California Energy Policy How Can Raters Help?

Bill Pennington

California Track

2008 RESNET Building Performance Conference
February 18, 2008

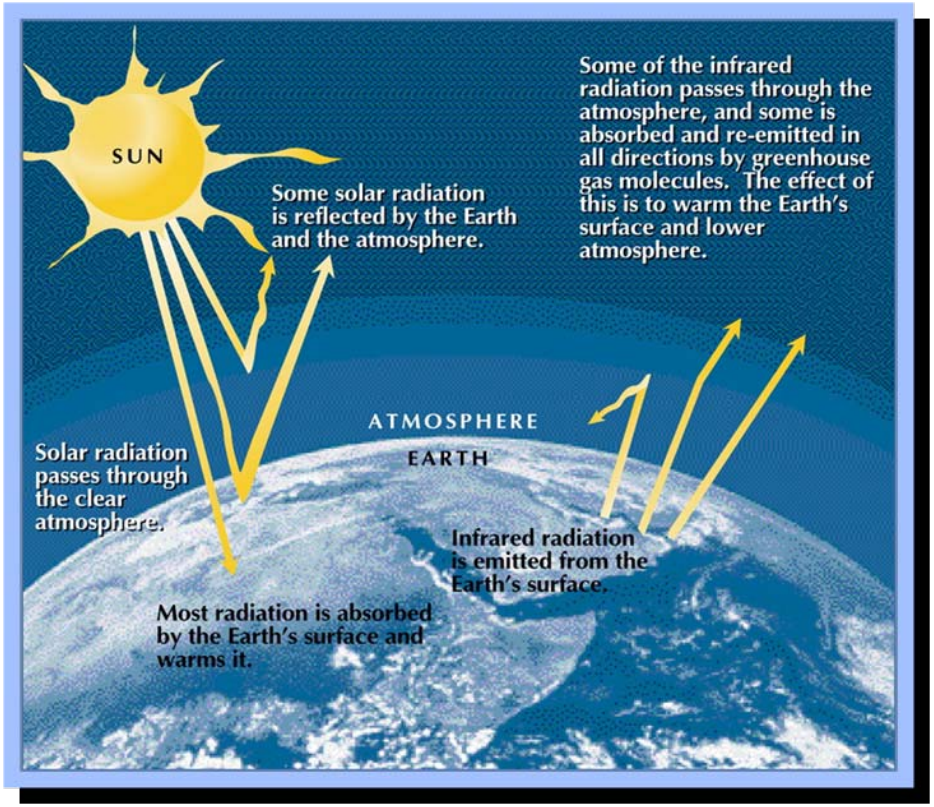
San Diego, California

EFFICIENCY · ENERGY FOR THE FUTURE ·

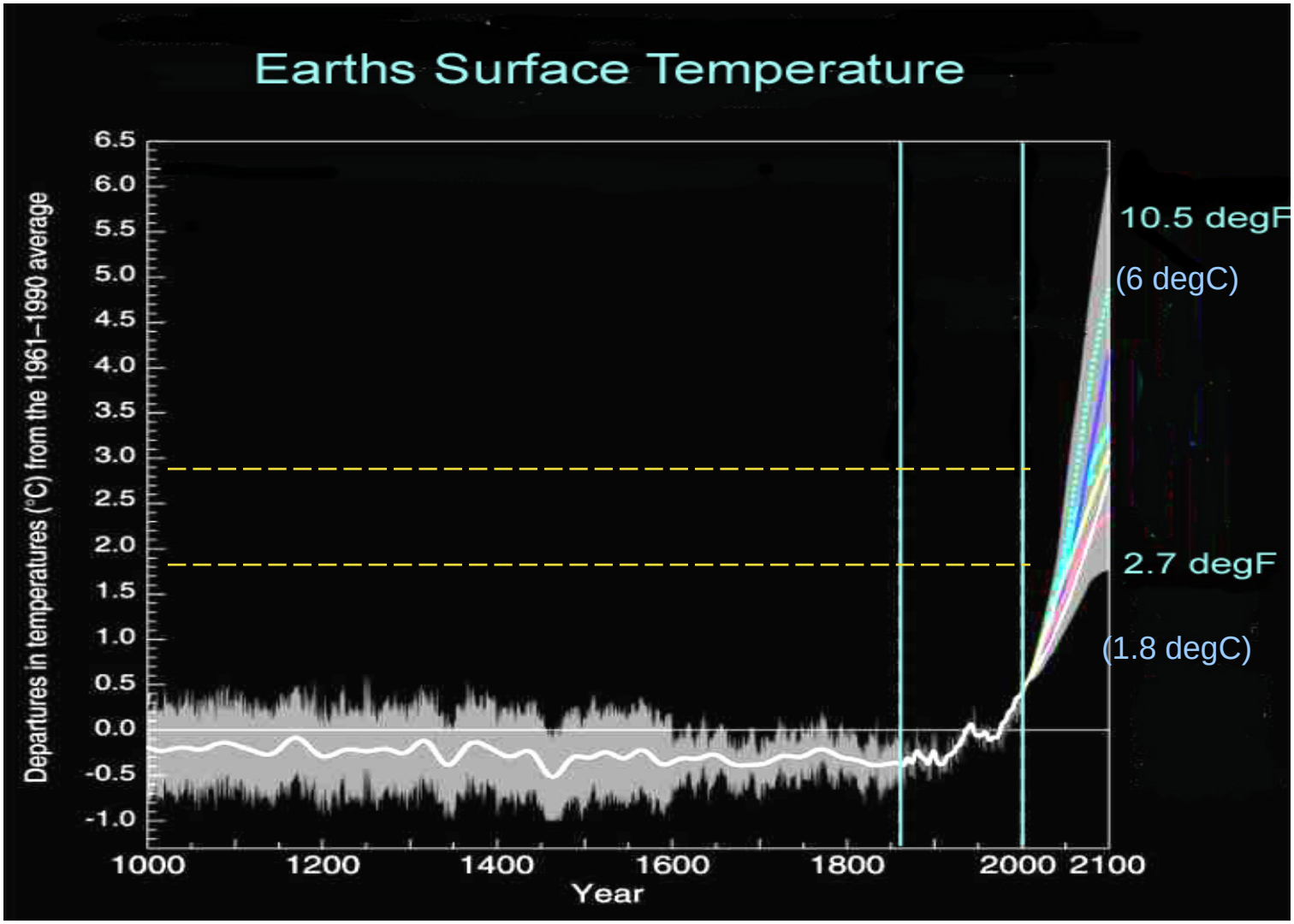
Climate Change – The Top Priority

"The debate is over. We know the science. We see the threat. And we know that the time for action is now."

Governor Arnold Schwarzenegger

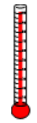


EFFICIENCY · ENERGY FOR THE FUTURE ·



Source: UN Intergovernmental Panel on Climate Change (IPCC)

Climate Changes



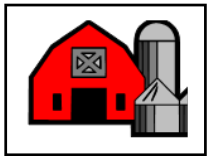
Temperature Increase

Precipitation Patterns and Extremes

Sea Level Rise

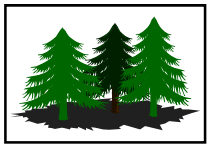
Health

Air Quality - Respiratory Illness
Weather-related Mortality
Infectious and Tropical Diseases



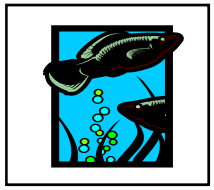
Agriculture

Crop Yields
Irrigation Demands



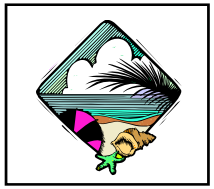
Forests

Forest Composition
Geographic Range of Forests
Forest Health and Productivity



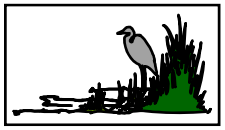
Water Resources

Water Supply
Water Quality
Competition for Water



Coastal Areas

Erosion of Beaches
Inundation of Coastal Wetlands
Additional Costs to Protect Coastal Communities

