



CITY COUNCIL STAFF REPORT

DATE: September 19, 2012 NEW BUSINESS

SUBJECT: ADOPTION OF THE "GREEN FOR LIFE VOLUNTARY GREEN BUILDING PROGRAM"

FROM: David H. Ready, City Manager

BY: Michele Mician, Manager, Office of Sustainability

SUMMARY

In 2010, cities and tribes served by Southern California Edison and within the Coachella Valley Association of Governments (CVAG) region applied collectively for a grant to provide vital sustainability elements as they relate to the Sustainability Pledge that Mayors from each City signed at the Palm Springs Sustainability Summit in 2008. The CVAG application was among the largest awards and the program stemming from it has been titled "Green for Life." Elements of the program being developed for each city/tribe include:

- Greenhouse Gas Inventories
- Energy Action Plans
- Climate Action Plans
- City Facility Benchmarking
- City Facility Retro-Commissioning
- City Facility Utility Management Software
- A Voluntary Green Building Program

Additional tools that enhance these primary elements have been developed. The Voluntary Green Building Program is ready for consideration by the City. No public hearing is required.

RECOMMENDATION:

Adopt Resolution No. _____ "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PALM SPRINGS ADOPTING THE 'GREEN FOR LIFE VOLUNTARY GREEN BUILDING PROGRAM'"

PREVIOUS ACTION:

On June 11, 2012, the Architectural Advisory Committee reviewed the draft Green for Life Voluntary Green Building Program and provided comments.

On June 13, 2012, the Planning Commission received a presentation on the Voluntary Green Building Program from CVAG and adopted Resolution No. 6276 (attached) recommending the program to the City Council.

On June 5 and July 31, 2012, the Sustainability Commission reviewed the Voluntary Green Building Program and recommended approval of the program.

BACKGROUND:

Green Building is a holistic approach to siting, designing, constructing and efficiently operating buildings to reduce, eliminate or reverse the energy impacts of conventional building. Green Building benefits the environment, the community and the economy. In summary, Green Building is good design, construction, operation and maintenance!

Green Building Objectives:

1. Increase energy efficiency and sustainability in new and existing residential & commercial buildings.
2. Assist the local economy by minimizing utility expenses where businesses and residents utilize the cost savings on local purchases.
3. Assist in job creation in the construction sector by helping drive the market in remodeling of existing residential buildings with energy efficiency and sustainability measures that are cost-effective.
4. Provide support to our local construction sector by educating them on the benefits of building sustainable buildings (health, comfort, cost effectiveness, and marketing). The California Public Utility Commission set a goal that new homes will be "net-zero" energy consumption by 2020.
5. Reduce greenhouse gas emissions to benefit the entire region.

Why is Green Building Important?

The demolition, construction, and use of buildings have an impact on the environment, the economy, and our health. Green buildings reduce energy use, conserve water indoors and out, limit solid waste during construction, and in urban areas reduce the amount of vehicle miles traveled by residents. All of these benefits have been found to reduce emissions of carbon dioxide, a green house gas (GHG) and contributor to global warming.

In addition, green buildings are constructed from sustainable products that preserve natural resources through the use of local materials and recycled products. Green buildings benefit occupants through the use of healthy building materials, including zero to low Volatile Organic Compound (VOC) and formaldehyde free products. In addition, green buildings encourage the growth of additional businesses and jobs in order to support the needs of the green building industry.

The Green for Life Voluntary Green Building Program addresses "green building" on a voluntary basis, ahead of mandatory measures anticipated for January 1, 2014. It

provides for voluntary compliance for all newly constructed and reconstructed (remodel) residential and non-residential structures currently subject to the 2010 California Green Building Standards Code (Cal Green) regulations, and would exceed the minimum energy efficiency standards established in the 2010 California Energy Code (Energy Code) by 15 percent.

The program is structured to allow residents to learn about the options available when they build or remodel their home, and work with their designer or contractor to achieve the reductions. It goes beyond Title 24 by offering credits, or points, beyond the Title 24 requirements, for items that will save energy but are not counted in Title 24. A home or business owner can implement the design solutions that he or she thinks are most appropriate for them. The online version of the program adds the points for them, and gives them a total score, that can then be used by their designer or contractor in drawing up the plans.

The program manual also includes a number of municipal incentives that the City Council may consider to increase participation in the Voluntary Green Building Program.

DISCUSSION:

Many of the items addressed in the Voluntary Green Building Program are consistent with the proposed mandatory update of Title 24 of the Uniform Building Code, which will be effective January 1, 2014. It is important to note that this updated Title 24 code will only affect new residential and commercial buildings which are much more efficient than most of our existing building stock from decades ago.

The Voluntary Green Building Program being proposed will also assist those who are remodeling their homes or businesses by providing them with a framework needed to exceed their buildings' original performance design. Existing buildings provide significant opportunities for energy savings, especially in today's economy when more buildings will be renovated than new buildings built.

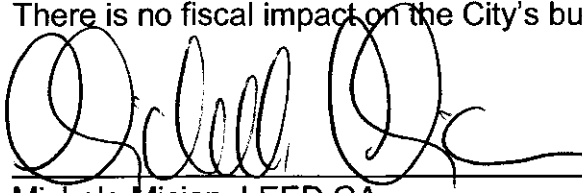
Finally, the Voluntary Green Building Program provides an opportunity to educate the region's construction industry on how to build sustainably as the marketplace changes. It is in keeping with California's goal of producing the "Net Zero Home" by 2020 which means that newly built homes will be both energy efficient and create the energy they require to support comfortable living. The City's support for this program will help our local contractors by showing how sustainable buildings can be constructed in a cost-effective manner. The program will also help build our contractors' knowledge base to ensure that they are not displaced from the market when the State's new rules take effect in 2014.

Adopting this program now on a voluntary basis will make available funding from Southern California Edison to help train city staff and local contractors. The potential outcomes include producing new energy-efficient buildings, upgrading / modernizing our existing building stock and increasing community's level of understanding.

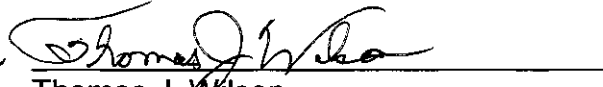
The program also facilitates the City's ability to work with the residents and building owners on "green initiatives" when building, remodeling or replacing equipment at their homes and businesses. Additional advantage to early adoption includes local green job development because the Program includes educational workshops with designers, contractors and builders that will occur during the summer.

FISCAL IMPACT:

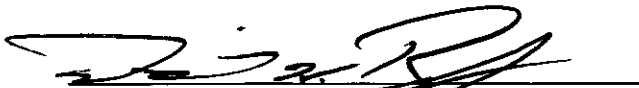
Funding for the program is through a Southern California Edison grant obtained by CVAG on behalf of the City of Palm Springs as part of the Desert Cities Energy Partnership. There is no fiscal impact on the City's budget.



