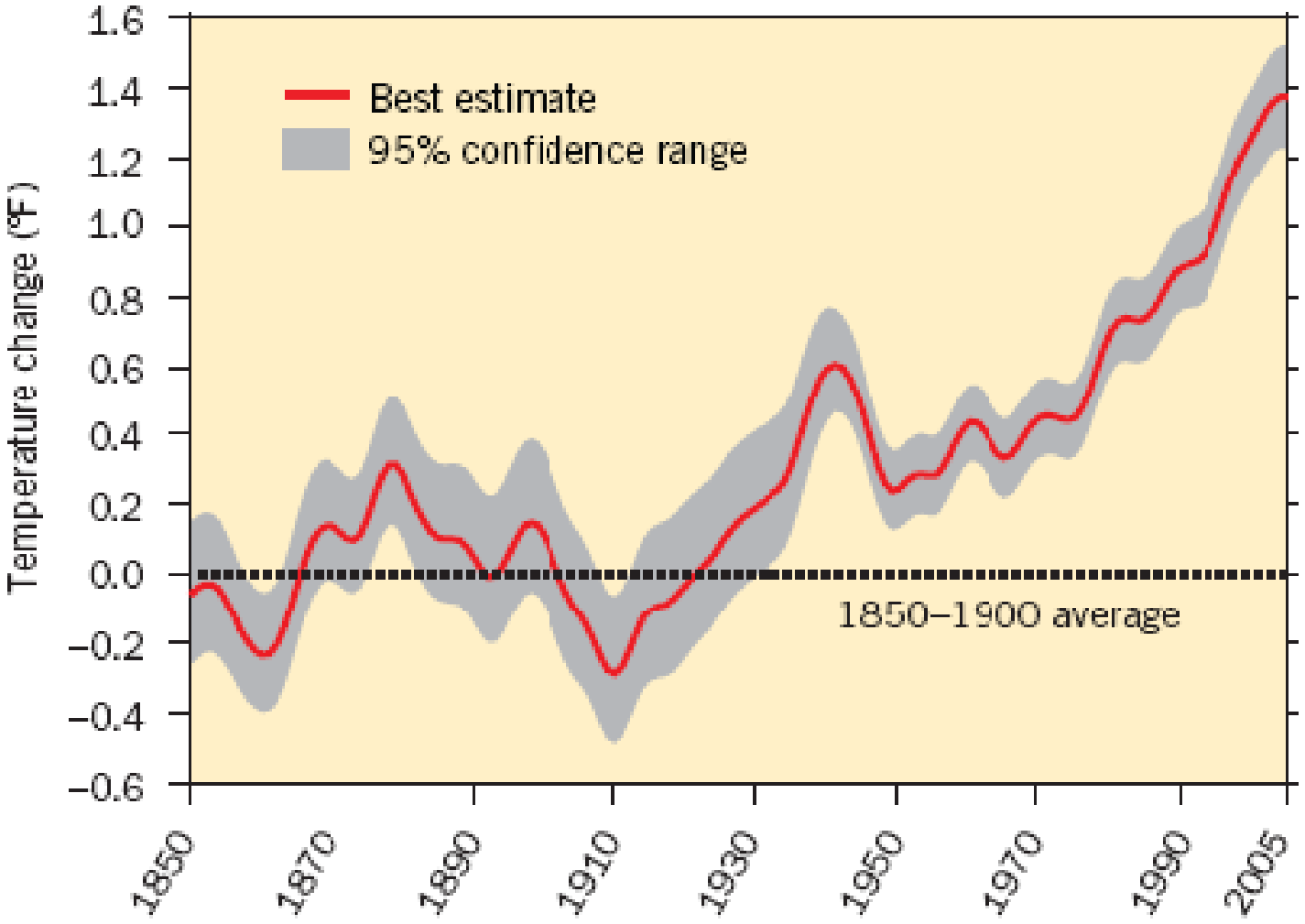
AB 32: California Global Warming Solutions Act of 2006



Lloyd L. Tran
Director
California Institute of Nanotechnology
Clean Tech Institute

