

Keynote: The Next Level of Energy Efficiency

Dian Grueneich

Stanford University | Precourt Institute for Energy



8th Annual Statewide Energy Efficiency Forum

**Save Money, Save the World—
The Next Level of Energy Efficiency**

Dian Grueneich

dgrueneich@stanford.edu

June 15, 2017

Stanford | Precourt Institute for Energy

HOOVER INSTITUTION



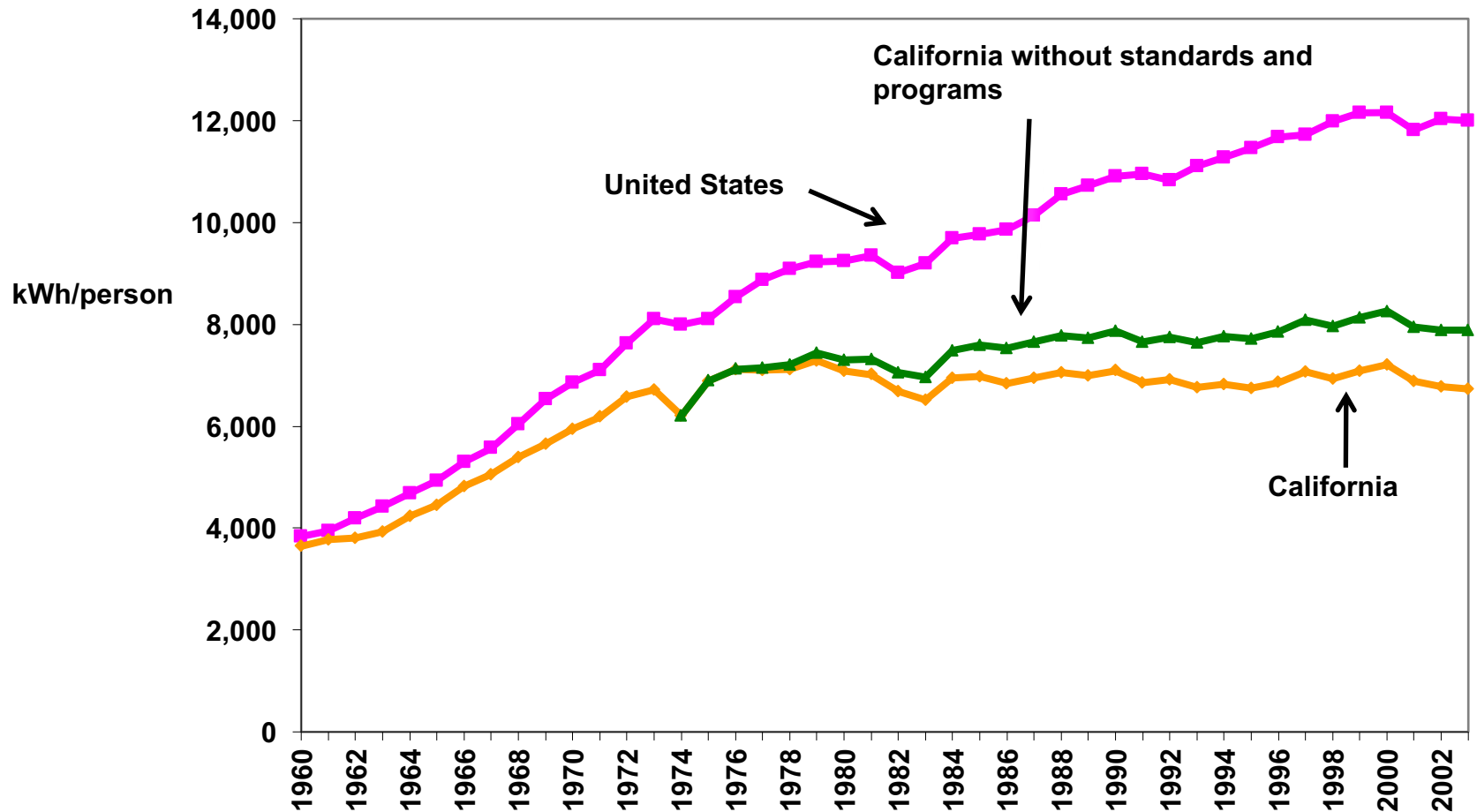
SHULTZ-STEPHENSON TASK FORCE ON
Energy Policy

