

ENERGY ENGINEERING ANALYSIS
PROGRAM STUDY REPORT

EXECUTIVE SUMMARY
FINAL REPORT

MILAN ARMY AMMUNITION PLANT
MILAN, TENNESSEE

MOBILE DISTRICT
CORPS OF ENGINEERS

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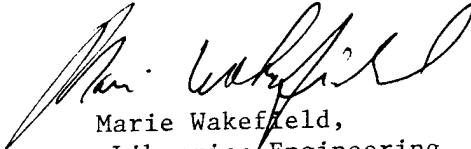


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EXECUTIVE SUMMARY

This is a summary of the Energy Engineering Analysis for the Milan Army Ammunition Plant (MAAP) in Milan, Tennessee. It includes the recommendations for the development of a Basewide Energy Plan consisting of energy conservation projects and other recommendations for reduction of the installation's 1985 source energy consumption.

Milan Army Ammunition Plant, containing 22,541 acres, is situated in both Gibson and Carroll Counties, Tennessee, and is approximately equally divided longitudinally into the two counties. Milan, Tennessee, is 5 miles west and has a population of 8,100; Humboldt is 17 miles southwest with a population of 10,200; Trenton is 18 miles northwest with a population of 4,600; and Jackson is 28 miles south with a population of 49,100. The Mississippi River is approximately 55 miles west of the plant, the Tennessee River 45 miles east.

Milan Army Ammunition Plant and the surrounding area is gently rolling terrain. The elevation of the plant varies from a high of approximately 590 feet on the south side, to a low of approximately 320 feet on the north boundary of the reservation. The Milan area experiences typically short mild winters and long warm summers. With the exception of a few modernized facilities, the overwhelming majority of buildings at MAAP were constructed for World War II ammunition production.

This Energy Engineering Analysis summary presents data on:

- Historical and predicted energy consumption
- Energy conservation procedures for distribution systems
- Energy conservation procedures for buildings and processes
- Utilization of energy monitoring and control systems (EMCS)
- Utilization of wood biomass
- Conservation procedures under higher levels of mobilization

The conservation of energy in existing facilities can be accomplished in two basic ways:

- Reduce the basic system energy requirements and source energy use
- Recover energy discharged from one user and utilize this waste energy for other purposes

A reduction in source energy requirements is represented by such activities as lowering equipment operating temperatures, reduction of transmission losses by better insulation, and night/weekend setback or shutdown of energy users and associated distribution systems.

Recovery of energy discharged by one user and utilization of this waste energy for other purposes is demonstrated by such activities as returning condensate to boiler systems and recovery of heat from process exhaust air systems to preheat replacement air. Examples of energy below the level of practical utilization are exhaust flue gases from boilers (cooled to near the dew point), and air exhausted from buildings near ambient temperature conditions.

This study has been directed towards identifying means of energy conservation conforming to those two methods identified as reduction in overall use and recovery of waste energy. Although the above discussion may appear to be confined to heat energy, investigations covered electrical usage, water usage, compressed air, wood biomass and solar energy.

The number and type of viable ECAM projects has been restricted by direction of the COE, Mobile to those which qualify at the 1980 level of mobilization (approximately 15%) and which exceed a Capital Cost Value of \$100,000. The total energy savings presented in this report can be obtained only upon full implementation of the viable ECAM projects and compliance with the recommended conservation measures requiring capital investments less than \$100,000. Those measures requiring policy changes at the management level, will result in additional savings.

Computer simulations of building energy use were modeled using the DOE-2.1 program. Computer simulations for energy utilization were performed on typical building types. Categorizing and prototyping methodology followed procedures outlined in the Black & Veatch Study "Engineering Instructions for Preparation of a Basewide Energy Systems Plan", dated January 1980. After careful examination of the MAAP facilities during field surveys, taking into consideration the building construction, building functions, and plant operating procedures, a total of 17 typical buildings were computer modeled to determine their energy use, both thermal and electrical, and to verify recorded historical energy consumption figures during the base year 1975. The final

analysis resulted in a correlation which was within 3 percent of recorded consumption figures.

Energy conservation projects were generated from the energy model for conservation measures involving building insulation, reduction in fenestration area, temperature controls installation, relighting with energy-efficient fixtures, and a basewide EMCS. A detailed analysis is provided in the main report.

The following is a tabulation of the MAAP source energy consumption for the fiscal years 1975 and 1980.

<u>Source</u>	<u>1975</u>	<u>1980</u>
Electricity	218,751 x 10 ⁶ BTU	126,226 x 10 ⁶ BTU
Fuel Oil No. 2 & 6	245,205 x 10 ⁶ BTU	107,153 x 10 ⁶ BTU
Coal	255,115 x 10 ⁶ BTU	124,841 x 10 ⁶ BTU

This yields a total of 358,220 Mega BTU's for FY-80 (see Figure 1) as compared to a total of 718,891 Mega BTU's for FY-75. It is reported that operations during this period had decreased from an average level of 37% mobilization in FY 1975 to an average level of 15% mobilization in FY-1980.

Figure 2 shows the historical and predicted annual energy consumption for a ten-year period through fiscal year 1986, reflecting the effect of proposed conservation measures.

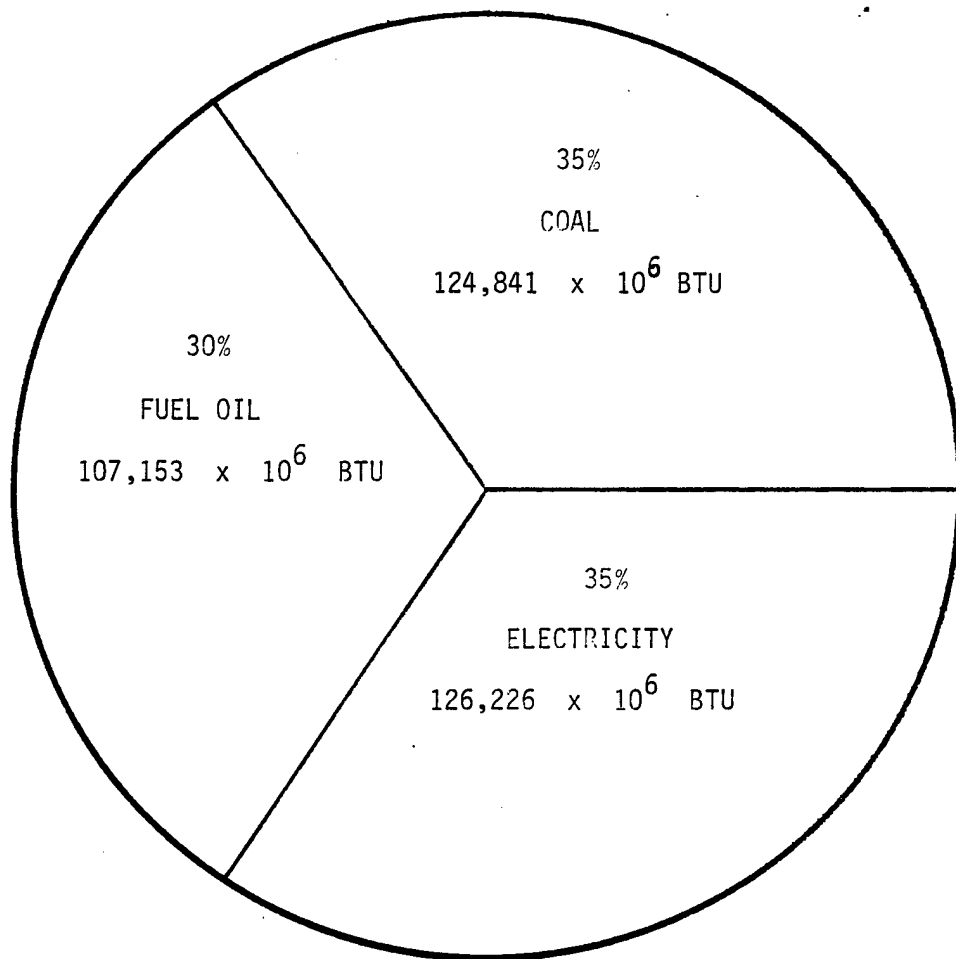


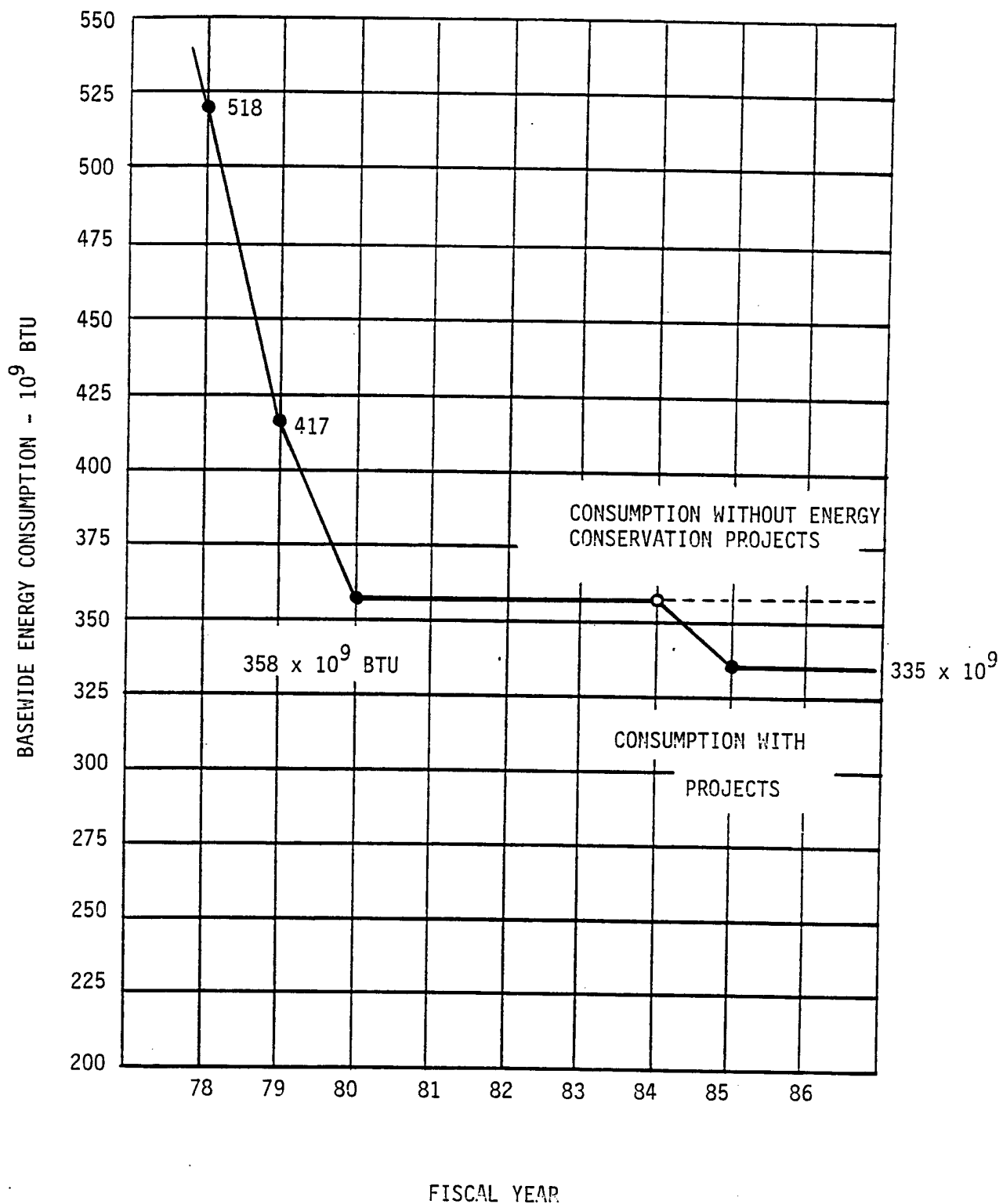
FIGURE 1

BASEWIDE CONSUMPTION FY '80

(358,220 x 10⁶ BTU)

PROJECTED ENERGY CONSUMPTION

MILAN AAP



It was determined that the fuel consumption rate for this facility is almost totally weather-dependent. Since less than 1% of the steam generated in the boilers is consumed in process operations, the remainder is therefore consumed in building heating and transmission line losses getting the steam to the buildings. Figure 3 shows the monthly fuel consumption for fiscal year 1980. Note the peak during the cold winter months as compared to the low level of consumption during the summer.

Figure 4 shows the basewide electrical consumption for the past three fiscal years. It can be seen that the January peaks have steadily declined, while the average yearly consumption remains relatively constant around 11 million kilowatt hours. It is apparent the peaks have been reduced as a result of an Executive Order prohibiting supplemental electrical heating units where a building already contains a main source of heat.

