

# Solar-Ready Homes

- Chula Vista (California), City of. 2011. ***Municipal Code***. Title 15, Buildings and Construction; Chapter 15.24, Electrical Code and Regulations; Section 15.24.065, Photovoltaic Pre-Wiring Requirements. Chapter 15.28, Plumbing Code; Section 15.28.015, Solar Water Heater Pre-Plumbing. Code Publishing Company: Seattle, Wash.
- Henderson (Nevada), City of. 2011. ***Development Code***. Chapter 19.7, Development and Design Standards; Section 19.7.12, Sustainability; Table 19.7.12-1, Menu of Site and Building Design Options for Sustainability, part 1.9: Solar-Ready Design.
- Oro Valley (Arizona), Town of. 2009. ***Ordinance No. (O)09-11: An Ordinance of the Mayor and Council of the Town of Oro Valley, Amending Chapter 6, Article 6-1-7, "Residential Code" Otherwise Known as the "2006 International Residential Code" to Add a "Residential Solar Ordinance" Requiring Installation of Solar Ready Measures in Residential Construction.***
- Rancho Palos Verdes (California), City of. 2011. ***Municipal Code***. Title 15, Buildings and Construction; Chapter 15.04, Building Code; Section 15.04.070, Renewable Energy Systems. Tallahassee, Fla.: Municipal Code Corporation.
- Tucson (Arizona), City of. 2008. ***Ordinance No. 10549: Relating to Buildings and Construction: Requiring New Single Family and Duplex Residential Dwelling Units to Provide for Future Installation of Solar Energy Devices; "Residential Plan Review: Solar Ready Ordinance"; Ordinance No. 10605: Relating to Buildings and Construction: Amending the International Residential Code 2006...by Adding Local Amendments to Chapter 23, Section M2301, Solar Energy Systems.***

**City of Chula Vista, California**  
**Municipal Code (2011)**  
**Title 15 Buildings and Construction**

**Chapter 15.24 Electrical Code and Regulations**  
**Section 15.24.065 Photovoltaic Pre-Wiring Requirements**

All new residential units shall include electrical conduit specifically designed to allow the later installation of a photovoltaic (PV) system which utilizes solar energy as a means to provide electricity. No building permit shall be issued unless the requirements of this section and the Chula Vista Photovoltaic Pre-Wiring Installation Requirements are incorporated into the approved building plans.

The provisions of this chapter can be modified or waived when it can be satisfactorily demonstrated to the Building Official that the requirements of this section are impractical due to shading, building orientation, construction constraints or configuration of the parcel. (Ord. 3173 § 1, 2010; Ord. 3121 § 1, 2009).

**Chapter 15.28 Plumbing Code**  
**Section 15.28.015 Solar Water Heater Pre-Plumbing**

All new residential units shall include plumbing specifically designed to allow the later installation of a system which utilizes solar energy as the primary means of heating domestic potable water. No building permit shall be issued unless the requirements of this section and the Chula Vista Solar Water Heater Pre-Plumbing Installation Requirements are incorporated into the approved building plans.

The provisions of this chapter can be modified or waived when it can be satisfactorily demonstrated to the Building Official that the requirements of this section are impractical due to shading, building orientation, construction constraints or configuration of the parcel. (Ord. 3174 § 1, 2010; Ord. 3122 § 1, 2009).

**CHAPTER 19.7: DEVELOPMENT AND DESIGN STANDARDS****SECTION 19.7.12 SUSTAINABILITY | 19.7.12.C MENU OF SITE AND BUILDING DESIGN OPTIONS FOR SUSTAINABILITY**

