The California Air Resources Board: Cleaning the Air for a Healthier California

Hector De La Torre

July 2016

California Air Resources Board | Mission

- Leads California's fight against air pollution and climate change
- Protects public health
- Promotes clean, energy-efficient fuels and technology

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CARB sets California's own air quality standards and monitors pollutants statewide.

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CARB verifies vehicle manufacturers' emissions compliance and researches causes and effects of air pollution.

California Air Resources Board | The Mission

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- Protects public health
- Promotes clean, energy-efficient fuels and technology

CARB reduces greenhouse gas emissions through measures that promote clean, efficient and sustainable energy.

EL CONSEJO DIRIGE LA POLÍTICA, ADOPTA NORMAS Y REGULACIONES

PRESIDENTA

EXPERTOS

SALUD • LEYES • CIENCIA • AGRICULTURA
AUTOMOTRIZ • JUSTICIA AMBIENTAL

REPRESENTANTES DE DISTRITOS DE CONTROL DE AIRE LOCALES

Personal Diverso y Profesional

CIENTÍFICOS

INGENIEROS

ECONOMISTAS

ABOGADOS & ANALISTAS POLÍTICOS

Afrontando la contaminación del aire

FEDERAL • ESTATAL • LOCAL

LA US EPA

La Agencia de protección Ambiental de los Estados Unidos

Establece e impone los estándares.

Regula el transporte interestatal.

El Consejo de Recursos del Aire de California

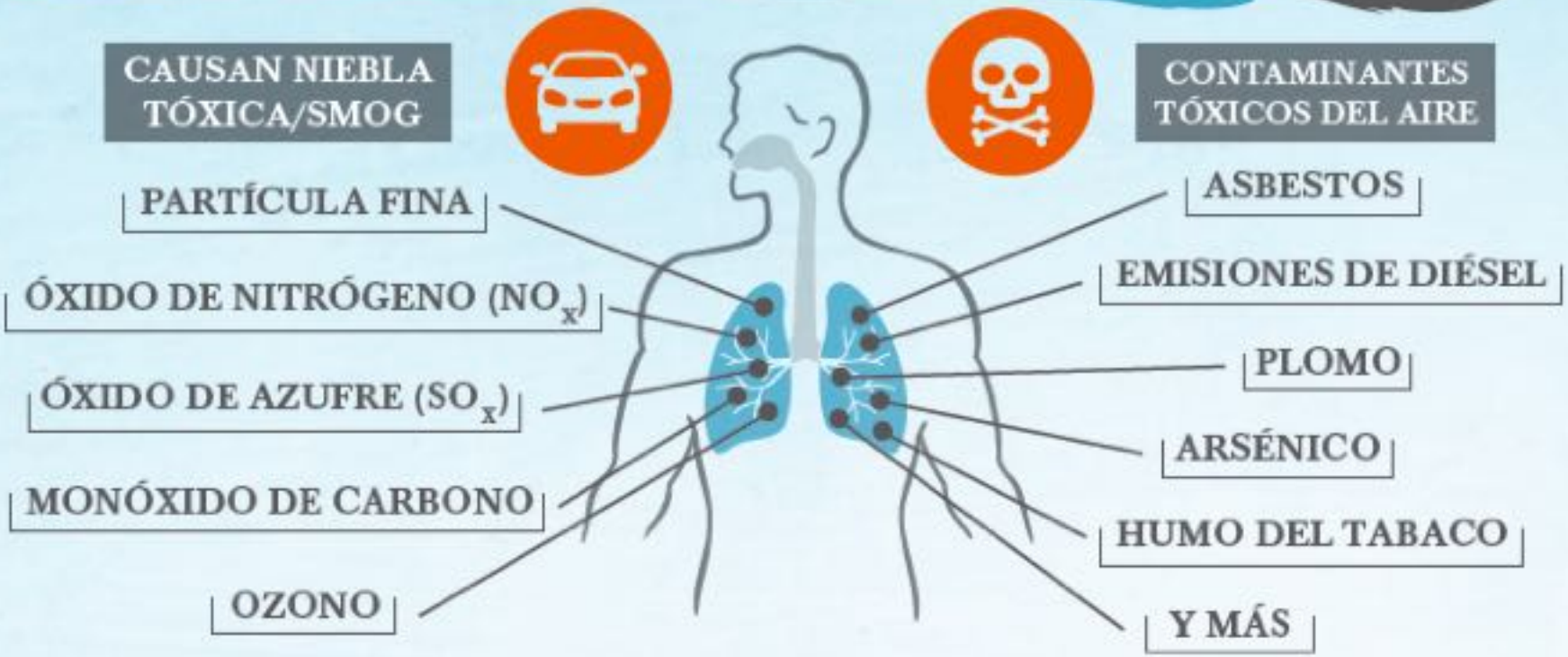
Regula las fuentes móviles que contaminan el aire, los gases de efecto invernadero y productos de consumo.

Los Distritos de Control de Aire Locales

Regulan las fuentes estacionarias y locales de contaminación del aire.

CONTAMINACIÓN DEL AIRE

Tipos de Contaminantes



La contaminación del aire causa efectos serios a la salud

ASMA Y OTRAS ENFERMEDADES RESPIRATORIAS

DERRAME CEREBRAL

ENFERMEDADES CARDÍACAS

CÁNCER

MUERTE PREMATURA

Cleaner Air = Healthier Lungs

USC Researchers find less pollution in LA area is associated with better lung function in children

USC CHILDREN'S HEALTH STUDY

2,120 Children

5 SoCal Communities

WHAT WAS MEASURED ?

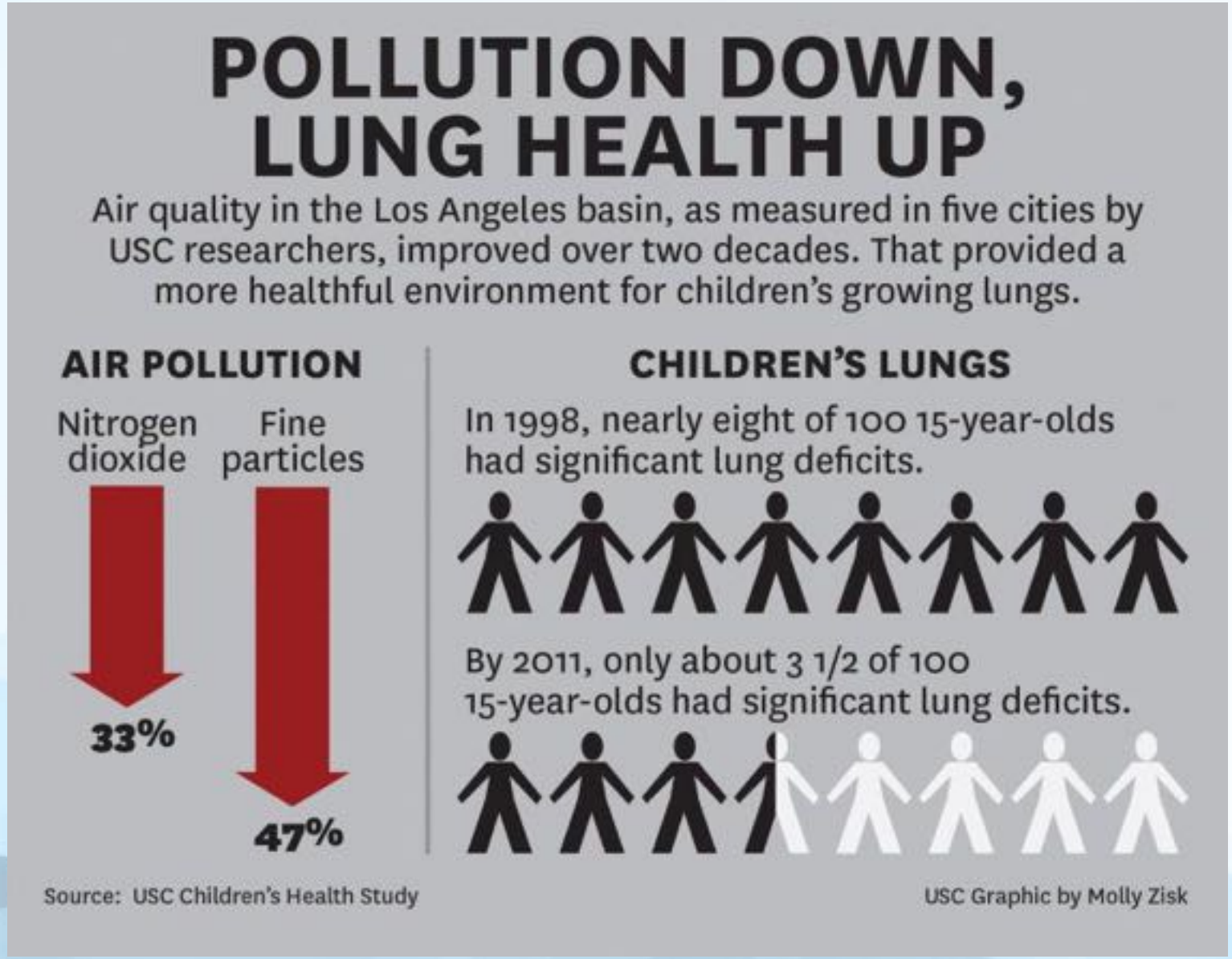
Lung function

3 groups of kids were tested from 11-15 years of age.
Group 1 was tested: 1994-1998
Group 2 was tested: 1997-2001
Group 3 was tested: 2007-2011

Pollution

Pollution levels across So Cal have been measured for a period spanning 20 years starting in 1994.