The projected basewide energy costs through fiscal year 1986 are shown on Figure 5. Projections are made for the facility if left in its present condition and level of utilization based on FY-80 consumption rate. Predicted costs resulting from the anticipated energy savings upon implementation of all energy conservation projects and recommendations in FY-85 are shown by the solid line graph. The following escalation rates were used for calculation purposes:

Fuel Oil:	1.14 (14%)
Coal:	1.10 (10%)
Electricity:	1.13 (13%)

FUEL CONSUMPTION FY - 80

MILAN AAP

FISCAL YEAR 1980

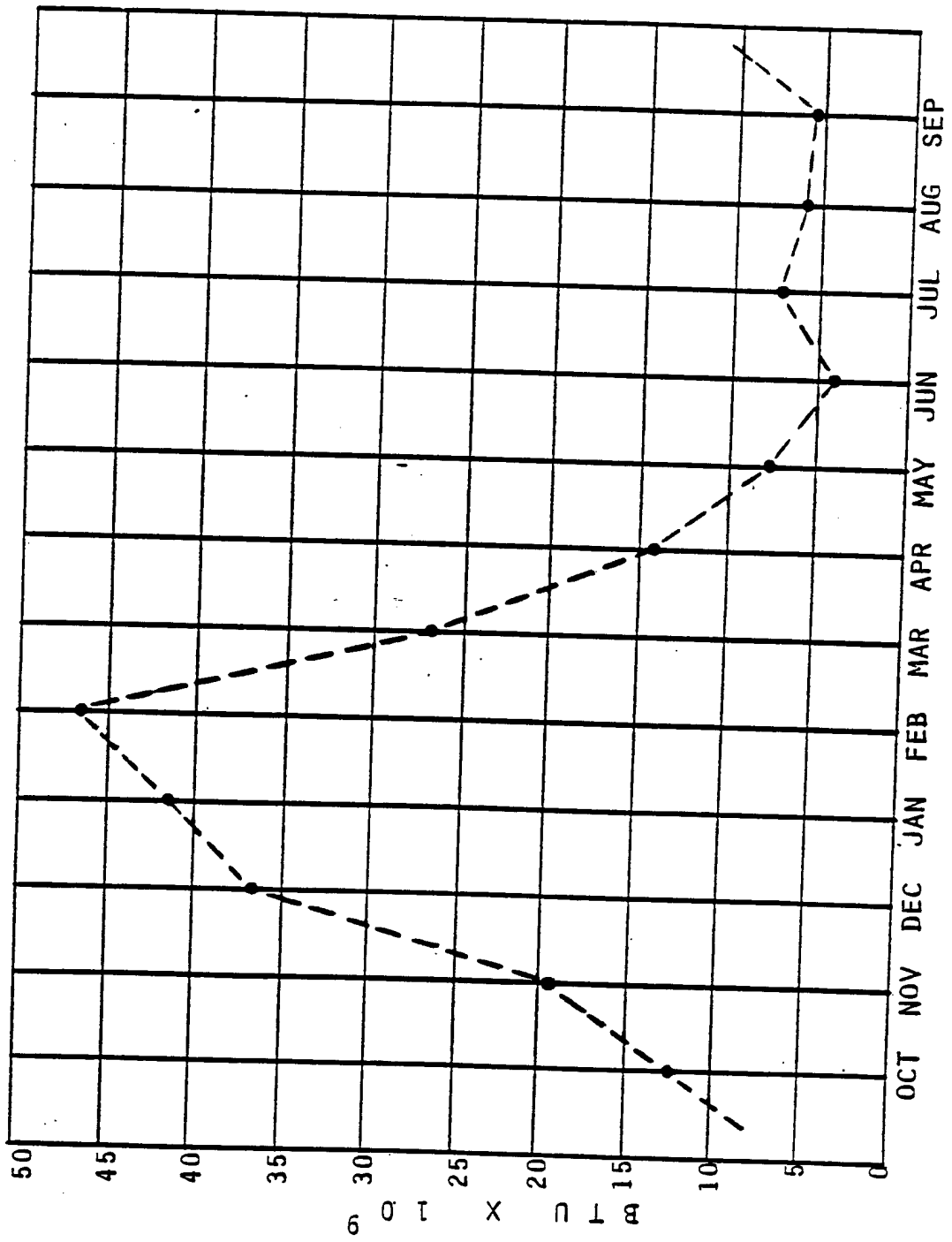


FIGURE 3

MILAN AAP ELECTRICAL LOAD

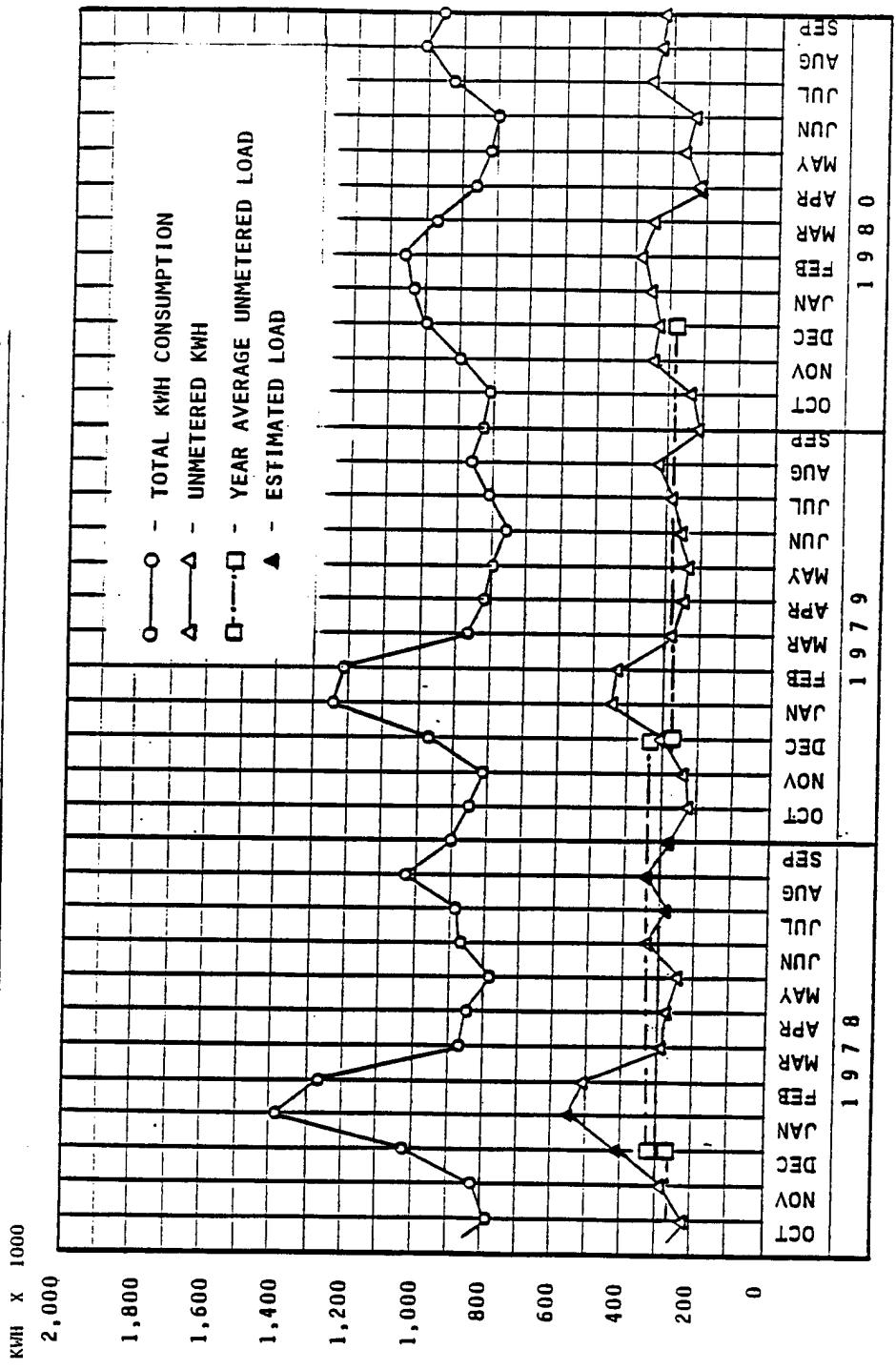


FIGURE 4

PROJECTED ENERGY COSTS

M I L A N A A P

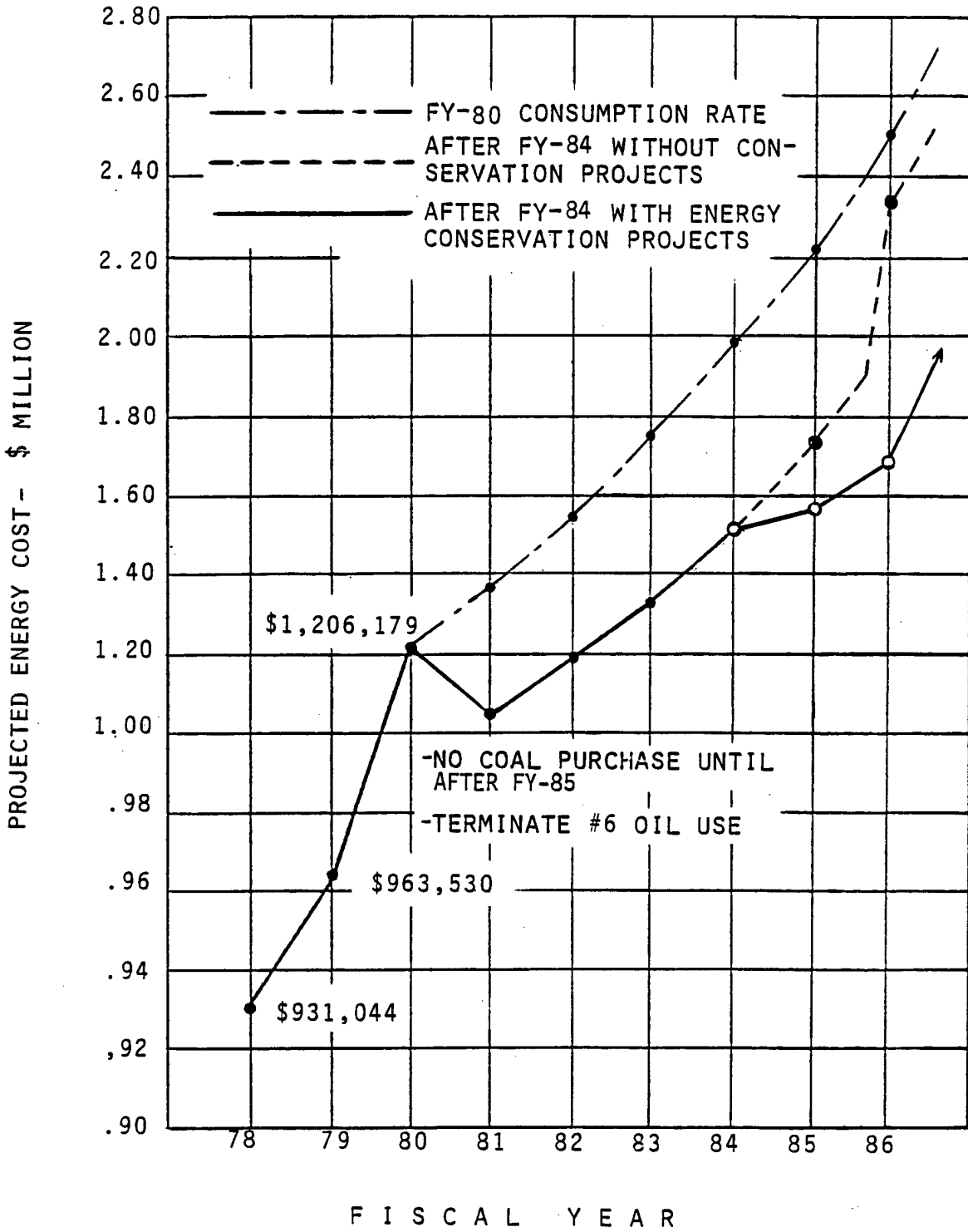


FIGURE 5

A total of 3.2% or 11,500 Mega BTU can be saved annually upon implementation of the viable ECAM projects determined by this study. Figure 6 shows the total source energy reduction. Further breakdown of the total savings yields the following:

Fuel Oil	7,520 x 10 ⁶ BTU saved
Coal	2,800 x 10 ⁶ BTU saved
Electricity	1,200 x 10 ⁶ BTU saved

An additional 10,600 Mega BTU, or 2.9% savings in basewide coal consumption can be achieved by implementation of recommended energy conservation projects which do not qualify for ECAM funding. (See Appendix A of this summary).

ECAM Projects for source energy reduction are listed in Table 1 with their corresponding E/C ratio. Table 2 contains projects not qualifying for ECAM funding, i.e., requiring less than \$100,000 capital expenditure, but which are good energy-saving measures.