Topics

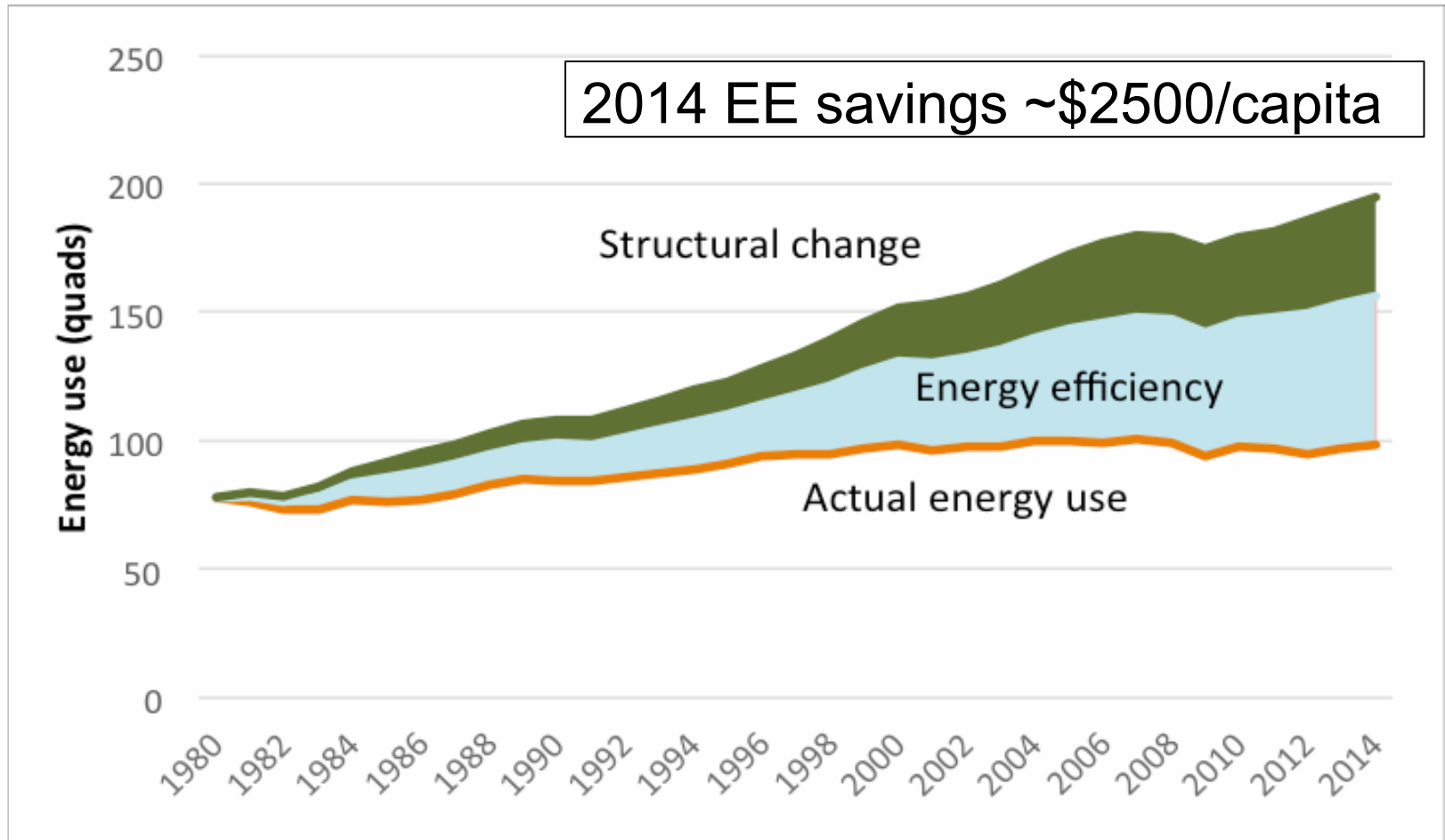
- Why Am I Optimistic?
- California's Future Driven By Climate Change
- What Are the Challenges?
- What Must We Do For The Next Level of Energy Efficiency?

Why Am I Optimistic?

Per Capita Electricity Sales (not including self-generation)



U.S. Energy Use Since 1980



Source: ACEEE, EE in US, 2015

Back to California's Leadership (NRDC)

DECREASES POLLUTION

- ▶ Avoided at least **30 LARGE POWER PLANTS** since 1970s, 11 more expected to be avoided over the next decade 
- ▶ Cuts **MILLIONS OF TONS OF POLLUTANTS** contributing to asthma, other ills

CUTS ENERGY WASTE

- ▶ Saved enough electricity since 2003 to power **MORE THAN HALF OF CALIFORNIA'S HOMES FOR ONE YEAR** 
- ▶ Met about 1/5 of the state's electricity need in 2013
- ▶ Helped keep per capita electricity use flat vs. 50% increase in rest of U.S. (since 1970s)

SAVES CALIFORNIANS MONEY

- ▶ Efficiency programs saved \$12 billion after costs (2003-2013)
 - ▶ Research projects yielded \$446 for every \$1 invested
 - ▶ Newest building codes to save \$6,000 per house
- \$75 billion** (since 1970s)

CREATES JOBS, SPURS ECONOMY

- ▶ Efficiency jobs grew 15% compared to 2% economy-wide (2002-2012)
- ▶ California produces 2x benefit for every unit of electricity compared to the rest of U.S.