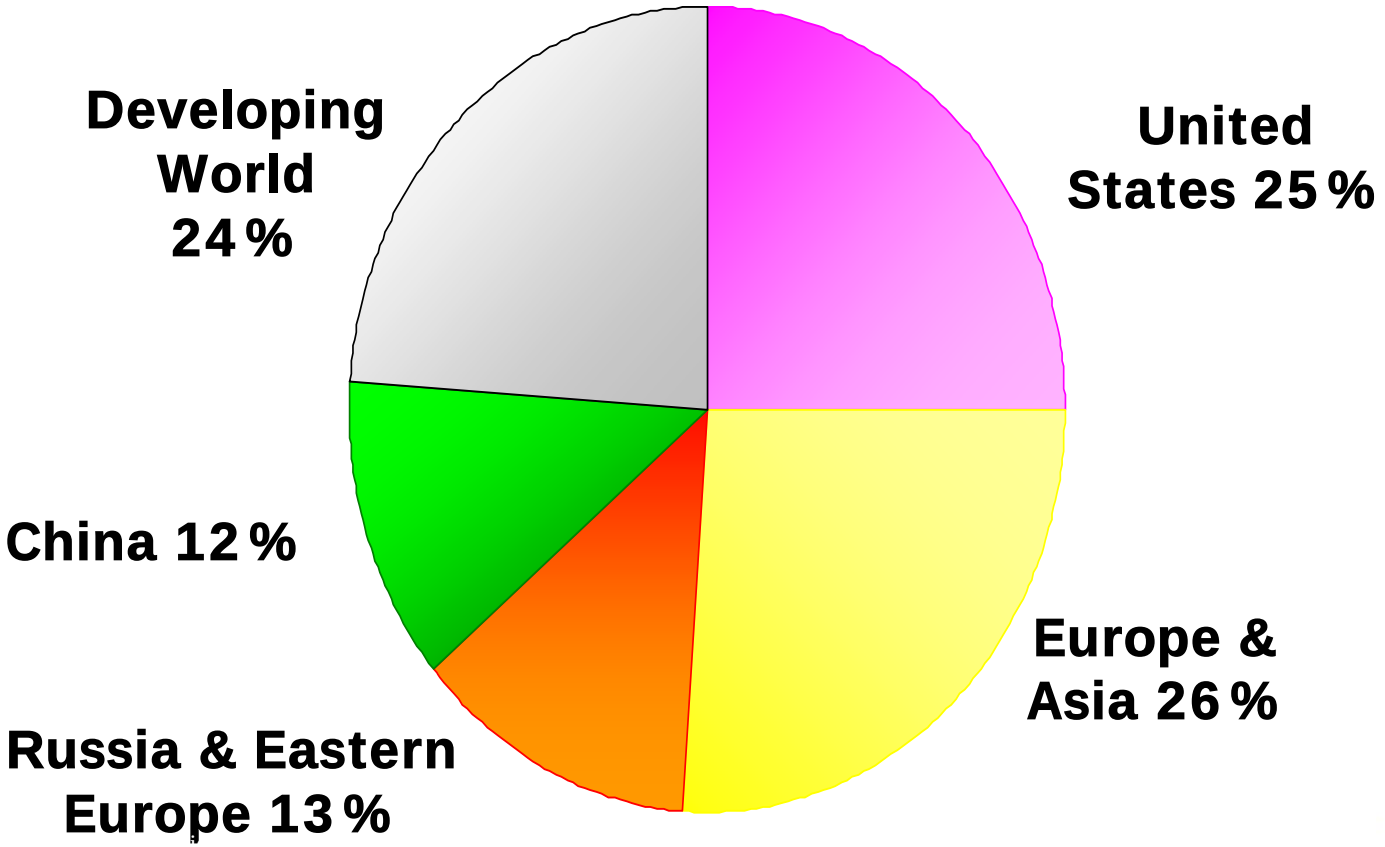


Species and Natural Areas

Loss of Habitat and Species

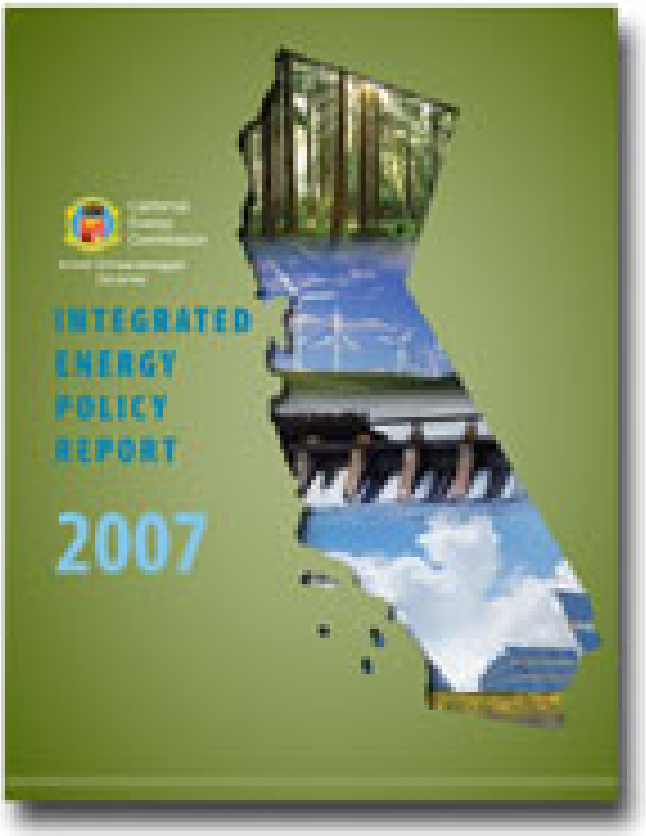
EFFICIENCY · ENERGY FOR THE FUTURE ·

U.S. Is The Largest Single Contributor To Greenhouse Gas Emissions



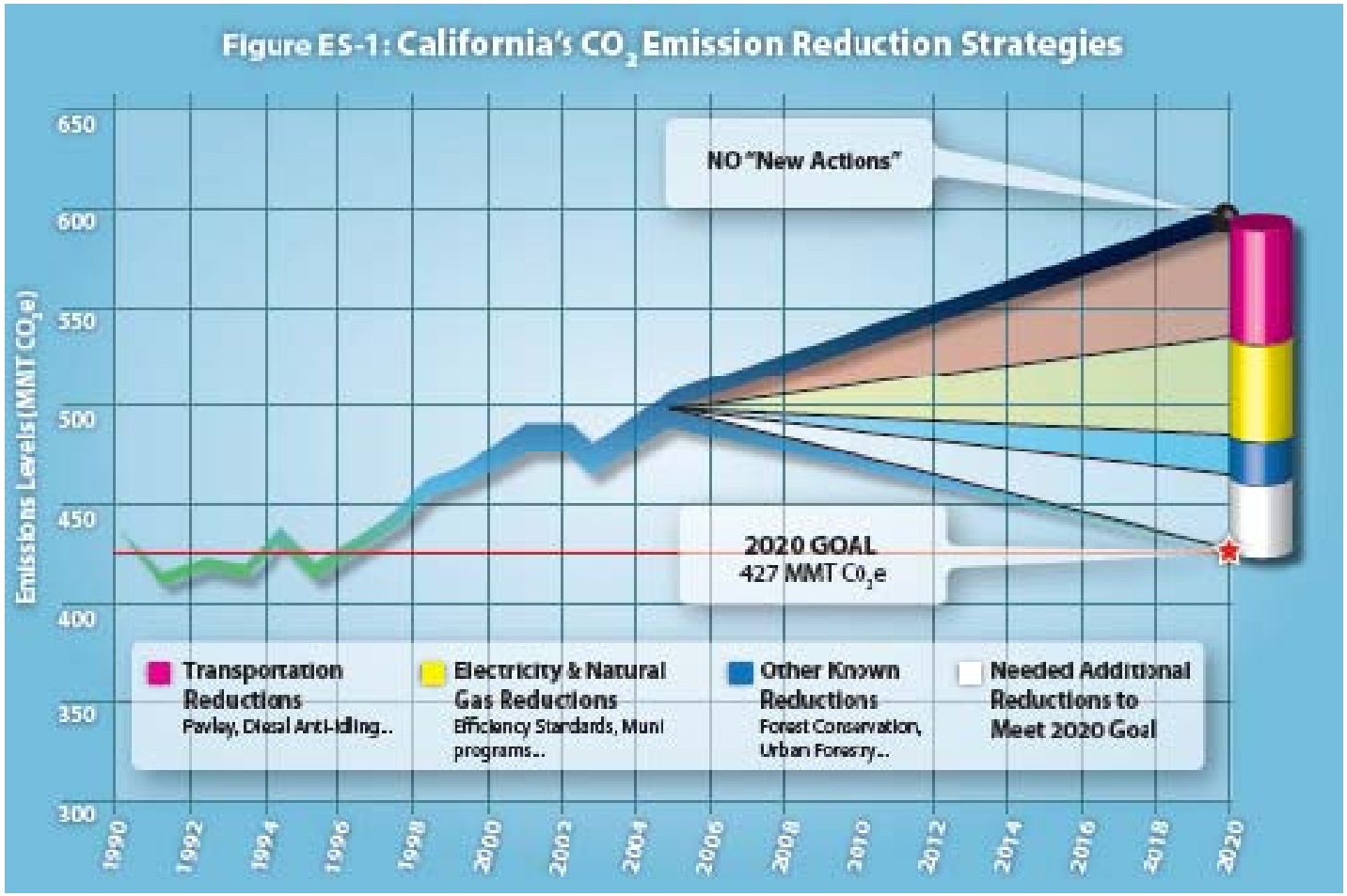
EFFICIENCY · ENERGY FOR THE FUTURE ·

- California is 5th Largest Economy in the World
- California is the 12th Largest GHG Emitter in the World
- Governor Schwarzenegger and
- California Legislature (AB 32, California Global Warming Solutions Act of 2006) mandate that California reduce its GHG Emissions to 1990 levels by 2020