<b>TABLE 19.7.12-1: MENU OF SITE AND BUILDING DESIGN OPTIONS FOR SUSTAINABILITY</b>				
<b>SITE OR BUILDING DESIGN FEATURE</b>	<b>POINTS</b>	<b>DISTRICTS IN WHICH OPTION IS AVAILABLE</b>		
		<b>NONRES/ MIXED USE</b>	<b>MULTI- FAMILY RESIDTL</b>	<b>OTHER RESIDTL</b>
<b>1. ENERGY</b> Intent: Encourage on-site renewable energy production; promote the design and construction of energy efficient buildings; reduce air, water, and land pollution from energy consumption; and, reduce the heat island effect				
<b>1.1 Renewable Energy Sources</b> Design and incorporate on-site renewable energy generation technologies such as solar, wind, geothermal, or biomass. Two points granted for each 1% of the project's annual electrical energy demand generated up to a maximum of 30 points.	2-30	*	*	*
<b>1.2 District Heating and Cooling</b> Design and incorporate into the project a district heating and/or cooling system for space conditioning and/or water heating of new buildings in the project (at least two buildings total must be connected).	4	*	*	
<b>1.3 Solar Orientation</b> Design and orient the project such that 50% or more of the blocks have one axis within plus or minus 15 degrees of geographical east/west, and the east/west length of those blocks are at least as long, or longer, as the north/south length of the block.  OR  Design and orient the project such that 50% or more of the project total building square footage (excluding existing buildings) such that the longer axis is within 15 degrees of geographical east/west axis.	3	*	*	*
<b>1.4 Shade Structures</b> Where appropriate, provide shade structures over windows/doors to minimize glare and unwanted solar heat gain. Such structures shall provide shading to at least 50% of the south- and west-facing glazing on June 21 at noon with one additional point granted for each additional 25% of the glazing shaded. Structures may include awnings, screens, louvers, architectural features, or similar devices.	2-4	*	*	*
<b>1.5 Heat Island Reduction</b> Use any combination of the following strategies for 50% of the non-roof impervious site landscape (including roads, sidewalks, courtyards, parking lots, and driveways). <ul style="list-style-type: none"> <li>Provide shade from open structures such as those supporting solar panels, canopied walkways, pergolas, all with a Solar Reflectance Index (SRI) of at least 29. (SRI is a measure of the roof's ability to reject solar heat; a higher SRI yields a cooler roofing choice.) (2 points)</li> <li>Use paving materials with a Solar Reflectance Index (SRI) of at least 29. (1 point)</li> <li>Use an open grid pavement system (at least 50% pervious). (2 points)</li> </ul>	1-5	*	*	*

**CHAPTER 19.7: DEVELOPMENT AND DESIGN STANDARDS****SECTION 19.7.12 SUSTAINABILITY | 19.7.12.C MENU OF SITE AND BUILDING DESIGN OPTIONS FOR SUSTAINABILITY**

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<p><b>1.6 Cool Roofs</b> Use roofing materials that have a SRI equal to or greater than 78 for low-sloped roofs (&lt;2:12) or 29 for steep-sloped roofs (&gt;2:12) for a minimum of 75% of the roof surface of all new buildings within the project.</p> <p>OR</p> <p>Install a vegetated roof on a minimum of 50% of the total project roof area (exclusive of existing buildings). Any combination of SRI compliant and vegetated roof may be used, provided they collectively cover 75% of the total project roof area.</p>	2	*	*	*
<p><b>1.7 Covered Parking</b> Locate at least 20 percent of all off-street parking spaces under cover with one additional point granted for each additional 20% of covered parking up to a maximum of 100%.</p> <p>Note: Cover may be provided by a combination of tree canopy, a building, a deck, or a shade structure, or parking may be underground. Tree canopy coverage to be determined by mature shade trees selected from the City of Henderson plant list.</p> <p>Any cover, roof, or shade used for this requirement must have a minimum Solar Reflectance Index of 78 for low-sloped roofs (&lt;2:12) or 29 for steep-sloped roofs (&gt;2:12).</p>	1-5	*	*	*
<p><b>1.8 Shaded Walkways</b> Provide shaded walkways along a minimum of 60% of all building facades adjacent to or facing streets, drive aisles, outdoor gathering spaces, or parking areas. One additional point granted for each additional 10% provided up to a total of 100%.</p> <p>Note: See base code requirements (50% shaded walkways) for commercial, mixed-use, and industrial buildings in Section 19.7.6.D.3.(h), <i>Response to the Climate</i>.</p> <p>Note: See definition of “shaded walkway” in Chapter 19.12, <i>Measurement and Definitions</i>.</p>	1-5	*		
<p><b>1.9 Solar-Ready Design</b></p> <ul style="list-style-type: none"> <li>For stand-alone buildings, design and build the project so that it will readily accommodate the installation of solar photovoltaic panels or solar thermal hot water heating devices, including all necessary conduit, chases, roof penetrations, roof pitch, and orientation. (2 points)</li> <li>For projects with multiple buildings, design and build at least 20% of the buildings to be solar-ready as described above. Two additional points granted for each additional 20% provided up to a total of 100% solar-ready buildings. (2-10 points)</li> <li>For residential development, offer solar photovoltaic panels or solar thermal hot water heating as a design option. (2 points)</li> </ul>	2-10	*	*	*
<p><b>1.10 Energy Efficiency</b></p> <ul style="list-style-type: none"> <li>Provide energy-efficient lighting such as compact fluorescent or LED lighting throughout a minimum of 75% of the project. (1 point)</li> <li>Reduce solar heat gain through the use of glazing/fenestration with a U-factor less than .50 and a solar heat gain coefficient (SHGC) less than .30. (2 points)</li> <li>Provide increased insulation to achieve a minimum R-19 in walls and R-38 in ceilings. (2 points)</li> <li>Locate HVAC ductwork within conditioned space. (1 point)</li> <li>Select high-efficiency HVAC equipment for the project. (2 points)</li> </ul>	1-8	*	*	*

