



# Climate Action Planning: A Regional Perspective



American Planning Association  
**California Chapter**  
**San Diego**

*Making Great Communities Happen*

## American Planning Association (APA) San Diego Section

### Luncheon Program November 21, 2014

# Agenda

- **Dr. Sam Iacobellis**

- Research Specialist in the Climate, Atmospheric Science and Physical Oceanography (CASPO) Division of the Scripps Institution of Oceanography at the University of California, San Diego

- **Allison Wood**

- Associate Regional Energy/Climate Planner, San Diego Association of Governments (SANDAG)

- **Dr. Nilmini Silva-Send**

- Senior Policy Analyst and Adjunct Professor at the Energy Policy Initiatives Center, University of San Diego (USD)

- **Mike Hansen**

- Director of Land Use and Environmental Policy, Advisor to the Mayor, City of San Diego

- **Cody Hooven**

- Senior Environmental Specialist and Manager of the Climate Action Plan, Environment and Land Use Management Department, Unified Port District of San Diego

- **Q&A / Discussion led by Brian Schoenfisch**

- Program Manager, City of San Diego Planning Department



# Projected Impacts of Climate Change in Southern California and the Western U.S.

Sam Iacobellis and Dan Cayan

Scripps Institution of Oceanography  
University of California, San Diego

Sponsors: NOAA RISA Program, California-Nevada Applications Project (CNAP)  
California Energy Commission

# Projected Regional Impacts

- Temperature
- Precipitation
- Sea Level Extremes

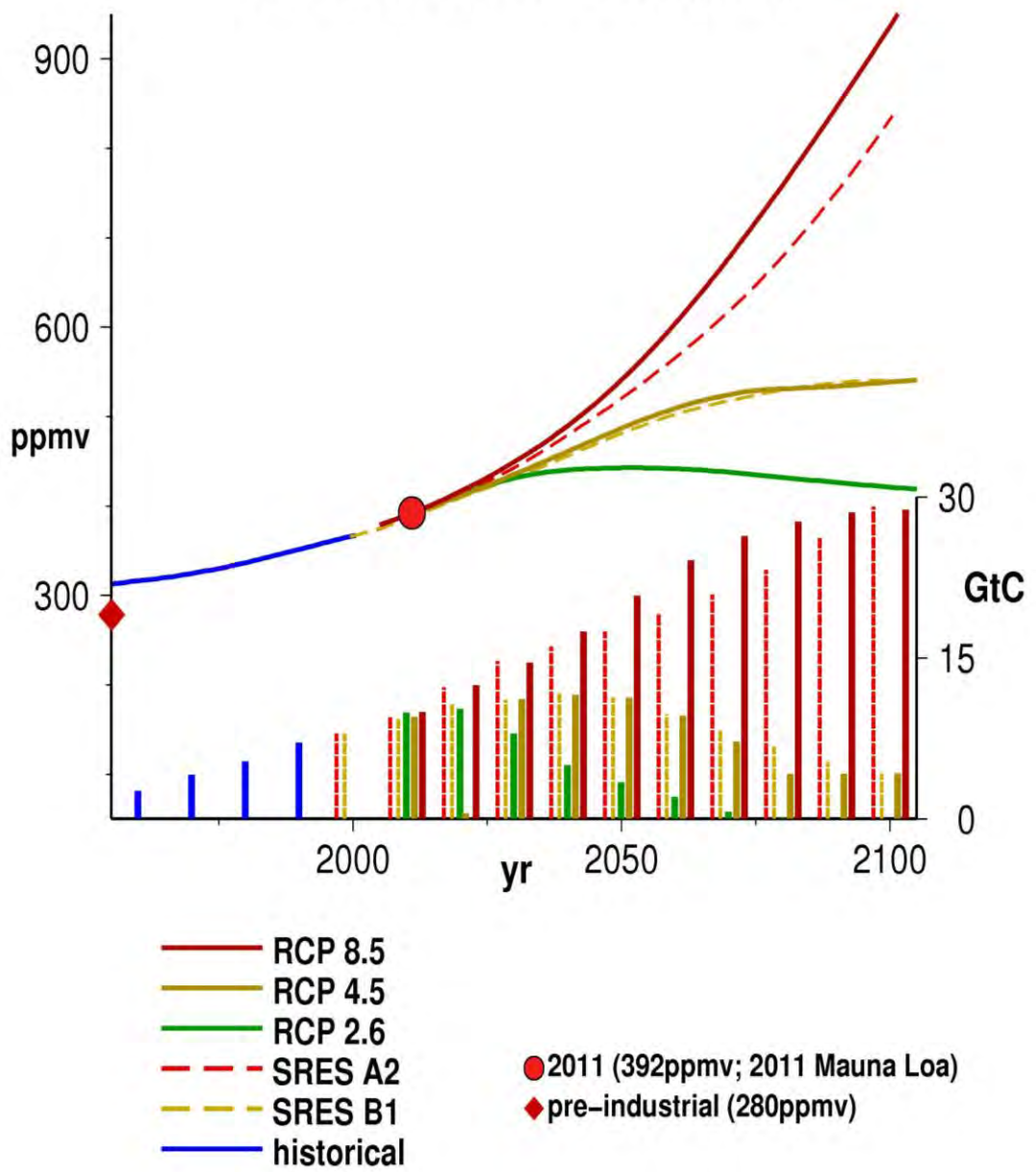
**GOAL:** Inform you about some of our research examining how climate change may impact Southern California

# Global Atmospheric CO<sub>2</sub> Concentration (ppmv) and Carbon Emissions (GtC)

IPCC 4<sup>th</sup> and 5<sup>th</sup> Assessment Scenarios

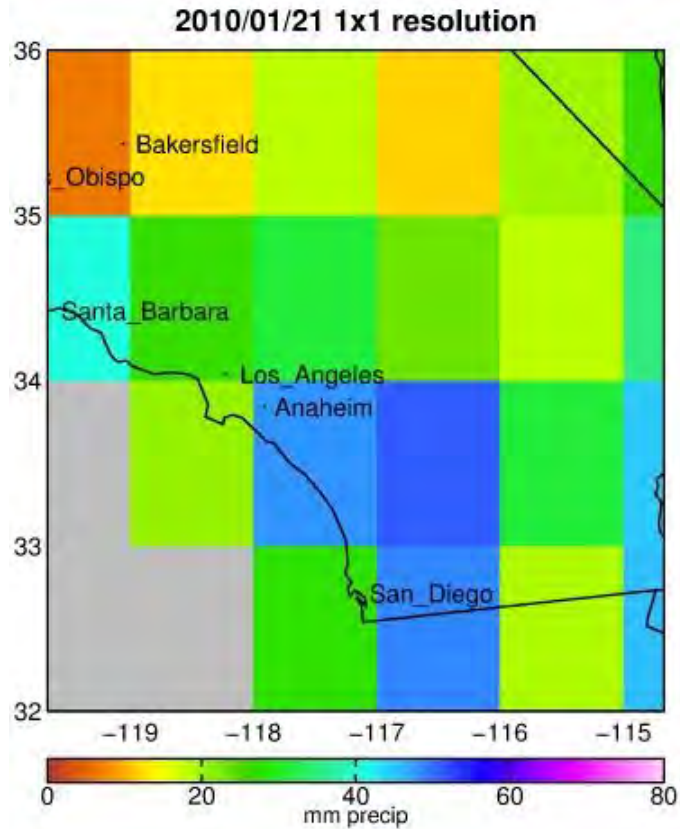
Projections based on climate models forced with various scenarios of CO<sub>2</sub> concentration

Different greenhouse gas emissions trajectories would have enormous impacts on climate in future decades



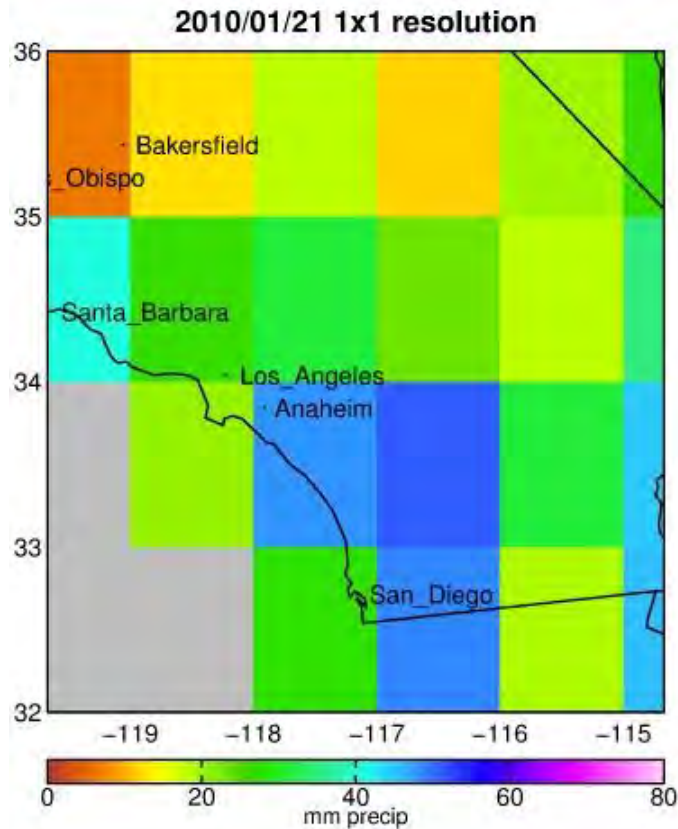
# Downscaling

Precipitation from January 21, 2010 storm:

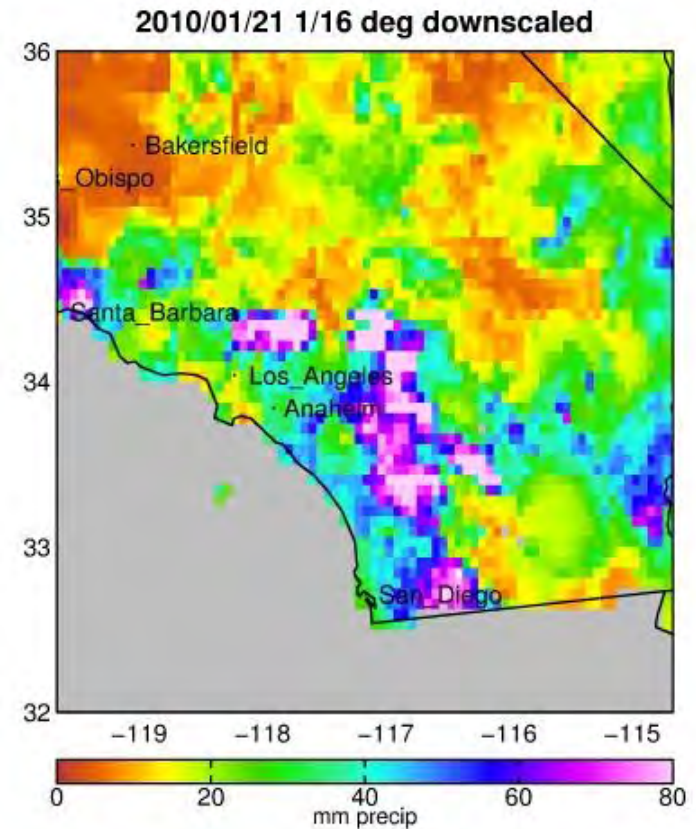


# Downscaling

Precipitation from January 21, 2010 storm:



Downscaled to  
6-km grid



Downscaling resolves regional precipitation features

LOCA: Localized Constructed Analog statistical downscaling (Pierce et al 2014)

# Temperature

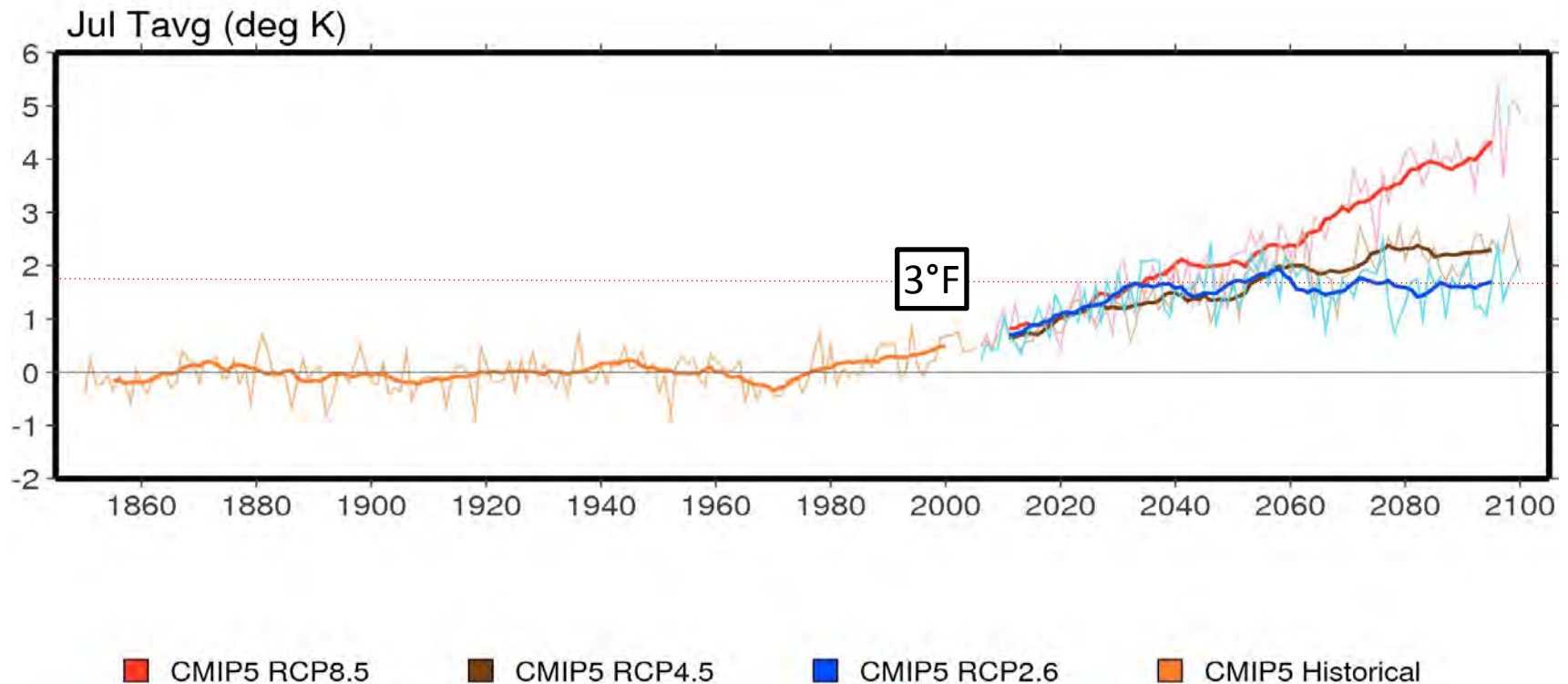




# Projected Climate Warming through the 21<sup>st</sup> Century

- *because of greenhouse gas build-up we are committed and are already warming*
- *amount of warming in future decades depends on greenhouse gas emissions*