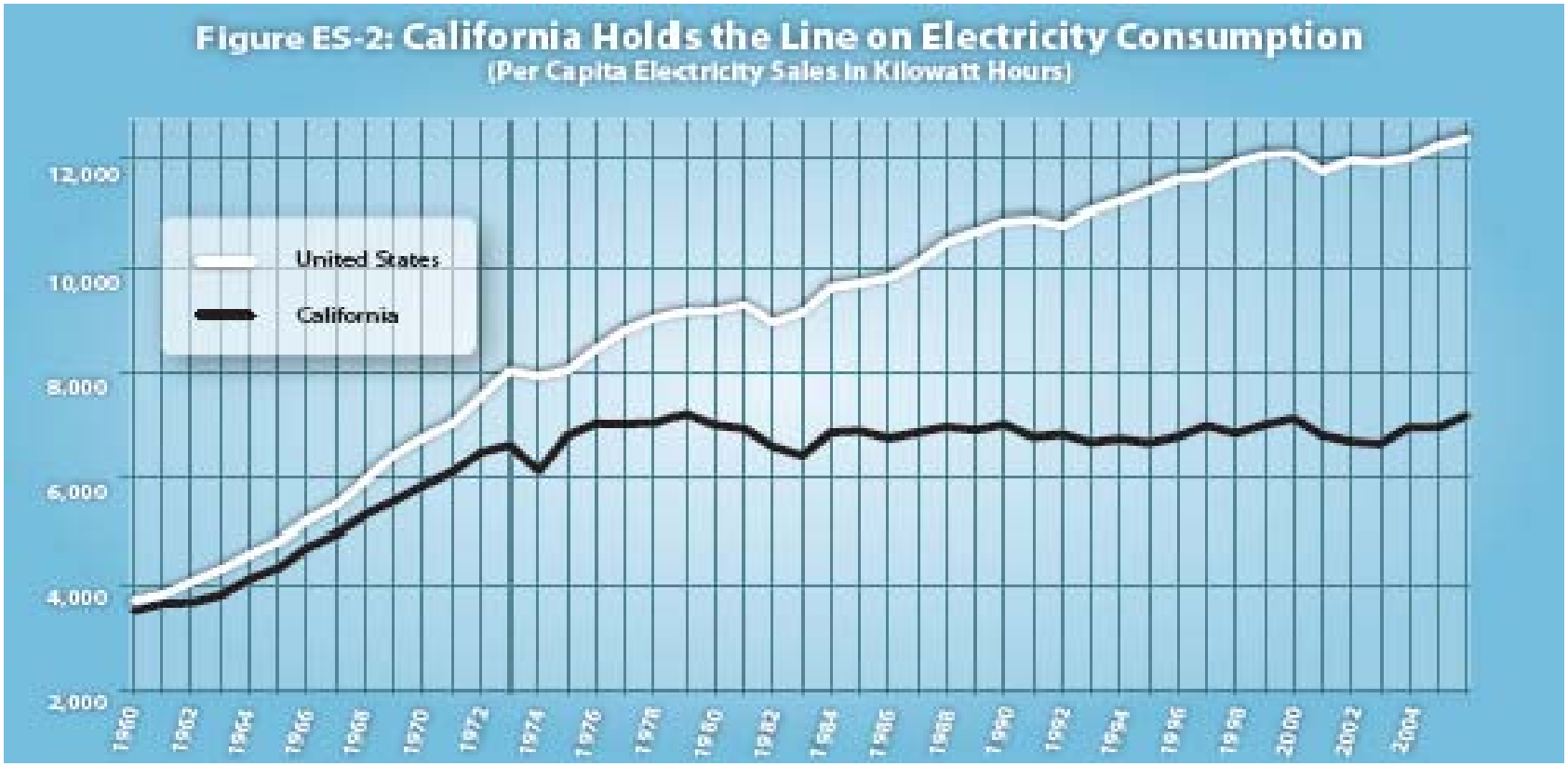


- California Law Requires Integrated Energy Policy Report
- Integrated Assessment of Energy Trends and Issues
- California's Energy Policy to
  - Conserve Resources
  - Protect the Environment
  - Ensure Reliable, Secure and Diverse Energy Supply
  - Enhance State Economy
  - Protect Public Health and Safety
- AB 32 Upped the Ante
- Moving Forward in a Carbon Constrained World

