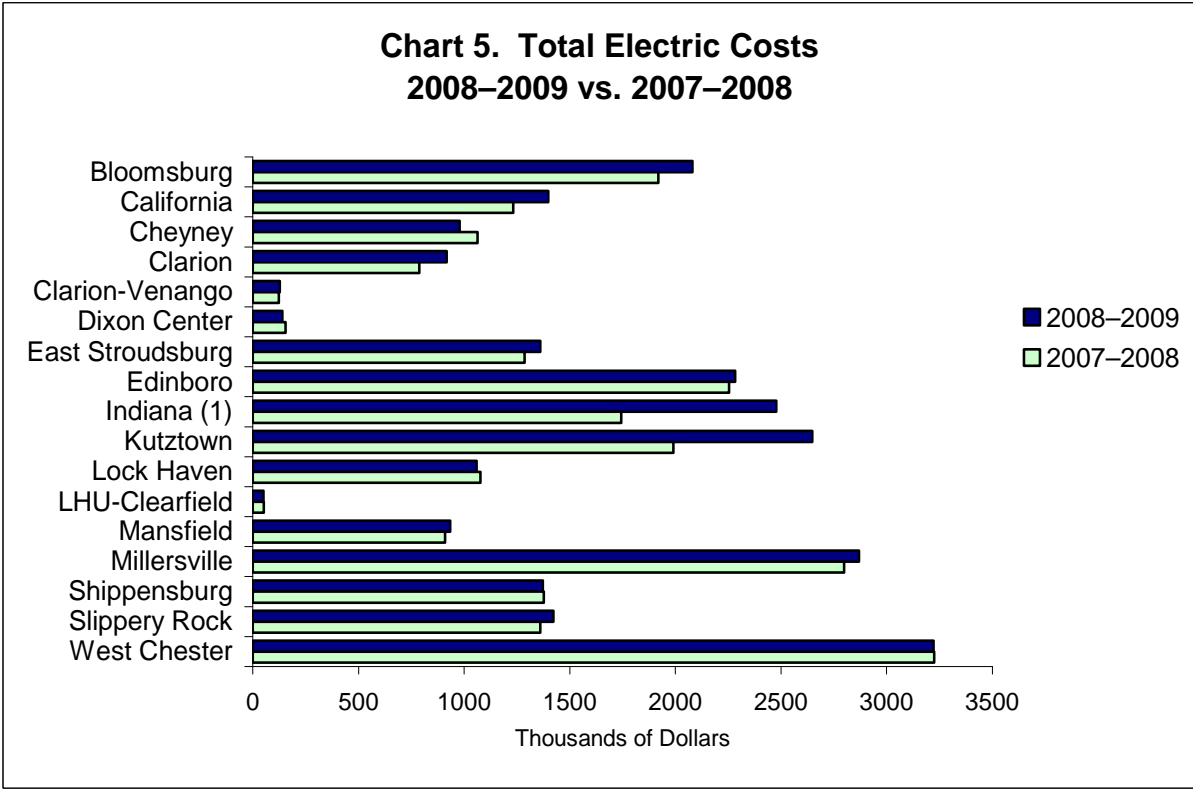


**Chart 3. Energy Utilization Index  
2008–2009 vs. 2007–2008**

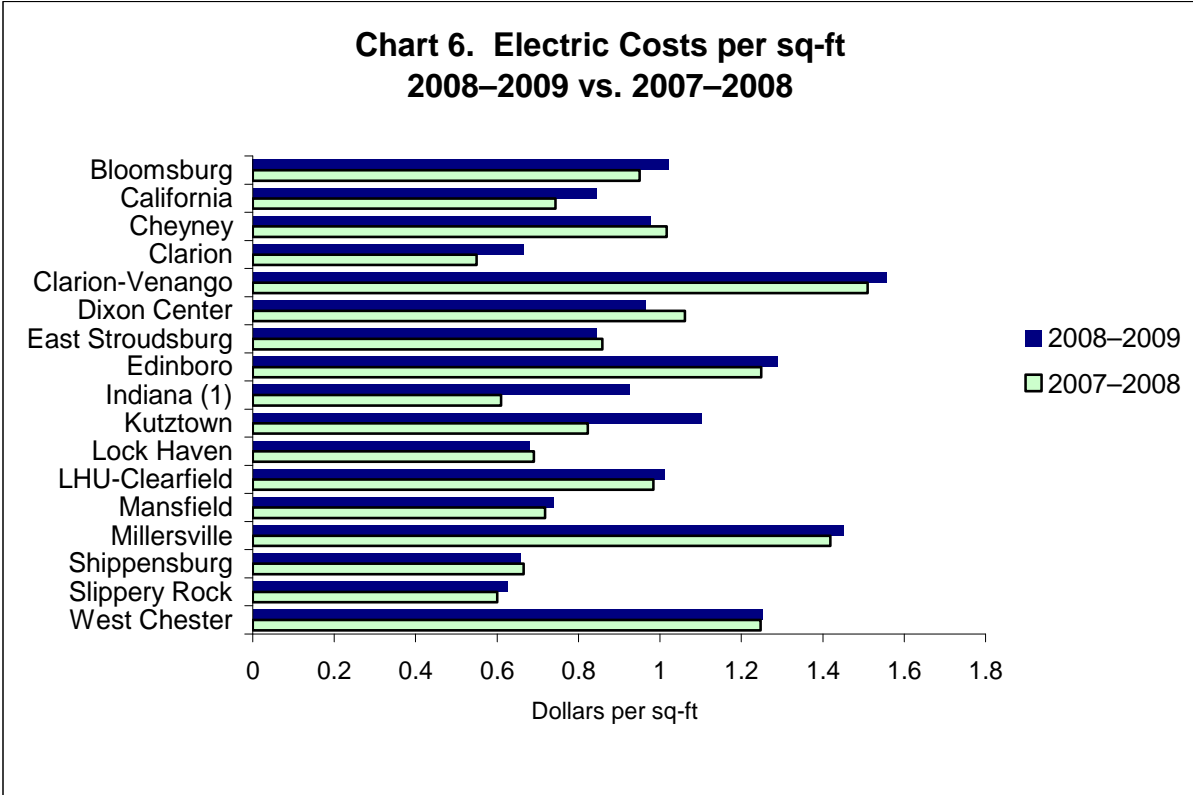


**Chart 4. Energy Costs per mmBtu  
2008–2009 vs. 2007–2008**



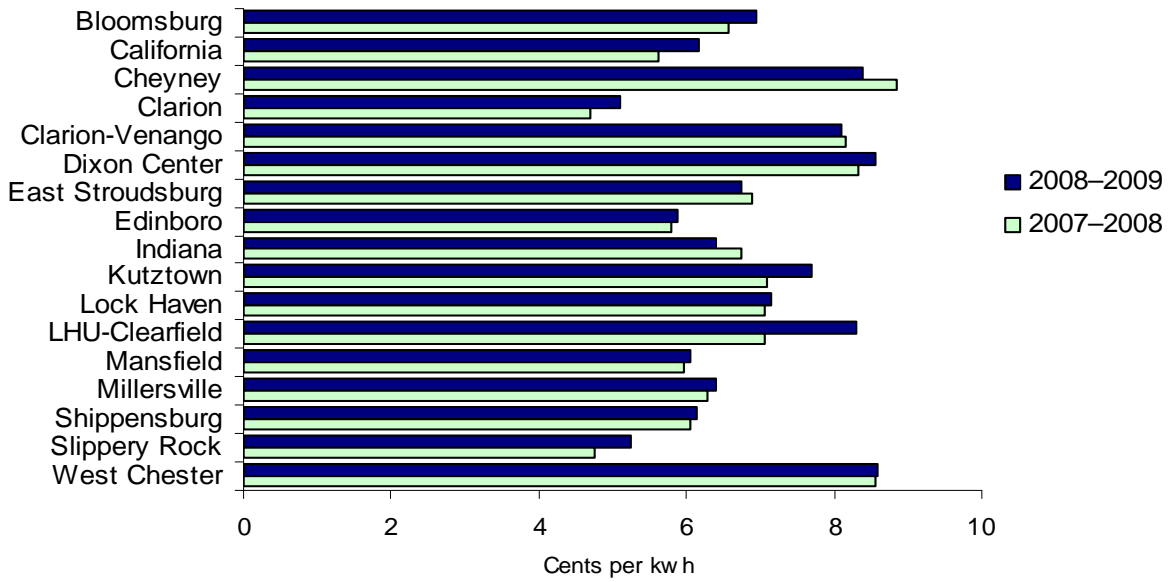


(1) Electric purchased directly for campus.

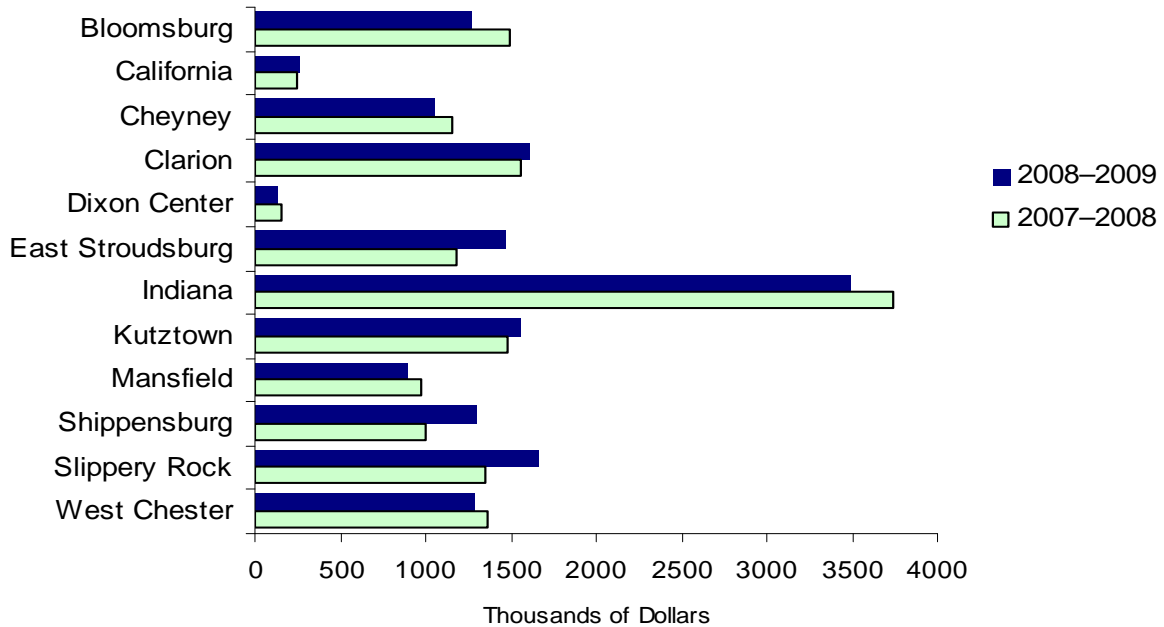


(1) Data includes "Net" electric produced and purchased for campus.