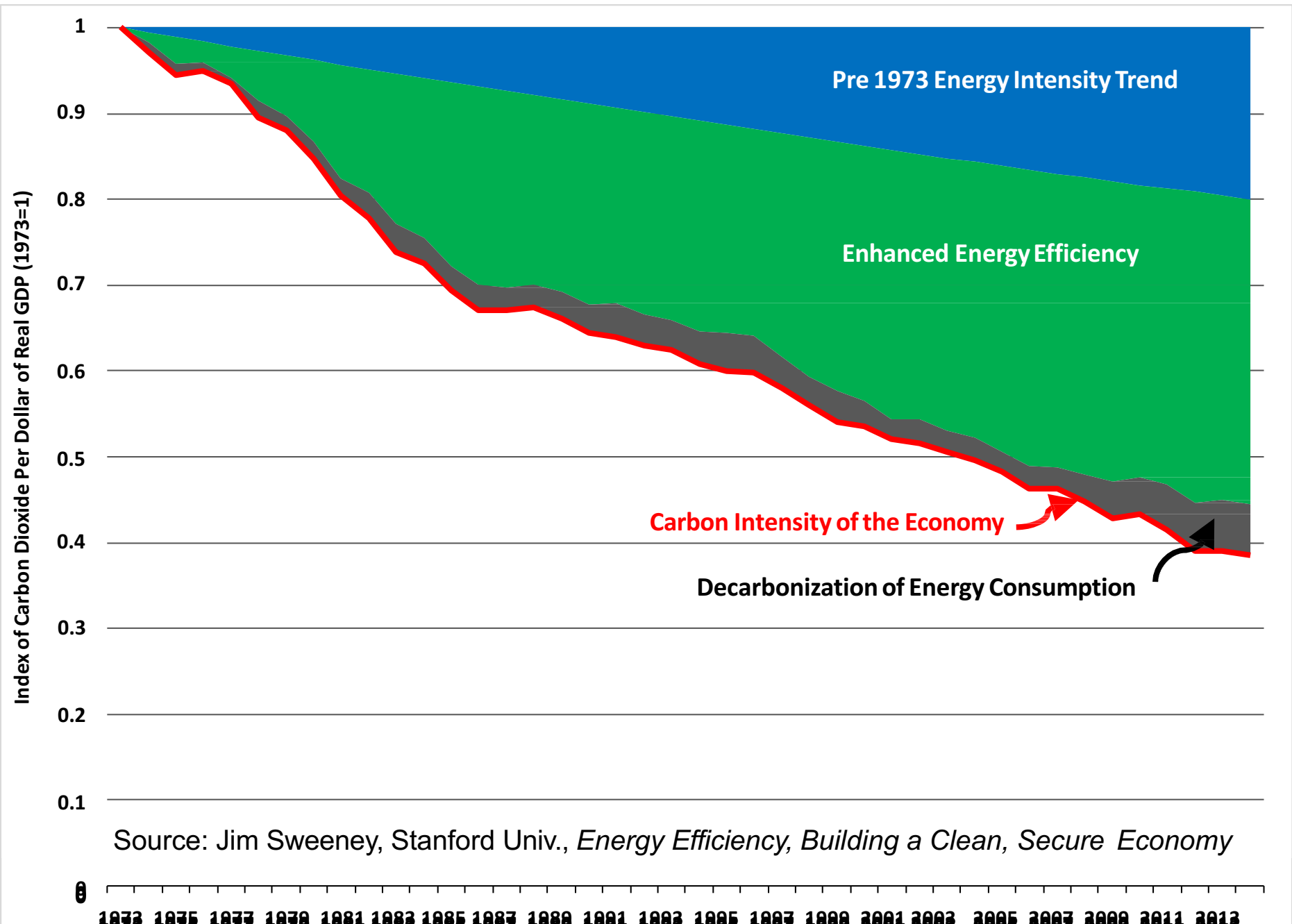
HELPS LOW-INCOME CUSTOMERS

- ▶ Low-income efficiency programs served almost **3 MILLION HOUSEHOLDS** (since 2003)
- ▶ Saved enough electricity to power **90,000 HOMES** and enough natural gas for nearly **80,000 HOMES** for 1 year

HELPS MEET CLIMATE GOALS

- ▶ Slashed **30 MILLION** metric tons of CO₂ pollution, equal to annual emissions of **6 MILLION** cars (since 2003) 
- ▶ Cuts one of the largest sources of California's greenhouse gas emissions

