



A BILL FOR AN ORDINANCE

RELATING TO THE ADOPTION OF THE STATE ENERGY CONSERVATION CODE.

BE IT ORDAINED by the People of the City and County of Honolulu:

SECTION 1. Purpose.

The purpose of this ordinance is to regulate the design and construction of residential and commercial buildings for the effective use of energy through the adoption of the State Energy Conservation Code (2017), subject to the local amendments herein.

SECTION 2. Title.

Chapter 32, Articles 1 to 4, Revised Ordinances of Honolulu (ROH) 1990, are repealed in their entirety.

SECTION 3. Adoption of the International Energy Conservation Code

A new Article 1, Adoption of the State Energy Conservation Code (SECC), of Chapter 32, ROH 1990, is hereby adopted to read as follows:

Article 1. Adoption of the State Energy Conservation Code.

Sec. 32-1.1. Title 3, Chapter 181.1 of the Hawaii Administrative Rules (HAR). The State Energy Conservation Code (SECC), which adopts the International Energy Conservation Code, 2015 Edition (IECC), is hereby adopted and made a part of this chapter, subject to the following amendments:

- (1) Section 3-181.1-6 of the SECC is amended to read as follows:

C101.1 Title

This code shall be known as the Building Energy Conservation Code (BECC) of the City and County of Honolulu (CCH) or the CCH BECC. It is referred to herein as "this code."

- (2) Subsection 3-181.1-7 of the SECC is amended and adopted to read as follows:



A BILL FOR AN ORDINANCE

C103.1 General. When the requirements in this code apply to a building as specified in Section C101.4, plans, specifications or other construction documents submitted for a building, electrical or plumbing permit required by the jurisdiction must comply with this code and will be prepared, designed, approved and observed by a design professional. The responsible design professional shall provide on the plans a signed statement certifying that the project is in compliance with this code.

Exception: Any building, electrical or plumbing work that is not required to be prepared, designed, approved or observed by a licensed professional architect or engineer pursuant to Chapter 464, Hawaii Revised Statutes (HRS).

- (3) Subsection C103.2 of the IECC, adopted by the SECC, is amended to read as follows:

C103.2. Information on construction documents. Construction documents must be drawn to scale upon suitable material or submitted in an electronic form acceptable to the code official. Construction documents must be of sufficient clarity to indicate the location, nature and extent of work proposed and show, in sufficient detail, pertinent data and features of the building, systems and equipment as herein governed. Details must include, but are not limited to the following, as applicable:

1. Insulation materials and their thermal resistance (R-values);
2. Fenestration U-Factors and solar heat gain coefficients (SHGCs);
3. Area-weighted U-factor and SHGC calculations;
4. Mechanical system design criteria and power requirements;
5. Mechanical and service water heating system and equipment types, sizes and efficiencies;
6. Economizer description;
7. Equipment and system controls;
8. Fan motor horsepower (hp) and controls;



A BILL FOR AN ORDINANCE

- 9. Duct sealing, duct and pipe insulation and location;
- 10. Lighting fixtures schedule with wattage and control narrative;
- 11. Location of daylight zones on floor plans; and
- 12. Air sealing details.

All plans, reports, and documents must be certified by the project design professional or engineer, using the appropriate form shown below and submitted to the code official certifying that the plans and documents conform to the requirements of this code.

CITY AND COUNTY OF HONOLULU
REVISED ORDINANCE CHAPTER 32,
HONOLULU COUNTY CODE 1990, AS AMENDED

To the best of my knowledge, this project's design substantially conforms to the Building Energy Conservation Code for:

Building Component Systems
 Electrical Component Systems
 Mechanical Component Systems

Signature: _____ Date: _____
 Name: _____
 Title: _____
 License No.: _____

Include only those items that the signator is responsible for. This block shall be on the first sheet of the pertinent plan, e.g. architectural, electrical, and mechanical. The above may be submitted separately to the Building Official in a letter including the identification of the building.

- (4) Subsection C104 of the IECC, adopted by the SECC, is amended to read as follows:

C104.2 Required inspections. Inspections must comply with Chapter 16 of the ROH 1990 (as amended).