**ORDINANCE NO. (O) 09-11**

**AN ORDINANCE OF THE MAYOR AND COUNCIL OF THE TOWN OF ORO VALLEY, AMENDING CHAPTER 6, ARTICLE 6-1-7, "RESIDENTIAL CODE" OTHERWISE KNOWN AS THE "2006 INTERNATIONAL RESIDENTIAL CODE" TO ADD A "RESIDENTIAL SOLAR ORDINANCE" REQUIRING INSTALLATION OF SOLAR READY MEASURES IN RESIDENTIAL CONSTRUCTION; REPEALING ALL RESOLUTIONS, ORDINANCES, AND RULES OF THE TOWN OF ORO VALLEY IN CONFLICT THEREWITH; AND PRESERVING THE RIGHTS AND DUTIES THAT HAVE ALREADY MATURED AND PROCEEDINGS THAT HAVE ALREADY BEGUN THEREUNDER**

**WHEREAS**, the Town of Oro Valley is a political subdivision of the State of Arizona vested with all associated rights, privileges and benefits and is entitled to the immunities and exemptions granted municipalities and political subdivision under the Constitution and laws of the State of Arizona and the United States; and

**WHEREAS**, on December 6, 1995, the Council approved Ordinance No. (O) 95-85, adopting that certain document entitled "Oro Valley Town Code, Chapter 6, Building" as the sixth chapter of the official Town Code; and

**WHEREAS**, the Town of Oro Valley's adopted residential code is the "2006 International Residential Code"; and

**WHEREAS**, the Town desires to require all new single and/or two family residential construction to have connections for future solar systems which will reduce heating and cooling demands, provide more comfortable indoor and outdoor living spaces and avoids blocking or reflecting sun on adjacent public spaces or buildings; and

**WHEREAS**, it is in the best interest of the Town to amend Oro Valley Town Code, Chapter 6, Building, Section 6-1-7, Residential Code, otherwise known as the "2006 International Residential Code", adding the Residential Solar Ordinance, attached hereto as Exhibit "A" and incorporated herein by this reference.

**NOW, THEREFORE, BE IT ORDAINED by the Mayor and Council of the Town of Oro Valley, Arizona, that:**

**SECTION 1.** The certain document entitled Oro Valley Town Code, Chapter 6, Building, Section 6-1-7, Residential Code, otherwise known as the "2006 International Residential Code", is hereby amended by adding the Residential Solar Ordinance, attached hereto as Exhibit "A" and incorporated herein by this reference to be effective

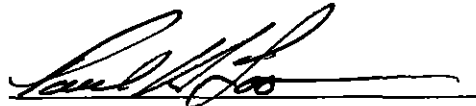
30 days after adoption by the Oro Valley Town Council. Three copies of Exhibit "A" shall be kept on file in the Office of the Town Clerk.

**SECTION 2.** All Oro Valley ordinances, resolutions or motions and parts of ordinances, resolutions or motions of the Council in conflict with the provision of this Ordinance are hereby repealed.

