

MEETING DATE: 06/18/07

AGENDA ITEM: Introduction of an Ordinance Establishing a Mandatory 1 Kw Solar Photovoltaic Requirement for Each 10,000 Square Feet of New Multifamily or Commercial Construction, Pending California Energy Commission Approval.

ATTACHMENTS

	<u>Pages</u>
1. Proposed Ordinance	1-5
2. Draft CEC Application	6-11

ORDINANCE NO. 2007-_____

AN ORDINANCE OF THE CITY OF CULVER CITY, CALIFORNIA, AMENDING CHAPTER 15.02 OF THE CULVER CITY MUNICIPAL CODE TO ADD SUBCHAPTER 15.02.1000, *et seq.*, ESTABLISHING A MANDATORY 1KW SOLAR PHOTOVOLTAIC REQUIREMENT PER 10,000 SQUARE FEET OF NEW COMMERCIAL OR NEW MULTIFAMILY RESIDENTIAL CONSTRUCTION.

WHEREAS, California Health and Safety Code §13146 requires local jurisdictions to enforce the California Code of Regulations (CCR), Title 24, also known as the California Building Standards Code; and

WHEREAS, California Health and Safety Code § 17958(a) allows local jurisdictions to establish more restrictive building standards than those contained in the California Building Standards Code, if the amendment is reasonably necessary because of local climatic, geological, or topographical conditions; and

WHEREAS, California Public Resources Code §25402.1 states that a local agency may adopt more restrictive energy standards when they are cost-effective and approved by the California Energy Commission; and

WHEREAS, energy efficiency is an important part of a sustainable Culver City, and Culver City is part of the greater Los Angeles Basin, which climate and topography are known to trap air pollutants that are known to be harmful to human health; and

WHEREAS, solar photovoltaic power generation consumes no fossil fuels, generates no air pollution and will therefore increase energy efficiency and will reduce air pollution in the Los Angeles Basin and Culver City; and

WHEREAS, the City Council of the City of Culver City desires to establish a

1 mandatory 1kw solar photovoltaic requirement per 10,000 square feet of new commercial
2 or new multifamily residential construction.

3 **NOW THEREFORE**, the City Council of the City of Culver City, California,
4 **DOES HEREBY ORDAIN** as follows:

5 **SECTION 1.** Based on the foregoing recitations and findings, Chapter 15.02
6 of the Culver City Municipal Code is hereby amended to add subchapter 15.02.1000, *et*
7 *seq.* as follows:

8 **SOLAR PHOTOVOLTAIC SYSTEMS**

- 9 §15.02.1000 Definitions.
10 §15.02.1005 Requirements.
11 § 15.02.1010 Exceptions.
12 § 15.02.1015 Building Permit Fees and Inspections.

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14 **§ 15.02.1000 DEFINITIONS.**

15 Terms defined herein shall have the following meanings when used in
16 this Subchapter:

17 ***Building Official*** shall mean the Building Official of the City of Culver
18 City or his or her designee.

19 ***California Energy Efficiency Standards*** shall mean the California
20 Energy Efficiency Standards set forth in Title 24, Part 6 of the California Code
21 of Regulations.

22 ***City*** shall mean the City of Culver City.

23 ***Solar Photovoltaic System*** shall mean a system that generates
24 electricity from the sun.

25 **§ 15.02.1005 REQUIREMENTS.**

26 A. All new commercial and multi-family residential buildings of
27 10,000 square feet or more, and additions of 10,000 square feet or more to
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1 existing commercial or multifamily residential buildings, shall be equipped
2 with a 1kw solar photovoltaic system per each 10,000 square feet, or fraction
3 thereof, of said buildings.

4 B. All new freestanding structures shall be equipped with a
5 minimum of one (1) new, empty 2 inch electrical conduit routed from the
6 electrical service panels to the roof of the structure, to be used for future
7 wiring of future solar equipment that may be installed at the option of the
8 building owner.

9 **§ 15.02.1010 EXCEPTIONS.**

10 A. *Exceptions to Section 15.02.1005.A.*

11 1. The Building Official may, in his or her discretion, allow
12 all or a portion of the required solar photovoltaic system to be
13 substituted with a solar hot water heating system that generates an
14 equivalent amount of electricity.

15 2. If the applicant is unable to install the required solar
16 photovoltaic system due to the configuration of the proposed
17 construction project, then the project applicant shall pay an in lieu fee
18 in an amount equal to the value of the solar photovoltaic system that is
19 unable to be installed. Fees generated from in lieu payments pursuant
20 to this subsection, shall be appropriated and disbursed only for solar
21 photovoltaic designs and installations on City properties or facilities.
22 The accounting and return of in lieu fees required by this subsection
23 shall be similar to those established in Sections 15.06.030 and
24 15.06.050 of this Code.

25 B. *Exception to Section 15.02.1005.B.* The requirement set forth
26 in Section 15.02.1005.B may be waived by the Building Official, in his or her
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1 discretion, if the requirement is satisfied through other means or is unduly
2 burdensome or impractical.

