

**Pittsburgh Allegheny County Thermal (PACT)  
Operational Analysis Report  
For the Period  
June 1, 2008 through May 31, 2011**

*(Non-Audit Service)*

**February 13, 2013**

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January 10, 2013

Mr. Robert L. Fazio  
President  
Pittsburgh Allegheny County Thermal  
Law and Finance Building  
429 Fourth Avenue, Suite 806  
Pittsburgh, PA 15219

Pittsburgh Allegheny County Thermal (PACT)  
Operational Analysis Report for the Period  
June 1, 2008 through May 31, 2011

Dear Mr. Fazio:

The Allegheny County Controller's Office performed an analysis of Pittsburgh Allegheny County Thermal's ("PACT") operations. Our procedures were applied to the period June 1, 2008 through May 31, 2011. We evaluated the fiscal prudence of PACT's operational expenditures, maintenance of its infrastructure, measures taken to maintain and expand its member base, its overall governance practices, and other matters. We also analyzed the County's energy alternatives and evaluated the benefits and disadvantages associated with both remaining a member of PACT as well as leaving the PACT cooperative. Our engagement was performed as a non-audit service. Therefore, our engagement was not performed in accordance with *Government Auditing Standards*.

The procedures we performed have resulted in the identification of a number of ways in which PACT can improve its operating efficiency and lower steam rates for its members. It will be important for PACT's Board of Directors to provide more effective governance going forward to ensure that appropriate measures to address the issues we have identified are properly implemented and that an acceptable level of efficiency can be maintained over the long term. The results of our procedures are included in the attached report.

Mr. Robert L. Fazio  
January 10, 2013  
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We would like to thank the management and staff of Pittsburgh Allegheny County Thermal for their courtesy and cooperation during our engagement.

Kind regards,

Chelsa Wagner  
Controller

Lori A. Churilla  
Assistant Deputy Controller, Auditing

CW/lc

cc: Honorable Charles Martoni, President, County Council  
Honorable Nicholas Futules, Vice-President, County Council  
Honorable Rich Fitzgerald, Allegheny County Executive  
Mr. William McKain, County Manager, Allegheny County  
Ms. Jennifer Liptak, Chief of Staff, County Executive  
Mr. Warren Finkel, Budget Director, Allegheny County  
Mr. Joseph Catanese, Director of Constituent Services, County Council  
Mr. Walter Szymanski, Budget Director, County Council  
Mr. Jim Sloss, Board Chairman, PACT  
Mr. Robert A. Loose, Former Board Chairman, PACT  
Mr. Doug Straley, Board Vice Chairman, PACT

## **Purpose of Procedures**

The Office of the Controller of Allegheny County performed an operational analysis of Pittsburgh Allegheny County Thermal, Ltd. (PACT) for the period June 1, 2008 through May 31, 2011. PACT's steam rates have generally increased in the past at a rate that has exceeded those of other energy providers. For the fiscal year ended May 31, 2011, the County paid PACT \$2,410,970 in heating and cooling costs. Our analysis involved gaining an understanding of PACT's operations to help determine the factors influencing PACT's steam rates. We then evaluated the fiscal prudence of PACT's operational expenditures, maintenance of its infrastructure, measures taken to maintain and expand its member base, its overall governance practices, and other items. We also analyzed the County's energy alternatives and evaluated the benefits and disadvantages associated with both remaining in and in leaving the PACT cooperative.

## **Background**

PACT was formed in 1983 following the dissolution of the Allegheny County Steam Heating Company (ACSHCo). All ACSHCo owned steam distribution lines, pipes, tunnels, structures, facilities and equipment were transferred to PACT for a sum of \$1. Subsequently, PACT purchased its boiler plant facility located in downtown Pittsburgh from Duquesne Light. PACT currently serves approximately 56 member buildings, with Allegheny County accounting for approximately 23% of total steam usage for the fiscal year ended May 31, 2011. PACT currently operates as a non-profit cooperative, exempt from both federal and state income tax and is not subject to the jurisdiction of the Pennsylvania Public Utility Commission. Allegheny County is a significant stakeholder in PACT and maintains representation on PACT's Board of Directors.

PACT provides district steam heating and cooling to government buildings and businesses throughout the "golden triangle" region of downtown Pittsburgh. Because PACT is the only district steam heating and cooling provider in downtown Pittsburgh, businesses must make the choice to utilize PACT's services or install their own self-contained infrastructure. PACT provides a valuable service to residents of the "golden triangle". However the increasing cost of steam has forced members to reevaluate their heating and cooling sources.

PACT's steam distribution tunnel system was constructed in 1915 with the expectation the system would serve approximately 300 members. Due in part to rising steam rates, PACT currently serves only a small fraction of its capacity of members. PACT's steam rates are largely dependent on the cost of natural gas and other utilities necessary to produce steam. However, the efficiency of PACT's system also impacts PACT's steam rates. PACT's system operates at its greatest efficiency when steam production is at 100% of capacity. As members leave PACT, the system is operating at decreased efficiency, ultimately leading to an increase in wasted steam throughout the system. Also, as members leave, fixed overhead costs are spread over a smaller member base, which causes steam rates to increase for PACT's remaining members.

## **Results in Brief**

Throughout our analysis, we identified areas for improvement that will help PACT to increase its operational efficiencies and thus reduce the cost of steam charged to its members. Following is a listing of our observations and recommendations that resulted from our operational assessment:

### **Observation #1: Governance Issues Have Adversely Impacted PACT's Operational Efficiency and Steam Rates**

A cooperative is owned by its members, which means that the PACT cooperative is not a public utility, and therefore responsible for its own governance. Because PACT is not otherwise regulated, strong governance from PACT's Board of Directors is necessary in order to ensure that PACT operates efficiently and charges its members reasonable steam rates. However, we observed that PACT's By-Laws are silent with respect to any measures to be taken to ensure that PACT's Board of Directors collectively possesses adequate knowledge and practical experience in the needed disciplines in order to be able to effectively govern PACT. Further, it appears that the Board lacks extensive knowledge and practical experience across a variety of disciplines that pertain to PACT's operations, which could adversely impact its ability to provide effective governance. In addition, we were advised that PACT's Board was not provided with any board member training. Consequently, the directors may not have fully understood their responsibilities and obligations as board members and how to fulfill them, including dealing with various circumstances that may have inhibited their ability to provide proper governance. Taking the steps necessary to create an environment that facilitates PACT's Board exercising strong "hands-on" governance appears to be the best way to stimulate the changes needed to improve PACT's operational efficiency and steam rates. It appears that taking steps to ensure that future Board appointments will result in the formation of a Board that collectively possesses knowledge and practical experience across most if not all of the disciplines associated with PACT's operations, as well as taking steps to ensure that Board members fully understand their responsibilities and obligations as board members and how to fulfill them may be all that is needed to create an environment that facilitates strong governance of PACT.

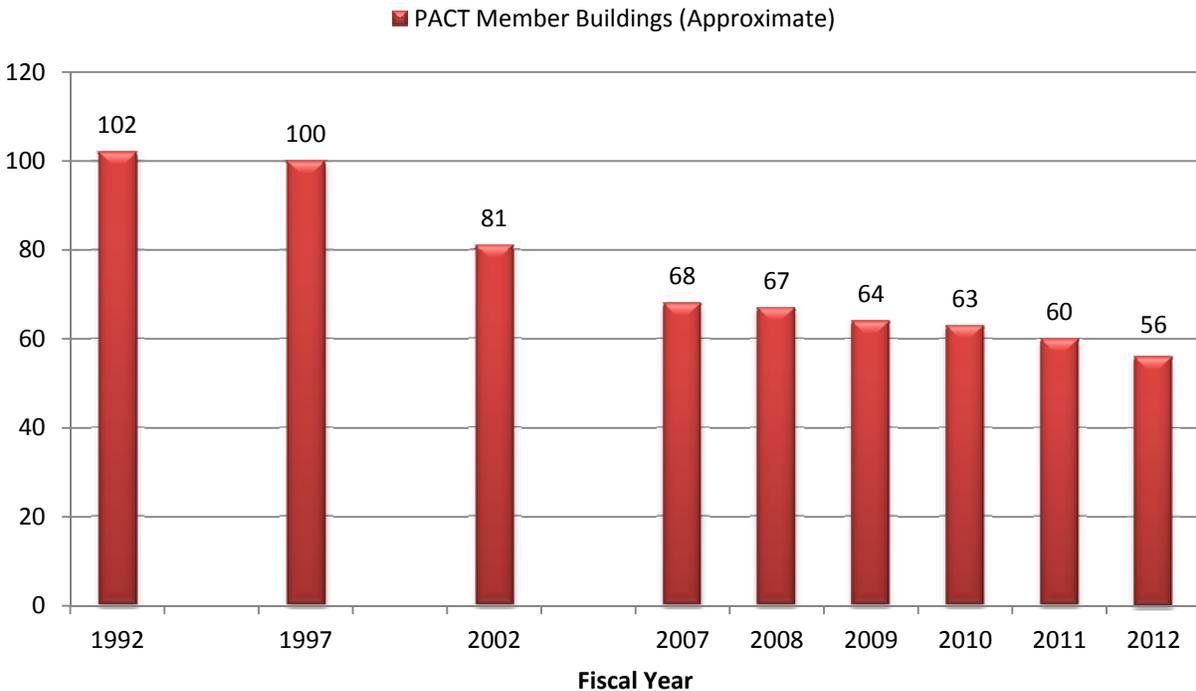
**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Take steps to ensure that future Board appointments will result in the formation of a Board that collectively possesses knowledge and practical experience across most if not all of the disciplines associated with PACT's operations. This could potentially be accomplished through revision of the provisions of PACT's By-Laws, and via routine communication among PACT's members regarding the knowledge and expertise of potential candidates.
- Take steps to ensure that Board members fully understand their responsibilities and obligations as Board members and how to fulfill them. This could be accomplished by sending newly-appointed Board members for professionally-conducted governance training.

**Observation #2: The Size of PACT’s Member Base Has a Significant Impact on its Ability to Offer its Members Competitive Energy Rates**

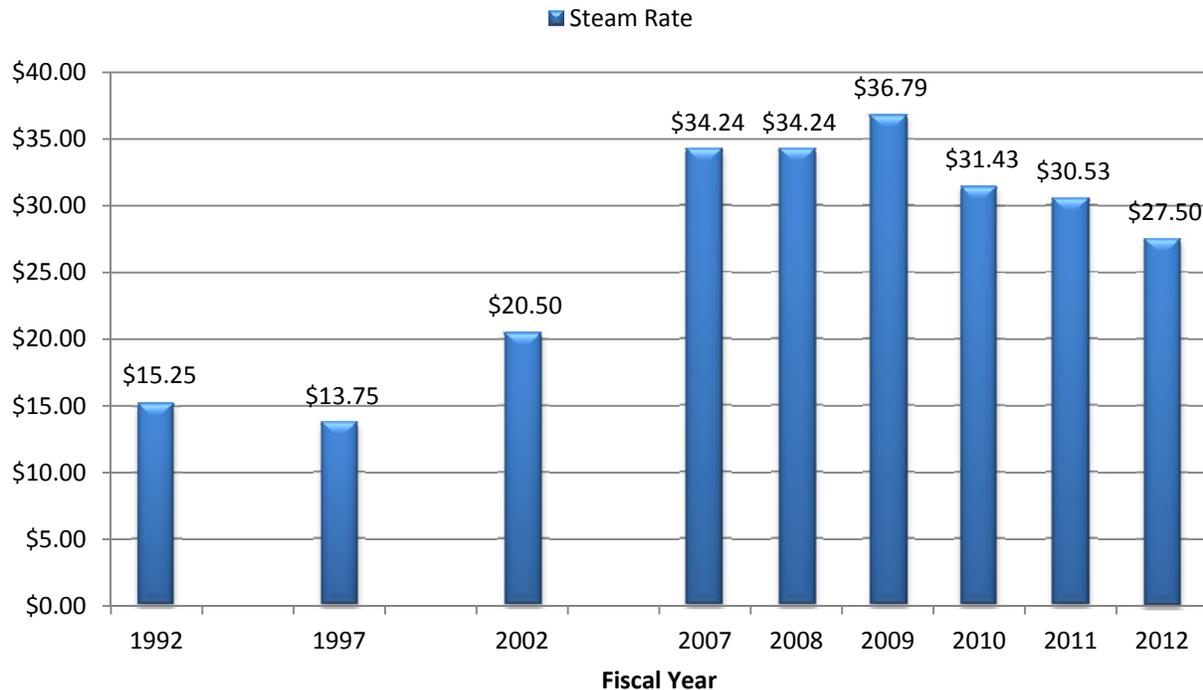
The steam production plant and distribution system utilized by PACT were designed to be able to serve and are capable of serving many more members in the “golden triangle” region of Pittsburgh than PACT currently serves. A district steam heating network is intended to serve a large member base. The allocation of fixed steam production and overhead costs over a large member base reduces the cost to each member, which is one of the factors (along with the return of condensate for reuse in the steam production process – see also Observation #4) that contributes to the district steam heating model being a viable option to other energy alternatives. PACT currently serves only approximately 56 member buildings. PACT’s membership has declined over the years, which appears to be attributable to a variety of factors.

**PACT Member Buildings Over Time**



There are typically a number of barriers PACT must overcome to add new members. While PACT engaged a marketing consultant in 2011 to help expand its member base, to the best of our knowledge no new members have since been added. The effect of this condition is that the size of PACT’s member base could continue to adversely impact PACT’s ability to offer its members competitive steam rates unless appropriate measures are taken to expand its member base. PACT should focus first on reducing its costs to facilitate the lowering of steam rates.

## Historical PACT Steam Rates



In addition to improving PACT's attractiveness to prospective new members, reducing costs and offering lower steam rates that are sustainable may influence the local governments to take greater measures to help PACT increase its member base. In any event, PACT also needs to consider implementing strategic new marketing approaches to increase the likelihood of attracting new members.

**Recommendations:** The Controller's Office recommends that PACT:

- Focus first on implementing our other recommendations to reduce its operating costs to facilitate the lowering of steam rates.
- Attempt to garner support from the local governments in expanding PACT's customer base.
- Develop and implement new strategic marketing approaches to improve the likelihood of attracting new members.

**Observation #3: The Utilization of a Hedging Strategy for Forward Natural Gas Purchases Should Reduce the Extent to Which PACT's Natural Gas Costs Exceed Actual Commodity Prices**

PACT's senior management utilizes prior experience purchasing gas, as well as historical trends and pricing, to purchase natural gas forward contracts. If enough natural gas is not purchased via the New York Mercantile Exchange (NYMEX) to cover a particular month's need, the remainder is purchased at the NYMEX settlement price for the month of use. During the course of PACT's

three fiscal years ending May 31, 2012, 2011 and 2010, PACT purchased forward contracts to cover an average of 74% of its anticipated natural gas needs, with the remaining 26% purchased at the month end settlement price. While there is no guarantee the settlement price will be less than PACT's trigger price, by purchasing 74% of its natural gas at the trigger price for the aforementioned time period, PACT paid \$3,187,372 more in those three fiscal years than if it had just purchased natural gas at the monthly settlement prices.