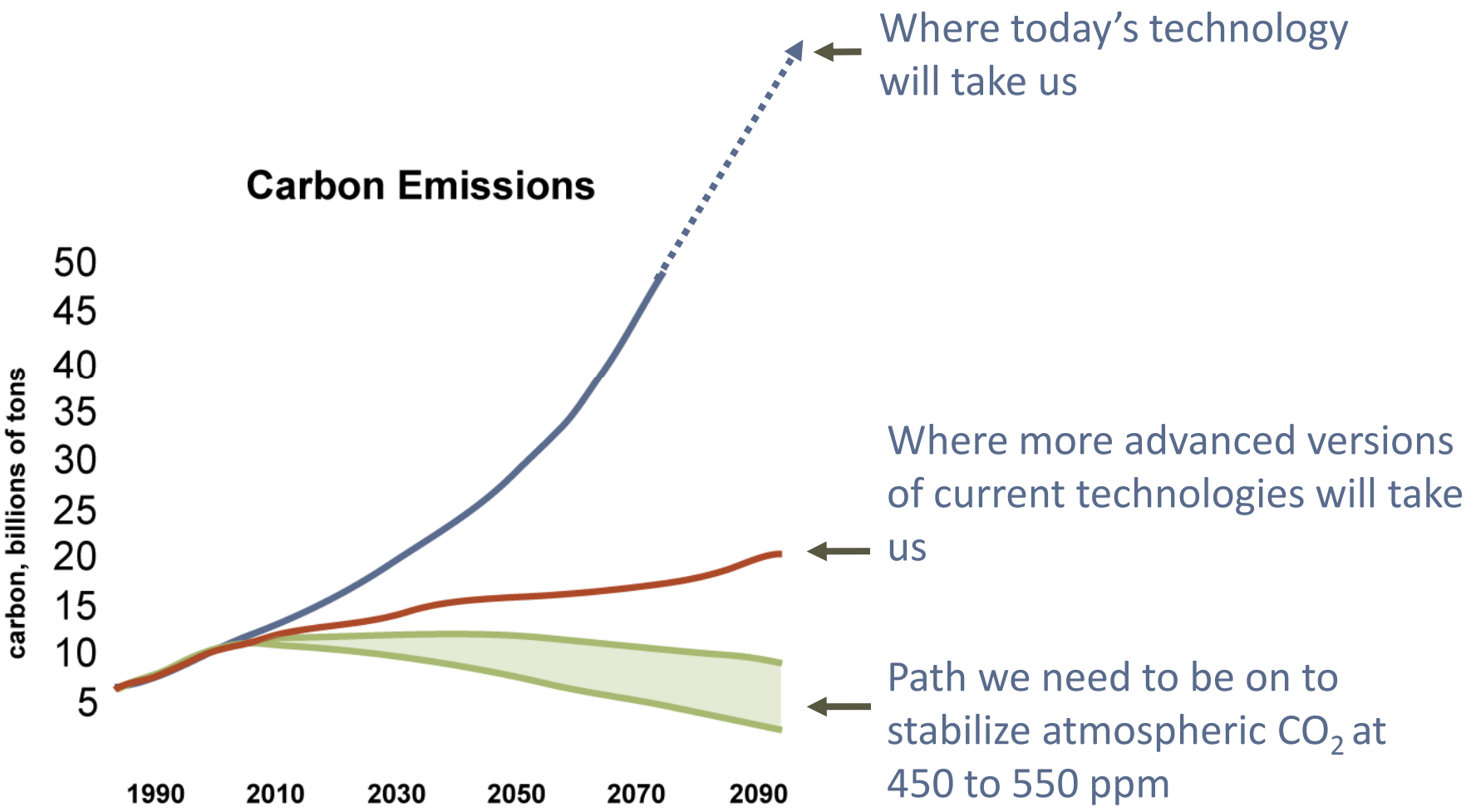


The World is Getting Warmer



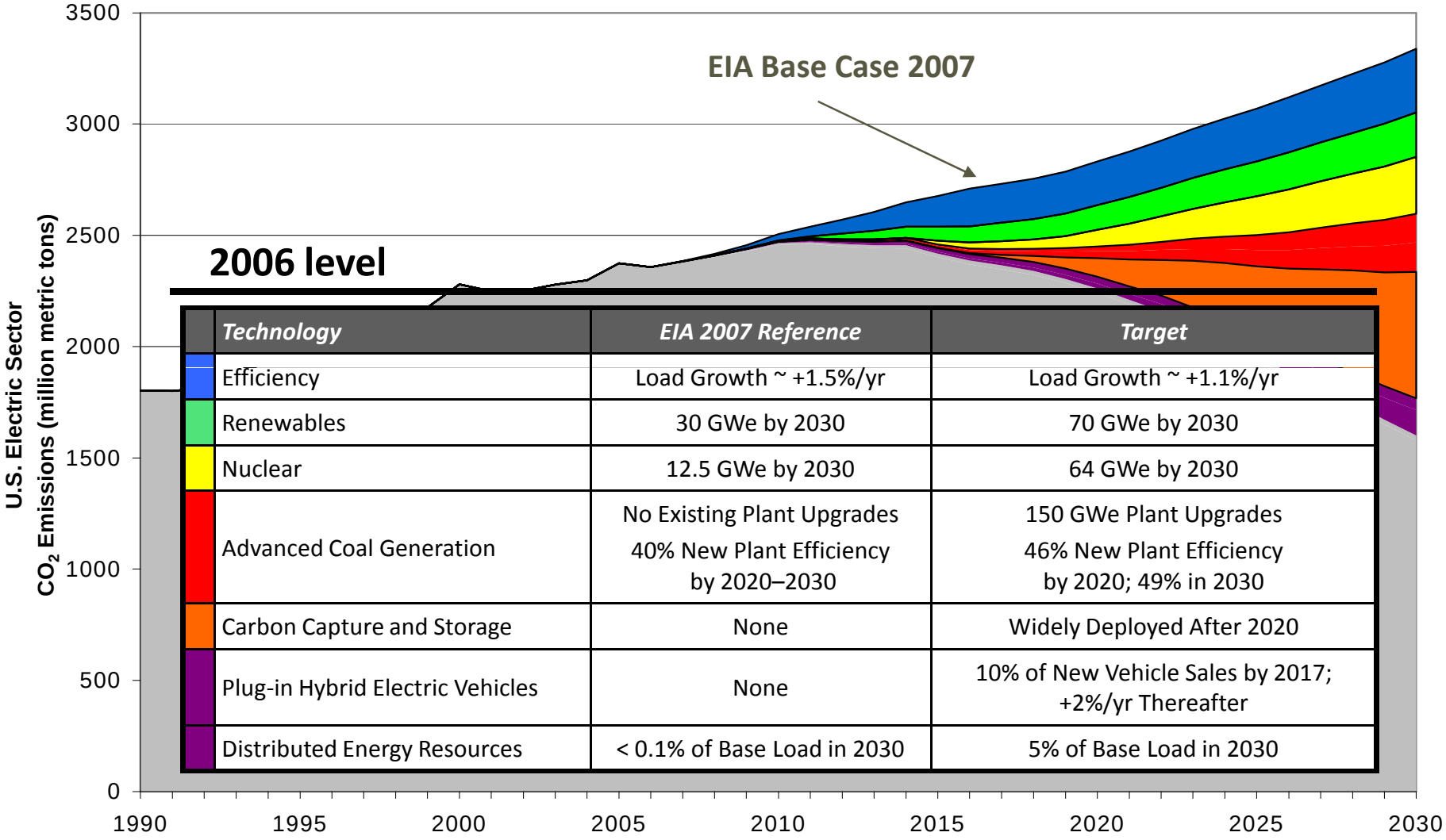
Source: Brohan P., et al, 2006.

