

**CITY COUNCIL  
COMMUNICATION:**

**03-330**

**AGENDA:**

JULY 14, 2003

**SUBJECT:**

ENERGY MANAGEMENT  
PLAN FOR CERTAIN  
CITY BUILDINGS

**TYPE:**

**RESOLUTION**  
ORDINANCE  
RECEIVE/FILE

**SUBMITTED BY:**

DONALD M. TRIPP  
PARK AND  
RECREATION  
DIRECTOR

**ITEM 51**

**OFFICE OF THE CITY MANAGER  
CITY OF DES MOINES, IOWA**

**SYNOPSIS —**

Approve a professional services agreement entitled "Technical Engineering Analysis Contract" to hire Michaels Engineering (David Waffenschmidt, President, 811 Monitor Street, Suite 100, LaCrosse, WI 54602-2377) to complete an Energy Audit and Energy Management Plan for City Hall, the Argonne Armory, and the Police Station. Approval of the contract will authorize Michaels Engineering to proceed with the preparation of an Energy Audit and Plan necessary for the City of Des Moines to participate in the Iowa Building Energy Management Program sponsored by the Iowa Department of Natural Resources (IDNR) in partnership with MidAmerican Energy Company (MEC). The contract is a three-party agreement between Michaels Engineering, MEC, and the City of Des Moines. This contract will be Phase 1 of a three-phase plan for implementing energy management plans and physical improvements for most City buildings and facilities.

**FISCAL IMPACT —**

City's anticipated share is approximately \$9,495. Total project expense is approximately \$18,990. MEC funds half of the consulting service fee, and the City funds the other half. The City's half of the consulting fee and the first year implementation expenses will be funded through the Capital Improvement Program (CIP) Budget, Account No. CP040 PKS99000 BLD (not yet assigned). If the City implements a predetermined quantity of the IDNR approved energy management improvements within one year after receiving the final Energy Management Plan from the consultant, MEC will reimburse the City for its half of the consulting fee. The Municipal Building's CIP Budget includes \$75,000 in Fiscal Year (FY) 2003 and \$50,000 in FY2004 budgeted for expenditures associated with implementing an energy management program.

The Parks and Recreation Department's Operating Budgets for the Parks and Municipal Buildings included a combined \$98,922 reduction in gas and electric costs for FY2004 (July 1, 2003 – June 30, 2004). After reviewing the schedule for developing and implementing the Phase 1 project, a consultant retained by IDNR (The Energy Group) has projected that Phase 1 has the potential of reducing energy consumption costs by approximately \$35,000 (an estimated 15 percent savings) by June 30, 2004. Phase 2 of the Energy Management Plan will include approximately 23 additional buildings and facilities with implementation beginning by December 2003. The Energy Group has estimated that the implementation of additional Phase 2 energy management improvements could reduce energy consumption costs by an additional \$35,000 in FY2004. The remaining \$28,922 savings in energy will be achieved through changes in current

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Heating, Venting and Air Conditioning (HVAC) policies by establishing more reasonable hours of operation and temperature limits for the heating and cooling units in the City's municipal buildings and other physical structures.

Funding for the Phase 2 Energy Audit and Plan, and its implementation, has not been budgeted in the FY2004 CIP Budget. The Park and Recreation Department will propose revising the CIP Budget during the upcoming budgeting process to reflect the funding required to complete the Phase 2 and Phase 3 Energy Plans and their implementation.

**RECOMMENDATION —**

**Approval.**

**BACKGROUND —**

Michaels Engineering was chosen as the consultant for Phase 1 through a bidding process by which a list of IDNR prequalified consultants are allowed to bid on projects involved with the Iowa Building Energy Management Program.

The remaining process for the City's participation in the Iowa Building Energy Management Program is as follows:

1. The City selected consultant—Michaels Engineering, MEC, and the City enter into a three-party professional services agreement. The consultant performs all audits and analysis work and develops an Energy Management Plan in accordance with IDNR Guidelines.
2. The Energy Management Plan will contain approved Energy Management Improvements (EMIs) for the enrolled facilities. An EMI is a document that analyzes the cost and savings associated with making an energy management improvement. The IDNR and MEC must concur with and approve EMIs presented by the consultant. The approved EMIs will have a payback period of one to ten years. The consultant will be required to complete the Energy Management Plan within two months after receiving a notice to proceed. The IDNR and MEC must approve the Energy Management Plan for each building.
3. The City will implement the EMIs through contractors or in-house staff and must document the implementation in accordance with MEC and IDNR guidelines in order to receive rebates and incentives from MEC.

To realize energy savings quickly, the energy audits of all City buildings and the implementation of EMIs will occur in three phases. The Phase 1 analysis will take approximately two months and include City Hall, the Argonne Armory, and the Police Station. While the EMIs from Phase 1 are being evaluated, the Phase 2 audit will begin.

The Energy Group has determined that participants in the program will realize a minimum of a 10 percent reduction in energy usage per building,

and that percentage could be as high as 30 percent. The Energy Group researched the utility costs for a two-year period for the three buildings in Phase 1 and found the average annual building costs were as follows:

City Hall	Electric	\$ 51,000
	Gas	<u>12,000</u>
	Total	\$ 63,000
Argonne Armory	Electric	\$ 84,000
	Gas	<u>7,000</u>
	Total	\$ 91,000
Police Station	Electric	\$ 71,000
	Gas	<u>9,000</u>
	Total	\$ 80,000

Total Annual Energy Costs \$234,000

After implementing most of the recommended improvements for these three Phase 1 buildings, the City should realize an annual savings between \$23,400 (10 percent) and \$70,200 (30 percent) if the unit cost of energy purchased were to remain constant. Implementation of the recommended improvements should begin in October 2003.

The following comparison shows the current energy usage in British Thermal Units (BTUs) per square foot per year for each of the three buildings in Phase 1, compared to the expected energy usage of an energy-efficient building of the same type and use.

Since the price of energy will vary from year to year, the energy consumed per square foot of building per year (for each of the BTU/sq.ft./year) is used as the index to compare the improved energy efficiency of a building.

<u>Building</u>	<u>Current Energy Usage</u>	<u>Efficient Building Energy Usage</u>
1. Argonne Armory	220,000 BTU/sq.ft./year	50,000 BTU/sq.ft./year
2. City Hall	105,000 BTU/sq.ft./year	60,000 BTU/sq.ft./year
3. Police Station	103,000 BTU/sq.ft./year	90,000 BTU/sq.ft./year

The following is a list of typical improvements implemented and which qualify for MEC incentives and rebates.

1. Eliminate non-operational electric meters and seasonalize others.
2. Replace fluorescent light lamps and ballasts with more energy efficient models.
3. Replace all incandescent lights and ballasts with fluorescent and electronic ones where appropriate. Many lights in several buildings now run continuously for 18 hours.
4. Utilizing time clocks to shut off all unnecessary lighting during

evening/night hours, and place them on circulating pumps for hot water heaters and water coolers.

5. Change all "EXIT" lights to LED type. They currently are 30 watt and could be reduced to 2.6 watts with a 20-year life span at \$20 per fixture.
6. Install computer-programmed thermostats on all individual heating units to eliminate employees overriding setback times and forgetting to reduce heat and cooling during evenings and on weekends, and in shops and other work areas where staff are there only a couple hours each day.
7. Install motion sensors for turning lights on and off in conference rooms, bathrooms, and other appropriate areas.
8. Review policies Citywide regarding evening and weekend work and the relationships to heating and cooling.
9. Review policies Citywide regarding type and use of space heaters.
10. Require all computer screens to "sleep" when not in use and eliminate screen savers.