**Recommendations:** The Controller's Office recommends that PACT:

- Implement our other recommendations designed to help PACT lower its steam rates so that PACT can rely less on locking in natural gas prices for the majority of its anticipated needs to reduce steam rates.
- Develop a written natural gas purchasing policy to be utilized by senior management when purchasing natural gas. This policy should be approved by the Board of Directors. PACT should consider the utilization of a hedging strategy for the purchase of forward natural gas contracts to help minimize PACT's exposure to unfavorable natural gas costs and maintain an adequate correlation between PACT's natural gas supply costs and actual commodity prices. It may be beneficial to engage a consultant with expertise in this area to assist in developing the policy.

**Observation #4: Many PACT Members Do Not Have or Do Not Properly Maintain Condensate Return Lines**

Saving energy and lowering costs by reusing condensate for steam production is a key component of the district steam heating model, and contributes to district steam heating being a viable alternative to the utilization of other conventional energy sources. Many current PACT members do not have or do not properly maintain their condensate return lines. Condensate is often routed directly to drainage systems in member buildings. We were also advised that at least one PACT member uses the condensate for its own purposes, specifically to heat water. A "High Level Operational Assessment" recently issued by AECOM indicated that on average, less than 30% of the condensate associated with steam delivered to PACT's members was returned to PACT's steam production plant during 2009. In addition, it was indicated that condensate was returned to the PACT plant at an average temperature of 155°F, where ideally condensate would be returned to the plant at approximately 200°F. Natural gas is a major component of PACT's steam production costs, which in turn is a major factor that influences PACT's steam rates. Consequently, significant reductions in natural gas costs attributable to more condensate being returned to PACT's steam production plant could help to significantly lower steam rates for members.

**Recommendations:** The Controller's Office recommends that PACT:

- Prioritize the installation of condensate return lines to buildings of members that purchase a high volume of steam (provided that the members plan to purchase and maintain the necessary equipment to return the condensate).

- Repair and install the condensate return meters as planned, with a focus on members that purchase a high volume of steam, to help ensure that members will take the action needed to improve the efficiency of the system.
- Consider the appropriateness of utilizing incentives to encourage members to return condensate to the PACT plant, and if deemed appropriate, update PACT's standard steam use agreements and its Rules and Regulations to reflect the incentives to be offered (once condensate return meters have been installed).

**Observation #5: PACT Needs to Avoid No Bid Contracts and Improve its Procurement Practices**

We determined that PACT did not have written agreements in place to cover the services provided by three legal services providers, including PACT's current legal counsel. We also observed that PACT has utilized the same external auditors for more than 20 years. We determined that PACT's audits have not been performed for a fixed fee, which is common practice in today's environment. Finally, it came to our attention that senior management entered into a one year agreement with a marketing consultant without the approval of PACT's Board of Directors. The agreement provided for payment of a \$50,000 retainer and a monthly stipend of \$10,000, for a total annual cost to PACT of \$170,000. The agreement, which was drafted by the consultant, did not explain in adequate detail the services that would be provided or specify how the results would be communicated to PACT. PACT's contracts with its external auditors and marketing consultant were both no bid contracts. Senior management stated that the audit contract has not been put out to bid since the original contract was awarded. The marketing contract was a result of recommendations made to PACT's senior management. It appears that at the time we performed our procedures PACT had not secured any new members as a result of the services that were provided by the consultant. The effect of these conditions is that the procurement practices that were utilized, specifically the lack of written contracts that specify the services to be provided and related compensation, and the failure to use a bidding process for large procurements, do not provide assurance that services procured are properly authorized and approved, within established budgetary limits, and satisfactory in terms of price and quality.

**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Develop a competitive bidding policy to be used for large procurements to help ensure that PACT consistently obtains a satisfactory quality and price for the goods or services it purchases.
- Continue to require the use of written contracts for the provision of services. The Board of Directors should continue to review and approve these contracts prior to their execution.
- Periodically review performance under awarded contracts to help ensure that PACT is receiving goods or services of satisfactory quality at the agreed upon prices.

**Observation #6: Preferential Rates Offered to Members Should Be Approved by PACT's Board of Directors**

Prior to 2012, PACT's Board of Directors was not involved in decisions regarding preferential steam rates offered to members. Preferential rates currently range from \$15.75 to \$25.85 per mlb. Senior management advised us that it made those decisions based on an evaluation of the relevant facts and circumstances without input or approval from the Board of Directors. Senior management had viewed the offering of preferential steam rates to members as an activity that was a component of day-to-day business, and believed that the Board would not want to be involved, and did not need to be involved, in that level of detail. The effect of this condition is that prior to 2012 PACT's Board of Directors did not have an opportunity to evaluate the appropriateness of preferential steam rates and their impact on PACT's operations. Beginning in 2012, the Board of Directors has required senior management to obtain Board approval before offering preferential rates to members.

**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Consider evaluating the appropriateness of preferential steam rates currently in effect.
- Continue the newly-instituted practice of evaluating and approving preferential steam rates before they are offered to members to help ensure that all PACT's members benefit.
- Consider developing written standards for determining which customers could be eligible for preferential rates and setting the rates.

**Observation #7: The Board of Directors Should Be More Involved In Setting the Compensation of Administrative Staff**

PACT's Board of Directors approves the office salaries budget in total via its approval of the proposed budget, but is not necessarily aware of the personnel and the corresponding salaries that comprise the budgeted expense amount. While any bonus paid to PACT's President has historically been initiated and approved by the Board of Directors, we were advised that all other salary increases or bonuses awarded to administrative staff have been determined exclusively by PACT's President based on an assessment of performance. The process used by PACT's President for administering increases and bonuses does not involve benchmarking to identify comparable rates of pay for similar positions in other organizations or other procedures to gain assurance that the compensation to be paid is reasonable based on the market for services. The effect of this condition is that PACT's compensation rates could be significantly out of line with those available in the labor market for similar positions.

**Recommendation:** The Controller's Office recommends that PACT's Board of Directors review and approve any salary increases or bonuses to be paid to PACT's administrative staff.

**Observation #8: PACT Needs to Update and Adhere to its Written Policies and Procedures**

We were advised that PACT's written policies and procedures have not been updated for some time and need to be updated. Consequently, PACT's written policies and procedures may not

incorporate all of the necessary elements designed to help ensure that misstatements are prevented or detected and corrected and that PACT's objectives are achieved in a manner that complies with all applicable requirements. In addition, the fact that the policies and procedures actually utilized on a day to day basis likely vary significantly from PACT's written policies and procedures increases the likelihood that internal control procedures and procedures designed to ensure compliance are not being performed. Without up to date written policies and procedures, it would also be more difficult to hold employees accountable for actions that may be deemed inappropriate.

**Recommendation:** The Controller's Office recommends that PACT update its written policies and procedures and then take steps to ensure that the updated policies and procedures are properly implemented.

**Observation #9: PACT's Natural Gas Surcharge is Not Strictly Based on Utility Costs**

PACT's monthly invoices for steam provided to members include two steam rate components, "total steam" and "natural gas surcharge". The caption "natural gas surcharge" implies that the cost relates directly to specific utility costs incurred by PACT that are being passed on to its members, or represents an additional charge for natural gas that directly corresponds with actual increases in natural gas commodity prices over a certain limit. We determined that the natural gas surcharge is only loosely based on increases in natural gas costs. While the natural gas surcharge rate component is intended to fluctuate as variable costs fluctuate, it is also used as a mechanism to help PACT ensure that it not only covers operating costs but generates enough revenue to provide funding for future repairs or improvements to PACT's infrastructure and any unforeseen costs. Senior management believes that to the extent steam rate increases are necessary, members are more likely to accept them if they are presented as a surcharge. The effect of this condition is that PACT's monthly steam invoices are somewhat misleading in that increases in the natural gas surcharge cannot be tied directly to increases in natural gas costs.

**Recommendation:** The Controller's Office recommends that PACT modify the manner in which steam charges are presented to members for payment. PACT should utilize a single rate for steam, or use captions that more accurately reflect the specific costs that serve as the basis for any additional charges.

**Observation #10: Gross Receipts Have Been Understated For Purposes of Calculating the City of Pittsburgh Gross Receipts Tax**

City of Pittsburgh Ordinance #227 of 1915 required PACT's predecessor, the Allegheny County Steam Heating Company (ACSHCo), to pay the City of Pittsburgh 3% of its calendar year gross receipts for the third and each succeeding year of its operations. The City of Pittsburgh has maintained that PACT as ACSHCo's successor is obligated to continue to pay 3% of its annual gross receipts to the City. PACT has contested its obligation to continue making the payments, although it has made the payments to the City for 2010 and 2011 under protest. We observed that PACT collects late charges from members that have past due balances. Upon review of PACT's general ledger, we noted that late charges collected were recorded as an offset to a

*Executive Summary*

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miscellaneous expense account rather than as revenue, which resulted in those amounts being excluded from gross receipts for purposes of calculating the payments to be made to the City of Pittsburgh. The late charges that should have been included in gross receipts for the calendar years 2011 and 2010 were \$28,711 and \$23,419, respectively. Consequently, PACT should have paid the City of Pittsburgh an additional \$861 and \$703 for the calendar years 2011 and 2010, respectively, in order for the payments made to the City to represent 3% of PACT’s calendar year gross receipts. We have not determined any additional amounts that may be payable to the City of Pittsburgh that are attributable to this condition for years prior to 2010.

**Recommendations:** The Controller’s Office recommends that PACT:

- Properly classify its late charges as revenue in its general ledger and financial statements to help ensure that payments made to the City of Pittsburgh actually represent 3% of PACT’s calendar year gross receipts.
- Review its accounting records for prior years to determine the amounts of any underpayments attributable to this condition and issue a payment to the City of Pittsburgh to resolve all such underpayments.

**Observation #11: Cooperation Between PACT and its Local Government Members Could Result in Greater Operating Efficiency and Lower Steam Rates for All Members**

PACT’s senior management has suggested that there are a number of ways in which the local governments can do more to help PACT expand its customer base and operate with greater efficiency. These include:

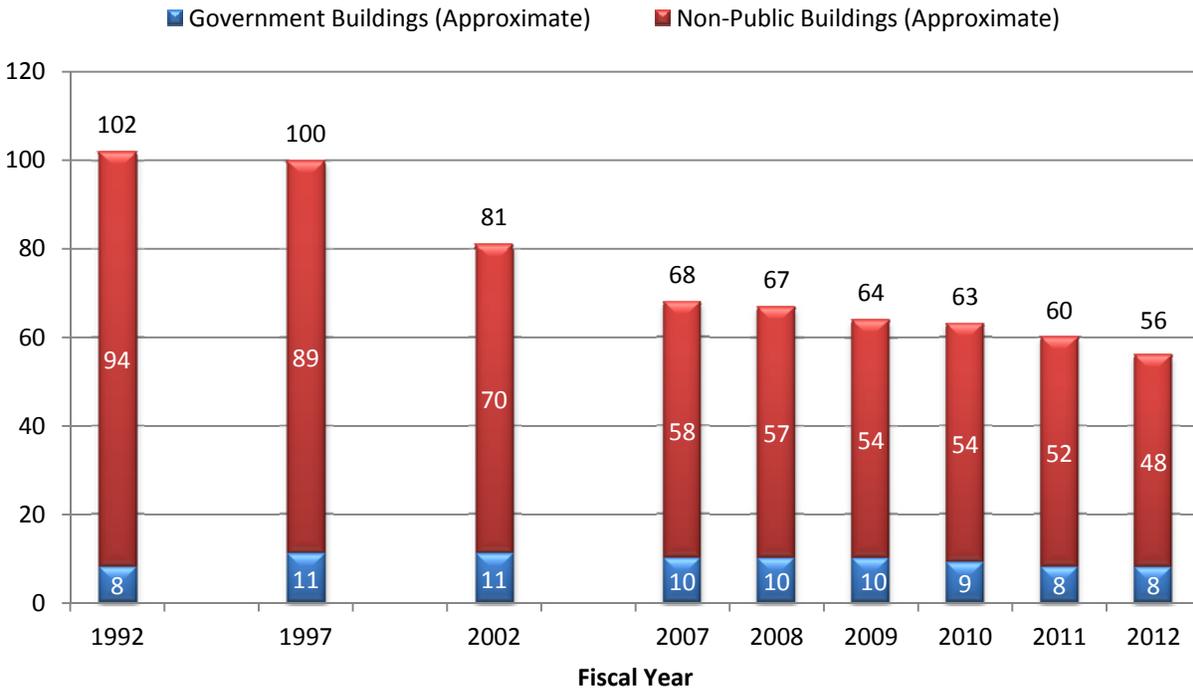
- Assisting in the identification of potential new members
- Properly maintaining and operating condensate return equipment
- Maintaining City streets better
- Abolishing the requirement for nighttime construction
- Easing other construction-related restrictions

The effects of these conditions is that PACT has had difficulty in expanding its customer base with respect to new construction and its operating costs are higher than they could be. Consequently, steam rates are higher than they could be. Although the local governments may have had legitimate reasons for taking the actions they have taken in the past, it appears that greater cooperation between PACT and its local government members could have a significant positive impact on PACT’s operations and steam rates. Historical data presented to us by PACT senior management shows that governmental members have accounted for 42% of total steam consumption since fiscal year 1992. The table below summarizes information supplied by PACT regarding revenues generated from both governmental and non-governmental sources for its last three fiscal years.

| <u>Revenue Sources</u> | <u>Fiscal Year</u>  |                     |                    |
|------------------------|---------------------|---------------------|--------------------|
|                        | <u>2010</u>         | <u>2011</u>         | <u>2012</u>        |
| Governmental Members   | \$ 4,852,687        | \$ 4,700,400        | \$2,976,997        |
| All Other Members      | \$ 6,326,899        | \$ 6,341,557        | \$3,784,333        |
| Total                  | <u>\$11,179,586</u> | <u>\$11,041,957</u> | <u>\$6,761,330</u> |

We noted that fiscal year 2012 revenues were substantially lower due to a \$3.03/Mlb. reduction in the Natural Gas Surcharge and moderate temperatures during the winter months.

### Decline in PACT Member Buildings Served



With such a large consumption percentage, both historical and ongoing, PACT’s local government members clearly have a stake in the success of PACT’s operations. We have identified a number of opportunities for PACT to implement on its own to improve its operational efficiency, which should facilitate the lowering of steam rates for its members. However, the local governments cannot expect that they will ultimately achieve the maximum amount of potential savings unless they are willing to cooperate with PACT and take the steps necessary to help PACT expand its customer base and reduce its costs.

**Recommendations:** The Controller’s Office recommends that PACT:

- Take the first steps to lower its costs.
- Meet with those charged with governance of the City and the County to discuss opportunities for cooperation, and consider utilizing written agreements to serve as a record of any mutual understanding reached.