- (5) Subsection C104.2.6 of the IECC, adopted by the SECC, is amended to read as follows:



A BILL FOR AN ORDINANCE

C104.2.6 Final inspection. The building must have a final inspection and cannot be occupied until approved. The final inspection must include verification of the installation of and proper operation of all required building controls, and documentation verifying activities associated with required building commissioning have been conducted and any findings of noncompliance corrected.

- (6) Subsection C104.6 of the IECC, adopted by the SECC, is amended to read as follows:

C104.6 Re-inspection and testing. Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made to achieve compliance with this code. The work or installation must then be resubmitted to the responsible code official for inspection and testing as required by this code.

- (7) Subsection C104.7 of the IECC, adopted by the SECC, is amended to read as follows:

C104.7 Approval. After a building passes all tests and inspections required by this code, the responsible design professional must submit a confirmation letter to the code official certifying that the building has passed all of the tests and inspections required and stating that the building owner has received the Preliminary Commissioning Report, as required by IECC Section C408.2.4.

- (8) Subsection C107.1 of the IECC, adopted by the SECC, is amended to read as follows:

C107.1 Fees. Prescribed fees must comply with Chapter 18 of the ROH 1990 (as amended).

- (9) Subsection C108.1 of the IECC, adopted by the SECC, is amended to read as follows:

C108.1 Authority. Stop work order shall comply with Chapter 18 of the ROH 1990 (as amended).

- (10) Subsection C109.1 of the IECC, adopted by the SECC, is amended to read as follows:



A BILL FOR AN ORDINANCE

C109.1 General. Board of Appeals shall comply with Chapter 16 of the ROH 1990 (as amended).

- (11) The following definitions in Section C202 of the IECC, adopted by the SECC, are amended to read as follows:

CODE OFFICIAL means the Director of the Department of Planning and Permitting or the director's authorized representative.

DWELLING UNIT means a building or portion thereof that contains living facilities, including permanent provisions for living, sleeping, eating, cooking and sanitation, as required by this code, for not more than one family, or a congregate residence for 16 or fewer persons.

RENEWABLE ENERGY by reference to HRS §269-91, renewable energy means energy generated or produced using the following sources:

1. Wind;
2. Sun;
3. Falling water;
4. Biogas, including landfill and sewage-based digester gas;
5. Geothermal;
6. Ocean water, currents and waves, including ocean thermal energy conversion;
7. Biomass, including biomass crops, agricultural and animal residues and waste, and municipal solid waste and other solid waste;
8. Biofuels; and
9. Hydrogen produced from renewable energy sources.

- (12) Subsection C402.2.3 of the SECC is amended as follows:



A BILL FOR AN ORDINANCE

C402.2.3 Thermal resistance of above-grade walls. The minimum R-value of materials installed in the wall cavity between framing members and continuously on the wall shall be as specified in Table C402.1.3, based on framing type and construction materials used in the wall assembly.

Exception: Continuous insulation for wood and metal framed walls are not required when one of the following conditions are met:

1. Walls have a covering with a reflectance of equal to or greater than 0.64 and/or overhangs with a projection factor equal to or greater than 0.3;
2. Walls have overhangs with a projection factor equal to or greater than 0.3. The projection factor is the horizontal distance from the surface of the wall to the farthest most point of the overhang divided by the vertical distance from the first floor level to the bottom-most point of the overhang; or
3. Concrete, concrete masonry units (CMU), and similar mass walls are six inches or greater in thickness.

The R-value of integral insulation installed in CMUs shall not be used in determining compliance with Table C402.1.3. Mass walls shall include walls:

1. Weighing not less than 35 psf (170 kg/m²) of wall surface area.
2. Weighing not less than 25 psf (120 kg/m²) of wall surface area where the material weight is not more than 120 psf (1900 kg/m³).
3. Having a heat capacity exceeding 7 Btu/ft²·F (144 cal/m²·K).
4. Having a heat capacity exceeding 5 Btu/ft²·F (103 kJ/m²·K), where the material weight is not more than 120 psf (1900 kg/m³).

Exception: Concrete, CMU, and similar mass walls are six inches or greater in thickness.