Current technology will get us to where we won't want to be



Source: EPRI 2007

Reducing GHG will require sound public policy & new technologies



Technology	*EIA 2007 Reference*	*Target*
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
Carbon Capture and Storage	None	Widely Deployed After 2020
Plug-in Hybrid Electric Vehicles	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
Distributed Energy Resources	< 0.1% of Base Load in 2030	5% of Base Load in 2030

Source: EPRI 2007

Think Globally





Act Locally

Government Initiatives

- In December 2005, seven northeastern U.S. states announced an agreement to reduce the CO2 emissions of regional electric utilities through the Regional Greenhouse Gas Initiative (RGGI). The scheme is underwritten by a multi-state emissions “cap and trade” system, which is scheduled to begin in 2009. Approximately 600 power plants will be affected by this regime.

- 22 states have established renewable portfolio standards or goals that require electric utilities to generate a certain amount of power from renewable sources by a specific date.

- 10 states (including New York and California) have adopted automobile emissions standards that require a 30% reduction in greenhouse gas emissions by the year 2016.

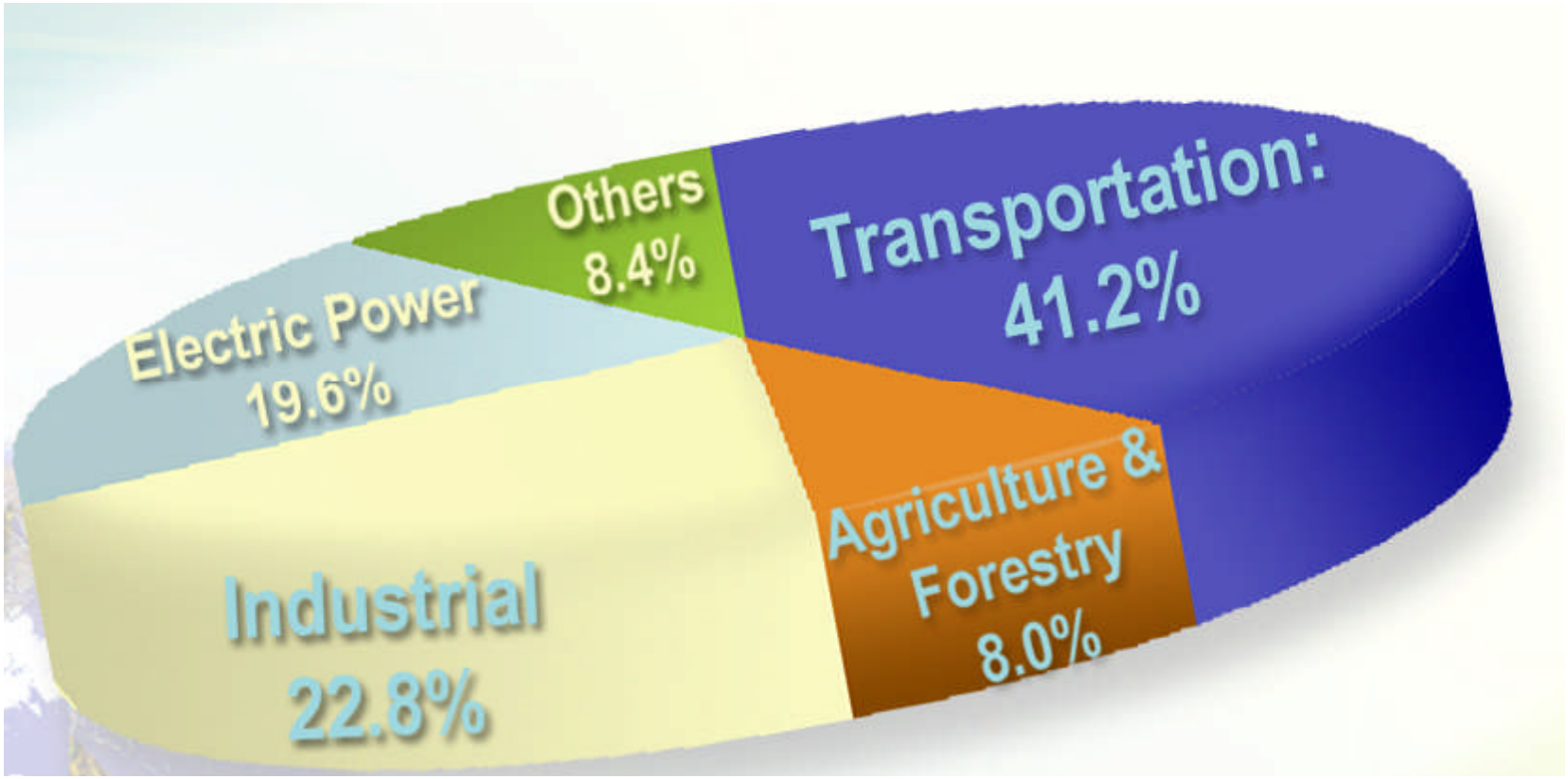
Government Initiatives

- Mayors from 187 U.S. cities and towns have pledged to adopt Kyoto-inspired limits on GHG emissions.