energy.ca.gov/2007_energypolicy/documents/index.html



EFFICIENCY · ENERGY FOR THE FUTURE ·

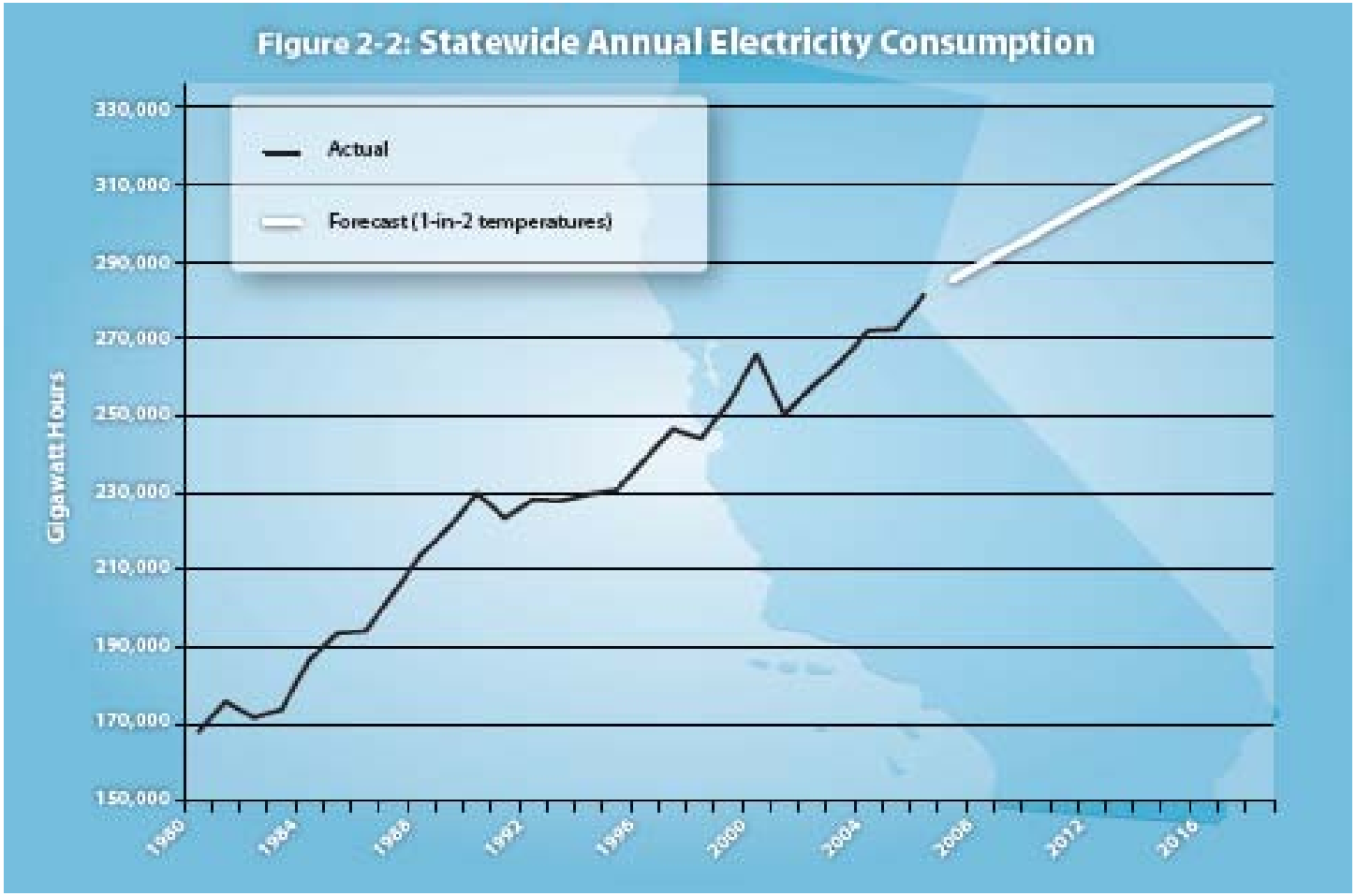


EFFICIENCY · ENERGY FOR THE FUTURE ·

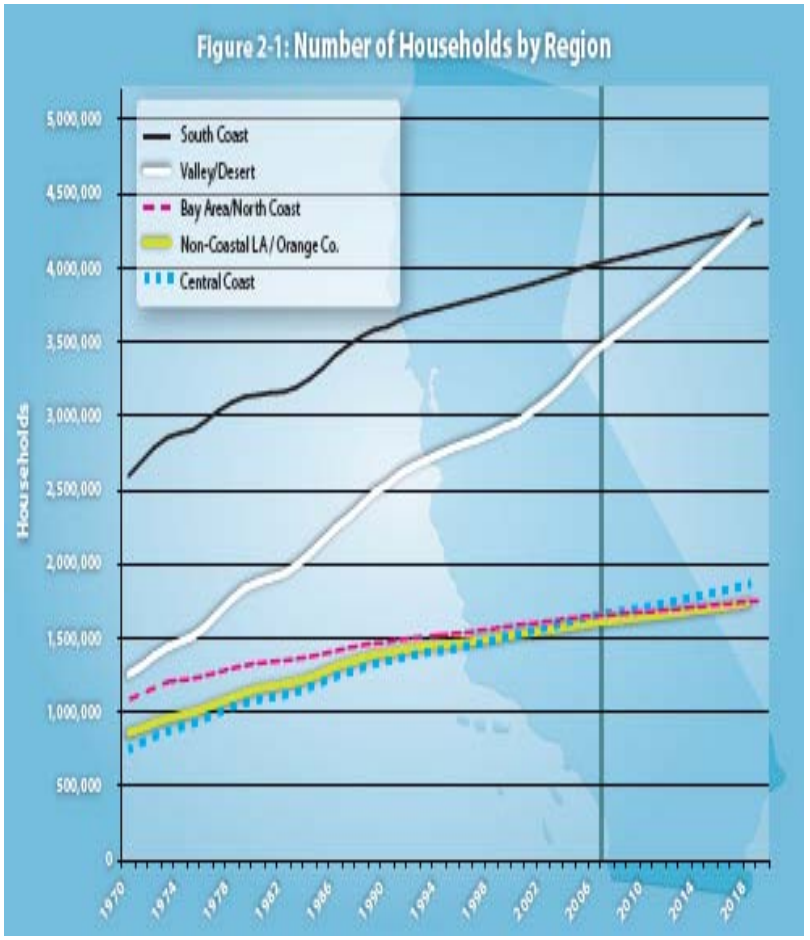
Its All About Population Growth

- 1 in 8 Americans live in California
- 37 million - 33rd largest in the world
- Population doubled since 1965, fastest growing developed area in the world
- Growing to 44 million by 2020
- And to 60 million by 2050