Factors Reducing US Carbon Dioxide Intensity



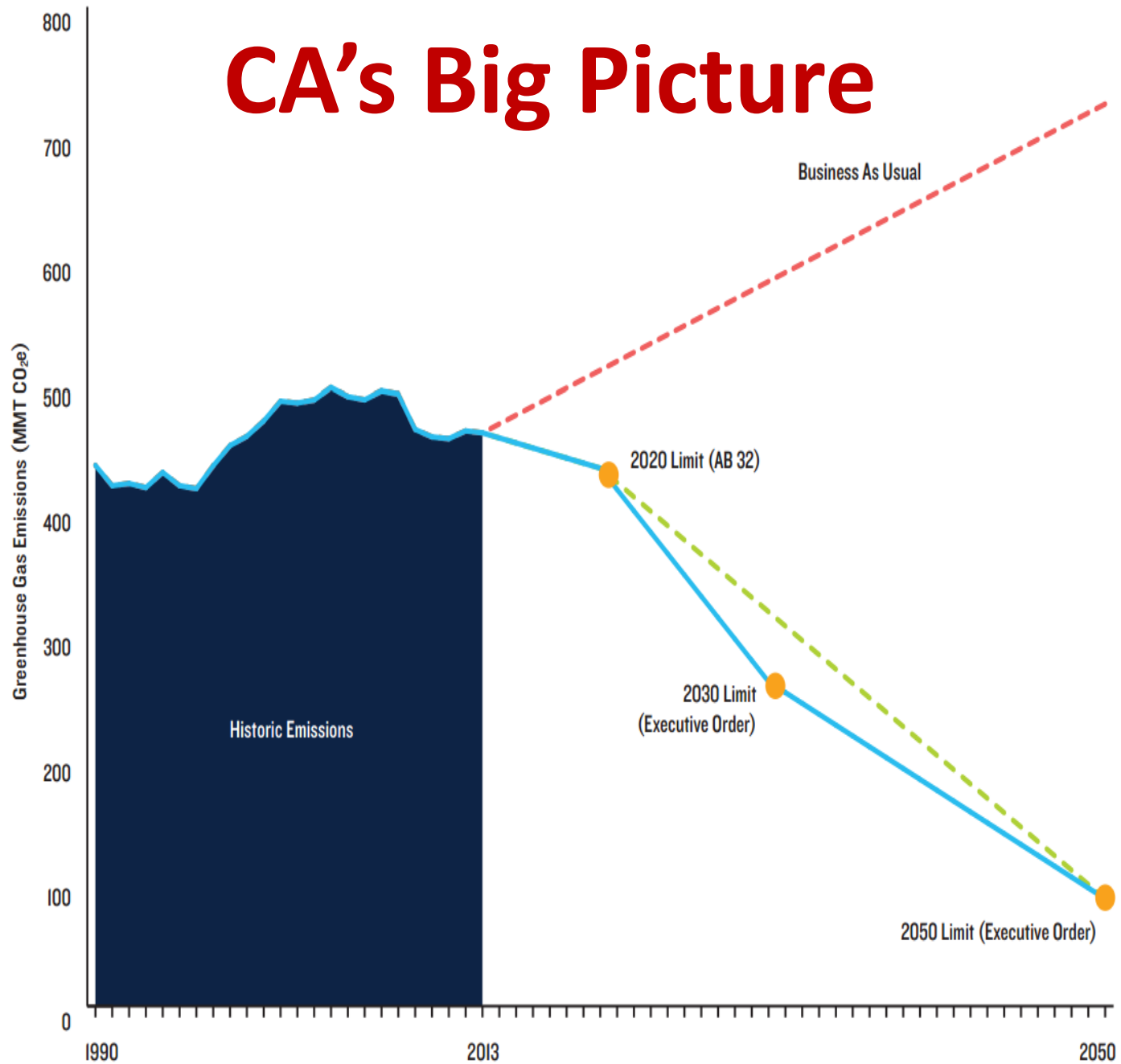
Local Government Leadership (CA's Local Government EE Portal)

- CA's Energy Efficiency Strategic Plan
- Local EE, sustainability, and climate action plans
- Lead by Example in city buildings, esp. benchmarking
- Education, promotion and support
- Adoption of Title 24 Reach and local codes
- Supporting increased EE code compliance