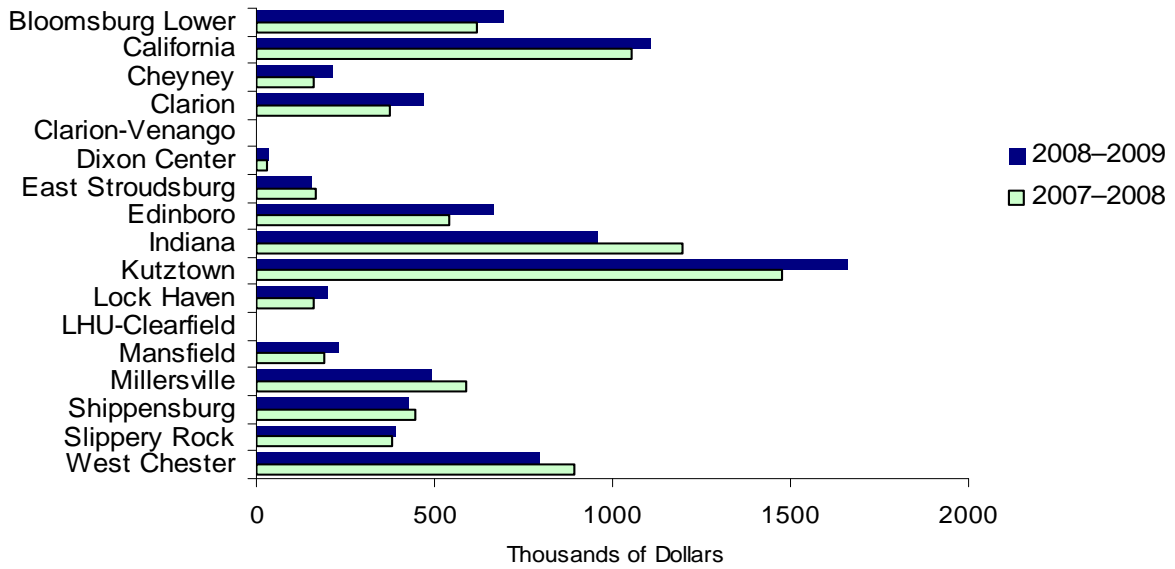
**Chart 7. Electric Costs per kwh  
2008–2009 vs. 2007–2008**



**Chart 8. Total Central Plant Fuel Costs  
2008–2009 vs. 2007–2008**

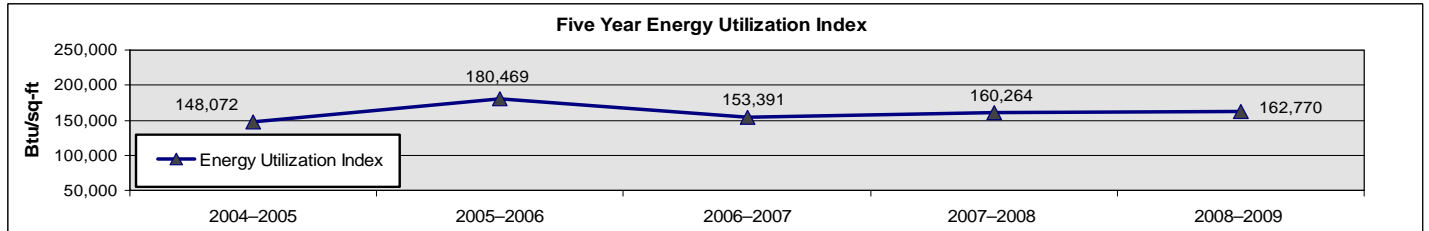
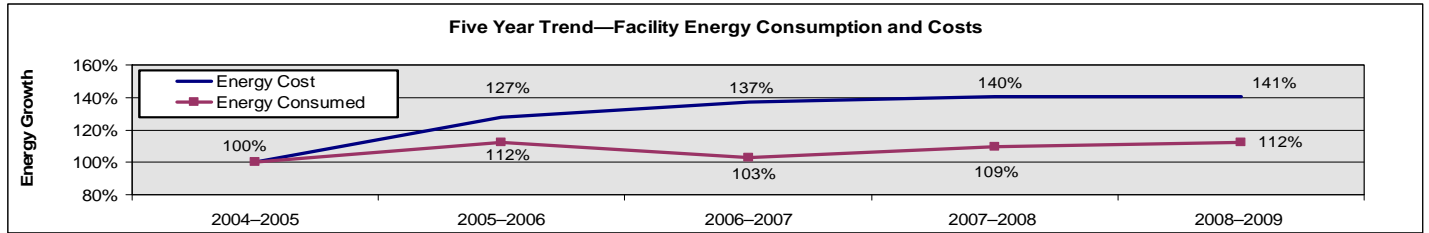


**Chart 9. Water and Sewage Costs  
2008–2009 vs. 2007–2008**



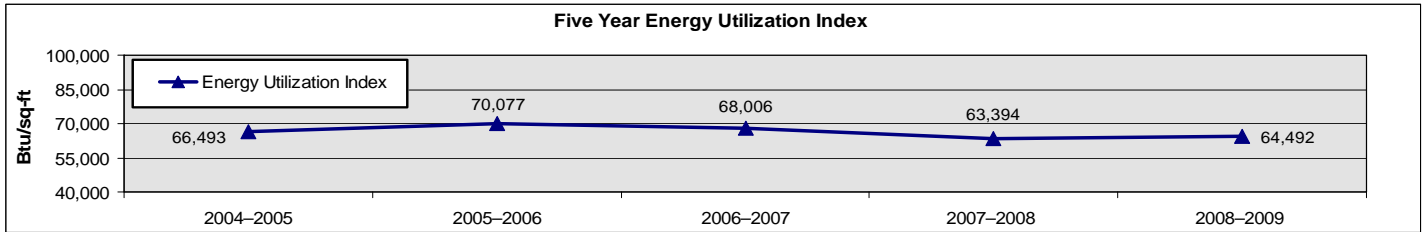
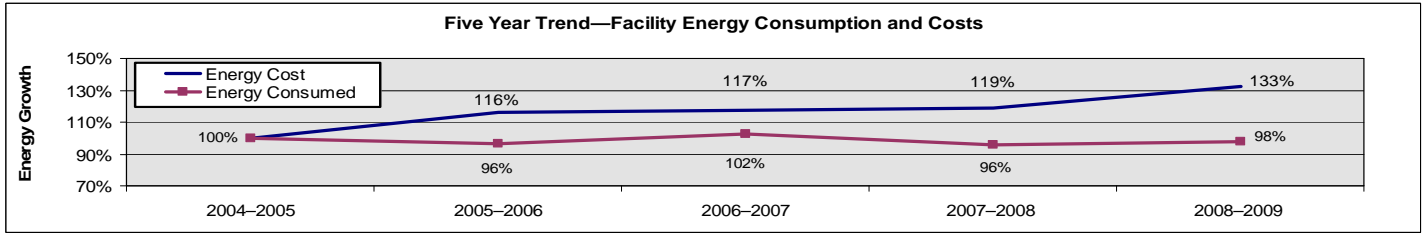
# FIVE-YEAR UNIVERSITY UTILITY DATA, COSTS, AND ILLUSTRATIONS

## Bloomsburg University



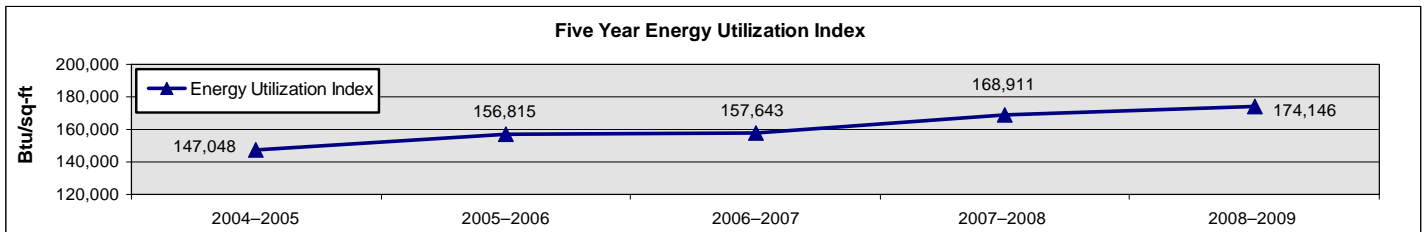
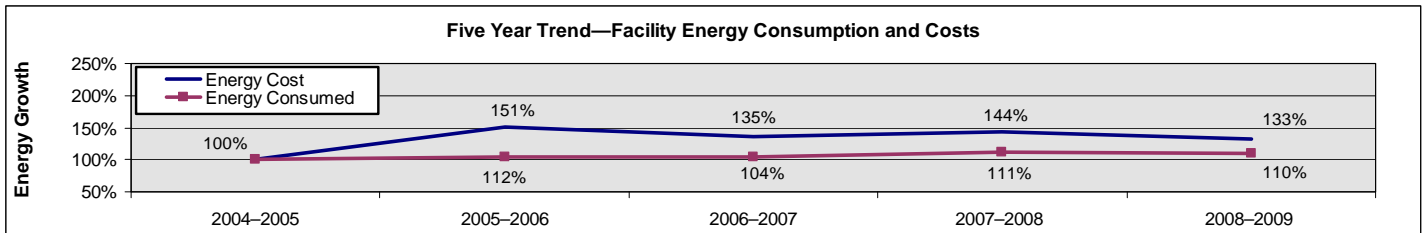
	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	6,979	7,424	6,417	7,732	7,832
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	30,527	48,084	46,144	27,149	30,119
Oil	gal	---	---	---	---	---
Electric	kwh	25,777,582	27,668,649	27,698,642	29,235,360	29,994,360
<b>Energy Costs</b>						
Anthracite Coal	\$	\$ 639,530	\$ 892,225	\$ 1,187,145	\$ 1,415,199	\$ 1,213,113
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 322,012	\$ 581,664	\$ 506,656	\$ 348,002	\$ 404,811
Oil	\$	---	---	---	---	---
Electric	\$	\$ 1,664,551	\$ 1,873,362	\$ 1,909,461	\$ 1,918,902	\$ 2,080,368
<b>Total</b>	\$	\$ 2,626,093	\$ 3,347,251	\$ 3,603,262	\$ 3,682,103	\$ 3,698,292
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	176,569	187,827	162,350	195,620	198,150
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	31,138	49,046	47,067	27,692	30,721
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	87,979	94,433	94,535	99,780	102,371
<b>Total</b>	mmBtu	295,685	331,306	303,952	323,092	331,242
<b>Energy Utilization Index</b>	Btu/sq-ft	148,072	180,469	153,391	160,264	162,770
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	\$ 91.64	\$ 120.18	\$ 185.00	\$ 183.03	\$ 154.89
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 10.55	\$ 12.10	\$ 10.98	\$ 12.82	\$ 13.44
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	6.46 ¢	6.77 ¢	6.89 ¢	6.56 ¢	6.94 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	\$ 3.62	\$ 4.75	\$ 7.31	\$ 7.23	\$ 6.12
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 10.34	\$ 11.86	\$ 10.76	\$ 12.57	\$ 13.18
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 18.92	\$ 19.84	\$ 20.20	\$ 19.23	\$ 20.32
<b>Weighted Average</b>	\$/mmBtu	\$ 8.88	\$ 10.10	\$ 11.85	\$ 11.40	\$ 11.16
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 149,798	\$ 163,991	\$ 319,143	\$ 442,278	\$ 431,114
Sewage Cost	\$	\$ 173,831	\$ 135,403	\$ 166,483	\$ 179,580	\$ 262,695
<b>Reported Information</b>						
Gross Area	sq-ft	1,996,896	1,835,808	1,981,556	2,015,996	2,035,026
Reported Student Population		7,620	7,818	7,988	8,011	8,065
Reported Heating Degree Day	degree day	5,539	4,973	5,375	5,435	5,670
Reported Cooling Degree Day	degree day	834	1,019	926	964	659