(13) Subsection C402.4.1.2 of the SECC, is amended as follows:



A BILL FOR AN ORDINANCE

C402.4.1.2 Increased skylight area with daylight responsive controls. The skylight area shall be permitted to be not more than five percent of the roof area provided *daylight responsive controls* complying with Section C405.2.3.1 are installed in *daylight zones* under skylights.

Exception: Spaces where the designed general lighting power densities are equal to or less than 60 percent of the lighting power densities specified in Table C405.2(1) or C405.4.2(2).

- (14) Subsection C403.2.4.2.4 of the IECC, adopted by the SECC, is amended to read as follows:

C403.2.4.2.4 Door switches. Opaque and glass doors opening to the outdoors in hotel and motel sleeping units, guest suites and timeshare condominiums shall be provided with controls that disable the mechanical cooling or reset the cooling setpoint to 90 degrees Fahrenheit or greater within five minutes of the door opening. Mechanical cooling may remain enabled if the outdoor air temperature is below the space temperature.

- (15) Subsection C405.2 of the SECC, is amended to read as follows:

C405.2 Lighting controls (Mandatory).

Exception: Spaces that use 60 percent or less of designated watts per square foot are exempt from Sections C405.2.2 (Time switch controls) and C405.2.3 (Daylight-responsive controls).

- (16) Subsection C406.3 of the SECC, is amended to read as follows:

C406.3 Reduced lighting power density. The total interior lighting power (watts) of the building shall be determined by using 80 percent of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or by using 80 percent of the lighting power values specified in Table C405.4.2(2) times the floor area for the building type, or by using 80 percent of the interior lighting power allowance calculated by the Space-by-Space Method in Section C405.4.2.

- (17) Subsection C406.8 of the SECC, is amended to read as follows:

C406.8 Electric vehicle infrastructure. New residential multi-unit buildings that have eight or more parking stalls, and new commercial



A BILL FOR AN ORDINANCE

buildings that have twelve or more parking stalls, shall be electric vehicle charger ready for at least 25 percent of the parking stalls. As used in this section, “electric vehicle charger ready” means that sufficient wire, conduit, electrical panel service capacity, overcurrent protection devices and suitable termination points are provided to connect to a charging station capable of providing simultaneously an AC Level 1 charge per required parking stall for residential and multi-unit buildings. For commercial buildings, at least 25 percent of the parking stalls are required to be AC Level 2 charger ready. Charge method electrical ratings are provided below:

CHARGE METHODS ELECTRICAL RATING

Charge Method	Normal Supply Voltage (Volts)	Maximum Current (Amps – Continuous)	Supply power
AC Level 1	120V AC, 1-phase 120V AC, 1-phase	12A 16A	120VAC/20A (12-16A continuous)
AC Level 2	208 to 240V AC, 1-phase	≤ 80A	208/240VAC/20-100A (16-80A continuous)

- (18) Subsection C408.2.4.1 of the IECC, adopted by the SECC, is amended to read as follows:

C408.2.4.1 Acceptance of reports. Buildings, or portions thereof, shall not be considered acceptable for a certificate of occupancy until the *code official* has received a letter of transmittal from the building owner acknowledging that the building owner or owner’s authorized agent has received the Preliminary Commissioning Report.

- (19) Subsection C408.3.1 of the IECC, adopted by the SECC, is amended to read as follows:

C408.3.1 Functional testing. Prior to issuance of a certificate of occupancy, the *licensed design professional* shall provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the *construction documents* and manufacturer’s instruction. Functional testing shall be in accordance with Sections C408.3.1.1 and C408.3.1.2 for the applicable control type.



A BILL FOR AN ORDINANCE

- (20) Subsection C501.4 of the SECC is amended to read as follows:

C501.4 Compliance. Alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions and regulations for alterations, repairs, additions and changes of occupancy to, or relocation of, respectively, required by the ROH 1990, as amended.

- (21) Subsection C503.3.1 of the SECC, is amended to read as follows:

C503.3.1 Roof replacement. Roof replacements shall comply with Table C402.1.3 or C402.1.4 where the existing roof assembly is part of the building thermal envelope and contains insulation entirely above the roof deck.