**Observation #12: The Removal of the Allegheny County Jail’s Jail Steam Chillers from PACT’s System Should Have Caused a Significant Increase in Steam Rates for All PACT Members**

Prior to 2006, the Allegheny County Jail utilized three steam chillers for its air conditioning and chilled water needs. PACT had historically provided steam to power the chillers in the spring and summer months until the Jail took one chiller offline in 2006. In mid 2011 the Jail's remaining two steam chillers were removed and replaced with two new high efficiency electric centrifugal chillers as recommended by a consultant based on a collaborative decision made by the Allegheny County's former Jail Warden, Department of Public Works, and Office of Budget and Finance. We were unable to determine whether the Jail had tried to negotiate a lower steam rate for the usage of its steam chillers from PACT, and whether the potential impact on PACT's future steam rates had been taken into account prior to replacing the Jail's steam chillers. PACT's senior management indicated to us that PACT was not advised of the replacement of the Jail's steam chillers beforehand. We do not know the method that the consultant used to compute the energy savings that it was willing to guarantee that the County would realize. Consequently, we do not know whether the potential for a PACT steam rate increase, which would result in higher future steam costs for the County with respect to the buildings that PACT still supplies with steam (as well as higher steam costs for all of PACT's other members) was factored into the computation as an offset to the energy savings that the County was projected to realize. An analysis we performed suggests that PACT should have been able to offer all of its members steam rates approximately \$1.96/mlb lower for its 2012 fiscal year had the Jail continued to utilize its three steam chillers. Since Allegheny County purchased 59,892 mlbs of steam in PACT's 2012 fiscal year to heat its other buildings, the County should have been able to save approximately \$117,388 in PACT steam costs. Despite the impact of unfavorable natural gas purchasing practices (see Observation #3), PACT's actual natural gas costs decreased over its last three fiscal years, which (among other factors) led to PACT refraining from increasing steam rates for 2012. Although PACT's steam rates did not increase, the County and PACT's other members did not realize a cost savings in the form of lower steam rates that otherwise should have been realized as a result of the decrease in PACT's natural gas costs. This also suggests that the cost savings to Allegheny County as a result of the Jail chiller conversion may be significantly less than what was anticipated.

**Recommendations:** The Controller's Office recommends that Allegheny County:

- Determine the potential impact of decisions to be made about energy consumption on PACT and its members before making those decisions.
- Monitor the energy savings realized from the Jail chiller replacements and evaluate whether the guaranteed annual savings have been achieved. Consider holding the consultant accountable for its guarantee of savings to the extent that such savings have not been realized.

**Observation #13: The Allocation of City-County Building Steam Costs Is Not Based on Current Space Usage**

The City of Pittsburgh and Allegheny County share in the cost of steam used in the City-County Building ("CCB") based calculations of the square footage utilized by each government that were made prior to the year 2000. Based on the square footage utilized at the time, the cost of steam provided through the low pressure meter is shared equally between the local governments, while 67% of the cost of steam provided through the high pressure line is to be paid by the City

and 33% paid by the County. We determined that the allocation of steam costs associated with the low pressure meter appears to be appropriate. However, it appears that the allocation of steam costs associated with the high pressure meter results in the County bearing approximately 6% more than its equitable share of the costs. We determined that during the year 2000, the City began utilizing the 6<sup>th</sup> floor of the CCB which had previously been utilized by the County. The square footage calculations that serve as the basis for the current allocation of costs have not been updated to take the aforementioned change in the utilization of the 6<sup>th</sup> floor of the CCB into account. It appears that Allegheny County paid \$26,315 in excess of its equitable share of CCB steam costs for the period January 2008 through July 2012. We have not determined the impact of this condition on other periods. We discussed allocation of CCB steam costs with a representative of the City of Pittsburgh, who indicated that it was his understanding that the City was in the process of working with the Allegheny County Department of Public Works to revise the allocation of CCB steam costs.

**Recommendations:** The Controller's Office recommends that Allegheny County:

- Work with the City of Pittsburgh to adjust the high pressure steam meter billing allocation to ensure both the City and County are paying for steam used in the City-County Building based on actual occupied square footage.
- Work with the City to recover the excess costs incurred by the County during prior years.

### **Analysis and Conclusions**

One of the primary objectives of our engagement was to determine the advantages and disadvantages associated with Allegheny County renewing its steam agreement with PACT versus seeking to pursue other energy alternatives. The results of our analysis, which are based on our understanding of PACT's operations, the performance improvement opportunities for PACT we have identified, and available information about other energy alternatives and other relevant factors, are presented below.

The primary reason for contemplation about whether Allegheny County's renewal of its steam agreement with PACT would be in the best interest of Allegheny County taxpayers is that PACT's steam rates are higher than the energy rates offered by other local energy providers. However, to take advantage of a natural gas or fuel oil rate from a local energy provider, the local governments would need to purchase and install boilers in their buildings. In addition to building space being taken up by the boilers and personnel resources being utilized to ensure safe and efficient operation of the equipment, the equipment itself would represent a significant cost to the local governments. Although the cost savings that may be realized from switching local energy providers could be substantial, these factors diminish to a certain extent the true cost savings associated with lower natural gas or fuel oil rates offered by other local energy providers.

Natural gas and fuel oil are not necessarily the only other energy options available. They are just options that are more conventional. Utilizing solar, wind, and hydroelectric power are also options that have been available for some time, and the technology associated with those power sources has improved in recent years. Geothermal heating, a newer technology which involves drilling to significant depths underground to harness the heat at those levels, is also an option.

## *Executive Summary*

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All of these more unconventional energy options are also “greener” alternatives to using natural gas and fuel oil. However, it appears that there are a number of factors that make these options impractical for the local governments. For example, Pittsburgh is not exceptionally sunny or windy, which means that solar panels or windmills in Pittsburgh would typically not harness as much energy as they would in other cities with a more suitable environment. Further, all of these options would require a significant up-front investment, and could require the use of additional land. For example, utilizing hydroelectric power would require the construction of a power plant along one of Pittsburgh’s three rivers.

We deemed it valuable to determine how some other governments have addressed their energy needs. We focused on Westmoreland County (PA) and the City of Philadelphia. Westmoreland County replaced the inefficient heating and air conditioning mechanical equipment in its Courthouse with a modern and highly efficient boiler and chiller system. The upgrades have reduced the energy needs of the facility and resulted in immediate financial savings to the taxpayers of Westmoreland County. The City of Philadelphia, which is slightly larger than the City of Pittsburgh, utilizes Trigen-Philadelphia Energy Corporation for its steam heating and cooling needs. Trigen-Philadelphia Energy Corporation is regulated by the Pennsylvania Public Utility Commission, and its steam tariffs are significantly lower than PACT’s. Although the Westmoreland County example demonstrates that installing boilers and chillers can result in energy efficiency and cost savings, the City of Philadelphia example demonstrates that district steam heating can also be efficient. During the performance of our procedures, we identified a number of performance improvement opportunities for PACT (see Observations section). Many of these performance improvement opportunities should help PACT lower its costs and steam rates for its members. Therefore, it appears that the real question is whether the local governments should immediately switch energy providers, or wait to see whether PACT can improve its efficiencies and lower its steam rates for its members. To develop an answer to this question requires more than just a consideration of current energy costs

If Allegheny County and the City of Pittsburgh elect to leave the PACT cooperative, PACT would likely be forced to terminate its operations because the exit of the local governments would make steam rates cost-prohibitive to PACT’s remaining members. Some of PACT’s current members may not be fortunate enough to have the same energy options that the local governments currently have. As was indicated earlier, new equipment and available building space would be necessary to use natural gas or fuel oil as an energy source. If a member was unable to make the immediate (unplanned) capital outlay for the equipment, or did not have appropriate space available for the equipment, using natural gas or fuel oil would not be a viable option for the member. In addition, the same factors that suggest that utilizing other unconventional energy sources is impractical for the local governments also impact PACT’s other members. This means that some of PACT’s members could be left without a viable energy alternative. Further, if Allegheny County and the City of Pittsburgh elect to leave the PACT cooperative and PACT ceases to exist, the underground steam tunnel infrastructure would no longer be maintained by PACT. Ownership of the infrastructure would most likely revert to the City of Pittsburgh, along with the responsibility for maintaining its structural integrity. Consequently, the City of Pittsburgh would likely have financial responsibility for any harm to individuals or property that would arise from a tunnel collapse or similar occurrence.

## *Executive Summary*

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While we have identified a number of performance improvement opportunities that should help PACT improve its operational efficiency and lower steam rates for its members, it will take some time to realize the benefits from measures PACT takes to improve its performance. Clearly those charged with governance of Allegheny County and the City of Pittsburgh must evaluate whether or not a failure to generate an immediate cost savings on energy used will have a significant adverse impact on the services that the governments are able to provide. However, if there is no immediate need for the governments to take drastic measures to maintain service levels, providing PACT with a reasonable amount of time to improve its operations and lower steam rates for its members could result in a significant cost savings, especially if the local governments are also willing to take measures to assist PACT in expanding its member base and lowering its maintenance costs. The commitment of PACT's Board of Directors and management to implementing the various process improvements is very important to realizing a cost savings.

Should those charged with governance of Allegheny County and the City of Pittsburgh elect to exit the PACT cooperative, either because immediate cost reductions are required, because PACT failed to improve its operating efficiency and lower steam rates within a reasonable period of time, or for some other reason, it would be important to ensure that PACT's other members are left with viable energy alternatives to PACT's steam, and that any potential issues associated with the future ownership and maintenance of PACT's infrastructure are identified and an appropriate plan developed to address those potential issues should they arise.

## **I. Introduction**

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Pittsburgh Allegheny County Thermal (“PACT”) is a member-owned district steam heating company that serves the “golden triangle” region of Pittsburgh. The district steam heating model involves distributing steam that is generated in a steam production plant through piping to member facilities to meet their energy needs.

The district steam heating model is much less common in the United States than in Europe where it is a widely accepted method for providing safe, efficient, low cost heating. District steam heating systems can be found in most of the larger cities in Europe, especially in regions with colder climates. Most of these cities are densely populated and thus the initial investment and ongoing operation and maintenance costs of the systems can be spread across a greater number of users. Many European cities offer incentives for the updating of older district steam heating systems, thus reducing costs for all users. Even if not required by law to do so, many building owners choose to participate in district steam heating due to the efficient and low cost source of heating offered by these systems. More often than not, due to the colder climate and sustained level of demand in Europe versus the United States, European district heating systems still provide efficient energy during our summer months.

In the U.S., district steam heating networks are most commonly found in the northern states and were usually installed 50 to 100 years ago to service the urban centers of major cities. The infrastructure of these systems tends to be nearing the end of its useful life (as is the case with PACT’s underground piping). Over time, system efficiency is impacted as steam and condensate are lost through cracks in aging piping. Repairing or replacing infrastructure can be costly, as it is typically located underground. U.S. businesses are not required by any law or other government directive to utilize district steam heating systems and are therefore free to choose their own source of heating. Fewer users of district steam heating systems results in higher steam costs as repairs and maintenance costs are shared by fewer participants. Warmer weather in the U.S. also means less system utilization and therefore less efficiency during the summer months.

PACT was formed in 1983 following the dissolution of the Allegheny County Steam Heating Company (“ACSHCo”). All ACSHCo owned steam distribution lines, pipes, tunnels, structures, facilities and equipment were transferred to PACT for a sum of \$1. PACT’s steam tunnel distribution system was constructed in 1915 with the expectation the system would serve approximately 300 members.

PACT is organized as an Internal Revenue Code 501(C)(12) organization, a non-profit cooperative, and is therefore exempt from federal and state income tax. To qualify as a 501(C)(12) organization the Internal Revenue Service stipulates the organization must receive 85 percent or more of its income from members for the sole purpose of meeting losses and expenses each year. Although PACT does supply energy, it is not regulated by the Public Utility Commission.

PACT currently only serves approximately 56 member buildings, a small fraction of its capacity. Allegheny County purchases more of PACT’s steam on an annual basis than any other member. The County utilizes PACT’s steam to heat the County Courthouse, the County Office Building, Family Court, the City-County Building (shared with the City of Pittsburgh), as well as the

## **I. Introduction**

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County Jail and the building that formerly served as the Allegheny County Morgue. For its fiscal year ended May 31, 2011, steam sales to Allegheny County represented approximately 23% of PACT's total steam sales, at a cost to the County of \$2,410,970.

Allegheny County's most recent contract agreement with PACT expired on June 30, 2012. PACT currently provides steam to the County on a month-to-month basis. We performed this engagement because further analysis was necessary to determine the advantages and disadvantages associated with entering into a new agreement with PACT versus seeking to pursue other energy alternatives. We began by gaining an understanding of PACT's operations, including the various factors impacting PACT's steam rates. We identified a number of performance improvement opportunities during the process and provided corresponding recommendations to PACT. Finally, we evaluated the County's energy alternatives and provided the results for use by those charged with governance.

## **II. Scope and Methodology**

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We performed an operational assessment of Pittsburgh Allegheny County Thermal (“PACT”) to assist those charged with governance of Allegheny County in determining whether renewing the contract with PACT for another five-year term is in the best interest of Allegheny County taxpayers. Specifically, we performed the following procedures:

- Interviewed PACT personnel and reviewed relevant documents to gain an understanding of PACT’s:
  - Governance practices
  - Budgeting process and the method for determining the rates members are charged for steam
  - Billing process and the process for monitoring accounts receivable
  - Operating expenses and how they are approved
  - Accounting and financial reporting processes
  - Existing infrastructure, including current deficiencies and planned improvements
  - Marketing efforts to maintain existing and secure new members
- Toured PACT’s steam production plant.
- Made additional inquiries of PACT personnel and applied analytical and other procedures to assess the efficiency and effectiveness of PACT’s operations.
- Identified a variety of performance improvement opportunities based on our assessment of the efficiency and effectiveness of PACT’s operations, including potential opportunities for Allegheny County and the City of Pittsburgh to assist PACT in improving its performance.
- Evaluated whether maintaining membership in the cooperative would be the best option for Allegheny County and the City of Pittsburgh over the long term based on a variety of factors, including our understanding of PACT’s operations and the various performance improvement opportunities we identified.

We conducted our procedures from July through November, 2012. We provided a draft copy of this report to the President of PACT for comment. His response begins on page 50.

### **III. Observations and Recommendations**

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#### *Observation #1*

### **Governance Issues Have Adversely Impacted PACT's Operational Efficiency and Steam Rates**

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Public utilities in Pennsylvania are regulated by the Pennsylvania Public Utility Commission ("PUC"). This regulation (governance) is intended to ensure that the public utilities operate efficiently and that the energy rates that customers are charged are reasonable and based on the costs incurred. A cooperative is owned by its members, which means that the PACT cooperative is not a public utility, and therefore responsible for its own governance. Because PACT is not otherwise regulated, strong governance from PACT's Board of Directors is necessary in order to ensure that PACT operates efficiently and charges its members reasonable steam rates. Managing PACT's operations requires knowledge and experience across a wide variety of disciplines, including thermodynamics, engineering, financial management, financial accounting and reporting, purchasing, marketing and public relations, human resources, etc. Consequently, to be most effective, PACT's Board of Directors should consist of individuals who collectively have knowledge and practical experience across most if not all of the relevant disciplines. Directors should also fully understand their governance responsibilities and obligations and how to execute them.

We reviewed PACT's By-Laws and noted that they provide for Board appointments to be made by specific PACT members or member groups. Specifically, the Mayor of the City of Pittsburgh and Allegheny County Executive each appoint one Board member, the five largest non-governmental users of steam appoint two Board members, the Building Owners and Managers Association of Pittsburgh appoints one Board member, and two Board members are appointed by a majority vote of all non-governmental members with each member having one vote. Board members serve a period of three years. It appears this structure was designed to ensure that cooperative members are appropriately represented on PACT's Board. However, we observed that the By-Laws are silent with respect to any measures to be taken to ensure that PACT's Board of Directors collectively possesses adequate knowledge and practical experience in the needed disciplines in order to be able to effectively govern PACT. While appropriate representation of cooperative members on PACT's Board may be important, it is not as important as the effectiveness of the governance that will ultimately be provided by the Board members.