# California University



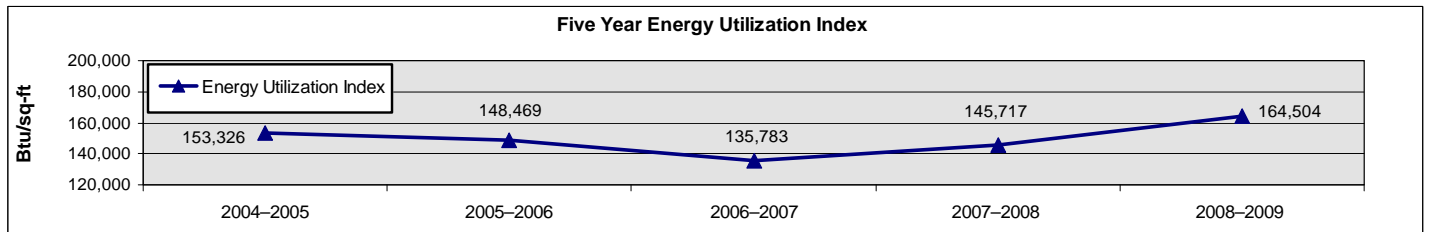
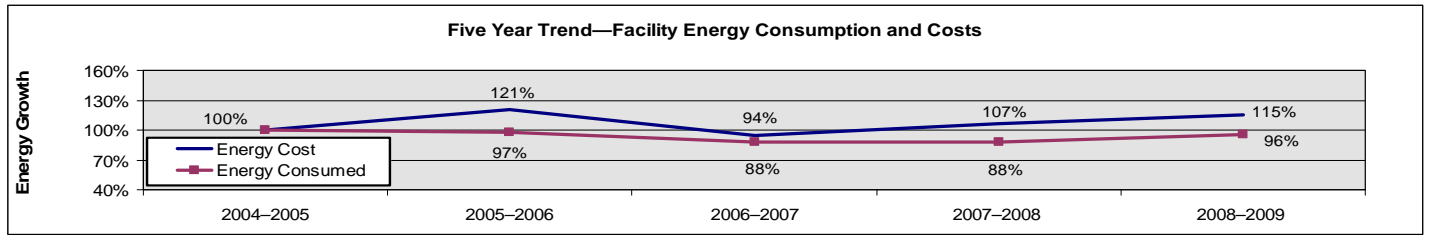
	Units	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	37,969	36,609	37,201	29,603	29,105
Oil	gal	---	---	---	---	---
Electric	kwh	20,709,023	19,864,314	21,645,634	21,953,916	22,636,589
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 280,408	\$ 502,830	\$ 364,714	\$ 320,646	\$ 334,857
Oil	\$	---	\$ 297	---	---	---
Electric	\$	\$ 1,026,497	\$ 1,015,552	\$ 1,166,297	\$ 1,232,380	\$ 1,399,209
<b>Total</b>	\$	\$ 1,306,905	\$ 1,518,679	\$ 1,531,011	\$ 1,553,026	\$ 1,734,066
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	38,728	37,341	37,945	30,195	29,687
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	70,680	67,797	73,877	74,929	77,259
<b>Total</b>	mmBtu	109,408	105,205	111,822	105,124	106,946
<b>Energy Utilization Index</b>	Btu/sq-ft	66,493	70,077	68,006	63,394	64,492
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 7.39	\$ 13.74	\$ 9.80	\$ 10.83	\$ 11.51
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	4.96 ¢	5.11 ¢	5.39 ¢	5.61 ¢	6.18 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 7.24	\$ 13.47	\$ 9.61	\$ 10.62	\$ 11.28
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 14.52	\$ 14.98	\$ 15.79	\$ 16.45	\$ 18.11
<b>Weighted Average</b>	\$/mmBtu	\$ 11.95	\$ 14.44	\$ 13.69	\$ 14.77	\$ 16.21
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 191,075	\$ 214,539	\$ 250,390	\$ 272,196	\$ 294,914
Sewage Cost	\$	\$ 696,270	\$ 755,072	\$ 760,982	\$ 783,082	\$ 814,000
<b>Reported Information</b>						
Gross Area	sq-ft	1,645,404	1,501,270	1,644,296	1,658,269	1,658,269
Reported Student Population		5,813	6,339	6,804	5,462	5,957
Reported Heating Degree Day	degree day	5,529	5,383	5,494	5,433	5,746
Reported Cooling Degree Day	degree day	628	831	772	843	672

# Cheyney University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	105,586	117,174	121,814	132,957	132,233
Oil	gal	115,531	49,505	---	---	---
Electric	kwh	10,303,000	11,675,000	12,020,028	12,032,105	11,663,587
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 712,837	\$ 1,455,957	\$ 1,240,317	\$ 1,357,876	\$ 1,245,234
Oil	\$	\$ 139,130	\$ 83,663	---	---	---
Electric	\$	\$ 826,651	\$ 987,182	\$ 1,029,298	\$ 1,063,593	\$ 979,104
<b>Total</b>	\$	\$ 1,678,618	\$ 2,526,802	\$ 2,269,615	\$ 2,421,469	\$ 2,224,338
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	107,698	119,517	124,250	135,616	134,878
Oil	mmBtu	16,174	6,931	---	---	---
Electric	mmBtu	35,164	39,847	41,024	41,066	39,808
<b>Total</b>	mmBtu	159,036	166,295	165,275	176,682	174,685
<b>Energy Utilization Index</b>	Btu/sq-ft	147,048	156,815	157,643	168,911	174,146
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 6.75	\$ 12.43	\$ 10.18	\$ 10.21	\$ 9.42
Oil	\$/gal	\$ 1.20	\$ 1.69	---	---	---
Electric	cts/kwh	8.02 ¢	8.46 ¢	8.56 ¢	8.84 ¢	8.39 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 6.62	\$ 12.18	\$ 9.98	\$ 10.01	\$ 9.23
Oil	\$/mmBtu	\$ 8.60	---	---	---	---
Electric	\$/mmBtu	\$ 23.51	\$ 24.77	\$ 25.09	\$ 25.90	\$ 24.60
<b>Weighted Average</b>	\$/mmBtu	\$ 10.55	\$ 14.69	\$ 13.73	\$ 13.71	\$ 12.73
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 68,441	\$ 102,847	\$ 106,743	\$ 98,043	\$ 142,038
Sewage Cost	\$	\$ 59,006	\$ 59,890	\$ 57,457	\$ 61,440	\$ 69,796
<b>Reported Information</b>						
Gross Area	sq-ft	1,081,527	1,060,454	1,048,412	1,046,004	1,003,099
Reported Student Population		1,322	1,401	1,550	1,285	1,368
Reported Heating Degree Day	degree day	4,629	4,352	5,846	4,251	4,681
Reported Cooling Degree Day	degree day	1,257	949	1,366	1,461	1,124

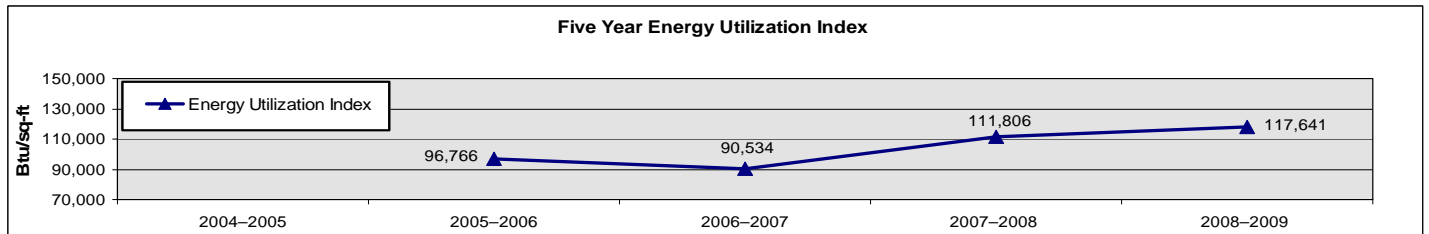
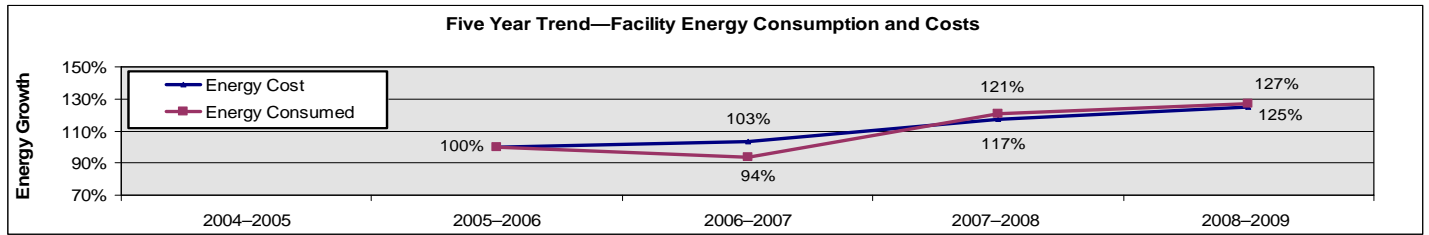
# Clarion University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	173,532	170,403	149,239	148,820	162,712
Oil	gal	---	---	---	---	---
Electric	kwh	17,481,082	16,583,190	16,714,531	16,744,356	18,016,756
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 1,557,531	\$ 2,051,041	\$ 1,397,213	\$ 1,646,379	\$ 1,710,337
Oil	\$	---	---	---	---	---
Electric	\$	\$ 720,309	\$ 708,527	\$ 752,142	\$ 788,078	\$ 918,305
<b>Total</b>	\$	\$ 2,277,841	\$ 2,759,568	\$ 2,149,355	\$ 2,434,458	\$ 2,628,642
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	177,003	173,811	152,224	151,796	165,966
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	59,663	56,598	57,047	57,148	61,491
<b>Total</b>	mmBtu	236,666	230,409	209,270	208,945	227,457
<b>Energy Utilization Index</b>	Btu/sq-ft	153,326	148,469	135,783	145,717	164,504
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 8.98	\$ 12.04	\$ 9.36	\$ 11.06	\$ 10.51
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	4.12 ¢	4.27 ¢	4.50 ¢	4.71 ¢	5.10 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 8.80	\$ 11.80	\$ 9.18	\$ 10.85	\$ 10.31
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 12.07	\$ 12.52	\$ 13.18	\$ 13.79	\$ 14.93
<b>Weighted Average</b>	\$/mmBtu	\$ 9.62	\$ 11.98	\$ 10.27	\$ 11.65	\$ 11.56
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 184,041	\$ 177,388	\$ 157,779	\$ 245,338	\$ 288,471
Sewage Cost	\$	\$ 83,102	\$ 84,086	\$ 106,791	\$ 129,704	\$ 179,458
<b>Reported Information</b>						
Gross Area	sq-ft	1,543,540	1,551,903	1,541,215	1,433,905	1,382,686
Reported Student Population		5,233	5,128	5,121	5,197	4,741
Reported Heating Degree Day	degree day	5,162	5,018	5,322	5,276	5,711
Reported Cooling Degree Day	degree day	471	588	509	626	419

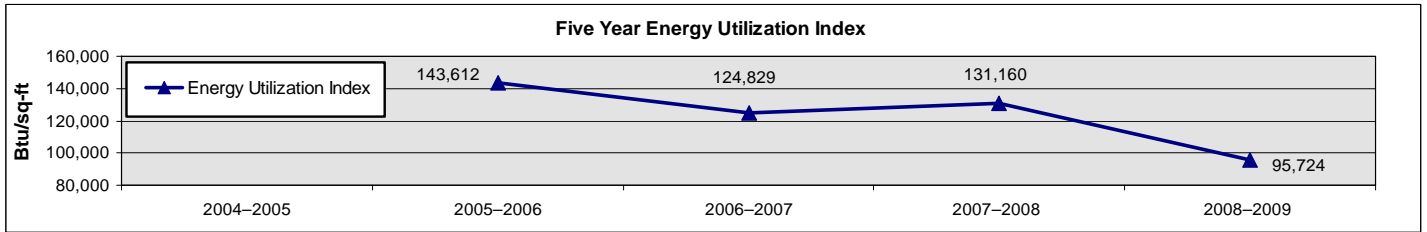
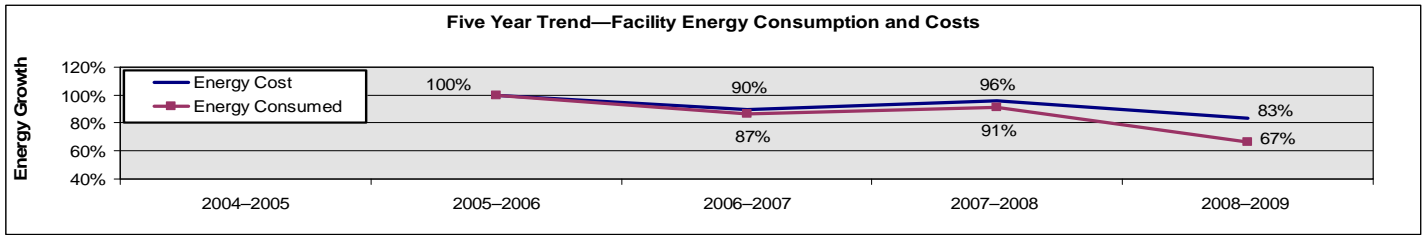
Note: Data do not include Clarion-Venango Campus.