Particles: Coarse (PM10), Fine (PM 2.5)
Gases: Nitrogen Dioxide (NO2), Ozone (O3)


POLLUTION DOWN, LUNG HEALTH UP
Air quality in the Los Angeles basin, as measured in five cities by USC researchers, improved over two decades. That provided a more healthful environment for children's growing lungs.
AIR POLLUTION
Nitrogen dioxide
Fine particles
33%
47%
CHILDREN'S LUNGS
In 1998, nearly eight of 100 15-year-olds had significant lung deficits.
By 2011, only about 3 1/2 of 100 15-year-olds had significant lung deficits.
Source: USC Children's Health Study
USC Graphic by Molly Zisk

La Contaminación del aire proviene de una variedad de fuentes

ESTACIONARIAS

TINTORERÍAS
FÁBRICAS
REFINERÍAS
PLANTAS DE ENERGÍA

PERSONALES

CHIMENEAS
PRODUCTOS PARA USO DIARIO

MÓVILES

AUTOS
CAMIONES
AUTOBUSES
TRENES
AVIONES

NATURALES

ANIMALES
POLVO
INCENDIOS FORESTALES

Los Medios para Mejorar la Calidad del Aire en California

- AVANCES CIENTÍFICOS
- PARTICIPACIÓN PÚBLICA
- INVERSIONES E INCENTIVOS
- CUMPLIMIENTO DE NORMAS
- NORMAS Y REGULACIONES
- TECNOLOGÍA INNOVADORA

Los Angeles 1948

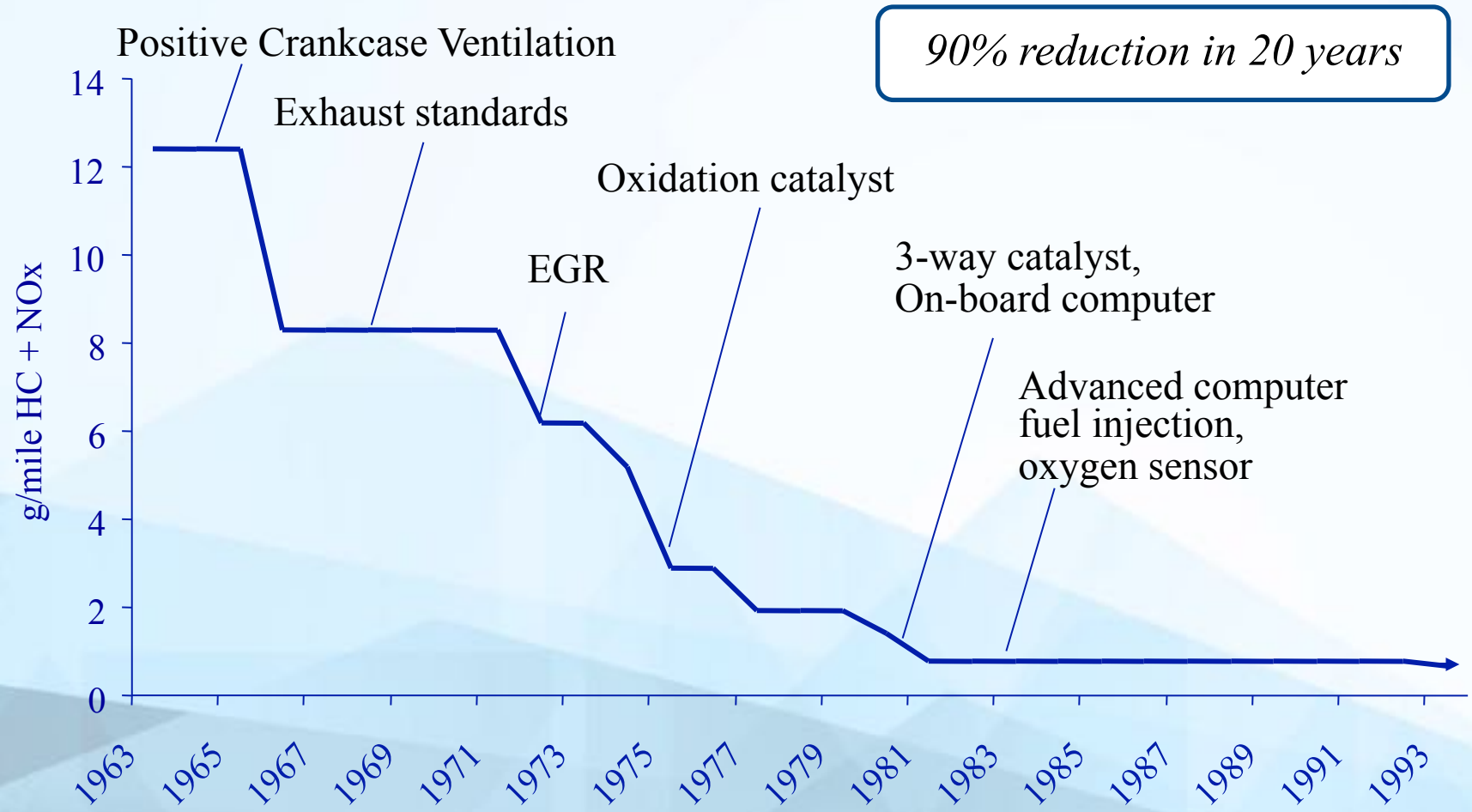
Los Angeles 50 Years Ago

- Unhealthy levels of lead, NO_2, SO_2, carbon monoxide, ozone, particulate matter, and air toxics
- In Los Angeles:
  - Over 100 air pollution alerts annually
  - Over 200 days with unhealthy air annually
  - 49 pphm one hour peak ozone level, five times the allowable level

Los Angeles Today

- NO_2, SO_2, and CO: Attained National Standards
- Ozone:
  - Los Angeles peak cut over 60%
  - Hours of exposure reduced 90%
- PM10: Annual levels cut in half
- Toxics: Nearly 50% risk reduction

Vehicle Rules Cut Ozone-Forming Emissions



Key ARB Fuel Regulations

- Limited vapor pressure
- Eliminated lead from gasoline
- Required oxygenates in winter to reduce carbon monoxide
- Cleaner-burning diesel
- Cleaner-burning gasoline
- Further cuts in sulfur, benzene in gas
- Low-sulfur diesel

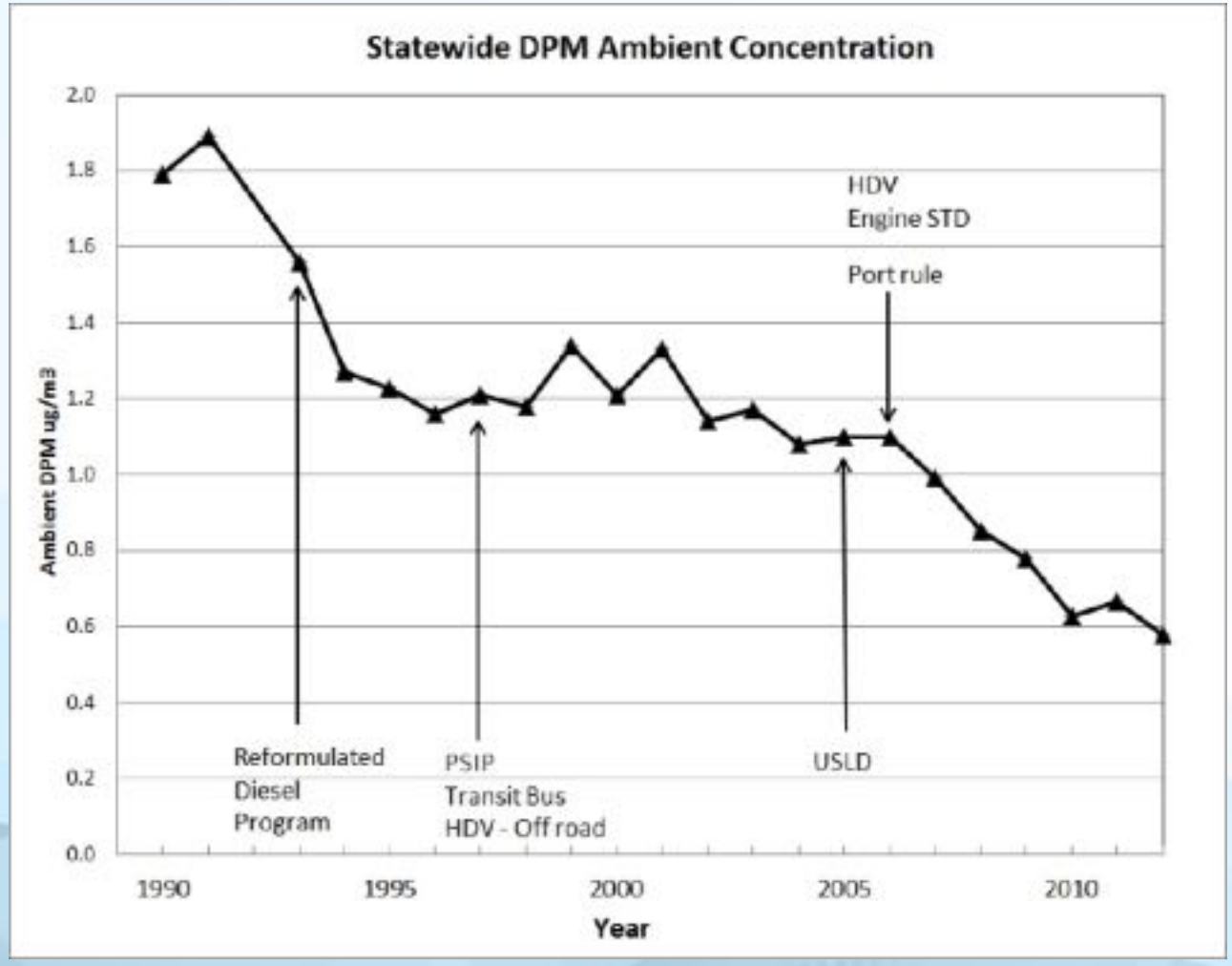
1992 1993 **1996** **1999** 2006 - 2007

Implementation dates

Diesel Risk Reduction Plan

- Adopted 2000
  - 85% reduction by 2020
- Four strategies:
  - Stringent new engine standards
  - Cleaner diesel fuel (<15 ppm sulfur)
  - Ensure in-use emissions compliance
  - Reduce emissions from older engines through retrofits and early retirements