**CMIP5 (14 models), simulation medians, San Diego, CA**  
(1961-1990 Historical Mean Removed)



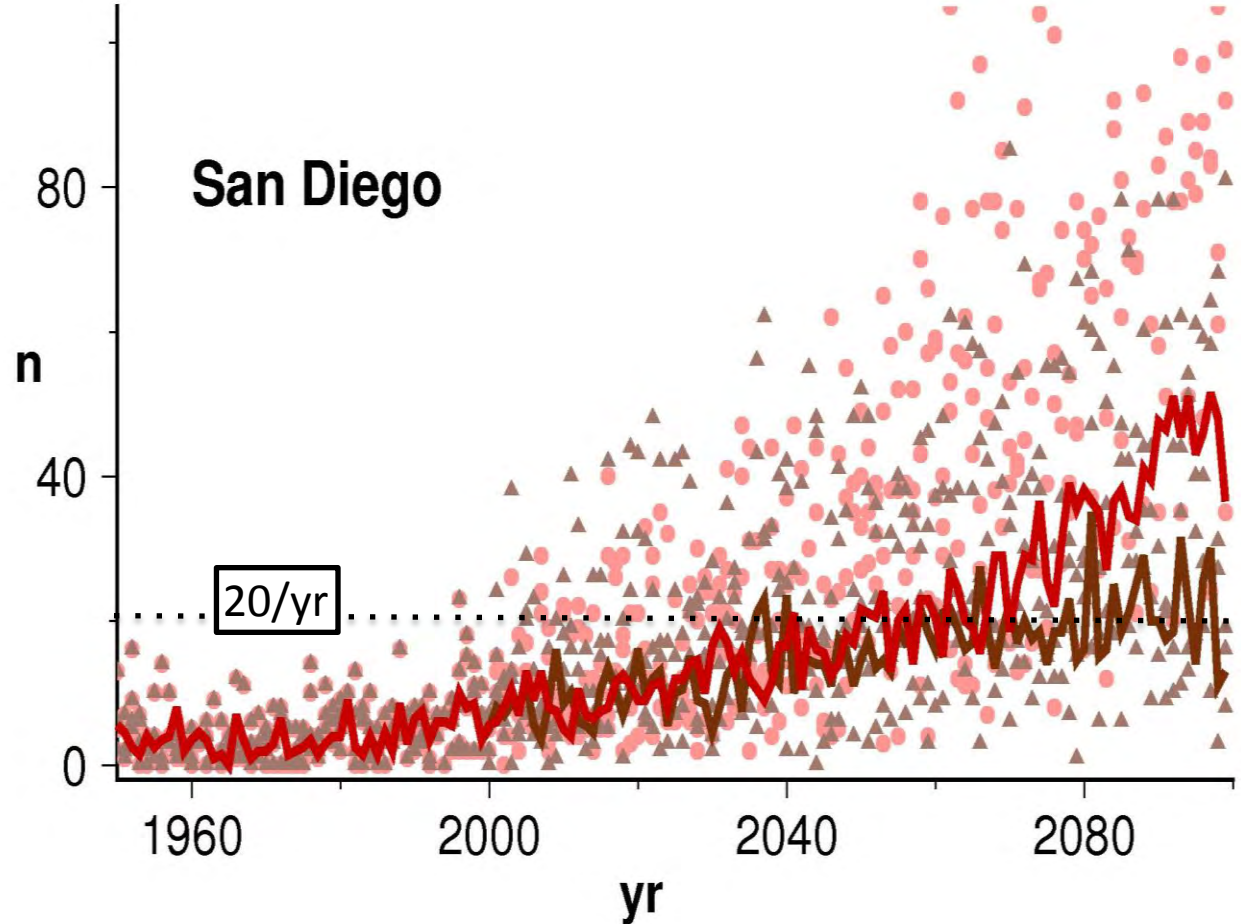
CMIP5 = Coupled Model Intercomparison Project Phase 5

# Impacts of Increasing Temperatures: Heat Waves

## Heat Waves

Projected in San Diego  
SRES A2 and SRES B1 GHG  
Emissions Scenarios

Number of Days (n), April–  
October, When Maximum  
Temperature (Tmax) Exceeds  
the 98th Percentile Historical  
(1961–1990) Level of 82° F at  
San Diego from Four BCCA  
Downscaled GCMs. Brown  
carrots and red dots shown for  
B1 and A2 emission scenarios,  
respectively. Thick brown (B1)  
and red (A2) lines show median  
value from the four simulations.

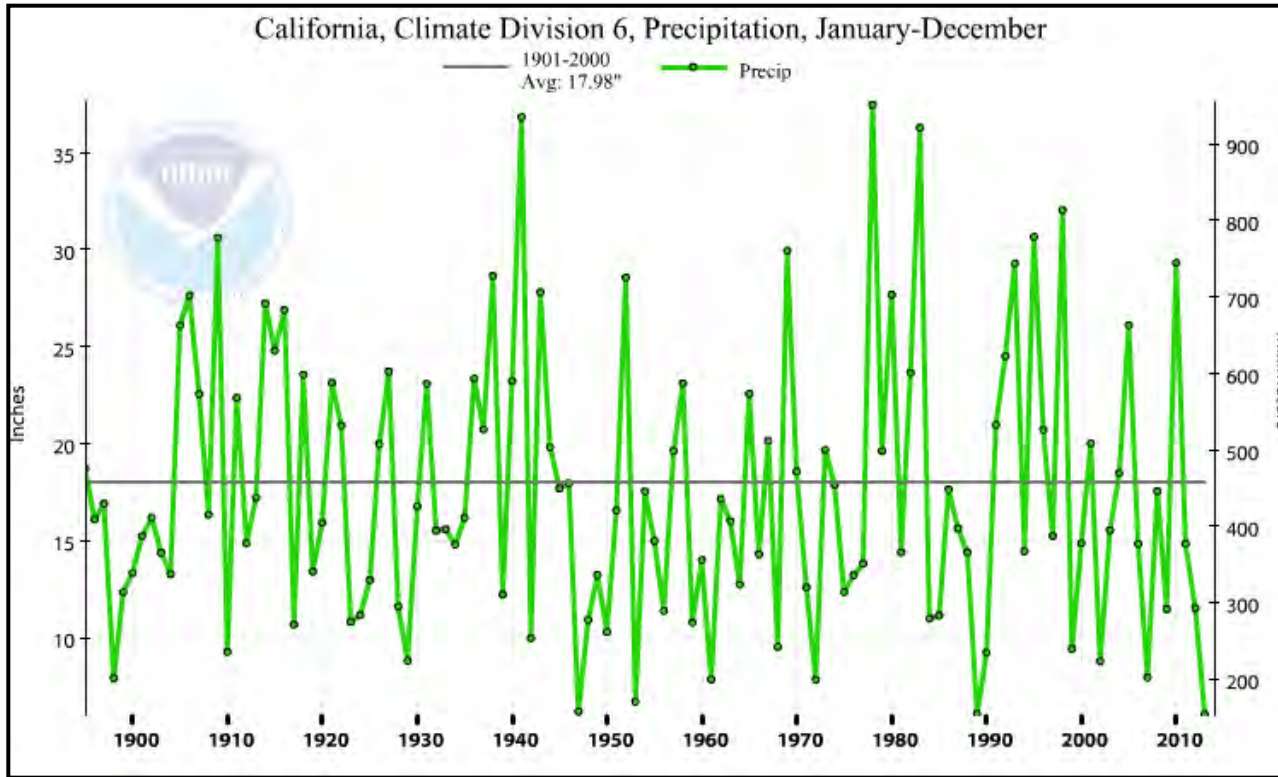


Additionally, most models project more warming at night  
=> less nighttime relief during heat wave episodes

# Precipitation



# Annual Precipitation Time Series: South Coast Drainage



Great year-to-year variability in San Diego precipitation

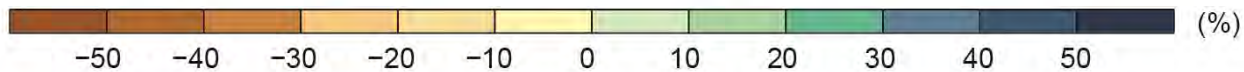
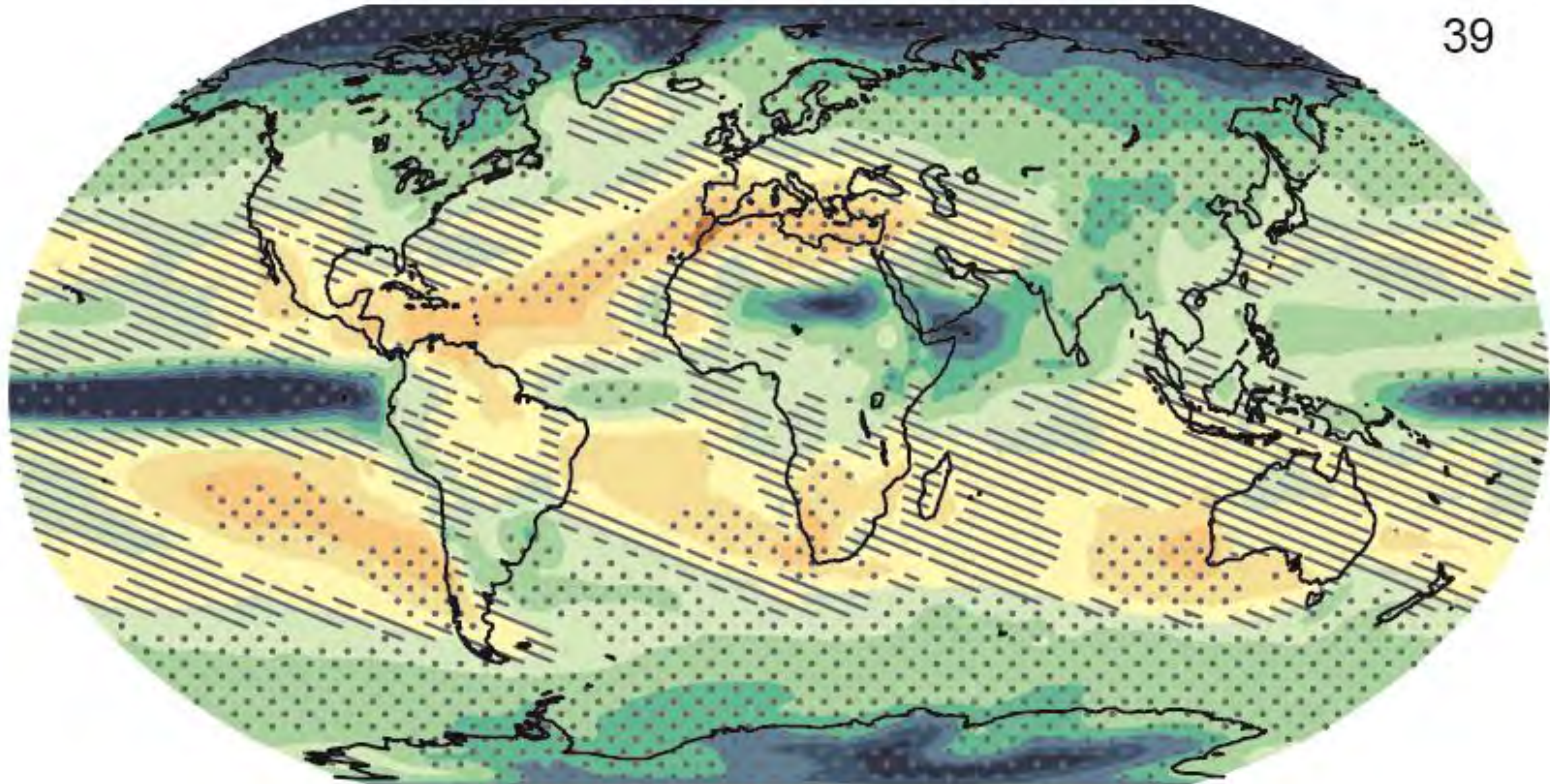
Ranges from ~33% to 200% of average

and, when Southern California is dry--  
Northern California is often dry  
and the Colorado River drainage is sometimes dry