# Clarion University – Venango Campus



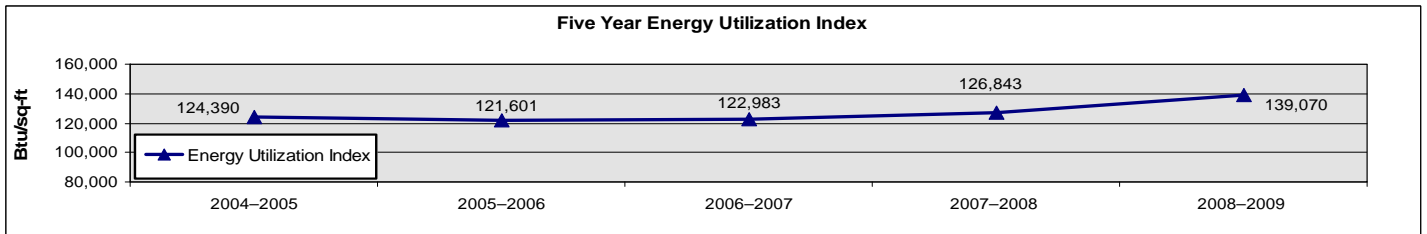
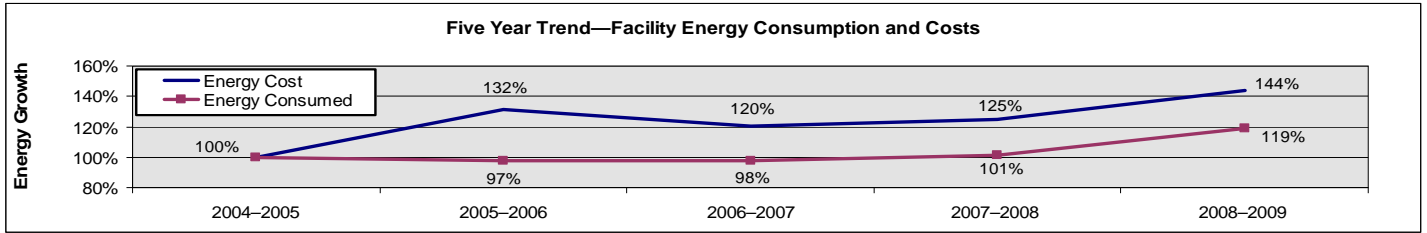
	Units	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	---	3,214	3,883	3,905	4,196
Oil	gal	---	---	---	---	---
Electric	kwh	---	1,269,440	925,880	1,520,400	1,573,680
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	---	\$ 47,260	\$ 46,526	\$ 47,747	\$ 54,835
Oil	\$	---	---	---	---	---
Electric	\$	---	\$ 99,033	\$ 104,743	\$ 123,880	\$ 127,625
<b>Total</b>	\$	---	\$ 146,293	\$ 151,269	\$ 171,627	\$ 182,460
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	---	3,278	3,961	3,983	4,280
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	---	4,333	3,160	5,189	5,371
<b>Total</b>	mmBtu	---	7,611	7,121	9,172	9,651
<b>Energy Utilization Index</b>	Btu/sq-ft	---	96,766	90,534	111,806	117,641
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	---	\$ 14.70	\$ 11.98	\$ 12.23	\$ 13.07
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	---	7.80 ¢	11.31 ¢	8.15 ¢	8.11 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	---	\$ 14.42	\$ 11.75	\$ 11.99	\$ 12.81
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	---	\$ 22.86	\$ 33.15	\$ 23.87	\$ 23.76
<b>Weighted Average</b>	\$/mmBtu	---	\$ 19.22	\$ 21.24	\$ 18.71	\$ 18.91
<b>Misc Facility Costs</b>						
Water Cost	\$	---	\$ 1,766	\$ 2,030	\$ 2,218	\$ 1,988
Sewage Cost	\$	---	\$ 1,249	\$ 1,385	\$ 1,448	\$ 1,470
<b>Reported Information</b>						
Gross Area	sq-ft	---	78,652	78,652	82,037	82,037
Reported Student Population		---	505	577	596	527
Reported Heating Degree Day	degree day	---	---	---	---	---
Reported Cooling Degree Day	degree day	---	---	---	---	---

# Dixon University Center



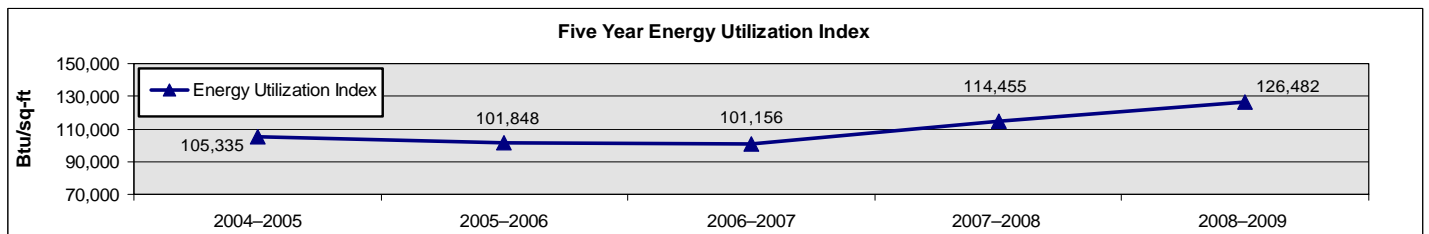
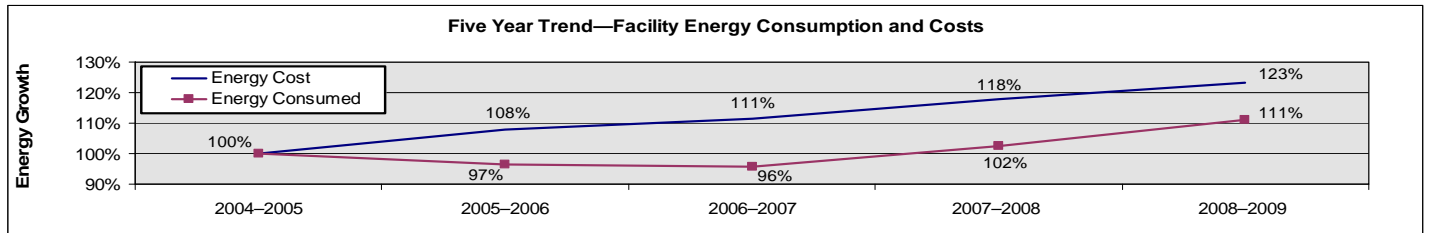
	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	---	14,437	11,840	12,535	8,170
Oil	gal	---	---	---	---	---
Electric	kwh	---	1,817,700	1,791,700	1,854,300	1,645,700
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	---	\$ 166,597	\$ 138,476	\$ 155,643	\$ 128,729
Oil	\$	---	---	---	---	---
Electric	\$	---	\$ 155,990	\$ 150,285	\$ 154,672	\$ 140,628
<b>Total</b>	\$	---	\$ 322,587	\$ 288,761	\$ 310,315	\$ 269,357
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	---	14,725	12,077	12,786	8,333
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	---	6,204	6,115	6,329	5,617
<b>Total</b>	mmBtu	---	20,929	18,192	19,114	13,950
<b>Energy Utilization Index</b>	Btu/sq-ft	---	143,612	124,829	131,160	95,724
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	---	\$ 11.54	\$ 11.70	\$ 12.42	\$ 15.76
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	---	8.58 ¢	8.39 ¢	8.34 ¢	8.55 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	---	\$ 11.31	\$ 11.47	\$ 12.17	\$ 15.45
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	---	\$ 25.14	\$ 24.58	\$ 24.44	\$ 25.04
<b>Weighted Average</b>	\$/mmBtu	---	\$ 15.41	\$ 15.87	\$ 16.23	\$ 19.31
<b>Misc Facility Costs</b>						
Water Cost	\$	---	\$ 31,365	\$ 32,659	\$ 25,605	\$ 28,423
Sewage Cost	\$	---	\$ 5,967	\$ 5,836	\$ 5,524	\$ 9,278
<b>Reported Information</b>						
Gross Area	sq-ft	---	145,734	145,734	145,734	145,734
Reported Student Population		---	---	---	---	---
Reported Heating Degree Day	degree day	---	4,769	4,650	4,210	5,435
Reported Cooling Degree Day	degree day	---	1,166	1,378	1,736	1,202

# East Stroudsburg University



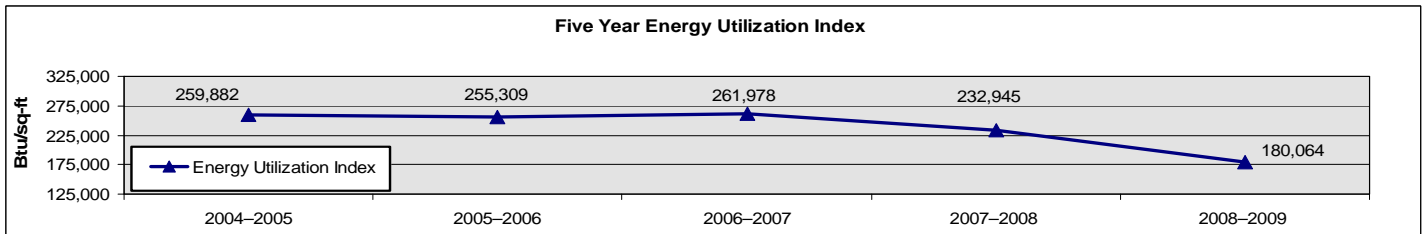
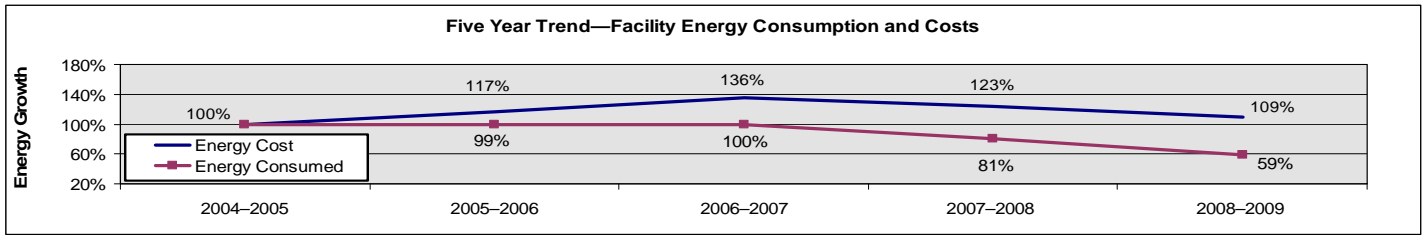
	Units	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	119,911	115,394	115,496	123,034	151,555
Oil	gal	6,610	5,338	23,291	5,554	7,763
Electric	kwh	19,020,000	18,996,000	18,369,600	18,636,000	20,133,600
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 940,300	\$ 1,549,342	\$ 1,258,946	\$ 1,406,556	\$ 1,751,595
Oil	\$	\$ 11,877	\$ 10,794	\$ 47,520	\$ 17,345	\$ 11,862
Electric	\$	\$ 1,222,889	\$ 1,303,843	\$ 1,304,130	\$ 1,285,473	\$ 1,360,397
<b>Total</b>	\$	\$ 2,175,066	\$ 2,863,979	\$ 2,610,596	\$ 2,709,374	\$ 3,123,854
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	122,310	117,701	117,806	125,494	154,586
Oil	mmBtu	925	747	3,261	778	1,087
Electric	mmBtu	64,915	64,833	62,695	63,605	68,716
<b>Total</b>	mmBtu	188,150	183,282	183,762	189,877	224,388
<b>Energy Utilization Index</b>	Btu/sq-ft	124,390	121,601	122,983	126,843	139,070
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 7.84	\$ 13.43	\$ 10.90	\$ 11.43	\$ 11.56
Oil	\$/gal	\$ 1.80	\$ 2.02	\$ 2.04	\$ 3.12	\$ 1.53
Electric	cts/kwh	6.43 ¢	6.86 ¢	7.10 ¢	6.90 ¢	6.76 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 7.69	\$ 13.16	\$ 10.69	\$ 11.21	\$ 11.33
Oil	\$/mmBtu	\$ 12.84	\$ 14.44	\$ 14.57	\$ 22.31	\$ 10.91
Electric	\$/mmBtu	\$ 18.84	\$ 20.11	\$ 20.80	\$ 20.21	\$ 19.80
<b>Weighted Average</b>	\$/mmBtu	\$ 11.56	\$ 15.63	\$ 14.21	\$ 14.27	\$ 13.92
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 109,694	\$ 108,128	\$ 109,026	\$ 84,982	\$ 77,556
Sewage Cost	\$	\$ 97,022	\$ 91,109	\$ 97,829	\$ 83,520	\$ 74,823
<b>Reported Information</b>						
Gross Area	sq-ft	1,512,587	1,507,244	1,494,213	1,496,940	1,613,490
Reported Student Population		5,684	5,806	6,148	6,258	6,364
Reported Heating Degree Day	degree day	5,483	4,965	5,030	4,827	5,552
Reported Cooling Degree Day	degree day	536	417	907	823	860