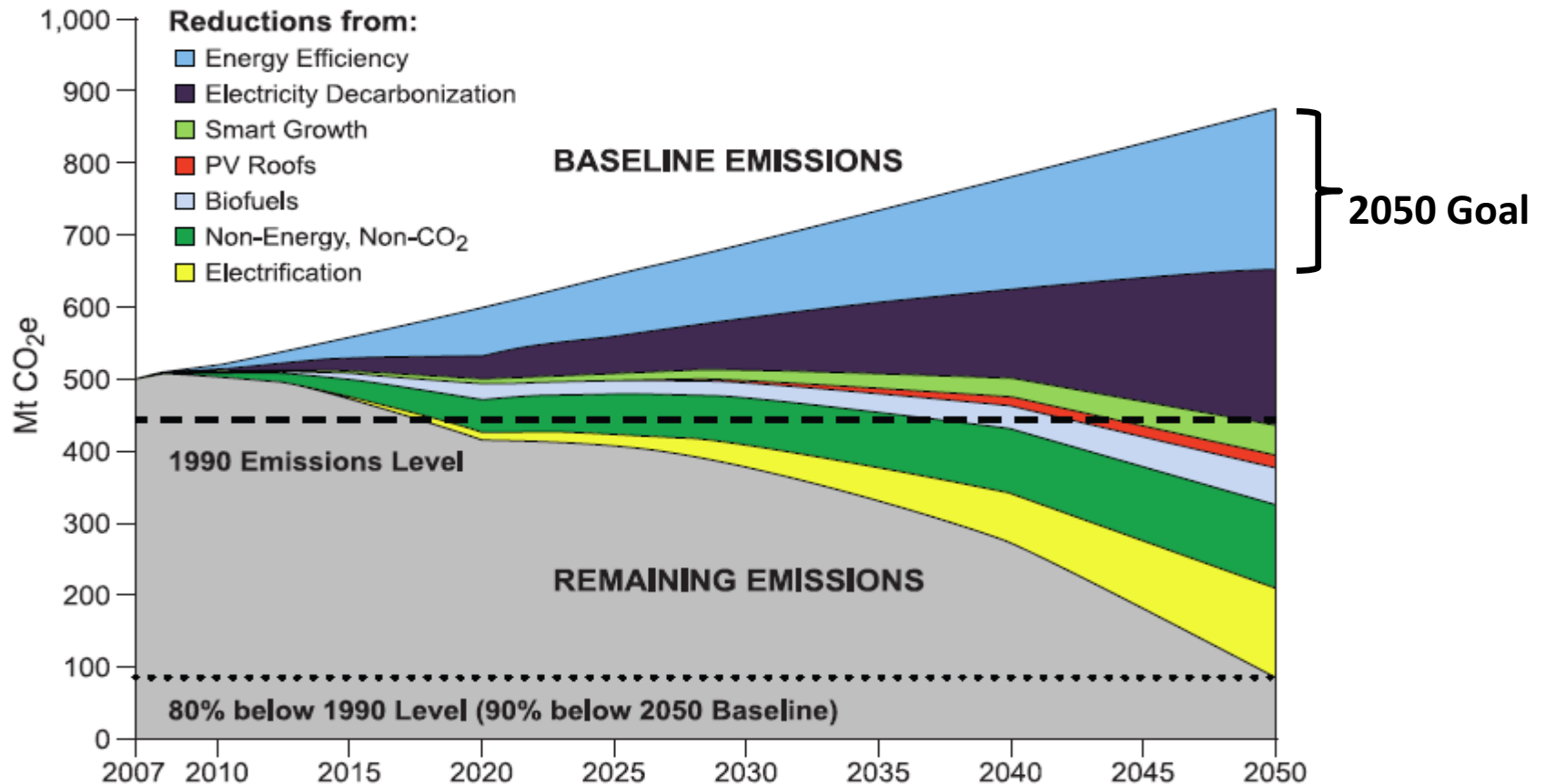
What Are the Challenges?