- The U.S. Energy Policy Act, signed into law in August 2005, provided new and extended tax incentives as well funding sources for companies investing in renewable power projects. The legislation also authorized “clean coal” funding.

- California Global Warming Solutions Act of 2006 (AB32)

California Climate Change Emissions



The Basics of AB 32

AB32 passed legislature on August 31, 2006

- Senate vote:23 to 14
- Assembly vote:46 to 31

Requires reduction in greenhouse gas emissions to 1990 levels by 2020

Will result in a 25% reduction compared with currently projected levels



The Basics of AB 32 (cont.)

Emissions Covered

- Carbon dioxide
- Methane
- Nitrous oxide
- Hydrofluorocarbons
- Perfluorocarbons
- Sulfur hexafluoride

The Basics of AB 32 (con't.)

Sources Covered

"Any source or category of source whose emissions are at a level of significance . . . that its participation in the program will enable the state board to effectively reduce greenhouse gas emissions and monitor compliance with the statewide greenhouse gas emissions limit"

The Basics of AB 32 (cont.)

Responsible Agencies

California Air Resources Board ("State Board" or "CARB")

The State Air Resources Board is the state agency charged with monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to reduce emissions of greenhouse gases

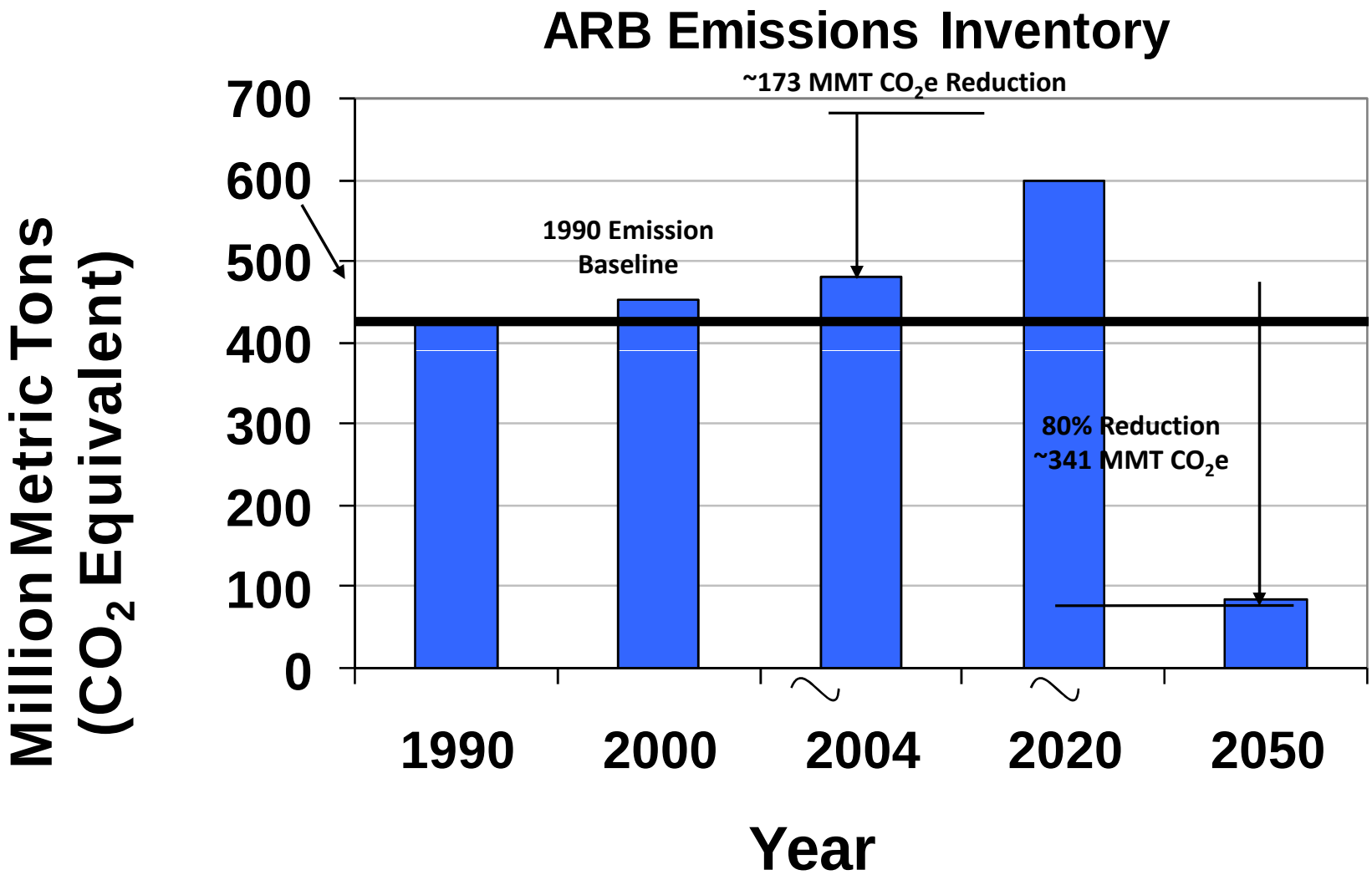
The Basics of AB 32 (cont.)