Exception: The following alterations need not comply with the requirements for new construction, provided the energy use of the building is not increased. When uninsulated roof sheathing is exposed during alteration, two of the following shall be installed:

1. Table C402.3 (solar reflectance); Energy Star compliant roof covering;
2. Radiant barrier;
3. Attic ventilation via solar attic fans or ridge ventilation or gable ventilation; and/or
4. Two or more of the exceptions listed in Table C402.3.

- (22) Subsection R103.1 of the IECC, adopted by the SECC, is amended to read as follows:

R103.1 General. Construction documents and other supporting data shall be submitted to indicate compliance with this code. The construction documents shall be prepared, designed, approved and observed by a duly licensed design professional, as required by Chapter 464 of the HRS. The responsible design professional shall provide on the plans a signed statement certifying that the project is in compliance with this code.



A BILL FOR AN ORDINANCE

Exception: Any building, electrical or plumbing work that is not required to be prepared, designed, approved or observed by a licensed professional architect or engineer, pursuant to Chapter 464, HRS. Specifications and necessary computations need not be submitted when authorized by the Building Official.

- (23) Subsection R401.2 of the IECC, adopted by the SECC, is amended to read as follows:

R401.2 Compliance. Projects shall comply with one of the following:

1. Sections R401.3 through R404;
2. Section R405 and the provisions of Sections R401 through R404 labeled "mandatory";
3. An energy rating index (ERI) approach in Section R406; or
4. The Tropical Zone requirements in Section R401.2.1.

- (24) Subsection R401.2.1 of the SECC, is amended to read as follows:

R401.2.1 Tropical zone. *Residential buildings* in the tropical zone at elevations below 2,400 feet (731.5 m) above sea level must comply with this chapter by satisfying the following conditions:

1. Not more than one-half of the area of the *dwelling unit* is air conditioned.
2. The *dwelling unit* is not heated.
3. Solar, wind or another renewable energy source supplies not less than 90 percent of the energy for service water heating.
4. Glazing in conditioned space shall have a maximum *solar heat gain coefficient* as specified in Table R402.2.1.

- (25) Table R402.2.1 of the IECC, adopted by the SECC, is amended to read as follows:



A BILL FOR AN ORDINANCE

Table R402.2.1. Window SHGC Requirements

Projection Factor of overhang from base of average window sill	SHGC
< 0.30	0.25
0.30 - 0.50	0.40
≥ 0.50	N/A

Exception: North-facing windows with pf > 0.20 are exempt from the SHGC requirement. Overhangs shall extend two feet on each side of window or to nearest wall, whichever is less.

5. Skylights in dwelling units shall have a maximum Thermal Transmittance (U-factor), as specified in Table R402.1.2.
6. Permanently installed lighting is in accordance with Section R404.
7. The roof/ceiling complies with one of the following options:
 - a. Comply with one of the roof surface options in Table C402.3 and install R-13 insulation or greater; or
 - b. Install R-19 insulation or greater.

If present, attics above the insulation are vented and attics below the insulation are unvented.

Exception: The roof/ceiling assembly are permitted to comply with Section R407.

8. Roof surfaces have a minimum slope of one fourth inch per foot of run. The finished roof does not have water accumulation areas.
9. Operable fenestration provides ventilation area equal to not less than 14 percent of the floor area in each room. Alternatively, equivalent ventilation is provided by a ventilation fan.



A BILL FOR AN ORDINANCE

10. Bedrooms with exterior walls facing two different direction have operable fenestration or exterior walls facing two different directions.
11. Interior doors to bedrooms are capable of being secured in the open position.
12. Ceiling fans or whole house fans are provided for bedrooms and the largest space that is not used as bedroom.
13. Jalousie windows shall have an air infiltration rate of no more than 1.2 cfm per square foot (6.1 L/s/m²).
14. Walls, floors and ceilings separating air conditioned spaces from non-air conditioned spaces shall be constructed to limit air leakage in accordance with the requirements in Table R402.4.1.1.