We observed that PACT's current Board members typically have full-time positions in their respective organizations. Four of the seven members of PACT's current Board of Directors have knowledge and practical experience in real property management, which is not directly related to PACT's operations. One of the other directors has studied organizational behavior, one has energy management experience, and the remaining director has a combination of corporate management, sales, and finance experience within the banking industry. Based on this, it appears that the Board lacks extensive knowledge and practical experience across a variety of disciplines that pertain to PACT's operations, which could adversely impact its ability to provide effective governance. This is further supported by the handling of various aspects of PACT's operations. For example, a Board member with energy industry and/or commodities trading experience could have inquired about and evaluated the process PACT's management uses to

### **III. Observations and Recommendations**

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purchase natural gas (see also Observation #3), and a board member with extensive purchasing experience could have inquired about and evaluated PACT's procurement practices (see also Observation #5).

It is important to note that much of the information we evaluated regarding PACT's governance was obtained via interviews we conducted with members of PACT's current Board of Directors. After we gathered all of the information, we analyzed the data in the aggregate, and based on our analysis formulated conclusions and developed our corresponding recommendations. Each board member's experiences with PACT and their individual perspectives are different. We acknowledge that this, coupled with the fact certain assertions made could not be otherwise verified, could impact the accuracy of our characterization of certain circumstances and events relative to PACT's governance. However, we believe that our ultimate conclusions can easily be drawn from relevant facts and known circumstances, and that our recommendations logically follow from the conclusions we have reached.

Several of PACT's current Board members have suggested to us that prior to January 2012 there was a general lack of transparency with respect to PACT's operations in that certain information that was available to PACT's three-person Executive Committee, including compensation costs and preferential rates being offered to members for example, was routinely not shared with PACT's entire Board even when such information was specifically requested. Meetings of the full Board have been characterized by various directors as infrequent and untimely (we were advised that on one occasion the Board was requested to approve PACT's annual operating budget in August, the third month of the fiscal year for which the budget was to be approved). It has also been suggested that Board meeting agendas often did not include discussion of major issues and that input from directors was often not taken into consideration, which appears to have created the perception that the full Board's participation in PACT's governance was intended to be limited. While several of PACT's directors have had prior board service experience, we were advised that PACT's Board was not provided with any Board member training. Consequently, the directors may not have fully understood their responsibilities and obligations as Board members and how to fulfill them, including dealing with various circumstances that may have inhibited their ability to provide proper governance.

It appears that the Executive Committee, which included the attorney who was initially involved in the formation of PACT as a separate legal entity, may have had concerns that Board members would not act in the best interest of the cooperative, but would utilize the information obtained to further the interests of the particular cooperative members (organizations) that they represented. These concerns may have been magnified by the fact that PACT's Board of Directors did not collectively possess a level of knowledge and practical experience across the needed disciplines that may have been perceived as necessary for effective governance.

There are various advantages and disadvantages associated with the various forms of legal organization. Clearly, organizing as a cooperative involves the inherent risks that the members of the cooperative will act in their own self-interest and/or not work together effectively to achieve common objectives. Some have suggested that PACT's organization as a not-for-profit cooperative is largely responsible for various conditions that have resulted in inefficiencies not being rectified by PACT's management in a timely manner, and that a profit motive would drive

### **III. Observations and Recommendations**

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improvements in efficiency. However, it does not appear to us that PACT's form of organization is directly responsible for any shortfalls in PACT's governance. The cooperative form of organization would not still exist today if cooperatives were not formed and utilized effectively. In addition, many for-profit businesses go out of existence each day because they fail to take steps to maintain their competitiveness in the marketplace. It is the lack of strong governance that has resulted in missed opportunities to better manage PACT's member base, control operating costs, and lower its steam rates. Taking the steps necessary to create an environment that facilitates PACT's Board exercising strong "hands-on" governance appears to be the best way to stimulate the changes needed to improve PACT's operational efficiency and lower steam rates.

In early 2012, the composition of those charged with PACT's governance changed. A new Board chairman was elected, and the former Executive Committee was disbanded. It is our understanding that the sharing of information pertaining to PACT's operations among all directors has increased since the change in those charged with governance took place. Based on this, it appears that taking steps to ensure that future Board appointments will result in the formation of a Board that collectively possesses knowledge and practical experience across most if not all of the disciplines associated with PACT's operations, as well as taking steps to ensure that Board members fully understand their responsibilities and obligations as Board members and how to fulfill them may be all that is needed to create an environment that facilitates strong governance of PACT. An increase in the size of PACT's Board of Directors and the appointment of a limited number of directors who do not represent particular cooperative members would provide for a greater collective knowledge and experience base as well as diminish the risk that decisions will be made to benefit particular cooperative members or member groups.

**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Take steps to ensure that future Board appointments will result in the formation of a Board that collectively possesses knowledge and practical experience across most if not all of the disciplines associated with PACT's operations. This could potentially be accomplished through revision of the provisions of PACT's By-Laws, and via routine communication among PACT's members regarding the knowledge and expertise of potential candidates.
- Take steps to ensure that Board members fully understand their responsibilities and obligations as Board members and how to fulfill them. This could be accomplished by sending newly-appointed Board members for professionally-conducted governance training.

### III. Observations and Recommendations

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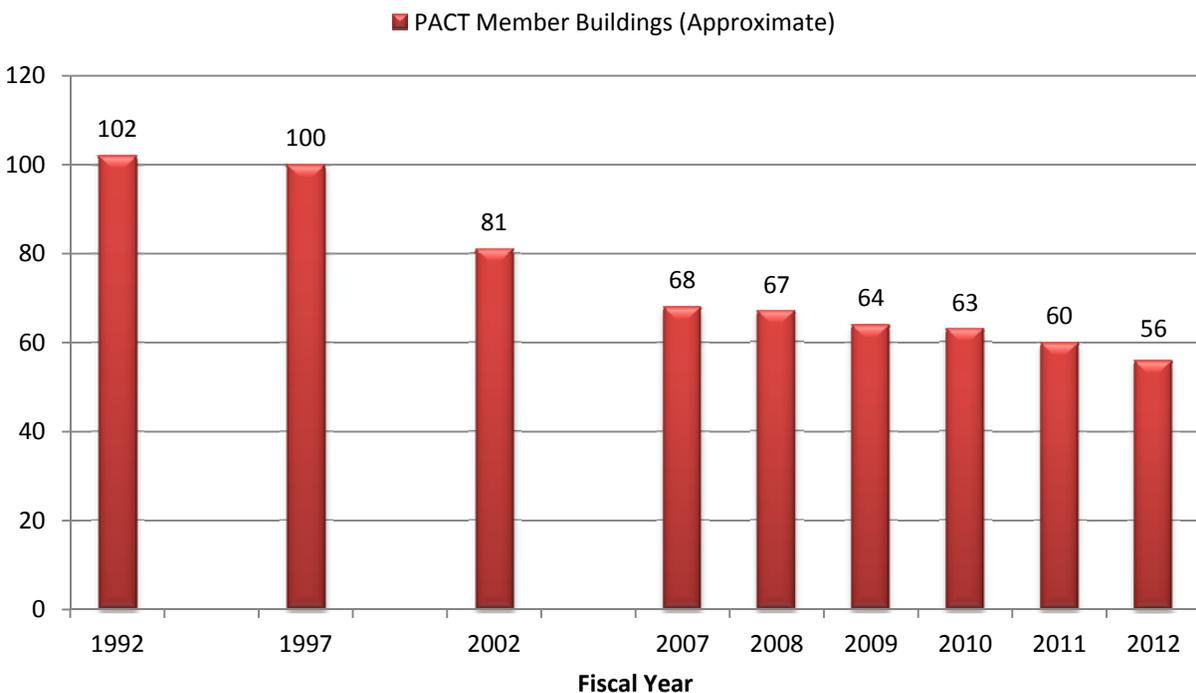
#### *Observation #2*

### **The Size of PACT’s Member Base Has a Significant Impact on its Ability to Offer its Members Competitive Energy Rates**

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The steam production plant and distribution system utilized by PACT were designed to be able to serve and are capable of serving many more members in the “golden triangle” region of Pittsburgh than PACT currently serves. PACT has asserted that it can produce up to 500 mlbs of steam per hour, which would translate to an annual production capacity of up to 4,380,000 mlbs of steam per year (500mlbs x 24 hours per day x 365 days per year). A district steam heating network is intended to serve a large member base. The efficiency of the system increases with increased steam production. The allocation of fixed steam production and overhead costs over a large member base reduces the cost to each member, which is one of the factors (along with the return of condensate for reuse in the steam production process – see also Observation #6) that contributes to the district steam heating model being a viable option to other energy alternatives. In addition, changes in a member’s steam consumption have less of an impact on operations and steam rates when there is a large member base.

### **Decline in Member Buildings Served Over Time**



PACT currently serves only approximately 56 member buildings. PACT produced only 628,222 mlbs of steam in its 2011 fiscal year. PACT’s membership has declined over the years, which appears to be attributable to a variety of factors. For example, a number of commercial and industrial buildings that were formerly served by PACT have recently been converted to apartment buildings. Individual residents in these buildings expect to have the ability to adjust

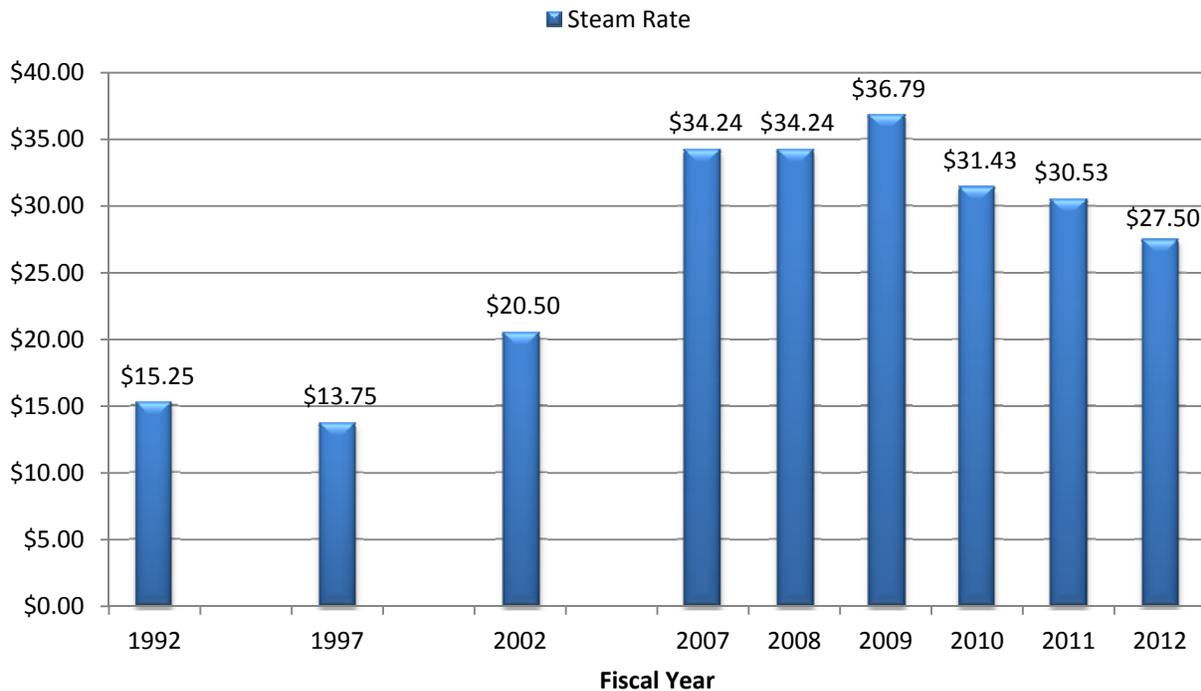
### III. Observations and Recommendations

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heating and cooling for their space to meet their particular needs. Consequently, PACT's steam has been viewed as no longer an appropriate energy option for those buildings. While PACT engaged a marketing consultant in 2011 to help expand its member base, to the best of our knowledge no new members have since been added (see Observation #7).

While some factors affecting PACT's member base may be out of its control, some members have also left the PACT cooperative because its steam rates were perceived to be too high in comparison to other available energy alternatives.

#### Historical PACT Steam Rates



There are typically a number of barriers PACT must overcome to add new members. First, existing structures typically already have boilers designed to burn natural gas for heating. Recent regulatory changes in Pennsylvania now provide utility customers the option to shop for the best rate offer from a variety of energy providers. This is important because customers that may be unhappy about the price they pay for natural gas now have easy alternatives available. In addition, since the building space and capital (and most likely personnel resources) have been devoted to natural gas heating in those structures, it is unlikely that the prospective members would disregard those investments and purchase steam from PACT. For existing structures, switching to PACT's steam is not as simple as the processes for residential customers changing their television or mobile phone services. PACT would first need to install piping to connect the members to its district steam heating system. The members are then expected to purchase condensate return pumps and related equipment to facilitate the return of condensate to the PACT plant for reuse in the steam production process. Identifying planned new construction early enough to suggest the use of PACT's steam from the inception of building operations

### **III. Observations and Recommendations**

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would enable PACT to avoid some of the barriers associated with adding members with existing structures, but PACT has generally not been successful in such endeavors (see Observation #5). Aside from the logistics associated with adding new members, PACT's steam rates also likely have a significant influence on its ability to maintain and attract new members.

The effect of this condition is that the size of PACT's member base could continue to adversely impact PACT's ability to offer its members competitive steam rates unless appropriate measures are taken to expand its member base. PACT should focus first on reducing its costs to facilitate the lowering of steam rates. We have identified a number of opportunities for improvement in this area. For example, we determined that instituting a hedging strategy for natural gas purchasing (see Observation #3) and exercising greater fiscal prudence in procurements (see Observation #5) should help reduce its operating costs. In addition to improving PACT's attractiveness to prospective new members, reducing costs and offering lower steam rates that are sustainable may influence the local governments to take greater measures to help PACT increase its member base. In any event, PACT also needs to consider implementing some new marketing approaches to increase the likelihood of attracting new members. For example, a member referral program, which could involve offering existing members preferential rates for a period of time for bringing new members, would encourage existing members to participate in member recruitment efforts. Offering members savings in the form of an invoice credit associated with the amount and average temperature of returned condensate (after condensate return meters are installed) might also spark interest in membership and prompt members to purchase and properly maintain condensate pumps and the other equipment necessary to return condensate to the PACT plant. PACT should also consider communicating with existing members more regularly regarding new customer possibilities and issues impacting its members.

**Recommendations:** The Controller's Office recommends that PACT:

- Focus first on implementing our other recommendations to reduce its operating costs to facilitate the lowering of steam rates.
- Attempt to garner support from the local governments in expanding PACT's customer base.
- Develop and implement new strategic marketing approaches to improve the likelihood of attracting new members.