Benefits of Diesel Engine Standards



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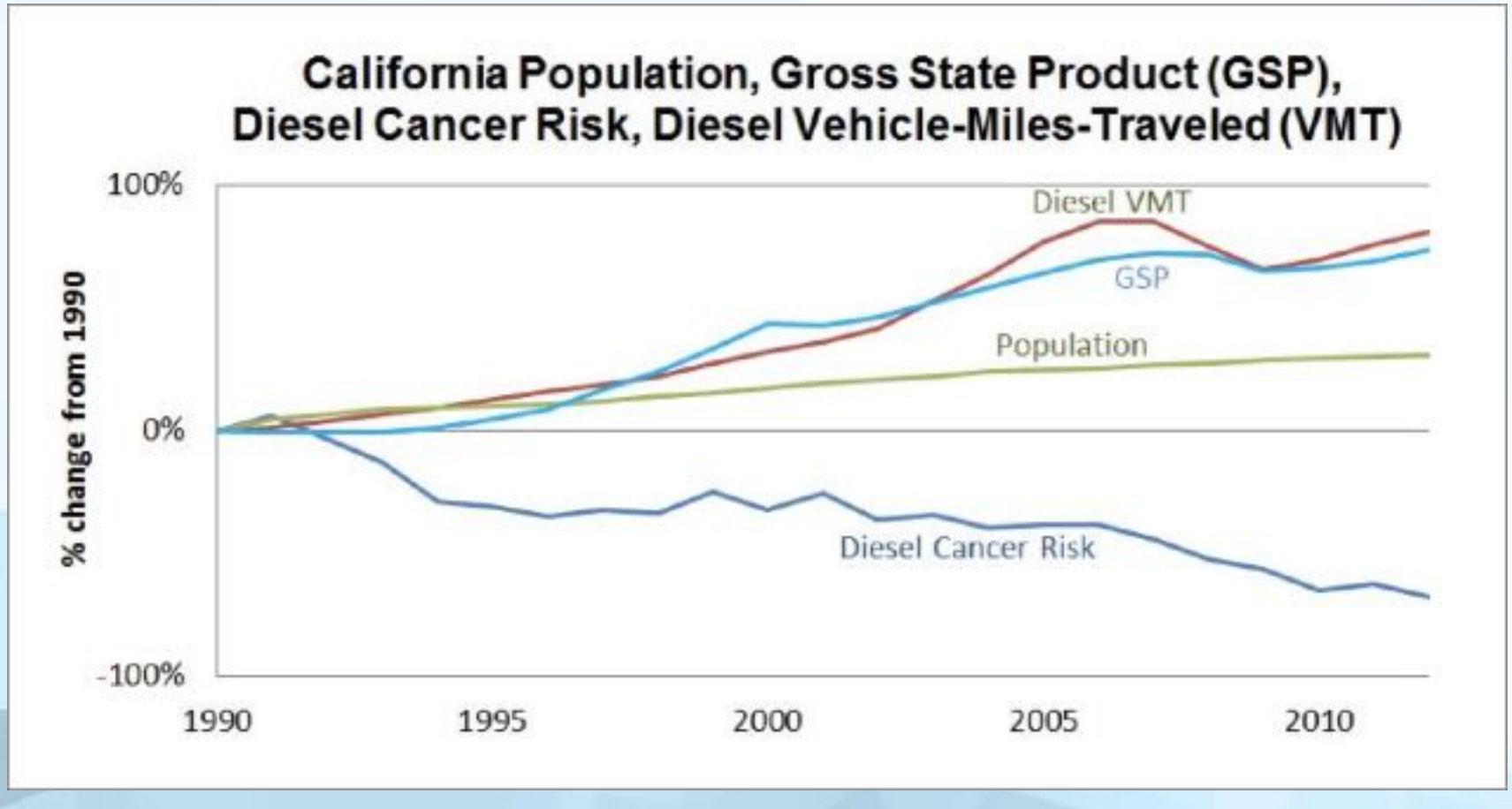
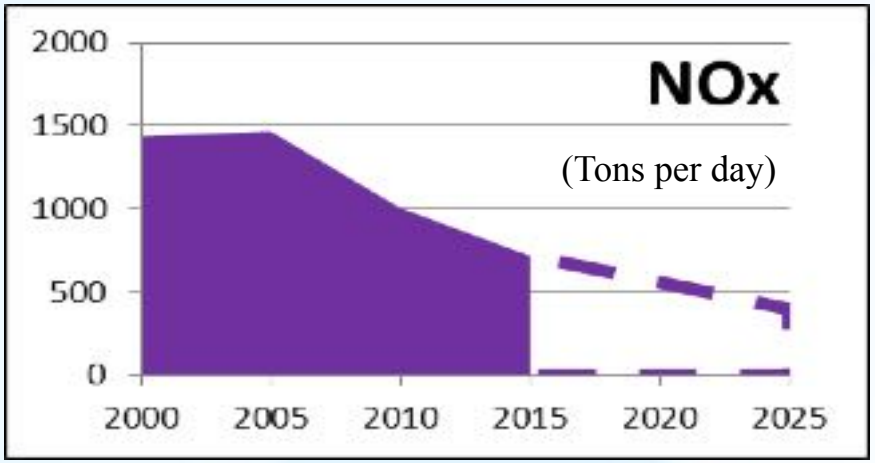
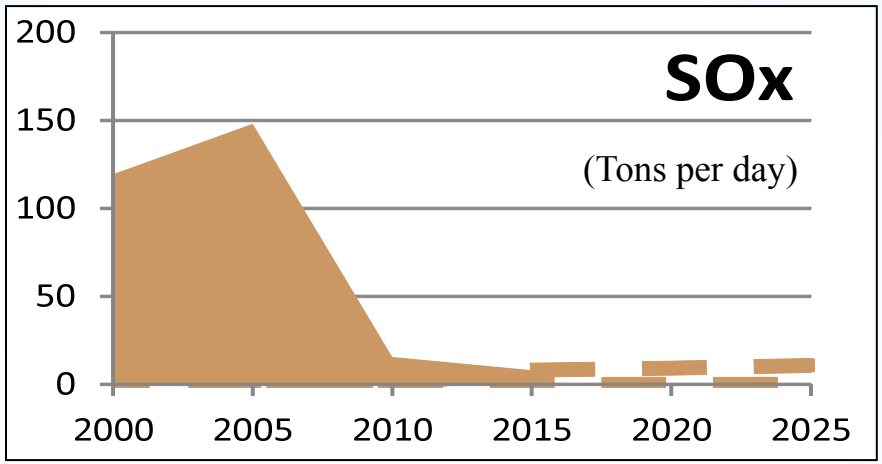


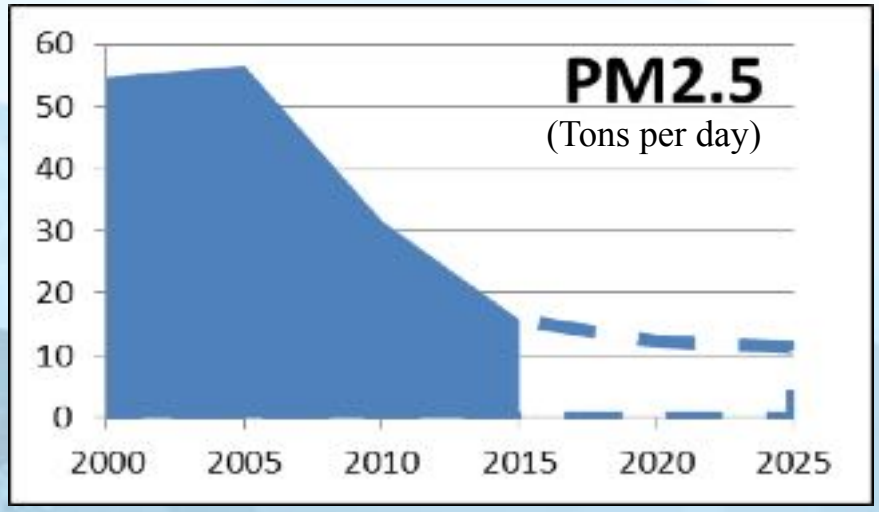
Key California measures in place

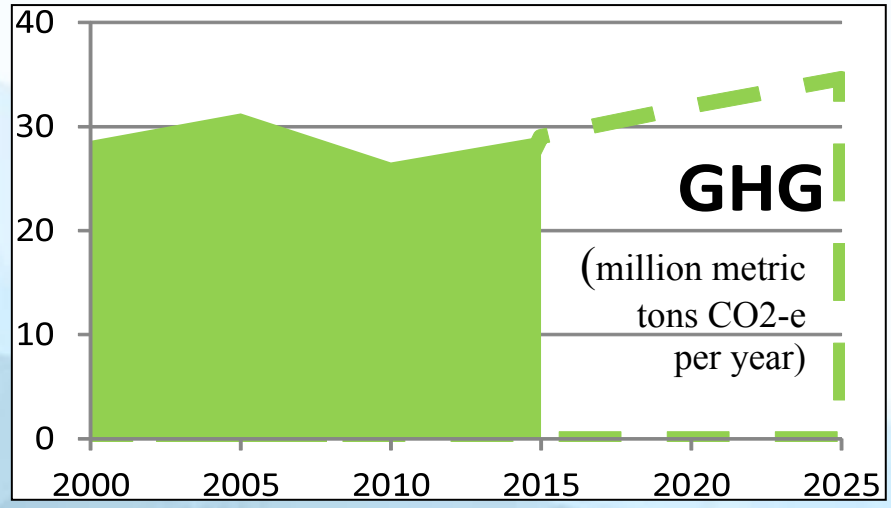
Trucks	Ships	Locomotives	Equipment & harbor craft
• Drayage trucks • All truck fleets • Optional low-NOx standards • Tractor-trailer GHG • Idling limits • Smoke limits • International trucks • Transport refrigeration	• Lower sulfur fuel • Shore power • Ban on incineration • Ports: vessel speed reduction	• Low sulfur fuel • Fleet average NOx limits for South Coast • Diesel PM risk reduction at rail yards	• Low sulfur fuel • In-use diesel equipment at ports, railyards • In-use gas forklifts • Ground service equipment • In-use harbor craft

Progress in reducing freight emissions in California (2000-2025)