CA's Big Picture

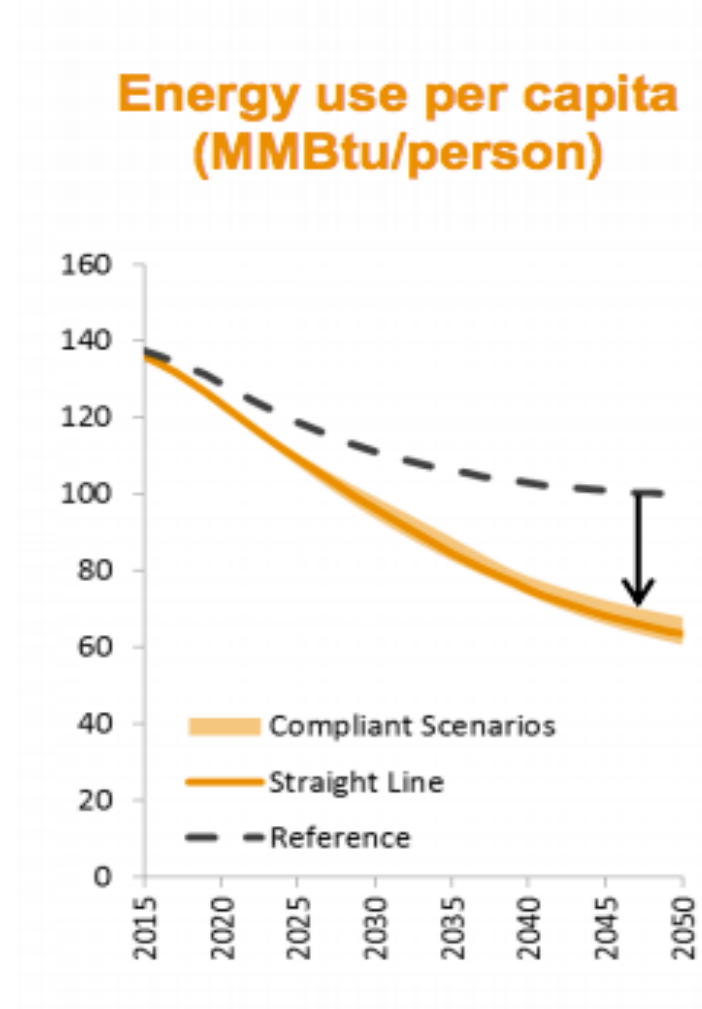


CA Climate Change Strategies



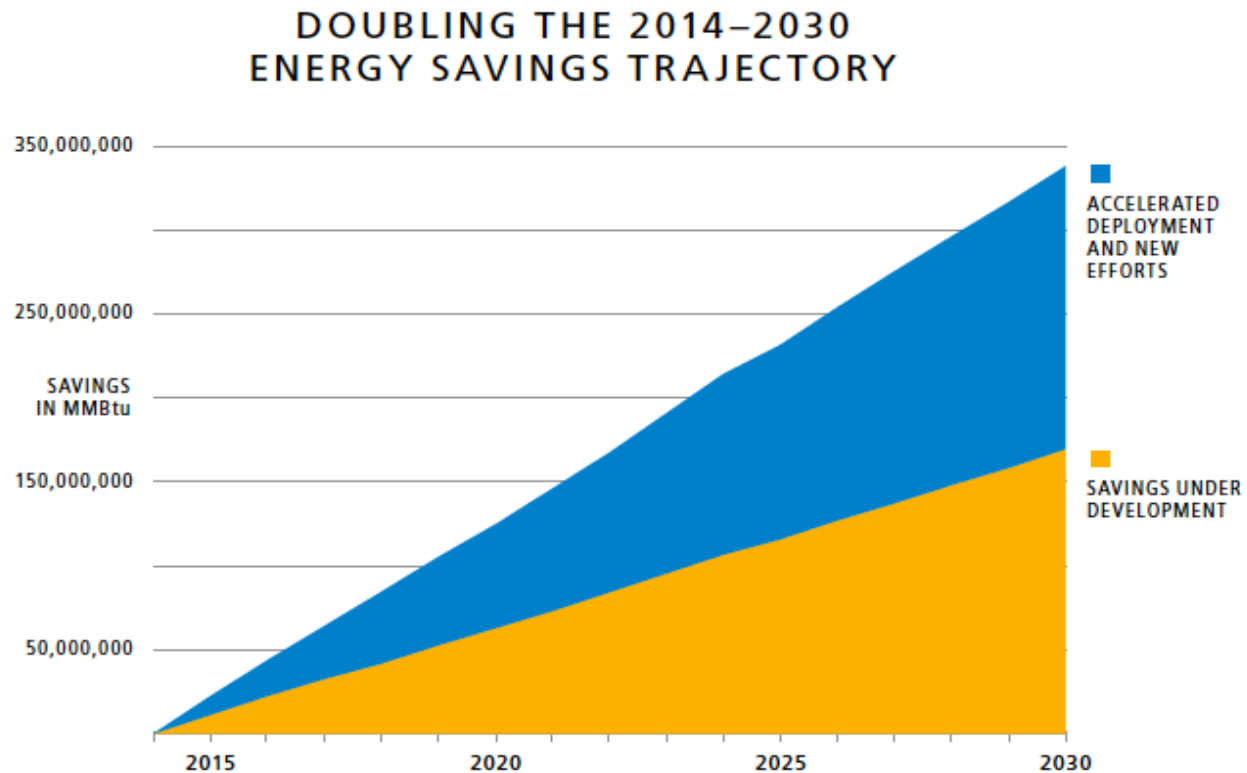
Source: "The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity", Science January, 2012

CA's Energy Use Per Capita Challenge



Source: Energy and Environmental Economics (E3),
California PATHWAYS: GHG Scenario Results

EE's Role - SB 350



NOTE: 1 MMBtu = 300kWh

350,000,000 MMBtu = approx 100,000 GWH

Source: CEC

**What Must We Do For The Next
Level Of Energy Efficiency?**

Use Our New Tools!