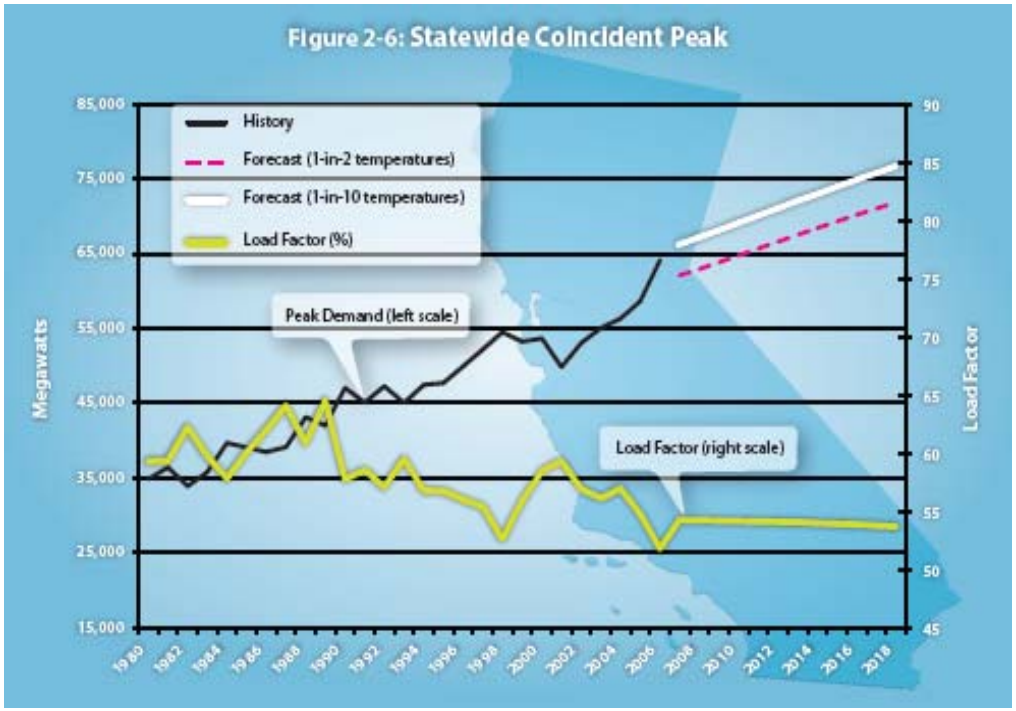
EFFICIENCY · ENERGY FOR THE FUTURE ·

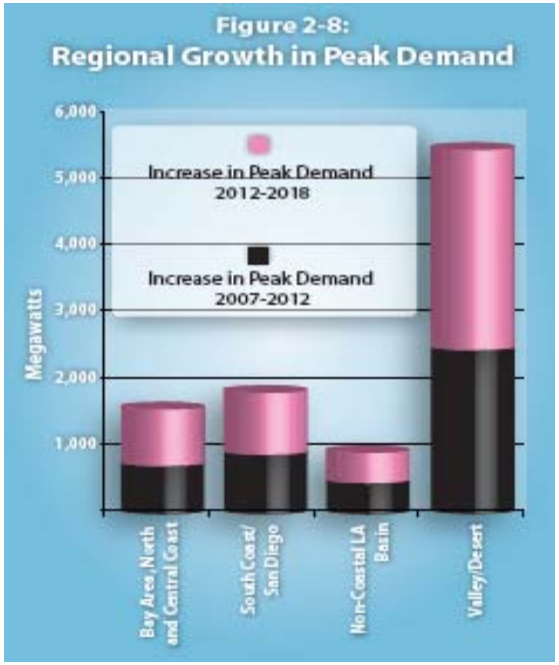


EFFICIENCY · ENERGY FOR THE FUTURE ·

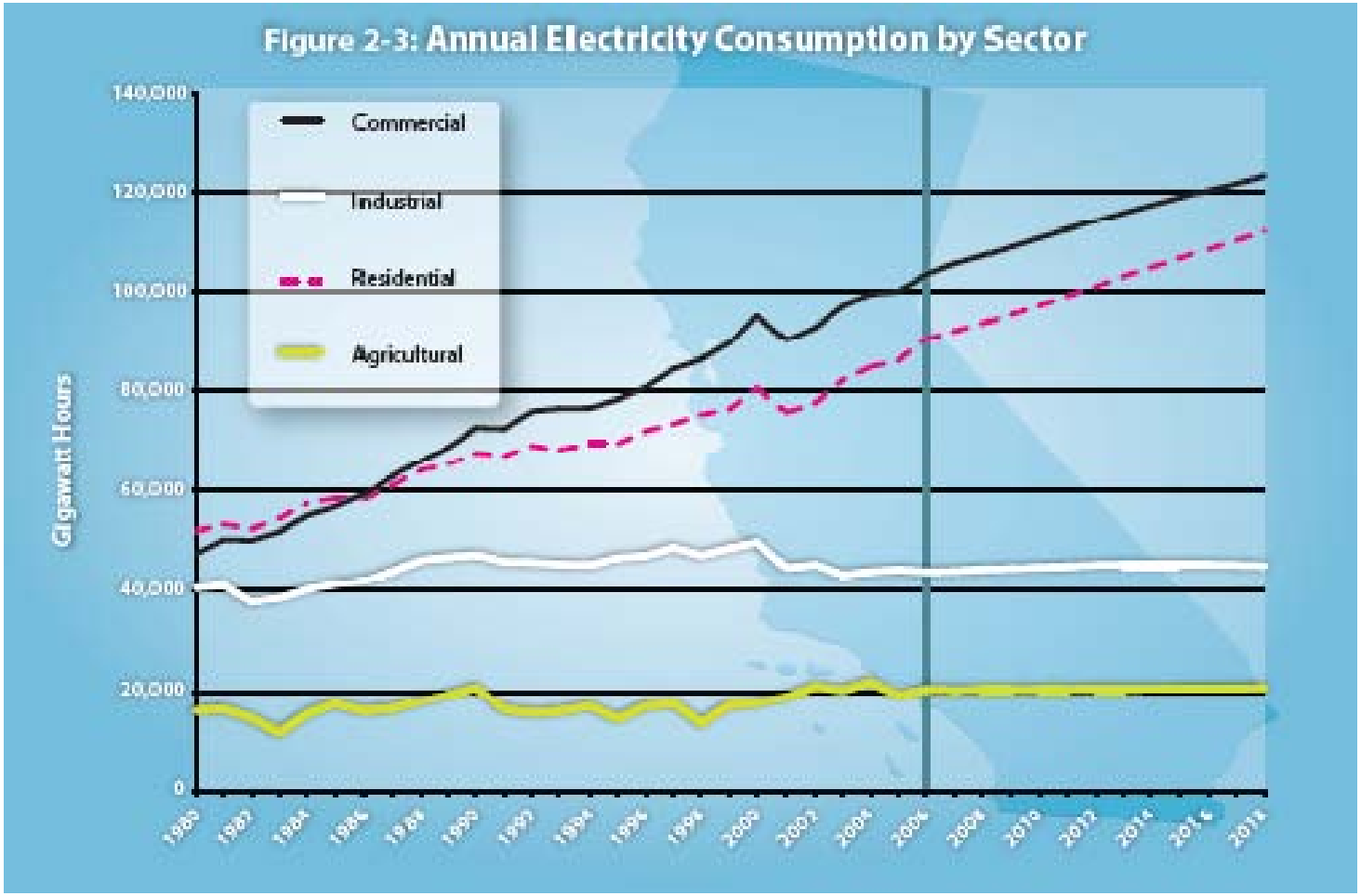


EFFICIENCY · ENERGY FOR THE FUTURE ·



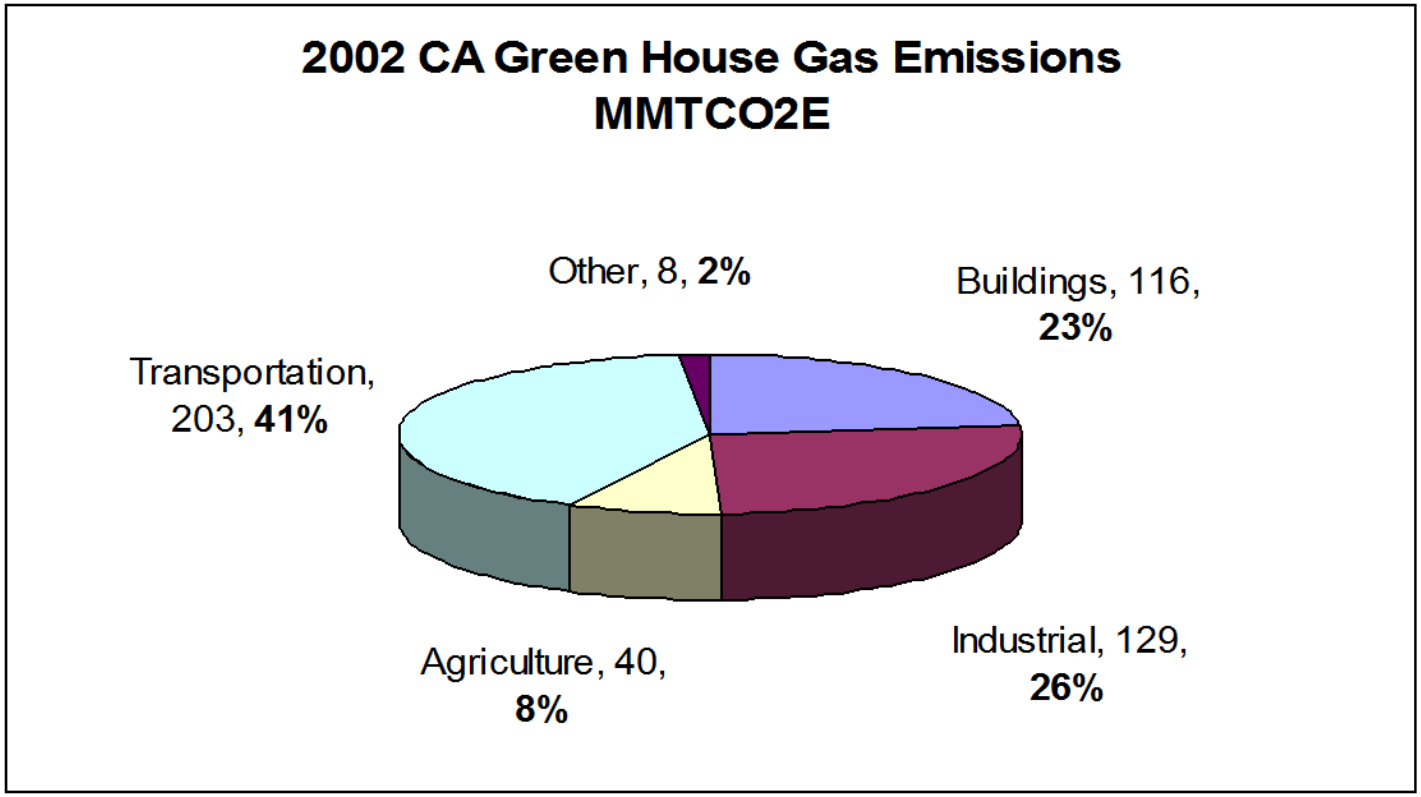


EFFICIENCY · ENERGY FOR THE FUTURE ·



EFFICIENCY · ENERGY FOR THE FUTURE ·

Buildings Are a Major Contributor to GHG Emissions



Energy Efficiency & Renewables

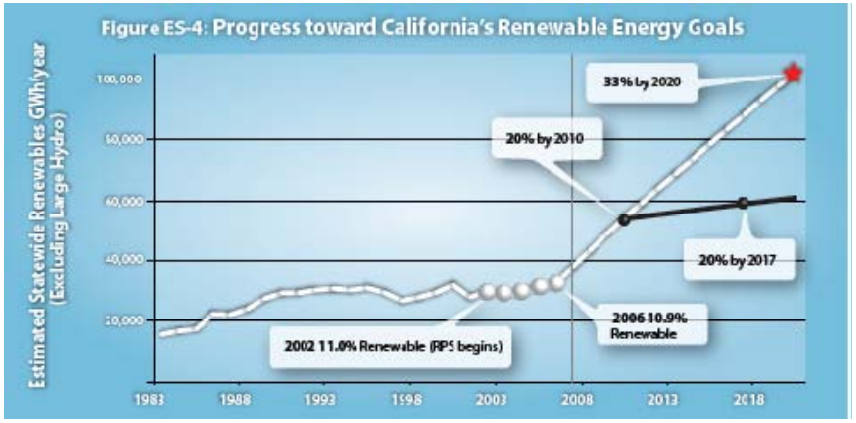
- Top of the Loading Order
- Vigorous Efficiency Baseline
  - Aggressive Building and Appliance Standards
  - $2 Billion for 2006 – 2008 Utility Programs
- SB 1 PV Programs - $3.35 Billion by 2018
- Renewable Portfolio Standard Goals

"Energy conservation is the foundation of energy independence."

Tom Allen, U.S. Representative, R-Maine

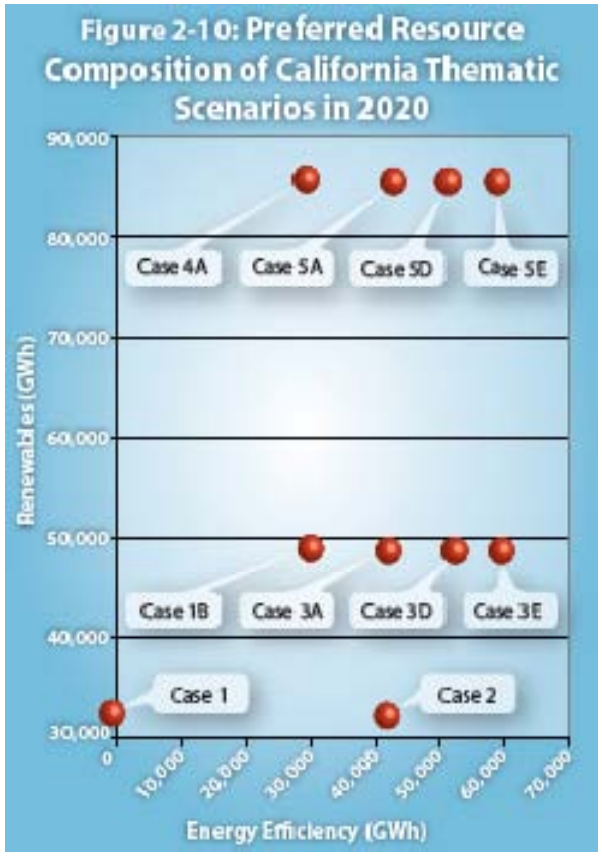
"I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait 'til oil and coal run out before we tackle that."