Responsible Agencies

California Public Utilities Commission ("CPUC")

The state board shall consult with the Public Utilities Commission in the development of the regulations as they affect electricity and natural gas providers in order to minimize duplicative or inconsistent regulatory requirements

Magnitude of the Challenge



GHG Reductions Required

By 2020 California must reduce GHG emissions to 1990 levels – 173 MMT

Collectively this means reducing:

Today's levels by 15%
Projected levels by 28%
Emission intensity by 33%

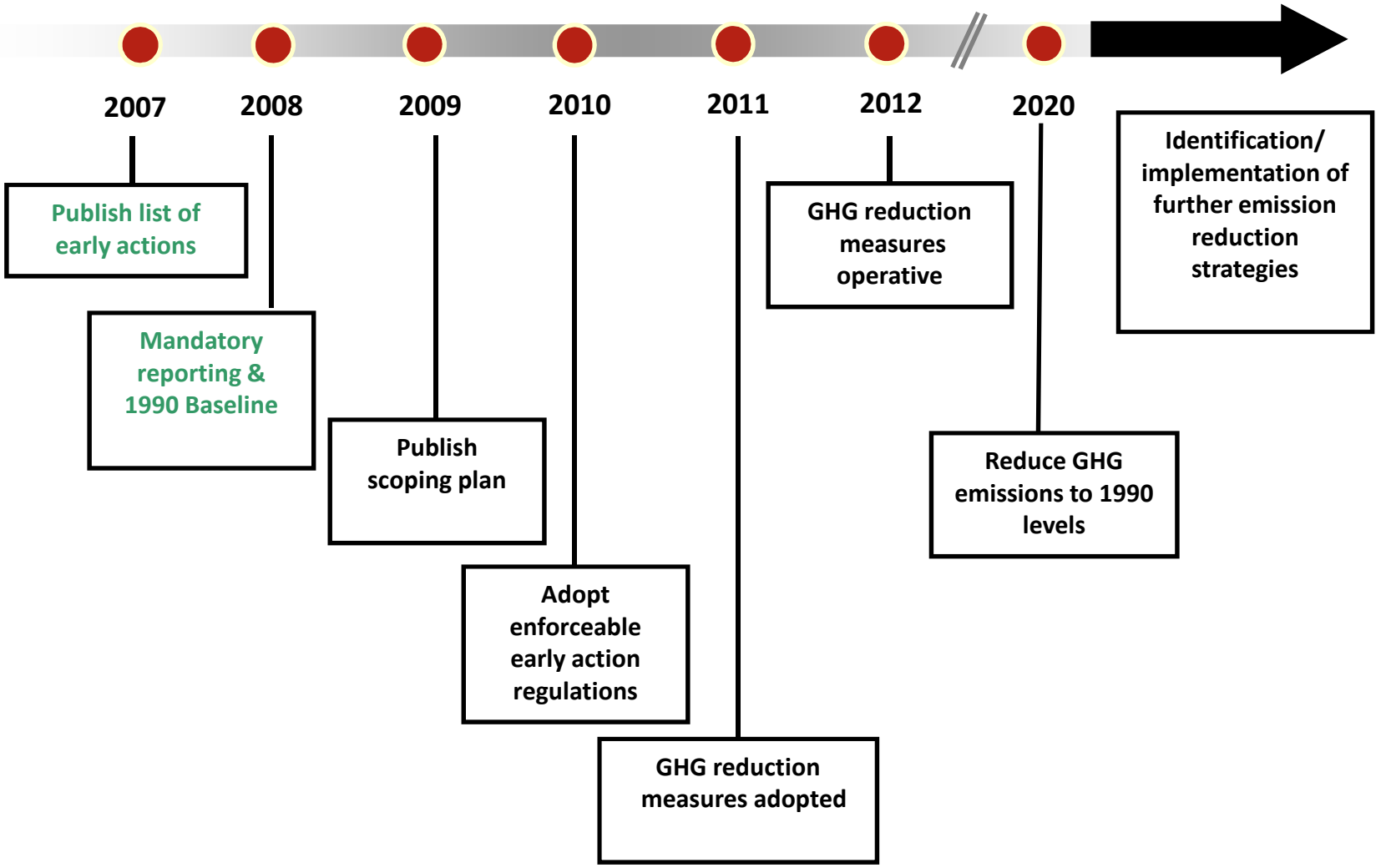
The Basics of AB 32 (cont.)

