

Chemistry Building Energy Analysis

Energy Analysis:

NMSU performs regularly scheduled preventive maintenance on the building and fume hood ventilation system for the Chemistry Buildings. A utility cost analysis was performed for the period of FY 18 through April 2022 with a prior year forecasted increase for the remainder of FY 2022. During this time frame, NMSU spent \$1,909,022 for Chemistry building combined utilities. NMSU anticipates reducing energy by 40% post FY 2025 facilitated by the conversion of the HVAC system from Constant Air Volume to Variable Air Volume. This coupled with heat recovery and updated automation controls should be easy to achieve.

Cost Reduction						
Building and Equipment Maintenance	\$0	\$0	\$0	\$51,044	\$53,096	\$104,140
Energy and Utilities	\$0	\$0	\$88,353	\$72,803	\$0	\$161,156
Staff Labor	\$0	\$0	\$0	\$0	\$0	\$0
Contract Labor	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Reduction	\$0	\$0	\$88,353	\$123,847	\$53,096	\$265,296
Cost Avoidance						
Building and Equipment Maintenance	\$0	\$0	\$0	\$72,535	\$148,843	\$221,378
Energy and Utilities	\$0	\$0	\$103,413	\$191,728	\$197,480	\$492,621
Staff Labor	\$0	\$0	\$0	\$0	\$0	\$0
Contract Labor	\$0	\$0	\$0	\$0	\$0	\$0
Total Cost Avoidance	\$0	\$0	\$103,413	\$264,263	\$346,323	\$713,999
Total Benefit	\$0	\$0	\$191,766	\$388,110	\$399,419	\$979,295

Project Benefits:

Performing the project is in alignment with NMSU's carbon reduction efforts and offers attractive energy cost reductions. It is anticipated that \$653,777 in potential savings could be realized by FY27.

Project Development:

Facilities Operations needs to be an active participant in the project design. The Energy Analysis is based upon a detailed utilities billing review from AiM. The Energy Management shop is the subject matter experts in regards to ensuring the control systems are commissioned at the completion of the project and will continue with measurement, verification and continuous commissioning through the life of the system. At a minimum we recommend the following energy items be addressed as part of the project:

1. Conversion of Constant Flow Ventilation system to Variable Flow Ventilation systems.
2. Replace obsolete automation controls for the HVAC system.
3. Install heat recovery systems for all laboratory exhaust ventilation.
4. Install redundant HVAC design to facilitate continuity of operation.