3 **§ 15.02.1015 BUILDING PERMIT FEES AND INSPECTIONS.**

4 A. All plan check and permit fees shall be waived for solar
5 photovoltaic installations.

6 B. The value of the required solar photovoltaic system shall not be
7 required to be included in the overall construction valuation of the project for
8 the purposes of determining building permit fees.

9 C. No final inspection shall be approved for a construction project
10 subject to the requirements of this Subchapter, nor shall a temporary or final
11 certificate of occupancy be issued for such project, prior to the installation of
12 the solar photovoltaic system being completed, inspected and fully
13 operational, unless otherwise excepted pursuant to Section 15.02.1010.

14 **SECTION 2.** Pursuant to Section 619 of the City Charter, this Ordinance
15 shall take effect thirty (30) days after the date of its adoption. Pursuant to Sections 616
16 and 621 of the City Charter, prior to the expiration of fifteen (15) days after the adoption,
17 the City Clerk shall cause this Ordinance, or a summary thereof, to be published in the
18 Culver City News and shall post this Ordinance or a summary thereof in at least three
19 places within the City.

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1 **SECTION 3.** The City Council hereby declares that, if any provision, section,
2 subsection, paragraph, sentence, phrase or word of this ordinance is rendered or declared
3 invalid or unconstitutional by any final action in a court of competent jurisdiction or by
4 reason of any preemptive legislation, then the City Council would have independently
5 adopted the remaining provisions, sections, subsections, paragraphs, sentences, phrases
6 or words of this ordinance and as such they shall remain in full force and effect.

7 **APPROVED AND ADOPTED** this ____ day of _____, 2007.

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10 _____
11 ALAN CORLIN, Mayor
12 City of Culver City, California

13 ATTEST:

APPROVED AS TO FORM:

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16 _____
17 CHRISTOPHER ARMENTA, City Clerk

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20 _____
21 CAROL A. SCHWAB, City Attorney

ATTACHMENT 2

Application for:

Revised Locally Adopted Energy Standards by the City of Culver City
Building Safety Division

Establishing a mandatory 1kw solar photovoltaic system (or as an alternate an equivalent solar water heating system) for new commercial construction of 10,000 s.f. or greater and new multifamily construction of 10,000 s.f. or greater in Accordance with Section 10-106 of the California Code of Regulations, Title 24, Part 1

April ____, 2007

From:
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Executive Summary

The City of Culver City Building Safety Division has researched and reviewed the feasibility and cost effectiveness of building permit applicants exceeding the performance requirements of the 2005 Energy Efficiency Standards.

The current and projected staffing level of the Culver City Building Safety Division will not support an additional energy efficiency program which requires a large amount of additional plan check staff time or additional field inspection staff time. The existing Building Safety Division staff will be able to implement and manage this proposed solar photovoltaic initiative.

Having established local energy efficiency criteria contained in the language of draft Resolution #____ (included as attachment #1 to this document). The City would like to implement its resolution at the earliest convenient date following approval by the California Energy Commission.

As stated in the resolution application, the proposed local energy efficiency standards and implementation have been designed with several key criteria in mind. These include:

- Consistency with the structure, format, and calculation methods of the 2005 Title 24 Energy Efficiency Standards;
- Simplicity and clarity for Building Safety Division enforcement for both energy plan review and field inspection;
- Meeting the local energy compliance requirements as defined by the resolution which exceed the 2005 Title 24 standards; and;
- The provision of flexibility by allowing construction permit applicants to meet the new requirement by one or more design approaches: (a) a solar photovoltaic system; and/ or (b) a solar hot water heating system; and/ or (c) paying an equivalent amount into a City fund to pay for solar systems on City owned facilities or other local non-profit entities.

This application to the California Energy Commission conforms to the requirements laid out in Section 10-106 of the California Code of Regulations, Title 24, Part 1, *LOCALLY ADOPTED ENERGY STANDARDS*. The proposed Culver City resolution shall take effect only after the Commission has reviewed and formally approved the proposed local energy standards as meeting all requirements of Section 10-106.

Statement per Section 10-106(b)3. The proposed resolution requires that all new commercial and multifamily residential construction shall be designed to consume no more TDV energy than permitted by Title 24, Part 6.

The main features of the proposed resolution are that:

1. New commercial or multifamily construction shall be required to install 1kw of solar photovoltaic power per each new 10,000 square feet of construction, or fraction thereof.
2. If the geometry of the new project doesn't permit compliance with the requirement, the construction permit applicant may pay an equivalent amount into a City fund to pay for solar systems on City facilities or other local non-profit entities.
3. This requirement will reduce the demand for offsite electricity for new commercial and multifamily buildings in Culver City.
4. It is expected that builders will consider enlarging the photovoltaic systems beyond the 1kW requirement,

With respect to any technical questions concerning the development, methodology, descriptions, or implementation outlined in this application, please contact Craig Johnson at Culver City Building Safety.