Further explanation of the historical energy consumption, basewide energy model, and energy conservation analysis can be found in the Energy Use Survey, Section 3 of this report. The analysis for temperature control schemes and basewide EMCS applications is included in the report on Energy Monitoring and Control Systems, Section 4 of this report.

BASEWIDE CONSUMPTION AFTER FY-85

ENERGY CONSERVATION PROJECTS

CURRENT (FY-80) CONSUMPTION = $358,000 \times 10^6$ BTU

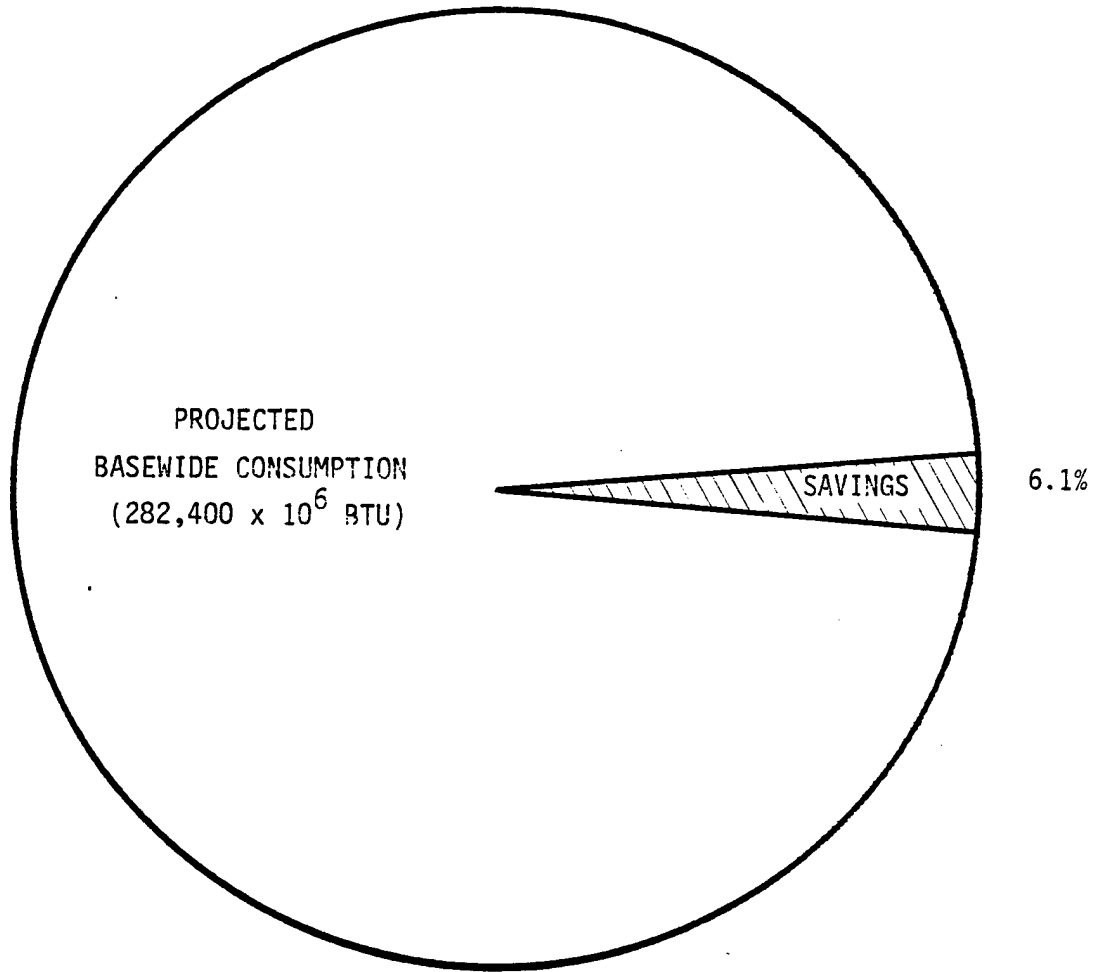


FIGURE 6

ECAM PROJECT SUMMARY

MILAN ARMY AMMUNITION PLANT

PROJECT NO.	PROJECT TITLE	BUILDINGS	CAPITAL \$ COST \$	ELEC.	ENERGY SAVED - OIL	MEGA BTU COAL	TOTAL	B/C	E/C	PB YEARS
M-101	Insulation: B Line	(7)	406,400	(-) 70	3230	-	3300	3.2	8.5	5.7
M-102	Insulation: X-Line	(11)	482,900	2.0	3241	-	3243	2.6	7.0	6.8
M-103	Insulation: D-Line, H-Line, O-Line & J Area	(12)	460,400	8.8	-	3662	3750	0.9	8.6	14.9
M-104	Temp. Controls	(92)	198,500	1211	7526	2796	11533	11.3	60.9	1.0
M-105	Basewide EMCS	(68)	889,200	1286	7289	2796	11371	2.15	13.3	5.8

NOTE: 1. Projects M-101, M-102 and M-103 do not qualify for ECAM funding.

2. Projects M-104 and M-105 are similar. One or the other may be chosen for programming.

TABLE 1

TABLE 2
ENERGY CONSERVATION PROJECTS
UNDER \$100,000

PROJECT TITLE	ANNUAL ENERGY SAVINGS	COST 1984
Replace (10) Expansion Fittings in Steam Distribution System	390×10^6 BTU	\$28,200
Replace U/G District Steam Piping - Line "D"	6580×10^6 BTU	\$55,000
Replace U/G District Steam Piping - Line "H"	3630×10^6 BTU	\$71,400

Total Annual Savings = 10,600 Mega Btu

The composite total in energy reduction for building improvement projects is not a simple algebraic summation of individual project's energy savings. Due to synergistic effects, the average composite total savings are approximately 63% of the simple sum. Consideration must be given to these synergistic effects when arriving at energy savings using different combinations of energy conservation projects.

The addition of simple temperature controls (Project M-104) or the installation of a basewide EMCS (Project M-105) essentially accounts for the same block of energy to be saved. One or the other may be chosen, and thus the energy savings can only be taken credit for one time. Although the initial cost is greater to install the EMCS, it does have a decided advantage over the simpler temperature controls arrangement due to its inherent ability to monitor and report out of state operating conditions. This discourages tampering by personnel and ultimately guarantees energy savings, provided the system is properly installed and maintained. The total basewide energy reduction figure quoted includes the savings resulting from Temperature Controls installation.

A detailed study of the utilization of Biomass material from the 21,800 acre Milan Site as an energy source was conducted. This study indicated that it would take 20 to 25 years to develop woodlands capable of maintaining a reasonably uniform level of Biomass material.

At present, wood biomass would be a more expensive fuel than coal or oil at Milan AAP. Due to the high moisture content of wood and handling expenses, the cost of burning wood grown on site would be about 1.7 times that of coal per useful BTU equivalent.

However, since there is a growing market for pulp wood in this location, it appears desirable to plant loblolly pine in several suitable areas in rotation during the coming years. The harvesting of this pine would begin after 20 to 25 years, and depending upon conditions existing at that time, be utilized in one of three ways. The wood may be burned as fuel at Milan AAP, sold to pulp mills, or burn the low quality wood at Milan and sell the high quality wood to pulp mills. Accordingly, it is desirable that some of the boilers which may be installed in the coming years be capable of conversion to burning wood, with minimum adaption, in the future. Companies in the vicinity of Milan which generate waste wood materials all have existing markets for their materials. A detailed analysis is included in the Biomass Survey, Section 5 of this report.

Based on instructions received at the 40% review meeting on June 17, 1981, this report was directed to cover only the currently operational lines B, D, H, X, I and K-10 and areas K, Q, J and T on their present operating schedules, approximately 15% mobilization.

Field surveys, hand calculations and computer calculations had initially been prepared for the entire base assuming 100% mobilization on a 5-8-3 shift operation, according to the initial scope of work. It was subsequently agreed that the basewide energy use model derived in this manner could be scaled down to current mobilization levels without re-running the DOE 2.1 computer analysis, by developing factors using manual calculation methods. These factors were then applied to the computer generated energy figures to obtain current building energy requirements and ECAM project savings.

It is suggested that the supporting documentation of this report be reviewed if mobilization levels are increased or operating areas changed, to determine if potentially viable projects for energy conservation may exist in these other production lines or areas. Examples include relighting for interconnecting walkways and consolidation of the compressed air systems, which promise economically attractive energy savings during periods of maximum mobilization.

The Basewide Energy Plan Recommendations for the Milan Army Ammunition Plant are presented in Section 6 of this report. Copies of ECAM Projects generated as a result of this energy Engineering Analysis are included in Volume 1 under Section 7.

APPENDIX A

- A-1 IMPLEMENTATION OF EXPANDED MAINTENANCE PROGRAM

- A-2 POTENTIAL CONSERVATION MEASURES REQUIRING
 CAPITAL INVESTMENT

- A-3 POTENTIAL CONSERVATION MEASURES REQUIRING
 POLICY CHANGE

A-1 IMPLEMENTATION OF AN EXPANDED MAINTENANCE PROGRAM

The following energy conservation and/or control projects are discussed in the report as viable projects under an expanded maintenance program.

1. Addition of water preheat coils in laundry waste water sump.
2. Control changes in building H-115 to utilize outside air for makeup under certain temperature conditions.
3. Replacement of malfunctioning or disconnected steam traps.
4. Repair of pipe hangers and supports to align pipe.
5. Repair of damaged pipe insulation.
6. Repair or replacement of leaking valves.
7. Initiate program to locate and repair compressed air, steam, condensate, water and sewer line leaks.
8. Interconnect compressed air systems.
9. Renegotiate electric demand rates.
10. Adjust fuel inventory.
11. Install oil and steam flow meters on operating lines.
12. Install electric meters on all operational substations.
13. Install run-off water control and treatment at coal storage area.
14. Add coal fired boilers to reduce oil consumption.
15. Add uninterruptable power supplies to all microprocessor or computer facilities.
16. Add emergency generators where total power failure could cause a hazardous situation.

A-2 POTENTIAL CONSERVATION MEASURES REQUIRING CAPITAL INVESTMENT

Project Studied	Comments
1. Install vestibules around high traffic doors.	This project has limited application. The calculations are subject to numerous assumptions.
2. Install solar shading devices: <ul style="list-style-type: none"> . Solar Film . Solar Screens . Overhangs . Awnings 	This project has limited application.
3. Install attic ventilation fans.	This project has limited application to the Administration Bldg. and would likely disrupt the performance of window air conditioners.
4. Install whole-house attic fans.	The savings are too occupant-dependent.
5. Reset outside air dampers to minimum requirements of ASHRAE 62-73.	This project has limited application.
6. Install boiler economizers, oxygen trim controls, blowdown heat reclaim devices, etc.	Not cost effective for heating boilers due to short duty cycle.
7. Install storm windows.	This project has limited further applications.
8. Weatherstrip doors.	Good Project.
9. Add floor, ceiling, and wall insulation.	This is a good project where there is no insulation present, however, short heating cycles prevent meeting ECAM criteria.
10. Install setback/setup controls.	Good Project.
11. Add warmup cycle with fresh air dampers closed where setback/setup controls are used.	Good Project.

A-2 POTENTIAL CONSERVATION MEASURES REQUIRING CAPITAL INVESTMENT
(Continued)

Project Studied	Comments
12. Install flue dampers, smaller jets, dual burners, electronic ignition, etc. in small furnaces.	Not cost effective for heating boilers due to short duty cycle.
13. Replace manual control valves or install temperature regulators in cast-iron radiators.	Not cost effective where thermostatic controls are being provided.
14. Replace existing coal boilers with gas/oil conversion kits with modern packaged boilers.	This project does not meet the criteria.
15. Replace incandescent lighting with higher efficiency lighting systems.	Good Project.
16. Install photocell lighting controls.	This project has limited application.
17. Replace existing motors with motors of the high efficiency type.	Limited application due to short duty cycles on current level of mobilization.
18. Reduce lighting levels to minimum standards.	Limited application - most facilities are below minimum standards.
19. Install water closet tank inserts, flow reducing shower heads, or other water conserving devices to reduce pumping energy consumption.	Limited Application.
20. Insulate existing steam lines.	This project does not meet the criteria in most areas due to short duty cycle.
21. Revise existing chilled water/hot water pumping schemes to more efficient methods.	N/A

A-2 POTENTIAL CONSERVATION MEASURES REQUIRING CAPITAL INVESTMENT
(Continued)

Project Studied	Comments
22. Deactivate individual room thermostats in barracks and install temperature reset controls on chilled and hot water.	N/A.
23. Shut down steam plants in the summer and satisfy process steam needs with electric boilers.	N/A.
24. Install infrared heating in warehouses and shops.	This project does not meet the criteria due to short heating duty cycles.
25. Install economizer systems for "free cooling" in intermediate seasons.	This project does not meet the criteria in retrofit applications.
26. Modify multizone systems to include hot/cold deck reset.	N/A.
27. Modify cooling tower systems to install fan with load and/or install bypass valving.	N/A.
28. Install load-shedding system to minimize demand charges.	N/A.
29. Correct power factor.	This project does not meet the criteria.
30. Install chilled and hot water reset controls.	N/A.
31. Install FM radio control system.	N/A.
32. Replace existing windows with insulating panels.	Good Project - Limited application.
33. Insulate temporary buildings.	N/A.