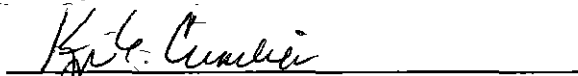
**SECTION 3.** If any section, subsection, sentence, clause, phrase or portion of this Ordinance is for any reason held to be invalid or unconstitutional by the decision of any court of competent jurisdiction, such decision shall not affect the validity of the remaining portions thereof.

**PASSED AND ADOPTED** by the Mayor and Town Council of the Town of Oro Valley, Arizona, this 17 day of June, 2009.

**TOWN OF ORO VALLEY**

  
\_\_\_\_\_  
Paul H. Loomis, Mayor

**ATTEST:**

  
\_\_\_\_\_  
Kathryn E. Cuvelier, Town Clerk

Date: 6-24-09

**APPROVED AS TO FORM:**

  
\_\_\_\_\_  
Tobin Rosen, Town Attorney

Date: 6/22/09

PUBLISH: **DAILY TERRITORIAL**  
JULY 6, 7, 8, 9. 2009

## EXHIBIT "A"

The 2006 International Residential Code adopted under Article 6-1 of the Oro Valley Town Code is hereby revised with additions being shown in ALL CAPS and deletions in ~~strikethrough text~~. Text placement instructions are in *italics*.

*Add the requirement to provide solar measures by adding the following at the end of Section M2301.1 General.*

### **Section M2301 Solar Energy Systems**

#### **Section M2301.1 General.**

This section provides for the design, construction, installation, alteration and repair of equipment and systems using solar energy to provide space heating or cooling, hot water heating and swimming pool heating.

ALL SINGLE FAMILY OR TWO FAMILY RESIDENCES SHALL INSTALL SLEEVES, CONDUITS, WATER STUB-OUTS, ROOF TO WATER HEATER SPACE CONDUIT, OR OTHER CONNECTIONS REQUIRED FOR THE FUTURE CONNECTION OF SOLAR SYSTEMS. THE BUILDING OFFICIAL SHALL DEVELOP STANDARDS TO PROSCRIBE INSTALLATION REQUIREMENTS.

THE BUILDER OR OWNER SHALL INSTALL:

- FULL SOLAR HOT WATER SYSTEM ; OR
- CONDUIT TO THE ROOF AND TWO T'S WITH VALVES IN THE COLD AND HOT WATER PIPING FOR THE WATER HEATER FOR LATER INSTALLATION OF A SOLAR HOT WATER SYSTEM WITH ; OR
- INSULATED PLUMBING FROM WATER HEATER TO ROOF WITH VALVES IN THE COLD AND HOT WATER PIPING FOR THE WATER HEATER FOR LATER INSTALLATION OF A SOLAR HOT WATER SYSTEM; AND
- THE WATER HEATER(S) MUST BE INSTALLED IN AN AREA THAT IS LARGE ENOUGH FOR THE FUTURE INSTALLATION OF AN 80 GALLON WATER HEATER, EXPANSION TANK, AND A HEAT EXCHANGER.

*Add the following section:*

#### **SECTION M2301.1.1 SOLAR SYSTEM DEFINED.**

SOLAR SYSTEMS SHALL BE DEFINED AS THE FOLLOWING:

1. PHOTO VOLTAIC SYSTEMS,
2. SOLAR DOMESTIC HOT WATER SYSTEMS,
3. SOLAR HOT WATER HEATING SYSTEMS (ACTIVE),
4. PASSIVE SOLAR HEATING SYSTEM WHEN DESIGNED BY A REGISTRANT,
5. WIND TURBINE FOR ELECTRICAL GENERATION
6. OTHER TECHNOLOGIES THAT UTILIZE SOLAR ENERGY AS APPROVED BY THE BUILDING OFFICIAL.

OTHER SOLAR SYSTEMS SUCH AS POOL HEATERS SHALL NOT BE CONSIDERED MEETING THE REQUIREMENT FOR SOLAR SYSTEMS.

*Add a new subsection:*

**SECTION E3304.12 PHOTO VOLTAIC SYSTEM CONDUIT.**

A CONDUIT OR SLEEVE SHALL BE INSTALLED FROM THE SERVICE ENTRANCE LOCATION TO ABOVE THE ROOF AREA TO FACILITATE THE INSTALLATION OF CONDUCTORS FOR A FUTURE PV SYSTEM.