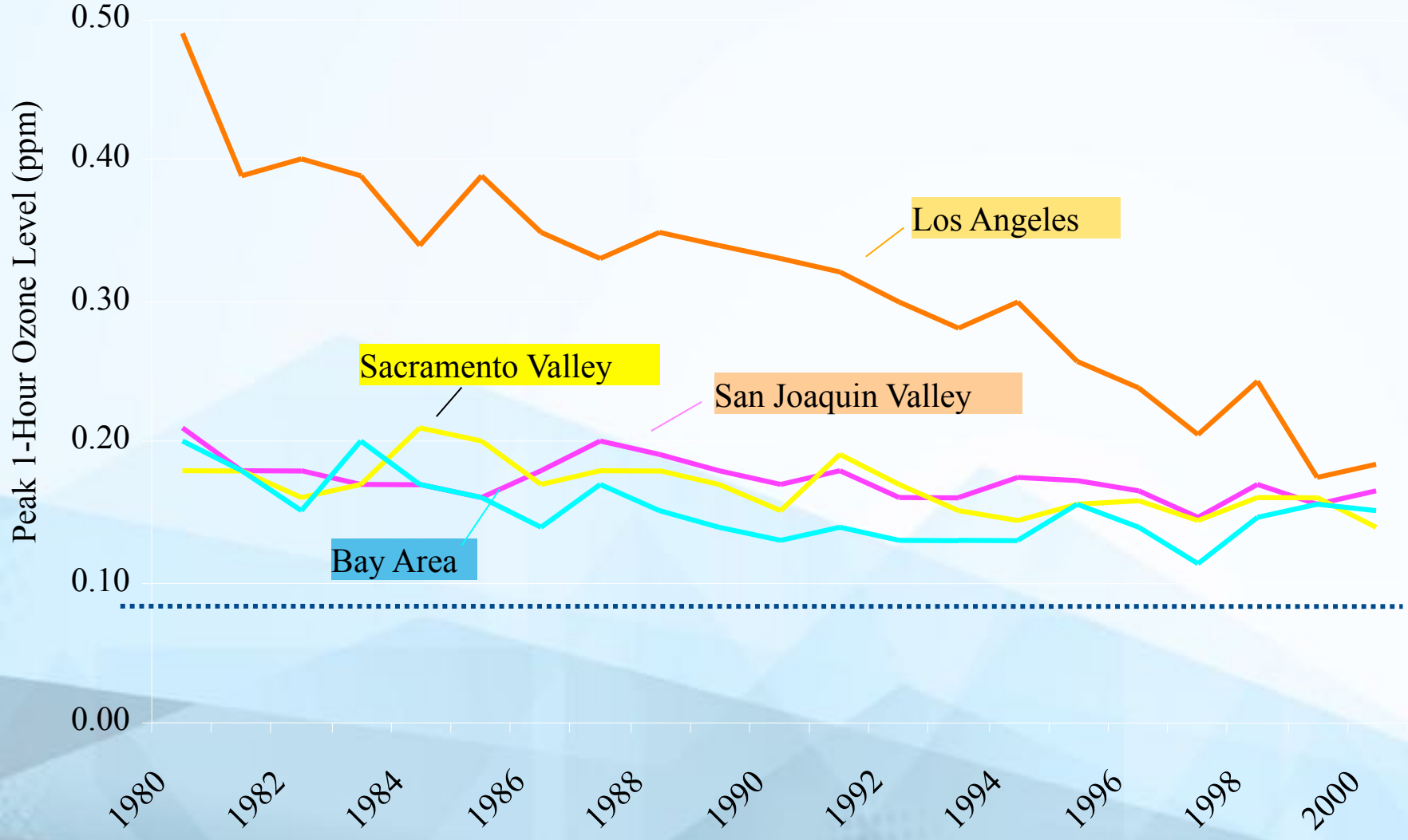




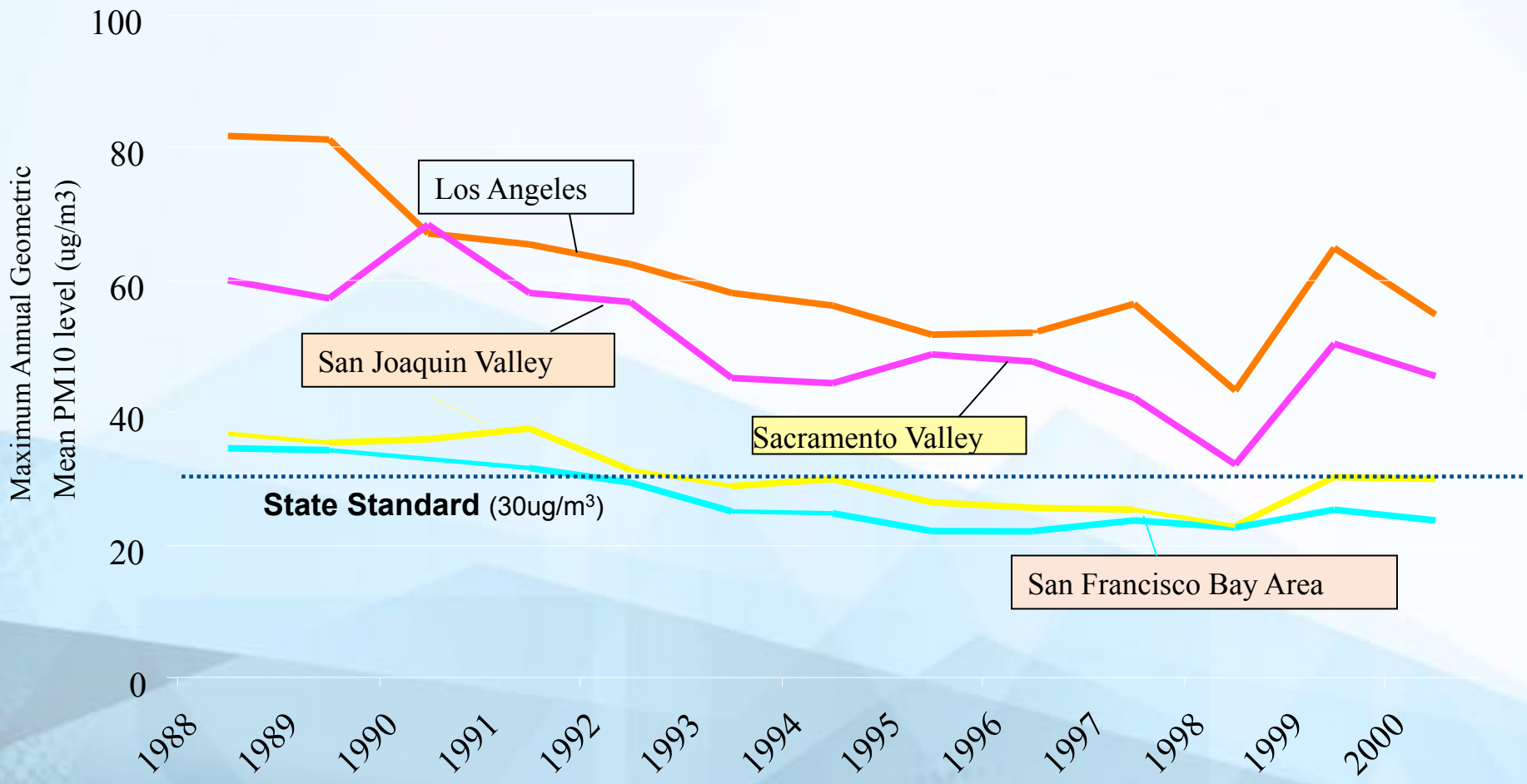




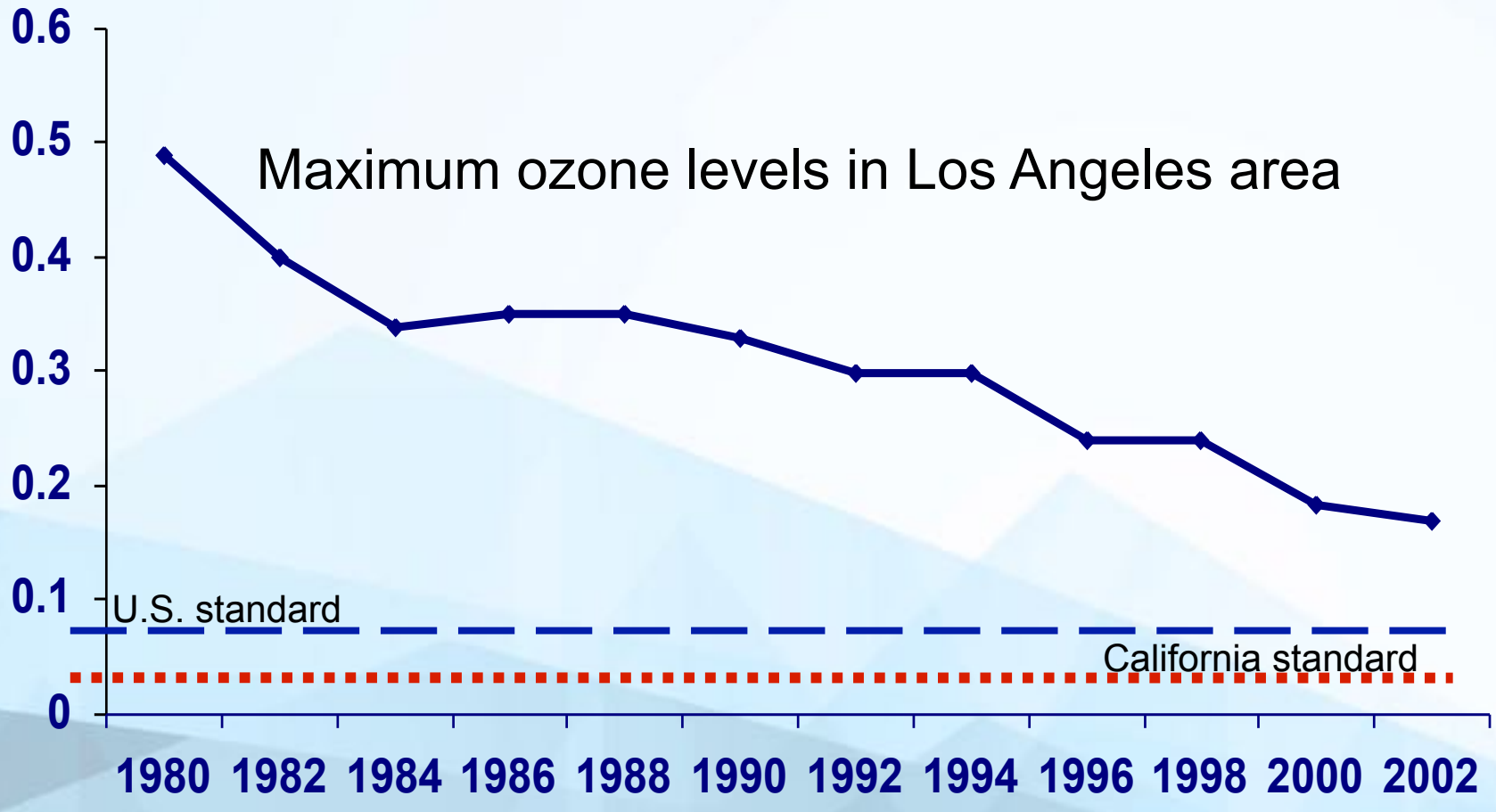
Clean Air Progress: Peak Ozone Levels Decline