A-2 POTENTIAL CONSERVATION MEASURES REQUIRING CAPITAL INVESTMENT
(Continued)

Project Studied	Comments
34. Upgrade electrical distribution voltage.	N/A.
35. Install total or selective energy plants.	N/A.
36. Install energy monitoring and control system.	Good Project.
37. Install heat reclaim devices on air-cooled condensers.	Limited application.
38. Replace remotely located absorption chillers with more efficient electric-driven chillers.	N/A.
39. Install solid waste-burning boilers.	This project does not meet the criteria.
40. Install trailer enclosing devices at loading docks.	This project has limited application.
41. Install solar energy systems where feasible.	This project does not meet the criteria.
42. Install air-to-air heat reclaim devices in high exhaust areas, such as messhall kitchens.	This project does not meet the criteria.

A-3 POTENTIAL CONSERVATION MEASURES REQUIRING POLICY CHANGES
AT INSTALLATION LEVEL

Project Studied	Comments
1. Replace domestic water heaters with higher efficiency models as replacement is required.	Good Project.
2. Shut down steam boilers and branch lines in summer.	Currently practiced.
3. Reduce domestic hot water temperatures from 140 F to 110-120 F.	Good Project.
4. Replace electric motors with motors of the high efficiency type on replacement basis.	Good Project. Limited application due to motor frame sizes of older equipment.
5. Use task lighting.	Good Project.
6. Install temporary 4-mil plastic storm windows.	Limited application due to short heating cycle.
7. Shut down HVAC and DHW systems in unoccupied buildings.	Good Project.
8. Calk cracks on self-help basis.	Good Project.
9. Install high-efficiency transformers on replacement basis.	Good Project.
10. Enforce indoor space temperature regulations.	Currently practiced.
11. Repair steam and condensate leaks.	Good Project.
12. Repair air leakage in ducts.	N/A.
13. Turn pilot lights for heating equipment off for the summer.	Good project - Limited application.
14. Replace air-conditioning units with high efficiency models as replacement is required.	Good Project.

APPENDIX B

- B-1 TYPICAL BUILDING DATA
- B-2 BUILDING ENERGY SUMMARY
- B-3 ECAM PROJECT SAVINGS

TYPICAL BUILDING DATA

This appendix includes summaries of building data as collected and analyzed by the computer program.

Table 1 - Lists the category code and buildings selected as prototypes for computer calculations

Table 2 - Lists the prototype buildings and their source energy consumption @ 100% mobilization.

Table 3 - Lists infiltration rates used for the computer analysis under different insulation conditions.

TABLE I

Prototype/Computer Simulated			Similar Buildings
Category Code	MAAP Bldg. No.	Function	
A-1-E	T-1	Admin.	T-2, 10; D-44, F-50
A-1-E	T-114	Computer Bldg.	None
A-1-F D-1-F CH-1-F	X-20	Admin., Cafe, Change House	B-20; D-11; H-12; The following buildings are similar to A/C zone of X-20 only: I-23; J-10; O-15
CH-1-F	X-21	Change House, Boiler Plant	B-21; J-2, 3, 5, 8, 52, 106, 111, 123; V-101 thru 104, V-201 thru 204
D-1-E	T-113	Cafeteria	The following Bldgs. are similar to A/C zone of T-113 only: H-111, 115; J-124, 135; V-20, 21
FH-1-E	Q-23	Family Housing	Q-1 thru Q-22, Q-24 thru Q-32
M-1-E	I-3	Vehicle Repair	I-4, 5, 6, 7, 9, 40, 154; J-9; K-301, 312, 315
M-1-F	C-6	Production	J-129, 130; V-22 thru 26
M-1-F	X-4	Pelletizing	I-4
M-1-F	X-8	Assembly (Production)	H-81
M-1-F	X-12	Assembly (Production)	B-12; O-1, 3, 4
M-1-F	X-14	Assembly (Production)	B-14; D-3
M-1-F	X-18	Assembly (Production)	B-18
M-1-F	X-27	Assembly (Production)	None
M-1-F	X-41	Melt-Pour (Production)	O-14 (heated only portion of X-41)
W-1-F	X-2	Storage	None
W-1-F	X-33	Inert Storage	B-10, 15, 16, 19, 261; H-3, 5; X-7, 10, 17, 19

TABLE 2
TYPICAL BUILDING ENERGY CONSUMPTION DATA
MAAP

GROUP NO.	BLDG.	BUILDING DESCRIPTION	ANNUAL ENERGY SOURCE CONSUMPTION BTU x 10 ⁶				ELEC. ENERGY CONSUMPTION		BTU x 10 ⁶ / SQ. FT./YR
			FUEL		ELEC.	TOTAL	KW PEAK	KWH/YEAR	
			COAL	OIL					
A-I-E	T-1	Administration	--	2675.4	5752.8	8428.2	264.5	495,931	0.167
A-I-E	T-114	Computer Bldg.	--	113.8	1459.8	1573.6	38.0	125,845	0.273
A-I-F CH-I-F D-I-F	X-20	Change House, Cafeteria, Off.	--	2831.3	1099.3	3930.6	72.0	94,767	0.254
CH-I-F	X-21	Change House, Boiler Plant	--	1522.8	145.0	1667.8	18.5	12,500	0.122
D-I-E	T-113	Cafeteria	--	657.4	1083.3	1740.7	49.2	93,388	0.143
FH-I-E	Q-23	Family Housing	--	149.3	132.6	281.9	3.2	11,431	0.118
M-I-E	I-3	Vehicle Repair	--	2429.5	1108.5	3538.0	37.5	95,560	0.117
M-I-F	CC-6	Production	--	502.1	267.1	769.2	9.0	23,026	0.078
M-I-F	X-4	Pelletizing	--	875.2	323.9	1199.1	11.6	27,922	0.248
M-I-F	X-8	Assembly (Production)	--	1182.0	419.1	1601.1	15.0	36,129	0.244
M-I-F	X-12	Assembly (Production)	--	1683.9	477.3	2161.2	17.1	41,147	0.281
M-I-F	X-14	Assembly (Production)	--	2699.8	1210.0	3909.8	40.9	104,310	0.195
M-I-F	X-18	Assembly (Production)	--	3355.9	855.0	4210.9	30.6	73,707	0.248

Table 2 Continued

GROUP NO.	BLDG.	BUILDING DESCRIPTION	ANNUAL ENERGY SOURCE CONSUMPTION BTU x 10 ⁶				ELEC. ENERGY CONSUMPTION		BTU x 10 ⁶ / SQ. FT./YR.
			FUEL		ELEC.	TOTAL	KW PEAK	KWH/YEAR	
			COAL	OIL					
M-I-F	X-27	Assembly (Production)	--	1154.4	360.5	1514.9	12.9	31,078	0.215
M-I-F	X-41	Melt-Pour (Production)	--	3154.3	1380.6	4534.9	91.6	119,017	0.261
W-I-F	X-2	Storage	--	492.5	118.6	611.1	4.0	10,224	0.255
W-I-F	X-33	Inert Storage	--	2435.8	282.9	2718.7	9.6	24,388	0.245

MILAN AAP

AIR CHANGE RATES USED FOR INFILTRATION

<u>BLDG. NO</u>	<u>AS IS</u>	<u>INSUL. ROOF</u>	<u>INSUL. WALLS</u>	<u>REDUCE GLASS</u>
X-2	5	4.5	4	4.5
X-4	7	6.5	5	6.5
X-8	5	4.5	4	4.5
X-12	5	4.5	4	4.5
X-14	5	4.5	4	4.5
X-18	5	4.5	4	4.5
X-20	4	3.5	3	3.5
X-21	4	3.5	3	3.5
X-27	5	4.5	4	4.5
X-33	4	3.5	3	3.5
X-41	4	-	-	-

TABLE 3

This appendix lists the energy requirements for all heated/cooled buildings at MAAP, for 100% mobilization and 15% mobilization levels.

The energy requirements reported in the 100% table represent energy requirements that would result if operations were scheduled around the clock with all lines operating.

The 15% tables reflect the application of scaling factors derived considering single shift operation of production lines and the current practice of Milan operating personnel of shutting down boilers when the ambient air temperature is expected to remain reasonably above freezing during non-working hours.

GROUP NO.	BLDG. NO.	BLDG. DESCRIP.	PROTOTYPE		MAAP		CONSUMP.		DATA		TOTAL MBTU/SQ.FT./YR	
			AS IS	100 PER CENT	ENERGY MBTU	PER CENT	MOBIL.	BLDG.	ELEC.	ENERGY CONSUMP.		
												BLDG. SQ. FT.
A-1-E	T-1	ADMIN	50481	2370.20	1948.75	8512.98	12831.94	264.50	167996	733878	901874	25419343
A-1-E	T-114	COMPUTER OFFICE	5760	113.80	273.90	1185.98	1573.68	38.00	23612	102240	125852	27320889
A-1-F	X-20	CH6 HOUSE	15500	2597.50	714.88	1075.67	4388.05	72.00	61628	92730	154358	28310018
D-1-F	X-21	CH6 HOUSE	13700	1397.10	0.00	345.23	1742.33	18.50	0	29761	29761	12717720
D-1-E	T-113	CAFE	12184	644.70	382.19	1485.57	2512.45	49.20	32947	128066	161013	20620903
FH-1-E	Q-23	FAMILY HOUSING	2400	149.40	0.00	117.39	266.79	1.50	0	10120	10120	11116333
M-1-E	I-3	VEHICLE REPAIR	20040	2228.90	0.00	2640.59	4869.49	37.50	0	227637	227637	24298848
M-1-F	C-6	PRODUC.	9814	460.60	0.00	635.98	1096.58	9.00	0	54826	54826	11173646
M-1-F	X-4	PELLETIZ.	4830	810.40	0.00	578.35	1388.75	11.60	0	49858	49858	28752646
M-1-F	X-8	ASSEMBLY	6350	1094.50	0.00	748.36	1842.86	15.00	0	64514	64514	28135304
M-1-F	X-12	ASSEMBLY	7696	1559.20	0.00	852.44	2411.64	17.10	0	73486	73486	3136247
M-1-F	X-14	ASSEMBLY	20050	2476.90	0.00	2881.00	5357.90	40.90	0	248362	248362	26722689
M-1-F	X-18	ASSEMBLY	17000	3107.30	0.00	1526.71	4634.01	30.60	0	131613	131613	27258887
M-1-F	X-27	ASSEMBLY	7050	1069.00	0.00	643.70	1712.70	12.90	0	55491	55491	24293555
M-1-F	X-41	MELT POUR	17408	2894.00	193.73	3093.35	6181.08	91.60	16701	266668	266668	35507125
M-1-F	X-2	STORAGE	2400	451.80	0.00	282.32	734.12	4.00	0	24338	24338	30588367
M-1-F	X-33	INERT STORAGE	11118	2234.70	0.00	673.48	2908.18	9.60	0	58059	58059	26157442