# Edinboro University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	62,673	59,418	60,534	72,358	89,375
Oil	gal	---	---	---	---	---
Electric	kwh	40,408,019	39,348,361	38,456,393	38,910,038	38,872,172
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 587,453	\$ 778,877	\$ 801,234	\$ 931,549	\$ 1,046,586
Oil	\$	---	---	---	---	---
Electric	\$	\$ 2,115,990	\$ 2,134,916	\$ 2,208,047	\$ 2,254,044	\$ 2,282,364
<b>Total</b>	\$	\$ 2,703,443	\$ 2,913,793	\$ 3,009,281	\$ 3,185,593	\$ 3,328,950
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	63,926	60,606	61,745	73,805	91,163
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	137,913	134,296	131,252	132,800	132,671
<b>Total</b>	mmBtu	201,839	194,902	192,996	206,605	223,833
<b>Energy Utilization Index</b>	Btu/sq-ft	105,335	101,848	101,156	114,455	126,482
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 9.37	\$ 13.11	\$ 13.24	\$ 12.87	\$ 11.71
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	5.24 ¢	5.43 ¢	5.74 ¢	5.79 ¢	5.87 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 9.19	\$ 12.85	\$ 12.98	\$ 12.62	\$ 11.48
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 15.34	\$ 15.90	\$ 16.82	\$ 16.97	\$ 17.20
<b>Weighted Average</b>	\$/mmBtu	\$ 13.39	\$ 14.95	\$ 15.59	\$ 15.42	\$ 14.87
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 177,168	\$ 187,057	\$ 232,302	\$ 128,135	\$ 234,877
Sewage Cost	\$	\$ 276,429	\$ 257,906	\$ 309,480	\$ 410,607	\$ 433,777
<b>Reported Information</b>						
Gross Area	sq-ft	1,916,156	1,913,666	1,907,910	1,805,121	1,769,688
Reported Student Population		6,747	5,990	6,435	6,414	6,014
Reported Heating Degree Day	degree day	6,893	5,387	6,548	6,613	6,770
Reported Cooling Degree Day	degree day	299	1,294	468	499	370

# Indiana University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	781,584	774,476	778,256	555,779	340,123
Oil	gal	91,434	91,471	96,422	51,154	16,138
Electric	kwh	1,611,819	1,611,819	2,211,842	25,840,671	38,763,544
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 5,640,844	\$ 6,595,133	\$ 7,711,434	\$ 5,507,480	\$ 3,990,578
Oil	\$	\$ 112,160	\$ 170,477	\$ 191,566	\$ 93,225	\$ 28,936
Electric Purchased	\$	\$ 158,177	\$ 198,096	\$ 198,096	\$ 1,743,905	\$ 2,477,172
<b>Total</b>	\$	\$ 5,959,273	\$ 6,963,706	\$ 8,101,095	\$ 7,344,610	\$ 6,496,686
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	797,216	789,966	793,821	566,894	346,926
Oil	mmBtu	12,801	12,806	13,499	7,162	2,259
Electric Purchased	mmBtu	7,673	5,500	7,547	88,194	132,300
<b>Total</b>	mmBtu	817,690	808,271	814,867	662,250	481,485
<b>Energy Utilization Index</b>	Btu/sq-ft	259,882	255,309	261,978	232,945	180,064
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 7.22	\$ 8.52	\$ 9.91	\$ 9.91	\$ 11.73
Oil	\$/gal	\$ 1.23	\$ 1.86	\$ 1.99	\$ 1.82	\$ 1.79
Electric Purchased	cts/kwh	9.81 ¢	9.81 ¢	8.96 ¢	6.75 ¢	6.39 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 7.09	\$ 8.35	\$ 9.71	\$ 9.72	\$ 11.50
Oil	\$/mmBtu	\$ 8.76	\$ 13.31	\$ 14.19	\$ 13.02	\$ 12.81
Electric Purchased	\$/mmBtu	\$ 20.61	\$ 28.76	\$ 26.25	\$ 19.77	\$ 18.72
<b>Weighted Average</b>	\$/mmBtu	\$ 7.29	\$ 8.57	\$ 9.94	\$ 11.09	\$ 13.49
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 498,080	\$ 508,513	\$ 487,845	\$ 475,151	\$ 402,804
Sewage Cost	\$	\$ 725,533	\$ 786,716	\$ 725,757	\$ 720,390	\$ 552,869
<b>Reported Information</b>						
Gross Area	sq-ft	3,165,851	3,110,445	3,110,445	2,842,942	2,673,968
Reported Student Population		12,377	12,405	12,405	12,175	12,147
Reported Heating Degree Day	degree day	5,139	5,553	5,517	5,389	6,176
Reported Cooling Degree Day	degree day	718	710	606	552	464

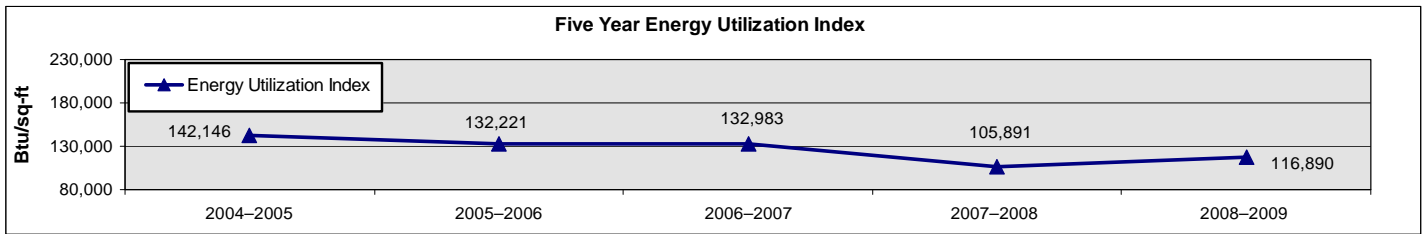
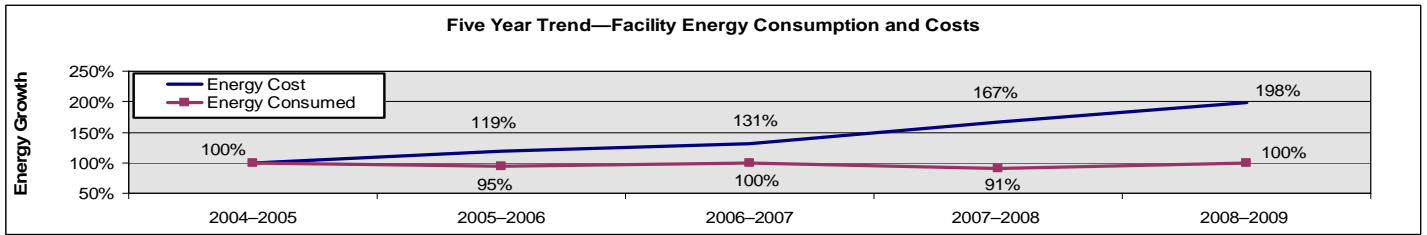
**Notes:**

Data reflects campus usage only and excludes FIUP usage for residential revival.

Data reflects Main & Branch Campuses.

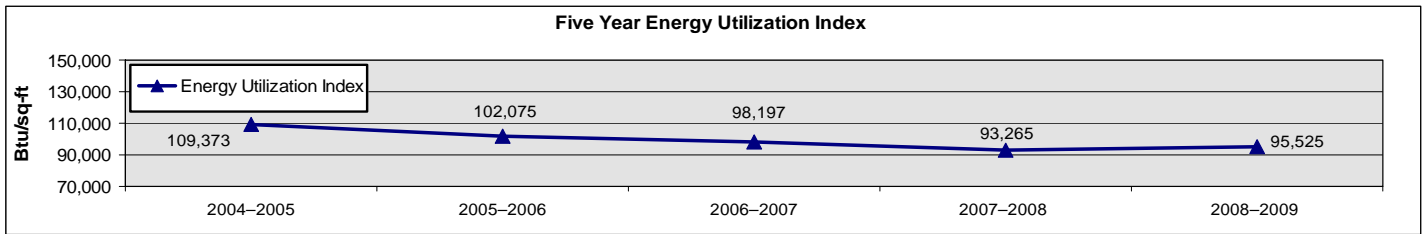
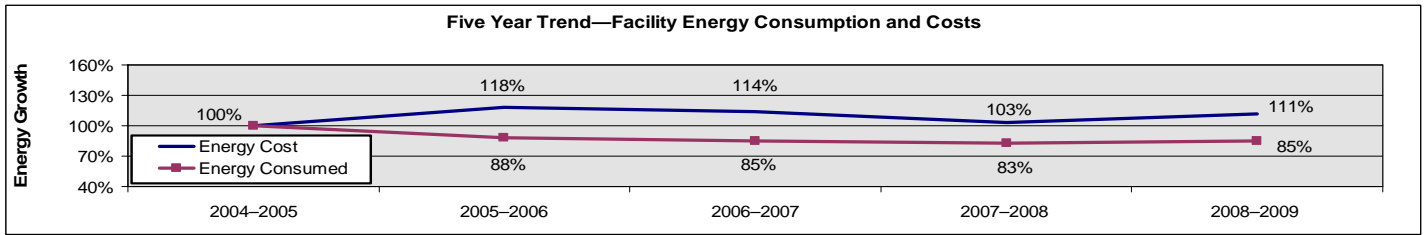
Electric data represents all purchased electricity, including electricity that flows through the Cogen plant to be redistributed throughout campus.