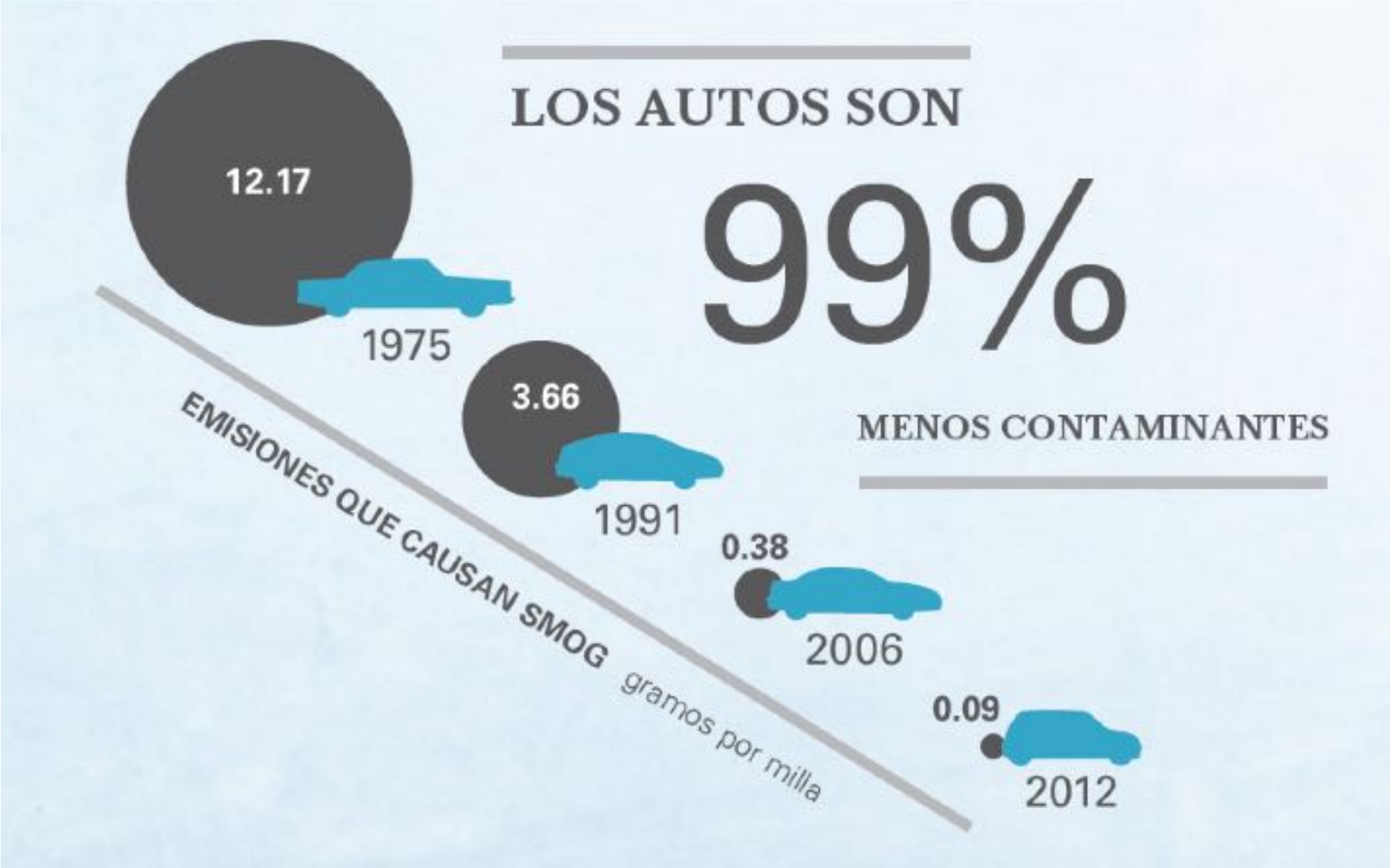
Clean Air Progress: Annual Average PM10 Levels Drop



Clean Air Progress: Dramatic Improvement in Los Angeles



Clean Air Progress: Cleaner Cars



Smog Check Program Overview

- Launched in 1984
- Administered by Bureau of Automotive Repair, designed in consultation with CARB
- De-centralized program design
  - Privately owned smog stations licensed by BAR
- Historically: most vehicles tested by OBD and ASM
- March 2015: OBD only testing for 2000 and newer gasoline vehicles

Testing Requirements Per Area

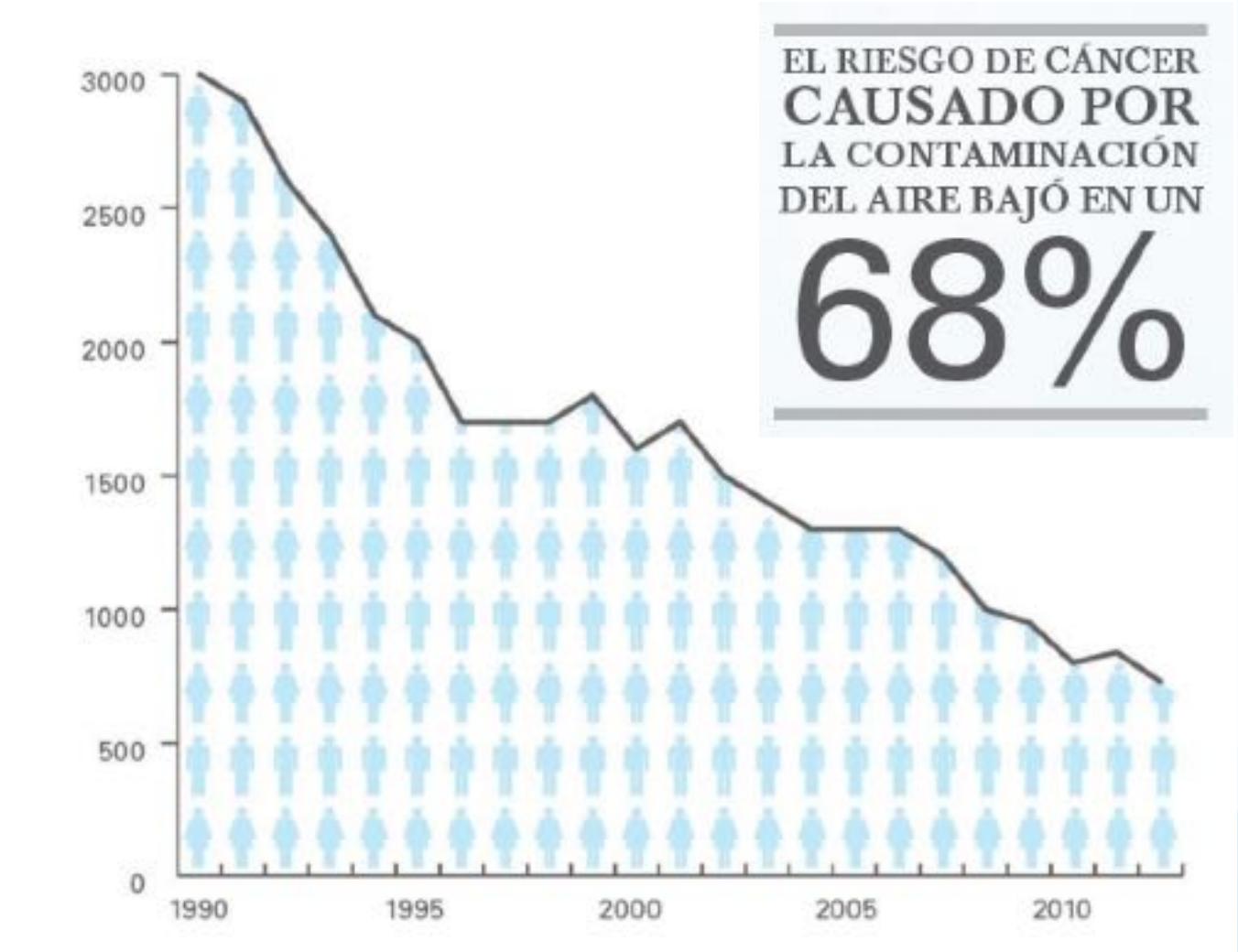
Program Area	Smog Check Required	Testing Required
Enhanced	Every 2 Years When Owner Changes	OBD for 2000+ MY OBD + ASM for 1996-1999 MY ASM for 1976-1996 MY
Basic	Every 2 Years When Owner Changes	OBD for 2000+ MY OBD + TSI for 1996-1999 MY TSI for 1976-1999
Change of Ownership	When Owner Changes	OBD for 2000+ MY OBD + TSI for 1996-1999 MY TSI for 1976-1999

OBD = On-Board Diagnostic System Focused Inspections
ASM = Acceleration Simulation Mode Test
TSI = Two Speed Idle Test

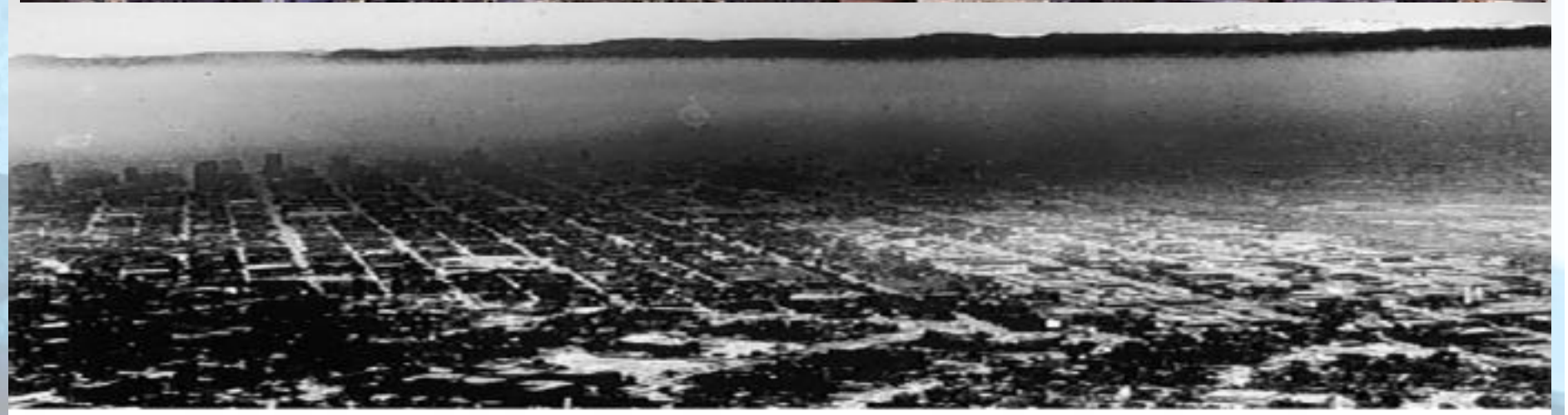
California Smog Check Statistics

- 22 million vehicles in program
  - 11.3 million initial inspections/year
- 7,000 smog check stations
- 21,000 inspectors/technicians
- Overall failure rate (2014): 12.14%
- Average inspection cost (2014): $47
- Average repair cost (2014): $297

Clean Air Progress: Reduced Risk



Californians now breathe the cleanest air since the first air pollution monitors were installed more than 40 years ago.