### **III. Observations and Recommendations**

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#### *Observation #3*

#### **The Utilization of a Hedging Strategy for Forward Natural Gas Purchases Should Reduce the Extent to Which PACT's Natural Gas Costs Could Exceed Actual Commodity Prices**

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Natural gas is a major component of PACT's steam production costs, which in turn is a major factor that influences PACT's steam rates. Natural gas is a commodity that is bought and sold daily, often months in advance of anticipated need, on the New York Mercantile Exchange (NYMEX) via forward contracts. Prospective purchasers set a trigger price and volume of natural gas. If the NYMEX spot rate hits the trigger price, the requested volume is purchased. PACT can purchase all or a portion of its anticipated natural gas needs via forward natural gas contracts, or elect to purchase all or a portion of the needed natural gas at the settlement price for the month. The monthly settlement prices are established at the close of business on the third business day prior to the end of each month based on the volume-weighted average price of outright trades placed between 14:28 and 14:30 Eastern Time. Natural gas spot rates are influenced by a variety of factors, such as the amount of natural gas currently available in the market and conditions anticipated to impact future natural gas supply or demand. Natural gas spot rates fluctuate daily and can vary significantly over time. Spot rates can also vary significantly from the ultimate settlement price for the applicable month. Since monthly settlement prices are not known in advance, spot rates vary widely, and the factors influencing spot rates may not always be clear and cannot be controlled, purchasing forward contracts for natural gas requires a significant amount of price speculation. Consequently, purchasing forward natural gas contracts involves the inherent risk that the purchaser may ultimately pay more than the monthly settlement price. For energy providers such as PACT, excessive purchasing based on price speculation that ultimately results in the incurrence of natural gas supply costs that greatly exceed the actual commodity costs could severely impact competitiveness in the marketplace. As more of the anticipated natural gas needs are purchased via forward contracts, the correlation of the costs incurred to actual commodity prices (monthly settlement prices) is reduced. In addition, because natural gas is a major component of PACT's steam production costs, PACT members would likely expect increases in steam rates to correspond with higher production costs, specifically higher natural gas commodity costs. Based on these factors, PACT should have, and adhere to, a formal natural gas purchasing policy designed to help control those costs that takes the risks associated with speculation into consideration and maintains an adequate correlation between the natural gas costs PACT incurs and actual commodity market costs.

PACT routinely purchases forward natural gas contracts in an attempt to achieve natural gas cost reductions and lower steam rates for its members. However, PACT does not have a formal natural gas purchasing policy. Senior management has prior natural gas purchasing experience, and has exclusively been involved in the purchase of forward natural gas contracts. Senior management obtains weekly updates from the U.S. Energy Information Administration (EIA) and analyzes historical trends and pricing before engaging in such transactions.

During the course of its three fiscal years ending May 31, 2012, 2011, and 2010, PACT purchased forward contracts to cover 77%, 62%, and 83%, respectively, of its anticipated natural

### **III. Observations and Recommendations**

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gas needs (with the remainder purchased at month end settlement prices). This purchasing strategy could be characterized as a speculative strategy, as opposed to a hedging strategy, in that speculation that PACT could obtain lower prices, which involves the acceptance of considerable risk, was associated with the majority of the natural gas purchases. Conversely, a hedging strategy would involve an attempt to minimize risk by focusing on minimizing exposure to potentially higher prices. While purchasing the majority of anticipated natural gas needs via forward contracts based on speculation that lower prices can be obtained could result in lower costs, it could also result in the incurrence of costs that far exceed those associated with the applicable monthly settlement prices. In fact, for the fiscal years ending May 31, 2012, 2011, and 2010, respectively, PACT paid \$666,615, \$968,010, and \$1,552,747 more for the natural gas it purchased than if the monthly settlement prices had been paid, \$3,187,372 in the aggregate.

We discussed PACT's purchases of forward natural gas contracts over the last three fiscal years with senior management to gain a better understanding of the rationale for the purchases. Senior management is aware that many view PACT's steam rates as being too high, and that taking steps toward getting PACT's steam rates closer to the energy rates offered by other energy suppliers is critical to maintaining and potentially expanding PACT's member base. Although there has been day-to-day variability in spot rates, natural gas commodity prices have fallen fairly consistently over the last three fiscal years. An increase in the available natural gas supply over that period helped to drive natural gas commodity prices down, especially in 2012 which saw a boom in Marcellus shale drilling. Locking in the price of the majority of the natural gas PACT would need to purchase over those years was viewed as a big positive. Certainty about its natural gas costs helped PACT ensure that it could avoid instituting unanticipated steam rate increases. In addition, the prices locked in were lower than prior year natural gas prices, which did enable PACT to maintain or lower its steam rates over the last three fiscal years.

Although PACT did secure lower natural gas prices than prior years, the natural gas costs incurred were still higher than those that would have been incurred had PACT avoided forward natural gas contracts entirely or utilized a hedging strategy for purchasing such contracts. While PACT did maintain or lower its steam rates over the last three fiscal years, further reductions in its natural gas supply costs would have significantly improved its ability to lower its steam rates.

We reviewed PACT's operating budgets for the 2013, 2012, and 2011 fiscal years, noting projected steam production in mlbs. and the anticipated cost of steam sold. (Steam production and consumption is typically measured in increments of 1000 pounds, abbreviated as mlbs.) For illustrative purposes, we deducted the potential cost savings associated with purchasing natural gas at the monthly settlement prices over each of the last three fiscal years from the subsequent year's anticipated cost of steam sold to show the extent to which PACT should have been able to reduce its steam rates (see table on the next page). We also projected the cost savings that Allegheny County would have realized (a benefit to Allegheny County taxpayers) had the County used the same number of mlbs it had used in the previous year.

### III. Observations and Recommendations

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|                           | <u>2013</u> | <u>2012</u> | <u>2011</u> |
|---------------------------|-------------|-------------|-------------|
| Budgeted mlb Production   | 313,000     | 323,581     | 329,802     |
| Total Budgeted COGS       | \$6,754,540 | \$7,157,612 | \$8,218,666 |
| COGS per mlb              | \$21.58     | \$22.12     | \$24.92     |
|                           |             |             |             |
| Adjusted COGS             | \$6,087,925 | \$6,189,602 | \$6,665,919 |
| Adjusted COGS per mlb     | \$19.45     | \$19.13     | \$20.21     |
| Projected Savings per mlb | \$2.13      | \$2.99      | \$4.71      |
|                           |             |             |             |
| Allegheny County Savings  | \$127,556   | \$253,536   | \$467,319   |

If PACT had used a hedging strategy for purchases of forward natural gas contracts during its last three fiscal years, such as limiting purchases of forward contracts to no more than 50% of PACT's anticipated natural gas needs, PACT would not have generated cost savings to the extent we described above since some natural gas would have still been purchased at prices that were higher than the monthly settlement prices. However, PACT would have still had the opportunity to attempt to secure lower natural gas costs to help lower its steam rates for members while at the same time limiting its exposure to unfavorable prices and maintaining a higher correlation of PACT's natural gas supply costs to actual commodity prices.

**Recommendations:** The Controller's Office recommends that PACT:

- Implement our other recommendations designed to help PACT lower its steam rates so that PACT can rely less on locking in natural gas prices for the majority of its anticipated needs to reduce steam rates.
- Develop a written natural gas purchasing policy to be utilized by senior management when purchasing natural gas. This policy should be approved by the Board of Directors. PACT should consider the utilization of a hedging strategy for the purchase of forward natural gas contracts to help minimize PACT's exposure to unfavorable natural gas costs and maintain an adequate correlation between PACT's natural gas supply costs and actual commodity prices. It may be beneficial to engage a consultant with expertise in this area to assist in developing the policy.

### **III. Observations and Recommendations**

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#### *Observation #4*

#### **Many PACT Members Do Not Have or Do Not Properly Maintain Condensate Return Lines**

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PACT engages in district steam heating. The district steam heating model involves transporting steam from a production plant to members via distribution piping (lines). The model also involves members returning condensate (steam that has converted back to hot water) to the plant via condensate return lines to be used again in the steam production process. The availability of returned condensate to be used to generate steam reduces the extent to which groundwater must be extracted and treated for use in the process. In addition, condensate should be returned to the steam production plant at a temperature significantly higher than groundwater, which reduces the amount of natural gas needed for heating in the steam production process. Using returned condensate helps to keep steam production costs low, which in turn helps to keep steam rates low for all of the district steam heating members. Saving energy and lowering costs by reusing condensate for steam production is a key component of the district steam heating model, and contributes to district steam heating being a viable alternative to the utilization of other conventional energy sources.

Many current PACT members do not have or do not properly maintain their condensate return lines. Condensate is often routed directly to drainage systems in member buildings. We were also advised that at least one PACT member uses the condensate for its own purposes, specifically to heat water. A “High Level Operational Assessment” recently issued by AECOM indicated that on average, less than 30% of the condensate associated with steam delivered to PACT’s members was returned to PACT’s steam production plant during 2009. In addition, it was indicated that condensate was returned to the PACT plant at an average temperature of 155°F, where ideally condensate would be returned to the plant at approximately 200°F. The document further indicated that improvements to the condensate return line system could reduce PACT’s natural gas usage by up to 8.1%, which would have lowered PACT’s costs in 2009 approximately \$459,000 based on its 2009 natural gas usage.

PACT is responsible for expanding its condensate return system piping to member buildings. PACT members are responsible for the piping from the point it enters their building, and for purchasing, installing, and properly maintaining the condensate pumps and other related equipment necessary to return condensate to the PACT plant. Senior management explained to us that there are several factors that influence decisions made about extending condensate return system piping to member buildings. PACT utilizes a “five year plan” that details projected infrastructure repairs and maintenance, capital improvements, and additions. We observed that senior management updates the plan on an annual basis. Only a limited amount of financial resources (typically approximately \$700,000) are budgeted and used each year for infrastructure improvements. In updating the five year plan, senior management first identifies items that are deemed critical for system efficiency to be addressed first. Other items are then evaluated in terms of the potential improvements in system efficiency and cost. While the cost associated with PACT installing new condensate return piping to member buildings should be recovered over time through the incurrence of lower natural gas costs, the time it takes to recover those costs has made installing such piping less favorable than various other available system

### **III. Observations and Recommendations**

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improvement opportunities. This is especially true for PACT members whose steam usage is low. Even if PACT believes that installing condensate return piping to a particular member's building would be a good utilization of the limited financial resources budgeted for improvements, the member must be able and willing to purchase and install the condensate pumps and other needed equipment for the condensate return system to work. If the member advises PACT it does not intend to purchase and install the needed equipment, PACT's installation of condensate return system piping to the member's building would be a waste of resources. We noted that the majority of PACT's members with relatively high steam usage, including Allegheny County and the City of Pittsburgh, do have condensate return lines (see also Observation #11).

While some PACT members may not have the necessary resources to install and maintain the necessary equipment for returning condensate to PACT, other members have been unwilling to devote those resources to returning the condensate. It appears that this may be attributable to the fact that PACT members may believe that they will not receive a tangible benefit for expending those resources. The current long term steam use agreement being utilized by PACT provides for members to receive an invoice credit based on the quantity and temperature of condensate returned in excess of 75% of the steam used that month. The agreement also entitles PACT to impose an additional charge should less than 75% of the condensate associated with steam used that month be returned to the PACT plant (for metered condensate return lines). These provisions were included in the agreements because using returned condensate in the steam production process is important to keeping natural gas costs down and a key component of the district steam heating model. However, neither of these provisions has been enforced. Although certain members have been offered preferential rates, members are not offered lower steam rates for returning condensate. At the time we performed our procedures, there were no meters in place to measure returned condensate at member locations, and the meter at the PACT plant was in need of repair. Based on the aforementioned conditions, the benefits associated with any particular member devoting resources to installing and maintaining the needed equipment would not accrue entirely to that member, the benefits (which should be in the form of lower steam rates) would rather be divided among all PACT members.

We observed that PACT's five year plan includes the repair of the condensate return meter at the PACT plant and installation of condensate return meters at various member locations, including Allegheny County and City of Pittsburgh buildings. Senior management pointed out that better information about the condensate being returned to the plant PACT would enable PACT to better determine which members might not be maintaining their equipment properly, and provide a basis for PACT offering any incentives or enforcing penalties in the future associated with the volume and temperature of condensate returned to the PACT plant by its members. It is anticipated that offering incentives or imposing penalties will encourage many PACT members to take the needed action to help make the system more efficient.

As was indicated earlier, natural gas is a major component of PACT's steam production costs, which in turn is a major factor that influences PACT's steam rates. Consequently, significant reductions in natural gas costs attributable to more condensate being returned to PACT's steam production plant could help to significantly lower steam rates for members.

### **III. Observations and Recommendations**

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**Recommendations:** The Controller's Office recommends that PACT:

- Prioritize the installation of condensate return lines to buildings of members that purchase a high volume of steam (provided that the members plan to purchase and maintain the necessary equipment to return the condensate).
- Repair and install condensate return meters as planned, with a focus on members that purchase a high volume of steam, to help ensure that members will take the action needed to improve the efficiency of the system.
- Consider the appropriateness of utilizing incentives to encourage members to return condensate to the PACT plant, and if deemed appropriate, update PACT's standard steam use agreements and its Rules and Regulations to reflect the incentives to be offered (once condensate return meters have been installed).

### **III. Observations and Recommendations**

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#### *Observation #5*

#### **PACT Needs to Avoid No Bid Contracts and Improve its Procurement Practices**

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An entity's procurement process should be designed to provide assurance that purchases made are properly authorized and approved, within established budgetary limits, and satisfactory in terms of price and quality. For large procurements, an entity should consider using a bidding process. The utilization of a bidding process typically encourages bidders to compete on price and helps the entity to ensure that any goods or services purchased will be of acceptable quality and at the lowest available price. In addition, procurements of services should involve the utilization of written contracts that clearly specify the services to be provided and the compensation. This provides the entity with a basis for determining whether the contracted services have actually been provided and a means to hold the contractor accountable if they have not.

During the process of gaining an understanding of PACT's operations, we determined that PACT did not have written agreements in place to cover the services provided by three legal services providers, including PACT's current legal counsel. We were advised that verbal agreements covered the provision of those services. We also observed that PACT has utilized the same external auditors for more than 20 years. We determined that PACT's audits have not been performed for a fixed fee, which is common practice in today's environment. Allegheny County and its component units contract with accounting firms on a regular basis for a variety of audit services, and the audit services provided by those firms are typically performed for a fixed fee. PACT's audit firm invoices for services provided based on hourly rates for various classes of employees and hours spent. Finally, it came to our attention that senior management entered into a one year agreement with a marketing consultant without the approval of PACT's Board of Directors. The agreement, which began August 15, 2011, provided for payment of a \$50,000 retainer and a monthly stipend of \$10,000, for a total annual cost to PACT of \$170,000. PACT's contracts with its external auditors and marketing consultant were both no bid contracts. Senior management stated that the audit contract has not been put out to bid since the original contract was awarded. The marketing contract, as well as a separate agreement with a consulting firm, were both a result of recommendations made to PACT's senior management. Senior management indicated that the goal of entering the agreement was to identify new business opportunities for PACT. However, the agreement, which was drafted by the consultant, did not explain in adequate detail the services that would be provided or specify how the results would be communicated to PACT. In January of 2012, the Board of Directors was made aware of both the marketing agreement and the oral legal agreements. The Board has since mandated that all contracts must be in writing and be approved by the Board prior to being executed. Also, at the request of PACT's Board of Directors, the consultant provided a report that described the services that were provided. While the consultant identified some opportunities that were still being explored, it appears that at the time we performed our procedures PACT had not secured any new members as a result of the services that were provided by the consultant.