# Kutztown University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	5,906	5,536	6,124	92	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	43,023	35,433	46,500	154,656	157,503
Oil	gal	2,863	4,822	6,668	1,843	20,381
Electric	kwh	25,855,391	26,711,875	22,842,757	28,062,250	34,417,134
<b>Energy Costs</b>						
Anthracite Coal	\$	\$ 437,761	\$ 655,698	\$ 736,377	\$ 11,044	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 283,277	\$ 328,862	\$ 459,784	\$ 1,932,162	\$ 1,972,317
Oil	\$	\$ 5,749	\$ 10,556	\$ 12,781	\$ 4,906	\$ 51,784
Electric	\$	\$ 1,628,977	\$ 1,800,468	\$ 1,880,662	\$ 1,990,319	\$ 2,648,483
<b>Total</b>	\$	\$ 2,355,764	\$ 2,795,584	\$ 3,089,604	\$ 3,938,431	\$ 4,672,584
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	148,820	139,505	154,325	2,318	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	43,883	36,142	47,430	157,749	160,653
Oil	mmBtu	401	675	934	258	2,853
Electric	mmBtu	88,244	91,168	77,962	95,776	117,466
<b>Total</b>	mmBtu	281,348	267,489	280,651	256,102	280,972
<b>Energy Utilization Index</b>	Btu/sq-ft	142,146	132,221	132,983	105,891	116,890
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	\$ 74.13	\$ 118.44	\$ 120.24	\$ 120.04	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 6.58	\$ 9.28	\$ 9.89	\$ 12.49	\$ 12.52
Oil	\$/gal	\$ 2.01	\$ 2.19	\$ 1.92	\$ 2.66	\$ 2.54
Electric	cts/kwh	6.30 ¢	6.74 ¢	8.23 ¢	7.09 ¢	7.70 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	\$ 2.94	\$ 4.70	\$ 4.77	\$ 4.76	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 6.46	\$ 9.10	\$ 9.69	\$ 12.25	\$ 12.28
Oil	\$/mmBtu	\$ 14.34	\$ 15.64	\$ 13.69	\$ 19.01	\$ 18.15
Electric	\$/mmBtu	\$ 18.46	\$ 19.75	\$ 24.12	\$ 20.78	\$ 22.55
<b>Weighted Average</b>	\$/mmBtu	\$ 8.37	\$ 10.45	\$ 11.01	\$ 15.38	\$ 16.63
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 339,556	\$ 280,552	\$ 605,244	\$ 601,170	\$ 669,530
Sewage Cost	\$	\$ 448,534	\$ 374,711	\$ 1,087,811	\$ 874,140	\$ 990,130
<b>Reported Information</b>						
Gross Area	sq-ft	1,979,285	2,023,043	2,110,429	2,418,551	2,403,728
Reported Student Population		8,490	8,780	9,047	9,201	9,296
Reported Heating Degree Day	degree day	5,054	4,329	4,930	4,724	5,196
Reported Cooling Degree Day	degree day	1,533	1,345	977	1,311	1,180

# Lock Haven University

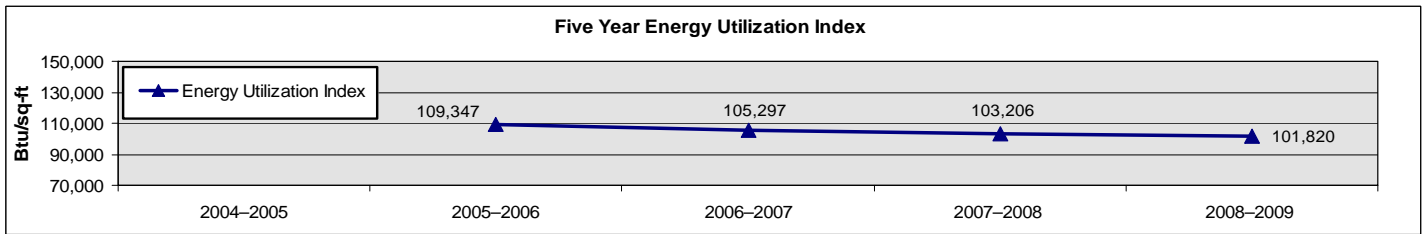
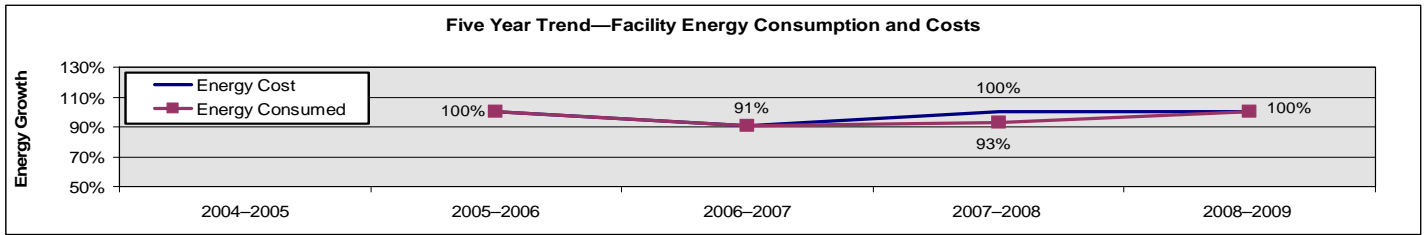


	Units	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	118,097	100,167	96,412	91,338	95,860
Oil	gal	4,368	1,841	3,791	2,825	3,093
Electric	kwh	15,915,706	15,309,835	14,556,755	15,235,697	14,816,006
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 992,768	\$ 1,330,343	\$ 1,261,913	\$ 1,031,075	\$ 1,216,434
Oil	\$	\$ 6,304	\$ 3,704	\$ 7,551	\$ 8,573	\$ 5,487
Electric <sup>(1)</sup>	\$	\$ 1,049,824	\$ 1,080,750	\$ 1,068,313	\$ 1,077,139	\$ 1,058,682
<b>Total</b>	\$	\$ 2,048,896	\$ 2,414,797	\$ 2,337,777	\$ 2,116,787	\$ 2,280,603
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	120,459	102,170	98,340	93,165	97,777
Oil	mmBtu	612	258	531	396	433
Electric	mmBtu	54,320	52,252	49,682	51,999	50,567
<b>Total</b>	mmBtu	175,391	154,681	148,553	145,560	148,777
<b>Energy Utilization Index</b>	Btu/sq-ft	109,373	102,075	98,197	93,265	95,525
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 8.41	\$ 13.28	\$ 13.09	\$ 11.29	\$ 12.69
Oil	\$/gal	\$ 1.44	\$ 2.01	\$ 1.99	\$ 3.03	\$ 1.77
Electric	cts/kwh	6.60 ¢	7.06 ¢	7.34 ¢	7.07 ¢	7.15 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 8.24	\$ 13.02	\$ 12.83	\$ 11.07	\$ 12.44
Oil	\$/mmBtu	\$ 10.31	\$ 14.37	\$ 14.23	\$ 21.68	\$ 12.67
Electric	\$/mmBtu	\$ 19.33	\$ 20.68	\$ 21.50	\$ 20.71	\$ 20.94
<b>Weighted Average</b>	\$/mmBtu	\$ 11.68	\$ 15.61	\$ 15.74	\$ 14.54	\$ 15.33
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 55,841	\$ 47,076	\$ 55,486	\$ 58,443	\$ 66,791
Sewage Cost	\$	\$ 63,395	\$ 54,178	\$ 76,108	\$ 99,343	\$ 136,360
<b>Reported Information</b>						
Gross Area <sup>(2)</sup>	sq-ft	1,603,597	1,515,369	1,512,806	1,560,713	1,557,462
Reported Student Population		4,711	4,526	4,505	4,581	4,444
Reported Heating Degree Day	degree day	5,211	5,485	5,699	5,681	5,851
Reported Cooling Degree Day	degree day	465	885	868	882	669

(1) Electric data prior to 2004-2005 did not include electric kwh from all accounts.

(2) Note revised Gross Area.

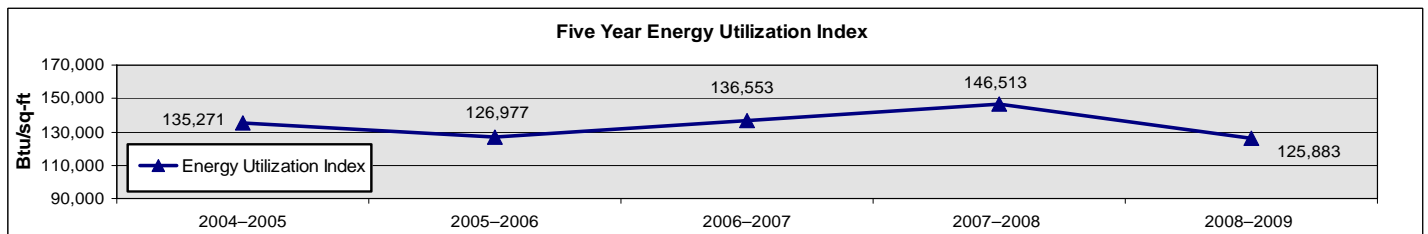
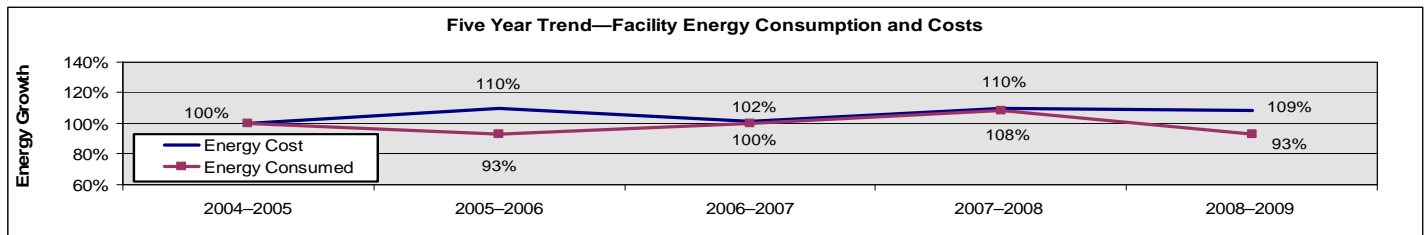
# Lock Haven University – Clearfield Campus



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	---	3,261	3,140	3,126	2,901
Oil	gal	---	---	---	---	---
Electric	kwh	---	698,400	672,600	644,800	599,690
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	---	\$47,101	\$43,621	\$38,898	\$ 40,761
Oil	\$	---	---	---	---	---
Electric	\$	---	\$53,723	\$56,211	\$51,377	\$ 49,711
<b>Total</b>	\$	---	\$100,824	\$99,832	\$90,275	\$ 90,472
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	---	3326	3,203	3,189	2,959
Oil	mmBtu	---	---	---	---	-
Electric	mmBtu	---	2,384	2,296	2,201	2,047
<b>Total</b>	mmBtu	---	5,710	5,498	5,389	5,006
<b>Energy Utilization Index</b>	Btu/sq-ft	---	109,347	105,297	103,206	101,820
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	---	\$ 14.44	\$ 13.89	\$ 12.44	\$ 14.05
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	---	\$ 7.69	8.36 ¢	7.97 ¢	8.29 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	---	\$ 14.16	\$ 13.62	\$ 12.20	\$ 13.77
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	---	\$ 22.54	\$ 24.49	\$ 23.35	\$ 24.29
<b>Weighted Average</b>	\$/mmBtu	---	\$ 17.66	\$ 18.16	\$ 16.75	\$ 18.07
<b>Misc Facility Costs</b>						
Water Cost	\$	---	\$ 1,953.00	\$1,948	\$1,928	\$ 2,827
Sewage Cost	\$	---	\$ 1,661.00	\$1,690	\$1,756	\$ 1,964
<b>Reported Information</b>						
Gross Area <sup>(1)</sup>	sq-ft	---	52,218	52,218	52,218	49,164
Reported Student Population		---	311	274	294	299
Reported Heating Degree Day	degree day	---	5,485	5,699	5,681	5,851
Reported Cooling Degree Day	degree day	---	885	868	882	669