…But Work Still Remains

MOST POLLUTED CITIES IN U.S. California

By ozone pollution	By particle pollution
1 Los Angeles-Long Beach	1 Bakersfield
2 Bakersfield	2 Visalia-Porterville-Hanford
3 Visalia-Porterville-Hanford	3 Fresno-Madera
4 Fresno-Madera	4 Los Angeles-Long Beach
5 Phoenix	5 El Centro
6 Sacramento-Roseville	6* San Francisco Bay Area
7 Modesto-Merced	6* Modesto-Merced
8 Denver	8 Pittsburgh
9 Las Vegas	9 Harrisburg, Pa.
10 Fort Collins, Colo.	10 Louisville, Ky.

Source: American Lung Association *A tie The Sacramento Bee

EL CAMBIO CLIMÁTICO

El Impacto de los Gases de Efecto Invernadero

EL CAMBIO CLIMÁTICO
es el resultado de la acumulación de
GASES DE EFECTO INVERNADERO
en la atmósfera generada principalmente por
LA QUEMA DE COMBUSTIBLES
y otras actividades del hombre

ALGUNOS RAYOS SOLARES QUE LLEGAN A LA TIERRA SON REFLEJADOS, OTROS SE CONVIERTEN EN CALOR

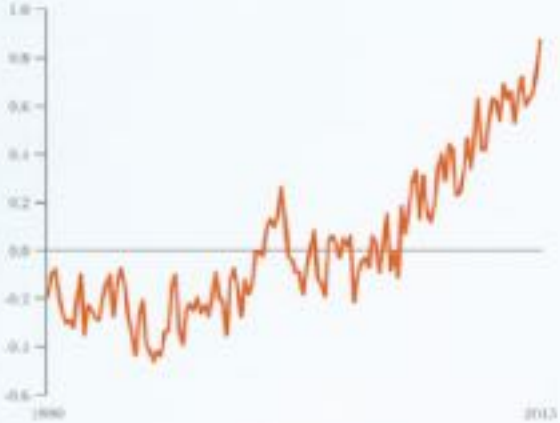
CO_2 Y OTROS GASES EN LA ATMÓSFERA ATRAPAN MÁS CALOR DEL SOL INCREMENTANDO LA TEMPERATURA GLOBAL

La temperatura global ha incrementado rápidamente en los últimos 100 años.

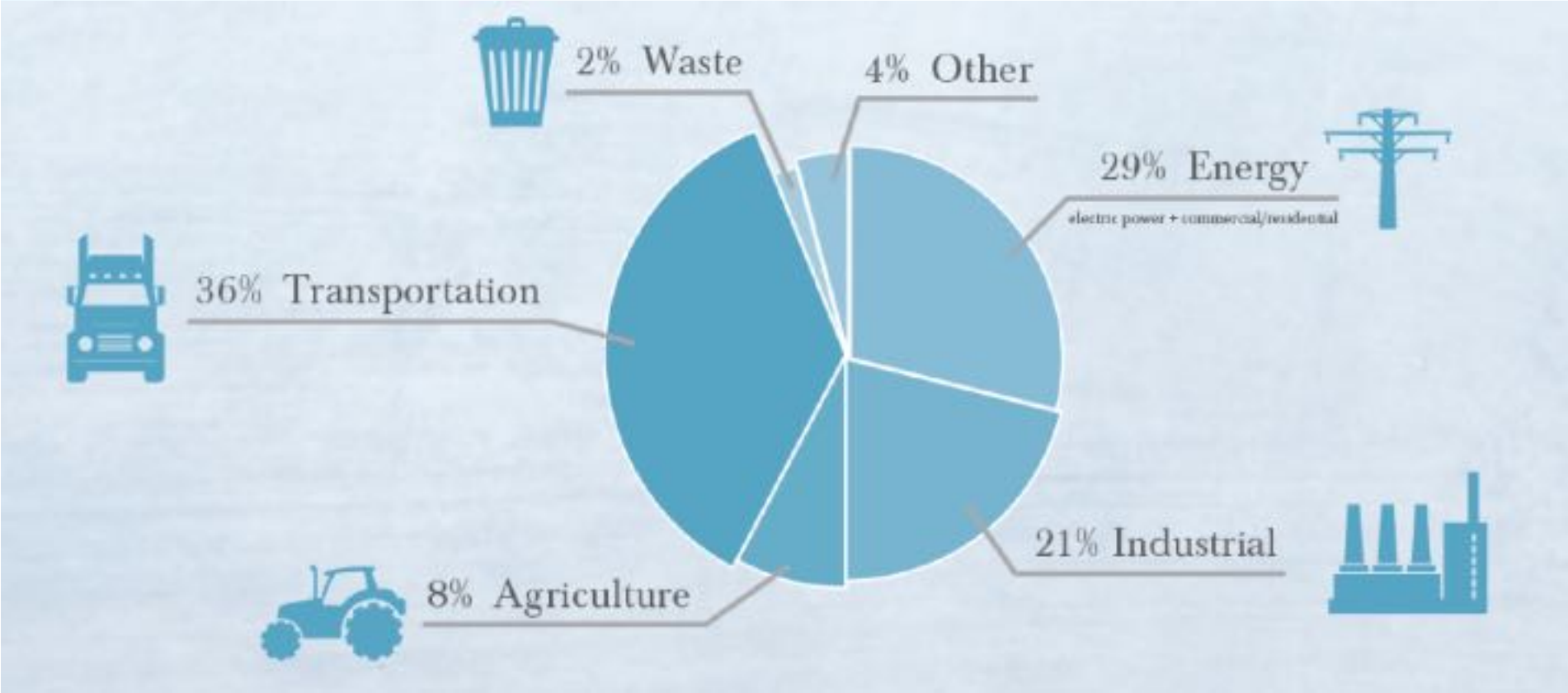
CADA AÑO DESDE
1976 HA SIDO

MÁS CALUROSO

que el año anterior. El 2015 fue el más caluroso en la historia y el 2016 podría ser aún más caluroso.