# Projected Change (%) in Average Precipitation (1986-2005 to 2081-2100)

RCP85 – Mean of 39 models

39



*Globally, dry regions become drier including the Southwest United States!*

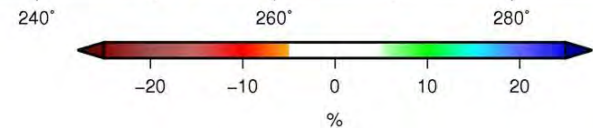
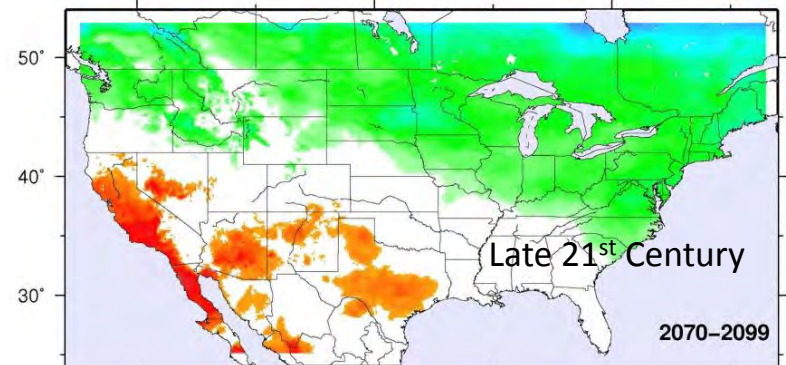
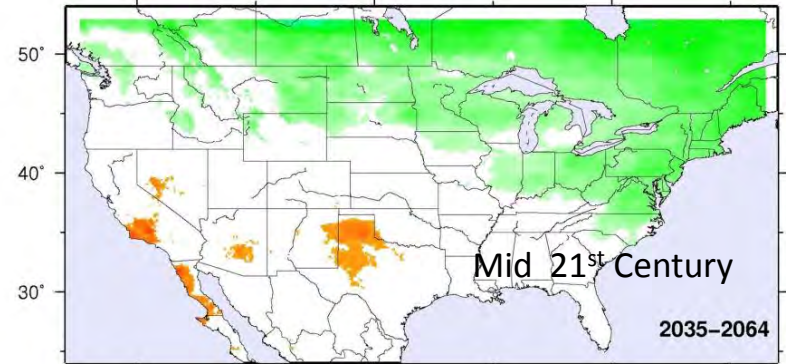
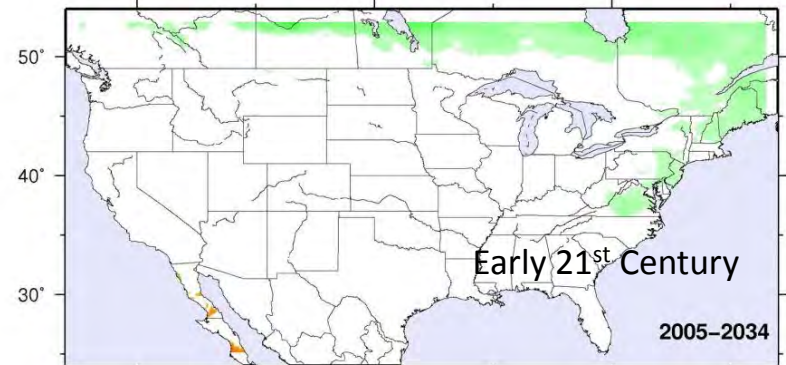
# Downscaled Projected Precipitation Change

Incrementally drier Southwest, especially Southern California develops over the 21<sup>st</sup> Century.

Drying becomes greater as climate becomes warmer

from 48 climate model simulations downscaled to 12km using BCSD

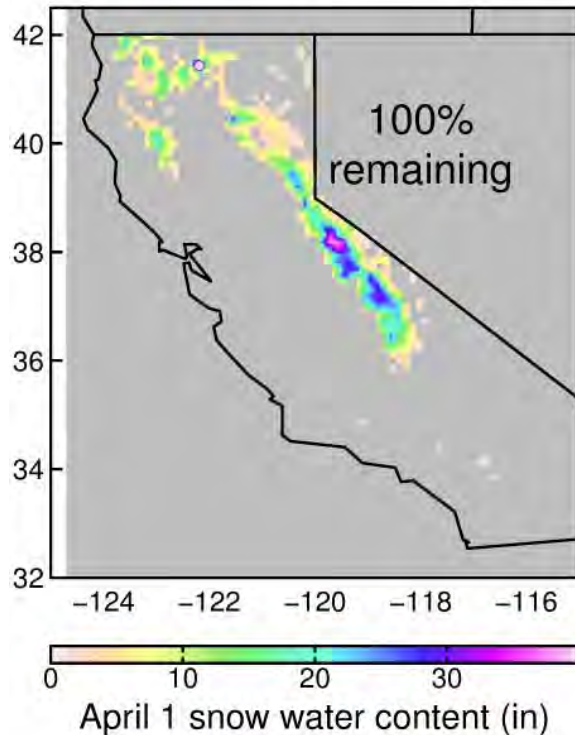
median precip percent of historical (water yr precip) 1961–1990  
BCSD 16 SRESA2 + 16 SRESB1 + 16 SRESA1B



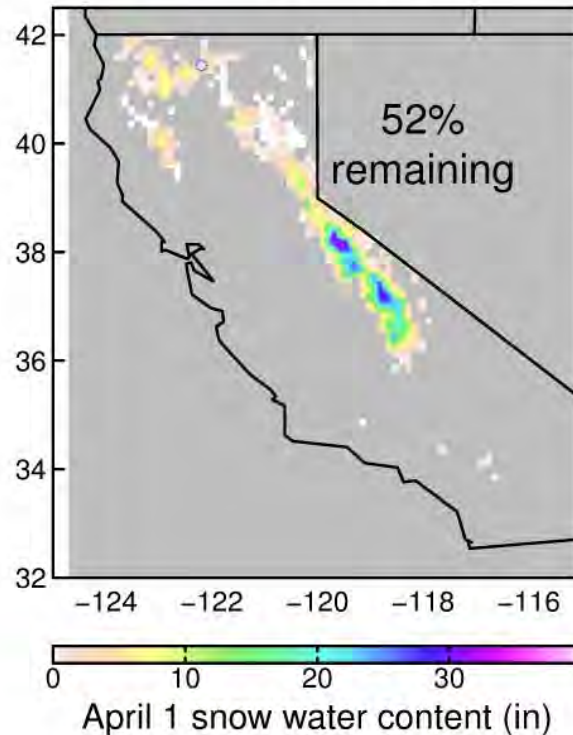
# Substantial Decline of California Spring SnowPack from Projected Climate Warming

high or even higher losses by end of 21<sup>st</sup> Century depending on how much warming

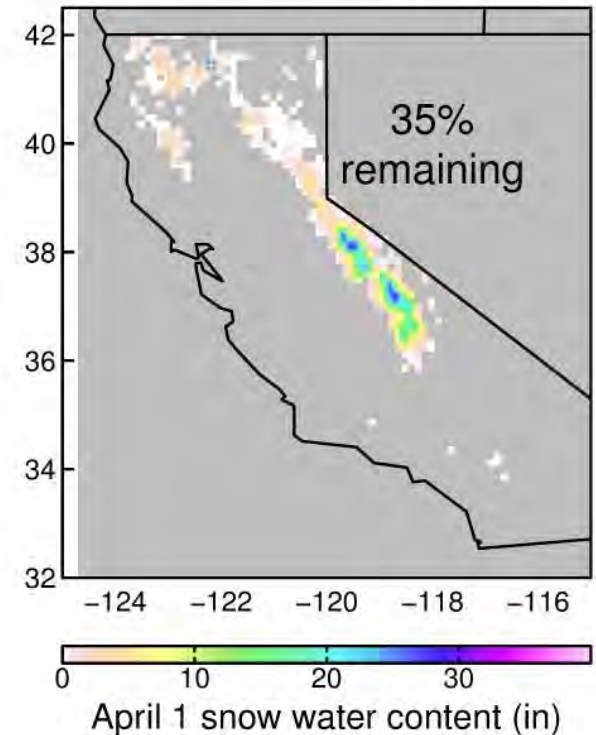
### Historical (1961–1990)



### Lower warming range (2070–2099)



### Higher warming range (2070–2099)



/net/puddle/data/cmip5\_BCCA\_and\_VICed/west\_us\_BCCA\_2012-06-10/plot\_future\_change\_SWE\_Apr1\_v2.R Fri Dec 14 14:46:43 2012

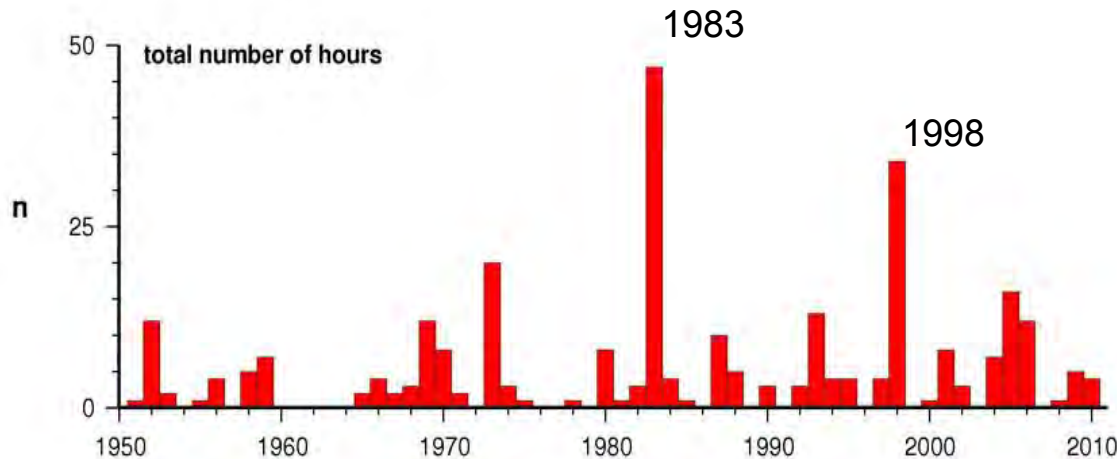
# Sea Level





# Extreme sea level occurrences

observed at or above 99.99% historical hourly threshold 1.41m above mean



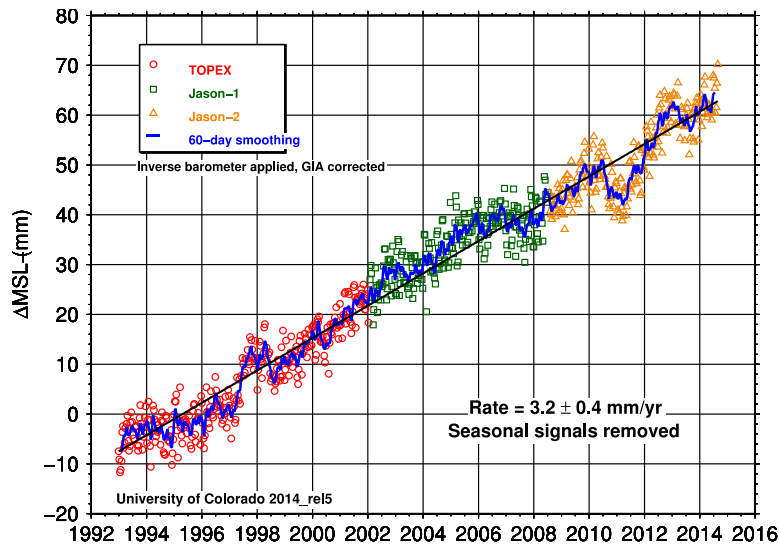
Highest California sea levels have mainly occurred in a few stormy years, especially during large El Ninos (1983 and 1998)

from hourly sea level record at Ft Point, mouth of San Francisco Bay

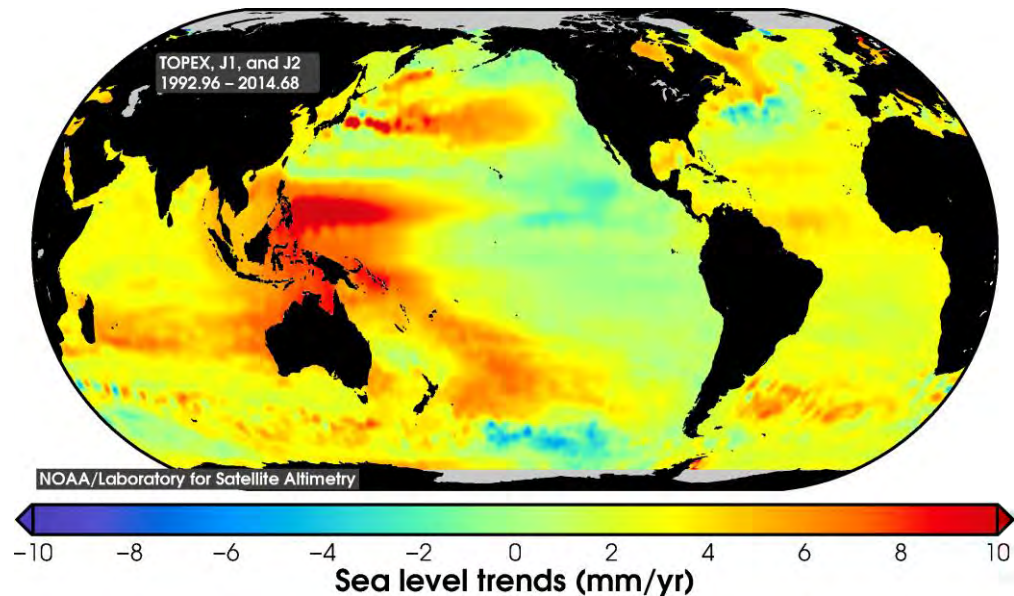
**As global sea levels increase, expect number of extreme events to also increase.**