AREA/LINE A/L	NUMBER OF BLDG.	ALL BLDG		MAAP ENERGY CONSUMP.		DATA		HTG FUEL SOURCE			
		AS IS	100 PER CENT	ANNUAL ENERGY CONSUMP.	MOBIL. ALL LINES AND AREAS	TOTAL BLDG. SQ. FT.	PERCENT		TOTAL MBTU		
										FUEL OIL	A/C ELEC.
A LINE	16	18151.13	714.88	8518.03	9232.92	27384.05	61628	734313	795941	253078999	OIL
B LINE	13	16125.29	714.88	8589.87	9304.75	25430.04	61628	740506	802134	25266319	OIL
C LINE	23	135024	1100.62	10224.40	11331.02	27221.47	95398	881414	976812	20160467	OIL
D LINE	13	19018.71	1101.05	1515.59	12616.64	31635.35	94918	992723	1087641	284811	COAL
D AREA	1	4656	179.74	785.19	964.93	1183.76	15495	67689	83184	254244	OIL
E LINE	8	29406	796.97	2834.55	3631.52	7511.68	68704	244358	313062	25544716	OIL
F LINE	16	9254.25	558.08	3740.74	4298.82	13553.07	48110	32478	370588	23323376	OIL
F AREA	1	3190	123.15	537.96	661.11	811.04	10616	16376	56992	23424364	OIL
H LINE	8	31880	1105.29	2388.66	3493.95	7222.64	95284	205919	301203	22655724	OIL
I AREA	7	7413	0.00	822.07	822.07	2103.98	1	70868	70868	2838285	OIL
J AREA	9	62686	243.52	7847.56	8091.08	14726.34	20993	676514	697507	2349233	OIL
K AREA	13	94043	464.38	5374.79	5839.17	14340.48	40033	463344	503377	15248058	COAL
L AREA	4	25415	55.34	3273.97	3329.32	6218.79	4771	282239	287010	24468959	COAL
O AREA	4	15930	191.63	1592.65	1784.28	4870.91	16520	137297	153817	30576944	COAL
Q AREA	32	67400	0.00	3297.01	3297.01	7475.81	0	284225	284225	11091706	OIL
S AREA	2	15300	352.83	723.68	1076.50	3142.00	30416	62386	92802	20535969	OIL
T AREA	5	88655	363.85	14596.14	17981.96	22061.47	291881	1258288	1550169	4684632	OIL
V LINE	15	38498	908.62	2271.85	2635.69	4969.72	31366	195849	227215	12909045	OIL
X LINE	20	135856	22617.73	13532.25	14490.87	37108.60	78329	1170884	1249213	27314657	OIL
Z LINE	6	42916	1016.76	3582.08	4598.84	9265.83	87652	308800	396452	21590626	OIL
TOTALS	216	1170931	13383.41	106099.05	119482.46	268237.04	1153742	9146470	10300212	22908014	
OIL BLDG	179	918778	10521.05	85227.37	95748.42	210167.66	906987	7347187	8254174	22874694	
COAL BLDG	37	252153	2862.36	20871.68	23734.04	58069.38	246755	1799283	2046038	23024423	

ALL BLDG. ENERGY CONSUMP. DATA
 AS 18 100 PER CENT MOBIL, AAP LINES

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		A/G ELEC.	LIG. ELEC.	A/C+LIG. ELEC.	TOTAL QIL+ELEC.	MBTU	BLDG.	ELEC. CONSUMP.		TOTAL ENERGY KWH/YR	TOTAL MBTU/50,000 FT./YR
			ANNUAL	PER CENT							KWH/YR	A/C KWH/YR		
X-14	A-2	15083	1863.30	2167.29	0.00	2167.29	4030.59	186835	186835	0	186835	186835	267227008	
X-18	A-3	19260	3520.39	1729.68	0.00	1729.68	5250.07	149110	149110	0	149110	149110	27258910	
X-18	A-4	15881	2902.77	1426.22	0.00	1426.22	4328.99	122950	122950	0	122950	122950	27258926	
X-33	A-5	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-33	A-6	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-33	A-7	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-33	A-8	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-33	A-9	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-20	A-14	15500	2597.50	1075.67	714.88	1790.55	4388.05	61628	61628	0	92730	15437	28310018	
X-21	A-15	12820	1307.36	323.05	0.00	323.05	1630.41	27449	27449	0	27449	27449	12717694	
X-33	A-33	11118	2234.70	673.48	0.00	673.48	2908.18	58059	58059	0	58059	58059	26157442	
X-33	A-34	11118	2234.70	673.48	0.00	673.48	2908.18	58059	58059	0	58059	58059	26157442	
X-33	A-39	2571	516.77	155.74	0.00	155.74	672.51	13426	13426	0	13426	13426	6157588	
X-33	A-40	1044	209.84	63.24	0.00	63.24	273.08	5452	5452	0	5452	5452	6157395	
X-33	A-43	200	40.20	12.11	0.00	12.11	52.31	1044	1044	0	1044	1044	261552	
X-2	A-44	400	80.40	24.23	0.00	24.23	104.63	2089	2089	0	2089	2089	261581	
X-4	B-2	2436	487.58	286.55	0.00	286.55	745.13	24703	24703	0	24703	24703	30588456	
X-12	B-4	2798	469.46	335.04	0.00	335.04	804.50	28883	28883	0	28883	28883	28752781	
X-12	B-12	3296	667.77	365.08	0.00	365.08	1032.85	31472	31472	0	31472	31472	31336323	
X-14	B-14	23050	2847.51	3312.07	0.00	3312.07	6159.58	28523	28523	0	28523	28523	2672676	
X-33	B-15	54	10.85	3.27	0.00	3.27	14.12	282	282	0	282	282	26150370	
X-33	B-16	640	128.64	38.77	0.00	38.77	167.41	3342	3342	0	3342	3342	26157375	
X-18	B-18	15996	2923.79	1436.54	0.00	1436.54	4360.33	123840	123840	0	123840	123840	27258902	
X-20	B-20	15500	2597.50	1075.67	714.88	1790.55	4388.05	61628	61628	0	92730	15437	28310018	
X-21	B-21	14050	1432.79	354.04	0.00	354.04	1786.83	30521	30521	0	30521	30521	12717677	
X-33	B-33	11118	2234.70	673.48	0.00	673.48	2908.18	58059	58059	0	58059	58059	26157442	
X-33	B-34	11118	2234.70	673.48	0.00	673.48	2908.18	58059	58059	0	58059	58059	26157442	
X-262	B-262	296	59.50	17.93	0.00	17.93	77.43	1546	1546	0	1546	1546	2616	
X-33	B-263	296	59.50	17.93	0.00	17.93	77.43	1546	1546	0	1546	1546	2616	
TOTALS	29	208843	34276.42	1429.77	17107.90	18537.67	52814.09	123256	1474819	1598075	1598075	25288896		

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	ALL BLDG.		MAAP ENERGY CONSUMP.		DATA		ENERGY TOTAL KWH/YR	TOTAL MBTU/ FT. YR				
			AS IS	100 PER CENT	MOBIL.	C LINE	BLDG.	ELEC. CONSUMP.			BLDG.	A/C KWH/YR	BLDG.	ELEC. CONSUMP.
			FUEL OIL	ANNUAL ELEC.	LIG, ELEC.	A/C+LIG. ELEC.	MOBIL.	MBTU	BLDG.	ELEC. CONSUMP.	BLDG.	A/C KWH/YR	BLDG.	TOTAL OIL+ELEC.
C-6	C-1	2420	113.59	0.00	156.82	156.82		270.40		13519		0		270.40
C-6	C-3	17241	809.17	0.00	1117.28	1117.28		1926.45		96317		0		1926.45
C-6	C-5	3380	158.63	0.00	219.04	219.04		377.67		18882		0		377.67
C-6	C-6	9814	460.60	0.00	635.98	635.98		1096.58		54826		1		1096.58
X-33	C-9	640	128.64	0.00	18.77	38.77		167.41		3342		0		167.41
X-18	C-10	12050	2202.33	0.00	1082.17	1082.17		3284.70		93290		0		3284.70
X-20	C-11	21458	3595.95	989.68	1489.14	2478.82		6074.76		128374		85317		6074.76
C-6	C-12	10687	501.57	0.00	692.56	692.56		1194.13		213691		0		1194.13
X-33	C-14	336	67.54	0.00	20.35	20.35		87.89		59703		0		87.89
C-6	C-19	1280	60.07	0.00	82.95	82.95		143.02		1755		0		143.02
X-33	C-21	244	49.04	0.00	14.78	14.78		63.82		715		0		63.82
X-33	C-22	244	49.04	0.00	14.78	14.78		63.82		1274		0		63.82
X-33	C-23	244	49.04	0.00	14.78	14.78		63.82		1274		0		63.82
C-6	C-24	7140	335.10	0.00	462.70	462.70		797.80		1274		0		797.80
X-33	C-33	11118	2234.70	0.00	673.48	673.48		2908.18		39888		0		2908.18
X-33	C-34	11118	2234.70	0.00	673.48	673.48		2908.18		58059		0		2908.18
C-6	C-41	11708	549.49	0.00	758.72	758.72		1308.21		58059		0		1308.21
X-41	C-42	10508	1746.91	116.94	1867.24	1984.18		3731.09		65407		10081		3731.09
C-6	C-45	896	42.05	0.00	58.06	58.06		100.12		160969		0		100.12
X-33	C-46	576	115.78	0.00	34.89	34.89		150.67		5006		0		150.67
X-33	C-62	640	128.64	0.00	38.77	38.77		167.41		3008		0		167.41
X-33	C-72	640	128.64	0.00	38.77	38.77		167.41		3342		0		167.41
X-33	C-100	642	129.04	0.00	38.89	38.89		167.93		3353		0		167.93
TOTALS	23	135024	15890.45	1106.62	10224.39	11331.01		27221.46		95398		881413		27221.46

ALL BLDG. ENERGY CONSUMP. DATA
 AS IS 100 PER CENT MOBIL. DNE LINES D AREA

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		A/C ELEC.	L.T.G. ELEC.	A/C+L.T.G. ELEC.	TOTAL OIL+TELEC.	BLDG.	ELEC. CONSUMP.		TOTAL SQ. FT./YR
			ANNUAL	ENERGY CONSUMP.						KBH/YR	LTG. KBH/YR	
X-2	P-2	640	120.48	75.28	0.00	75.28	195.76	0	0	6490	6490	30588125
X-14	P-3	16763	2078.60	2408.64	0.00	2408.64	4487.26	0	0	207643	207643	36768829
X-20	P-10	28146	5150.72	2527.71	0.00	2527.71	7678.43	0	0	217906	217906	27280713
X-33	P-11	18900	3175.20	1311.72	871.68	2183.41	5358.61	75146	0	113079	188225	28352434
X-33	P-21	244	49.04	14.78	0.00	14.78	63.82	0	0	1274	1274	26155082
X-33	P-22	244	49.04	14.78	0.00	14.78	63.82	0	0	1274	1274	26155082
X-33	P-33	11118	2234.70	673.48	0.00	673.48	2908.18	0	0	58059	58059	26157442
X-33	P-34	11118	2234.70	673.48	0.00	673.48	2908.18	0	0	58059	58059	26157442
X-41	P-41	10508	1744.33	1867.28	116.89	1984.17	3728.50	10077	0	160972	171049	35482474
X-41	P-42	10109	1678.09	1796.38	112.46	1908.84	3586.93	9695	0	154860	164555	35482521
X-41	P-44	6556	218.83	785.19	179.74	964.93	1183.76	15495	0	67689	83184	25424493
X-33	P-61	640	128.64	38.77	0.00	38.77	167.41	0	0	3342	3342	26157375
X-33	P-62	640	128.64	38.77	0.00	38.77	167.41	0	0	3342	3342	26157375
X-33	P-63	1230	247.23	74.51	0.00	74.51	321.74	0	0	6423	6423	26157463
X-33	E-1	300	60.30	18.18	0.00	18.18	78.48	0	0	1567	1567	26159067
X-33	E-2	989	198.79	59.91	0.00	59.91	258.70	0	0	5165	5165	26158140
X-33	E-3	120	24.12	7.27	0.00	7.27	31.39	0	0	627	627	26161
X-4	E-4	5760	967.68	689.74	0.00	689.74	1657.42	0	0	59460	59460	28774583
T-113	E-6	10116	536.15	1233.42	317.31	1550.72	2086.87	27354	0	106329	133683	20629427
X-33	E-7	1023	205.62	61.97	0.00	61.97	267.59	0	0	5342	5342	26157107
X-20	E-9	10400	1747.20	721.79	479.66	1201.45	2948.65	41350	0	62223	103573	28352373
X-33	F-41	698	140.30	42.28	0.00	42.28	182.58	0	0	3645	3645	2617880
TOTALS	22	143722	22997.92	17137.81	2077.76	15060.05	40135.73	179117	1298280	1477397	37925944	

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	ALL BLDG. 100 PER CENT MOBIL. F LINE & F AREA	MAAP ENERGY CONSUMP. DATA		BLDG.	ELEC. CONSUMP.	ENERGY TOTAL MBTU/SQ. FT./
				FUEL OIL	A/C ELEC.			
X-33	F-1	54	10.23	0.00	3.09	3.09	13.34	266
X-33	F-2	225	43.23	0.00	13.63	13.63	58.86	1175
X-33	F-3	1369	275.17	0.00	82.93	82.93	358.10	7149
X-8	F-4	4000	820.08	0.00	247.15	247.15	1067.23	21306
X-33	F-5	54	10.23	0.00	3.09	3.09	13.34	266
X-33	F-6	225	43.23	0.00	13.63	13.63	58.86	1175
X-33	F-7	1283	257.88	0.00	77.72	77.72	335.60	6700
X-8	F-8	2440	490.44	0.00	147.81	147.81	638.25	12742
X-33	F-9	340	68.34	0.00	20.59	20.59	88.93	1775
X-18	F-11	22850	4035.15	0.00	1980.25	1980.25	6015.40	170711
X-33	F-12	1210	243.21	0.00	73.30	73.30	316.51	6319
X-33	F-17	120	24.12	0.00	7.27	7.27	31.39	627
X-33	F-18	720	144.72	0.00	43.62	43.62	188.34	376
X-20	F-19	12100	2032.80	558.08	839.77	1397.85	3430.65	72394
X-21	F-20	7130	727.26	0.00	179.64	179.64	906.90	15486
T-1 AREA	F-50	3190	149.93	123.15	337.96	661.11	811.04	46376
X-33	F-171	120	24.12	0.00	7.27	7.27	31.39	627
TOTALS	17	56710	9404.18	681.22	4278.71	4959.93	14364.11	368854
								427560
								25339057