(26) Subsection R402.3.2 of the IECC, adopted by the SECC, is amended to read as follows:

R402.3.2 Glazed fenestration SHGC. Fenestration shall have a maximum *solar heat gain coefficient* as specified in Table R402.1.2. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements.

Exception: *Dynamic glazing* is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table R402.1.2.

(27) Table R402.1.2 of the IECC, adopted by the SECC, is amended and adding a footnote to read as follows:

**Table R402.1.2. - Insulation and Fenestration Requirement
by Component**

Climate Zone 1 Floor R-Value - NR



A BILL FOR AN ORDINANCE

Footnote:

- j. Exemption R-values for mass walls are not required if mass walls have a coating with a reflectance of 0.64 or greater and/or walls have overhangs with a projection factor equal to or greater than 0.3.

- (28) Subsection R403.5.5 of the IECC, adopted by the SECC, is amended to read as follows:

R403.5.5 Solar water heating. Residential single-family buildings shall use solar, wind or another renewable energy source for not less than 90 percent of the energy for service water heating.

Exception: If an architect or mechanical engineer licensed under Chapter 464, of the HRS, attests and demonstrates that installation is impracticable due to poor solar resource or installation is cost-prohibitive based upon a life cycle cost-benefit analysis that incorporates the average residential utility bill and the cost of the new solar water heater system with a life cycle that does not exceed fifteen years, then one of the following technologies advancing renewable energy shall be used for service water heating: 1) a grid-interactive water heater; 2) a heat pump water heater; or 3) a gas-powered water heater that is fueled by a source that is not less than 90 percent renewable. For the purpose of this section, "grid-interactive water heater" means an electric resistance water heater fitted with grid-integrated controls that are capable of participating in an electric utility load control or demand response program.

- (29) Subsection R403.6.2 of the IECC, adopted by the SECC, is amended to read as follows:

R403.6.2 Ceiling fans (Mandatory). A ceiling fan or whole house fan is provided for bedrooms and the largest space that is not used as bedroom.

- (30) Subsection R404.2 of the SECC, is added to read as follows:

R404.2 Ceiling fans (Mandatory). A ceiling fan or whole-house fan is provided for bedrooms, provided the whole house mechanical ventilation system complies with the efficacy requirements of Table R403.6.1.

- (31) Subsection R404.3 of the SECC, is amended to read as follows:



A BILL FOR AN ORDINANCE

R404.3 Electric Vehicle Capability. In addition to what is required by the Electrical Code, a dedicated receptacle for an electrical vehicle must be provided for each residence which provides at a minimum, Level 1 service.

- (32) Table Subsection R405.5.2(1) of the IECC, adopted by the SECC, is amended to read as follows:

Table R405.5.2(1)		
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS		
BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating Systems	Fuel type: Same as proposed design	As proposed
	<u>Efficiencies</u>	
	Electric: Air-source heat pump with prevailing federal minimum standards	As proposed
	Nonelectric furnaces: Natural gas furnace with prevailing federal minimum standards	As proposed
	Nonelectric boilers: Natural gas boiler with prevailing federal minimum standards	As proposed
	Capacity: Sized in accordance with Section R403.7	As proposed
Cooling systems	Fuel type: Electric Efficiency: In accordance with prevailing federal minimum standards	As proposed
	Capacity: Sized in accordance with Section R403.7	As proposed



A BILL FOR AN ORDINANCE

Service water heating	Fuel type: Same as proposed design	As proposed
	Efficiency: In accordance with prevailing federal minimum standards	As proposed
	Use: Same as proposed design	gal/day=30+(10x Nbr)

(33) Table R407.1 is added to the IECC, adopted by the SECC. Table R407.1 is added to read as follows:

TABLE R407.1			
POINTS OPTION			
Walls		Standard Home Points	Tropical Home Points
Wood Framed			
	R-13 Cavity Wall Insulation	0	1
	R-19 Roof Insulation	-1	0
	R-19 Roof Insulation + Cool roof membrane ¹ or Radiant Barrier ³	0	1
	R-19 Roof Insulation + Attic Venting ²	0	1
	R-30 Roof Insulation	0	1
	R-13 Wall Insulation + high reflectance walls ⁴	1	2
	R-13 Wall insulation + 90% high efficacy lighting and Energy Star Appliances ⁵	1	2
	R-13 Wall insulation + exterior shading wpf=0.3 ^b	1	2
	Ductless Air Conditioner ⁷	1	1
	1.071 X Federal Minimum SEER for Air Conditioner	1	1
	1.142 X Federal Minimum SEER for Air Conditioner	2	2
	No air conditioning installed	Not applicable	2
	House floor area ≤ 1,000 ft ²	1	1
	House floor area ≥ 2,500 ft ²	-1	-1