Michele Mician, LEED GA
Manager, Office of Sustainability



Thomas J. Wilson
Assistant City Manager



David H. Ready, Esq., Ph.D.
City Manager

ATTACHMENTS:

1. Draft Resolution No. _____
2. Planning Commission Resolution No. 6276
3. Green for Life Voluntary Green Building Program Guide

RESOLUTION NO. _____

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF
PALM SPRINGS, CALIFORNIA, ADOPTING THE "GREEN
FOR LIFE VOLUNTARY GREEN BUILDING PROGRAM"

WHEREAS, in 2010, cities and tribes served by Southern California Edison and within the Coachella Valley Association of Governments (CVAG) region applied collectively for a grant to provide vital sustainability elements as they relate to the Sustainability Pledge that Mayors from each City signed at the Energy Summit in 2009; and

WHEREAS, the CVAG application was among the largest awards and the program stemming from it has been titled "Green for Life." Elements of the program being developed for each city/tribe include:

- Greenhouse Gas Inventories,
- Energy Action Plans,
- Climate Action Plans,
- City Facility Benchmarking,
- City Facility Retro-Commissioning,
- City Facility Utility Management Software and
- A Voluntary Green Building Program

; and

WHEREAS, the Voluntary Green Building Program is ready for consideration by the City; and

WHEREAS, on June 11, 2012, the Architectural Advisory Committee reviewed the draft Green for Life Voluntary Green Building Program and provided comments; and

WHEREAS, on June 13, 2012, the Planning Commission received a presentation on the Voluntary Green Building Program from CVAG and adopted Resolution No. (attached) recommending the program to the City Council; and

WHEREAS, on June 5 and July 31, 2012, the Sustainability Commission reviewed the Voluntary Green Building Program and recommended approval of the program; and

WHEREAS, the City Council has carefully reviewed and considered all of the evidence presented in connection with the appeal hearing on the project, including, but not limited to the staff report and all written and oral testimony presented.

THE CITY COUNCIL OF THE CITY OF PALM SPRINGS DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The Voluntary Green Building Program ("Program") includes provisions which are consistent with a proposed mandatory update of Title 24 of the Uniform Building Code, which are anticipated to be effective January 1, 2014.

SECTION 2. The Program will assist developers of new construction as well as those renovating and remodeling existing properties to exceed the originally designed performance of their projects, as well as provide a great opportunity to educate the region's construction industry on how to build sustainably as the marketplace changes; and

SECTION 3. By adopting this Program now on a voluntary basis, the City will be eligible to utilize funding obtained by CVAG on the City's behalf through a grant from Southern California Edison. These funds will be used to help train city staff and local contractors; will encourage the development of new energy-efficient buildings and the upgrading/ modernizing of the City's existing building stock; increase community's level of understanding; and facilitate the City's ability to work with the residents and building owners on "green initiatives" when building, remodeling or replacing equipment at their homes and businesses.

SECTION 4. The Voluntary Green Building Program is in keeping with California's goal of producing the "Net Zero Home" by 2020 which means that newly built homes will be both energy efficient and create the energy they require to support comfortable living.

SECTION 5. The City Council hereby adopts the "Green for Life Voluntary Green Building Program" attached as Exhibit A and incorporated herein.

PASSED, APPROVED AND ADOPTED BY THE PALM SPRINGS CITY COUNCIL THE 19TH DAY OF SEPTEMBER, 2012.

DAVID H. READY, CITY MANAGER

ATTEST:

JAMES THOMPSON, CITY CLERK

CERTIFICATION

STATE OF CALIFORNIA)
COUNTY OF RIVERSIDE) ss.
CITY OF PALM SPRINGS)

I, JAMES THOMPSON, City Clerk of the City of Palm Springs, hereby certify that Resolution No. _____ is a full, true and correct copy, and was duly adopted at a regular

meeting of the City Council of the City of Palm Springs on September 19, 2012, by the following vote:

AYES:

NOES:

ABSENT:

ABSTAIN:

James Thompson, City Clerk
City of Palm Springs, California



A GUIDE TO THE VALLEY-WIDE VOLUNTARY GREEN BUILDING PROGRAM

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GUIDE

Green For Life is an energy-saving program funded by the California Public Utilities Commission through Southern California Edison and administered by the Coachella Valley Association of Governments.

CREDITS

This GUIDE was produced by the collaborative effort of Southern
California Edison,
Coachella Valley Association of Governments,
Terra Nova Planning & Research and
Interactive Design Corporation.

PREFACE

This GUIDE to the Valley-Wide VOLUNTARY GREEN BUILDING PROGRAM introduces the issues of energy efficiency in buildings from the practical perspective of a property owner: “What should I do (to save energy/money)?” This practical introduction is not comprehensive, but rather is a “soft” opening. A knowledgeable person may choose to skip over these few pages. This GUIDE is an introduction to the VOLUNTARY GREEN BUILDING PROGRAM and the GREEN BUILDING MANUAL which is the “meat and potatoes” of the Program. You can find the GREEN BUILDING MANUAL online at www.greenforlifecv.org.

CHAPTER ONE, the next section, addresses the primary “things to do” with more information.

CHAPTER TWO illustrates the principles that underlie the “things to do.” This section is intended to help interested citizens, building owners, contractors and professionals become more fluent in the language of “green building.” If one understands the principles of energy-efficient design, other actions can also be taken to complement and supplement the basic “What should I do?” actions.

(CHAPTER THREE) Finally, because this Voluntary Program and the California Building Code are based upon standards and measurements, the Voluntary Program includes an extensive checklist of specific actions, and how they are counted toward a more energy efficient building.

What follows is the INTRODUCTION to the Valley-wide VOLUNTARY GREEN BUILDING PROGRAM.

PURPOSE AUDIENCE BUILDING

The purpose of the VOLUNTARY GREEN BUILDING PROGRAM is to answer three questions:

“What should I do to make my building more energy efficient?”

“Why do those actions reduce energy usage?”

“How are the effects of doing those actions measured?”

The Voluntary Program is intended for four audiences:

City Staff (Building & Planning Departments)

Owner and interested citizens

Building Contractors

Designers

The Voluntary Program addresses three building types:

Single family homes (new and remodel)

Multi-family (new and remodel)

Commercial (new and remodel)

PRACTICAL INFORMATIVE TECHNICAL

The GUIDE is written to assist City staff in understanding the Voluntary Program. It is also intended to explain the principles of energy efficient measures and design so that interested property owners, contractors and designers can communicate with each other about the most appropriate energy efficient measures to implement in their projects.

This GUIDE is organized as follows:

INTRODUCTION

The Practical Approach CHAPTER ONE
(What can I do now?)

The Informative Approach CHAPTER TWO
(Why does it save energy?)

The Technical Approach CHAPTER THREE
(How is it measured?)

Financial Analysis CHAPTER FOUR

Financial & Processing Incentive CHAPTER FIVE

Permitting Process CHAPTER SIX

Between the years 2007 and 2012, Southern California Edison's (SCE) energy efficiency programs have saved more than five billion kilowatt-hours—enough energy to power 725,000 homes for an entire year. The programs have reduced greenhouse gas emissions by more than 2 million metric tons—the equivalent of removing 350,000 cars from the road.

- SCE.com

INTRODUCTION

The INTRODUCTION explains why the Valley-wide VOLUNTARY GREEN BUILDING PROGRAM was developed:

Why was the Voluntary Program developed:

- To encourage building owners to exceed the California Energy Code by 15%
- To promote energy efficient design specific to THE COACHELLA & PALO VERDE VALLEY
- To promote energy efficient measures that are not part of the California Energy Code
- To explain the principles that underlie energy efficient design
- To promote practical and low-cost energy-saving measures and design

How does it relate to existing legislature and Codes:

- Make progress toward the 2020/2030 “net zero” State legislature goals
 - By 2020 all new single family homes must be “net zero”
 - By 2030 all new commercial buildings must be “net zero”

“Net zero” means that a building will generate, on site, as much energy as it uses.
- Provide a “soft opening” for upcoming changes to the California Energy Code (2014)
- Provide an extended learning period for City staff, contractors and designers regarding proposed changes to the California Energy Code.

