Project Profile Information Form

Project Title: Best Practices Study for Energy Management, Energy Management Study

Project Number: 2621

Principal Investigators: Jack Jacobs

Collaborating Agencies: There were 24 subscribing agencies to this project. They were the following: Azurix/Phillip Utilities Management Corp, City of Akron, City of Kissimmee, City of Phoenix, City of San Diego, City of Santa Rosa-Utilities Department, City of Tucson, City of Winnipeg, City/Co of San Francisco-PUC, Colorado Springs Utilities, East Bay Municipal Utilities District, EPCOR, Honolulu Board of Water Supply, Irvine Ranch Water District, King County-Wastewater Treatment Division, Las Vegas Valley Water District, Regional Municipality of Ottawa-Carleton, Saint Paul Regional Water Services, Salt Lake City, Seattle Public Utilities, Washington Suburban Sanitary Commission, Memphis Light, Gas and Water, San Antonio Water Company, Water Treatment Facilities Division, Dept of Water Supply Board of Water Supply.

Objectives:

The objective of this research project is to develop and report on best practices for energy management for water and wastewater utilities following the best practices methodology.

Background:

The Western Regional Water Utilities Benchmarking Group initiated this project with a submittal of a tailored collaboration project. Subscribers were then recruited to co-fund the study and commit to participation. In the consortium submittal, several practice areas were identified. The Research Foundation approved only one practice area (energy management) for the initial project. A proposal was then initiated to expand the initial practice area study by first developing a best practice benchmarking methodology for reuse in future practice areas. The Research Foundation approved this approach.

Highlights:

This project developed a best practices model and detailed practices proven by the “best” to achieve results. These “best” practices were identified using a methodology guided by the project subscribers who focused the areas of top interest in energy management. The utility subscribers developed a survey to screen the top performers in energy management who were then selected as case study companies. The project researchers who conducted interviews and identified the best practices visited these case study companies. The project researchers analyzed these practices, based upon metrics, to demonstrate comparable cost and service improvements as justification of their position in the industry as “best”. These case study companies were both inside and outside the water/wastewater industry.

The process of developing the best practices for energy management from design of the survey to completing the case studies and evaluating the results was very comprehensive and provided a valuable learning experience for the subscribers that can be taught to others. This process went beyond the expected results of the project for the subscribers of the study in that they learned both specific practices that could help them achieve better energy management and they learned to use a survey tool within their companies to make a high level self-assessment of how they compared with the best in many aspects of energy management. The survey and comparison with others provided utilities guidance in defining

strategic areas for improvement in their energy management program by breaking the issues into specific practice areas and indicating where better practices are available.

Approach:

The overall project approach was to develop the methodology, apply it to an energy management best practices study, learn from the test approach, and adapt the final results of the study to meet the project participants needs. The methodology approach included the following steps:

1. Conduct secondary research on potential best practices,
2. Develop a survey of potential best practitioners to screen for those who could demonstrate leading practices,
3. Conduct on-site interviews of the best and document these as case studies,
4. Review the results with the project subscribers to validate best practices, and
5. Target applications and actions for achieving results by each utility.

Details of this approach are documented in the project methodology guide.

Results/Findings:

The project results included documentation of over twenty best practices in energy management and a survey tool for utilities to use in assessing and planning for their energy management activities. The best practices included a description, metrics to measure them, obstacles in applying them, and benefits achieved in using them. Beyond the development of best practices, an overall energy management model that provides a structure for the expansion of future best practices in energy management was identified. This model was crucial to many participants in understanding an overall strategy for energy management as well as providing a tool for communicating it to others in their utility.

Developing and applying best practices for energy management within a utility was found to be challenged by many since it involved many organizations, crossed many functions, and was not generally perceived by all to have significant opportunities for improvement. This study helped all participants see many new opportunities and gave them ideas to pursue them.

Further, the process of developing best practices included development of a survey document that provides a valuable assessment tool for utilities to both learn all aspects of energy management as it may apply to them and begin the process of developing a strategy that will allow them to save substantial funds.

Impact:

This project is expected to provide utilities with expanded opportunities for reducing costs of energy and thus overall operating costs for the utility. Utilities surveyed averaged 11% (water) and 7% (wastewater) of their operating costs in energy costs that totaled over $100 million for those surveyed. Case studies demonstrated up to 50% reduction in energy costs possible by applying the best practices. Specific benefits of utilities conducting benchmarking studies on energy management and applying the results is expected to have a high rate of return, based on the subscribing utilities.

Investigating and applying best practices in energy management should include the following practice areas identified in the study in order to provide a utility-wide strategy that achieves the greatest benefits:

- General Energy Management
- Procurement
- Asset Performance
- Information Systems
- Contingency Planning

- Real-Time Operations
- Staff Skills and Training

These practice areas were found to be interrelated and thus should be considered together in the utility strategy. For example, managing real-time energy use is best based on procurement or contract provisions of the energy and potential options from contingency features using information systems for planning and deployment tactics with highly trained staff. Each utility may have unique features of each of these practice areas at any point in time that could contribute to their best practice or least cost with highest reliability or quality of service.

Participating Utilities The participating utilities were most of the 24 subscribing utilities plus the case study companies. There were three Case Study companies, one from the subscribers, one from the PAC, and one from outside the industry (oil refinery).