*Add the following at the end of the section:*

**Section E3305.1 Equipment Location and Clearances.** Sufficient access and working space shall be provided and maintained around all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with this section and Figure E3305.1. A SPACE NEAR THE SERVICE EQUIPMENT MUST BE PROVIDED TO MOUNT EQUIPMENT FOR PHOTO VOLTAIC SYSTEMS IN A MANNER SUITABLE FOR THE INSTALLATION.

*Add the new sub section as follows:*

**E3506.5 CIRCUIT BREAKER FOR SOLAR CIRCUITS.**

SERVICE EQUIPMENT SHALL BE SIZED AND SPACE PROVIDED SO THAT ONE 240VOLT CIRCUIT BREAKER MAY BE BACK-FED FROM A PHOTO VOLTAIC SYSTEM.



**TOWN OF ORO VALLEY**

Page 1 of 2

**COUNCIL COMMUNICATION****MEETING DATE: 6/17/09****TO: HONORABLE MAYOR AND COUNCIL****FROM:** Bayer Vella, AICP, Principal Planner  
Jack Holden, Assistant Building Official**SUBJECT: Public Hearing: Ordinance No. (O) 09\_\_\_\_**, Residential Solar Ordinance requiring installation of solar ready elements in residential construction by amending the Oro Valley Town Code, Article 6-1, and the 2006 International Residential Code.**SUMMARY**

This is an opportunity to establish a reasonable standard to further the Town's goal of resource conservation. The aim of this ordinance is to reduce the cost of post-construction solar applications for homeowners. This can be achieved by requiring low cost measures such as rooftop plumbing stub-outs at the time of construction.

Consistency of requirements for the building community and homeowners is another factor of importance. To meet both objectives, the proposed ordinance is very similar to the approach utilized by the City of Tucson.

**BACKGROUND**

On June 17, 2008, the City of Tucson passed an ordinance requiring all new residences to be solar ready for electric (PV) and hot water. As with the City's gray water and rain water harvesting efforts, a stakeholder advisory group was utilized and actual implementation measures/building code updates were relegated to post ordinance adoption.

For solar hot water systems, the rules have been established and made effective. Plans for all new single family homes or duplexes must include the following to receive a building permit:

- Full solar hot water system (approximate cost \$3,000 with TEP rebate); or
- Conduit with a stub-out for later installation of a solar hot water system (less than \$100.00); or
- Insulated plumbing from water heater to roof (less than \$100.00 and eligible for a \$75.00 state tax rebate); and
- Sufficient space must be provided to locate an 80 gallon water heater (variable cost)

Requirements for installation of solar electric (PV) are still being developed. In conversations with City staff, requirements are likely to be as follows:

- Designate two pole breaker for solar feed (no cost)
- Provide clear equipment space around electric panel for future installation of solar equipment (variable cost)

**PROPOSED ORO VALLEY ORDINANCE**

The proposed ordinance includes all previously described solar ready elements. Ordinance development entailed the following input:

- Town Council (April 29<sup>th</sup> Study Session)
- Internal OV staff review team (Building Safety, Legal, and Planning)
- City of Tucson (technical review staff)
- Steve Solomon (local developer)

**TOWN OF ORO VALLEY****Page 2 of 2****COUNCIL COMMUNICATION****MEETING DATE: 6/17/09**

The proposed ordinance is very similar to the City of Tucson's approach. An additional requirement for conduit for solar electric (PV) is included in the Town's proposal. Anticipated builder cost is \$50.00.

**GENERAL PLAN**

General Plan: Policy 2.2.1 *The Town shall promote site planning and architectural design that reduces heating and cooling demands, provides more comfortable indoor and outdoor living spaces, and avoids blocking or reflecting sun on adjacent public spaces or buildings.*

The Town has adopted a recent version of the Energy Code. This proposed ordinance will be a step toward facilitating renewable energy production.

**RECOMMENDATION**

Staff recommends approval of the proposed solar-ready ordinance. If approved, the ordinance will be effective 30 days from the hearing date. Building plans submitted and approved prior to the effective date of the ordinance will not be impacted.

**MOTIONS**

Town Council may wish to consider one of the following suggested motions:

I move to [approve, approve with conditions, OR deny] the Residential Solar Ordinance requiring installation of solar ready measures in residential construction by amending the Oro Valley Town Code, Article 6-1, and the 2006 International Residential Code.