How will it be implemented:

- It is voluntary
- It is customized to each jurisdiction
- It is parallel to the California Energy Code – it does NOT replace Title 24 or the California Energy Code

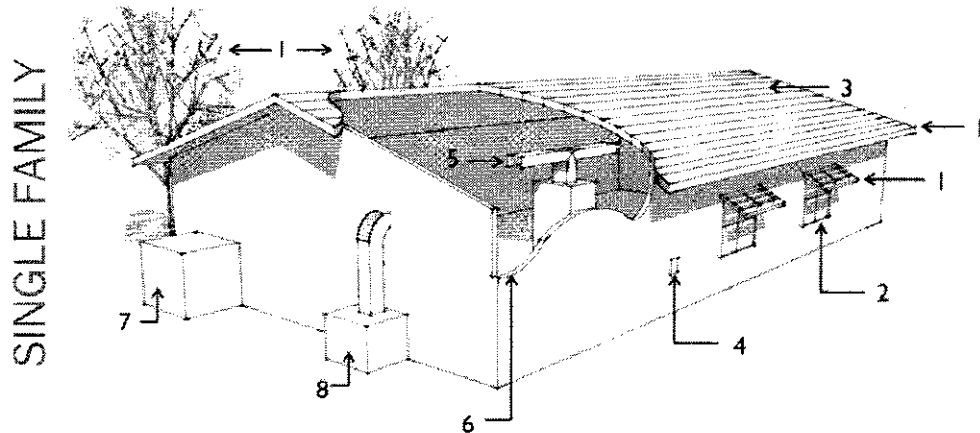
Harvesting the power of the sun is easy for homeowners and businesses like you who want to generate their own electricity. Incentives from the California Solar Initiative (CSI) program make it possible. Combined with tax credits and energy efficiency measures, CSI incentives can significantly reduce a solar system's cost, which means you get to keep more "green" in your wallet.

-SCE.com

CHAPTER ONE

The Practical Approach

“What can I do now for my home?”

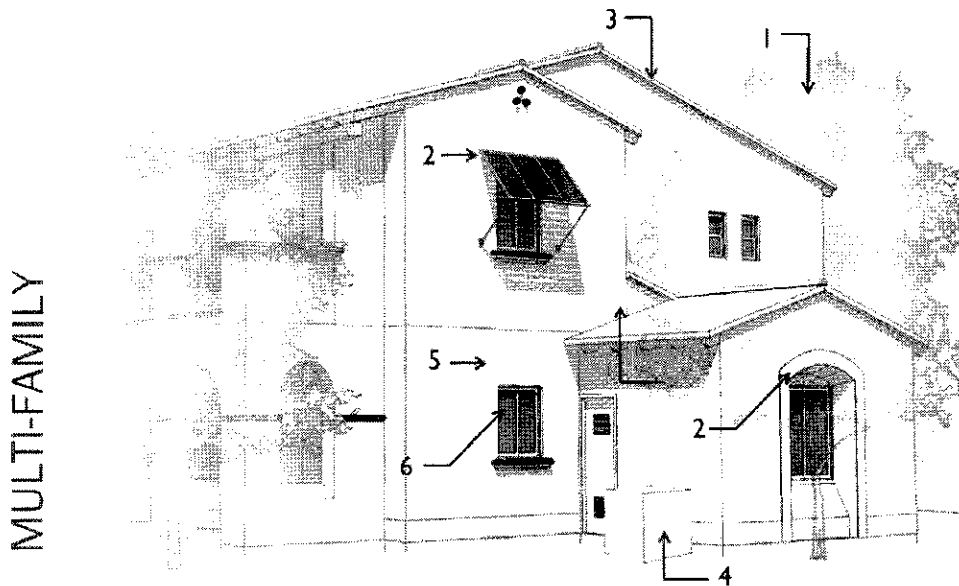


- 1 SHADE
Add trellis, awnings, trees, lattice/vines
- 2 WINDOWS
Install high efficiency windows with low U-value $\leq .34$ on new construction or replace/add film to existing
- 3 COOL ROOF
Add coating on existing or select light colored materials for new
- 4 ENVELOPE AIR SEAL
Seal gaps at existing wall penetrations
- 5 DUCT SEAL
Tape leaks in existing pipes and ducts
- 6 ENVELOPE INSULATION
Add spray foam with higher R-value to existing construction or select high R-value for new
- 7 HEATING VENTILATION & AIR CONDITIONING \geq SEER 13
Replace unit with higher efficiency rating but proper size the A/C first
- 8 EVAPORATIVE COOLER
Add cooler to existing or new for energy efficient ventilation

CHAPTER ONE

The Practical Approach

“What can I do now for my apartment building?”



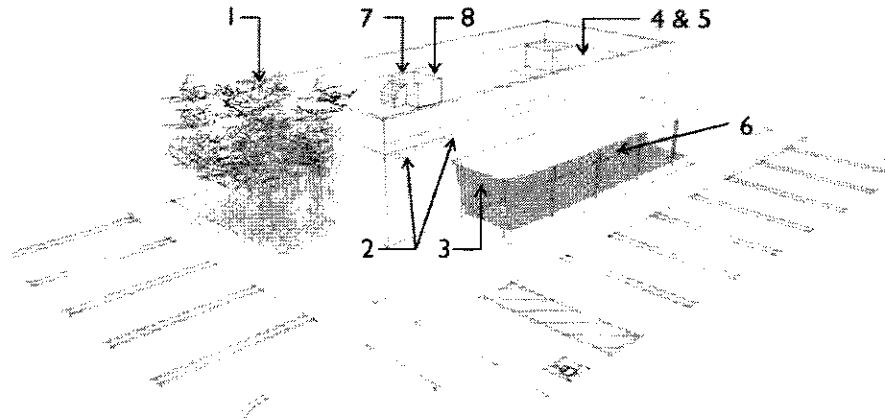
- 1 SHADE TREES
- 2 SHADE WINDOWS (E, S & W)
Add trellis, awnings, trees, lattice/vines
- 3 COOL ROOF
Add coating on existing or select light colored materials for new construction
- 4 HEATING VENTILATION & AIR CONDITIONING \geq SEER 13
Replace unit with higher efficiency rating
- 5 LIGHT COLORS
Paint exterior light colors to reflect the sun and heat
- 6 HIGH PERFORMANCE WINDOWS
Install film on the interior with a low Solar Heat Gain Coefficient.

CHAPTER ONE

The Practical Approach

“What can I do now for my business?”

COMMERCIAL



- 1 TREES ON WEST SIDE
- 2 UPDATE LIGHTING
Install compact fluorescent bulbs
- 3 SHADE WINDOWS
Add trellis, awnings, trees, lattice/vines
- 4 COOL ROOF
Add coating on existing or select light colored materials for new construction
- 5 ADD INSULATION
Add spray foam with higher R-value to existing construction or select high R-value for new
- 6 UPDATE WINDOWS
Install high efficiency windows with low U-value $\leq .34$ on new construction or replace/add film to existing single-glazed windows
- 7 DUCT TEST/SEAL
Tape leaks in existing pipes and ducts
- 8 HEATING VENTILATION & AIR CONDITIONING \geq SEER 13
Replace unit with higher efficiency rating

The Residential Multifamily Energy Efficiency Rebate Program offers property owners and managers incentives on a broad list of energy efficiency improvements in lighting, HVAC, insulation and window categories. These improvements are to be used to retrofit existing multifamily properties of two or more units.