### III. Observations and Recommendations

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The table below summarizes the total payments made to the service providers described above for each of PACT's last three fiscal years ending May 31.

|                                       | Hourly Rate | 2010      | 2011      | 2012      |
|---------------------------------------|-------------|-----------|-----------|-----------|
| <b>Audit &amp; Other Services</b>     |             |           |           |           |
| Henry Rossi & Company                 |             | \$101,988 | \$122,347 | \$140,218 |
| Partner                               | \$225.00    |           |           |           |
| Senior Manager                        | 155.00      |           |           |           |
| Senior Staff                          | 90.00       |           |           |           |
| Administrative Staff                  | 55.00       |           |           |           |
| <b>Legal Counsel</b>                  |             |           |           |           |
| Dennis S. Shilobod, Esq.              | 250.00      | 48,250    | 56,676    | 63,500    |
| Reed Smith, LLP                       | 585.00      | 14,757    | 19,375    | 205       |
| Strassburger McKenna Gutnick & Gefsky | N/A         | -         | -         | 2,340     |
| <b>Marketing Consultant</b>           |             |           |           |           |
| Richard A. Talarico, MPA              | N/A         | -         | -         | 140,000   |
| <b>Other Consulting</b>               |             |           |           |           |
| Strategic Consulting                  | 95.00       | 4,495     | 25,606    | 1,300     |
| <b>Total</b>                          |             | \$169,490 | \$224,004 | \$347,663 |

When we discussed the verbal agreements with senior management, we were advised that written agreements were perceived to be unnecessary since PACT had years of experience working with the attorneys and that the attorneys were familiar with PACT and capable of handling its various needs. Senior management responded similarly regarding the hourly rate billing of its external auditors. Senior management was aware of the importance of expanding its member base to be able to maintain or reduce steam rates for PACT's members, which led to the execution of the agreement with the marketing consultant. The effect of these conditions is that the procurement practices that were utilized, specifically the lack of written contracts that specify the services to be provided and related compensation, and the failure to use a bidding process for large procurements, do not provide assurance that services procured are properly authorized and approved, within established budgetary limits, and satisfactory in terms of price and quality.

**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Develop a competitive bidding policy (a formal policy to be included in PACT's Policies and Procedures) to be used for large procurements to help ensure that PACT consistently obtains a satisfactory quality and price for the goods or services it purchases.
- Continue to require the use of written contracts for the provision of services. The Board of Directors should continue to review and approve these contracts prior to their execution.
- Periodically review performance under awarded contracts to help ensure that PACT is receiving goods or services of satisfactory quality at the agreed upon prices.

### III. Observations and Recommendations

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#### *Observation #6*

### **Preferential Rates Offered to Members Should Be Approved by PACT's Board of Directors**

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From time to time, PACT has offered preferential steam rates to certain members. At the time we performed our procedures, there were preferential rates in effect for eight of approximately 56 PACT member buildings. Preferential rates currently range from \$15.75 to \$25.85 per mlb. PACT currently charges an aggregate rate of \$27.50 per mlb. to all customers who do not have a preferential rate. There are a variety of circumstances in which the offering of preferential steam rates to members can make good business sense and benefit all of PACT's members. For example, PACT may offer preferential steam rates to potential new members for a few years to secure their future business. As a general rule, any preferential steam rates offered to members should at least marginally exceed PACT's variable steam production costs. Since the offering of preferential rates does impact PACT's revenue stream and could have a significant adverse impact on operations if administered improperly, PACT's Board of Directors should be involved in the evaluation of circumstances surrounding the offering of preferential steam rates and the dollar impact on operations to help ensure that offering such rates is appropriate in that it will in fact actually benefit all of PACT's members. The development of a written policy to govern the offering of and determination of preferential steam rates could be beneficial.

Prior to 2012, PACT's Board of Directors was not involved in decisions regarding preferential steam rates offered to members. Senior management advised us that it made those decisions based on an evaluation of the relevant facts and circumstances without input or approval from the Board of Directors. Senior management had viewed the offering of preferential steam rates to members as an activity that was a component of day-to-day business, and believed that the Board would not want to be involved, and did not need to be involved, in that level of detail. The effect of this condition is that prior to 2012 PACT's Board of Directors did not have an opportunity to evaluate the appropriateness of preferential steam rates and their impact on PACT's operations. Beginning in 2012, the Board of Directors has required senior management to obtain Board approval before offering preferential rates to members.

**Recommendations:** The Controller's Office recommends that PACT's Board of Directors:

- Consider evaluating the appropriateness of preferential steam rates currently in effect.
- Continue the newly-instituted practice of evaluating and approving preferential steam rates before they are offered to members to help ensure that all PACT's members benefit.
- Consider developing written standards for determining which customers could be eligible for preferential rates and setting the rates.

### **III. Observations and Recommendations**

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#### *Observation #7*

### **The Board of Directors Should Be More Involved In Setting the Compensation of Administrative Staff**

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PACT's annual operating expenses significantly influence the steam rates that PACT charges its members. Consequently, it is essential for PACT to control its operating costs to minimize the need for steam rate increases. The analysis of detailed cost information as opposed to summary data is often necessary to identify areas of potential improvement.

Annually, PACT's senior management presents the Board of Directors with a proposed budget for the upcoming fiscal year for approval. The budget includes projected steam sales and the cost of steam sold, as well as all general and administrative costs, including legal and accounting fees, office salaries and benefits, and occupancy costs. However, the proposed budget does not provide detailed information about the cost components that comprise each budget line item. For example, the office salaries expense line contains only one budgeted amount representing office salaries in total. The Board approves the office salaries budget in total via its approval of the proposed budget, but is not necessarily aware of the personnel and the corresponding salaries that comprise the budgeted expense amount. While any bonus paid to PACT's President has historically been initiated and approved by the Board of Directors, we were advised that all other salary increases or bonuses awarded to administrative staff have been determined exclusively by PACT's President based on an annual assessment of performance. When we discussed this condition with PACT's President, it was explained to us that the information about administrative salaries was available to Board members if requested. The President perceived that the Board members did not want to get into that level of detail in that they trusted him to handle that type of issue.

Because PACT's President must answer to the Board of Directors regarding PACT's operations, the President has a clear incentive to drive employee performance. Increasing employee compensation is an easy way to motivate employees. However, while compensation increases may lead to improved performance, such increases could also lead to PACT's compensation being excessive for the work being performed. The process used by PACT's President for administering increases and bonuses does not involve benchmarking to identify comparable rates of pay for similar positions in other organizations or other procedures to gain assurance that the compensation to be paid is reasonable based on the market for services. Board involvement in determining compensation of administrative staff would provide greater assurance that PACT's compensation costs are reasonable for the work being performed. The effect of this condition is that PACT's compensation rates could be significantly out of line with those available in the labor market for similar positions.

### **III. Observations and Recommendations**

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**Recommendation:** The Controller's Office recommends that PACT's Board of Directors review and approve any salary increases or bonuses to be paid to PACT's administrative staff.

### III. Observations and Recommendations

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#### *Observation #8*

#### **PACT Needs to Update and Adhere to its Written Policies and Procedures**

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Written policies and procedures provide employees with guidance and clarity on how certain day to day activities are to be performed, and help to ensure that activities are performed consistently throughout the organization over time. Effective written policies and procedures typically incorporate a variety of internal controls designed to help ensure that financial statement misstatements are prevented or detected and corrected by management or employees during the normal course of performing their assigned functions. Effective written policies and procedures also help to ensure that an organization's objectives are achieved, and that its activities are performed in a manner that complies with any applicable requirements. Written policies and procedures also provide a basis for holding employees accountable when they do not perform activities in the prescribed manner.

During the process of gaining an understanding of PACT's operations, we asked to review its written policies and procedures. We ultimately did not review PACT's written policies and procedures, as we were advised that they had not been updated for some time and needed to be updated. The written policies and procedures have not typically been referred to by management on a regular basis. PACT's management was able to verbally explain to us how the processes we inquired about were actually performed. PACT's management indicated that the written policies and procedures have not been recently updated because the few individuals with detailed knowledge about how specific processes work must often devote their time exclusively to day to day operations.

The effect of this condition is that PACT's written policies and procedures may not incorporate all of the necessary elements designed to help ensure that misstatements are prevented or detected and corrected and that PACT's objectives are achieved in a manner that complies with all applicable requirements. In addition, the fact that the policies and procedures actually utilized on a day to day basis likely vary significantly from PACT's written policies and procedures increases the likelihood that internal control procedures and procedures designed to ensure compliance are not being performed. Finally, without up to date written policies and procedures, it would be more difficult to hold employees accountable for actions that may be deemed inappropriate.

**Recommendation:** The Controller's Office recommends that PACT update its written policies and procedures and then take steps to ensure that the updated policies and procedures are properly implemented.

### III. Observations and Recommendations

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#### *Observation #9*

### **PACT's Natural Gas Surcharge is Not Strictly Based on Utility Costs**

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Member invoices should clearly portray the products or services that were purchased and their cost. PACT's monthly invoices for steam provided to members include two steam rate components, "total steam" and "natural gas surcharge". The total steam component of the rate has remained constant for several years (\$25.50/mlb for most members). The natural gas surcharge component has fluctuated over time from a high of \$15.83/mlb in 2008 to a low of \$2.00/mlb at present. The caption "natural gas surcharge" implies that the cost relates directly to specific utility costs incurred by PACT that are being passed on to its members, or represents an additional charge for natural gas that directly corresponds with actual increases in natural gas commodity prices over a certain limit.

While we were gaining an understanding of PACT's steam rate determination and billing processes, we determined that the natural gas surcharge is loosely based on increases in natural gas costs. Senior management explained that the "total steam" rate component is intended to represent the basic costs associated with the provision of steam. While the natural gas surcharge rate component is intended to fluctuate as variable costs fluctuate, it is also used as a mechanism to help PACT ensure that it not only covers operating costs but generates enough revenue to provide funding for future repairs or improvements to PACT's infrastructure or any unforeseen costs. Senior management believes that to the extent steam rate increases are necessary, members are more likely to accept them if they are presented as a surcharge. The effect of this condition is that PACT's monthly steam invoices are somewhat misleading in that increases in the natural gas surcharge cannot be tied directly to increases in natural gas costs.

**Recommendation:** The Controller's Office recommends that PACT modify the manner in which steam charges are presented to members for payment. PACT should utilize a single rate for steam, or use captions that more accurately reflect the specific costs that serve as the basis for any additional charges.

### III. Observations and Recommendations

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#### *Observation #10*

### **Gross Receipts Have Been Understated For Purposes of Calculating the City of Pittsburgh Gross Receipts Tax**

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City of Pittsburgh Ordinance #227 of 1915 required PACT's predecessor, the Allegheny County Steam Heating Company (ACSHCo), to pay the City of Pittsburgh 3% of its calendar year gross receipts for the third and each succeeding year of its operations. The City of Pittsburgh has maintained that PACT as ACSHCo's successor is obligated to continue to pay 3% of its annual gross receipts to the City. PACT has contested its obligation to continue making the payments, although it has made the payments to the City for 2010 and 2011 under protest.

We observed that PACT collects late charges from members that have past due balances. Upon review of PACT's general ledger, we noted that late charges collected were recorded as an offset to a miscellaneous expense account rather than as revenue, which resulted in those amounts being excluded from gross receipts for purposes of calculating the payments to be made to the City of Pittsburgh. The late charges that should have been included in gross receipts for the calendar years 2011 and 2010 were \$28,711 and \$23,419, respectively. Consequently, PACT should have paid the City of Pittsburgh an additional \$861 and \$703 for the calendar years 2011 and 2010, respectively, in order for the payments made to the City to represent 3% of PACT's calendar year gross receipts. We have not determined any additional amounts that may be payable to the City of Pittsburgh that are attributable to this condition for years prior to 2010.

**Recommendations:** The Controller's Office recommends that PACT:

- Properly classify its late charges as revenue in its general ledger and financial statements to help ensure that payments made to the City of Pittsburgh actually represent 3% of PACT's calendar year gross receipts.
- Review its accounting records for prior years to determine the amounts of any underpayments attributable to this condition and issue a payment to the City of Pittsburgh to resolve all such underpayments.

### **III. Observations and Recommendations**

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#### *Observation #11*

### **Cooperation Between PACT and its Local Government Members Could Result In Greater Operating Efficiency and Lower Steam Rates for All Members**

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Utilization of the “cooperative” form of organization implies that the members intend to work together to achieve common objectives. To a certain extent, members of a cooperative accept a responsibility to the other members of the cooperative to act in a manner that helps to ensure that the objectives are achieved.

PACT’s senior management has suggested that there are a number of ways in which the local governments can do more to help PACT expand its customer base and operate with greater efficiency. These include:

- Assisting in the identification of potential new members
- Properly maintaining and operating condensate return equipment
- Maintaining City streets better
- Abolishing the requirement for nighttime construction
- Easing other construction-related restrictions

We have suggested that there are typically a number of barriers PACT must overcome with respect to adding new members, and that identifying potential new construction would help to avoid some of the barriers associated with converting existing structures to the utilization of PACT’s steam (see Observation #2). We were advised that when building owners make decisions about the energy to be utilized, they usually choose to install boilers but on occasion explore alternative energy options such as solar power. If PACT were able to meet with developers or others involved in new construction regarding the opportunity for and benefits of district steam heating prior to construction, it might convince them to utilize PACT’s steam heating for the new construction. Under these circumstances, building plans could potentially be drawn such that any necessary infrastructure to connect to PACT’s system could be installed as part of the construction process. Building plans could also then take into account that space that otherwise would have been utilized for boilers would be able to be used for other purposes.

PACT’s senior management has asserted that the Urban Redevelopment Authority of Pittsburgh (URA) was approached by PACT to ask if it could inform PACT of potential new construction within the City in advance of the actual construction. It has been suggested that the URA was not receptive to PACT’s request, and has not informed PACT of any plans for new construction within the City. Senior management also indicated it had met with City of Pittsburgh’s Mayor when the former Hilton Hotel was being remodeled and sold to the Wyndham Hotel Group. PACT asked the Mayor to talk with the new owners and to gauge their interest in potentially considering PACT for the hotel’s heating and hot water needs. PACT’s President stated that nothing ever came of this meeting with the Mayor, and the Wyndham Hotel is currently not utilizing PACT for its heating needs or hot water needs. Senior management has suggested that by the time PACT becomes aware of plans for new construction within the City, the choice for a heating system has almost always already been determined.