**ATTACHMENT**

Ordinance No. (O) 09\_\_\_\_\_.

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Bayer Vella, AICP, Principal Planner

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Jack Holden, Assistant Building Official

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Jerene Watson, Assistant Town Manager

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David Andrews, Town Manager

**City of Rancho Palos Verdes, California  
Code of Ordinances (2011)**

**Title 15 - Buildings and Construction  
Chapter 15.04 - Building Code**

**15.04.070 - Renewable energy systems.**

A. Notwithstanding the provisions of Section 15.04.010 of this chapter, new homes and major remodels, whereby more than fifty percent of the existing interior and/or exterior walls are removed, shall provide a roof layout plan that illustrates how future installation of a photovoltaic system and/or solar water heating system could be accommodated. The property owner shall only be required to provide for the installation of one system. The following requirements for each system are as follows:

1. Photovoltaic Systems. Installation of conduit leading from an exterior south-facing, east-facing or west-facing roof, where a minimum of four hours of direct sunlight is achieved, to a stubbed junction box next to the electrical panel. All exposed conduit shall be capped and provided with adequate flashing. The conduit shall not be located on or in the direction of a north-facing roof. Roof reinforcements shall be addressed at the time of installation.
2. Solar Water Heating System. Installation of three-fourths inch hot and cold copper water pipes from a south-facing, east-facing or west-facing roof, where a minimum of four hours of direct sunlight can be achieved, to an existing water heater/tank. Both ends of the three-fourths inch copper pipes shall be stubbed out and shall not be located on or in the direction of a north-facing roof. All exposed pipes shall be capped and provided with adequate flashing. Roof reinforcements shall be addressed at the time of installation.

(Ord. 481 § 24, 2008)

(Ord. No. 516, § 2, 12-7-10)



# MAYOR & COUNCIL COMMUNICATION

June 17, 2008

Subject: Residential Solar Readiness Ordinance (Citywide) Page: 1 of 1

Issue – Mayor and Council are asked to consider approval of an Ordinance requiring solar “stub ins” on all new single family and duplex residential dwelling units. The “stub ins” allow greater ease and convenience in subsequent solar energy system installations. The solar energy systems will provide for the use of solar energy as a means of heating domestic potable water and a means of providing electrical power.

Recommendation – It is recommended the Mayor and Council approve the attached Ordinance.

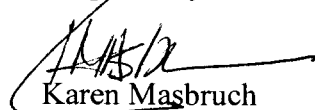
Background – On February 5, 2008 the Mayor and Council directed staff to form a stakeholder group to develop the Residential Solar Readiness Ordinance. The stakeholder group was formed with membership consisting of: Technicians for Sustainability, the Tucson Association of Realtors, the Sierra Club, the Southern Arizona Homebuilders Association, architectural professionals and representatives of solar energy installation companies. Staff support has been provided by Development Services, the City Attorney’s Office and the City of Tucson’s Solar Energy Coordinator. Stakeholder meetings were held on February 21, March 13 and April 10, 2008.

The stakeholder group recommends adoption of the attached ordinance. Additionally, the stakeholder group will continue working with staff to develop the needed additions to the appropriate codes to effectuate the ordinance. It is expected that language in the International Residential Code (IRC) will be modified to accommodate this ordinance provision. The specific code language created by the stakeholder group will be discussed and reviewed by the Joint City/County Building Code Committee before returning to the Mayor and Council for consideration.

Legal Considerations – The City Attorney has prepared and reviewed the attached Residential Solar Readiness Ordinance.

Financial Considerations – None.

Respectfully submitted,

  
Karen Masbruch  
Assistant City Manager

KM:ED:eac

Attachment: Residential Solar Readiness Ordinance

JUNE17-08-311

ADOPTED BY THE  
MAYOR AND COUNCIL

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ORDINANCE NO. 10549

RELATING TO BUILDINGS AND CONSTRUCTION: REQUIRING NEW SINGLE FAMILY AND DUPLEX RESIDENTIAL DWELLING UNITS TO PROVIDE FOR FUTURE INSTALLATION OF SOLAR ENERGY DEVICES; ADOPTING APPLICABLE BUILDING CODES AND REGULATIONS, WITH LOCAL AMENDMENTS ADDING REQUIREMENTS RELATED TO SOLAR ENERGY; AND DECLARING AN EMERGENCY.