- Intelligent efficiency
- New technologies
- Behavior interventions and information
- Expanding financing mechanisms
- Focus on localized EE

Engage Locally and Internationally!

- Under 2 MOU/Compact of States and Regions
- Local Government Climate Roadmap
- ICLEI/Local Governments for Sustainability
- Global Network of Cities, Local and Regional Governments (UCLG)
- C40 Cities
- City Energy Project (NRDC/IMT)
- 100 Resilient Cities
- United States Climate Alliance

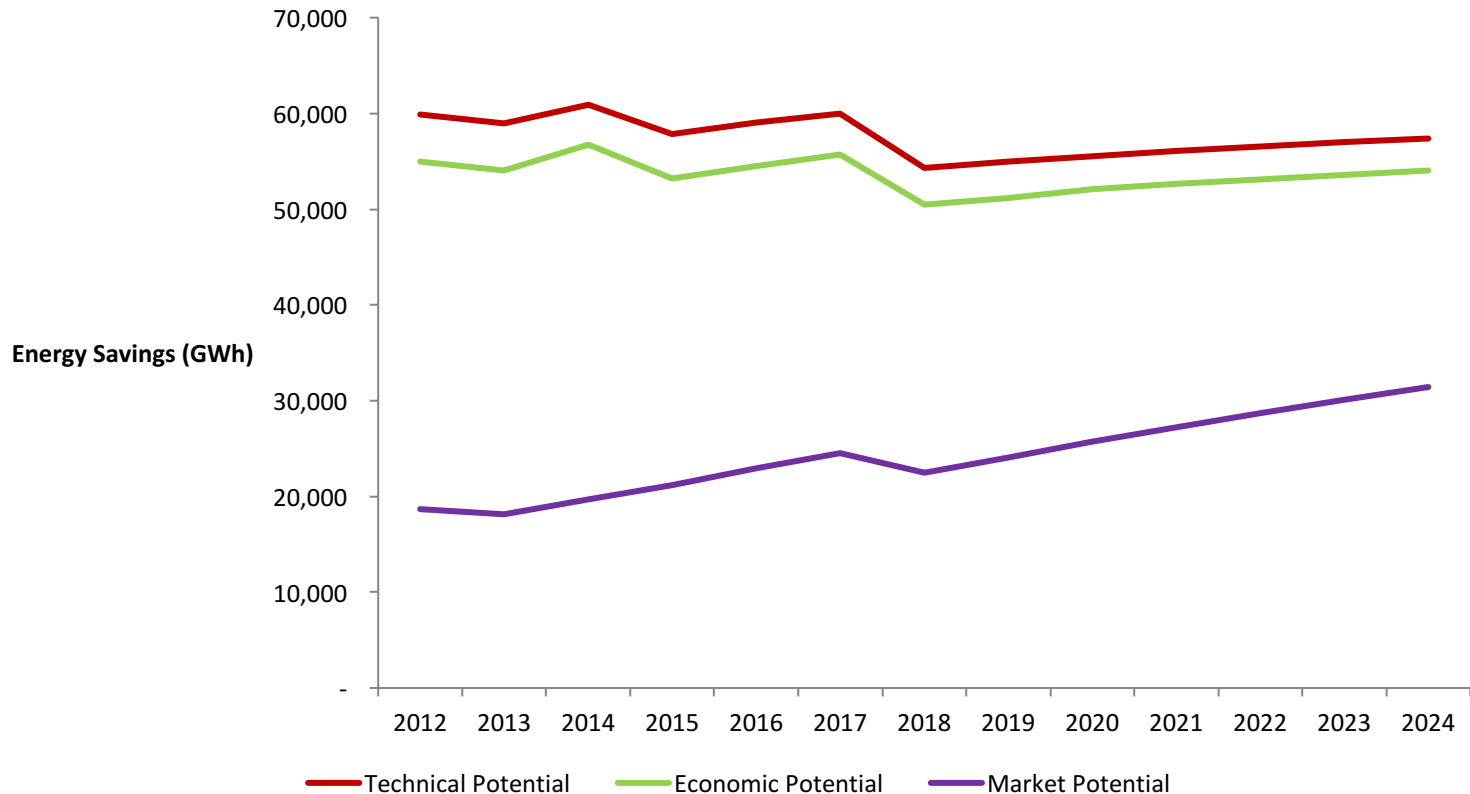
What Else Needs to Be Done?

