

BERKELEY Energy Conservation Ordinance

Section 19.16.050 Residential Conservation Measures.

A. Prior to the sale or exchange of any residential structure or unit, the seller must provide that residential structure or unit with ECMs that meet the standards of this section. Except as otherwise provided in this chapter, the seller and/or licensed real estate agent or broker handling a sale of residential property is responsible for compliance with this section.

ECM's in the following Section B shall be installed, if feasible, in a residential structure or unit each time it is exchanged or sold, or undergoes renovation, until all feasible ECMs are installed. A certificate of compliance must be filed at each of these sales, exchanges, or renovations. No renovation may receive final approval by the City until such a certificate is filed with the City of Berkeley.

After all feasible ECMs have been installed as evidenced by a duly filed certificate of compliance, the residential structure or unit is considered in full compliance with this chapter. From that point on, no further registration or filing of certificates of compliance under this chapter shall be required, as constituted at the time of adoption. This provision could be affected by future amendment of this chapter. This information shall be described in the certificate of compliance form.

B. The following are prescribed ECMs which must be implemented for a residential structure or unit to be deemed in compliance:

1. Install ceiling insulation to bring the thermal resistance value of the ceiling insulation to R-30 in buildings where the existing ceiling insulation value is R-11 or less, except in those buildings having no attic or inaccessible attic space between the roof and ceiling below. Inaccessible is defined such that the roof slope is less than two and one-half inches in twelve inches and the vertical clear height from the top of the bottom chord of the truss or ceiling joist to the underside of the roof structural members or rafters at the roof ridge is less than twenty-four inches.

2. Seal leaks in furnace ducts at all joints in the ducting system and at the plenum with pressure sensitive tape or mastic, and insulate all furnace ducts to at least a thermal resistance value of R-3 except where ducts are inside heated space, between floors, inside interior walls or partitions, are asbestos coated, or otherwise inaccessible without alteration.

3. Insulate all domestic storage water heaters with an external insulation blanket rated at a minimum thermal resistance value of R-6, except where a minimum clearance of two inches from a wall or other permanent fixture does not exist, or where the thermal resistance of the total water heater insulation jacket is in excess of R-12. For purposes of safety, water heaters that are having insulation blankets installed must also meet all legal requirements including the requirement of a pressure-temperature (PT) safety release valve.

4. Install low-flow devices with a maximum rated flow rate of no more than three gallons per minute in all shower fixtures, two and three quarters gallons per minute for sink and lavatory faucets, and four gallons per minute for all other faucets; or replace with fixtures designed to meet the same limits.

5. Insulate to at least a thermal resistance value of R-3 hot water pipes in pumped, recirculating domestic water heating systems. Exemptions shall be granted where hot water pipes are between floors, inside interior walls, or otherwise inaccessible without alteration.

6. Insulate to at least a thermal resistance of R-3 exposed hot water pipes and cold water pipes within twenty-four inches of water heater.

7. Replace incandescent light bulbs located in common areas of multiple unit structures with lamps that have an efficiency of at least twenty-five lumens per watt, such as fluorescent lamps.

8. Install approved weatherstripping on all exterior doors.

9. Install approved dampers, doors or other devices to obstruct or block air-flow to reduce heatloss through chimneys.

10. Replace existing tank or flushometer-type toilets with fixtures designed to use no more than one and six-tenths gallons per flush, or modify existing fixtures to reduce the amount of water used while insuring correct operation. Whenever a toilet is replaced in a renovation, it must be replaced with an ultra low-flow model. (Ord. 6099-NS § 1 (part), 1991: Ord. 6075-NS §§ 1, 3, 1991: Ord. 5802-NS § 2 (part), 1987)

Section 19.72.090 Required Commercial Energy Conservation Measures.

The following energy conservation measures shall be installed in a commercial building, where applicable, upon its sale or major renovation:

A. Heating, ventilating and air conditioning (HVAC).

1. Thermostatic control. All thermostats shall be functioning. All non-functioning thermostats shall be repaired or replaced.

2. Timeclock controls. Timeclock controls that can turn systems off and on according to building occupancy requirements shall be present and connected to the following HVAC devices: chillers and other space cooling devices, chilled water pumps, boilers and other space heating devices, hot water pumps, heat exchanger circulation pumps, supply fans, return fans, and exhaust fans. Occupant override may be provided; override must be designed with a timer to automatically revert to timeclock control in no longer than twelve hours. However, for spaces with twenty-four-hour occupancy or containing materials with special atmospheric requirements dependent on twenty-four-hour space conditioning, or where a majority of areas of the building served by the system are under set-back thermostat control, or where manufacturer's specifications stipulate that the system must not be shut off, a timeclock shall not be required.

