ADMINISTRATIVE POLICY NO. 05-04

CBJ ENERGY CONSERVATION AND EFFICIENCY POLICY

1. PURPOSE AND POLICY

Energy conservation and efficiency is an important concept that all departments and enterprise functions should embrace and practice on a regular basis. Simple practices such as turning off lights, controlling building temperatures, car pooling, as well as minimizing the use of vehicles. can result in measurable efficiencies and cost savings. With the increasing high costs of fuel, it is every employee's responsibility to do their part in conserving energy.

2. GENERAL PRACTICE

Each Department Director will review the operations of their department as an on-going practice and take appropriate steps to ensure that all functions are being performed in the most energy efficient way possible. Efforts being taken to contain energy costs will be discussed quarterly with each department director during staff meetings.

3. CAPITAL PROJECTS

It is important that energy efficiency and life cycle costs be considered in our large capital construction projects. Some projects lend themselves to this consideration and others clearly (i.e., street construction & paving, sewer/water) do not.

A. An Energy Life Cycle Cost Analysis (ELCCA) or other equivalent analysis of energy design considerations shall be performed on all new facility construction or major remodel or rehabilitation projects with a funding level of $3 million or more and/or projects that exceed 15,000 square feet.

B. A sensitivity analysis shall be done that incorporates a charge for external costs on energy consumption. The energy use analysis shall be done at the earliest time of project design when a sufficient level of detail is available to conduct such an analysis. Recommended design features for the purpose of energy conservation should be reconfirmed during the middle stages of design and incorporated into the final bid document. The Energy Advisory Committee should be consulted throughout this process. Funding to perform an appropriate energy analysis shall be anticipated and included in the original project cost estimate and bid document.

C. A checklist of energy conservation measures that is to be completed for all capital projects that qualify for an ELCCA is attached.

4. GENERAL PROVISIONS

A. Scope: This policy applies to all agencies and employees of the City and Borough of Juneau, Alaska under the general direction of the City Manager.

B. Authority to promulgate policy: The City Manager of the City and Borough of Juneau, Alaska, maintains the authority granted by the CBJ Charter to order policy and the guidelines for implementation.

C. Effective Date: This policy will take effect on: December 1, 2005.

Dated at Juneau, Alaska, this 5th day of November ,2005

Rod Swope
City and Borough Manager

Energy Conservation Measures (ECM's)

ECM Checklist Instructions

The ECM Checklist makes it easier to track ECMs though the analysis process.

An example of an ECM listing follows:

Status Code	ID	Potential ECMs
B S A E R	E111	Add ceiling/roof insulation

Status codes indicate the phase of analysis or recommendation for each ECM. Check the boxes under the appropriate status code as the analysis progresses. Codes include:

B Baseline. The ECM is included in the building baseline design and not analyzed further.

S Suggested. The ECM is suggested for analysis by the energy analyst, design team, or agency.

NA Not applicable.

A Analyzed. The ECM is selected for analysis.

R Recommended. The ECM is included in the Optimal ECM Package of the *Energy Analysis Report*.

The ID code includes a category letter and a three-digit number.

Put an "X" under the appropriate code for each ECM.
B = Baseline S = Suggested A = Analyzed R = Recommended NA = Not Applicable

E100 Envelope						
Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
					E110	**Reduce Heat Losses**
					E111	Ceiling/roof insulation
					E112	Above grade wall insulation
					E113	Below grade wall insulation
					E114	Floor/slab insulation
					E115	Fan penthouse insulation
					E116	Alternative wall framing techniques
					E117	Enhance wall thermal mass
					E118	Windows:
					a	Glazing layer
					b	Thermal break in metal window frames
					c	Wood or vinyl window frames
					d	Argon gas-filled glazing panels
					e	High-performance low-e coating
					f	Tinted glazing or reflective coatings
					E120	**Reduce Heat Gain**
					E121	Building orientation
					E122	Architectural shading and overhangs
					E123	Window sizing and orientation
					E124	Light-colored roof and wall surfaces
					E125	Landscape shading
					E126	Exhaust attic air
					E130	**Reduce Infiltration**
					E131	Caulk and weather strip doors and windows
					E132	Seal openings between walls and foundations and roof, and between adjacent wall panels
					E133	Seal openings at penetrations in roof, walls, and floor
					E134	Seal building assemblies at ducts or plenums
					E135	Air-lock vestibule or revolving doors
					E136	Air curtains
					E190	**Other Envelope Measures**