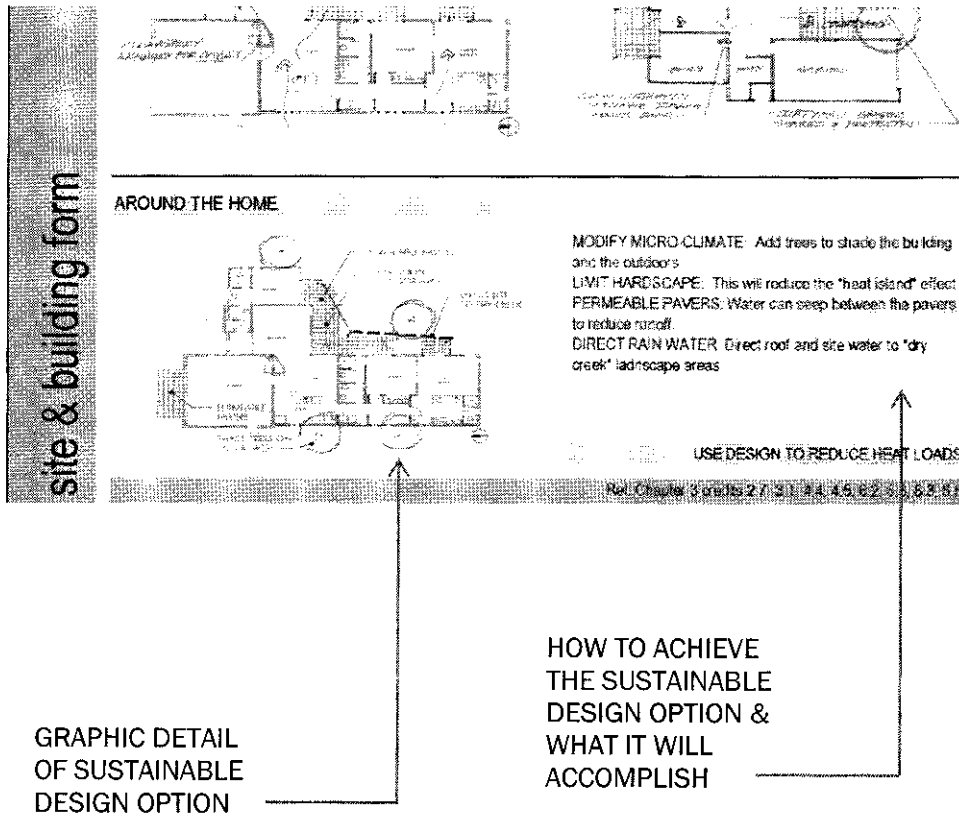
- SCE.com

CHAPTER TWO

The Informative Approach

Let's break it down...

See CHAPTER TWO of the GREEN BUILDING MANUAL for full pages.



CHAPTER TWO

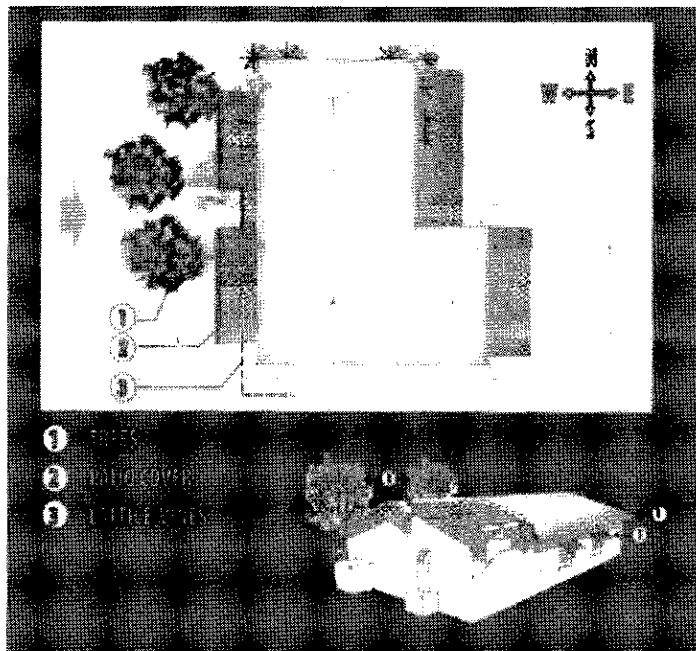
Informative Approach

It all starts with the sun...

Here in the Valley, we want protection from the sun: we park our cars under carports or under trees; we want roofs over our patios; we like the shade from trees. But the sun also feels good part of the year. So controlling exposure to the sun is the trick.

In the desert, cooling our buildings takes a lot more energy than heating them. So a common sense approach to energy saving is to shade the west (and south) sides of our buildings – with trees, patio covers, even “living walls.”

ORIENTATION
SHADE
REFLECTIVITY
EMISSIVITY



CHAPTER TWO

Informative Approach

See CHAPTER TWO of the GREEN BUILDING MANUAL for full pages.

VOLUNTARY GREEN BUILDING PROGRAM - MENU OF SUSTAINABLE DESIGN OPTIONS
FOR THE HOMEOWNER PLANNING TO BUILD A NEW HOME

ROOF & ATTIC

ROOF ASSEMBLY

THE ROOF
 Insulation is the principle means of resisting heat transfer, and generally more is better. But the location is also important. If the insulation is on top of the roof sheathing it helps more than the value from batt insulation between rafters – but both together is the best.

A reflective, "cool roof" system intercepts the radiant heat buildup. There are "cool roof" coated tiles, shingles and metal roof systems for sloped roofs. Single ply "cool roof" systems for nominally flat roofs are very effective, and cumulatively, over the entire city, the heat island effect is reduced by "cool roof" systems. A "cool roof" system also prolongs the life of the roof membrane itself.

A vented roof system shades the actual wear height thus prolonging its life, and circulates air over the membrane which also keeps it about the same temperature as the ambient air. Installing a PV system essentially creates a vented roof system.

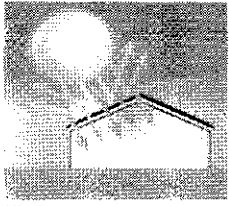


FIG. 10
ROOF WITH CONVENTIONAL ASSEMBLY

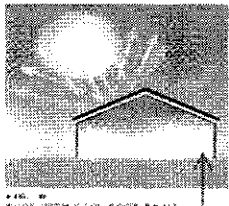


FIG. 11
PV SYSTEM ON ROOF ASSEMBLY

ATTIC COOLING

HOW TO ACHIEVE THE SUSTAINABLE DESIGN OPTION & WHAT IT WILL ACCOMPLISH

GRAPHIC DETAIL OF SUSTAINABLE DESIGN OPTION

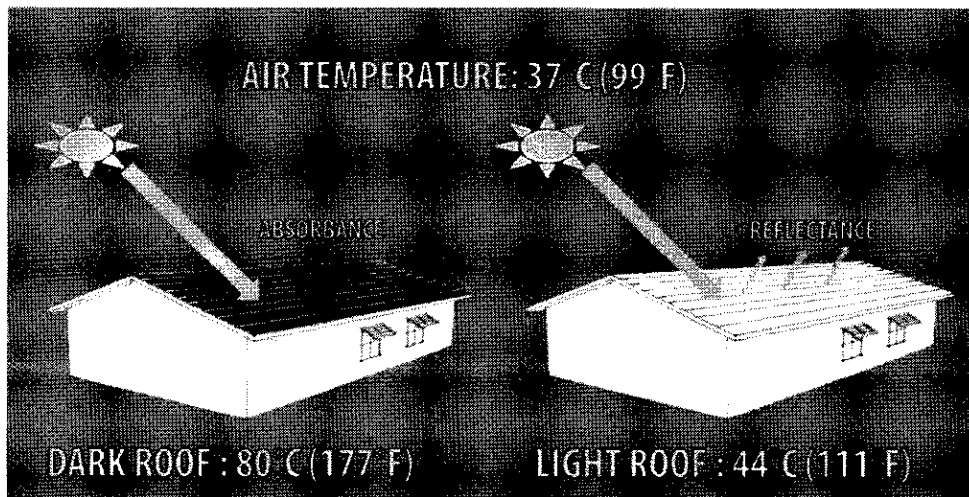
CHAPTER TWO

Informative Approach

The rest of CHAPTER TWO includes explanations and illustrations of the principles that underlie "Why does it save energy?" For example the idea of "cool roofs" is explained in terms of the solar reflectivity and emissivity of a roof.