WHEREAS, it is the intent and purpose of the City of Tucson, known as the "Sunshine City" with approximately 360 days of sunshine a year, to promote the conservation of energy and natural resources, which is a legitimate and worthy function of the City. The provisions of this ordinance are intended to decrease dependence upon nonrenewable energy sources by encouraging and, in some instances, requiring the installation of devices, structures, or materials for the conservation of energy on certain structures within the City; and

WHEREAS, the City of Tucson has been chosen as a 2007 Solar America City by the Department of Energy in recognition of Tucson's history of many years of solar energy development experience and as part of the Solar America Cities grant and the Tucson Solar Initiative is to increase solar installations in the City; and

WHEREAS, the City of Tucson has mandated that city staff follow the U.S. Mayor's Climate Protection Agreement of the United Nations Urban Environmental Accords and the Kyoto Accords as guidelines when developing city policy and to reduce the consumption of fossil fuels by 2030; and

WHEREAS, a solar water heating system offsets approximately 3000 kilowatt hours (kwh) per year, preventing 5760 pounds of Carbon Dioxide (CO<sub>2</sub>), 11 pounds of Nitrogen Oxides (NO<sub>x</sub>), 19 pounds of Sulfur Dioxide (SO<sub>2</sub>) being produced which results in a reduction of greenhouse gases, acid rain, and smog, and 1500 gallons of water (H<sub>2</sub>O) from being consumed;

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF TUCSON, ARIZONA, AS FOLLOWS:

SECTION 1. That this ordinance shall be known and referred to as the “Residential Solar Readiness Ordinance.”

SECTION 2. The Director of Development Services is authorized to adopt appropriate rules, regulations, and Development Standards necessary to implement the provisions of Sections 3 and 4.

SECTION 3. All new single family and duplex residential dwelling units shall include an acceptable method to allow for later installation of a system which utilizes solar energy as the primary means of heating domestic potable water. This section shall become effective upon approval of the new standards.

SECTION 4. All new single family and duplex residential dwelling units shall include an acceptable method to allow for later installation of a system which utilizes solar energy as a means of providing electrical power. This section shall become effective upon approval of the new standards.

SECTION 5. The requirements of this ordinance may be modified or waived when it can be satisfactorily demonstrated to the Building Official that compliance with these regulations is impractical due to such issues as shading, building orientation, construction constraints, or configuration of the parcel.

SECTION 6. If any of the provisions of this ordinance or the application thereof to any person or circumstance is invalid, the invalidity shall not affect other provisions or applications of this ordinance which may give effect without the invalid provision or circumstance, and to the end the provisions of this ordinance are severable.

SECTION 7. The various City officers and employees are authorized and directed to perform all acts necessary or desirable to give effect to this ordinance, including, but not limited to, providing an instructional pamphlet setting forth in plain language the requirements of this ordinance.

SECTION 8. WHEREAS, it is necessary for the preservation of the peace, health and safety of the City of Tucson that this ordinance becomes immediately effective, an emergency is hereby declared to exist and this ordinance shall be effective immediately upon its passage and adoption.

PASSED, ADOPTED AND APPROVED BY THE MAYOR AND COUNCIL OF THE CITY OF TUCSON, ARIZONA, \_\_\_\_\_.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED TO FORM:

  
\_\_\_\_\_  
CITY ATTORNEY

REVIEWED BY:

  
\_\_\_\_\_  
CITY MANAGER

Lk

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## DEVELOPMENT SERVICES DEPARTMENT

### Residential Plan Review

### Solar Ready Ordinance

#### GET READY FOR RESIDENTIAL PHOTO VOLTAIC!!!

On June 17, 2008, Mayor and Council unanimously voted to require all new residences to be solar ready for electric (PV) and hot water. Starting July 1, 2009, all new single family homes or duplexes must include in the plans either a Photo Voltaic system or preparation for later installation of a PV system in order to receive a building permit.

These new rules are part of Tucson's effort to promote solar energy and reduce the amount of greenhouse gases produced by the City and its residents. Saving utilities by using the sun to produce electricity saves you money and helps the environment at the same time!

The code changes for Residential Photo Voltaic are now in place.