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L100 Lighting						
Status Code					ECM#	Potential ECMs
B	S	A	R	NA		
					L110	**Design Intent**
					L111	Target illumination levels
					L112	Lamp color and CRI criteria
					L120	**Lighting Requirements**
					L121	Use task lighting, lower ambient-light levels
					L122	Use light-colored interior finishes for walls, partitions, and office furniture surfaces
					L123	Optimize fixture layout, spacing & orientation
					L124	Delamp overlit areas
					L130	**Efficient Lighting Systems**
					L131	T-8 lamps and electronic ballasts
					L132	Fluorescent ballast factors
					L133	Fixture CU
					L134	Compact fluorescents in place of incandescents
					L135	High-output fluorescents in place of HID fixtures
					L136	Exit signs (LED, compact fluorescent, incandescent)
					L137	Efficient exterior lighting
					L138	More efficient lenses, replace yellowed lenses
					L140	**Lighting Controls**
					L141	Occupancy sensors
					L142	Selective switching
					L143	Programmed sweep controls
					L144	Exterior lighting controls
					L150	**Optimize Daylighting**
					L151	Enhance architectural features: light shelves, clerestories, skylights, etc.
					L152	Dimming controls
					L153	Photocell on and off switching
					L190	**Other Lighting Measures**

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P100 Power/Electrical Distribution						
Status Code					ECM#	Potential ECMs
B	S	A	R	NA		
					P110	**Reduce Power System Losses**
					P111	Power factor correction
					P112	High-efficiency 80° C-transformers
					P120	**Reduce Peak Power Demand**
					P121	Isolate sheddable loads and install automated controls to limit electrical demand
					P130	**Motors and Drives**
					P131	Premium-efficiency motors
					P132	Optimize motor sizing
					P133	Variable-speed motor drives
					P190	**Other Power Measures**
W100 Domestic Hot Water (DHW)						
					W110	**Reduce DHW Heating Loads**
					W111	Fixture consumption (sinks, showers—gpm)
					W112	Fixture control (manual, infrared, spring, etc.)
					W113	Install flow restrictors
					W120	**Reduce DHW Distribution Losses**
					W121	Hot water pipe insulation
					W122	Water storage tank insulation
					W123	Stage circulation pumps or vary pump speed
					W124	Install time clock and return-line aqua stat circulating pump control
					W125	Combine domestic water heaters and use mixing valve to supply lower water temperature
					W126	Reduce water temperature and use local booster to supply higher water temperature
					W127	Heat tape vs. recirculating system
					W128	Point of use water heater

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Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
					P100 Power	
					W130	**Efficient DHW Generation**
					W131	90%-plus condensing hot water heaters
					W132	Instantaneous water heater requiring no storage
					W133	Summer water heater or small boiler
					W134	Preheat DHW with reclaimed waste heat (i.e., chiller condenser, direct-contact stack economizer)
					W135	Solar-assisted water heater
					W136	Heat pump water heater
					W140	**Process Related DHW Use**
					W141	Institutional laundry water reuse system
					W142	Horizontal axis washing machines
					W143	Hot water wash only, cool water rinse
					W144	Dishwasher final-rinse water reuse system
					W190	**Other DHW Measures**
					F100 HVAC - Unitary Equipment	
					F110	**Unitary Equipment**
					F111	Furnace efficiency
					F112	Condensing furnaces
					F113	Cooling-unit efficiency
					F114	Air-source heat pump
					F115	Ground-source heat pump
					F116	Radiant heating
					F117	Electronic ignition for gas pilot lights
					F118	Other HVAC general/unitary measures

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A100 HVAC - Air Distribution						
Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
					A110	**Reduce Airflow Rates**
					A111	Determine zone heating and cooling loads to size airflow rates
					A112	Balance zone airflow rates and adjust fan speed
					A113	VAV system to reduce fan energy-use
					A114	Replace inlet vanes or by-pass dampers with ASDs
					A115	Cold air distribution
					A120	**Reduce Fan Pressure Resistance**
					A121	Minimize fan unit pressure-drop through louvers, dampers, filters, cooling and heating coils, etc.
					A122	Enlarge ducting to minimize friction static pressure
					A123	Examine duct design for efficiency geometry: branch and transition fittings, turning vanes, etc.
					A130	**Reduce Ventilation Loads**
					A131	Design appropriate ventilation rates
					A132	Separate make-up air units for high-ventilation areas
					A133	Air-to-air heat recovery
					A134	Air-to-air evaporative pre-cooling
					A135	Run-around loop heat recovery
					A140	**Reduce Air Leaks and Heat Losses**
					A141	Duct insulation
					A142	Seal air shaft to duct connections
					A143	Close exhaust ducts when fans are off
					A144	Install low-leakage dampers
					A150	**Fan Systems and Delivery Systems**
					A151	Specify efficient fans
					A152	Separate HVAC units for perimeter and core zones
					A153	Change constant air-volume reheat to VAV reheat
					A154	Change multi-zone or dual duct to VAV
					A155	Rezone with isolation dampers and VAV
					A190	**Other HVAC - Air Distribution ECMs**