- Enhance agency coordination and integration
- Update rules and policies
- Track progress and performance

Enhance Agency Coordination and Integration

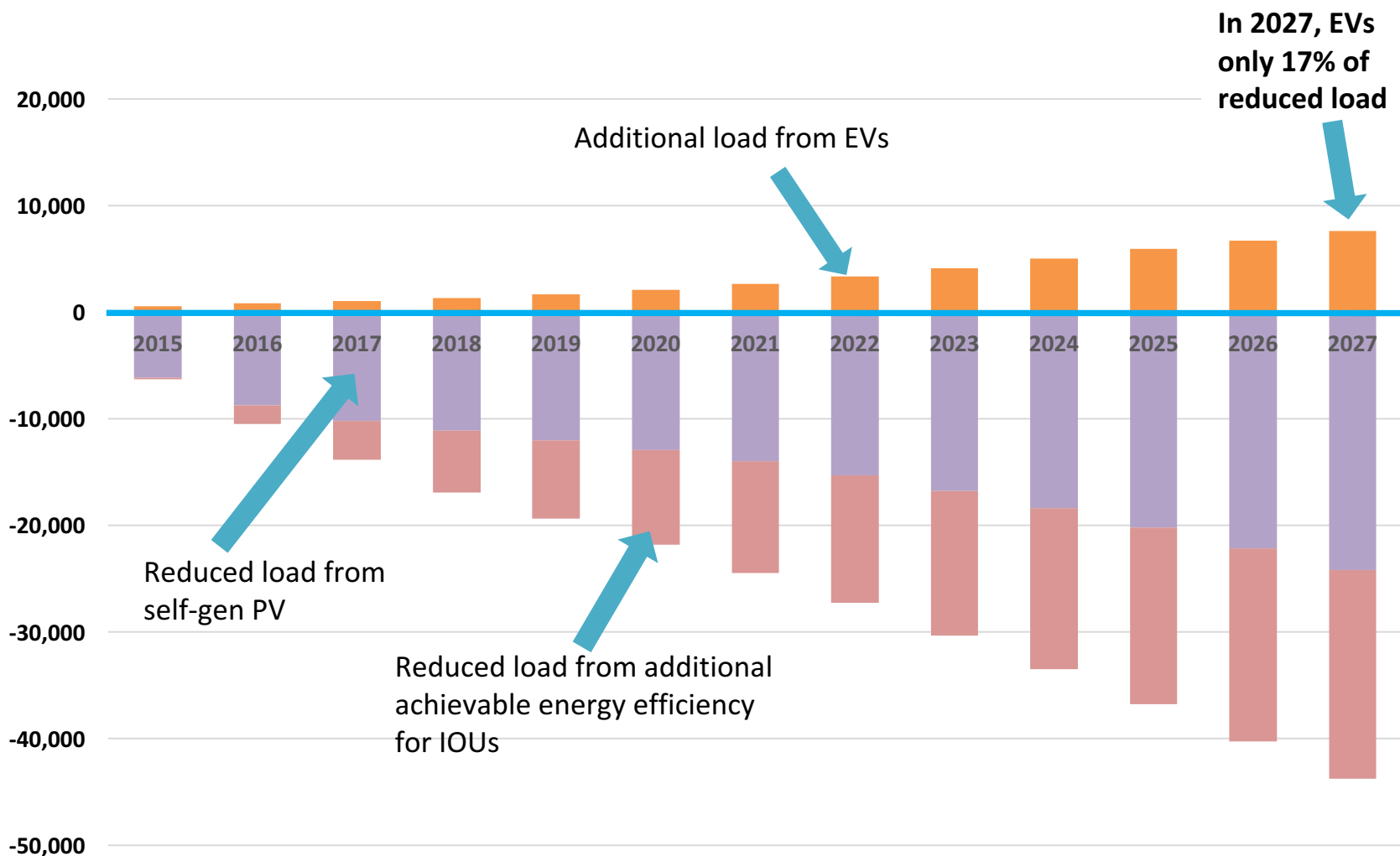
- Establish an “EE Statewide Leadership Collaborative” with dedicated staffing
- Expand use of stakeholder collaboration, including parties that do not traditionally participate before state agencies
- Establish a statewide Market Transformation Collaborative

Update Rules: Technical and Economic vs. Market (“Regulatory”) Potential



Source: Navigant, 2013 Goals & Potential Study

Update Rules: CCAs Need to Adopt Decoupling!



Track Progress

- EE actions to track
 - Utility customer-funded EE programs (IOU/POU)
 - Mandatory building codes and appliance standards (state and federal)
 - Other programmatic efforts (PACE, local gov'ts, etc.)
 - Price and market effects
- Link EE reporting with carbon goal reporting
- Other considerations (count transportation electrification, fuel switching)



Dr. Arthur H. Rosenfeld (1926-2017)

The Art of Energy Efficiency

Thank You

Dian Grueneich
California PUC Commissioner Emeritus

Senior Research Scholar
Precourt Institute for Energy
Precourt Energy Efficiency Center
Shultz-Stephenson Energy Policy Task Force
dgruenei@stanford.edu