Thomas Edison



EFFICIENCY · ENERGY FOR THE FUTURE ·

How Do We Get There Scenario Analysis



- Case 1 – Business As Usual
- Case 1B – Current Aggressive EE, RPS and PV Goals
- Cases 3A, 3D and 3E - Additional Expanded Energy Efficiency
- Cases 4A, 5A, 5D, 5E – Adds Expanded PV and

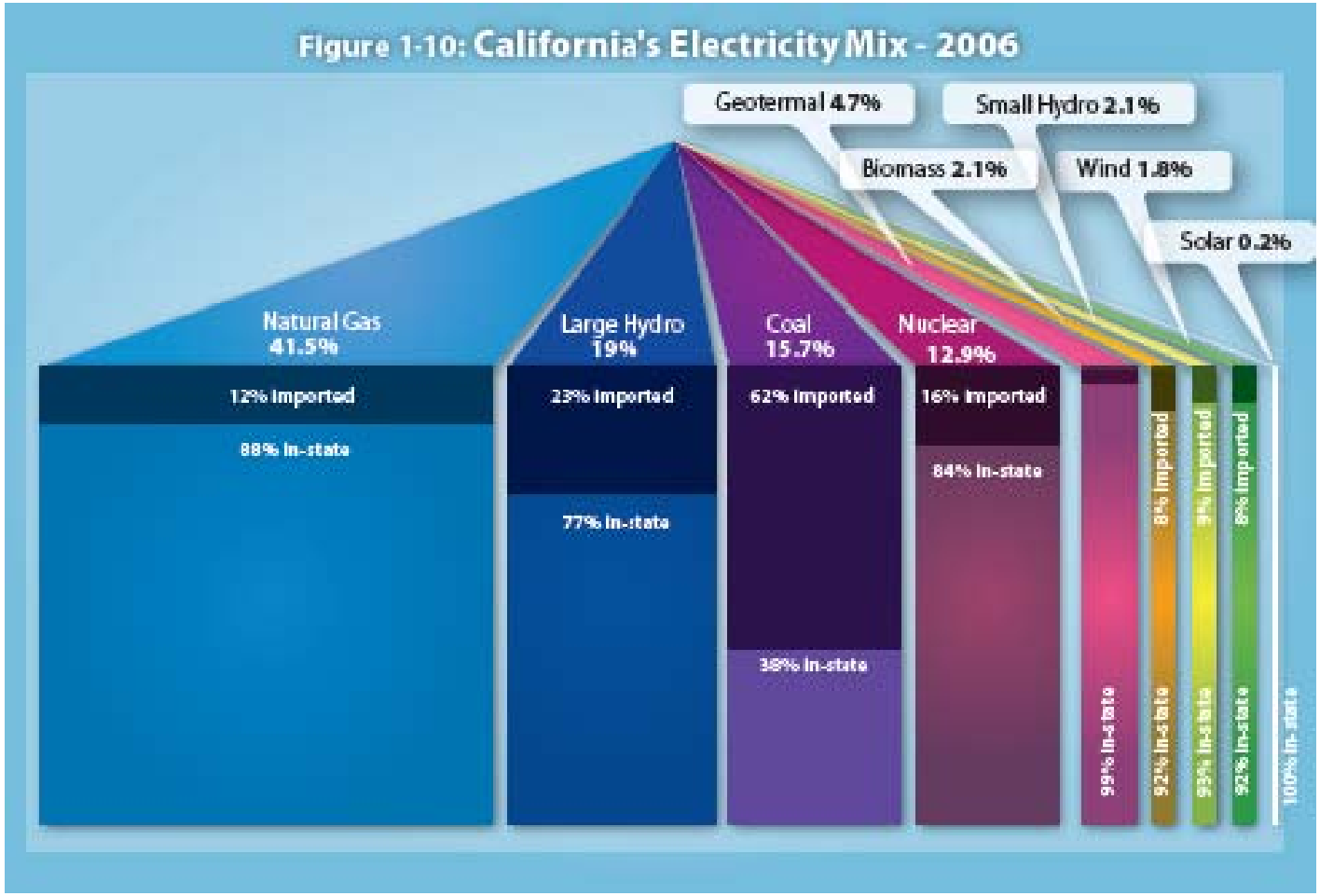
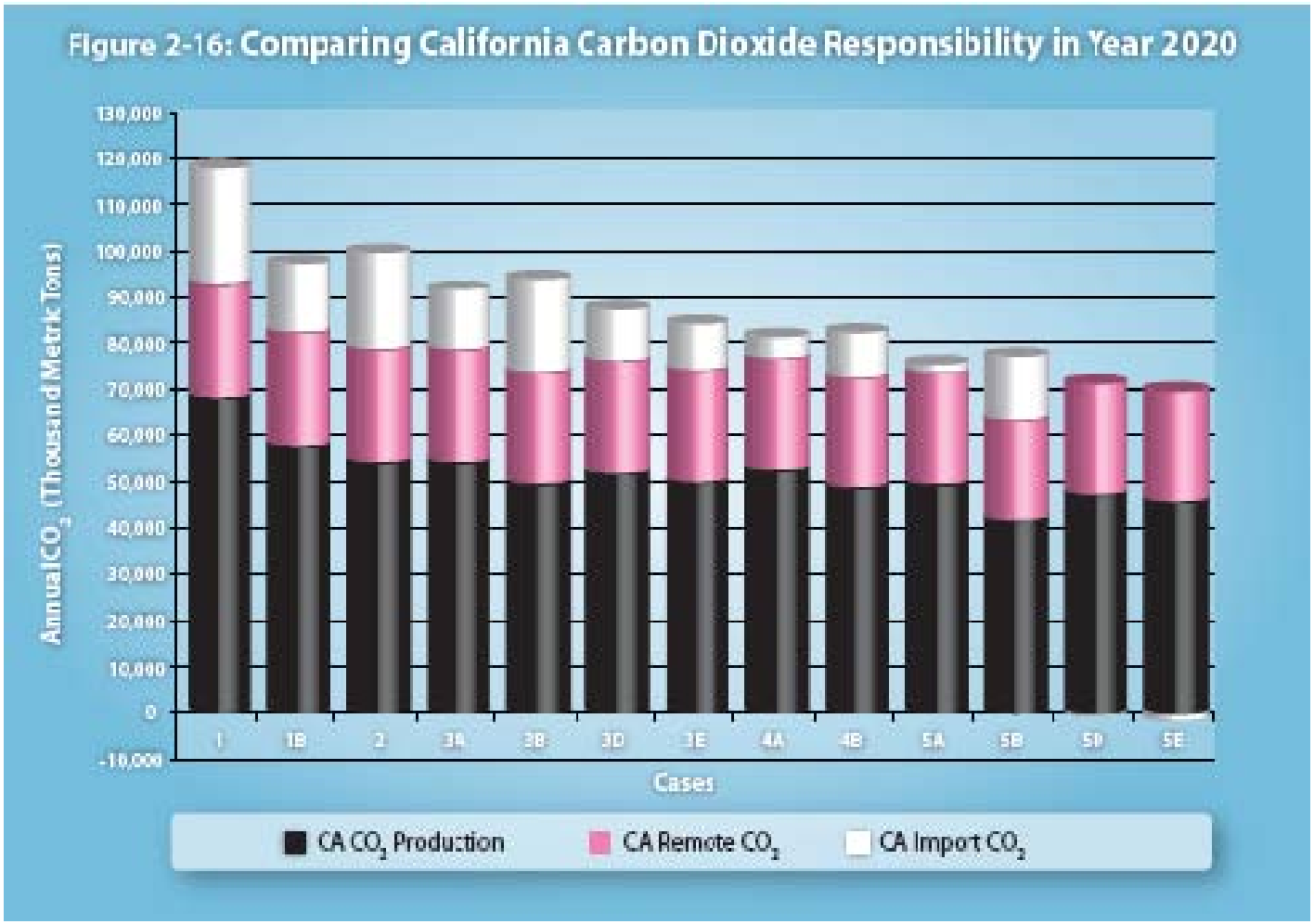
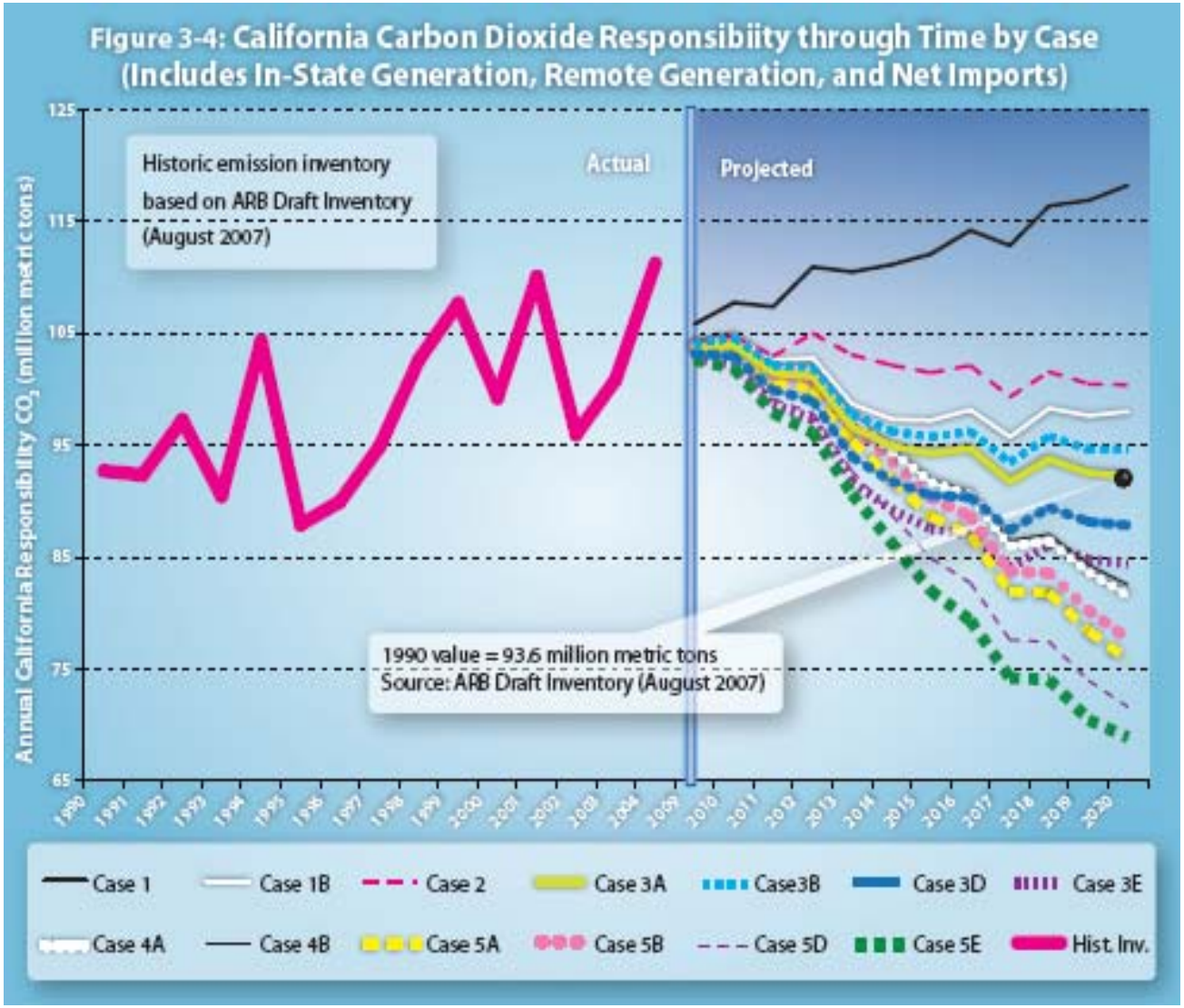