A BILL FOR AN ORDINANCE

	Energy Star Fans ⁸	1	1
	Install 1 kw or greater of solar electric	1	1
Metal Framed			
	R-13 + R-3 Wall Insulation	0	1
	R-13 Cavity Wall insulation + R-0	-1	0
	R-13 Wall Insulation + high reflectance walls ⁴	0	1
	R-13 Wall Insulation + 90% high efficacy lighting and Energy Star Appliances ⁵	1	2
	R-13 Wall Insulation + exterior shading wpf=0.3 ⁶	0	1
	R-30 Roof Insulation	0	1
	R-19 Roof Insulation	-1	0
	R-19 + Cool roof membrane ¹ or Radiant Barrier ³	0	1
	R-19 Roof Insulation + Attic Ventilation	0	1
	Ductless Air Conditioner ⁷	1	1
	1.071 X Federal Minimum SEER for Air Conditioner	1	1
	1.142 X Federal Minimum SEER for Air Conditioner	2	2
	No air conditioning installed	Not Applicable	2
	House floor area ≤ 1,000 ft ²	1	1
	House floor area ≥ 2,500 ft ²	-1	-1
	Energy Star Fans ⁷	1	1
	Install 1 kw or greater of solar electric	1	1

¹ Cool roof with three-year aged solar reflectance of 0.55 and 3-year aged thermal emittance of 0.75 or 3-year aged solar reflectance index of 64.
² One cfm/ft² attic venting.
³ Radiant barrier shall have an emissivity of no greater than 0.05 as tested in accordance with ASTM E-408. The radiant barrier shall be installed in accordance with the manufacturer's installation instructions.
⁴ Walls with covering with a reflectance of ≥ 0.64.
⁵ Energy Star rated appliances include refrigerators, dishwashers, and clothes washers and must be installed for the Certificate of Occupancy.
⁶ The wall projection factor is equal to the horizontal distance from the surface of the wall to the farthest most point of the overhang divided by the vertical distance from the first floor level to the bottom most point of the overhang.
⁷ All air conditioning systems in the house must be ductless to qualify for this credit.
⁸ Install ceiling fans or whole-house fans in all bedrooms and the largest space that is not used as a bedroom.



A BILL FOR AN ORDINANCE

- (34) Subsection R501.4 of the IECC, adopted by the SECC, is amended to read as follows:

R501.4 Compliance. Alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions and regulations for alterations, repairs, additions and changes of occupancy to, or relocation of, respectively required by the Revised Ordinances of Honolulu 1990, as amended.

- (35) Subsection R503.1.1 of the SECC, is amended by adding the following exception and footnote to read as follows:

7. When uninsulated roof sheathing is exposed during alteration, a minimum of two of the following shall be installed:
 - a. Energy Star compliant roof covering;
 - b. Radiant barrier;
 - c. Attic ventilation via solar attic fans or ridge ventilation or gable ventilation; or
 - d. A minimum of two exceptions listed in C402.3.

Footnote: Shake roofs on battens shall be replaced with materials that result in equal or improved energy efficiency.



CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

ORDINANCE _____
BILL 25 (2019)

A BILL FOR AN ORDINANCE

SECTION 4. This ordinance takes effect 90 days after its approval.

INTRODUCED BY:

Sam Koyanagi (br)

DATE OF INTRODUCTION:

MAY 6 2019

Honolulu, Hawaii

Councilmembers

APPROVED AS TO FORM AND LEGALITY:

Deputy Corporation Counsel

APPROVED this _____ day of _____, 20 _____.

KIRK CALDWELL, Mayor
City and County of Honolulu