Implementation Timelines

Three elements to implementation:

- Reporting
- Establishing limit 1990 emissions level
- Reductions

AB 32 Timeline



The Basics of AB 32 (cont.)

Timelines: Reductions

Emission Reduction Measures

- January 1, 2009: State Board must adopt scoping plan for achieving “maximum technologically feasible and cost effective reductions”
- January 1, 2011: State Board shall adopt limits and emission reduction measures by regulation
- January 1, 2012: Greenhouse gas emission regulations shall become operative

Summary of Key Deadlines

Due Date	Task	Agency
February 1, 2007	Establish emission performance standard for load-serving entities	CPUC
June 30, 2007	1. Publish list of early action emission reduction measures 2. Establish emission performance standard for local publicly owned electric utilities	CARB CEC
January 1, 2008	1. Adopt reporting and verification regulations 2. Determine 1990 baseline level	CARB
January 1, 2009	Approve scoping plan for maximum reductions by 2020	CARB
January 1, 2010	Adopt regulations for early action measures	CARB
January 1, 2011	Adopt regulations on emissions limits and reduction measures	CARB
January 1, 2012	Regulations go into effect	CARB

Accomplished in 2008

- Set 1990 GHG Inventory at 427 MMT

  Requires 173 MMT Reduction by 2020

- Adopted Mandatory Reporting Requirement for Major GHG Emitters
- Begin tracking in 2008, Begin reporting in 2009
- Approval of potential early action items:

  Low Carbon Fuel, Auto Refrigerants, Landfill Gas Truck Efficiency, Semiconductor Perflurocarbons, Can Propellants, Tire Inflation, Reduced Sulfur Hexafluoride

- Adopted at the end of 2008 -- enforced by 1/1/2010

  Would reduce 16 MMT

Passenger Car Regulations

. Air Board Adopted Regulations in September 2004

- Would provide largest single GHG reduction

  Requires auto manufacturers to cut GHGs 27% by 2030 – a reduction of 50 million metric tons.

- Currently under court challenge from auto industry
- US EPA rejected ARB's waiver request
- California now suing US EPA

AB-32: Scoping Plan

- Described how California will reduce GHG emissions to 1990 levels by 2020
- Provided a vision for a low carbon future - 2020 and 2050
- Established California's leadership in climate change, while considering other GHG programs
- Maximize benefits to California
  - Criteria and toxic air pollutant co-benefits
  - Economic development
  - Community participation