Figure 1-10: California's Electricity Mix - 2006
Geothermal 4.7%
Small Hydro 2.1%
Biomass 2.1%
Wind 1.8%
Solar 0.2%
Natural Gas 41.5%
Large Hydro 19%
Coal 15.7%
Nuclear 12.9%
12% Imported
88% In-state
23% Imported
77% In-state
62% Imported
38% In-state
16% Imported
84% In-state
1% Imported
99% In-state
8% Imported
92% In-state
7% Imported
93% In-state
8% Imported
92% In-state
100% In-state



EFFICIENCY · ENERGY FOR THE FUTURE ·



EFFICIENCY · ENERGY FOR THE FUTURE ·

EFFICIENCY · ENERGY FOR THE FUTURE ·

California's Water: A CRISIS WE CAN'T IGNORE.

www.energy.ca.gov/2005_energypolicy/index.html

Table 3:
2001 Water-Related Energy Use In California

	Electricity (GWh)	Natural Gas (Mill. Therms)	Diesel (Mill. Gallons)
Water Supply and Treatment			
Urban	7,554	19	?
Agricultural	3,188		
End Uses			
Agricultural	7,372	18	88
Residential Commercial Industrial	27,887	4,220	?
Wastewater Treatment	2,012	27	?
TOTAL	48,012	4,284	88
2001 Consumption	250,494	13,571	?
Percent of Statewide Energy Use	19%	32%	?

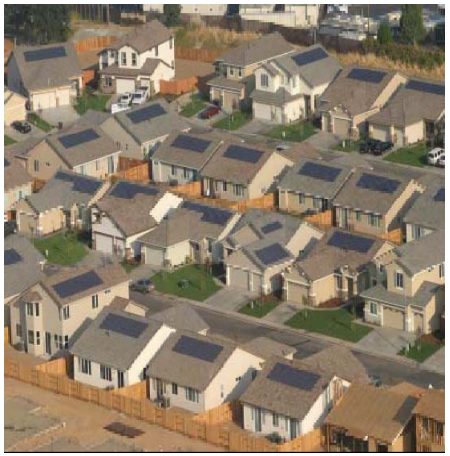
EFFICIENCY · ENERGY FOR THE FUTURE ·

Recent/Coming Program Initiatives

- New Solar Homes Partnership
- SB 1 Eligibility Criteria
- 2008 Building Energy Efficiency Standards
- Next Generation Appliance Efficiency Standards
- Green Building Standards
- Home Energy Ratings for Existing Buildings
- Big/Bold Initiatives
- Water Efficiency in the Standards
- Photovoltaics in the Standards
- Affordable Housing

"There are risks and costs to a program of action. But they are far less than the long-range risks and costs of comfortable inaction."
John F. Kennedy

New Solar Homes Partnership



- Achieve Dramatic Penetration of Highly Energy Efficient, Solar Powered Homes
- $400 Million Over 2007-2011
- Targeted at California Production Housing
- Expected Performance Based Incentives – Field Verification of Photovoltaic Installations
- Field Verified Energy Efficiency – All Measures
  - Tier I – 15% Better Than Title 24 Energy Budget
  - Tier II – 35% Better Than Title 24 Energy Budget and 40% Better Than Title 24 Cooling Budget
  - Energy Star Appliances
- Over 1,000 Applications to Date; 2/3 Tier II

SB 1 Eligibility Criteria

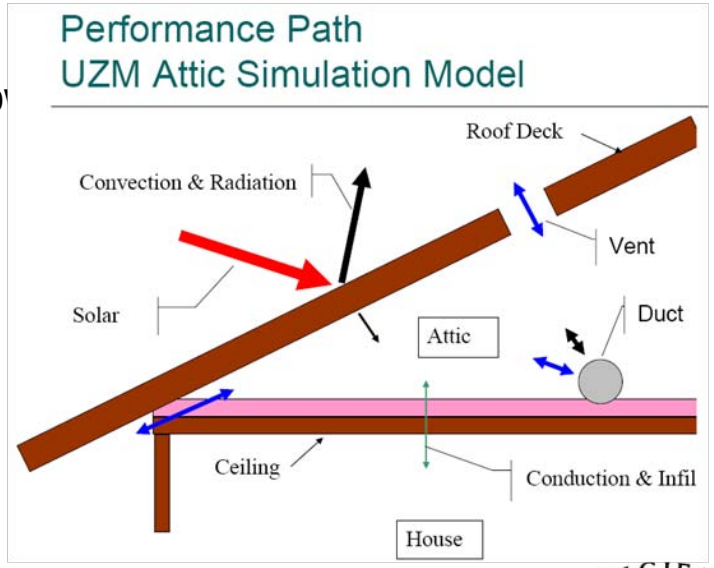
www.gosolarcalifornia.ca.gov/

- California Policy – High Energy Efficiency is Condition for Photovoltaic Incentives

- Direction to CEC, CPUC, POUs
- $3.35 Billion Incentives for PVs through 2018
- Extends NSHP to all new residential PV programs
- Aggressive EE for new and existing commercial
- Foot-in-the-door EE for existing residential