### III. Observations and Recommendations

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The Controller's Office also identified four buildings, in the downtown Pittsburgh area, that were recently constructed at a cost that was partially subsidized using governmental funds.

| <u>Building</u>                  | <u>Total Project Cost</u> | <u>Governmental Funding Sources</u>                               |
|----------------------------------|---------------------------|-------------------------------------------------------------------|
| 151 First Side<br>(Condominiums) | \$28 million              | Urban Redevelopment Authority (URA)                               |
| August Wilson Center             | \$39.5 million            | Commonwealth of Pennsylvania, URA,<br>Federal Government          |
| Piatt Place<br>(Condominiums)    | \$70 million              | Commonwealth of Pennsylvania, Allegheny<br>County, URA            |
| Three PNC Plaza                  | \$133 million             | URA (assistance with site assembly and land<br>for Triangle Park) |

These publicly subsidized projects are examples of opportunities in which greater cooperation and communication between local governments and PACT could have led to potential new PACT members.

We considered the impact that the addition of an average size member building would have on PACT's steam rates. Based on 2012 budget data we projected the steam used in an average member building to be approximately 5,000 Mlbs. PACT would to produce approximately 8,000 Mlbs. of steam to meet an additional demand of 5,000 Mlbs. We developed this estimate based on 2011 fiscal year actual data, where only approximately 60% of all steam produced was sold. Based on 2012 actual data the additional variable costs associated with producing an additional 8,000 Mlbs. of steam would be approximately \$55,840. Because the addition of only one member should not have a significant impact on PACT's fixed costs, PACT should only need to generate enough revenue to offset the variable costs associated with the additional 8,000 Mlbs. of steam production in order to maintain the same budgetary position. Consequently, based on PACT's 2012 operations budget it appears that PACT would be able to lower its steam rates by approximately \$0.24/mlb if an average size member building was added (\$26.33/mlb based on adjusted budgeted revenue of \$8,652,972 divided by adjusted mlb. sales of 328,581 versus an initial budgeted rate of \$26.57 per mlb). The steam rate reductions associated with the addition of additional member buildings beyond the first would of course decrease, as there are diminishing returns associated with the sharing of PACT's fixed costs as members increase.

At the time we performed our procedures, PACT's senior management advised us that the City of Pittsburgh and Allegheny County were not taking adequate measures to ensure that condensate was being returned to the PACT plant. In the Municipal Court Building (maintained by the City of Pittsburgh) PACT personnel observed that one condensate return pump was not connected to PACT's condensate return system and both condensate return pumps in the building had been turned off. The condensate return pumps in the County Office Building and City-County Building were reported as not working properly. In addition, we were advised that the Allegheny County Jail had the capability of returning condensate to the PACT plant, but that condensate was not being returned. We obtained a subsequent update from PACT's senior management on the status of the condensate being returned from the local governments in November 2012. We were informed that two new condensate return pumps had been installed in the County Office Building and four new pumps installed in the City-County Building and that

### **III. Observations and Recommendations**

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they were operating effectively. The condensate return piping had also been insulated, which should result in the condensate return to the PACT plant at higher temperatures, resulting in lower natural gas costs for PACT. We were also informed that the Allegheny County Jail was returning condensate to the PACT plant. Unfortunately, conditions had not changed in the Municipal Court building. We were also advised that one condensate return pump in the County Courthouse is not wired up, and the other pump is not working properly such that the condensate is flowing down a drain. In the Family Court building only one of two condensate return pumps was actually in place, such that some condensate was flowing down a drain. In addition, the condensate being returned from the Family Court building is being tempered with City water. Finally, we were also informed that contractors working on the former County Morgue building had disconnected PACT's steam and that PACT had not been notified.

PACT's senior management has also asserted that inadequate maintenance of City streets has adversely impacted the structural integrity of PACT's underground steam tunnel system. As a result, PACT is required to perform more frequent and often unplanned maintenance activities in order to help preserve the structural integrity of tunnels and ensure efficient operation of the steam delivery system. The need to perform additional maintenance results in additional costs that PACT must pass on to its members through higher steam rates.

We were also advised that the City's requirement that all construction be performed at night has resulted in PACT incurring higher costs that are also passed on to its members in the form of higher steam rates. In addition to the shift differential (higher hourly labor costs) for nighttime work, the cost of nighttime construction is also usually impacted by productivity issues and increased costs to procure certain materials such as concrete for nighttime use. It has been estimated that performing construction at night results in costs that are approximately 15% higher than if the construction were performed in the daytime.

Finally, we were informed that the City requires that sidewalks and curbs that are dug up when construction is performed be replaced with granite curbs and exposed aggregate sidewalks, which are expensive in comparison to other available alternatives. This requirement is in effect regardless of whether or not the curbs were initially granite and the sidewalks were initially exposed aggregate. Utilization of the higher cost alternative again results in additional costs being passed on to PACT's members in the form of higher steam rates.

We discussed several of these issues with a representative of the City of Pittsburgh. It was explained to us that the City is uncomfortable recommending PACT to potential new members based on its concerns about PACT's operating performance and the fact that PACT's steam rates are currently significantly higher than those of other local energy providers. (Unfortunately, the expansion of PACT's customer base would likely have the greatest impact on its ability to lower steam rates for its members.) The City's representative has denied that City road maintenance has impacted the structural integrity of PACT's steam tunnel infrastructure. It was also explained to us that the requirements pertaining to nighttime construction and granite curb and exposed aggregate sidewalk replacements are uniformly applied to all contractors who perform construction work in the City. Nighttime construction is required to minimize daytime traffic.

### III. Observations and Recommendations

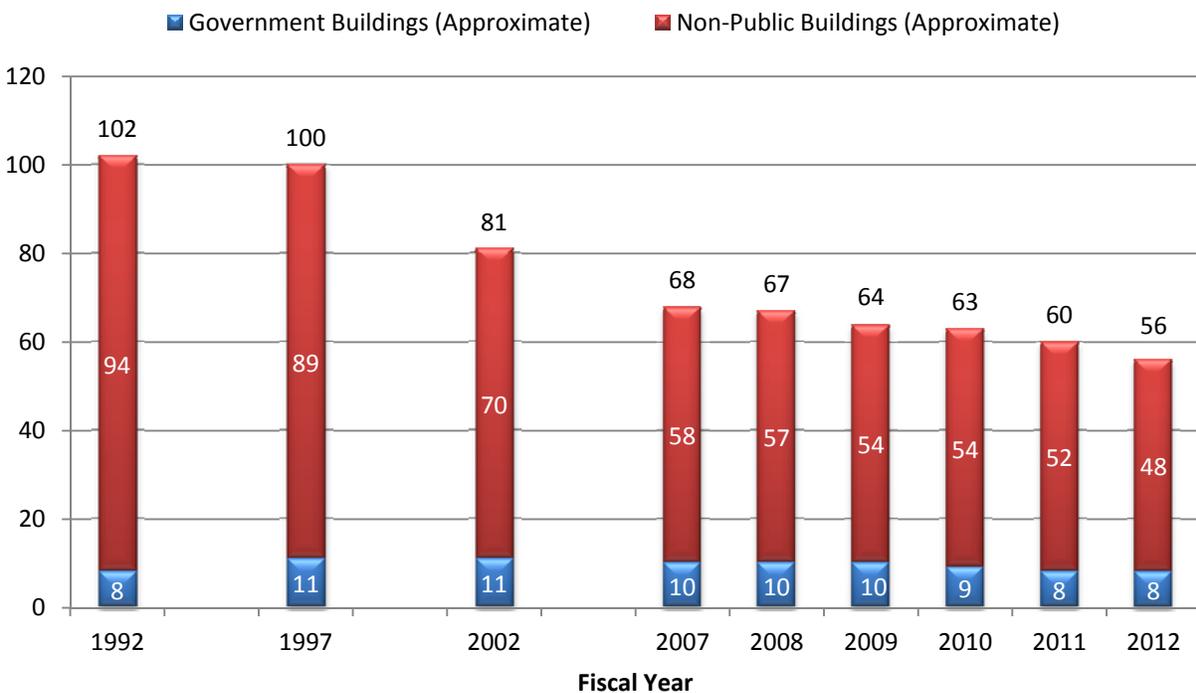
The effect of these conditions is that PACT has had difficulty in expanding its customer base with respect to new construction and its operating costs are higher than they could be. Consequently, steam rates are higher than they could be. Although the local governments may have had legitimate reasons for taking the actions they have taken in the past, it appears that greater cooperation between PACT and its local government members could have a significant positive impact on PACT's operations and steam rates.

Historical data presented to us by PACT senior management shows that governmental members have accounted for 42% of total steam consumption since fiscal year 1992. The table below summarizes information supplied by PACT regarding revenues generated from both governmental and non-governmental sources for its last three fiscal years.

| Revenue Sources      | Fiscal Year  |              |             |
|----------------------|--------------|--------------|-------------|
|                      | 2010         | 2011         | 2012        |
| Governmental Members | \$ 4,852,687 | \$ 4,700,400 | \$2,976,997 |
| All Other Members    | \$ 6,326,899 | \$ 6,341,557 | \$3,784,333 |
| Total                | \$11,179,586 | \$11,041,957 | \$6,761,330 |

We noted that fiscal year 2012 revenues were substantially lower due to a \$3.03/Mlb. reduction in the Natural Gas Surcharge and moderate temperatures during the winter months.

### Decline in PACT Member Buildings Served



### **III. Observations and Recommendations**

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With such a large consumption percentage, both historical and ongoing, PACT's local government members clearly have a stake in the success of PACT's operations. We have identified a number of opportunities for PACT to implement on its own to improve its operational efficiency, which should facilitate the lowering of steam rates for its members. However, the local governments cannot expect that they will ultimately achieve the maximum amount of potential savings unless they are willing to cooperate with PACT and take the steps necessary to help PACT expand its customer base and reduce its costs.

**Recommendations:** The Controller's Office recommends that PACT:

- Take the first steps to lower its costs.
- Meet with those charged with governance of the City and the County to discuss opportunities for cooperation, and consider utilizing written agreements to serve as a record of any mutual understanding reached.

### **III. Observations and Recommendations**

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#### *Observation #12*

### **The Removal of the Allegheny County Jail's Steam Chillers From PACT's System Should Have Caused a Significant Increase in Steam Rates for All PACT Members**

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Utilization of the “cooperative” form of organization implies that the members intend to work together to achieve common objectives. To a certain extent, members of a cooperative accept a responsibility to the other members of the cooperative to act in a manner that helps to ensure that the objectives are achieved. Ideally, members will carefully consider the impact on the other members of the cooperative of decisions to be made before making those decisions.

Prior to 2006, the Allegheny County Jail utilized three steam chillers for its air conditioning and chilled water needs. PACT had historically provided steam to power the chillers in the spring and summer months until the Jail took one chiller offline in 2006. In 2009, Allegheny County engaged NORESKO to perform an “Investment Grade Audit” of select County facilities and develop a Guaranteed Energy Savings Agreement project. NORESKO’s audit report detailed various recommendations on how to reduce County water, energy, and operating costs while upgrading energy consuming systems serving County facilities. Included in the report was a recommendation that the Jail’s remaining two steam chillers be removed and replaced with two new high efficiency electric centrifugal chillers. Under the subsequent agreement, NORESKO guaranteed the County a certain amount of energy savings to be realized by the Jail on an annual basis in connection with the chiller replacements, which means that NORESKO would be required to compensate the County to the extent that the guaranteed energy savings were not realized. It appears that NORESKO projected the cost savings associated with replacing the Jail’s two remaining steam chillers to approximate \$193,500 on an annual basis (in NORESKO’s Cost Savings Summary, the savings associated with the Jail chiller replacements was included with the savings associated with other improvements to be made).

In mid 2011 the Jail’s remaining two steam chillers were removed and replaced with two new high efficiency electric centrifugal chillers as was recommended based on a collaborative decision made by the Allegheny County’s former Jail Warden, Department of Public Works, and Office of Budget and Finance. We were unable to determine whether the Jail had tried to negotiate a lower steam rate for the usage of its steam chillers from PACT, and whether the potential impact on PACT’s future steam rates had been taken into account prior to replacing the Jail’s steam chillers. PACT’s senior management indicated to us that PACT was not advised of the replacement of the Jail’s steam chillers beforehand. The Department of Public Works has advised us that it is monitoring the energy savings associated with the Jail chiller replacements.

In addition to the steam that Allegheny County had purchased from PACT to operate the Jail’s steam chillers, the County also purchased and still purchases steam from PACT to heat the Jail and a number of its other buildings, including the County Courthouse, the City-County Building (shared with the City of Pittsburgh), County Office Building, Family Court, and the building that formerly served as the Allegheny County Morgue. Because PACT has a small member base, a significant loss of steam sales, such as the loss of the steam sales associated with the Jail’s steam chillers, should have a significant impact on PACT’s steam rates going forward. We do not

### **III. Observations and Recommendations**

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know the method that NORESKO used to compute the energy savings that it was willing to guarantee that the County would realize. Consequently, we do not know whether the potential for a PACT steam rate increase, which would result in higher future steam costs for the County with respect to the buildings that PACT still supplies with steam (as well as higher steam costs for all of PACT's other members), was factored into the computation as an offset to the energy savings that the County was projected to realize.

We noted that during its 2011 fiscal year PACT produced 628,222 mlbs of steam and its variable steam production costs (natural gas, electricity, water and sewage) were approximately \$5,013,257. Based on this, PACT's variable steam production costs during that year were approximately \$7.98 per mlb. We noted that the average of the Allegheny County Jail's aggregate monthly steam rates for PACT's 2011 fiscal year was \$21.01 (the Jail had been offered a preferential rate associated with its purchase of significant amounts of steam in off-peak periods). Even though the Jail had been offered a preferential steam rate, approximately \$13.03 (\$21.01-\$7.98) of what the County paid for each mlb of steam during PACT's 2011 fiscal year on average helped to cover PACT's fixed production and overhead costs and/or provide working capital or capital for infrastructure improvements.

PACT's fiscal years 2003 through 2006 were the last four fiscal years that all three of the Jail's steam chillers were still online. For those years, the Jail purchased an average of 48,808 mlbs of steam that was used by its steam chillers. Had all three of the Jail's steam chillers remained online during PACT's 2012 fiscal year, approximately \$635,968 (\$13.03/mlb x 48,808 mlbs) of the revenue PACT would have received associated with the steam sales would have helped to cover PACT's fixed production and overhead costs and/or provide working capital or capital for infrastructure improvements.

We observed that PACT's fiscal year 2012 operating budget reflected that revenue of \$8,597,132 would be needed to cover its operating costs and provide for infrastructure improvements and working capital based on the projected sale of 323,581 mlbs. Based on this, PACT's aggregate steam charge per mlb needed to be at least \$26.57. Had all three of the Jail's steam chillers still been online throughout PACT's 2012 fiscal year, the Jail would likely have purchased approximately 48,808 mlbs of steam. Due to normal steam losses that result from system inefficiencies, PACT would need to produce more than 48,808 mlbs of steam in order to deliver that much steam to the Jail. We are unable to determine how much steam PACT would actually need to produce in order to satisfy the Jail's steam needs because it is influenced by a wide variety of factors. However, if we estimate that 60% of the steam that is produced will be sold based on PACT's 2011 fiscal year actual data (628,222 mlbs produced and 375,172 mlbs sold), PACT would need to produce approximately 81,729 mlbs of steam to deliver 48,808 mlbs of steam to the Jail. Based on PACT's 2012 fiscal year variable steam production costs of approximately \$6.98/mlb (\$3,308,119/473,811 mlbs produced), the variable steam production costs associated with supplying steam to the Jail to operate its steam chillers throughout the year would have been approximately \$570,468 (\$6.98/mlb x 81,729 mlbs). If PACT's fiscal year 2012 budget were modified to reflect the revised estimated revenue target (\$9,167,600 based on the initial estimate of \$8,597,132 plus \$570,468 in estimated additional variable steam production costs) and projected mlbs sold (372,389, based on the initial projection of 323,581 plus estimated additional sales of 48,808), PACT's aggregate steam charge would have only

### **III. Observations and Recommendations**

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needed to be approximately \$24.61/mlb (\$9,167,600/372,389 mlbs). This means that PACT would have theoretically been able to offer its members steam rates that were approximately \$1.96/mlb lower (\$26.57-\$24.61) for its 2012 fiscal year had all three Jail chillers remained online. Since Allegheny County purchased 59,892 mlbs of steam in PACT's 2012 fiscal year to heat its other buildings, the County should have been able to save approximately \$117,388 in PACT steam costs.