AB 32: Scoping Plan Measures

AB 32 requires ARB to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions

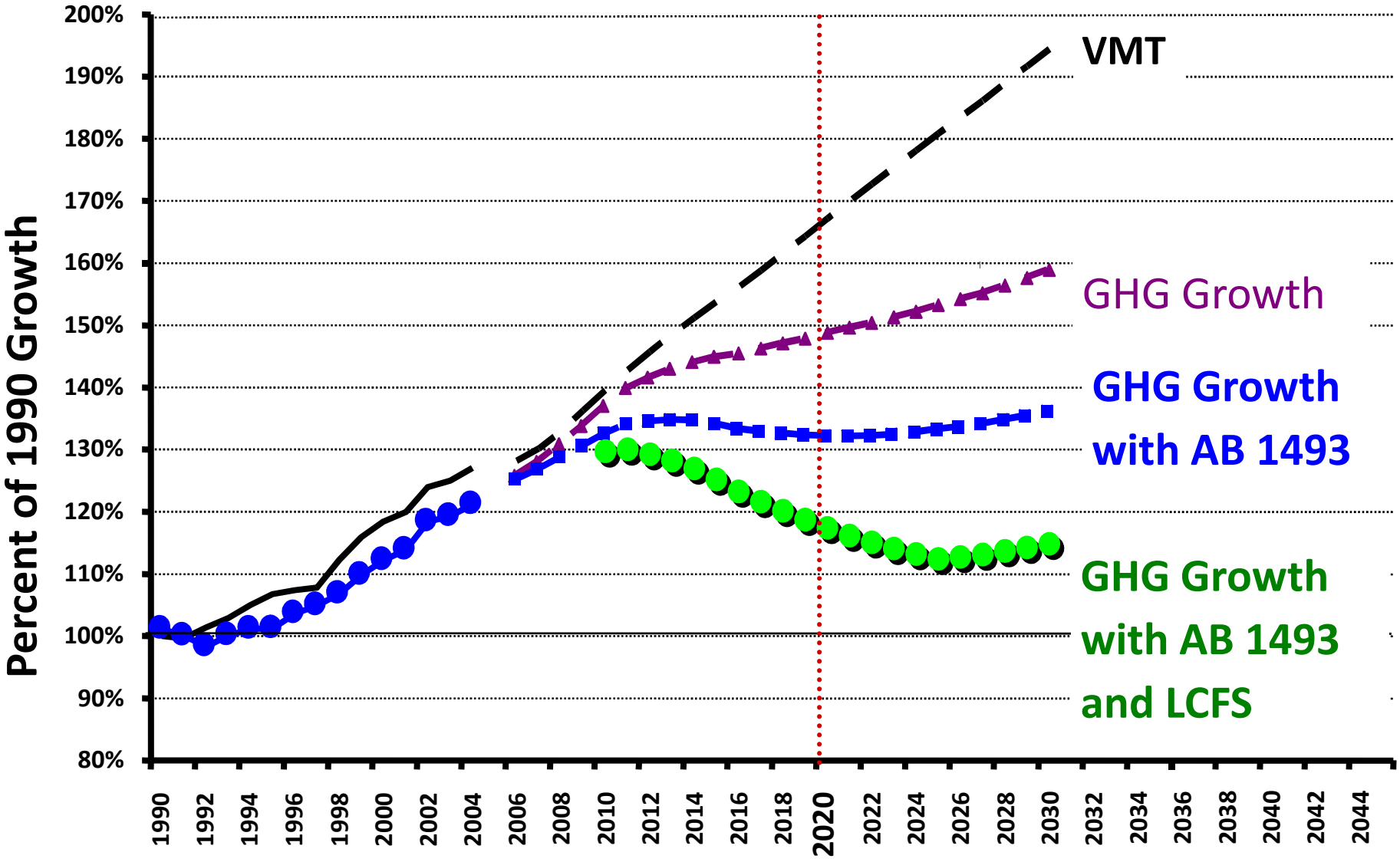
Possible measures include:

- Direct regulations
- Alternative compliance mechanisms
- Market-based compliance mechanisms
- Monetary and non-monetary incentives

Plan Implementation

- Scoping Plan will include a suite of emission reduction measures and methods
- Plan must be adopted by end of 2008
- ARB has until 1/1/11 to adopt protocols for GHG reduction measures
- Enforcement of GHG regulations will be key to achieving reduction goals

Historical and Projected Population, Vehicle Miles Traveled (VMT) and GHG Growth



Sources: Air Resource Board

Government, Business & Public

- Reduce Water Usage
- More Efficient Lighting
- More Efficient Air Conditioning
- Landscaping and Sprinkler Systems
- Trucking Fleets & Other Vehicles
- Energy Efficient “Green” Building Standards
- Solar Power

Effects of AB 32 and SB 1368

Reduction Measures and Limits: AB 32 imposes greenhouse gas emission reduction measures that can impact the cost and operation of in-state and out of state electric generation facilities

Performance Standards: SB 1368 will restrict the ability to sell the output of baseload electric generation facilities to electric service providers unless the facilities comply with to-be-established greenhouse gas emission performance standards

Both of these provisions will affect development of new generation

Impact of AB32 — Solar and Wind

- Renewable solar and wind power can benefit several ways
- They produce no greenhouse gases and thus will meet performance standards
- Might be able to obtain greenhouse gas offset credits if CARB adopts market-based programs that recognize wind and solar as "displacing" a certain level of CO2 emission from average combustion levels



New Generation — Biomass

- Biomass, because it combusts higher carbon content fuel, would normally present a significant greenhouse gas issue

- SB 1368 contains provisions recognizing the net emission, whole-fuel-cycle character of biomass

- In consideration of the position of biomass in the carbon cycle, biomass may be given special treatment that eases its requirement to comply with performance standards and to meet emission reduction requirements and limits

California Choice Aggregation- AB 117

When California deregulated electricity in 1997,many Californians switched to buy “green”energy.

After the energy crisis of 2000-01, consumer choice of electricity providers was suspended. Most Californians now get their electricity from the same utilities that provided it before deregulation.

In 2002, Community Choice Aggregation (AB 117) was signed into law. AB117 offers an opportunity for Californians to choose their electric provider and the source of their electricity.

California Choice Aggregation- AB 117

Community Choice Aggregation (CCA) enables California cities and counties – or groups of cities and counties – to supply electricity to the customers within their borders.

Unlike a municipal utility, such as the Los Angeles Department of Water and Power or the Sacramento Municipal Utility District, a CCA does not own the transmission and delivery systems (i.e., the poles and wires).

Instead, a CCA is responsible for providing the energy commodity (i.e., the electrons themselves) to its constituents – which may or may not entail ownership of electric generating resources.