ROOF: Roofs get hot because they absorb the sun's energy. A "cool roof" is a system that reflects sunlight and doesn't absorb (reflectivity), store and "emit" a lot of heat (emissivity). The minimum values for a "cool roof" are:

Reflectivity > 0.70 (Black tar ~ 0.10; Pure white ~ 0.95)
Emissivity > 0.75 (Aluminum foil ~0.90; Black tar ~ 0.20)

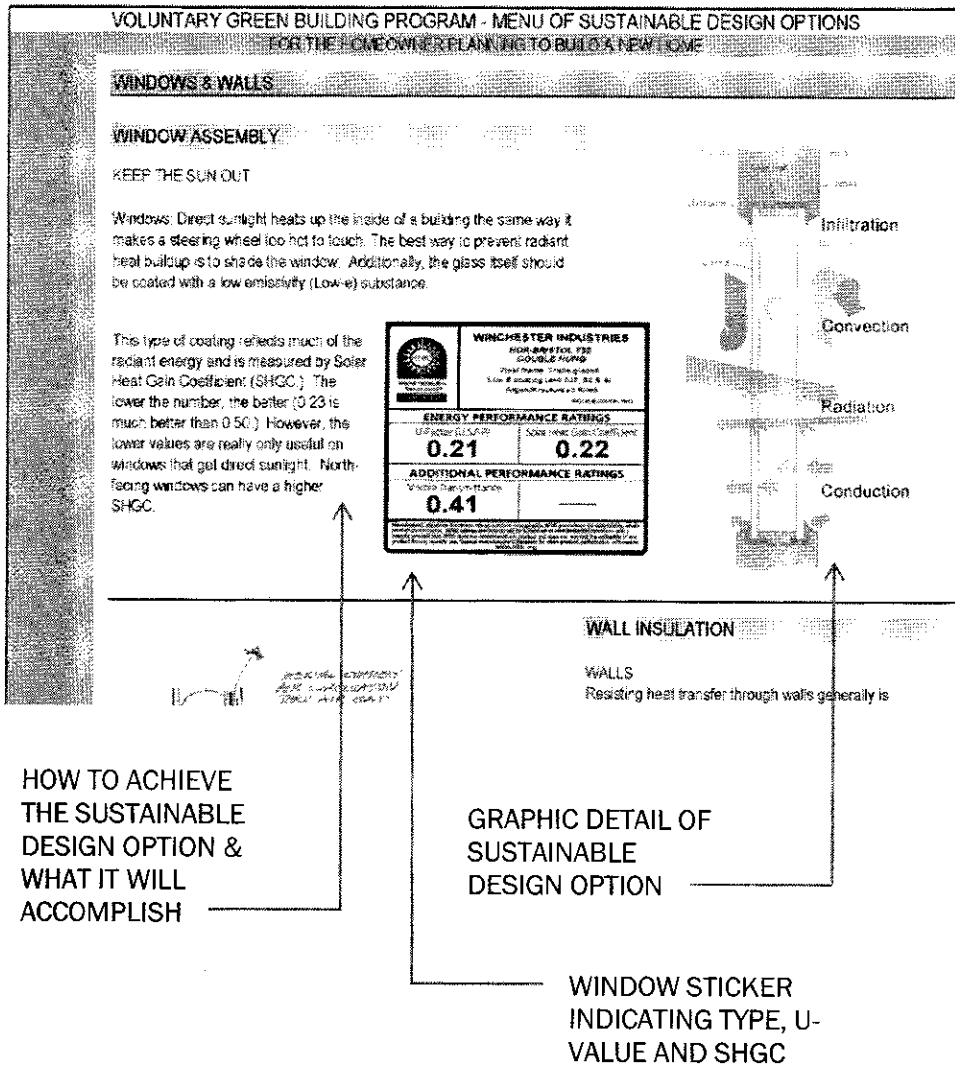


U vs R: The U-factor measures the entire assembly of a window, wall, roof, etc. The R-value is the resistance to thermal transfer of a single component (glass, insulation, stucco, etc.) To get the U-factor, you add up all the R-values and divide into 1 - sort of.

CHAPTER TWO

Informative Approach

See CHAPTER TWO of the GREEN BUILDING MANUAL for full pages.



CHAPTER TWO

Informative Approach

WINDOW: Windows leak heat from conductance (air temperature) and radiation (sunlight.) Energy efficient windows resist conducting heat by double glazing and insulated frames; this is measured by the “U-value.” Windows resist radiant heat transfer by coatings (low-e) on the glass; this is measured by SHGC (solar heat gain coefficient.) Here in the Valley (Climate Zone 15), the practical minimum values are:

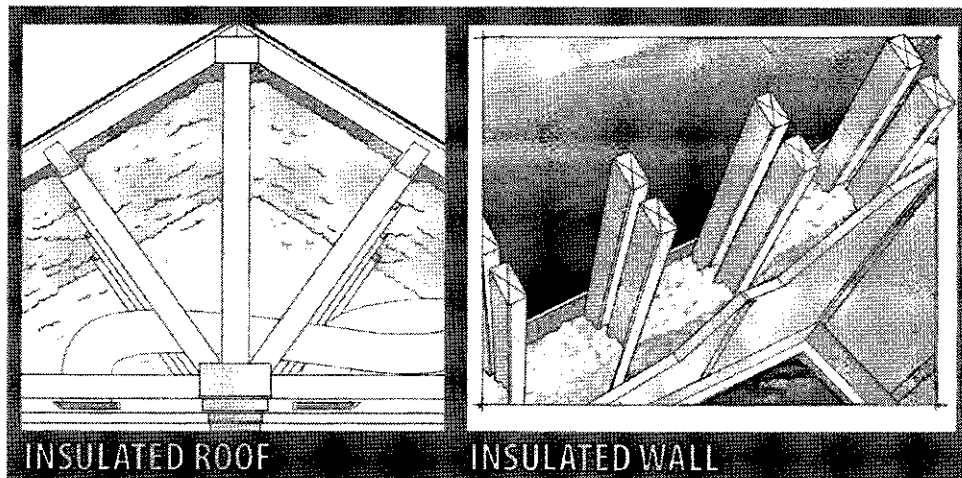
U-factor 0.35 (lower is better)

SHGC 0.30 (lower is better)

INSULATION: Insulation resists heat transfer by creating air pockets. The better the insulation material resists heat transfer the higher the R value (per inch.) Here in the Valley (Climate Zone 15), the practical minimum values are:

Walls R-19 (higher is better)

Roof/ceiling R-38



Consider unplugging consumer electronics when they are not in use. (Even when turned off, CD players in the U.S. consume enough energy in one year to power the Las Vegas Strip for six months.) Consumer electric products are responsible for approximately 15 percent of household electricity use.

Replace lights and lamps with energy-efficient ENERGY STAR® qualified compact fluorescent (CFL) bulbs, which last up to 10 times longer and use up to 75% less electricity.

- SCE.com

CHAPTER THREE

Technical Approach

How the VOLUNTARY GREEN BUILDING PROGRAM is measured?

CHAPTER THREE of the Voluntary Program is the technical scorecard and point system of the energy saving building measures. The more green principles used in your building, the higher your scorecard will read in this Program.