Las Fuentes de Gases de Efecto Invernadero en California



Estrategia Contra El Cambio Climático

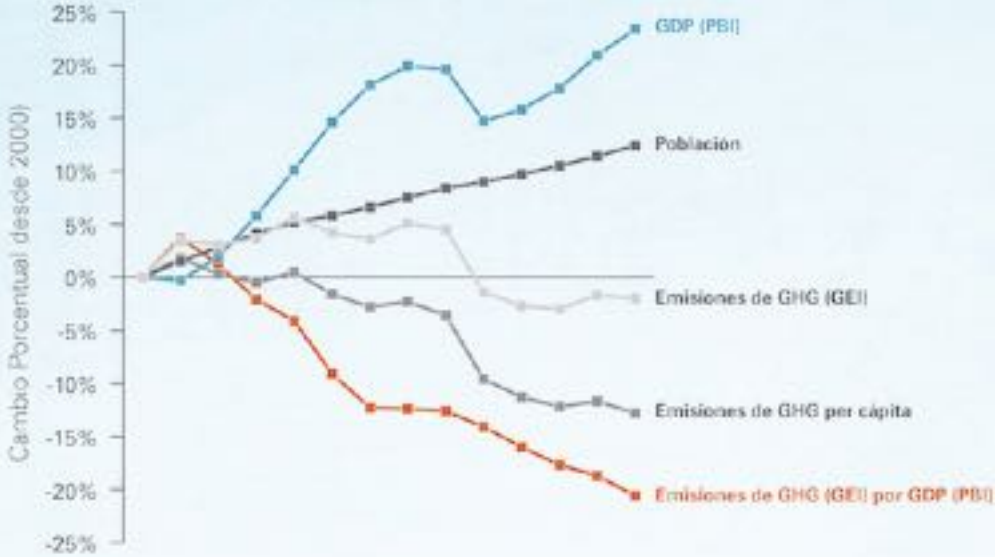
California se dirige a cumplir con

LAS METAS DE LA LEY AB 32

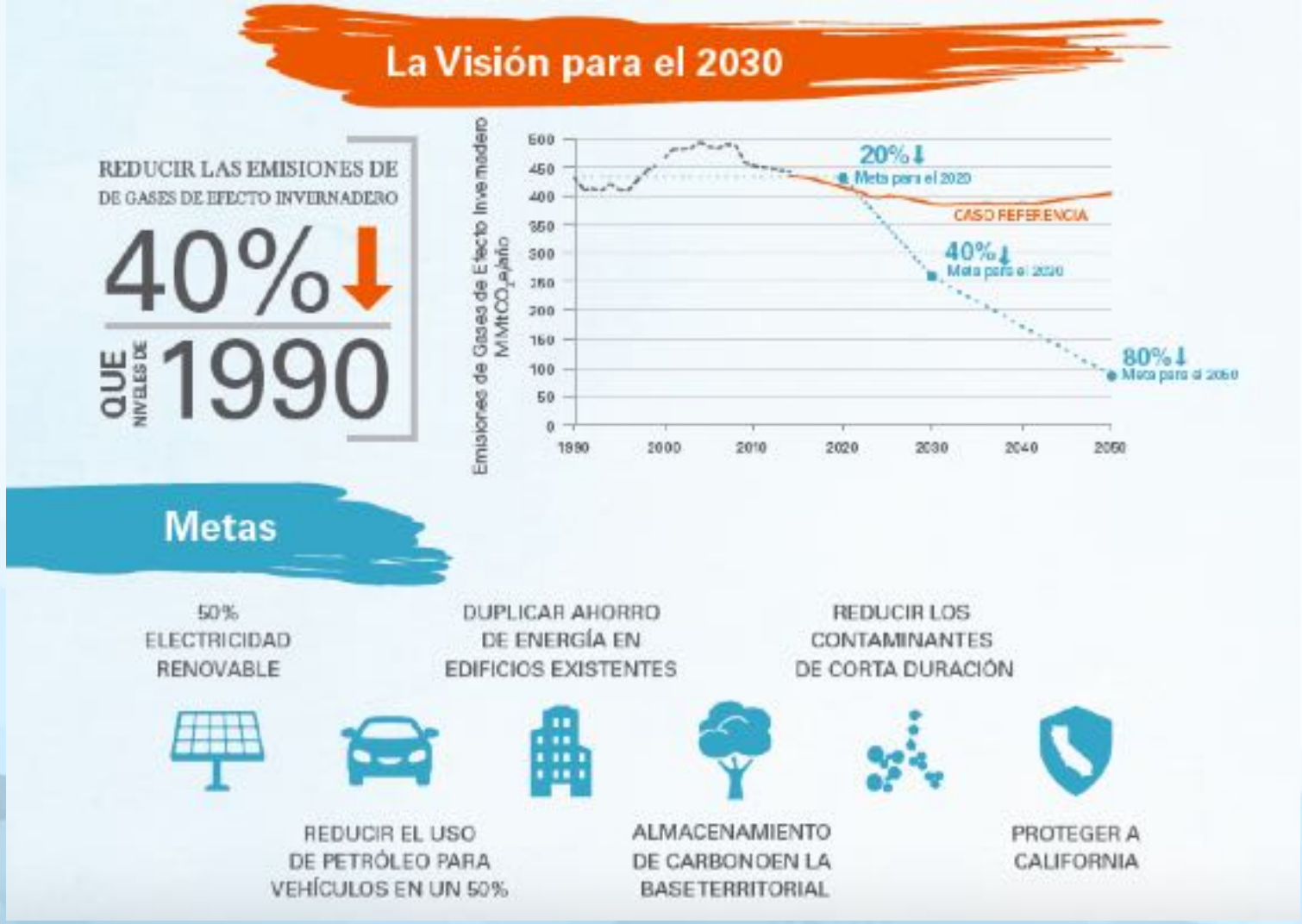
ECONOMÍA EN DESARROLLO

&

ENERGÍA LIMPIA



Estrategia Contra El Cambio Climático



Estrategia Contra El Cambio Climático

Inversiones Contra El Cambio Climático

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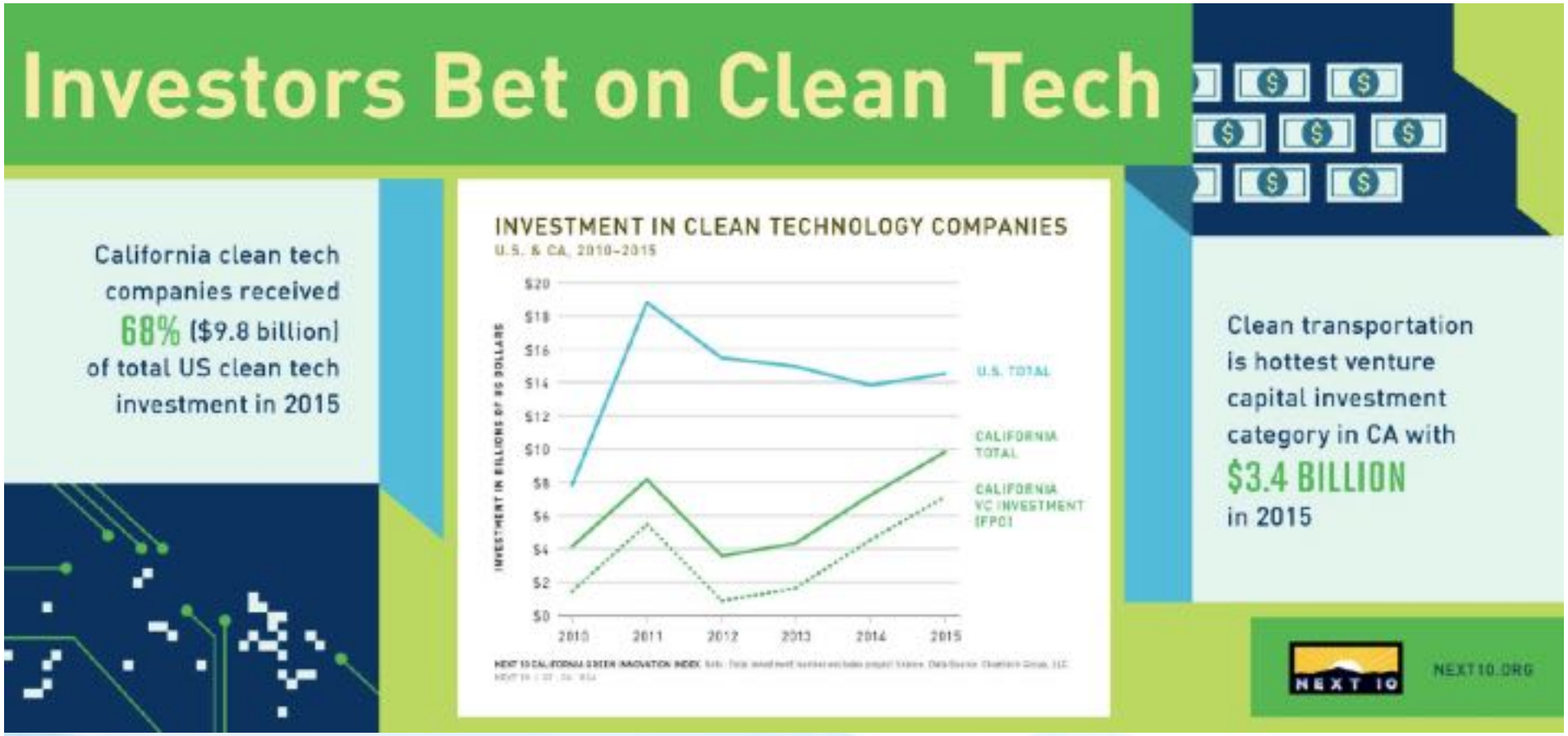
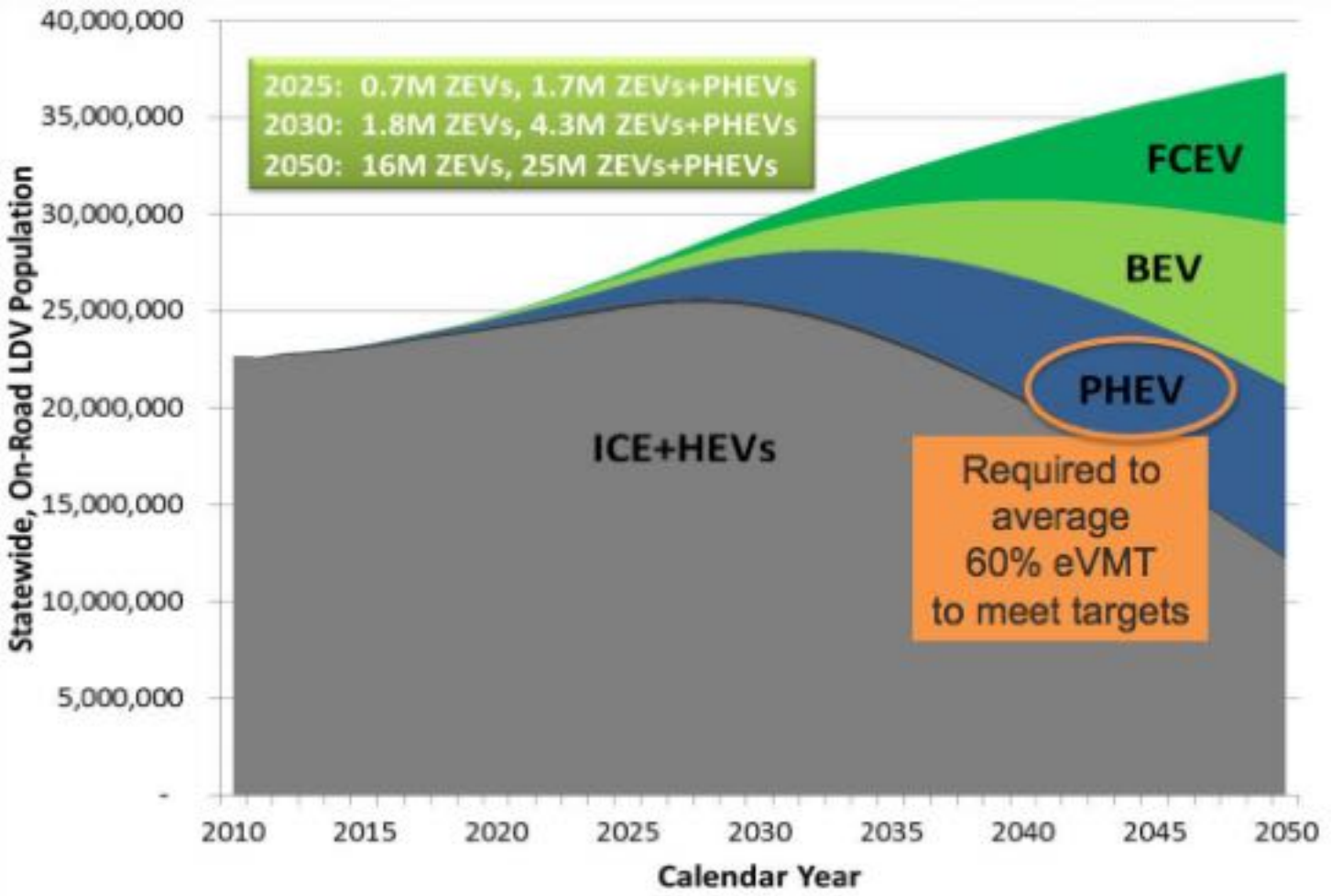
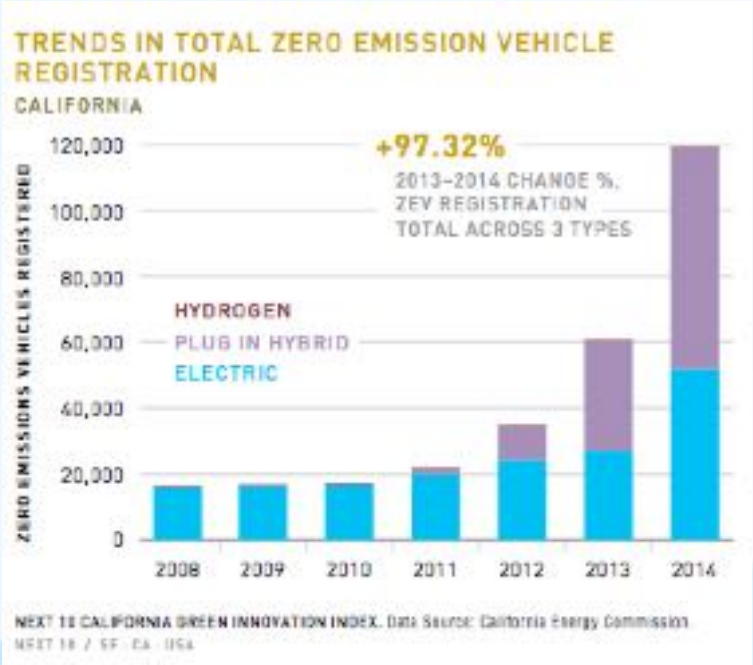