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Chemistry AIM BILLED AMOUNT					
	FY18	FY19	FY20	FY21	FY22
CHEMISTRY BUILDING TOTALS	\$386,917.97	\$358,088.85	\$328,920.93	\$347,710.62	\$487,383.84
CHILLED WATER	\$151,220.28	\$133,968.76	\$145,155.09	\$142,402.48	\$204,172.65
01-Jul	\$25,886.23	\$19,594.86	\$22,806.16	\$13,523.09	\$24,420.14
02-Aug	\$23,943.81	\$10,383.56	\$25,109.74	\$18,877.55	\$24,135.11
03-Sep	\$20,637.74	\$17,306.78	\$14,248.86	\$10,648.88	\$25,704.18
04-Oct	\$6,082.80	\$11,843.95	\$15,347.90	\$11,956.06	\$15,982.01
05-Nov	\$7,316.08	\$5,556.63	\$7,223.57	\$12,902.00	\$13,598.76
06-Dec	\$5,423.79	\$4,728.03	\$7,070.90	\$5,189.00	\$11,230.77
07-Jan	\$5,534.32	\$4,458.41	\$6,832.91	\$6,399.12	\$10,742.28
08-Feb	\$5,588.75	\$7,240.51	\$6,825.92	\$8,186.12	\$11,150.51
09-Mar	\$7,139.18	\$7,727.48	\$8,170.12	\$9,939.70	\$15,971.38
10-Apr	\$9,577.58	\$11,440.01	\$6,265.24	\$14,239.51	\$17,237.51
11-May	\$18,266.56	\$15,451.70	\$11,284.68	\$15,736.11	\$17,000.00
12-Jun	\$15,823.44	\$18,236.84	\$13,969.09	\$14,805.34	\$17,000.00
DOMESTIC WATER	\$5,618.20	\$3,811.79	\$5,489.44	\$5,568.21	\$14,507.20
01-Jul	\$630.93	\$375.72	\$1,239.11	\$588.64	\$2,546.89
02-Aug	\$432.44	\$535.91	\$649.92	\$969.53	\$1,737.02
03-Sep	\$176.25	\$331.36	\$515.53	\$631.61	\$1,251.35
04-Oct	\$401.51	\$64.51	\$237.21	\$557.56	\$1,170.36
05-Nov	\$204.30	\$74.04	\$67.34	\$217.68	\$1,127.03
06-Dec	\$116.27	\$122.02	\$91.82	\$149.25	\$430.82
07-Jan	\$346.28	\$158.40	\$106.31	\$237.79	\$668.15
08-Feb	\$260.81	\$292.70	\$158.58	\$232.55	\$803.35
09-Mar	\$571.21	\$353.86	\$211.64	\$230.43	\$956.89
10-Apr	\$556.69	\$457.27	\$623.59	\$302.97	\$1,439.34
11-May	\$1,051.23	\$513.16	\$847.07	\$1,071.05	\$1,188.00
12-Jun	\$870.28	\$532.84	\$741.32	\$379.15	\$1,188.00
ELECTRIC ENERGY	\$151,898.79	\$135,917.93	\$113,917.86	\$112,972.31	\$143,599.80
01-Jul	\$13,589.13	\$12,344.34	\$10,677.51	\$5,420.34	\$14,678.82
02-Aug	\$13,425.01	\$12,573.76	\$10,720.73	\$8,885.33	\$12,718.74
03-Sep	\$13,169.90	\$11,472.11	\$10,623.35	\$8,970.25	\$11,580.73
04-Oct	\$13,424.14	\$11,531.15	\$11,050.71	\$9,426.99	\$7,874.51
05-Nov	\$12,825.61	\$10,968.97	\$9,960.88	\$9,866.51	\$12,713.90
06-Dec	\$12,820.44	\$10,912.55	\$9,829.03	\$10,107.34	\$13,352.22
07-Jan	\$13,301.12	\$11,135.99	\$10,064.47	\$10,047.30	\$10,289.32
08-Feb	\$11,347.97	\$10,083.86	\$9,390.66	\$9,404.20	\$11,239.55
09-Mar	\$12,483.67	\$11,267.41	\$9,977.13	\$9,493.12	\$13,357.37
10-Apr	\$11,618.13	\$11,165.54	\$6,359.27	\$9,945.73	\$11,794.64
11-May	\$11,888.95	\$11,320.74	\$7,304.55	\$9,944.92	\$12,000.00
12-Jun	\$12,004.72	\$11,141.51	\$7,959.57	\$11,460.28	\$12,000.00
SEWER	\$9,110.29	\$10,493.78	\$8,646.36	\$10,437.55	\$17,990.49
01-Jul	\$561.97	\$690.46	\$712.09	\$683.54	\$1,369.31
02-Aug	\$875.67	\$561.37	\$711.79	\$1,080.57	\$1,451.20
03-Sep	\$880.86	\$1,010.63	\$1,110.66	\$924.37	\$1,837.38
04-Oct	\$1,009.68	\$2,555.63	\$951.66	\$987.81	\$1,822.50
05-Nov	\$943.52	\$940.50	\$869.81	\$1,069.06	\$1,532.73
06-Dec	\$881.71	\$812.50	\$737.56	\$1,018.66	\$1,322.47
07-Jan	\$637.38	\$488.10	\$497.05	\$895.61	\$1,265.32
08-Feb	\$580.28	\$538.67	\$521.89	\$682.87	\$1,238.33
09-Mar	\$759.80	\$630.52	\$628.59	\$703.33	\$1,541.22
10-Apr	\$725.80	\$662.90	\$972.63	\$801.83	\$1,630.03
11-May	\$735.03	\$764.62	\$359.80	\$842.35	\$1,490.00
12-Jun	\$518.59	\$837.88	\$572.83	\$747.55	\$1,490.00
STEAM	\$69,070.41	\$73,896.59	\$55,712.18	\$76,330.07	\$107,113.70
01-Jul	\$8,105.99	\$6,936.58	\$2,185.17	\$7,678.19	\$11,934.12
02-Aug	\$9,318.92	\$6,851.35	\$6,244.76	\$8,396.38	\$13,389.07
03-Sep	\$8,560.16	\$6,982.47	\$6,369.81	\$8,686.34	\$10,523.67
04-Oct	\$6,070.80	\$7,282.57	\$7,324.63	\$9,478.58	\$7,924.42
05-Nov	\$4,924.80	\$3,767.69	\$4,863.96	\$6,391.57	\$9,128.39
06-Dec	\$3,565.39	\$5,377.36	\$5,234.83	\$6,556.18	\$6,994.12
07-Jan	\$5,400.47	\$6,812.23	\$5,417.71	\$4,919.72	\$8,094.44
08-Feb	\$2,232.66	\$6,605.92	\$3,584.02	\$4,724.53	\$6,778.09
09-Mar	\$2,503.03	\$6,811.27	\$4,670.62	\$4,482.11	\$7,739.11
10-Apr	\$3,054.38	\$7,488.88	\$2,852.51	\$4,527.67	\$6,208.27
11-May	\$7,017.31	\$6,764.06	\$2,954.97	\$4,039.75	\$9,200.00
12-Jun	\$8,316.50	\$2,216.21	\$4,009.19	\$6,449.05	\$9,200.00