3. Outside air economizer cycle. Functional outside air economizers shall be present on all cooling systems of more than six and one-fourth tons total cooling capability (roughly seventy-five thousand Btu/hr.) or more than two thousand five hundred cubic feet per minute air flow, provided that there is a manufacturer-approved retrofit method for adding the economizer to the existing system. However, for buildings or special uses requiring one hundred percent outside air for ventilation, or where the existing system has a water-based economizer, or where the existing system does not have an outside air intake, or where special economizer operations (such as carefully controlled humidity) would require more energy use than is conserved, or where there is insufficient space to install necessary equipment, or where installation of an economizer would require major modifications to the building's life-safety system, or where the existing system is a multi-zone system where the same intake air may be used at the same time for either heating or cooling in different parts of the building, an outside air economizer cycle shall not be required.

4. Repair of air duct leaks. Accessible air supply and return ducts shall have no leaks. Any leaks shall be sealed with appropriate sealants. Presence of duct tape does not indicate noncompliance if the duct is not leaking, but duct tape is not acceptable for repair of such a leak. However, if duct repair would require major modification of the building structure in order to access the duct, the accessible air supply and return ducts are not required to be sealed.

5. Repair and adjustment of dampers. Outside air dampers, damper controls and linkages which are controlled by HVAC units shall be in good repair and adjustment.

6. Insulation of air ducts and plenums. All accessible heating and cooling air ducts and plenums, in mechanical rooms, around air handling units, and in other non-conditioned space, meaning space not served by heating or cooling equipment, shall be insulated to the R-value specified for them in Title 24. However, for ducts located within HVAC equipment, or exhaust air ducts, or ducts where asbestos is present, this chapter shall not require the installation of the specified insulation.

7. Piping insulation. All accessible hot water, steam, steam condensate return, and chilled water piping, including that above suspended ceilings, shall be insulated to R-values in accordance with Title 24. However, if piping is within HVAC equipment, or within conditioned space, meaning space served by heating or cooling equipment, and conveys fluids between sixty degrees Fahrenheit and one hundred five degrees Fahrenheit, or the piping is already insulated and the insulation is in good condition, or the insulation cannot be installed without structural alteration, the required insulation may not be installed.

8. Cleaning and tuning of furnaces. Furnace combustion units shall have been cleaned and tuned within one year prior to the inspection. Filters shall be replaced in accordance with the furnace manufacturer's recommendations. For electric heat, in existing apartment buildings, when central heat is intended to be replaced with individual electric space heaters, the application for the electrical permit shall include documentation which demonstrates, using an approved method, that the new electric heaters will not consume more energy than the existing nonelectric heater(s). An economic analysis for the energy consumption shall be provided. The total calculated annual electricity consumption shall be converted to British thermal units (BTU) at the rate of ten thousand two hundred thirty-nine BTU per kwh. The design shall be such that no more BTU of energy from depletable sources shall be consumed than allowed for a new building in Climatic Zone 3 in accordance with Title 24. However heat pumps are exempt from the economic analysis requirement.

9. Cleaning and tuning of boilers. Boiler systems shall have been cleaned and tuned within one year prior to the inspection.

10. Reset control for boilers. Boilers shall be equipped with at least one of the following two devices:

- a. Outdoor air lock-out thermostat; or
- b. Temperature reset control.

11. Repair of hot water and steam leaks. There shall be no hot water and steam leaks, or defective steam traps or radiator control, relief, and vent valves in any accessible piping.

12. Cleaning and tuning of chiller systems. Chiller systems shall have been cleaned and tuned within one year prior to the inspection.

13. Repair of chilled water leaks. There shall be no leaks in any accessible chilled water lines and equipment.

14. Reset control for chillers. Chillers shall be equipped with an outdoor air lockout thermostat and a chilled water reset control.

B. Service water systems.

1. Hot water temperature. The temperature of the supply of hot water for domestic or commercial purposes other than comfort heating shall be set and maintained to provide water at no higher than one hundred ten degrees Fahrenheit at point of use. However, if water from a water heater must be higher than one hundred ten degrees Fahrenheit for regular use of a dishwasher or for running other justifiable equipment, including instantaneous demand water heaters, the temperature reset shall not be required.

2. Insulation of water heater and storage tank and piping.

a. Water heater and hot water storage tanks shall have a combined total of external and internal insulation of R-6. Internal insulation must have manufacturer's certification.

b. Accessible hot water pipes shall be insulated to R-values as specified in Title 24.

3. Pressure-temperature safety release valve for water heaters. All water heaters of thirty gallons capacity or greater shall have a pressure-temperature safety-release valve.

4. Water heater secured for earthquake safety.

a. Each water heater and water storage tank with a tank capacity of thirty gallons or greater shall be strapped or otherwise secured to a wall, floor, ceiling, or other object that itself is adequately secured to a wall, floor, or ceiling, in order to protect the tank from falling over in an earthquake. Water, gas and overflow pipes connected to water tanks must be similarly secured.