TYPE OF BUILDING

SPECIFIC TOPIC

TECHNICAL BUILDING MEASURES AND POINT SYSTEM			
FOR THE HOMEOWNER PLANNING TO UPGRADE, REMODEL AND/OR RELOCATE AN EXISTING HOME			
	Measure Code	Points	Check
M BASIC REQUIREMENT <ul style="list-style-type: none"> All construction continues to grow the state funds green building programs in order to ensure a sustainable future to improve the energy efficiency of the building envelope. 			
1 EXISTING CONSTRUCTION REGULATION <ul style="list-style-type: none"> Reuse existing resources instead creating new building waste. 			
1.1	Deconstruct: 30% of the weight of existing buildings on the site are deconstructed and recycled or recycled content. Documentation is required. GCA4 105.1	M	<input type="checkbox"/>
1.2	Reuse of materials: Materials can be easily reused but must be in compliance with T24 requirements. For example: <ul style="list-style-type: none"> Light fixtures, light sockets, and electrical conduit. Plumbing fixtures. Door and trim. Atticwork. Insulation. Refrigerators. GCA4 105.2	4	<input type="checkbox"/>
1.3	Have floor, sheetrock ceiling walls, floors and roof. Maintain the existing building structure (including structural floor and roof decking) and envelope (the building framing, including passive assemblies and non-structural framing material). The minimum percentage building reuse for each point threshold is as follows: <ul style="list-style-type: none"> 50% 75% 90% Subtotal	2 3 4	<input type="checkbox"/>
2 ENERGY CONSERVATION <ul style="list-style-type: none"> Protect glass, south- and west-facing windows. Keep the glass side about windows. 			
2.1	T24 - Complete non-vented exterior wall, floor, roof and basement. The long-term thermal energy storage of walls. GCA4 106.1 (R-13) (C-2)		<input type="checkbox"/>
3 SUBTOTAL <ul style="list-style-type: none"> Shrink your home's foot, walls, windows, roof, doors, porches or patios. 			
3.1	T24 - Use state-of-the-art building materials to meet and beat energy efficiency goals for exterior walls, roofs, floors and basements. GCA4 106.2		<input type="checkbox"/>
3.2	T24 - Windows and doors must be in place to be eligible for efficiency. While the program is still in effect, it is required to be in place at the time of the energy audit. (e.g. If a window is not in place, it will not be eligible for a T24 energy audit.) GCA4 106.3 ENERGY CODE		<input type="checkbox"/>
3.3	T24 - All window openings with a viewing coefficient of 0.1 or less must be covered with insulation. GCA4 106.4		<input type="checkbox"/>

See CHAPTER THREE of the GREEN BUILDING MANUAL for full pages.

CHAPTER THREE

Technical Approach

Like CHAPTERS ONE & TWO, CHAPTER THREE is organized by building type (homes, apartments, and businesses) and progresses from issues outside the building (site conditions, building orientation, drainage, etc.), to the building envelope (roof, windows, etc), to the structural system (framing systems), to equipment selection and finally passive strategies and health considerations.

Each item is also cross referenced to other rating systems (Cal Green, LEED, Green Point) to direct a design professional toward further investigation.

CHAPTER THREE

Technical Approach

See CHAPTER THREE of the GREEN BUILDING MANUAL for full pages.

TECHNICAL BUILDING MEASURES AND POINT SYSTEM FOR THE HOMEOWNER PLANNING TO BUILD A NEW HOME					
15	AIR CONDITIONING				<p>Use high efficiency equipment (higher SEER and EER rating means higher efficiency - lower electrical usage, lower monthly bill). Efficiency is increased by dual-stage compressor and better controls. NOTE: the more choices you make that reduce the overall heat load on your home (more insulation, better windows, more shade) may reduce the size of the condensing unit (e.g. 3-ton vs. 4-ton).</p>
	15.1	* Right-size HVAC equipment. Carefully consider the energy efficiency measures selected in this Code that will influence the actual heat load on the air conditioning system. The size of the system (measured in "tons") may be reduced by as much as 30% through careful design and upgraded energy efficient measures.	CG A4 407, LEED EA 6.1, 6.2, 6.3 & GPR H.5	M	
	15.2	T24 - Perform duct leakage testing to verify a total leakage rate of less than 6 percent of the total fan flow	CG A4 207.8 & LEED EA 5.1		
		T24 - General HVAC equipment verification and correction	CG A4 207.8 & GPR H.1		
	15.3	T24 - Use condensing units with two-stage compressors (generally on units with SEER 14 or higher). Use units with a minimum of EER 11.5.	CG A4 207.6, GPR J.2.1, AZ (Scott)		
	15.4	T24 - Design and install a whole-house fan system.	AZ (Scott)		
	15.5	T24 - Design and install an evaporative cooling system.	AZ (Scott)		
	15.6	T24 - Install ductwork within the conditioned envelope of building, in an underfloor crawl space, with an R-8 or higher insulation value or buried in the ceiling insulation.	CG A4 207.7		
15.7	* Design the HVAC system to be zoned such that no more than two enclosed rooms are controlled by one thermostat (does not include bathroom, kitchen, closets, pantries, and laundry rooms).	AZ (Scott)	4	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	

SPECIFIC CATEGORY & BRIEF DESCRIPTION OF UNDERLYING PRINCIPLE

INDIVIDUAL CREDIT WITH DESCRIPTION

REFERENCE TO OTHER RATING SYSTEMS

CHAPTER THREE

The Technical Approach

CHAPTER THREE is the technical part of the Voluntary Green Building Program. All the design and equipment choices are listed and assigned a point value, and a “score card” is created for your building. When the points are totaled you will know whether the building meets or exceeds the minimum goal of the Voluntary Green Building Program: to exceed Title 24 by 15%.

Some of the items listed are mandatory (M) and some are already part of Title 24 energy calculations. These are highlighted in green (naturally) so one could simply select those items in green and they will directly improve Title 24 calculations. You may be able to reach the +15% simply by upping the values of these “green” items.

Items not highlighted in green do not directly relate to Title 24, but are valuable for energy efficient buildings. These items are assigned “points” and when the adjacent “check box” is checked, a running total is started.

CHAPTER THREE

Technical Approach

See CHAPTER THREE of the GREEN BUILDING MANUAL for full pages.