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	ANNUAL ENERGY CONSUMP.		PER CENT MOBIL.	MAAP ENERGY CONSUMP. DATA		BLDG.	ELEC. CONSUMP.	ENERGY TOTAL MBTU/FT./YR
				A/C ELEC.	A/C HTG. ELEC.		HTG. LINES	I AREA			
X-33	H-4	120	24.12	0.00	7.27	31.39	0	627	627	26161	
X-20	H-12	13800	2318.40	636.48	957.75	3912.63	54869	82565	137434	28352423	
X-33	H-81	4110	826.11	0.00	248.94	1075.07	0	214	214	26157401	
X-33	H-91	120	24.12	0.00	7.27	31.39	0	627	627	26161	
X-33	H-92	120	24.12	0.00	7.27	31.39	0	627	627	26161	
T-113	H-102	54	10.25	0.00	3.09	13.34	0	266	266	24695556	
T-113	H-111	3760	139.12	161.55	320.93	621.60	13927	27666	41593	16531883	
X-33	H-115	9796	362.45	307.26	836.12	1505.83	26488	72079	98567	15371858	
X-33	I-1	344	69.14	0.00	20.83	89.97	0	1796	1796	261551.6	
X-33	I-2	180	36.18	0.00	10.90	47.08	0	940	940	26157778	
X-4	I-3	225	45.23	0.00	13.63	58.86	0	1175	1175	2616	
X-33	I-4	6304	1059.00	0.00	754.88	1833.88	0	65076	65076	28773503	
X-33	I-5	120	24.12	0.00	7.27	31.39	0	627	627	26161	
X-33	I-52	120	24.12	0.00	7.27	31.39	0	627	627	26161	
X-33	I-53	120	24.12	0.00	7.27	31.39	0	627	627	26161	
I-3	AREA I-3	20040	2228.90	0.00	7.27	31.39	0	627	627	26161	
I-3	AREA I-4	12150	1348.65	0.00	2640.59	4869.49	0	227637	227637	24398848	
I-3	AREA I-5	7036	781.00	0.00	1600.94	2949.59	0	138012	138012	24276454	
I-3	AREA I-6	4237	470.31	0.00	927.10	1708.10	0	79922	79922	24276509	
I-3	AREA I-7	1463	162.39	0.00	558.28	1028.59	0	48128	48128	24276488	
I-3	AREA I-8	1567	173.94	0.00	192.77	355.16	0	16618	16618	24276063	
X-20	AREA I-23	5280	258.72	0.00	206.48	380.42	0	17800	17800	24276962	
I-3	AREA I-40	9617	1067.49	243.52	283.46	785.70	20993	24436	45429	14880614	
I-3	AREA I-154	1296	143.86	0.00	1267.18	2334.67	0	109240	109240	24276531	
TOTALS	24	101979	11643.86	1348.81	11058.29	24052.96	116277	953301	1069578	23586194	

MAAP ENERGY CONSUMP. DATA
 ALL BLDG. ENERGY CONSUMP. DATA
 AS IS 100 PER CENT MOBIL. J&K AREAS O L I E

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		A/C ELEC.	LIG. ELEC.		A/C ELEC.	TOTAL OIL-ELEC.	MBTU	BLDG. KWH/YR	ELEC. CONSUMP. KWH/YR	ENERGY TOTAL KWH/YR	TOTAL SQ. FT./YR
			BLDG.	ANNUAL		PER CENT	MOBIL.							
X-21	J-2	10233	1043.77	0.00	257.82	257.82	0.00	1301.59	22226	12719550	22226	22226	22226	12719550
X-21	J-3	2942	300.08	0.00	74.12	74.12	0.00	374.20	6390	12719375	6390	6390	6390	12719375
X-21	J-4	6360	648.72	0.00	160.24	160.24	0.00	808.96	13814	12719535	13814	13814	13814	12719535
X-21	J-5	16410	1673.82	0.00	413.46	413.46	0.00	2087.28	35643	12719554	35643	35643	35643	12719554
X-21	J-8	1500	153.00	0.00	37.79	37.79	0.00	190.79	3258	1271952	3258	3258	3258	1271952
I-3	J-9	10000	1110.00	0.00	1317.64	1317.64	0.00	2427.64	113590	2427644	113590	113590	113590	2427644
X-20	J-10	6667	1117.26	307.49	462.68	770.17	26508	1887.43	39886	28310018	39886	39886	66394	28310018
X-21	J-106	1928	196.66	0.00	48.58	48.58	0.00	245.24	4188	12719959	4188	4188	4188	12719959
X-21	J-123	4100	418.20	0.00	103.30	103.30	0.00	521.50	8905	12719463	8905	8905	8905	12719463
T-113	J-124	3002	111.07	94.16	256.23	350.39	8117	461.46	22089	15371739	22089	22089	30206	15371739
C-6	J-129	6779	310.61	0.00	439.34	439.34	0.00	757.95	37874	11180829	37874	37874	37874	11180829
C-6	J-130	28482	1336.12	0.00	1842.39	1842.39	0.00	3178.51	158827	11159726	158827	158827	158827	11159726
T-113	J-133	2000	74.00	62.73	170.71	233.44	5408	307.44	14716	1537192	14716	14716	20124	1537192
I-3	K-30	7495	831.95	0.00	987.58	987.58	0.00	1819.53	85136	24276552	85136	85136	85136	24276552
I-3	K-312	10880	1207.68	0.00	1433.60	1433.60	0.00	2641.28	123586	24276449	123586	123586	123586	24276449
I-3	K-315	5840	648.24	0.00	769.51	769.51	0.00	1417.75	66337	24276527	66337	66337	66337	24276527
X-20	K-345	1200	201.60	55.34	83.29	138.63	4771	340.23	7180	26352633	7180	7180	11951	26352633
X-12	O-1	3436	697.51	0.00	380.60	380.60	0.00	1078.11	32810	31376775	32810	32810	32810	31376775
X-12	O-3	2912	591.14	0.00	322.56	322.56	0.00	913.70	27807	31377102	27807	27807	27807	31377102
X-12	O-4	5427	1101.68	0.00	601.14	601.14	0.00	1702.82	51822	31376731	51822	51822	51822	31376731
X-20	O-15	4155	696.30	191.64	288.35	479.98	16520	1176.28	24858	26310018	24858	24858	41378	26310018
TOTALS	21	141748	14777.41	711.36	10450.92	11162.28	61324	25639.69	900941	18088220	900941	900941	962266	18088220

ALL BLDG. ENERGY CONSUMP. DATA

AR 10 100. PER CENT MOBIL. Q AREA S AREA T AREA

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	ANNUAL		ENERGY CONSUMP.		TOTAL OIL+ELEC.	BLDG.		TOTAL KWH/YR	TOTAL SQ.-FT./YR
				A/C ELEC.	L.TG. ELEC.	A/C+L.TG. ELEC.	MBTU		ELEC. CONSUMP.	ENERGY		
Q-23	Q-1T019	38456	2384.27	0.00	1881.16	1881.16	4265.43	0	0	162169	162169	11091716
Q-23	Q-20T023	9600	595.20	0.00	469.60	469.60	1064.80	0	0	40483	40483	11091696
Q-23	Q-24	2024	125.49	0.00	99.01	99.01	224.50	0	0	8535	8535	11091700
Q-23	Q-25T027	7200	446.40	0.00	352.20	352.20	798.60	0	0	30362	30362	11091656
Q-23	Q-28T032	10120	627.44	0.00	495.04	495.04	1122.48	0	0	42676	42676	11091715
X-21	8-31	7650	780.30	0.00	192.75	192.75	973.05	0	0	16616	16616	12719550
X-20	8-32	7650	1285.20	352.03	330.93	683.76	2168.96	30416	30416	45770	76186	28152387
T-1	T-1	50481	2370.20	1948.75	10461.74	12410.49	12831.94	167996	167996	733878	901874	25419343
T-1	T-2	6832	321.10	263.75	1152.16	1415.91	1737.01	22737	22737	99324	122061	25424584
T-1	T-10	13398	629.71	517.23	2259.43	2776.68	3406.39	44589	44589	194780	239369	25424619
T-113	T-113	12184	644.70	382.19	1867.75	2512.45	1573.68	32947	32947	128066	161013	20620903
T-114	T-114	5760	113.80	273.90	1185.98	1459.88	1573.68	23612	23612	102240	125852	27320889
TOTALS	39	171355	10323.81	3738.65	18616.83	22355.47	32679.28	320297	320297	1604857	1927196	19071100

ALL BLDG: ENERGY CONSUMP. DATA
 AS IS 100 PER CENT MOBIL. #7 LINES

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		ANNUAL ENERGY CONSUMP.		MPTU	BLDG.		ELEC. CONSUMP.		TOTAL MBTU/ SQ. FT./YR
			A/C ELEC.	LTS. ELEC.	A/C ELEC.	LTS. ELEC.		A/C KWH/YR	LTS. KWH/YR	TOTAL KWH/YR		
T-113	V-20	3850	142.45	328.68	120.76	449.36	591.81	10410	28328	38738	.15371709	
T-113	V-21	7750	286.75	651.49	243.89	904.58	1191.33	20956	57025	77981	.15371995	
C-6	V-22	3050	143.35	197.66	0.00	197.66	341.01	0	17040	17040	.11180787	
C-6	V-23	3050	143.35	197.66	0.00	197.66	341.01	0	17040	17040	.11180787	
C-6	V-24	3050	143.35	197.66	0.00	197.66	341.01	0	17040	17040	.11180787	
C-6	V-25	3050	143.35	197.66	0.00	197.66	341.01	0	17040	17040	.11180787	
C-6	V-26	3050	143.35	197.66	0.00	197.66	341.01	0	17040	17040	.11180787	
X-21	V-101	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-102	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-103	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-104	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-201	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-202	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-203	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-21	V-204	1456	148.51	36.68	0.00	36.68	185.19	0	3162	3162	.12719038	
X-33	Z-2	989	198.79	59.91	0.00	59.91	258.70	0	5165	5165	.26158140	
X-4	Z-4	3297	553.90	394.81	0.00	394.81	948.71	0	34035	34035	.28774824	
X-33	Z-6	1210	243.21	73.30	0.00	73.30	316.51	0	6319	6319	.26157884	
T-113	Z-8	17050	903.65	2078.87	534.79	2613.67	3517.32	46103	179213	225316	.20629417	
X-20	Z-10	10450	1755.60	725.26	481.97	1207.22	2962.82	41549	62522	104071	.28352379	
X-21	Z-11	9920	1011.84	249.93	0.00	249.93	1261.77	0	21546	21546	.12719492	
TOTALS	21	81414	7001.02	5853.93	1380.61	7234.54	14235.56	119018	504649	623667	.17485392	

ALL BLDG. MAAP ENERGY CONSUMP. DATA
 AS IS 100 PER CENT MOBIL. X LINE

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	A/C F-EE.	L.T.G. ELEC.	A/C+L.T.G. ELEC.	TOTAL OIL+TELEC.	BLDG. KWH/YR	A/C KWH/YR	ELEC. CONSUMP. KWH/YR	ENERGY TOTAL SQ. FT. /YR
X-2	X-2	2400	451.80	0.00	282.32	282.32	734.12	0	0	24338	24338
X-4	X-4	4830	810.40	0.00	578.35	578.35	1388.75	0	0	49858	49858
X-7	X-7	494	99.29	0.00	29.93	29.93	129.22	0	0	2580	2580
X-8	X-8	6550	1094.50	0.00	748.36	748.36	1842.86	0	0	64514	64514
X-11	X-11	120	24.12	0.00	7.27	7.27	31.39	0	0	627	627
X-12	X-12	7696	1559.20	0.00	852.44	852.44	2411.64	0	0	73486	73486
X-14	X-14	20050	2476.90	0.00	2881.00	2881.00	5357.90	0	0	248362	248362
X-33	X-16	640	128.44	0.00	38.77	38.77	167.41	0	0	3342	3342
X-33	X-17	120	24.12	0.00	7.27	7.27	31.39	0	0	627	627
X-18	X-18	15000	3107.30	0.00	1526.71	1526.71	4634.01	0	0	131613	131613
X-33	X-19	640	128.44	0.00	38.77	38.77	167.41	0	0	3342	3342
X-20	X-20	15500	2597.50	71.88	1075.67	1790.55	4388.05	61628	0	92730	154358
X-21	X-21	13700	1397.10	0.00	345.23	345.23	1742.33	0	0	29761	29761
X-27	X-27	7050	1059.00	0.00	643.70	643.70	1712.70	0	0	55491	55491
X-33	X-28	120	24.12	0.00	7.27	7.27	31.39	0	0	627	627
X-33	X-33	11118	2234.70	0.00	673.48	673.48	2988.18	0	0	58059	58059
X-33	X-34	11118	2234.70	0.00	673.48	673.48	2988.18	0	0	58059	58059
X-41	X-41	17408	2894.00	193.73	3093.35	3287.08	6181.08	16701	0	266668	283369
X-61	X-61	651	130.85	0.00	39.44	39.44	170.29	0	0	3400	3400
X-71	X-71	651	130.85	0.00	39.44	39.44	170.29	0	0	3400	3400
TOTALS	20	135854	22617.73	908.62	13582.23	14490.87	37188.60	78329	1170884	1249213	27314657

PROTOTYPE BLDG. ENERGY CONSUMP. DATA
AS IS 15 PER CENT MOBIL.