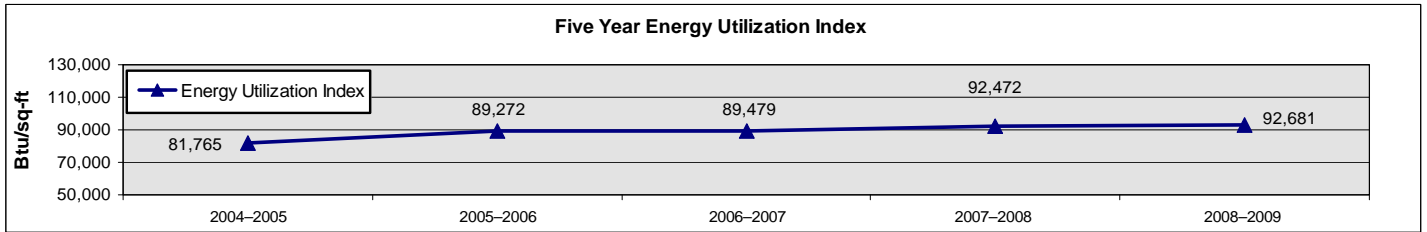
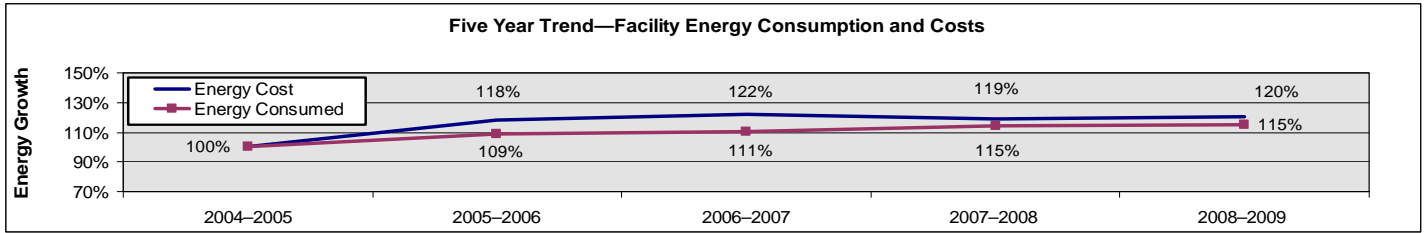
(1) Note revised Gross Area

# Mansfield University



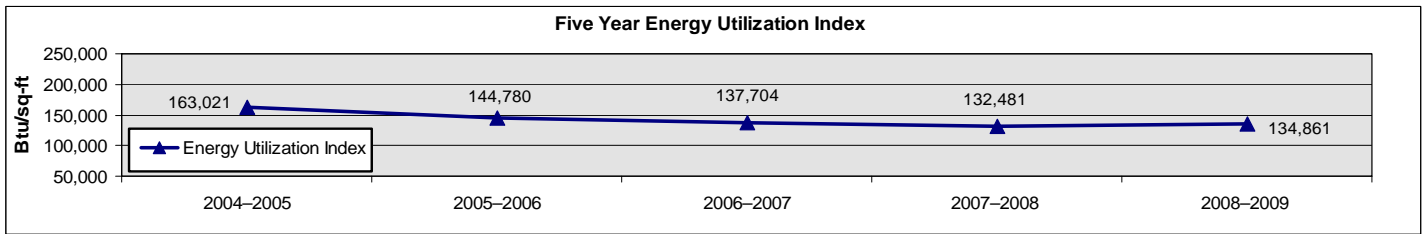
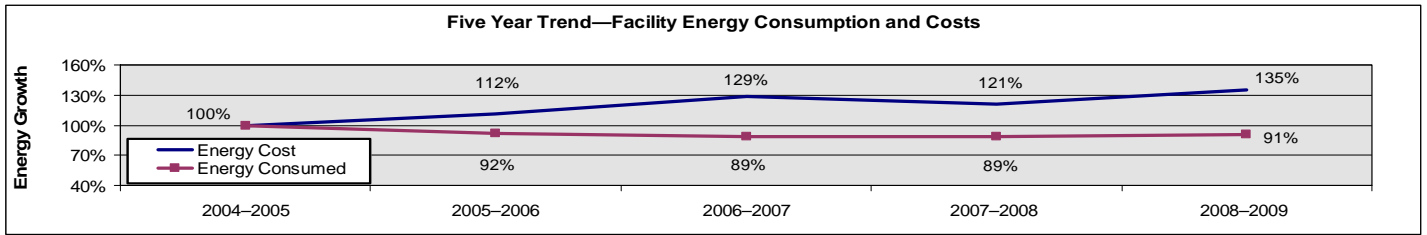
	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	118,086	105,398	117,949	131,128	104,701
Oil	gal	---	---	---	---	---
Electric	kwh	15,079,438	15,204,981	14,976,224	15,261,861	15,403,492
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 894,772	\$ 1,042,212	\$ 899,846	\$ 1,065,587	\$ 1,012,812
Oil	\$	---	---	---	---	---
Electric	\$	\$ 899,182	\$ 933,878	\$ 922,006	\$ 910,189	\$ 934,293
<b>Total</b>	\$	\$ 1,793,955	\$ 1,976,091	\$ 1,821,852	\$ 1,975,776	\$ 1,947,105
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	120,448	107,506	120,307	133,751	106,795
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	51,466	51,895	51,114	52,089	52,572
<b>Total</b>	mmBtu	171,914	159,400	171,421	185,839	159,367
<b>Energy Utilization Index</b>	Btu/sq-ft	135,271	126,977	136,553	146,513	125,883
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 7.58	\$ 9.89	\$ 7.63	\$ 8.13	\$ 9.67
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	5.96 ¢	6.14 ¢	6.16 ¢	5.96 ¢	6.07 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 7.43	\$ 9.69	\$ 7.48	\$ 7.97	\$ 9.48
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 17.47	\$ 18.00	\$ 18.04	\$ 17.47	\$ 17.77
<b>Weighted Average</b>	\$/mmBtu	\$ 10.44	\$ 12.40	\$ 10.63	\$ 10.63	\$ 12.22
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 77,315	\$ 69,656	\$ 72,091	\$ 61,233	\$ 64,392
Sewage Cost	\$	\$ 121,340	\$ 125,455	\$ 125,473	\$ 129,005	\$ 168,500
<b>Reported Information</b>						
Gross Area	sq-ft	1,270,884	1,255,349	1,255,349	1,268,416	1,265,991
Reported Student Population		3,023	2,976	2,919	2,920	2,722
Reported Heating Degree Day	degree day	5,984	5,729	5,257	5,240	7,201
Reported Cooling Degree Day	degree day	849	1,005	1,092	1,126	297

# Millersville University



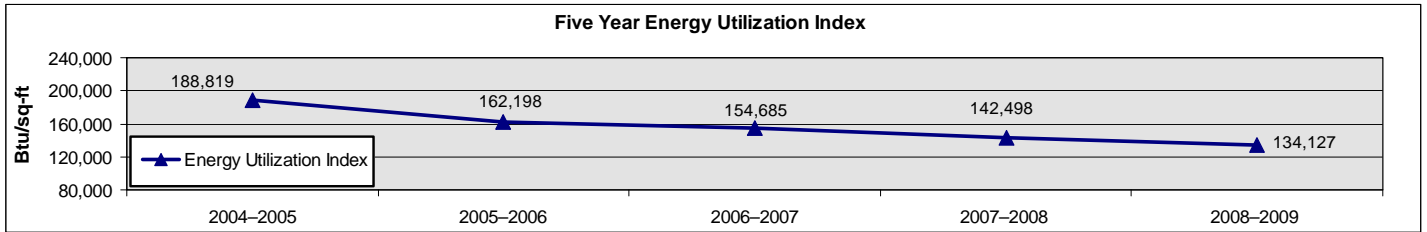
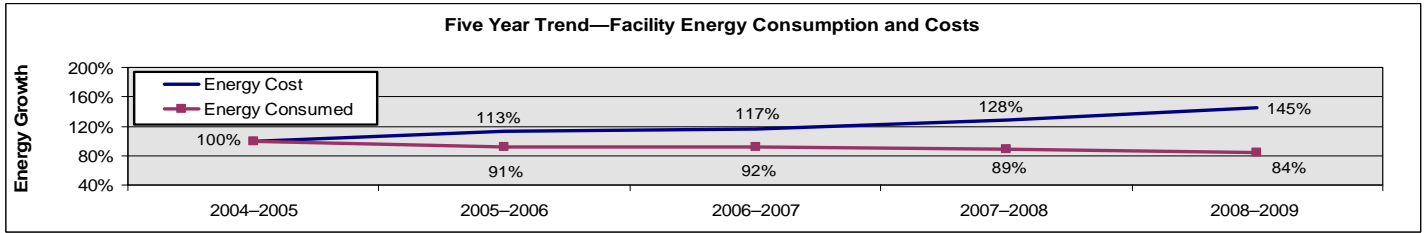
	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	13,089	19,212	21,583	25,277	24,903
Oil	gal	36,808	38,951	38,954	32,542	34,390
Electric	kwh	44,605,425	43,572,204	43,561,470	44,579,885	44,865,446
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 164,821	\$ 310,915	\$ 317,154	\$ 339,814	\$ 345,790
Oil	\$	\$ 59,170	\$ 79,123	\$ 77,773	\$ 96,345	\$ 59,482
Electric	\$	\$ 2,493,795	\$ 2,821,399	\$ 2,922,948	\$ 2,798,682	\$ 2,867,919
<b>Total</b>	\$	\$ 2,717,786	\$ 3,211,437	\$ 3,317,875	\$ 3,234,841	\$ 3,273,191
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	13,350	19,596	22,015	25,783	25,401
Oil	mmBtu	5,153	5,453	5,454	4,556	4,815
Electric	mmBtu	152,238	148,712	148,675	152,151	153,126
<b>Total</b>	mmBtu	159,205	173,761	176,144	182,490	183,341
<b>Energy Utilization Index</b>	Btu/sq-ft	81,765	89,272	89,479	92,472	92,681
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 12.59	\$ 16.18	\$ 14.69	\$ 13.44	\$ 13.89
Oil	\$/gal	\$ 1.61	\$ 2.03	\$ 2.00	\$ 2.96	\$ 1.73
Electric	cts/kwh	5.59 ¢	6.48 ¢	6.71 ¢	6.28 ¢	6.39 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 12.35	\$ 15.87	\$ 14.41	\$ 13.18	\$ 13.61
Oil	\$/mmBtu	\$ 11.48	\$ 14.51	\$ 14.26	\$ 21.15	\$ 12.35
Electric	\$/mmBtu	\$ 16.38	\$ 18.97	\$ 19.66	\$ 18.39	\$ 18.73
<b>Weighted Average</b>	\$/mmBtu	\$ 15.92	\$ 18.48	\$ 18.84	\$ 17.73	\$ 17.85
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 90,746	\$ 93,172	\$ 122,805	\$ 91,954	\$ 103,563
Sewage Cost	\$	\$ 579,655	\$ 422,669	\$ 445,865	\$ 497,089	\$ 390,070
<b>Reported Information</b>						
Gross Area	sq-ft	1,947,112	1,946,415	1,968,551	1,973,454	1,978,189
Reported Student Population		6,971	6,903	7,058	7,143	6,962
Reported Heating Degree Day	degree day	5,000	4,699	5,051	4,965	5,197
Reported Cooling Degree Day	degree day	972	1,211	1,098	1,170	981

