

ORDINANCE NO. _____
ORDINANCE OF THE MARIN COUNTY BOARD OF SUPERVISORS ADOPTING ENERGY EFFICIENCY STANDARDS FOR SINGLE FAMILY DWELLINGS GREATER THAN 3,500 SQUARE FEET OF CONDITIONED FLOOR AREA

THE BOARD OF SUPERVISORS OF THE COUNTY OF MARIN HEREBY ORDAINS AS FOLLOWS:

SECTION I. Section 19.04.100 of the Marin County Code is hereby added to read as follows:

19.04.100 Energy Efficiency Standards For Single Family Dwellings Greater Than 3,500 Square Feet of Conditioned Floor Area.

- a. Background. All single family dwellings must meet or exceed the energy requirements contained in the 2001 California Building Energy Efficiency Standards, including California Code of Regulations, Title 24, Parts 1 and 6. (The "Standards") This ordinance requires the application of the Standards, including but not limited to the definitions, procedures, forms, manuals and alternative calculation methods ("ACM's") associated with the Standards. In addition, this ordinance amends the Standards as described herein.
- b. Buildings Covered. The provisions of this ordinance shall apply to all single family dwellings for which a building permit has not been applied for and accepted as complete by the Building Department prior to January 1, 2003, or received Design Review approval prior to October 22, 2002 that are:
 1. New single family dwellings greater than 3,500 square feet of total conditioned floor area. In addition, a residential second unit of not greater than 750 square feet shall be exempt from the requirements of this ordinance.
 2. Additions to single family dwellings where the conditioned floor area of the existing building plus the addition is greater than 3,500 square feet and the addition is equal to or greater than 500 square feet, excluding up to a 750 square foot residential second unit.
- c. Definitions
 1. **PV CREDIT** is the energy credit applicable to the Proposed Design for a solar photovoltaic system that is capable of generating electricity from sunlight and supplying it directly to the building; and is connected, through a reversible meter, to the utility grid. The amount of PV credit under this Ordinance is defined as W_o multiplied by 6.80 KBtu/sf-yr source energy, where W_o is a unitless value calculated as 1000 multiplied by the nominal kilowatts of the proposed PV system and divided by the total conditioned floor area of the building.
 2. **ALTERNATIVE PROPOSED DESIGN CREDIT** is an energy credit applicable to the Proposed Design including but not limited to any renewable energy system which is not a solar photovoltaic system and any energy-efficiency measures not included in the Title 24 performance analysis which significantly exceed current building practice or applicable minimum state or federal efficiency standards. The permit applicant must submit calculations to document, explain and justify the amount of the credit claimed subject to approval by the Chief Building Official and the Director of the Marin County Community Development Agency.

3. **REVISED STANDARD DESIGN TOTAL** is the performance energy budget, in KBtu/sf-yr, which this Ordinance establishes for all buildings to which it applies. It is defined as the Standard Design Total (source KBtu/sf-yr) obtained from any state-approved residential alternative calculation method (ACM) multiplied times the Standard Design Adjustment Factor (contained in Table A).
4. **STANDARD DESIGN ADJUSTMENT FACTOR** is the arithmetic factor listed below which when multiplied by the standard design energy budget (from a state-approved residential ACM) produces the Revised Standard Design Total.)

Table A: Standard Design Adjustment Factor

House Size (Total Conditioned Sq.Ft.)	Climate Zone 2 Adjustment Factor	Climate Zone 3 Adjustment Factor
3,501 – 4,499	0.923	0.931
4,500 – 5,499	0.777	0.798
5,500 – 6,499	0.710	0.735
6,500 – 7,499	0.638	0.668
7,500 – 8,499	0.580	0.611
8,500 – 9,499	0.533	0.566
9,500 +	0.493	0.527

- d. Performance Compliance Approach
 1. **Basic Requirements.** New single family dwellings with a total conditioned floor area equal to or greater than 3,500 square feet shall meet both of the following:
 - A. The Revised Standard Design Total energy budget, in source Kbtu/sf-yr, using the performance compliance approach.
 - B. All other provisions applicable to low rise residential buildings contained in the California Building Energy Efficiency Standards.
- e. Additions
 1. Additions covered by this ordinance as defined in subsection (b)(2) shall meet the requirements of section and by one of the following:
 - A. The addition shall comply with subsection (d)
 - B. The energy efficiency of the existing building shall be improved so that the existing building plus the addition meet the energy budget in subsection as applied to the Standard Design Total for the Existing-plus-Addition generated by a state approved Alternative Calculation Method (ACM).
- f. Special Permit Form
 1. In addition to the standard Title 24 report submitted to the building department, a special form will be required which shall be available at the building department.