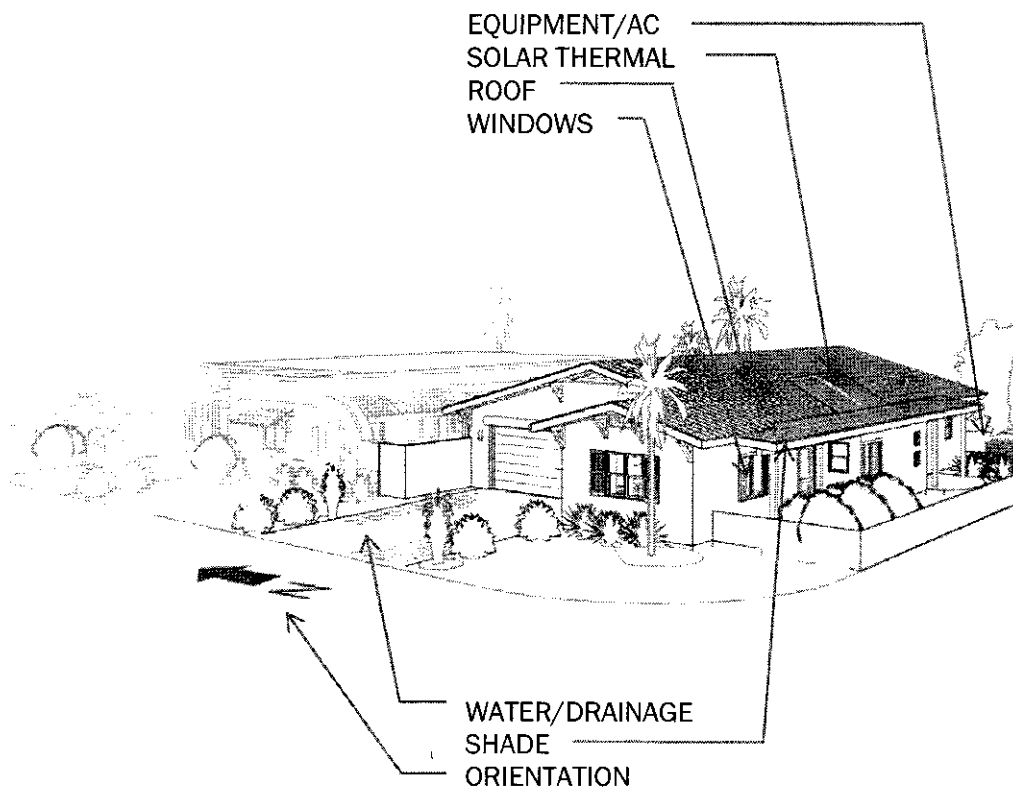
vs. 4-ton).			
size" HVAC equipment. Carefully consider the energy efficiency es selected in this Code that will influence the actual heat load on the itioning system. The size of the system (measured in "tons") may be l by as much as 30% through careful design and upgraded energy : measures.	CG A4.407, LEED EA 6.1, 6.2, 6.3 & GPR H.5	M	
duct leakage testing to verify a total leakage rate of less than 6 of the total fan flow.	CG A4.207.8 & LEED EA 5.1		
HVAC equipment verification and correction	CG A4.207 & GPR H.1		
ensing units with two-stage compressors (generally on units with 6 or higher.) Use units with a minimum of EER 11.5.	CG A4.207.6, GPR J.2.f AZ (Scott)		
and install a whole-house fan system	AZ (Scott)		
and install an evaporative cooling system.	AZ (Scott)		
uctwork within the conditioned envelope of building, in an underfloor pace, with an R-6 or higher insulation value or buried in the ceiling n.	CG A4.207.7		
the HVAC system to be zoned such that no more than two enclosed are controlled by one thermostat (does not include bathroom, s, closets, pantries, and laundry rooms).	AZ (Scott)	4	<input checked="" type="checkbox"/> #
the furnace as a sealed - combustion unit.	AZ (Scott)	1	<input checked="" type="checkbox"/> #

GREEN AREA:
THESE ITEMS
RELATE TO T-24
CALCULATIONS

POINT SYSTEM: RECEIVE
POINTS FOR EACH ITEM
('M' IS MANDATORY)

CHECKBOX:
CHECK THIS IF
YOU COMMIT TO
THIS ITEM

NEW HOME SAMPLE PROJECT



Now that you have gone through the GUIDE, picture a sample home of 3 bedrooms with 2 bathrooms built in 2010 somewhere in the valley. It was designed, built and scored using credits from the Voluntary Green Building Program.

SAMPLE PROJECT

Credit Selection

The Sample New Home is designed with these energy efficient principles in mind:

ORIENTATION

This sample home is configured to minimize west-facing walls and windows. The long axis is within 30 degrees of south.

SHADE

The roof on the south & east facing sides of the house extends beyond the exterior wall 5' providing a covered porch. 25% of liveable area is outdoors.

WATER/DRAINAGE

Permeable pavers are installed on 20% of site for patios, walkways and driveways/parking.

ROOF

A radiant barrier is installed at the roof level. Roof is made of high durability/low maintenance fiber cement.

WINDOWS

Spectrally selective glazing is used on the east-, south- and west-facing windows.

EQUIPMENT/AC

Condensing units with two-stage compressor units are installed (SEER \geq 16). Use units with a minimum Energy Efficient Ratio (EER) of 11.5.

SOLAR THERMAL

A solar water heating system is installed because the demand for hot water is equivalent to the production of hot water.

On the next pages, we have reproduced the credits related to the items above and then added up the "points" to see how the sample house will score.

SAMPLE Score PROJECT

See CHAPTER THREE of the GREEN BUILDING MANUAL for full pages.

		Source Code	Points	Check
M	BASE REQUIREMENT	As California continues to grow, the state faces ever-increasing challenges in energy. One way to ensure our future is to improve the energy efficiency of the building envelope.		
	T24 • Building designed to be at least 15% above California Building Code Title 24	CG	20	<input type="checkbox"/>
3	SOLAR ORIENTATION	Protect east, south, and west-facing windows from the sun, see also "window"		
3.1	T24 • Configure new home to minimize west-facing walls and windows. The long axis should be within 30 deg. of south.	CGA4.106.1 & AZ (Scott)		<input type="checkbox"/>
4	SHADE	Shade your home (roof, walls, windows) with trees, overhangs, shutters or awnings		
4.2	T24 • Awnings and overhangs need to be close to top of windows to effectively shade the glass. A good rule of thumb is to cover half the surface of glass at the summer solstice. (e.g. A 30" overhang at the header will cover the top half of a 4' tall window. 4'-6" would cover the top half of a 9'0" sliding glass door.)	CG A4.205.2, A4.407.7, GPR D.7 & AZ (Scott)		<input type="checkbox"/>
4.5	• Dwelling is designed with shaded outdoor living on north, south and/or east • Provide total area of shaded outdoor living equal to at least 25% of total liveable floor area served.	AZ (Scott)	2	<input type="checkbox"/>
Subtotal:			2	
6	WATER-RAIN	Keep storm water on your lot with french drains, cisterns, retention basins. Keep water (rain and irrigation) away from the house.		
6.6	• Use permeable pavers for patios, walkways and driveways/parking • Min. 80% of exposed paving is light colored (at least 30% light reflectance value) • No less than 20% of total on-site hardscape • No less than 30% of total on-site hardscape	AZ (Scott), CG A4.106.4 & GPR P.A.1	2 2 4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Subtotal:			2	
9	ROOF	Use "cool roof" coating or materials		
9.3	T24 • Install a radiant barrier at the roof level.	CG A4.205.1		<input type="checkbox"/>
9.9	• Use roof with a high durability/low maintenance material such as concrete, slate, clay or fiber cement.	AZ (Scott)	2	<input checked="" type="checkbox"/>
Subtotal:			2	

When you check this specific box, the Title 24 calculations must show that in fact your building is 15% over T-24 requirements.

Credit 3.1 credit 4.2 credit 9.3 credit 11.1 credit 12.2 help in the calculation of T-24 and do not provide points outside of the credit.

SAMPLE PROJECT Total Score

See CHAPTER THREE of the GREEN BUILDING MANUAL for full pages.

Red titles correspond to page 27.

'M' is mandatory; this credit is a must for the California Energy Code.

		Source Code	Points	Check
12	WINDOWS	<ul style="list-style-type: none"> Select windows for their frame material (Vinyl or fiberglass), dual-glazing, and coatings (low-e) in relation to their orientation. Verify coatings are appropriate to the desert climate. (SHGC < 0.50) 		
12.2	T24 • Use spectrally selective glazing (SHGC of <0.28) on east-, south- and west-facing windows			
15	AIR-CONDITIONING	<ul style="list-style-type: none"> Use high efficiency equipment (higher SEER and EER rating means higher efficiency – lower electrical usage, lower monthly bill). Efficiency is increased by dual-stage compressor and better controls. NOTE: the more choices you make that reduce the overall heat load on your home (more insulation, better windows, more shade) may reduce the size of the condensing unit (e.g. 3-ton vs. 4-ton). 		
15.1	• "Right-size" HVAC equipment. Carefully consider the energy efficiency measures selected in this Code that will influence the actual heat load on the air conditioning system. The size of the system (measured in "tons") may be reduced by as much as 30% through careful design and upgraded energy efficient measures.	CG A4 407, LEED EA 6.1, 6.2, 6.3 & GPR H.5	M	
15.3	T24 • Use condensing units with two-stage compressors (generally on units with SEER 16 or higher). Use units with a minimum of EER 11.5	CG A4.207.6, GPR J.2.1 AZ (Scott)		
32	SOLAR-THERMAL	<ul style="list-style-type: none"> Even though solar thermal water heating is very efficient, for very low demand, it may not be practical. 		
32.1	• Install a solar water heating system when the demand of hot water is equivalent to the production of hot water or provide space on the roof surface (200 SF south-facing), penetrations (stand-offs) through the roof surface, and one-inch conduit for future solar installation. Consult with a structural engineer for additional load requirements to the existing roof structure.	CG A4.211.2 & 3	2	<input checked="" type="checkbox"/>
Subtotal:			2	
Total			28	

Congratulations!! Your home scored at the Energy Leader Level

These credits are just a few examples. There are additional credits in CHAPTER THREE of the Voluntary Green Building Program but you are not required to select all.