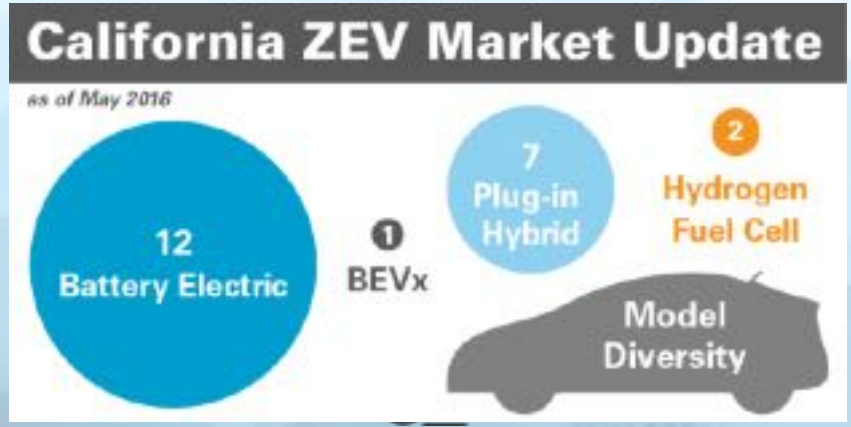
- ***Planning***
- ***Entrepreneurial***
- ***Engineering***
- ***Science***

California's Clean Car Future

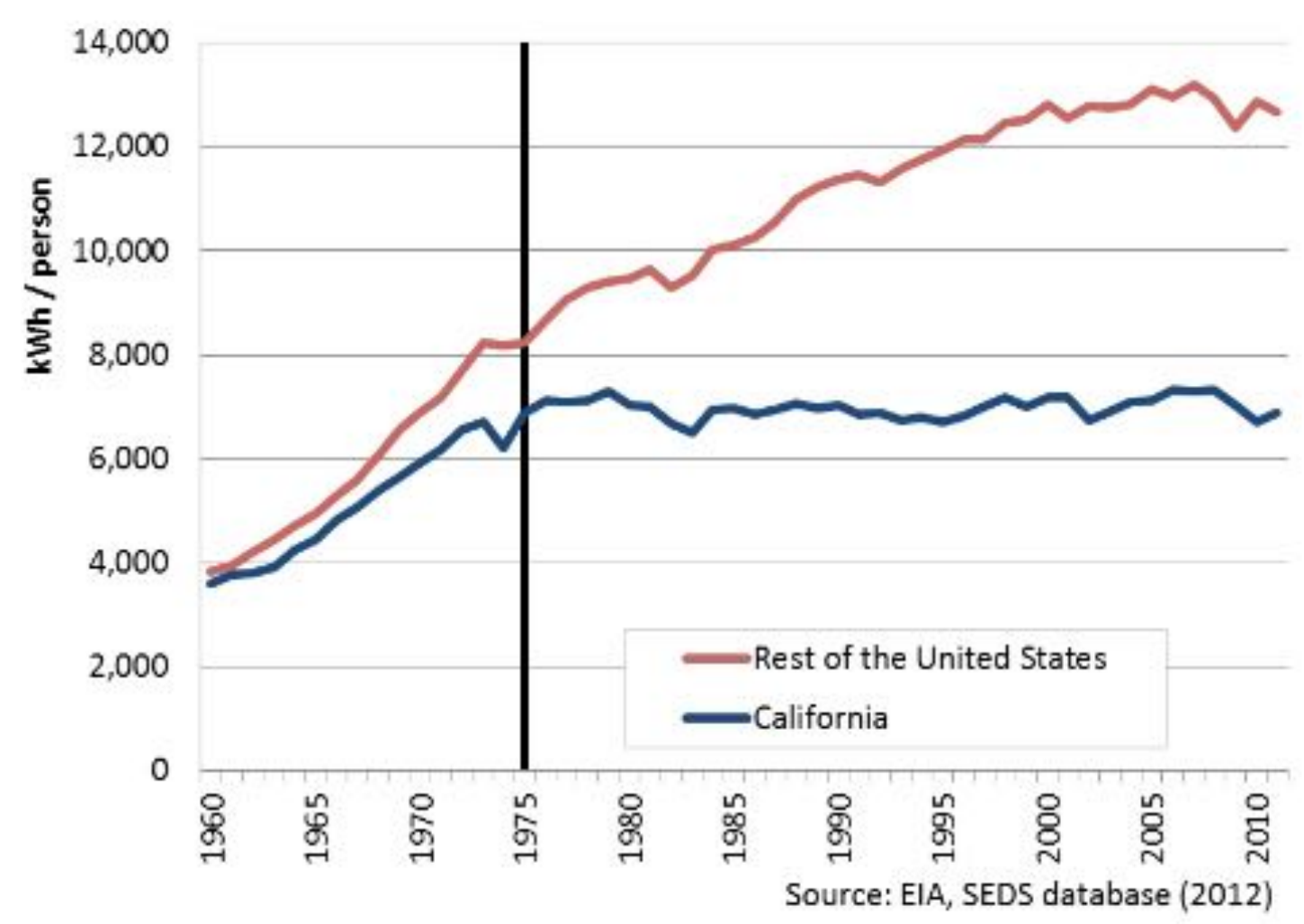


California's Clean Car Progress

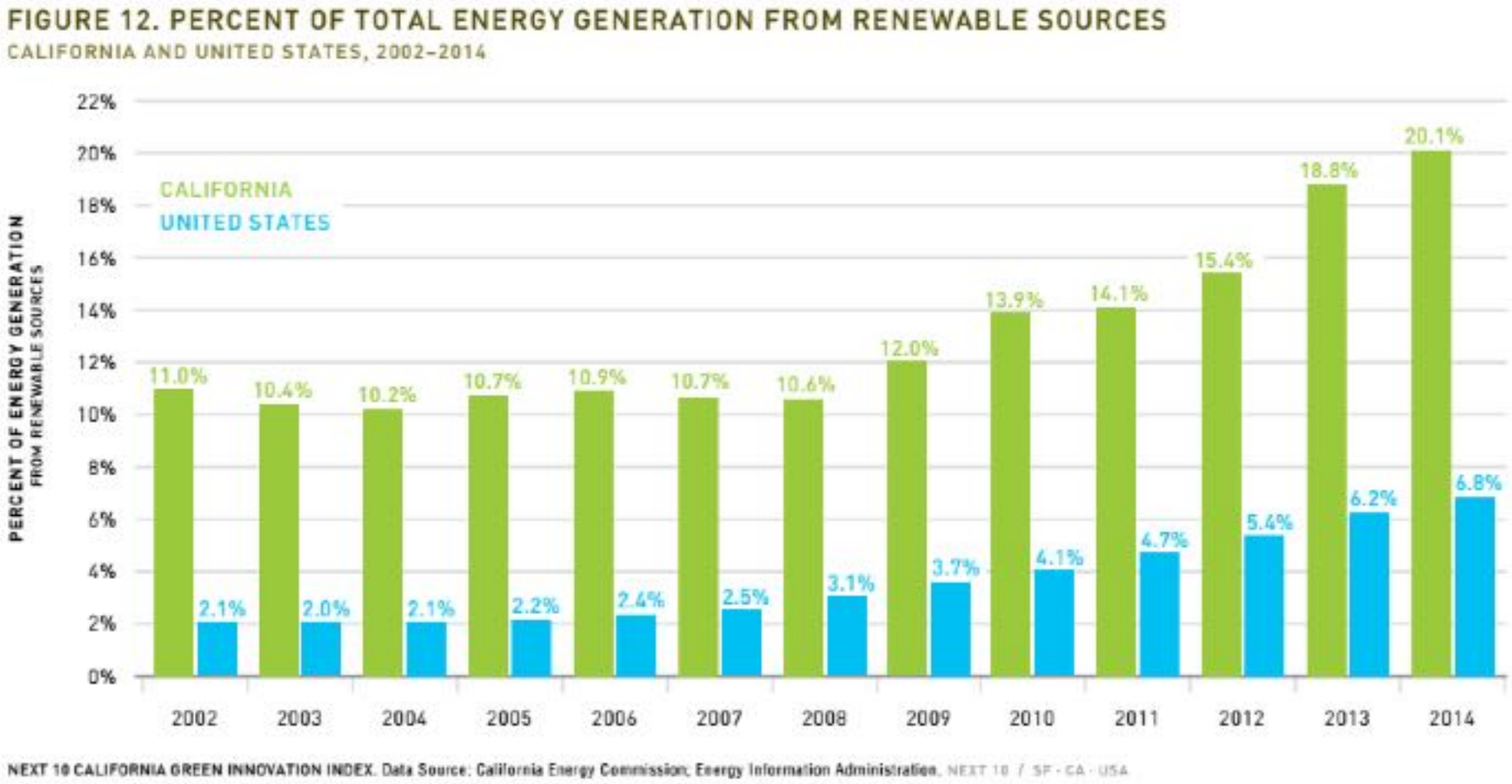




Energy Efficiency in California



Renewable Energy in California



California's Subnational Climate Leadership

- AB 32 already having national and international impact
- Partnerships & MOUs
- Lessons learned
  - Co-benefits
  - Public participation and transparency

California's Subnational Climate Leadership

California Agreements with States and Regions throughout the World

North America

United States
- Connecticut
- Illinois
- Massachusetts
- Maryland
- New York
- Oregon
- Rhode Island
- Vermont
- Washington
- Wisconsin

Pacific Coast Collaborative
- British Columbia
- Oregon
- Washington

Quebec and California Cap-and-Trade Linkage
- Quebec

Mexico
- Ministry of Energy
- Ministry of Environment
- Baja California
- Chiapas
- State of Mexico

Europe

Netherlands

South America

Brazil
- State of Acre

Chile

Peru

Middle East

Israel

Asia

China
- National Development & Reform Commission
- Ministry of Environment
- Beijing
- Chongqing
- Guangdong
- Inner Mongolia
- Jiangsu
- Shanghai Zhangjiang
- Shenzhen

India
- Forum of Regulators

Japan
- Osaka

Malaysia

South Korea

December 2014

Mexico-California MOU

Areas of Cooperation

- Climate Change
- Air Quality
- Clean Vehicles
- Wildfire