SECTION II. Findings Pursuant to Public Resources Code Section 25402.1(h)(2). This Board of Supervisors, following a public meeting, has determined that this ordinance is cost effective, based upon the report prepared for the California Energy Commission as follows. The cost effectiveness of the Ordinance is based on the results of the following analysis. The study considers energy measures that just meet the local energy code for different size homes in the two climate zones of Marin County and compares them to the equivalent Title 24 homes.

Using the Prototype House design in each instance, appropriate energy measures that just meet the current Title 24 Standards are assumed. Then the energy measures are gradually increased to just meet the requirements of the Ordinance. The incremental total first cost of all the measures and the incremental annual energy cost saving to meet the Ordinance as compared with the Title 24 house is then estimated. *The study is based on the following utility costs: \$0.14/kwh of electricity and \$0.70/therm of natural gas.*

The simple payback is calculated to be the incremental first cost divided by the incremental annual energy cost saving. Because the Ordinance effectively increases the relative amount of building energy efficiency as house size increases, one would expect the payback period to increase in the same fashion. This trend is generally true, but is not perfectly consistent when the incremental changes in first cost to meet the Ordinance do not correspond well to annual energy cost savings.

Table 5a: Summary of Simple Payback of Energy Measures that Meet the Requirements of the Ordinance in Climate Zone 2

House Size (Square Feet)	Incremental First Cost as Compared w/ Title 24 House (\$)	Incremental Annual Energy Cost Saving (\$)	Simple Payback (Years)
4,000	\$1,700	\$245	7.0
5,000	\$4,192	\$814	5.1
6,000	\$6,616	\$1,193	5.5
7,000	\$11,862	\$1606	7.4
8,000	\$20,468	\$2391	8.6
9,000	\$29,062	\$2940	9.9
10,000	\$37,647	\$3592	10.5

Table 5b: Summary of Simple Payback of Energy Measures that Meet the Requirements of the Ordinance in Climate Zone 3

House Size (Square Feet)	Incremental First Cost as Compared w/ Title 24 House (\$)	Incremental Annual Energy Cost Saving (\$)	Simple Payback (Years)
4,000	\$648	\$ 132	4.9
5,000	\$2,950	\$ 436	6.8
6,000	\$5,457	\$ 611	8.9
7,000	\$6,735	\$ 842	8.0
8,000	\$8,778	\$1,094	8.0
9,000	\$11,935	\$1,336	8.9
10,000	\$15,699	\$1,722	9.1

SECTION III. Findings Pursuant to Public Resources Code section 25402.2 and Health and Safety Code sections 17958.5, 17958.7 and 18941.5.

To the extent to requirements of this ordinance are deemed to constitute changes or modifications to the requirements of the California Building Standards Code and the other regulations adopted pursuant to Health and Safety Code section 17922, this Board of Supervisors expressly finds that the provisions of this ordinance are reasonably necessary because of local climatic, geological, or topographical conditions as follows. Marin County has two Title 24 climate zones and 24 microclimates. During periods when arctic masses dominate the weather nighttime lows drop into the high twenties with daytime highs in the thirties. In climate zone three, (Coastal and certain bay areas), fog is a consistent weather pattern that creates a demand for heating even during summer months. In addition, climatic conditions in Kentfield (Climate Zone Two), result in 2774 "heating degree days".

The Average Maximum temperature is over 80°F for the months of June, July, August and September, and during the summer it is not uncommon for temperatures to reach 100°F in some parts of Marin. Climatic conditions in Kentfield, (Climate Zone Two) result in 441 "cooling degree days".

The average house size in Marin is getting larger and using more energy. During the 1970s most home construction was approximately 1,500-2,500 square feet. In the years 1998 through 2001 average house size construction continued to rise to approximately 3,000 - 4,000 square feet. These large houses are using more energy and resources.

Due to local climatic conditions and increasing house size, total residential energy consumption increased from 619 million kWh to 734 million kWh from 1995 to 2000. This 18.5% increase in energy use raises the per capita contribution of costly uncertain energy supplies, pollution, and global warming. Due to local climatic conditions it is reasonably necessary to enhance the State of California energy code requirements for homes over 3,500 square feet.

SECTION IV. Effective Date. This ordinance shall be and is hereby declared to be in full force and effect as of January 1, 2003 or when the ordinance is approved by the California Energy Commission, whichever is later. This ordinance shall be published once before the expiration of fifteen (15) days after its passage, with the names of the supervisors voting for and against the same in the *Marin Independent Journal*, a newspaper of general circulation published in the County of Marin.

PASSED AND ADOPTED at a regular meeting of the Board of Supervisors of the County of Marin held on this ___th day of _____, 2002 by the following vote:

AYES: SUPERVISORS

NOES:

ABSENT:

PRESIDENT, BOARD OF SUPERVISORS

ATTEST:

CLERK