Here's what the new rules require:

1. Provide a Site Plan showing the best space available for accommodating Photo Voltaic (PV) equipment (meter, disconnect & inverter) with minimum area of 4 square feet. Locate the PV equipment adjacent to the electrical service panel if feasible or on a wall close to the proposed collector panel space.
2. Show on the Site Plan the best roof space available for accommodating PV solar collector panels. Provide a roof structure designed for the additional collector dead loading (typically 4 lbs/SF).
3. Show a minimum 3,800 volt-ampere PV electrical load entry on the Service Load Calculation. This load is continuous as with heating and cooling loads.
4. Show an Electrical Panel Schedule with a 240 volt circuit breaker space labeled "reserved for Photo Voltaic".

Websites you may find helpful:

General information about solar programs:

[http://www.energysavers.gov/your\\_home/electricity/index.cfm/mytopic=10390](http://www.energysavers.gov/your_home/electricity/index.cfm/mytopic=10390)

Tax and utility incentives: <http://www.dsireusa.org/>

TEP rebates: <http://www.tucsonelectric.com/Green/>



ADOPTED BY THE  
MAYOR AND COUNCIL

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ORDINANCE NO. 10605

RELATING TO BUILDINGS AND CONSTRUCTION: AMENDING THE INTERNATIONAL RESIDENTIAL CODE 2006 WITH LOCAL AMENDMENTS, ADOPTED BY MAYOR AND COUNCIL THROUGH TUCSON CODE SECTION 6-38 (ORDINANCE 10417; JUNE 12, 2007), BY ADDING LOCAL AMENDMENTS TO CHAPTER 23, SECTION M2301, SOLAR ENERGY SYSTEMS; AND DECLARING AN EMERGENCY.

WHEREAS, the City of Tucson passed Ordinance No. 10549 on June 17, 2008, "The Solar Readiness Ordinance," which authorized standards and methods for future installation of solar hot water systems and photovoltaic energy systems in new residential construction and which authorized the Director of Development Services to adopt appropriate rules, regulations, and Development Standards to implement the provisions of said ordinance;

NOW, THEREFORE, BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF TUCSON, ARIZONA, AS FOLLOWS:

SECTION 1. The International Residential Code 2006 with local amendments, adopted by Mayor and Council through Tucson Code Section 6-38 (Ordinance 10417; June 12, 2007), is hereby amended by adopting local amendments to Chapter 23, Section M2301, Solar Energy Systems, attached hereto as Attachment "A."

SECTION 2. WHEREAS, it is necessary for the preservation of the peace, health and safety of the City of Tucson that this ordinance becomes immediately effective, an emergency is hereby declared to exist and this ordinance shall be effective immediately upon its passage and adoption.

PASSED, ADOPTED AND APPROVED BY THE MAYOR AND COUNCIL OF THE CITY OF TUCSON, ARIZONA, \_\_\_\_\_.

\_\_\_\_\_  
MAYOR

ATTEST:

\_\_\_\_\_  
CITY CLERK

APPROVED TO FORM:

  
\_\_\_\_\_  
CITY ATTORNEY

REVIEWED BY:

  
\_\_\_\_\_  
CITY MANAGER

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11/17/2008 4:04 PM

## CHAPTER 23 SOLAR SYSTEMS

### Section M2301 Solar Energy Systems

M2301.1 General. Revise by adding:

This section provides for the design, construction, installation, alteration and repair of equipment and systems using solar energy to provide space heating or cooling, hot water heating and swimming pool heating.

All new residential development, if not constructed with a complete solar energy system at time of construction, shall incorporate the following to allow for the later installation of a solar energy system for heating domestic potable water.

1. Two (2) insulated pipes and a conduit of suitable size for at least two pairs of wires for monitoring and control purposes penetrating the roof and ceiling adjacent to the water heater storage area location, or

A sleeve or conduit of sufficient size to accommodate the above without bends or angles penetrating the roof and ceiling adjacent to the water heater storage area.

2. The water heater storage area shall be designed so that there is space for an 80 gallon water heater, an expansion tank and a heat exchanger as well as a 120 volt electrical receptacle in close proximity to the water heater on a circuit with a minimum 15 amp circuit breaker.

3. The installation shall conform with all other applicable codes.