Estimated solar photovoltaic energy result of the Proposed Resolution

The resolution proposes a mandatory 1kw solar photovoltaic system per 10,000 square feet of new commercial or multifamily construction; with an equivalent solar water heating system as an acceptable alternate, or if the geometry of the proposed project won't permit compliance with the resolution the permit applicant may pay an equivalent amount into a City fund to pay for solar systems on City facilities or other local non-profit entities.

It is expected that complying with the resolution will allow participating buildings to exceed the 2005 California Energy Efficiency Standards.

Note: the resolution makes it clear that all new buildings must comply with the California Title 24 Energy Standards in effect at the time of permit application. The resolution is in addition to the California Title 24 Energy Standards.

Participating buildings wishing to determine the energy value of photovoltaic installations in comparison to the total energy use calculated by using a California Energy Commission approved compliance program may follow the methodology provided below to convert kW installed PV to Time Dependant Valuation in kTDV/sf-yr.

$$1151 \text{ kWh} \times 3.414 \text{ Btu/Wh} \times 4.98 \times .88 = 17,186 \text{ kTDV/yr}$$

1151 kWh/year – assumed generation per year for a 1 kW system

3.414 Btu/W: = conversion from watts to British thermal units

4.98 = the average annual average TDV energy multiplier during daylight hours for Culver City.

0.88 = multiplier per the New Solar Homes PV Calculation for dirt and a modest percentage of non-working PV collectors

The value is then divided by the conditioned floor area of the building to calculate the kTDV/sf-yr.

For example; a 1 kw PV system on a new 10,000 sf commercial or multifamily building in Culver City:

$$\frac{17,186 \text{ TDV kBtu/yr}}{10,000 \text{ s.f.}} = 1.72 \text{ kTDV/sf-yr}$$

Simple Time Dependant Cost Benefit Analysis

	Estim. cost of constr.	Estim. cost of 1 kw PV system	Estimated CEC rebate	Estim. Fed. tax credit	Final 1 kw system cost	Final System cost as a percentage of constr. cost	Estim. annual dollar value of energy produced	Estim. simple payback time
10,000 s.f. commercial building	\$1,500,000 (\$150/ s.f.)	\$11,000	\$3,176 (\$2.50/ watt)	\$1,564	\$6,260	.4% (.0041)	\$380 (\$.3/ kWh)	<u>16 1/2 years</u>
10,000 s.f. multifamily building	\$1,700,00 (\$170/ s.f.)	\$11,000	\$3,176 (\$2.50/ watt)	\$1,564	\$6,260	.3% (.0036)	\$380 (\$.3 kWh)	<u>16 1/2 years</u>

Estimated cost of each 1 kw PV system if financed as part of the overall Building

Estimated 30 year finance costs as of April 2007 of \$1,000: \$4.50 per month or \$54 per year.

A final 1 kw solar PV cost of \$6,260 finance cost would be \$28 per month or \$336 per year.

A final 1 kw solar PV cost of \$6,260 would produce an energy value of \$31 per month or \$380 per year.

Financing as part of the overall building a 1 kw solar PV system may result in a positive cash flow of approximately \$3 per month or \$34 per year.

Estimated Carbon Emissions Reduction of a 1 kW solar PV system

Each 1 kw solar PV system is reasonably expected to generate 1,151 kWh annually.

Based on a carbon dioxide emission factor of 818 pounds per Mwh a 1 kW PV system would save approximately 940 lbs of carbon dioxide emissions per year.

Implementation Plan

The proposed Culver City solar initiative would only apply to the larger commercial and multifamily residential construction projects in Culver City. Culver City is approximately 98% built out. There are approximately 2,400 construction permits, including plumbing, electrical, and mechanical permits, issued in a typical year in Culver City. The vast majority of them are for small residential or commercial remodel and/ or addition projects.

The proposed Culver City solar initiative would apply to approximately 6 - 12 projects per year, obviously varying each year.

All medium to large proposed Culver city development projects are required to complete a City Planning Division discretionary review prior to any construction permit applications.

If the solar initiative is put into effect each project applying for a discretionary review would receive an informational handout; describing the program and listing further sources of information, system installers, etc.

All qualifying projects applying for construction permits will again be informed of the requirement at the time of permit application.

All projects the solar initiative applies to that apply for construction permits would be required to supply the standard energy forms and information on the plans indicating compliance with the 2005 California Energy Efficiency Standards. There will be no changes to the energy forms or the field inspection of qualifying projects, other than the plan review and field inspections of the required solar PV systems.

Culver City Building Safety staff have attended a training seminar on field inspecting solar PV systems, given by Mr. Bill Brooks of Brooks Engineering.

Required solar PV systems will be field inspected concurrently with the overall building construction. The overall building construction will not receive a final inspection nor will it receive a certificate of occupancy until all building systems, including the solar PV systems, are completed and operating.