# Shippensburg University



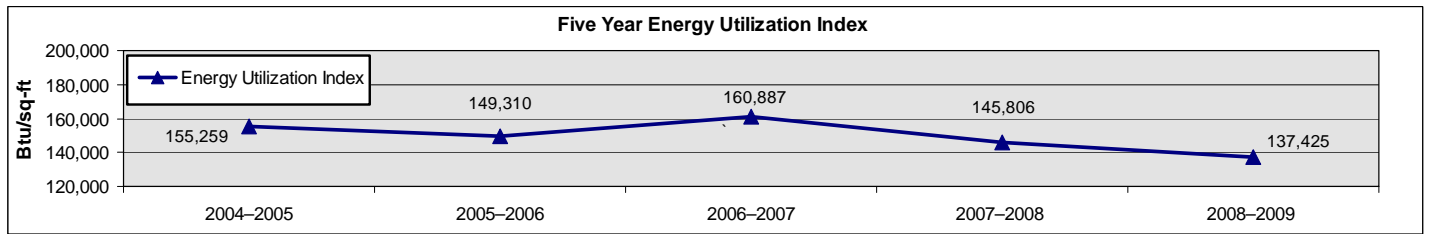
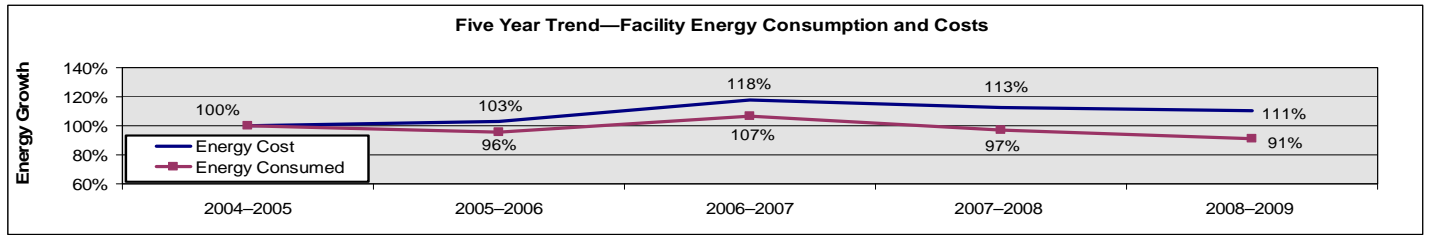
	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	8,522	7,562	7,226	7,031	7,268
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	19,147	15,008	17,042	19,229	21,612
Oil	gal	---	---	---	---	---
Electric	kwh	21,724,144	22,651,149	21,591,099	22,744,190	22,348,499
<b>Energy Costs</b>						
Anthracite Coal	\$	\$ 796,445	\$ 961,334	\$ 1,218,491	\$ 946,351	\$ 1,243,719
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 138,841	\$ 164,400	\$ 194,918	\$ 218,036	\$ 226,926
Oil	\$	---	---	---	---	---
Electric	\$	\$ 1,172,188	\$ 1,231,970	\$ 1,303,710	\$ 1,377,009	\$ 1,373,004
<b>Total</b>	\$	\$ 2,107,474	\$ 2,357,704	\$ 2,717,118	\$ 2,541,396	\$ 2,843,649
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	214,754	190,562	182,095	177,181	183,154
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	19,530	15,308	17,383	19,614	22,044
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	74,145	77,308	73,690	77,626	76,275
<b>Total</b>	mmBtu	308,429	283,179	273,168	274,421	281,473
<b>Energy Utilization Index</b>	Btu/sq-ft	163,021	144,780	137,704	132,481	134,861
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	\$ 93.46	\$ 127.13	\$ 168.63	\$ 134.60	\$ 171.12
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 7.25	\$ 10.95	\$ 11.44	\$ 11.34	\$ 10.50
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	5.40 ¢	5.44 ¢	6.04 ¢	6.05 ¢	6.14 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	\$ 3.71	\$ 5.04	\$ 6.69	\$ 5.34	\$ 6.79
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 7.11	\$ 10.74	\$ 11.21	\$ 11.12	\$ 10.29
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 15.81	\$ 15.94	\$ 17.69	\$ 17.74	\$ 18.00
<b>Weighted Average</b>	\$/mmBtu	\$ 6.83	\$ 8.33	\$ 9.95	\$ 9.26	\$ 10.10
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 315,264	\$ 280,931	\$ 218,654	\$ 262,804	\$ 294,827
Sewage Cost	\$	\$ 99,734	\$ 104,109	\$ 102,348	\$ 181,575	\$ 134,828
<b>Reported Information</b>						
Gross Area	sq-ft	1,891,961	1,955,926	1,983,740	2,071,396	2,087,130
Reported Student Population		6,752	6,595	6,601	6,790	6,866
Reported Heating Degree Day	degree day	5,173	4,224	5,009	4,917	5,306
Reported Cooling Degree Day	degree day	939	1,156	1,131	1,211	1,077

# Slippery Rock University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	---	---	---	---	---
Bituminous Coal	tons	7,807	6,051	5,467	4,331	3,595
Gas	mcf	65,846	76,036	88,381	108,200	114,123
Oil	gal	---	---	---	---	---
Electric	kwh	25,481,084	27,110,771	28,085,301	28,566,855	27,106,413
<b>Energy Costs</b>						
Anthracite Coal	\$	---	---	---	---	---
Bituminous Coal	\$	\$ 671,005	\$ 518,331	\$ 463,248	\$ 374,420	\$ 616,331
Gas	\$	\$ 487,249	\$ 849,826	\$ 896,982	\$ 1,169,604	\$ 1,252,090
Oil	\$	---	---	---	---	---
Electric	\$	\$ 1,106,597	\$ 1,187,548	\$ 1,278,847	\$ 1,360,487	\$ 1,422,843
<b>Total</b>	\$	\$ 2,264,851	\$ 2,555,705	\$ 2,639,077	\$ 2,904,512	\$ 3,291,264
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	---	---	---	---	---
Bituminous Coal	mmBtu	207,666	160,957	145,422	115,205	95,627
Gas	mmBtu	67,162	77,557	90,149	110,364	116,405
Oil	mmBtu	---	---	---	---	---
Electric	mmBtu	86,967	92,529	95,855	97,499	92,514
<b>Total</b>	mmBtu	361,796	331,042	331,426	323,067	304,547
<b>Energy Utilization Index</b>	Btu/sq-ft	188,819	162,198	154,685	142,498	134,127
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	---	---	---	---	---
Bituminous Coal	\$/ton	\$ 85.95	\$ 85.66	\$ 84.74	\$ 86.45	\$ 171.44
Gas	\$/mcf	\$ 7.40	\$ 11.18	\$ 10.15	\$ 10.81	\$ 10.97
Oil	\$/gal	---	---	---	---	---
Electric	cts/kwh	4.34 ¢	4.38 ¢	4.55 ¢	4.76 ¢	5.25 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	---	---	---	---	---
Bituminous Coal	\$/mmBtu	\$ 3.23	\$ 3.22	\$ 3.19	\$ 3.25	\$ 6.45
Gas	\$/mmBtu	\$ 7.25	\$ 10.96	\$ 9.95	\$ 10.60	\$ 10.76
Oil	\$/mmBtu	---	---	---	---	---
Electric	\$/mmBtu	\$ 12.72	\$ 12.83	\$ 13.34	\$ 13.95	\$ 15.38
<b>Weighted Average</b>	\$/mmBtu	\$ 6.26	\$ 7.72	\$ 7.96	\$ 8.99	\$ 10.81
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 150,871	\$ 170,843	\$ 157,783	\$ 184,221	\$ 181,944
Sewage Cost	\$	\$ 238,122	\$ 237,329	\$ 213,532	\$ 196,459	\$ 210,916
<b>Reported Information</b>						
Gross Area	sq-ft	1,916,095	2,040,971	2,142,582	2,267,173	2,270,589
Reported Student Population		7,467	7,633	7,734	7,819	7,761
Reported Heating Degree Day	degree day	5,654	5,382	5,596	5,609	6,133
Reported Cooling Degree Day	degree day	861	1,055	996	880	667

# West Chester University



	Units	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
<b>Fuel Consumption</b>						
Anthracite Coal	tons	6,729	6,584	7,603	6,171	4,757
Bituminous Coal	tons	---	---	---	---	---
Gas	mcf	52,630	44,834	53,531	59,811	57,764
Oil	gal	263,400	179,999	200,747	217,100	327,078
Electric	kwh	37,365,576	39,466,078	41,058,084	37,726,809	37,575,268
<b>Energy Costs</b>						
Anthracite Coal	\$	\$ 739,758	\$ 735,933	\$ 1,018,860	\$ 808,895	\$ 640,529
Bituminous Coal	\$	---	---	---	---	---
Gas	\$	\$ 615,276	\$ 648,918	\$ 731,429	\$ 808,081	\$ 814,974
Oil	\$	\$ 433,727	\$ 362,687	\$ 383,401	\$ 599,917	\$ 662,221
Electric	\$	\$ 3,036,201	\$ 3,237,996	\$ 3,540,330	\$ 3,224,281	\$ 3,221,516
<b>Total</b>	\$	\$ 4,824,963	\$ 4,985,534	\$ 5,674,020	\$ 5,441,174	\$ 5,339,240
<b>Energy Consumption</b>						
Anthracite Coal	mmBtu	170,917	167,234	193,116	156,743	120,828
Bituminous Coal	mmBtu	---	---	---	---	---
Gas	mmBtu	53,683	45,731	54,602	61,007	58,919
Oil	mmBtu	36,876	25,200	28,105	30,394	45,791
Electric	mmBtu	127,529	134,698	140,131	128,762	128,244
<b>Total</b>	mmBtu	389,004	372,862	415,954	376,906	353,782
<b>Energy Utilization Index</b>	Btu/sq-ft	155,259	149,310	160,887	145,806	137,425
<b>Unit Fuel Costs</b>						
Anthracite Coal	\$/ton	\$ 109.94	\$ 111.78	\$ 134.01	\$ 131.08	\$ 134.65
Bituminous Coal	\$/ton	---	---	---	---	---
Gas	\$/mcf	\$ 11.69	\$ 14.47	\$ 13.66	\$ 13.51	\$ 14.11
Oil	\$/gal	\$ 1.65	\$ 2.01	\$ 1.91	\$ 2.76	\$ 2.02
Electric	cts/kwh	8.13 ¢	8.20 ¢	8.62 ¢	8.55 ¢	8.57 ¢
<b>Unit Energy Costs</b>						
Anthracite Coal	\$/mmBtu	\$ 4.33	\$ 4.40	\$ 5.28	\$ 5.16	\$ 5.30
Bituminous Coal	\$/mmBtu	---	---	---	---	---
Gas	\$/mmBtu	\$ 11.46	\$ 14.19	\$ 13.40	\$ 13.25	\$ 13.83
Oil	\$/mmBtu	\$ 11.76	\$ 14.39	\$ 13.64	\$ 19.74	\$ 14.46
Electric	\$/mmBtu	\$ 23.81	\$ 24.04	\$ 25.26	\$ 25.04	\$ 25.12
<b>Weighted Average</b>	\$/mmBtu	\$ 12.40	\$ 13.37	\$ 13.64	\$ 14.44	\$ 15.09
<b>Misc Facility Costs</b>						
Water Cost	\$	\$ 464,098	\$ 518,843	\$ 601,288	\$ 601,650	\$ 561,948
Sewage Cost	\$	\$ 302,120	\$ 313,971	\$ 304,800	\$ 293,493	\$ 238,187
<b>Reported Information</b>						
Gross Area	sq-ft	2,505,516	2,497,229	2,585,375	2,584,993	2,574,367
Reported Student Population		10,768	11,570	10,928	11,284	11,623
Reported Heating Degree Day	degree day	4,616	4,237	4,426	4,292	4,712
Reported Cooling Degree Day	degree day	1,185	970	367	1,171	1,274

## Glossary

**Energy Utilization Index (Btu/sq-ft)** – Determined by dividing energy in Btu's by total space in sq-ft.

**Load Factor** – a measure of effective use of electricity, the ratio of the average load over a designated period of time to the peak load occurring during that period. Load Factor is determined by dividing the kwh by the product of the KW demand and 730 (the average number of hours in a month).

The value of a load factor ranges from 0.0 to 1.0. Facilities with higher load factors (0.7-0.9) realize a lower cost per kwh. Very low load factors (0.3-0.5) point toward higher kwh costs and indicate the need for review of electric use.

**Miscellaneous Gas Used, Oil Used** – the amount of gas or oil used to operate those buildings not served by the central boiler plant.

**Steam Capacity** – plant steam capacity based on the continuous output rating for all boilers in the central plant.

**Total Energy (Btu)** – the total amount of all energy, coal, gas, oil, and electric, converted to Btu's as delivered to the institution.

**Total Energy Cost** – total cost of all energy used at the facility. Energy cost includes coal, gas, oil, purchased steam, wood, and electricity.

**Total Fuel Cost** – all fuel cost for coal, gas, and oil combined.

**Total Space** – the gross total space at a facility measured in square feet. This includes heated and non-heated space.

**Unit Energy Cost (\$/mmBtu)** – determined by dividing the energy cost by the total million Btu's.

**Unit Cost of Steam (\$/mlb)** – the total cost to produce 1,000 pounds of steam in the boiler plant. It is determined by dividing the steam into the total operating cost including charges for fuel, labor, parts, services, and suppliers.

**Weighted Average** – a statistical method used when individual figures are dependent upon another factor that varies by facility. For example, a straight average of per unit energy cost would be misleading because it is dependent upon two variables at each facility: Total Energy Consumed and Total Energy Cost. Each value differs by facility.