GROUP NO.	BLDG. NO.	BLDG. DESCRIP.	BLDG. SQ. FT.	ANNUAL		ENERGY CONSUMP. MBTU		BLDG. KW PEAK	ENERGY CONSUMP.			TOTAL MBTU/ SQ. FT./YR
				FUEL OIL	A/C ELEC.	LITG. ELEC.	TOTAL OIL+ELEC.		ELEC.	A/C KWH/YR	LTG. KWH/YR	
A-1-E	T-1	ADMIN	50481	1398.42	1520.83	4256.49	7174.94	264.50	131837	366939	901874	.14213149
A-1-E	T-114	COMPUTER OFFICE	5760	113.80	273.90	1185.90	1573.68	38.00	23612	102240	125852	.27320889
CH-1-F	X-20	CHG HOUSE	15500	1532.53	650.54	451.79	2634.85	72.00	56081	38947	154358	.16999031
CH-1-F	X-21	CHG HOUSE	13764	824.29	0.00	145.00	969.29	18.50	0	12500	29761	.07075102
D-1-E	T-113	BOILER	12184	380.37	347.79	742.78	1470.95	49.20	29982*	64033	161010	.2072776
FH-1-E	Q-23	CAFE	2400	49.30	0.00	88.04	137.35	1.50	0	7590	10120	.0572275
M-1-E	I-3	FAMILY HOUSING	20040	1315.85	0.00	1109.03	2424.10	37.50	0	95608	227637	.12096326
M-1-F	C-6	REPAIR	9814	271.75	0.00	267.11	538.87	9.00	0	23027	54826	.05490801
M-1-F	X-4	PRODUCC. PELLETIZ.	4830	478.14	0.00	323.87	802.01	11.60	0	27920	49858	.16604720
M-1-F	X-8	ASSEMBLY	6550	643.76	0.00	419.08	1064.84	15.00	0	36128	64514	.1657096
M-1-F	X-12	ASSEMBLY	7696	919.93	0.00	477.36	1397.29	17.10	0	41152	73777	.10156071
M-1-F	X-14	ASSEMBLY	20050	1461.37	0.00	1210.02	2671.39	40.90	0	104312	248302	.13333647
M-1-F	X-18	ASSEMBLY	17000	1833.31	0.00	854.95	2688.26	36.60	0	73703	131613	.15813306
M-1-F	X-27	ASSEMBLY	7050	630.71	0.00	360.47	991.18	12.90	0	31075	55491	.14059291
M-1-F	X-41	MELT POUR STORAGE	17408	1707.46	87.17	1299.21	3093.85	91.60	7515	112001	266568	.17772551
W-1-F	X-2	INERT STORAGE	2400	266.56	0.00	118.58	385.14	4.00	0	10222	24338	.16047383
M-1-F	X-33	STORAGE	11110	1318.47	0.00	282.87	1601.34	9.60	0	24385	58059	.14403121

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	ALL BLDG. ENERGY CONSUMP. DATA		MAAF ENERGY CONSUMP.		ANNUAL ENERGY CONSUMP.		PER CENT MOBIL. B LINE		BLDG.	ELEC. CONSUMP. KWH/YR	ENERGY TOTAL SQ. FT./YR
			FUEL OIL	A/C ELEC.	LIG. ELEC.	A/C+LIG. ELEC.	OIL+ELEC.	TOTAL	BLDG.	ELEC. CONSUMP. KWH/YR			
X-12	B-12	3296	393.98	0.00	204.44	204.44	598.42	0	17624	17624	17624	18155974	
X-14	B-14	23050	1680.03	0.00	1391.07	1391.07	3071.10	0	119920	119920	119920	13323648	
X-33	B-15	54	6.40	0.00	1.37	1.37	7.77	0	118	118	118	14393692	
X-33	B-16	640	75.90	0.00	16.29	16.29	92.18	0	1404	1404	1404	14403627	
X-18	B-18	15996	1725.04	0.00	804.46	804.46	2529.50	0	69350	69350	69350	15813309	
X-20	B-20	15500	1532.53	650.54	451.79	1102.32	2634.85	56081	38947	38947	95028	16999063	
X-21	B-21	14050	845.35	0.00	148.70	148.70	994.05	0	12819	12819	12819	16999063	
TOTALS	7	72586	6259.23	650.54	3018.11	3668.65	9927.88	56081	260182	260182	315263	13677401	

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	ANNUAL		PER CENT		ENERGY CONSUMP.		MOBIL.	D LINE	D AREA	BLDG.	ENERGY CONSUMP.		TOTAL MBTU/ SQ. FT./YR
				A/C ELEC.	LTG. ELEC.	A/C+LTG. ELEC.	OIL+ELEC.	TOTAL	A/C KWH/YR					LTG. KWH/YR		
X-2	D-2	648	71.88	0.00	31.62	31.62	102.70	0	2726	2726	16047300					
X-14	D-3	16763	1221.79	0.00	1011.63	2233.44	87211	0	87211	87211	13323637					
X-20	D-11	18900	1868.70	793.24	1347.13	3212.82	47490	68383	47490	115873	16999063					
T-1 AREA	D-44	4636	128.98	140.20	532.78	661.76	33844	12084	33844	45930	14213153					
TOTALS	4	40959	3290.55	933.44	1984.74	2920.18	6210.73	80469	171271	251739	15163288					

ALL BLDG. ENERGY CONSUMP. DATA
 AS IS 13 PER CENT MOBIL. F LINE & F AREA

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		A/C ELEC.	LTG. ELEC.	A/C+LTG. ELEC.	TOTAL OIL-TELEC.	MBTU	BLDG.	ELEC. CONSUMP.		TOTAL SQ. FT. / YR
			ANNUAL	PER CENT							LTG. KWH/YR	TOTAL KWH/YR	
X-33	F-1	54	6.40	1.37	0.00	1.37	7.78	7.78	0	0	118	118	14403094
X-33	F-2	225	26.68	5.72	0.00	5.72	32.41	32.41	0	0	493	493	14403094
X-33	F-3	1369	162.35	34.83	0.00	34.83	197.18	197.18	0	0	3003	3003	14403094
X-8	F-4	4080	402.24	261.05	0.00	261.05	663.29	663.29	0	0	22504	22504	16257173
X-33	F-5	54	6.40	1.37	0.00	1.37	7.78	7.78	0	0	118	118	14403094
X-33	F-6	225	26.68	5.72	0.00	5.72	32.41	32.41	0	0	493	493	14403094
X-8	F-7	1283	152.15	32.64	0.00	32.64	184.79	184.79	0	0	2814	2814	14403094
X-33	F-8	2440	240.56	156.12	0.00	156.12	396.68	396.68	0	0	13458	13458	16257173
X-33	F-9	340	40.32	8.65	0.00	8.65	48.97	48.97	0	0	746	746	14403094
X-18	F-11	22050	2377.91	1108.93	0.00	1108.93	3486.84	3486.84	0	0	95597	95597	15813322
X-33	F-12	1210	143.49	30.79	0.00	30.79	174.28	174.28	0	0	2654	2654	14403094
X-33	F-17	120	14.23	3.05	0.00	3.05	17.28	17.28	0	0	263	263	14401295
X-33	F-18	720	85.38	18.32	0.00	18.32	103.70	103.70	0	0	1579	1579	14403094
X-20	F-19	12100	1196.36	352.68	0.00	352.68	2056.89	2056.89	43779	0	30404	74183	16999063
X-21	F-20	7130	428.99	75.46	0.00	75.46	504.46	504.46	0	0	6505	6505	07075109
T-1 AREA	F-50	3190	88.37	268.98	96.05	365.03	453.40	453.40	8281	0	23188	31468	14213153
X-33	F-171	120	14.23	3.05	0.00	3.05	17.28	17.28	0	0	263	263	14403094
TOTALS	17	56710	5412.76	603.89	2368.75	2972.64	8385.40	8385.40	52060	0	204202	256262	14786460

ALL BLDG.		MAAP ENERGY CONSUMP.		DATA						
AS IS		15 PER CENT		HOT LINES		I AREA				
PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	ANNUAL A/C ELEC.	LTG. ELEC.	A/C LTG. ELEC.	TOTAL OIL+ELEC.	BLDG. KWH/YR	ELEC. CONSUMP. KWH/YR	ENERGY TOTAL SQ. FT./YR
X-33	H-6	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
X-20	H-12	13800	1364.45	579.19	402.23	981.42	2345.87	49930	34675	84606
X-33	H-81	4110	487.40	0.00	104.57	104.57	591.97	0	9014	.16999067
X-33	H-91	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
X-33	H-92	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
X-33	H-102	54	6.40	0.00	1.37	1.37	7.78	0	263	.14403094
T-113	H-111	3760	117.38	107.33	229.22	336.55	453.94	9252	19761	.14403094
T-113	H-115	9796	305.82	279.63	597.20	876.83	1182.65	24106	51483	.12072751
X-33	I-1	344	40.79	0.00	8.75	8.75	49.55	0	754	.14403094
X-33	I-2	180	21.35	0.00	4.58	4.58	25.93	0	395	.14403094
X-33	I-3	225	26.68	0.00	5.72	5.72	32.41	0	493	.14403094
X-4	I-4	6304	624.06	0.00	422.71	422.71	1046.77	0	36441	.16604803
X-33	I-51	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
X-33	I-52	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
X-33	I-53	120	14.23	0.00	3.05	3.05	17.28	0	263	.14403094
I-3	AREA I-3	20040	1315.05	0.00	1109.05	1109.05	2424.10	0	95608	.14401211
I-3	AREA I-4	12150	797.30	0.00	672.40	672.40	1469.70	0	263	.14401211
I-3	AREA I-5	17036	461.71	0.00	389.39	389.39	851.10	0	95608	.12096321
I-3	AREA I-6	4237	278.04	0.00	234.48	234.48	512.52	0	33568	.12096321
I-3	AREA I-7	1463	96.00	0.00	80.97	80.97	176.97	0	20214	.12096321
I-3	AREA I-8	1567	102.83	0.00	86.72	86.72	189.55	0	6980	.12096321
X-20	AREA I-23	5280	522.05	221.60	153.90	375.50	897.55	19104	13267	.12096321
I-3	AREA I-40	9617	631.08	0.00	532.22	532.22	1163.30	0	45881	.16999063
I-3	AREA I-154	1296	85.05	0.00	71.72	71.72	156.77	0	6183	.12096321
TOTALS	24	101979	7368.82	1187.75	5125.54	6313.29	13682.11	102392	441857	544249

PROTOTYPE BLDG. NO.	BLDG. SQ. FT.	BLDG. ANNUAL ENERGY CONSUMP.	PER CENT MOBIL. JAK AREAS	DATA		BLDG. MBTU	BLDG. ELEC. CONSUMP.	ENERGY TOTAL SQ. FT./YR
				BLDG. ENERGY CONSUMP.	Q L-LINE			
ALL BLDG. ENERGY CONSUMP.	AR 18	19	PER CENT	MOBIL. JAK AREAS	Q L-LINE	BLDG. ELEC. CONSUMP.	ENERGY TOTAL SQ. FT./YR	
BLDG. NO.	FUEL OIL	A/C ELEC.	L.T.G. ELEC.	A/C+L.T.G. ELEC.	TOTAL OIL-ELEC.	BLDG. ELEC. CONSUMP.	ENERGY TOTAL SQ. FT./YR	
X-21	10233	615.69	108.31	108.31	724.00	9337	9337	
X-21	2942	177.01	31.14	31.14	208.15	2684	2684	
X-21	6360	382.66	67.31	67.31	449.98	5803	5803	
X-21	16410	987.34	173.68	173.68	1161.03	14973	14973	
I-3	1500	90.25	15.88	15.88	106.13	1369	1369	
X-20	10000	656.21	553.42	553.42	1209.63	47709	47709	
X-21	1928	659.19	194.33	194.33	1133.33	16752	16752	
X-21	4100	114.00	20.41	20.41	136.41	40874	40874	
T-113	3002	246.69	43.39	43.39	290.08	1759	1759	
C-6	6779	93.72	256.23	350.39	444.11	3741	3741	
C-6	28482	187.71	184.51	184.51	372.22	22089	22089	
I-3	2000	788.67	775.21	775.21	1563.88	15906	15906	
I-3	7495	62.44	121.93	179.02	241.46	66829	66829	
K-301	10880	491.83	414.79	414.79	906.62	10511	10511	
K-312	5840	713.96	602.12	602.12	1316.08	35758	35758	
K-315	1200	383.23	323.20	323.20	706.43	51907	51907	
K-345	3436	118.65	34.98	34.98	203.99	27862	27862	
X-20	2912	410.72	213.13	213.13	623.84	3015	3015	
X-12	5427	348.08	180.62	180.62	528.71	18373	18373	
X-12	4155	648.71	336.62	336.62	985.33	15571	15571	
X-20	4155	410.82	121.11	295.49	706.31	29019	29019	
TOTALS	21	141748	8589.57	655.81	4772.30	5428.12	14017.69	
						56536	467971	
						411405	09889160	