The Southern California Edison (SCE) Resource Guide (PDF), also available in Spanish, helps link customers with community resources that can help, including programs to help income-qualified customers. The California Alternate Rates for Energy (CARE) program offers income-qualified customers a discount of 20% or more off their monthly electric bill. The Energy Savings Assistance Program pays for the cost of purchasing and installing energy efficient appliances and equipment for income-qualified customers.

- SCE.com

CHAPTER FOUR

Financial Analysis

CHAPTER FOUR offers a cost benefit analysis to help determine the most appropriate measures to apply for specific budgets. You can use this tool to determine the cost of the measures you have chosen and how long it will take for these measures to pay for themselves.

UNDER CONSTRUCTION

Incentives of up to \$4,000 are available to SCE and SoCalGas® residential customers with detached single-family homes (including all-electric) who complete qualifying energy-saving home upgrade projects. With a variety of participation options, you can correct your home's energy inefficiencies and reduce your monthly utility bills.

-SCE.com

Financial and Processing Incentive

CHAPTER FIVE

FINANCIAL INCENTIVES

To encourage participation in this Program, financial incentives are available to offset the costs of energy efficient upgrades. Incentives come in the form of private and public subsidies that support a variety of projects, including appliance upgrades and energy efficient building designs. The purpose of this section is to provide resources and information pertaining to current financial incentives for energy efficient upgrades.

The following websites and corresponding links provide incentive information:

Southern California Edison (SCE.com)

Rebates and Savings - SCE's Rebates and Savings homepage

Heating and Cooling - Rebates for products, installation and maintenance

Multifamily Energy Efficient Rebate Program - Offers property owners and managers incentives on a broad list of efficient improvements

ENERGY STAR (ENERGYSTAR.gov)

ENERGY STAR - Energy Star's homepage

Special Offers and Rebates - Check for special offers on qualified products

Energy Upgrade California (energyupgradeca.org)

Homeowners - Incentives offered to residential homeowners

Contractors - Incentives offered to licensed contractors

U.S. Department of Energy (energy.gov)

California Appliance Rebates - An application based, mail-in rebate program

Tax Credits - Federal tax credits for purchasing energy-efficient products

Edison International's subsidiary Southern California Edison (SCE) is the nation's largest purchaser of renewable energy, buying and delivering approximately 12.6 billion kilowatt hours (kWh) from wind, solar, biomass, geothermal and small hydro suppliers—almost 16 percent of the power it delivered to customers.

-SCE.com

CHAPTER SIX

Permitting Process

The VOLUNTARY GREEN BUILDING PROGRAM is designed to allow builders, developers and homeowners to go above and beyond California's Energy Code in terms of energy efficiency. As part of this Program, some Cities have committed to making it easier for those voluntarily participating in the Program to process their plans through the planning and building departments.

The requirements are different for each city. Please check the permitting process of your individual city.

Inspections by the City will continue to be required for the mandatory T24 requirements of the California Energy Code. These inspections are provided by the City's Staff (Building Department Inspector).

INSPECTIONS

The VOLUNTARY PROGRAM is self-reporting (except for the Title-24 credits.) It is based upon an honor system: you say you are going to do something to improve the energy efficiency of your building, and we believe that you will. However, there is great value to have third party verification of the actual installation of various measures.

Now, why do we say we will trust you, but not your contractor? Simply because the complexities and idiosyncrasies of every construction project present challenges to contractors. Sometimes they miss something, overlook something or simply make a mistake. It is in your interest to confirm that what the plans and specifications state, and what you pay for, are actually well-executed.

Therefore both the California Energy Code and the VOLUNTARY PROGRAM place high value on third party verification of four major elements: insulation, duct leakage, whole house leakage, and HVAC equipment. The first three require careful attention to detail and connections. Insulation and ducting is often installed improperly. HVAC requires proper sizing of the equipment prior to purchase. By inspecting insulation and duct work before walls are closed up (so errors can be corrected), the overall performance of the building is greatly enhanced. Professionals such as Home Energy Rating System (HERS) inspectors, are available to provide these services.

Every process of manufacturing and fabrication requires quality control; you can think of third-party verification as construction quality control.

WHERE TO LOOK

Where else to look for information...

Energy conservation is on everyone's mind, but it isn't always easy to find your way around all the programs and websites.

Below are links to some of these organizations - ones we think are especially relevant to our Desert Climate. By no means is the list comprehensive, but it will get you started looking for more information - or the same information presented differently.

Southern California Edison

<http://www.sce.com>

The California Energy Commission

<http://www.energy.ca.gov/title24/>

California State Energy Code

<http://www.bsc.ca.gov/Home/CALGreen.aspx>

United States Green Building Council

<http://www.usgbc.org>

Build It Green

<http://www.builditgreen.org/greenpoint-rated/>

California Energy Upgrade

<https://energyupgradeca.org/>

COLLEAGUES

ARCHITECTS AND DESIGNERS:

The Voluntary Green Building Program and this GUIDE are learning tools. As practitioners, we know how overwhelming and intimidating Building Codes are – for us and our clients. So we start with practical questions: “What should I do?” (to save money and energy). We give some simple practical steps, and then we illustrate the principles that underlie energy efficiency.

By starting simple and explaining terms and ideas, we hope everyone who uses this Program will have discussions about what options are available and appropriate for their project. Our goal is to bring “green” into the entire process of imagining, designing and building.

CONTRACTORS:

The Voluntary Green Building Program and this Guide are intended to help everyone who uses this Program understand the principles of energy efficient building. We have organized the Program and this GUIDE around the practical question “What should I do? (to save energy and money)”.

The Program is set up so you and your client can discuss the options available and appropriate for their project. Using the Program to help explain the principles behind energy efficient building, you can be an advisor as well as a builder.

Finally, the California Energy Code and the construction industry will continue to evolve toward the goal of “net zero” buildings. Becoming an advocate and expert now places you as a leader in your industry.

COLLEAGUES

CITY STAFF:

We all recognize that the California Energy Code continues to evolve. The COACHELLA VALLEY GREEN BUILDING PROGRAM (CVGBP) is voluntary. We see it as a “soft opening” to energy efficient measures that will soon be mandatory.

The Program is also a learning tool to help explain both the “what and why” of energy efficiency building. We start by asking “What should I do? (to save energy and money)”. We then illustrate and explain specific measures (cool roof) so that the owner, the designer, the contractor can all discuss the options that are available and appropriate.

The Program is intended to be a learning tool to help demystify the California Energy Code and other energy efficiency measures. Because the Program is voluntary, it is more an invitation than a mandate for the entire project design team to consider energy efficiency from the initial concept through the entire construction process.



www.greenforlifecv.org