Value of the California Community Aggregation

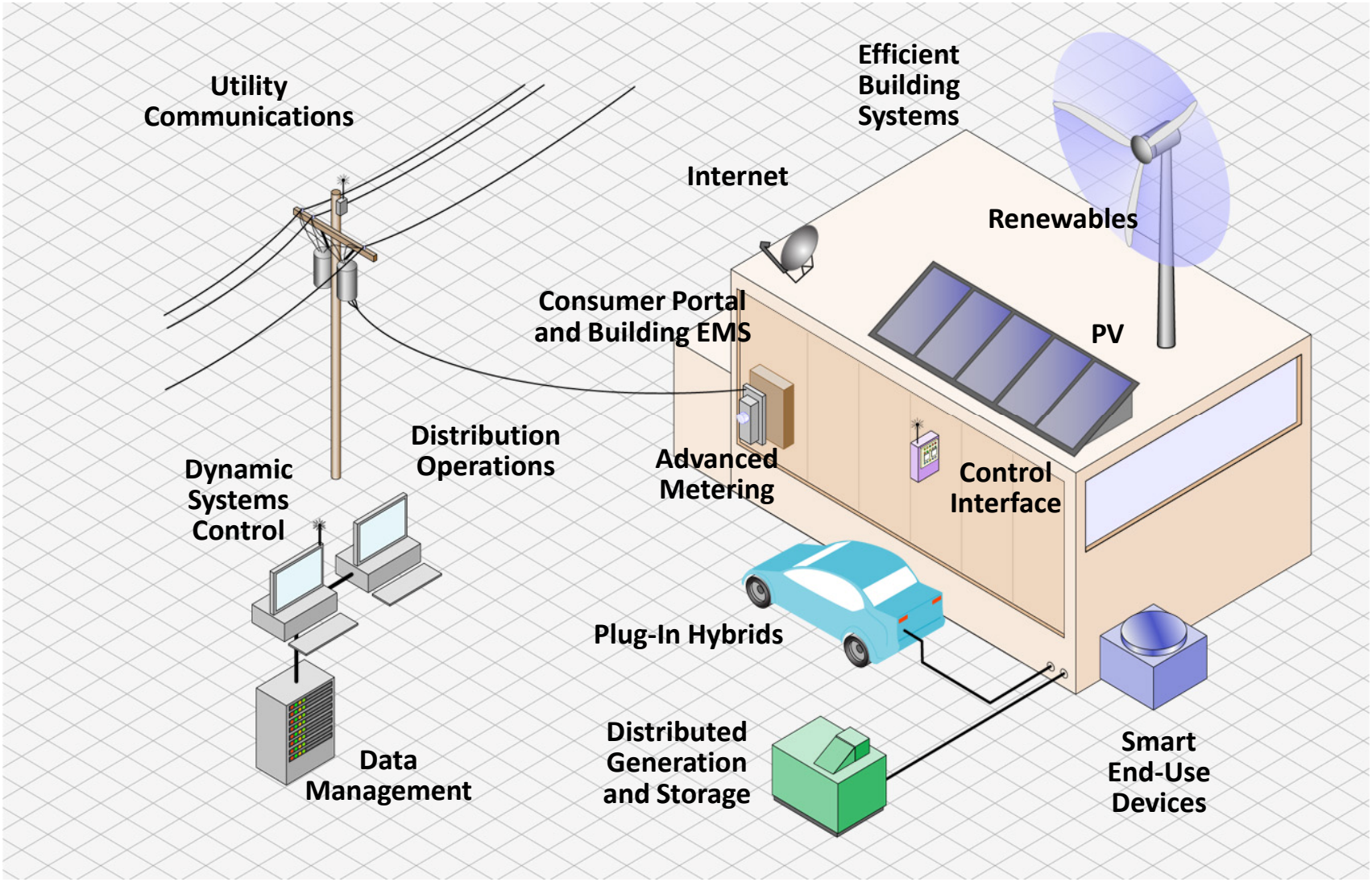
• Community Choice Aggregation is a mechanism for cities to create and manager their own electric power and increase the amount of non-polluting, renewable energy they use.

• CCA offers cost-effective than those supplied by Investor-owned utilities which frequently increases their service rates for electric generation, transmission and distribution

• Historically, public utilities across the nation have been able to offer rates that are 15-20% lower than investor owned utilities.
Example: Roseville Electric has been selected as the nation's most reliable utility serving less than 100,000 customers for five years in a row.

• Under CCA, decisions about rates, generating resources and public benefit programs will be made locally and be accountable to local customers.

“Smart Grid” electricity infrastructure



American Energy Choice, Inc.

Mission Statement

Enabling government agencies and business clients to achieve their goals, reduce carbon footprint, become Corporate Responsible Citizens, by adopting distributed solar services.

Services

- Solar Energy System Integrator - Providing electricty to you while you enjoy the benefits of clean, renewable energy, and no upfront capital investment

- A Complete Turn-Key Operation - Includes initial evaluation, overall design, procurement, logistics and construction of an advanced solar energy system

- Expert Consulting - Present a strategic plan for implementing a renewable energy program to accomplish the goals of our clients

- Innovated Design - Fabricate and construct a solar energy system, coordinating with current utility providers, securing necessary permits, from conception to completion

http://cleantechinstitute.org



Thank you

Lloyd L. Tran
Director
California Institute of Nanotechnology
Clean Tech Institute
Ltran@cleantechinstitute.org