- b. Each gas water heater shall have a flexible gas line entering the appliance.
5. Timeclock control of hot water recirculation pumps. The system of circulating pumps for hot water supply for domestic or commercial purposes other than comfort heating shall be under timeclock control. However, for pumps serving spaces where use requires service hot water available on a twenty-four hour per day basis, such as in hospitals, convalescent homes, motels and hotels, timeclocks shall not be required.
6. Low volume showerhead. Showerheads shall have a maximum flow of not more than two and one-half gallons per minute.
7. Leaks in hot and cold water-pipes. There shall be no leaks in any accessible hot and cold water pipes.
8. Toilets. Tank or flushometer-type toilets shall not use more than one and six tenths gallons per flush, or shall be modified to reduce the amount of water used while insuring correct operation. Any toilet that cannot be modified to reduce water consumption is exempt from this measure. Whenever a toilet is replaced in a renovation, it shall be replaced by an ultra-lo-flow model.

C. Lighting.

1. Reduce interior lighting load. One of the two following methods of compliance must be chosen:
 - a. All lighting shall comply with Title 24 prescriptive requirements. This includes both allowable watts per square foot controls, and the allowed exemptions under Title 24; or
 - b. Standard incandescent and halogen lighting shall be replaced with fluorescent lighting or light-bulbs with an efficacy of forty lumens/watt or more. Standard incandescent lighting, or other lighting with efficacy of less than forty lumens per watt, and halogen lighting may be installed only in the following cases:
 - (1) Permanently disabled fixtures; or
 - (2) Lighting under the control of occupancy sensor or dimmer switches; or
 - (3) Emergency lighting (excluding exit signs); or
 - (4) Portable or task lighting; or
 - (5) Lighting in hotel or motel guest rooms; or
 - (6) Ornamental lighting (such as chandeliers) where the presence of compact fluorescents would significantly degrade the appearance of the fixture; or
 - (7) Stage, entertainment, or audio-visual system lighting; or
 - (8) Lighting inside appliances or display cases; or
 - (9) Spotlights and floodlights; or
 - (10) Lighting used an average of two hours per day or less; or
 - (11) Lighting used an average of six hours per day or less, in fixtures that would have to be replaced to accept compact fluorescents.
2. Reduce exterior lighting load. Outside lights, exit signs, and lights in parking garages that are in use an average of two or more hours per day shall not use incandescent bulbs. Tungsten-halogen bulbs are not considered "incandescent" for the purposes of this requirement. Fixtures with lamps removed or burned out are to be considered as though all the lamps were operational unless the fixture is permanently disabled. Halogen bulbs may be used only in spot lights. However, fixtures that must be replaced to allow more efficient lamps, and that are in use less than six hours per day, may use incandescent bulbs. This requirement does not apply to emergency lighting.
3. Exterior lighting controls. Exterior lighting shall have automatic controls to turn off lighting during daylight hours. However, lighting in exit signs, parking garages, tunnels, and large covered areas that require illumination during daylight hours, and lights that are in use less than two hours per day, shall not be required to have such automatic controls.

D. Commercial refrigeration equipment.

1. Cleaning and tuning of refrigeration equipment. Commercial refrigeration equipment shall have been cleaned and tuned for efficiency, including, but not limited to, cleaning of condensor coils and evaporators, and replacement of defective or worn door gaskets and seals.

2. Thermal doors and curtains.
 - a. Doors and strip curtains. Low and medium temperature commercial refrigeration cases shall be equipped with doors, strip curtains, or similar devices. However open-tub systems with cooling capacities of less than twenty-five thousand BTU/hour shall not be required to have such doors or strip curtains.
 - b. Compressor systems. The compressor system shall be modified, as appropriate, to compensate for the reduced cooling load resulting from the installation of doors and strip curtains.
- E. Motor-driven equipment.
 1. Repair of air and water line leaks.
 - a. Leaks. There shall be no leaks in compressed air and in-pumped water systems.
 - b. Filters. Filters shall be cleaned or replaced.
 - c. Belts or other coupling systems shall be in good repair.
- F. Swimming pools and spas.
 1. Swimming pool and spa covers. Heated swimming pools and spas shall be equipped with a cover for unoccupied hours. However, a cover shall not be required for indoor pools or spas in which water temperature is less than eighty degrees Fahrenheit during time of non-use.
 2. Timeclock control of circulation pumps. Pool and spa recirculation pumps shall be under timeclock control.
 3. Cleaning and tuning of heaters. Heaters shall be cleaned and tuned for efficiency within one year prior to the inspection.
- G. Building envelope.
 1. Ceiling insulation. Buildings with three or fewer above ground stories shall have ceiling insulation which is rated R-19 or greater covering any accessible attic space which is directly above an area served by heating or cooling equipment. Accessible attic space shall mean a space between a ceiling joist and roof rafter where the vertical clear height from the top of the bottom chord of the truss or ceiling joist, to the underside of the roof sheathing at the roof ridge, is greater than twenty-four inches. If the R-19 insulation cannot fit in the attic space, then the maximum amount of insulation compatible with available space and existing uses shall be installed. (Ord. 6176-NS § 9, 1993)