# Sea Level Rise during Historical Period

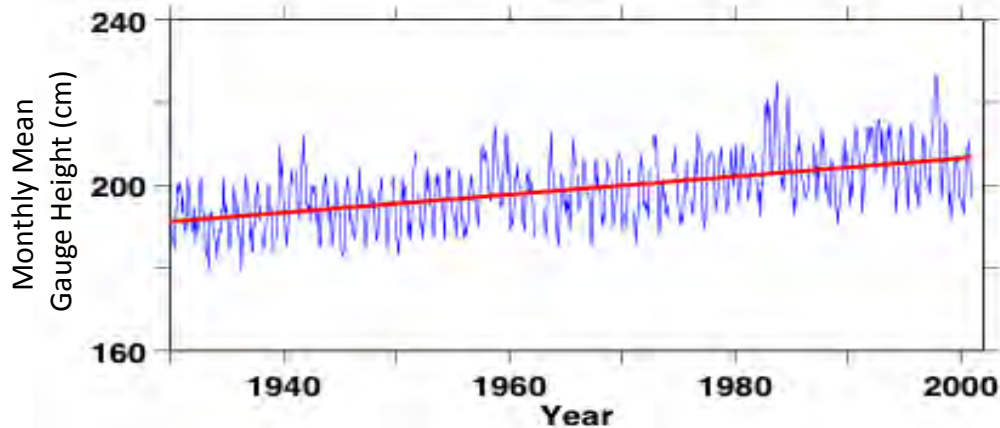
Global Mean from Satellite (1992-present)



Global MSL not evenly distributed



San Diego

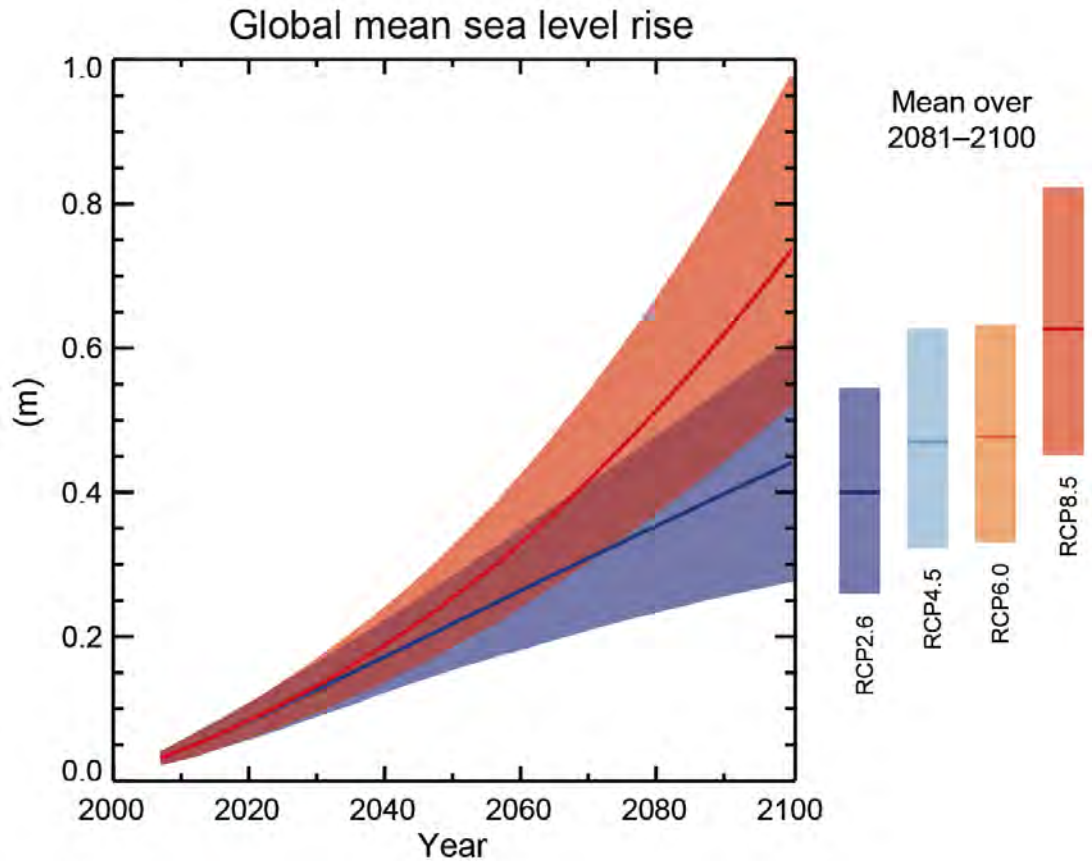


Over most of 20<sup>th</sup> Century, increasing trend of about 2.2 cm per decade in San Diego

# Global Sea Level Projections into 21<sup>st</sup> Century

IPCC 2013:

Total GLOBAL MEAN rise projected between 0.3 – 1.0 m by 2090-2099

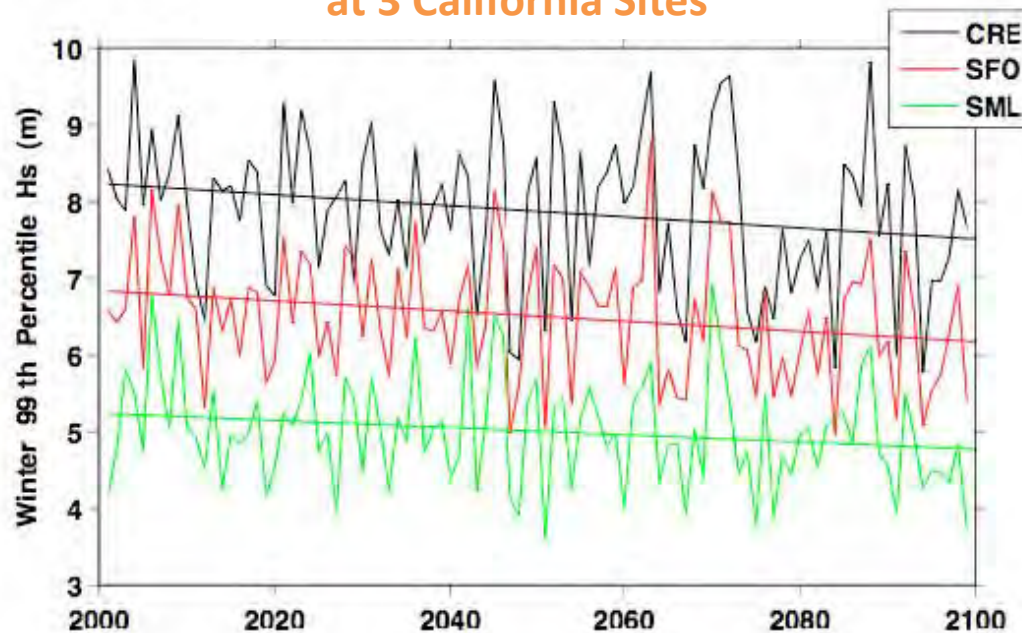


# Projections of N Pacific Wave Climate in 21<sup>st</sup> Century

Method: Force wave model with projections of surface wind from coupled climate models. Examine wind and wave height statistics.

Study: Cayan et al, 2009 focused on California

## 99<sup>th</sup> Percentile of Significant Wave Height at 3 California Sites



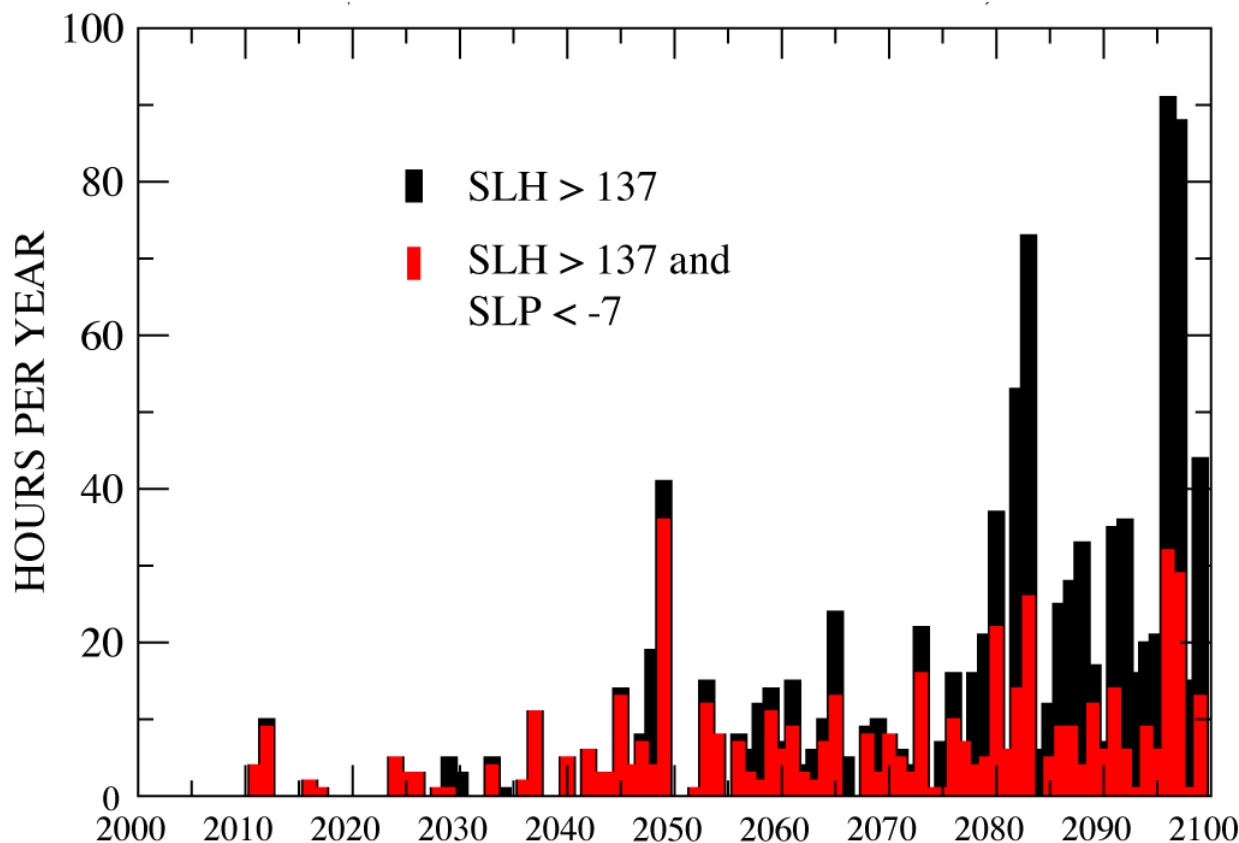
Notable decreasing trend in extreme waves along California coast  
=> due to poleward shift of storm track  
and/or decreased wind speeds

Also, significant decadal variability

Wavewatch III forced with NCAR CCSM3 model winds

# Extreme Sea Level Events

Despite projected decrease in extreme storm frequency, extreme sea level events are projected to increase due to rising global sea levels.

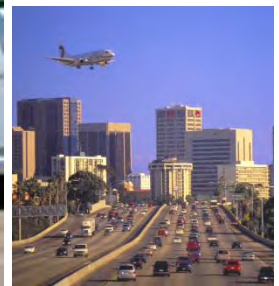
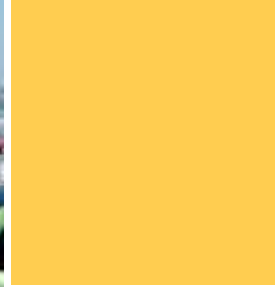
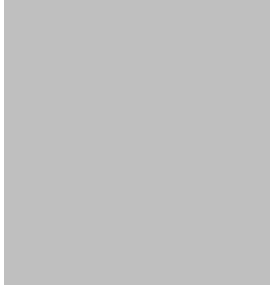


**Figure 5.** Projected total exceedances of San Francisco hourly sea level height (SLH) above historical 99.99 percentile (black), and number that are coincident with sea level pressure anomalies less than -7mb. Projected sea level from GFDL model weather and Nino3.4 SST with a linear trend of 30cm over 2000-2100. (Cayan et al. In Review)

# Summary

A utility worker in a hard hat and safety harness is working on a high-voltage electrical tower. The worker is positioned on a metal structure, reaching up to adjust or inspect a component at the top of the tower. The background is a clear blue sky with scattered white clouds. The tower is made of metal and has various electrical components, including insulators and wires, attached to it.