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D100 HVAC - Steam and Water Distribution						
Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
					D110	**Reduce Energy Losses**
					D111	Insulate piping and valve bodies
					D112	Steam trap monitoring and repair program
					D120	**Reduce System Flow**
					D121	Primary/secondary pumping with ASD motors
					D122	Increase cooling coil temperature difference
					D123	Reduce pump head and shave impeller
					D124	Balance hydronic system
					D130	**Reduce System Resistance**
					D131	Minimize resistance in piping system
					D132	Minimize resistance of coils, control and balancing valves and fittings
					D190	**Other Steam or Water Distribution System**
T100 HVAC Controls						
					T110	**EMC Features**
					T111	On/off daily, weekly, holiday scheduling
					T112	Heating thermostat setback and cooling thermostat setup during unoccupied hours
					T113	Optimum start/stop
					T114	Load limiting/shedding
					T115	PID and loop tuning control
					T116	Boiler and chiller optimization sequencing controls
					T117	Integration of lighting controls
					T118	Equipment monitoring, trend logs, and alarm notification
					T119	Remote access/communications

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Status Code					ECM#	Potential ECMs
B	S	A	R	NA		
					T120	**Air-Side Control Strategy**
					T121	Airflow reduction based on occupancy sensors or scheduled occupancy
					T122	Variable ventilation based on CO_2 control
					T123	Close OSA dampers when unoccupied and during startup
					T124	Lock out simultaneous heating and cooling
					T125	Airflow based on dynamic static pressure reset
					T126	Integrated economizer controls
					T127	Night-flush cooling cycle
					T130	**Water-Side Control Strategy**
					T131	Time clock and OSA lockout control of heating and cooling pumps
					T132	Reset heating water temperatures with OSA
					T133	Reset chilled water temperatures with OSA
					T134	Optimize cooling tower controls
					T190	**Other HVAC Controls**
C100 Cooling Plant						
					C110	**More Efficient Cooling Equipment**
					C111	Use calculation program to determine peak load
					C112	Select efficient kW/ton chillers: 1) centrifugal, 2) screw, 3) reciprocating
					C113	Select chiller size(s) for efficient sequencing
					C114	Automate isolate of off-line chiller(s)
					C120	**Alternate Cooling**
					C121	Water-side free cooling: cooling tower and P&F heat exchanger
					C122	Waste heat absorption chiller
					C123	Heat recovery chiller
					C124	Water or ice thermal storage system
					C130	**Increase Condenser Efficiency**
					C131	Specify more efficient cooling tower to reduce LWT
					C132	Two-speed or ASD condenser fan motor
					C133	Water-cooled versus air cooled
					C134	Evaporative-cooled versus air cooled
					C190	**Other Cooling Plant Measures**

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Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
H100 Heating Plant						
					H110	**Improve Boiler Efficiency**
					H111	Specify efficient boilers
					H112	Low-high-low or modulating burner controls
					H113	High turn-down (10:1) burner controls
					H114	Improve draft controls: turbulators, barometric dampers
					H115	Improve combustion by reducing excess air
					H116	Preheat combustion air
					H117	Recover heat from boiler blow-down
					H120	**Improve System Efficiency**
					H121	Use simulation program to determine peak loads
					H122	Match boiler size to load
					H123	Select boilers size(s) for efficient sequencing
					H124	Isolate off-line boiler
					H125	Boiler make-up water softener or treatment
					H130	**Alternate Heating Systems**
					H131	Condensing hydronic boiler
					H132	Water- or ground-source heat pumps
					H133	Radiant heating
					H190	**Other Heating Plant Measures**
R110 Refrigeration						
					R110	**Improve Controls**
					R111	Optimize defrost cycle control
					R112	Optimize condensing unit capacity control
					R113	Install floating-head pressure controls
					R120	**Reduce Refrigeration System Losses**
					R121	Refrigerator space doors or curtains
					R122	Refrigerated area insulation

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Status Code						
B	S	A	R	NA	ECM#	Potential ECMs
					R130	**Improve Refrigeration System Efficiency**
					R131	Multiple compressors and optimizing controls
					R132	Increase condensing unit efficiency
					R133	Select high-efficiency compressors
					R134	Eliminate water-cooled condensers
					R190	**Other Refrigeration Measures**
S100 Swimming Pools						
					S111	Elevate air temperature to reduce pool evaporation rates
					S112	Air-to-air heat recovery of ventilation air
					S113	De-humidification heat recovery
					S114	Variable ventilation based on advanced climate controls sensing humidity, indoor/outdoor/dew-point temperatures
					S115	Lower ventilation rates during unoccupied hours
					S116	Low pressure-drop pool water filters/strainers
					S117	Two-speed pumping
					S118	Pool cover
K100 Kitchen						
					K111	Minimize exhaust hood airflows
					K112	Minimize exhaust hood run time
					K113	Proper equipment sizing
					K114	Separate make-up air unit set at lower temperature
					K115	Use evaporative cooling for make-up air cooling
M100 Miscellaneous						
					M111	Elevator/escalator optimization
					M112	Thermal storage
					M113	Utility rate analysis/optimization
					M114	Efficient office equipment (PCs, printers, copiers, etc.)
					M115	Low water-use landscaping
					M116	Recycling services designed into facility
					M117	Recycle construction debris/materials
					M118	Building commissioning
					M119	Building operator training