We have suggested that the removal of the Jail's steam chillers from PACT's system should have caused a significant steam rate increase for all members, yet PACT was able to maintain its fiscal 2012 steam rates at the 2011 level. This is because the steam rates for each fiscal year ultimately set by PACT are determined in connection with the development of its annual budgets, and are consequently based on analysis and a variety of assumptions made with respect to PACT's revenues and costs. As we indicated earlier, natural gas is a major component of PACT's steam production costs, and natural gas commodity prices dropped significantly over PACT's last three fiscal years. Despite the impact of unfavorable natural gas purchasing practices (see Observation #3), PACT's actual natural gas costs nevertheless decreased over those years. For budget purposes, PACT's fiscal 2012 total natural gas costs were projected to be \$930,000 lower than its 2011 costs, which (among other factors) led to PACT refraining from increasing steam rates for 2012. Although PACT's steam rates did not increase, the County and PACT's other members did not realize a cost savings in the form of lower steam rates that otherwise should have been realized as a result of the decrease in PACT's natural gas costs. This data further supports that the Jail's conversion to electric chillers did have a significant impact on the cost of PACT's steam to Allegheny County and PACT's other members, and further supports that the cost savings to Allegheny County as a result of the conversion may be significantly less than what was anticipated.

**Recommendations:** The Controller's Office recommends that Allegheny County:

- Determine the potential impact of decisions to be made about energy consumption on PACT and its members before making those decisions.
- Monitor the energy savings realized from the Jail chiller replacements and evaluate whether the guaranteed annual savings have been achieved. Consider holding NORESKO accountable for its guarantee of savings to the extent that such savings have not been realized.

### III. Observations and Recommendations

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#### *Observation #13*

### **The Allocation of City-County Building Steam Costs Is Not Based on Current Space Usage**

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The City-County Building (“CCB”), located in the center of downtown Pittsburgh, has been utilized by both the City of Pittsburgh and Allegheny County since construction of the building was completed in 1917. On May 13, 1915, the local governments entered into an agreement relating to the occupancy, maintenance and operation of the CCB which has been modified over time as needed. Steam usage at the CCB is measured by two steam meters – one low pressure and one high pressure meter. A low pressure meter measures steam supplied to the basement and first floor of the CCB. A high pressure meter measures steam provided to all other floors and steam provided for hot water usage. The local governments share in the cost of steam used in the CCB based calculations of the square footage utilized by each government that were made prior to the year 2000. Based on the square footage utilized at the time, the cost of steam provided through the low pressure meter is shared equally between the local governments, while 67% of the cost of steam provided through the high pressure line is to be paid by the City and 33% paid by the County.

There have been a number of changes in the amount of square footage in the CCB that has been used by each of the local governments over the years. To assess whether the allocation of current steam costs among the local governments is equitable, we analyzed the square footage currently being utilized by each of the governments. We determined that the allocation of steam costs associated with the low pressure meter appears to be appropriate. However, it appears that the allocation of steam costs associated with the high pressure meter results in the County bearing approximately 6% more than its equitable share of the costs. We determined that during the year 2000, the City began utilizing the 6<sup>th</sup> floor of the CCB which had previously been utilized by the County. The square footage calculations that serve as the basis for the current allocation of costs have not been updated to take the aforementioned change in the utilization of the 6<sup>th</sup> floor of the CCB into account. The total cost of steam provided to the CCB through the high pressure meter for the period January 2008 through July 2012 was \$438,582. Based on this, it appears that Allegheny County paid \$26,315 in excess of its equitable share of CCB steam costs for that period. We have not determined the impact of this condition on other periods. We discussed allocation of CCB steam costs with a representative of the City of Pittsburgh, who indicated that it was his understanding that the City was in the process of working with the Allegheny County Department of Public Works to revise the allocation of CCB steam costs.

**Recommendations:** The Controller’s Office recommends that Allegheny County:

- Work with the City of Pittsburgh to adjust the high pressure steam meter billing allocation to ensure both the City and the County are paying for the steam actually used in the City-County Building based on actual occupied square footage.
- Work with the City to recover the excess costs incurred by the County in prior years.

## IV. Analysis of Alternatives

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One of the primary objectives of our engagement was to determine the advantages and disadvantages associated with Allegheny County renewing its steam agreement with PACT versus seeking to pursue other energy alternatives. The results of our analysis, which are based on our understanding of PACT's operations, the performance improvement opportunities for PACT we have identified, and available information about other energy alternatives and other relevant factors, are presented below.

The primary reason for contemplation about whether Allegheny County's renewal of its steam agreement with PACT would be in the best interest of Allegheny County taxpayers is that PACT's steam rates are higher than the energy rates offered by other local energy providers. In a recent study, AECOM provided Allegheny County with a comparison of thermal energy costs (see chart below). Although the study data is only a few years old, using the data for current rate comparison purposes would not result in an accurate assessment since energy rates change frequently and current rates may vary significantly from the data that was initially provided (for example, PACT's steam rates have decreased since 2009). However, we have presented the data to help explain the other energy options available to the local governments and considerations that need to be made when evaluating them.

| Thermal Energy Source                                                                                                   | Cost per MMBtu |
|-------------------------------------------------------------------------------------------------------------------------|----------------|
| Mid-Atlantic Average Fuel Oil Cost (2003 survey results)                                                                | \$ 13.50       |
| Mid-Atlantic Average Natural Gas Cost (2003 survey results)                                                             | \$ 8.69        |
| Northeast/Mid-Atlantic Average District Heat Cost (2003 survey results)                                                 | \$ 16.19       |
| NRG Energy Pittsburgh Steam Cost (2006, based on posted tariff for first 1,200 mlbs and escalated to 2011 project cost) | \$ 14.28       |
| Cleveland Thermal Steam Cost (2009)                                                                                     | \$ 16.67       |
| Con Edison (NY) Steam Cost (most recent available at time of study)                                                     | \$ 27.16       |
| PACT Steam Cost (2009)                                                                                                  | \$ 30.09       |

It appears that Cleveland and New York steam rates were presented in the study for benchmarking purposes. The data demonstrates that at the time the study was prepared, members in Cleveland and New York would have benefitted from lower steam rates. Benchmarking can be a valuable tool, but for purposes of evaluating other available energy options, the data is not relevant as those rates were not available to the local governments. In addition, there are no other district steam heating providers that serve Pittsburgh's "golden triangle". While NRG provides steam to members on the north side of Pittsburgh, the local governments are not in NRG's service area, and we are not aware of any plans involving NRG expanding its service area to include the local governments. Consequently, the Northeast/Mid-Atlantic Average District Heat Cost and the NRG steam cost are also not relevant for purposes of evaluating other available energy options. What remains in the chart for consideration are the Mid-Atlantic Average Fuel Oil and Natural Gas Costs, which may have varied from the rates that were actually available at the time from other local energy suppliers. To properly evaluate the other energy options available to the local governments, obtaining the current energy rates of the other providers would be an appropriate starting point. However, simply comparing the rates for

## **IV. Analysis of Alternatives**

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fuel oil and natural gas that are currently available from other local energy providers with PACT's steam rate would not result in an accurate assessment of the true energy costs.

It is our understanding that to take advantage of a natural gas or fuel oil rate from a local energy provider, the local governments would need to purchase and install boilers in their buildings. The boilers would need to be much larger than furnaces designed to heat residential structures, and this equipment for each building would represent a significant cost to the local governments. The governments would also have to devote space to the equipment, which means that there would need to be space available, and that once the equipment was installed there would be less space in each building that could be used for other purposes. In addition to the up-front costs and space requirements, significant personnel resources would be necessary to operate and monitor the performance of the equipment on a continuous basis going forward. Although the cost savings that may be realized from switching local energy providers could be substantial, these factors diminish to a certain extent the true cost savings associated with lower natural gas or fuel oil rates offered by other local energy providers.

It is important to note that natural gas and fuel oil are not necessarily the only other energy options available. They are just options that are more conventional. Utilizing solar, wind, and hydroelectric power are also options that have been available for some time, and the technology associated with those power sources has improved in recent years. Geothermal heating, a newer technology which involves drilling to significant depths underground to harness the heat at those levels, is also an option. All of these more unconventional energy options are also "greener" alternatives to using natural gas and fuel oil. However, it appears that there are a number of factors that make these options impractical for the local governments. For example, Pittsburgh is not exceptionally sunny or windy, which means that solar panels or windmills in Pittsburgh would typically not harness as much energy as they would in other cities with a more suitable environment. Further, all of these options would require a significant up-front investment, and could require the use of additional land. For example, utilizing hydroelectric power would require the construction of a power plant along one of Pittsburgh's three rivers.

We deemed it valuable to determine how some other governments have addressed their energy needs. We focused on Westmoreland County (PA) and the City of Philadelphia. Westmoreland County is adjacent to Allegheny County. At the recommendation of Constellation Energy via a recently completed "Investment Grade Audit", Westmoreland County replaced the inefficient heating and air conditioning mechanical equipment in its Courthouse with a modern and highly efficient boiler and chiller system. The upgrades have reduced the energy needs of the facility and resulted in immediate financial savings to the taxpayers of Westmoreland County. Funding for the Courthouse improvements, among other projects, was provided by a \$3 million ARRA grant through the U.S. Department of Energy. The City of Philadelphia, which is slightly larger than the City of Pittsburgh, utilizes Trigen-Philadelphia Energy Corporation for its steam heating and cooling needs. Trigen-Philadelphia Energy Corporation is regulated by the Pennsylvania Public Utility Commission. The district energy network utilized serves more than 300 members in Philadelphia's central business district from three steam production facilities and one chilled water facility. The following table identifies Trigen-Philadelphia Energy Corporation's heating and cooling service tariffs that took effect December 21, 2009.

#### IV. Analysis of Alternatives

| Trigen-Philadelphia Energy Corporation Monthly Rate Table |                |                |          |                                               |
|-----------------------------------------------------------|----------------|----------------|----------|-----------------------------------------------|
| Months Covered                                            | Type of Charge | Tier Breakdown | Rate     | Unit of Measure                               |
| October through<br>May                                    | Capacity       | 0 to 300       | \$ 1.94  | Per pound per hour of<br>steam billing demand |
|                                                           |                | 301 to 40,000  | \$ 1.31  |                                               |
|                                                           |                | Over 40,000    | \$ 1.15  |                                               |
|                                                           | Consumption    | 0 to 100       | \$ 14.17 | Per thousand pounds of<br>steam used          |
|                                                           | Over 100       | \$ 13.20       |          |                                               |
| June through<br>September                                 | Capacity       |                | None     |                                               |
|                                                           | Consumption    | 0 to 100       | \$ 13.32 | Per thousand pounds of<br>steam used          |
|                                                           | Over 100       | \$ 12.56       |          |                                               |

Although the Westmoreland County example demonstrates that installing boilers and chillers can result in energy efficiency and cost savings, the City of Philadelphia example demonstrates that district steam heating can also be efficient. During the performance of our procedures, we identified a number of performance improvement opportunities for PACT (see Observations section). Many of these performance improvement opportunities should help PACT lower its costs and steam rates for its members. Therefore, it appears that the real question is whether the local governments should immediately switch energy providers, or wait to see whether PACT can improve its efficiencies and lower its steam rates for its members. To develop an answer to this question requires more than just a consideration of current energy costs.

If Allegheny County and the City of Pittsburgh elect to leave the PACT cooperative, PACT would likely be forced to terminate its operations because the exit of the local governments would make steam rates cost-prohibitive to PACT's remaining members. Some of PACT's current members may not be fortunate enough to have the same energy options that the local governments currently have. As was indicated earlier, new equipment and available building space would be necessary to use natural gas or fuel oil as an energy source. If a member was unable to make the immediate (unplanned) capital outlay for the equipment, or did not have appropriate space available for the equipment, using natural gas or fuel oil would not be a viable option for the member. In addition, the same factors that suggest that utilizing other unconventional energy sources is impractical for the local governments also impact PACT's other members. This means that some of PACT's members could be left without a viable energy alternative. Further, if Allegheny County and the City of Pittsburgh elect to leave the PACT cooperative and PACT ceases to exist, the underground steam tunnel infrastructure would no longer be maintained by PACT. Ownership of the infrastructure would most likely revert to the City of Pittsburgh, along with the responsibility for maintaining its structural integrity. Consequently, the City of Pittsburgh would likely have financial responsibility for any harm to individuals or property that would arise from a tunnel collapse or similar occurrence.

We determined that the utilization of a hedging strategy as opposed to a speculative strategy with respect to forward natural gas purchases should reduce to extent to which PACT's natural gas costs could exceed actual commodity market prices. In addition to the potential for the utilization of a hedging strategy to lower PACT's natural gas costs, maintaining a closer correlation between PACT's natural gas costs and actual commodity market prices should improve PACT's competitiveness in relation to rates offered by other energy providers. We further determined

## **IV. Analysis of Alternatives**

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that installing condensate return lines (an essential element of the district steam heating model) to the buildings of members that purchase large amounts of steam (that do not already have them) would lower PACT's natural gas costs. We also determined that tighter fiscal controls, especially with respect to PACT's procurement practices, should help lower its operating expenses. In addition, we concluded that cooperation between PACT and the local governments could help PACT expand its members base and lower its maintenance costs.

While we have identified a number of performance improvement opportunities that should help PACT improve its operational efficiency and lower steam rates for its members, it will take some time to realize the benefits from measures PACT takes to improve its performance. Clearly those charged with governance of Allegheny County and the City of Pittsburgh must evaluate whether or not a failure to generate an immediate cost savings on energy used will have a significant adverse impact on the services that the governments are able to provide. However, if there is no immediate need for the governments to take drastic measures to maintain service levels, providing PACT with a reasonable amount of time to improve its operations and lower steam rates for its members could result in a significant cost savings, especially if the local governments are also willing to take measures to assist PACT in expanding its member base and lowering its maintenance costs. The commitment of PACT's Board of Directors and management to implementing the various process improvements is very important to realizing a cost savings.

Should those charged with governance of Allegheny County and the City of Pittsburgh elect to exit the PACT cooperative, either because immediate cost reductions are required, because PACT failed to improve its operating efficiency and lower steam rates within a reasonable period of time, or for some other reason, it would be important to ensure that PACT's other members are left with viable energy alternatives to PACT's steam, and that any potential issues associated with the future ownership and maintenance of PACT's infrastructure are identified and an appropriate plan developed to address those potential issues should they arise.