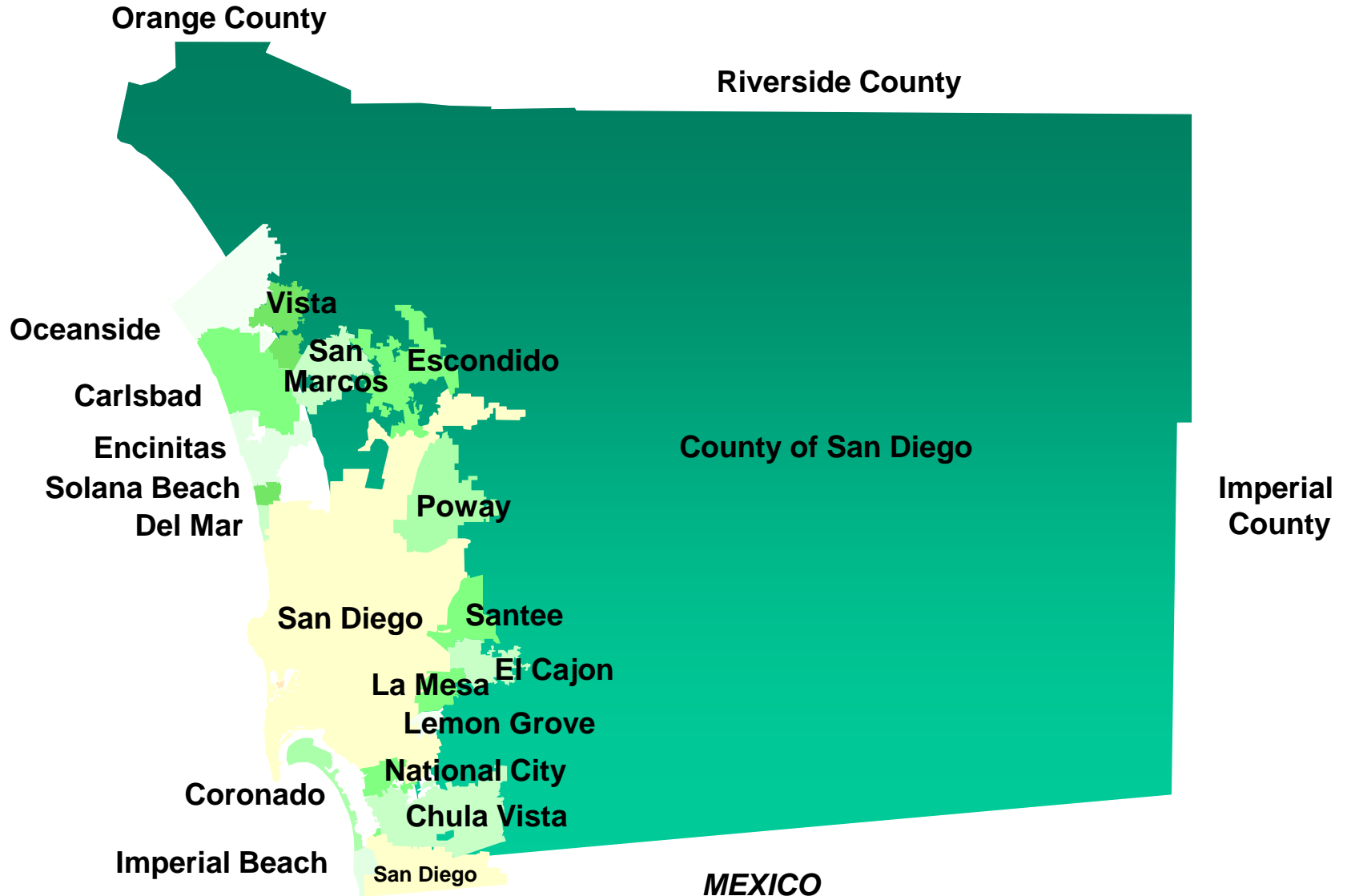
- California has a dry, volatile climate. Southern California's water supply is vulnerable to weather extremes
- Warming is already underway and more is expected to come. Projected local impacts include increased heat waves and wildfires
- While not unanimous, most model projections point toward reduced precipitation in Southern California
- Reduced snowpack in Sierras would further exasperate California's water supply problems
- Sea level rise is likely to continue resulting in increasing frequency and duration of extreme water level events



# CLIMATE ACTION PLANNING: A REGIONAL PERSPECTIVE

November 21, 2014 – San Diego American Planning Association  
Allison Wood, Associate Regional Energy/Climate Planner

# San Diego Region





# State Framework for Reducing GHGs

**Executive Order S-3-05  
(2005)**

Two statewide goals:

- Return to 1990 GHG levels by 2020
- Reduce 80% below 1990 by 2050

**Assembly Bill 32 (2006)**

- Set the 2020 reduction target into law
- California Air Resources Board to prepare Scoping Plan

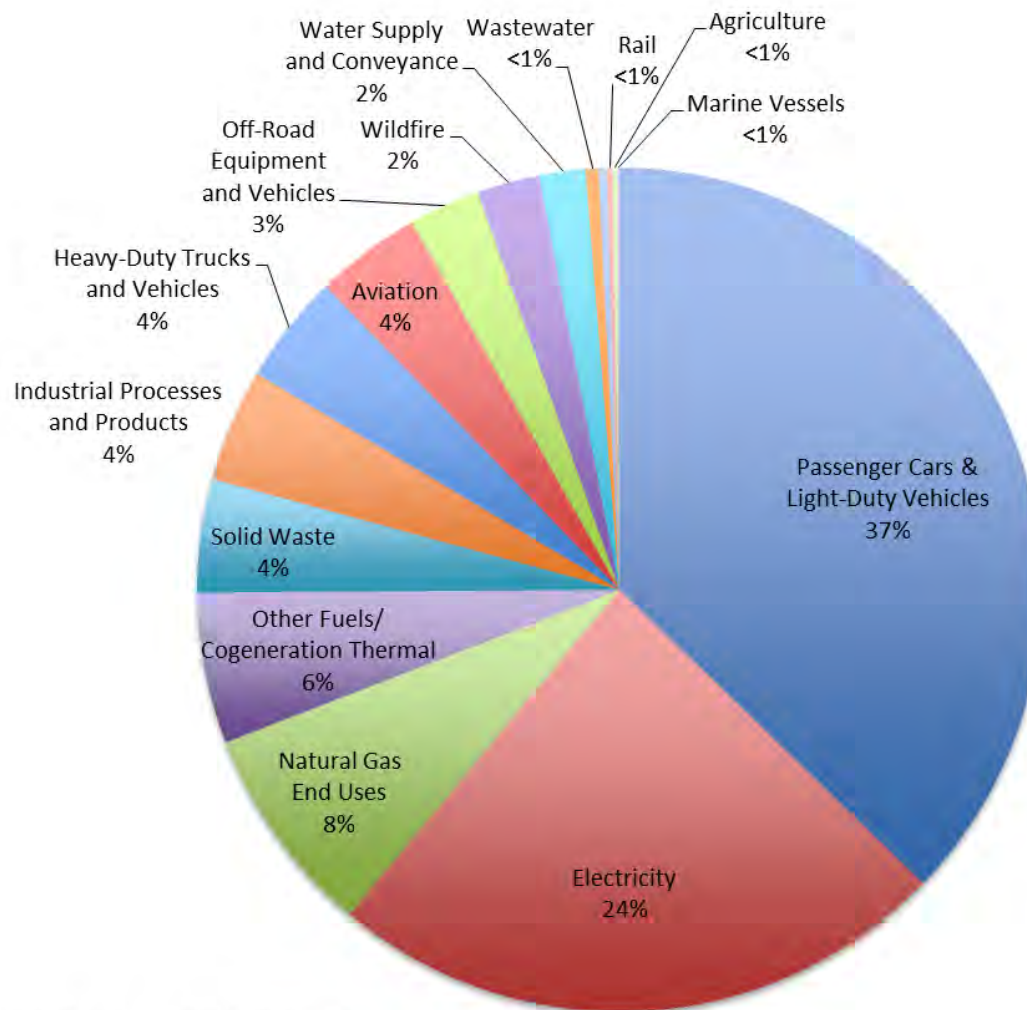
**Senate Bill 97 (2007)**

CEQA Amendments for GHG emissions

**Senate Bill 375 (2008)**

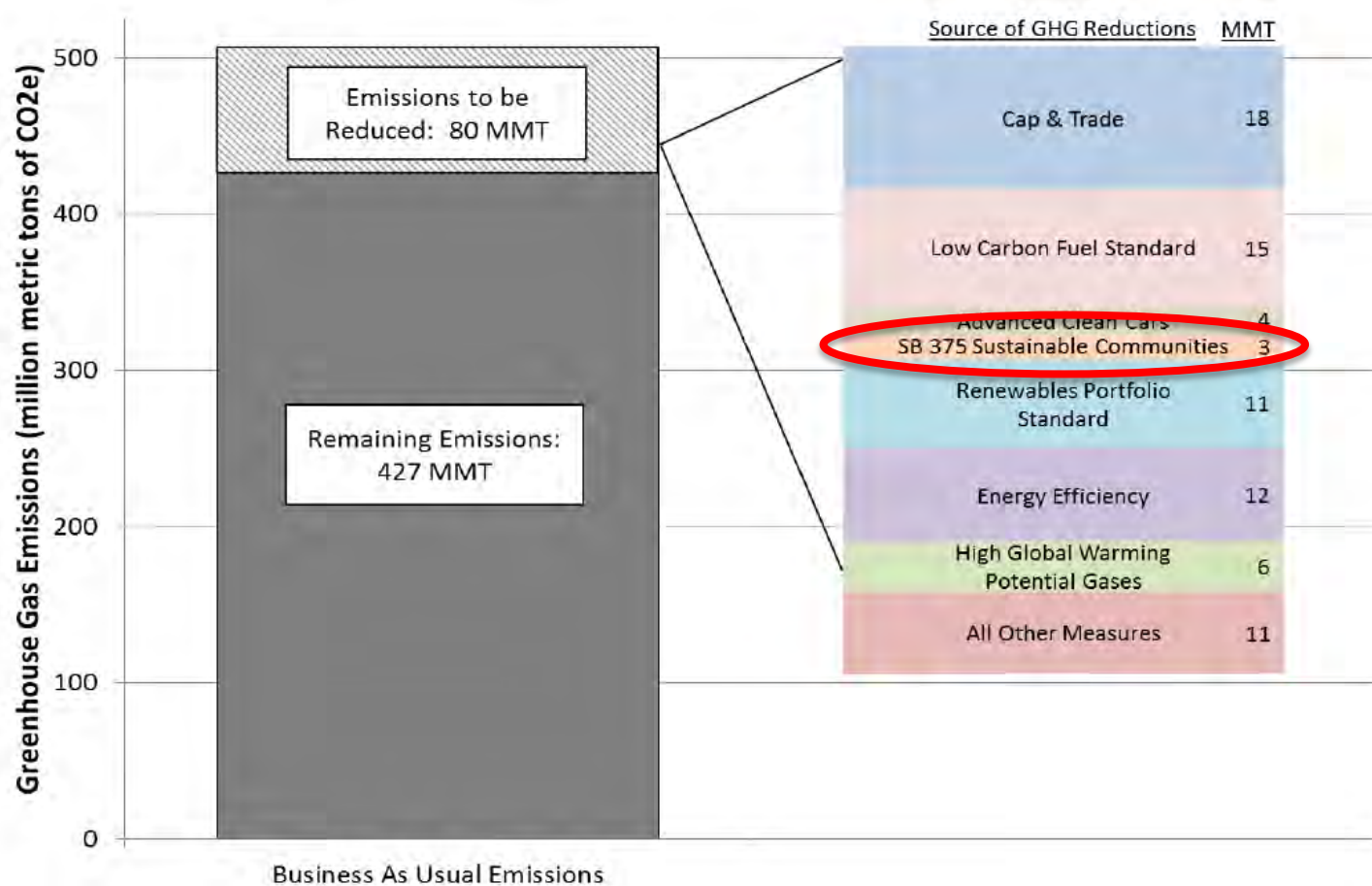
Metropolitan planning organizations to reduce transportation-related GHGs through land use and transportation planning

# San Diego Region 2012 Greenhouse Gas Emissions Inventory



Source: Energy Policy Initiatives Center (EPIC)

# Statewide 2020 GHG Emissions and Sources of Reductions



# SANDAG Energy and Climate Planning

## Regional Energy Strategy

for the  
San Diego Region



December 2009  
Updated June 2014



SAN DIEGO ASSOCIATION OF  
GOVERNMENTS

## CLIMATE ACTION STRATEGY

FINAL

March 2010



## San Diego Regional PLUG-IN ELECTRIC VEHICLE (PEV) READINESS PLAN

Preparing the San Diego Region for Plug-In Electric Vehicles



November 2013



## City of San Marcos Energy Roadmap



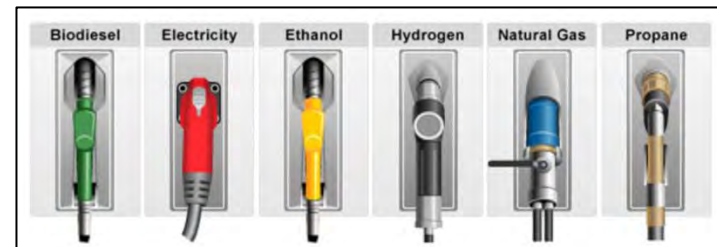
Prepared through the SANDAG  
Energy Roadmap Program