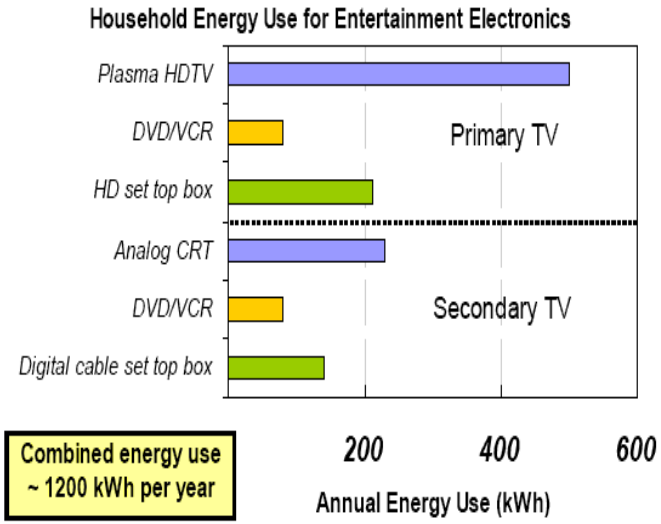
2008 Building Efficiency Standards

- Substantial Tightening of Residential Energy Budget (Varies by Climate Zone; Averages About 15%)
- Budget Based on:
  - 0.40 U-factor for windows
  - Field Verified Furnace Fan Energy
  - Field Verified Refrigerant Charge and Airflo
- Mechanical Ventilation per ASHRAE 62.2
- Improved Attic Model; Higher credit for duct sealing, radiant barriers and cool roofs
- Increased focus on compliance credit for field verified measures:
  - Buried ducts
  - Duct design
  - Quality Insulation Installation
  - Air Conditioner Sizing
  - Envelope Sealing
- Improved Approach for Electronic Data Registry of Compliance Forms
- Increased Effort to Improve Building Department Enforcement
- Cool Roofs Required at Reroofing



Next Generation Appliance Efficiency Standards

- AB 1109 California Lighting Efficiency Act
  - Adopt Federal Efficient Light Bulb Standard Early
    - Tier I – 20+ Lumens/Watt; California Effective 2011
    - Tier II – 45 Lumens/Watt; California Effective 2018
  - 2018 Lighting Savings Requirements
    - Residential – 50% of 2007 Use
    - Commercial and Outdoor – 25% of 2007 Use



- Battery Chargers
- Televisions and Consumer Electronics
  - Start with Televisions
  - Move to Set Top Boxes, Video Display Equipment, Game Consoles

California Green Building Standards

- State Agencies with Building Code Authority Working Together to Develop State Green Building Standards
  - Lead – CBSC for Commercial; HCD for Residential
  - Planning and Design, Energy Efficiency, Water Efficiency, Material Conservation, Environmental Quality
- CEC Advocating Field Verified NSHP Levels
- Expected to be Used for Local Green Ordinances

"I am directing the California Building Standards Commission to work with specified state agencies on the adoption of green building standards for residential, commercial, and public building construction for the 2010 code" – Governor Schwarzenegger.

Home Energy Ratings for Existing Buildings

www.energy.ca.gov/HERS/booklet.html

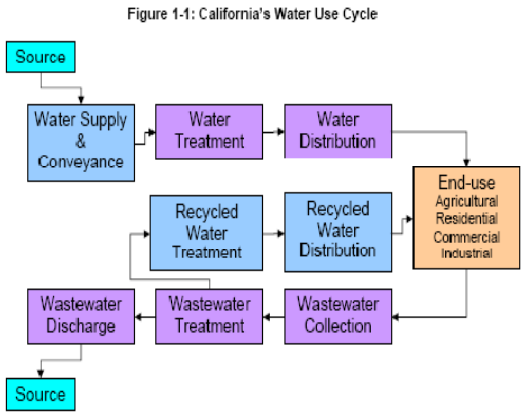
- AB 549 Point-of-Sale Project Timeline
  - Point-of-Sale Booklet – 2007
  - Home Energy Rating Program Rules – 2008
  - Home Energy Rating Program Booklet – 2009
  - Real Estate Industry Training – 2009
  - Point-of-Sale Pilot Program – 2010
  - Statewide Point-of-Sale Program – 2011
- Further Legislation May Accelerate

Big/Bold Strategies
IEPR Zero Energy Buildings Goal

- CPUC Approved Big/Bold Strategies
  - Zero Energy New Homes By 2020
  - Zero Energy New Commercial Buildings By 2030
    - Industry Collaboration For Verified Quality Installation and High Efficiency HVAC Systems

- IEPR Zero Energy Buildings Goals
  - Achieve in Building Standards (EE + PV)
- Strategic Planning for 2009 – 2011 Utility Programs
  - NSHP Tier II Energy Efficiency Levels
  - Focused Attention on Verified HVAC Quality
    - Strategies to Increase Pulling Permits, Incentives, Recognition, Create California Quality Brand, Consumer Marketing

Water Efficiency in the Standards



- AB 1881 – Directed to Adopt Standards for Landscape Irrigation Controllers
- AB 662 – Authority to Adopt Appliance Standards for Water Efficiency
- AB 1560 – Authority to Adopt Building Standards for Water Efficiency

- Historically, Standards have Addressed Only Water Heating Energy (Showerheads, Water Heaters, Pipe Insulation)
- Legislation Enables Standards to Address Energy due to Cold Water Use (Energy Upstream of End-Use)
- Allows Water Use Savings to be Included in Cost Effectiveness Justification of the Standards

Affordable Housing

- NSHP Places Special Emphasis on Affordable Housing
- Verified Energy Efficiency and Verified PV Installations
- Incentives Coordinated with State/Federal Tax, PV Incentives & IOU EE Incentives
  - Working to Eliminate Disincentives
  - Utility Allowance Calculator
  - Energy Bill Savings Can Count for Project Capitalization
  - Reviewing Utility Metering Rules That Block PVs

Solara, High Efficiency Solar Low-Income Apartment Community, Poway, California

Increasing Reliance on HERS Raters

- Field Verified Measures are Increasingly Specified for Title 24 Compliance
- Tighter Energy Budgets and Need for Compliance Credit Under 2008 Standards
- NSHP PV Verification and Tier I and II
- Extension of NSHP Tiers to Green Buildings, Big/Bold, Affordable Housing
- Climate Change Efforts Will Increasingly Call for Reliable, Verified Energy/Carbon Savings
- HERS Ratings at Point-of-Sale Coming

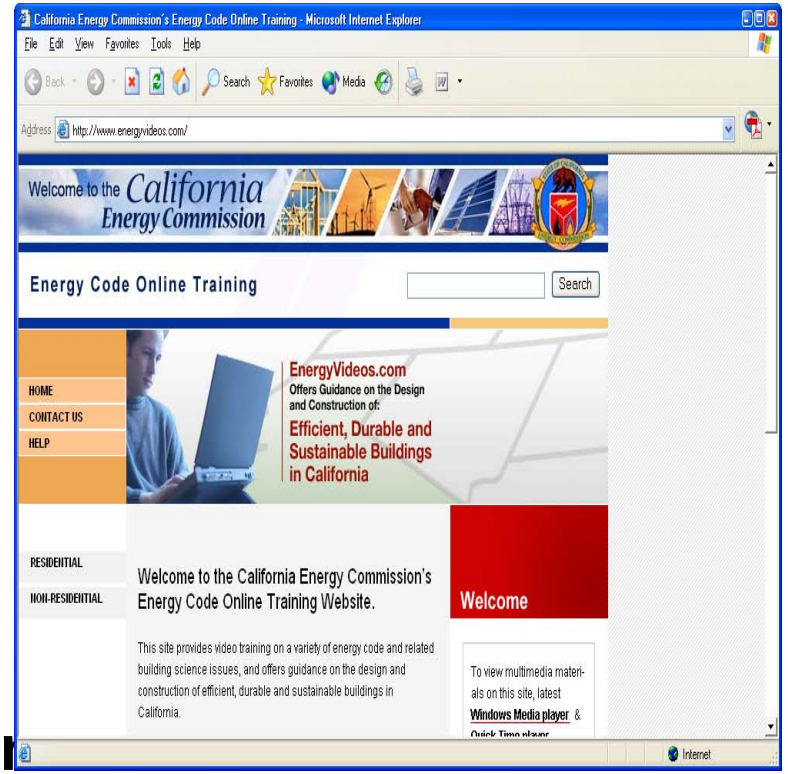
www.energy.ca.gov

- Title 24 Building Standards
- Compliance Manuals

- Online Training Videos
- BluePrint (Seeking Excellence)
- HVAC Changeouts

- New Solar Homes Partnership
- Appliance Efficiency Regulation
- Climate Action Initiative

- bpenning@energy.state.ca.us



EFFICIENCY · ENERGY FOR THE FUTURE ·