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL		ANNUAL ENERGY CONSUMP.		PER CENT ENERGY CONSUMP.		MOBIL. DATA		Q AREA		S AREA		T AREA		TOTAL MBTU/ SQ. FT./YR
			A/C ELEC.	LIG. ELEC.	A/C ELEC.	LIG. ELEC.	A/C ELEC.	LIG. ELEC.	Q AREA	S AREA	T AREA	BLDG.	ELEC. CONSUMP.	BLDG.	ELEC. CONSUMP.		
Q-23	Q-11019	38456	787.93	1410.74	0.00	1410.74	1410.74	0.00	2200.71	1410.74	0	0	0	0	0	121617	.05722667
Q-23	Q-201023	9600	197.20	352.18	0.00	352.18	352.18	0.00	549.38	352.18	0	0	0	0	0	30360	.05722667
Q-23	Q-24	2024	41.58	74.25	0.00	74.25	74.25	0.00	115.83	74.25	0	0	0	0	0	6401	.05722667
Q-23	Q-251027	7200	147.90	264.13	0.00	264.13	264.13	0.00	412.03	264.13	0	0	0	0	0	22770	.05722667
Q-23	Q-281032	10120	207.88	371.25	0.00	371.25	371.25	0.00	579.13	371.25	0	0	0	0	0	32005	.05722667
X-21	8-31	7650	460.28	80.97	0.00	80.97	80.97	0.00	541.25	80.97	0	0	0	0	0	6980	.07075109
X-20	8-32	7650	756.30	222.98	321.07	222.98	544.05	27679	1300.43	544.05	0	0	0	0	0	19233	.16999063
T-1	T-1	50481	1398.42	4256.49	1520.03	4256.49	5776.52	131037	7174.94	5776.52	0	0	0	0	0	497976	.14213153
T-1	T-2	6832	189.26	576.07	205.72	576.07	781.78	17734	971.04	781.78	0	0	0	0	0	67395	.14213153
T-1	T-10	13398	371.15	1129.70	403.43	1129.70	1533.13	34778	1904.28	1533.13	0	0	0	0	0	132166	.14213153
T-113	T-113	12184	380.37	742.78	347.79	742.78	1090.57	29982	1470.94	1090.57	0	0	0	0	0	94015	.12072751
T-114	T-114	9760	113.80	1185.98	273.90	1185.98	1459.88	23612	1573.68	1459.88	0	0	0	0	0	125852	.27320889
TOTALS	39	171353	5054.14	18667.54	3071.94	18667.54	13739.48	18793.64	264822	919616	1184438	10967664					

ALL BLDG. ENERGY CONSUMP. DATA
AS IS 15 PER CENT MOBIL. X LINE

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	FUEL OIL	A/C ELEC.	LIG. ELEC.	A/C+LIG. ELEC.	TOTAL OIL+TELEC.	BLDG. MBTU	BLDG. ELEC. CONSUMP.	E. RGY. TOTAL SQ. FT. / KWH/YR	TOTAL MBTU / SQ. FT. / YR
X-4	X-4	4830	478.14	0.00	323.88	323.88	802.01		27920	27920	.16604E
X-8	X-7	494	58.98	0.00	12.57	12.57	71.15		1084	1084	.1440300E
X-12	X-8	6550	645.76	0.00	419.08	419.08	1764.84		75128	75128	.16257068
X-14	X-12	7696	919.93	0.00	477.37	477.37	1397.29		41152	41152	.18156095
X-33	X-14	20050	1461.37	0.00	1210.02	1210.02	2671.39		104312	104312	.13323644
X-18	X-17	120	14.23	0.00	3.05	3.05	17.29		263	263	.1440462
X-33	X-18	15000	1833.31	0.00	854.96	854.96	2488.27		73703	73703	.17921767
X-20	X-19	640	75.90	0.00	16.28	16.28	92.18		1404	1404	.14403098
X-21	X-20	15500	1532.53	650.55	451.78	1102.33	2634.85	56081	38947	95028	.16999037
X-27	X-21	13700	824.29	0.00	145.00	145.00	969.28		12500	12500	.07075070
X-41	X-27	7050	630.71	0.00	360.47	360.47	991.18		31075	31075	.14059284
X-41	X-41	17400	1707.46	87.18	1299.21	1386.39	3093.85	7515	112001	119516	.1777251
TOTALS	12	1097030	10182.19	737.72	5573.66	6311.39	16493.58	63597	48188	54485	.15126449

PROTOTYPE BLDG.	BLDG. NO.	BLDG. SQ. FT.	ALL BLDG. AS IS		MAAP ENERGY CONSUMP.		DATA		TOTAL MBTU	ENERGY CONSUMP.	BLDG. A/C	ELEC. CONSUMP.		TOTAL KWH/YR	TOTAL MBTU/SQ. FT./YR
			PER CENT	PER CENT	ANNUAL	MORIL. V&L LINES	FUEL OIL	A/G				LTG. ELEC.	A/C LTG. ELEC.		
T-113	V-20	3850	120.19	109.90	234.71	344.61	644.80	29708	20234	9474	29708	12072751			
T-113	V-21	7750	241.93	221.22	472.47	693.69	935.64	59801	40736	19071	59801	12072751			
C-6	V-22	3050	84.45	0.00	83.01	83.01	167.47	7156	7156	0	7156	05490760			
C-6	V-23	3050	84.45	0.00	83.01	83.01	167.46	7156	7156	0	7156	05490760			
C-6	V-24	3050	84.45	0.00	83.01	83.01	167.46	7156	7156	0	7156	05490760			
C-6	V-25	3050	84.45	0.00	83.01	83.01	167.46	7156	7156	0	7156	05490760			
C-6	V-26	3050	84.45	0.00	83.01	83.01	167.46	7156	7156	0	7156	05490760			
X-21	V-101	1456	87.60	0.00	15.41	15.41	103.00	1328	1328	0	1328	07074505			
X-21	V-102	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-103	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-104	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-201	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-202	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-203	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-21	V-204	1456	87.60	0.00	15.40	15.40	103.00	1328	1328	0	1328	07074505			
X-33	Z-2	989	117.28	0.00	23.16	23.16	142.45	2169	2169	0	2169	14403094			
X-4	Z-4	3297	324.38	0.00	221.08	221.08	547.46	19058	19058	0	19058	16004803			
X-33	Z-6	1210	143.49	0.00	30.79	30.79	174.29	2654	2654	0	2654	14403094			
T-113	Z-8	17050	532.28	534.79	1039.43	1574.23	2106.51	89606	89606	46103	135709	12354886			
X-20	Z-10	10450	1033.22	481.97	304.59	786.56	1819.78	26258	26258	41549	67807	17414171			
X-21	Z-11	9920	596.86	0.00	104.99	104.99	701.85	9051	9051	0	9051	07075109			
TOTALS	21	81414	4234.72	1347.88	2971.52	4319.40	8954.12	256165	256165	116197	372362	10506936			

The first table shows energy savings for the various ECAM project groupings of buildings.

The second table shows the results of computer run composite project energy savings, when performed on insulated buildings, with and without temperature controls added.

E	LINE OR AREA	C		A		M		S		A		V		I		N		G		S
		ROOF	FUEL MBTU	INSULATION	KWH	TOTAL MBTU	WALL	FUEL MBTU	INSULATION	KWH	TOTAL MBTU	REDUCED	FUEL MBTU	FENESTRATION	KWH	TOTAL MBTU	ATC	FUEL MBTU	MODIFICATIONS	
	B - LINE	3548	3544	9283	0	3656	1923	8590	2023	531	1580	549	1490	16895	1686					
	X - LINE	3544	3544	0	3544	2369	8591	2469	669	1581	687	2449	16880	2644						
	ALL OTHER LINES & AREAS																			
	D - LINE*	1933	0	11320	0	2064	1052	10475	1173	175	1927	197	810	20601	1049					
	D - AREA	0	0	0	0	0	0	0	0	0	0	0	34	1	34					
	F - AREA	0	0	0	0	0	0	0	0	0	0	0	23	1	23					
	H - LINE*	854	0	8265	0	950	635	7648	724	69	1407	86	534	22456	794					
	I - AREA*	0	0	0	0	0	0	0	0	0	0	0	1584	5756	734					
	J - AREA*	282	0	0	0	282	423	0	423	136	0	136	1024	10733	1148					
	K - AREA	0	0	0	0	0	0	0	0	0	0	0	889	0	889					
	O - LINE*	1502	0	2489	0	1531	331	2303	358	62	424	67	428	4529	481					
	Q - AREA	0	0	0	0	0	0	0	0	0	0	0	439	0	439					
	T - AREA	0	0	0	0	0	0	0	0	0	0	0	618	6677	695					
	V - LINE	0	0	0	0	0	0	0	0	0	0	0	202	6345	275					
	TOTAL OTHER FUEL OIL	4571	0	22074	0	4827	2441	20426	2678	442	3758	486	6585	77099	7478					
	COAL	4571	0	0	0	0	2441	0	0	442	0	0	3789	0	0					
	TOTAL ALL PROJECTS	11663	7092	31357	0	12027	6733	37607	7170	1642	6919	1722	10524	110874	11808					
	FUEL OIL	4571	0	0	0	0	4292	0	0	1200	0	0	7728	0	0					
	COAL	4571	7092	0	0	0	2441	0	0	442	0	0	2796	0	0					

COAL FUEL SOURCE IS INDICATED BY AN * - ALL OTHER LINES & AREAS HAVE FUEL OIL AS A HEATING SOURCE

LINE OR AREA	ECAM				SAVINGS			
	COMPOSITE SAVING - ROOF, GLASS, WALL, ATC MODIFIC		SAVINGS ATTRIBUTABLE TO GLASS, ROOF, WALL MOD ONLY		COMPOSITE SAVING - ROOF, GLASS, WALL, ATC MODIFIC		SAVINGS ATTRIBUTABLE TO GLASS, ROOF, WALL MOD ONLY	
	FUEL MBTU	KWH	TOTAL MBTU	FUEL MBTU	KWH	TOTAL MBTU	FUEL MBTU	TOTAL MBTU
B - LINE	4720	22899	4986	3230	6004	3300		
X - LINE	5690	17043	5887	3241	163	3243		
ALL OTHER LINES & AREAS								
D - LINE*	2501	27923	2824	1691	7322	1775		
D - AREA	34	1	34	0	0	0		
F - AREA	23	1	23	0	0	0		
H - LINE*	1318	25059	1609	784	2603	815		
I - AREA	1584	5756	1651	0	0	0		
J - AREA*	1175	6762	1253	151	0	105		
K - AREA	889	0	889	0	0	0		
O - LINE*	1463	6139	1535	1035	1610	1054		
Q - AREA	439	0	439	0	0	0		
T - AREA	618	6677	695	0	0	0		
V - LINE	202	6345	275	0	0	0		
TOTAL OTHER FUEL OIL COAL	10247	84664	11228	3662	11536	3750		
	3789			0				
	6458			3662				
TOTAL ALL PROJECTS FUEL OIL COAL	20656	124606	22101	10132	17703	10293		
	14198			6471				
	6458			3662				

COAL FUEL SOURCE IS INDICATED BY AN * - ALL OTHER LINES & AREAS HAVE FUEL OIL AS A HEATING SOURCE

APPENDIX C
LIST OF REPORTS

LIST OF REPORTS

ENERGY USE SURVEY

Narrative - Volume I, Section 3

Supporting Data - Volume II and III

ENERGY MONITORING AND CONTROL SYSTEMS

Narrative - Volume I, Section 4

Supporting Data - Volume II

BIOMASS SURVEY

Narrative - Volume I, Section 5

Supporting Data - Volume III

BASEWIDE ENERGY PLAN RECOMMENDATIONS

Volume I, Section 6

ECAM PROJECTS BROCHURES

Volume I, Section 7