November 2011

This Program is a collaboration between SANDAG and San Diego Gas & Electric\*



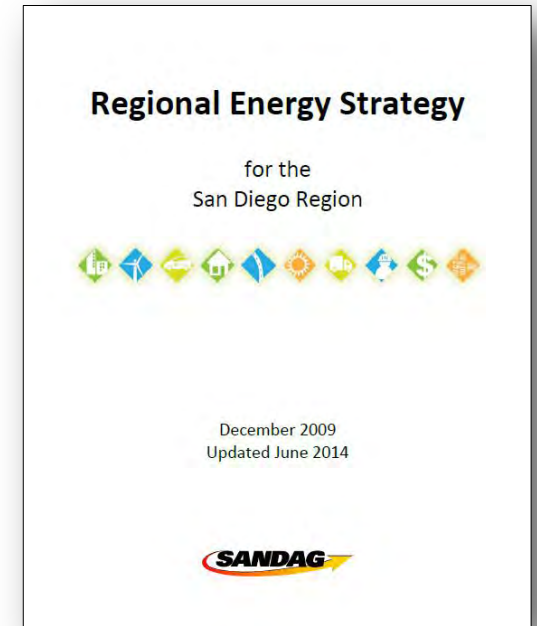
# refuel



San Diego Regional Alternative Fuel  
Coordinating Council

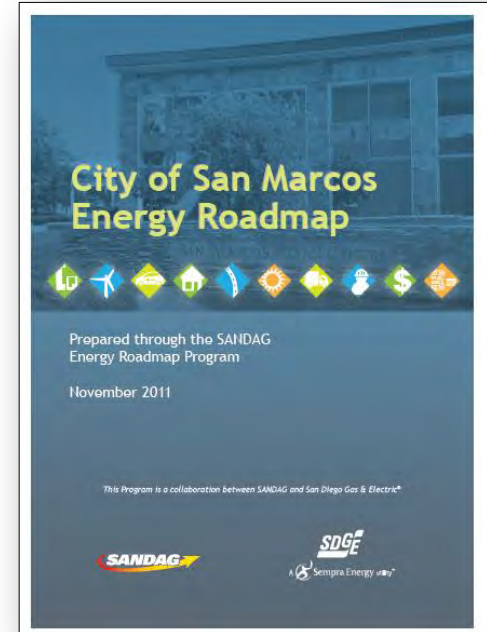
# Regional Energy Strategy (RES)

- Energy policy guide for the region
- Used by:
  - SANDAG
  - Member agencies
  - Regional stakeholders
- Last RES adopted in 2009
- Technical update in 2014
  - Developed by Regional Energy Working Group
  - Existing conditions and forecast to 2050
  - Demonstrates progress toward 11 goals

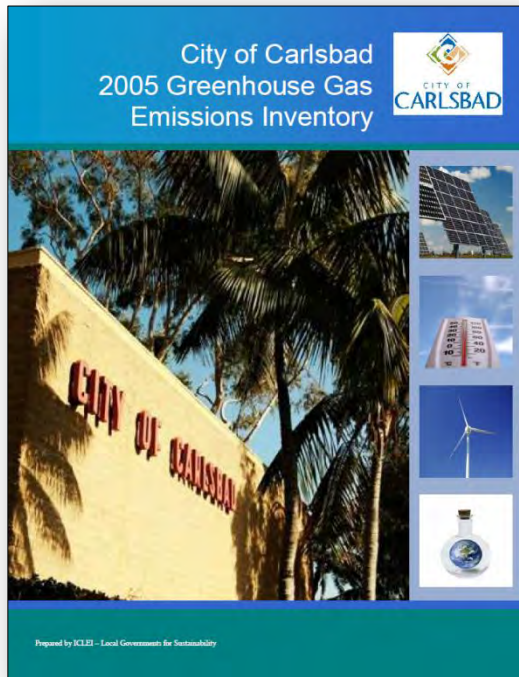


# SANDAG Energy Roadmap Program

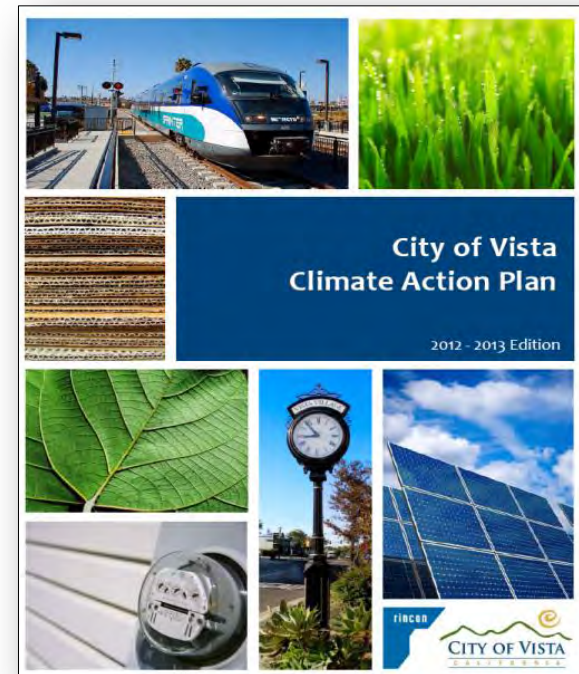
- Partnership with SDG&E
- Energy savings in government operations and community
- Roadmap implementation assistance:
  - Municipal retrofits
  - Energy/climate planning
  - Community outreach/programs
  - Green business
  - Subregional collaboration
- More info: [www.sandag.org/energyroadmap](http://www.sandag.org/energyroadmap)



# Local Government Climate Action Planning



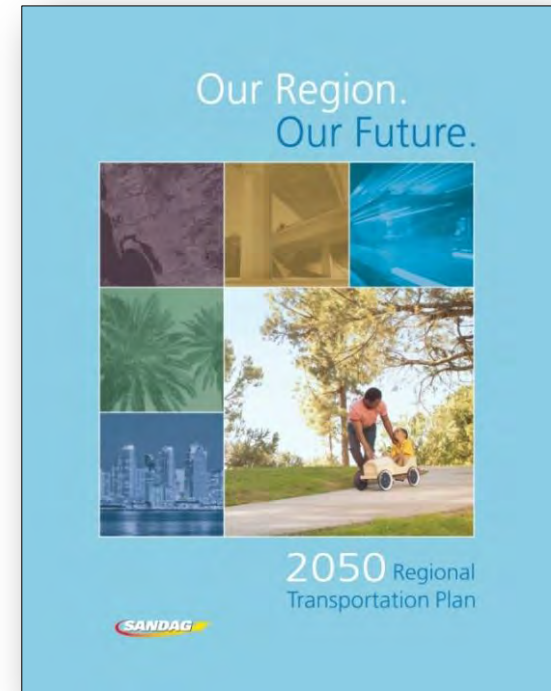
All 19 jurisdictions have completed a GHG inventory



Seven jurisdictions have adopted a Climate Action Plan, another six are in development

# Transportation – Reducing VMT

- **SB 375 Requirements**
  - State sets regional targets for per capita GHG reductions from passenger vehicles
  - SANDAG develops SCS for acceptance by CARB
- **Efforts to Reduce VMT**
  - Smart growth development
  - Mobility options
  - Active transportation
  - iCommute/TDM strategies
  - Parking strategies





# Transportation – Fuel Efficiency and Low Carbon Fuels

## State

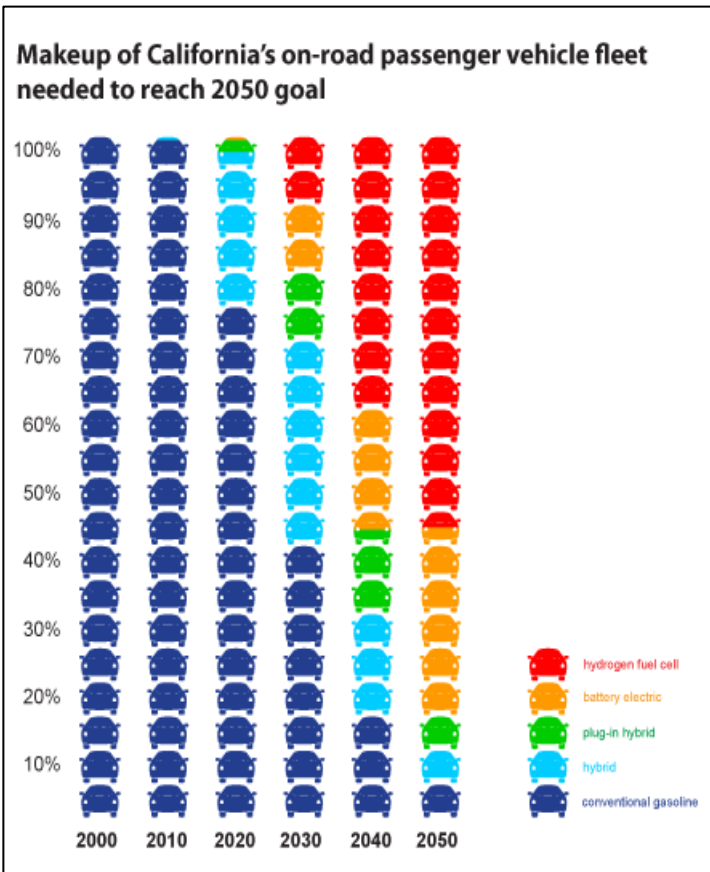
- Vehicle emissions standards
- Rebates for consumers
- Low Carbon Fuel Standard

## SANDAG

- Readiness planning for EVs/alt fuels
- EV charging at transit facilities
- Energy Roadmap fleet assessments

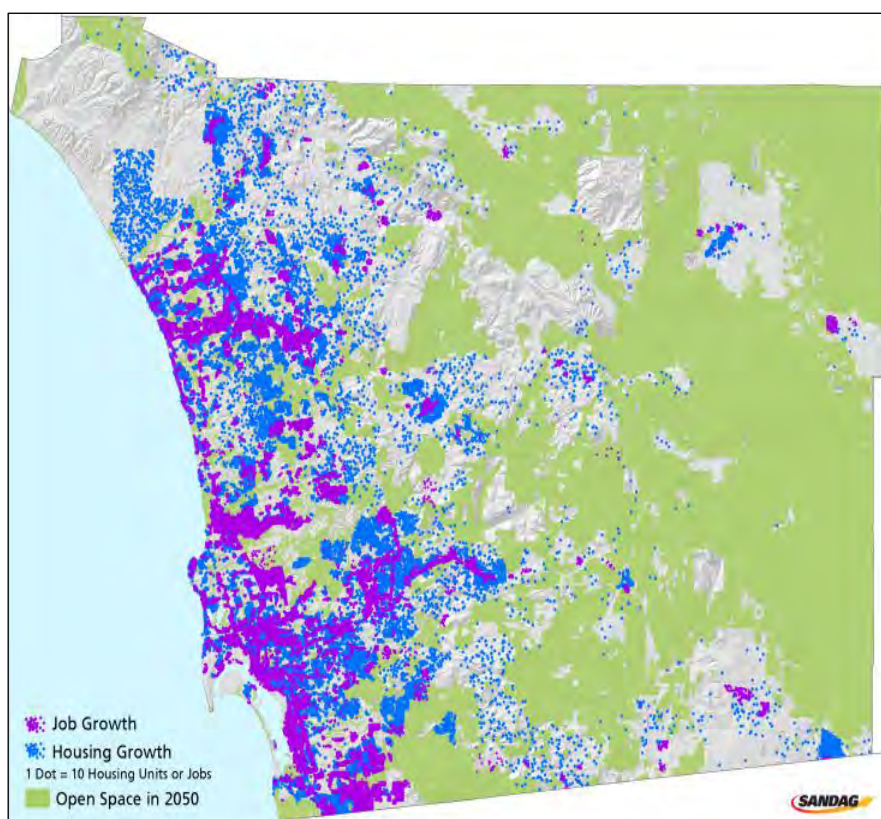
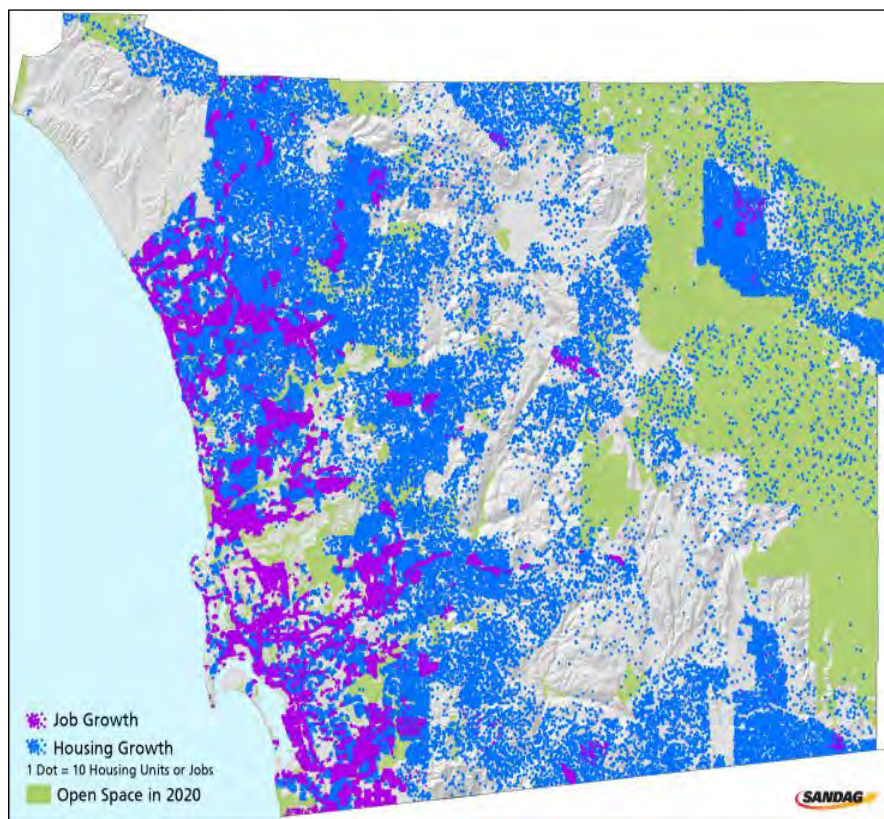
## Local Governments

