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Technical Bulletins: A Voluntary Energy Conservation Program that Worked

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technical bulletin

Municipal Technical Advisory Service
Institute for Public Service, The University of Tennessee
In cooperation with the Tennessee Municipal League

November 16, 1976

A VOLUNTARY ENERGY CONSERVATION PROGRAM THAT WORKED

A planned, well-executed program for conservation can save both energy and dollars. Such a program was developed and followed last year by the First National Bank of Memphis. Most features of it could be used or adapted by cities for municipally-owned buildings.

Listed below are some things done at First National's main office, operations, and 36 branch bank buildings to reduce the consumption of natural gas and electricity. Each item is followed by a brief description of the result of the change made.

1. Adjust operating hours of all mechanical equipment to give maximum shut down time daily.
Equipment not operating uses no energy. Chillers, pumps, fans, boilers, etc., are kept off the line when use is not essential. Several hours of energy-using time are saved in this manner.
2. Raise chilled water temperature from 42 to 47 degrees.
This will reduce the chiller load. The humidity will increase slightly but is tolerable.
3. Turn water chilling unit off whenever outside air temperature drops to 60 degrees.
Cool outside air is used to balance building temperatures, whenever possible, by opening outside air intake dampers. The building is kept at a good temperature without running a water chilling machine.
4. Keep condenser water tubes clean.
This is done by use of chemical water treatment. Dirty condenser tubes makes the chiller motor work harder and thus uses more electric energy to produce the needed cooling.
5. Don't start all mechanical equipment at the same time.
Stagger the start up. Energy use and money can be saved by holding the peak kilowatt demand as low as possible.
6. Turn off all exhaust fans as early as possible each evening.
These devices blow air out of the building. This causes more air to be brought into the building. All incoming air must be heated or cooled.

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7. Check burners in boilers and furnaces for combustion efficiency.
A burner out of adjustment wastes a lot of fuel. Smoke is unburned fuel, for example. This should be checked on a regular schedule several times a season.
8. A good combustion test instrument will pay for itself in a single season.
A flue gas analysis is important if you want to know that burners are using all the fuel.
9. Keep boiler tubes (flues) clean.
A thin coat of soot makes a very good insulator and lets too much heat go up the stack to the atmosphere. Use a chemical compound to lower the kindling temperature of the soot and burn it off the tube walls.
10. Every boiler and furnace stack (vent pipe) needs its own thermometer.
An exceptionally high stack temperature is an indication that too much heat is being lost to the outside. It is a signal that the tubes may be coated with soot.
11. Leaking steam traps waste steam.
A single leaky steam trap can waste a lot of energy and money over a short period of time. Check all steam traps regularly (once a week at least).
12. Bad, broken, or missing insulation allows energy to be wasted.
Insulation on the boiler, steam and hot water piping, and air ducts must be kept in good condition. Also insulation on chilled water piping must be checked.
13. Turn off steam and hot water reheat systems in summer months.
Shut these systems down as early as possible in the spring and during mild weather in fall and winter, too. This saves a huge amount of energy by not keeping the system full of unneeded hot water.
14. Close all outside air intake dampers when heating building.
Every cubic foot of cold air from outside must be heated and filtered before it is delivered to the office area.
This uses a vast amount of energy.
15. Lower domestic hot water temperatures from 150 to 125 degrees.
This simple step saves a lot of energy. Most places have hot water temperature much high than necessary.
16. Turn off all decorative lighting.
Almost 250,000 watts of decorative lights were turned off. You don't realize how much of this type lighting you have until you check.
17. Turn off some parking lot lighting.
Several of these high output lights are permanently off. Most of the remaining ones are controlled by a time switch rather than photo cells. This saves several hours of energy consumption every night.

18. Turn off office lighting not essential for normal work area. The bank disconnected ballasts in about 50 per cent of the fluorescent light fixtures to cut this use of energy by half. Use a foot candle light meter to adjust this lighting. Allow no more than 75 FC on desks and work areas and often much less than that. Lighting is the big load here.
19. Turn off 50 per cent of all hall lights. These were 100-watt incandescent lamps. Every other lamp was removed from the ceiling fixtures. Smaller wattage lamps than the original ones were utilized in areas such as restrooms, electrical and janitorial closets, and store rooms.
20. Turn mechanical equipment off at night and on weekends if building isn't in use.
Time switches (7-day) have been installed to limit the number of hours this machinery operates. Instead of running 168 hours per week, it is now using only 68 hours per week.
21. Turn unnecessary lights off at night and permanently cut off as many as possible during daytime hours.
Disconnected ballasts and removed lamps have greatly reduced energy use. Only the federal law requirements are met with night lights. This includes the vault doors and night depository areas.

The chart below shows a comparison of the total annual electrical KWH and natural gas CCF consumption for the years 1973 and 1975 at several of the bank's branch buildings:

| <u>Branch</u> | <u>Electrical Usage</u> | | <u>% Difference</u> |
|---------------------|-------------------------|-----------------|---------------------|
| | <u>1973 KWH</u> | <u>1975 KWH</u> | |
| Main Office | 21,731,000 | 13,910,000 | 36 |
| Operations Building | 11,652,000 | 8,956,000 | 23 |
| Poplar Drive-In | 272,040 | 179,440 | 34 |
| Park Highland | 118,422 | 71,007 | 44 |
| Holiday City | 166,608 | 97,800 | 41 |
| Civil Center | 125,880 | 80,000 | 36 |
| Linden | 110,960 | 77,960 | 30 |
| Crosstown | 726,720 | 495,240 | 32 |
| Collierville | 158,720 | 71,131 | 55 |
| Winbrook | 359,260 | 168,400 | 53 |

| <u>Branch</u> | <u>Natural Gas Usage</u> | | <u>% Difference</u> |
|---------------------|--------------------------|-----------------|---------------------|
| | <u>1973 Ccf</u> | <u>1975 Ccf</u> | |
| Main Office | 431,570 | 149,600 | 65 |
| Operations Building | 172,700 | 80,120 | 54 |

(This information was provided by the Environment Center of the University of Tennessee)

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