- Facilitate infrastructure installations
- Integrate EVs/alt fuels into gov't fleet
- Improve traffic flow and efficient driving




# Land Use

## Comparison of Housing and Job Growth Projected in 1999 vs. 2013

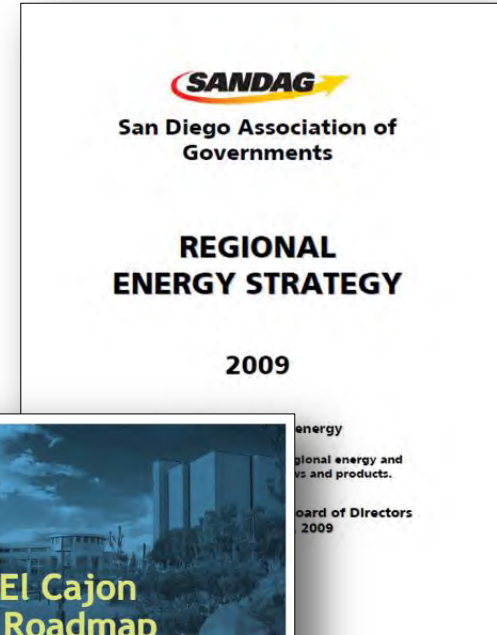


# Electricity & Natural Gas



**CA** Energy Efficiency Strategic Plan  
January 2011 Update

www.Engage360.com Engage 360

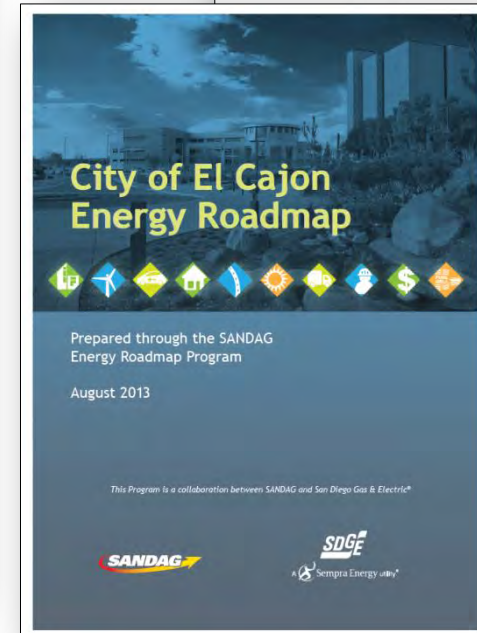



**SANDAG**  
San Diego Association of Governments

**REGIONAL ENERGY STRATEGY**

**2009**

energy  
regional energy and  
vs and products.  
Board of Directors  
2009



**City of El Cajon Energy Roadmap**

Prepared through the SANDAG Energy Roadmap Program  
August 2013

This Program is a collaboration between SANDAG and San Diego Gas & Electric®

**SANDAG** **SDGE**  
A Sempra Energy utility

# State Framework for Addressing Climate Impacts

**Executive Order S-13-08 (2008)**

- CA Sea Level Rise Assessment Report
- State Climate Adaptation Strategy
- Land use planning guidance

**CA Climate Adaptation Strategy (2009)**

Describes impacts, risks and strategies for climate adaptation in several sectors

**CA Coastal Commission Draft Sea Level Rise Guidance (2013)**

Recommends steps for addressing sea level rise in coastal zones

**Safeguarding California: Reducing Climate Risk (2014)**

CA Natural Resources Agency update of the 2009 Adaptation Strategy with advances in climate science and risk management options

# Climate Change Impacts



# Climate Change Impacts

## San Diego, 2050 Is Calling. HOW WILL WE ANSWER?



### FACING THE FUTURE:

How Science Can Help Prepare San Diego Regional Leaders for Climate Change

Temperature	+4.8° F in annual average temperature
Precipitation	16% fewer rainy days, and 8% more rainfall during the biggest rainstorms
Water Resources	12% decrease in the runoff and streamflow due to less snowpack and greater evaporation
Sea Level Rise	5 to 24 inches of sea level rise
Wildfires	Longer and less predictable fire season; larger and more catastrophic fires; and higher number of poor air quality days as a result.
Habitat	Threats to coastlines and beaches, wetlands, and unique plants and animals
Public Health	7 times as many days of extreme heat per year

[www.sandiego.edu/2050](http://www.sandiego.edu/2050)

# SANDAG Adaptation Planning

- Consider impacts on transportation infrastructure
- Shoreline preservation
- Habitat conservation



# Local Government Adaptation Planning

- Beginning to address adaptation in CAPs:
  - Reduce urban heat island
  - Water conservation
  - Emergency/disaster preparedness
  - Prepare for extreme heat events
- Collaborative efforts:
  - Sea Level Rise Adaptation Strategy for San Diego Bay
  - Climate change considerations in County of San Diego Multi-Jurisdictional Hazard Mitigation Plan



## Interrelationships - Economics

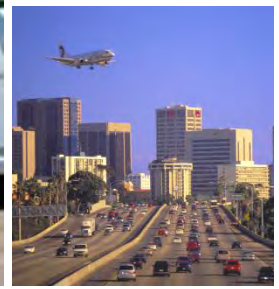
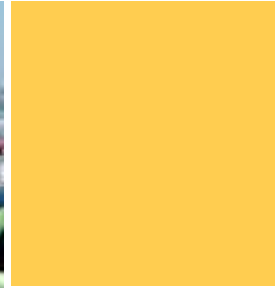
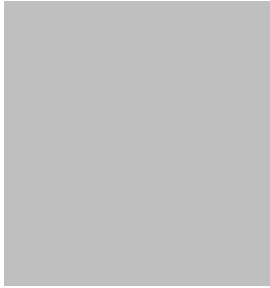
- Energy and water savings equate to economic savings
- Job growth opportunities:
  - Cleantech sector
  - Local jobs for energy contractors/engineering
- Preparing for impacts of climate change now can avoid or reduce costs in the future

# Interrelationships – Social Equity and Public Health

Strategy to Reduce GHGs	Potential Health/Social Equity Co-Benefits
Reduce vehicle miles traveled	<ul style="list-style-type: none"> <li>• Reduce air pollution</li> <li>• Increase physical activity</li> <li>• Reduce chronic disease (such as asthma and heart disease)</li> <li>• Improve mental health</li> <li>• Improve access to low-cost alternative transportation options</li> </ul>
Increase fuel efficiency and use of cleaner fuels in vehicles	<ul style="list-style-type: none"> <li>• Reduce air pollution</li> </ul>
Reduce emissions through land use changes such as more compact growth	<ul style="list-style-type: none"> <li>• Increase physical activity</li> <li>• Reduce chronic disease</li> <li>• Increase local access to essential services (affordable housing, jobs, amenities)</li> <li>• Enhance safety for biking and walking with reduced vehicle speeds and reduced collisions</li> </ul>
Reduce residential building energy and water use	<ul style="list-style-type: none"> <li>• Reduce household energy costs (especially beneficial for low-income households)</li> <li>• Promote healthy homes</li> <li>• Create local green jobs</li> <li>• Promote cooler communities through shade trees and cool pavements</li> </ul>
Urban greening	<ul style="list-style-type: none"> <li>• Reduce temperature and urban heat island health effects</li> <li>• Reduce air pollution</li> <li>• Reduce noise</li> <li>• Enhance safety</li> </ul>

# Moving Forward: Activities for 2015

- San Diego Forward: The Regional Plan
- Energy Roadmap Program Continuation
- Alternative Fuel Readiness Planning
- Electric Vehicle Readiness Implementation
  - New grant from CA Energy Commission
- Regional Collaboration



**THANK YOU!**

Allison Wood, Associate Regional Energy/Climate Planner  
[allison.wood@sandag.org](mailto:allison.wood@sandag.org)

# Greenhouse Gas Reduction Planning in Cities San Diego Region

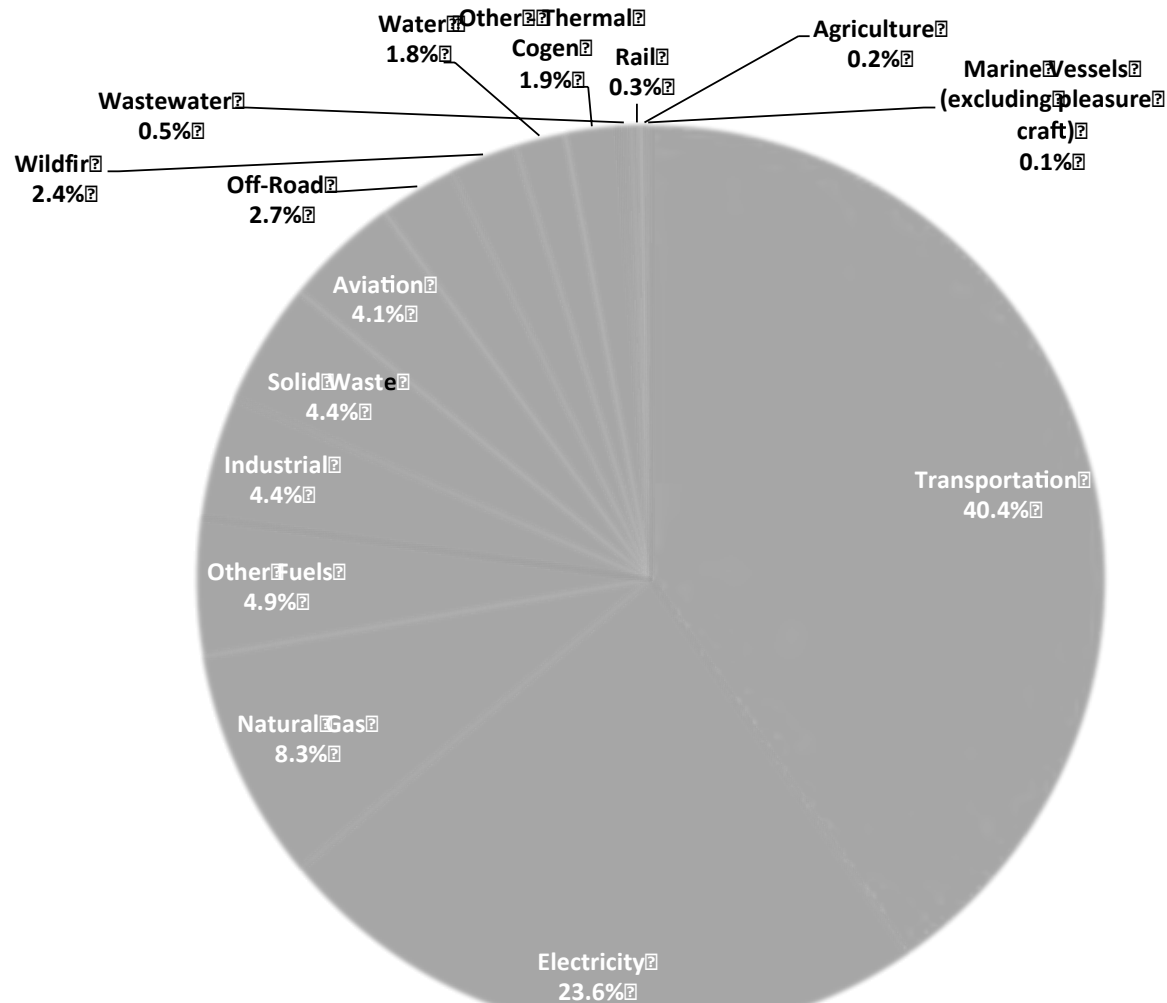
Nilmini Silva-Send  
November 21, 2014  
APA

Disclaimer: The materials included in this presentation are intended for informational purposes only, and should not be considered a substitute for legal advice in any particular case.

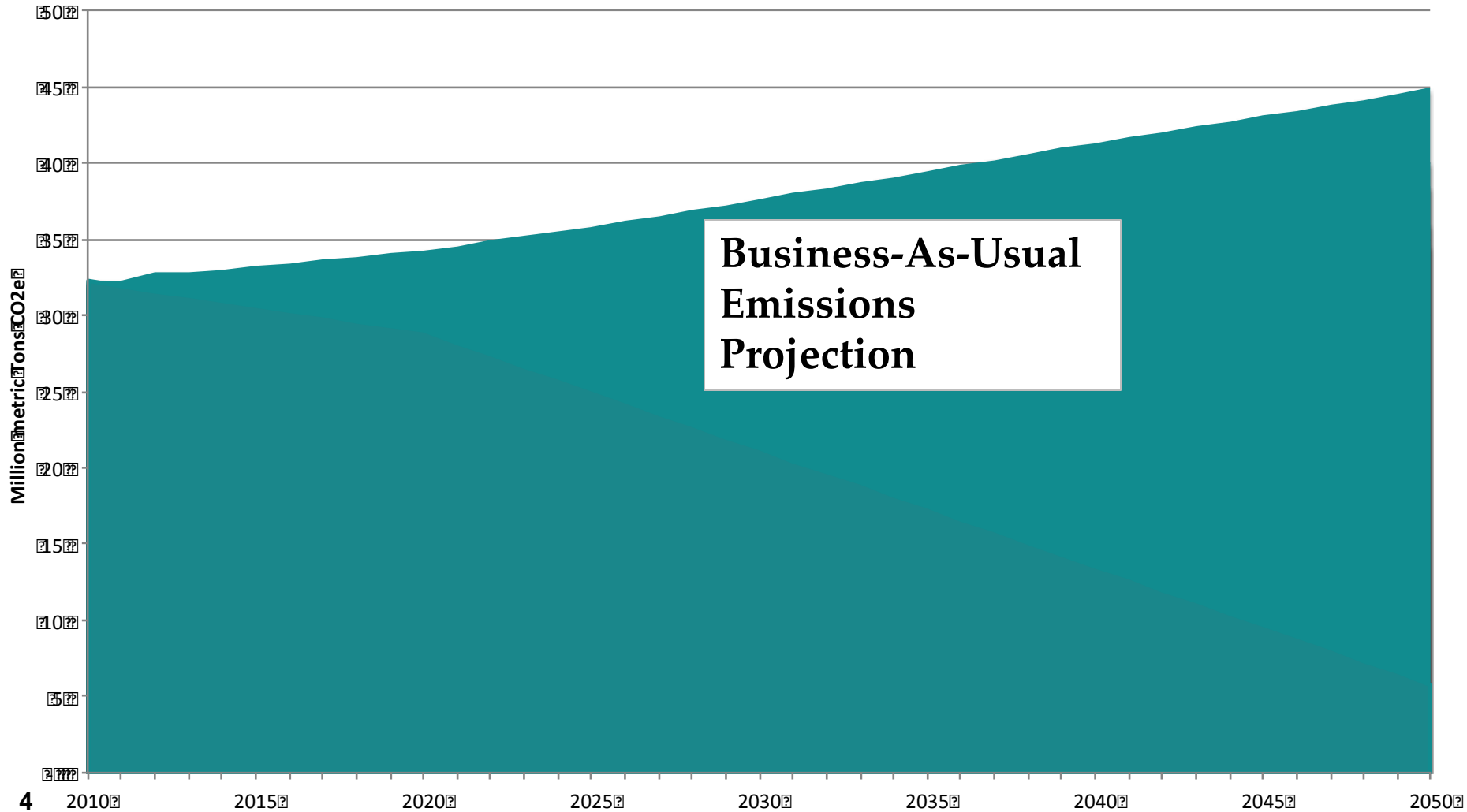
# Outline

- 1. Regional Greenhouse Gas Planning**
- 2. Local Government Process**
- 3. Climate Planning Tools**

# Regional GHG Inventory 2012

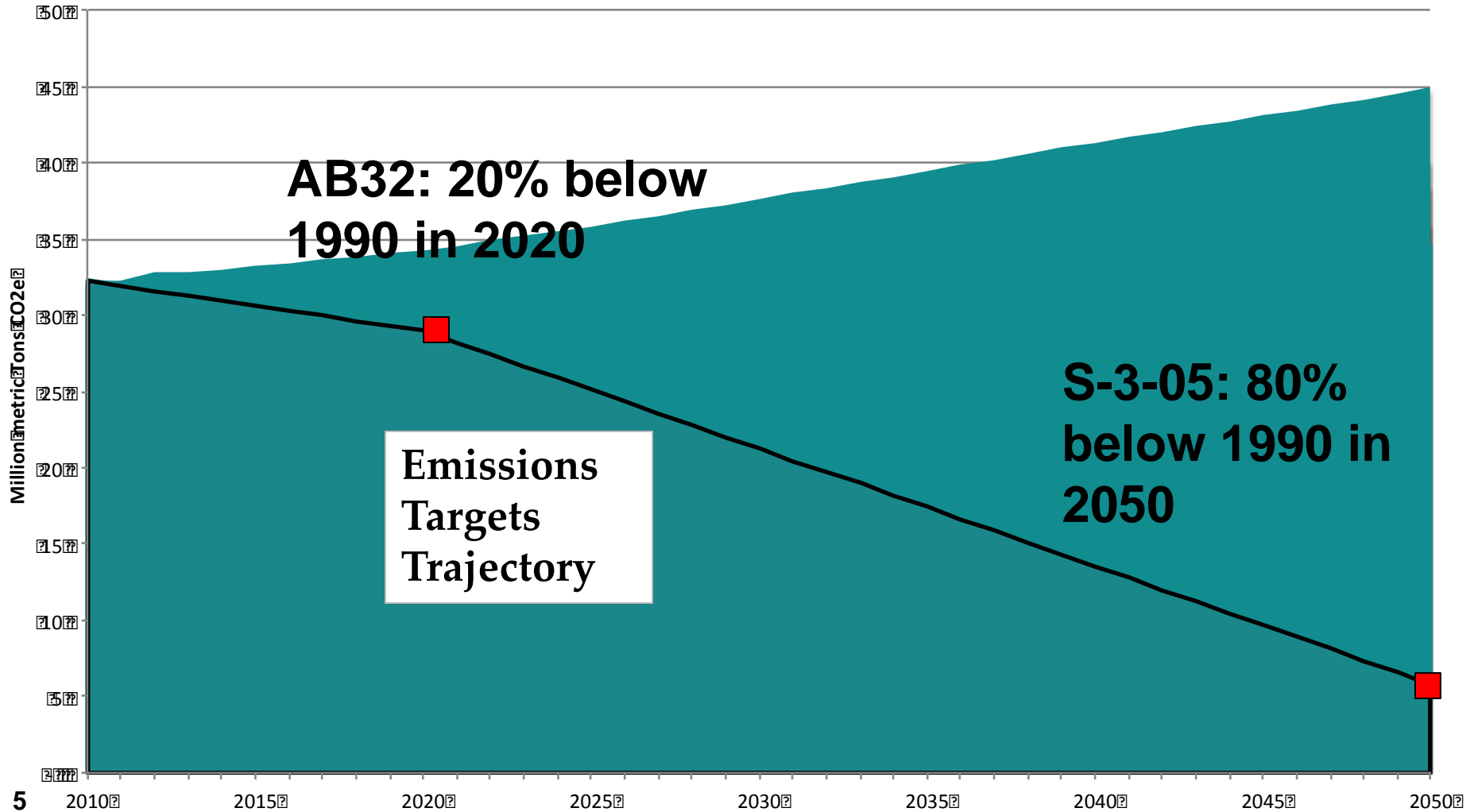


# Business-As-Usual GHG Projection San Diego Region

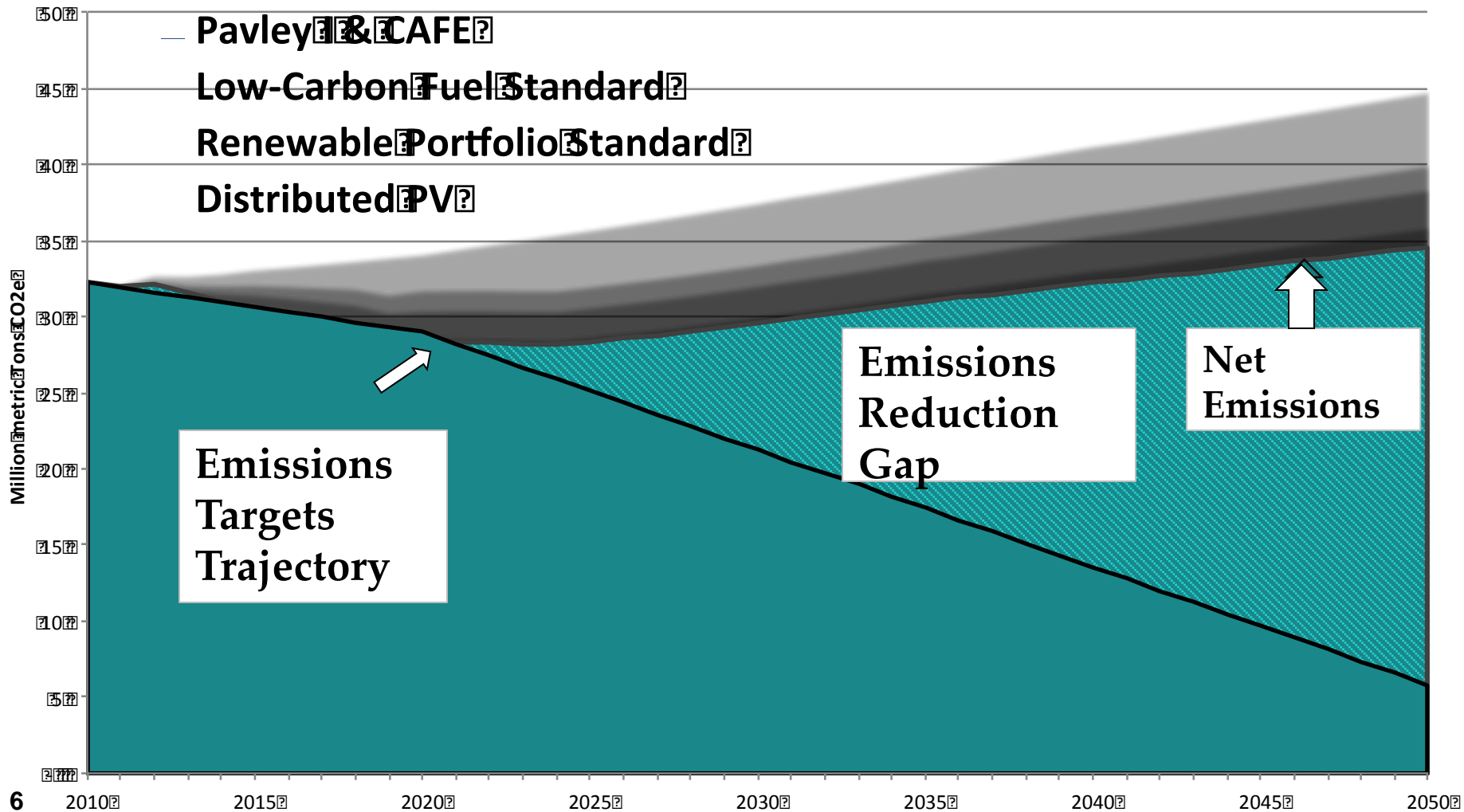




# BAU Projection and Targets Trajectory San Diego Region



# BAU, Targets and Mitigation



# Why greenhouse gas planning at city-level?

- AB32 Scoping Plan 2008, 2011(final), 2014 First Update
  - **Local and regional cooperation essential**
- **CEQA** guidelines (mandatory) for GHG analysis
  - 2010 SB 97 -Localities must review climate impacts of projects
- **CEQA** related bills
  - Exemptions favoring low carbon measures
  - 2011 SB 226 - exemption for certain solar systems (s 21080.35)
  - 2010 SB 375 – regional GHG reduction targets from transportation
- Attorney General Comments on GHG planning in general plans
- **CEQA Litigation**

# AB 32 Scoping Plan 2008: regional and local cooperation essential

Table 2: Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Measures	Reductions Counted Towards 2020 Target (MMTCO <sub>2</sub> E)
<b>ESTIMATED REDUCTIONS RESULTING FROM THE COMBINATION OF CAP-AND-TRADE PROGRAM AND COMPLEMENTARY MEASURES</b>	<b>146.7</b>
California Light-Duty Vehicle Greenhouse Gas Standards <ul style="list-style-type: none"> <li>Implement Pavley standards</li> <li>Develop Pavley II light-duty vehicle standards</li> </ul>	31.7
Energy Efficiency <ul style="list-style-type: none"> <li>Building/appliance efficiency, new programs, etc.</li> <li>Increase CHP generation by 30,000 GWh</li> <li>Solar Water Heating (AB 1470 goal)</li> </ul>	26.3
Renewables Portfolio Standard (33% by 2020)	21.3
Low Carbon Fuel Standard	15
Regional Transportation-Related GHG Targets <sup>16</sup>	3
Vehicle Efficiency Measures	4.5
Goods Movement <ul style="list-style-type: none"> <li>Ship Electrification at Ports</li> <li>System-Wide Efficiency Improvements</li> </ul>	3.7
Million Solar Roofs	2.1
Medium/Heavy Duty Vehicles <ul style="list-style-type: none"> <li>Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency)</li> <li>Medium- and Heavy-Duty Vehicle Hybridization</li> </ul>	1.4
High Speed Rail	1.0
Industrial Measures (for sources covered under cap-and-trade program) <ul style="list-style-type: none"> <li>Refinery Measures</li> <li>Energy Efficiency &amp; Co-Benefits Audits</li> </ul>	0.3
Additional Reductions Necessary to Achieve the Cap	34.4
<b>ESTIMATED REDUCTIONS FROM UNCAPPED SOURCES/SECTORS</b>	<b>27.3</b>
High Global Warming Potential Gas Measures	20.2
Sustainable Forests	5.0
Industrial Measures (for sources not covered under cap and trade program) <ul style="list-style-type: none"> <li>Oil and Gas Extraction and Transmission</li> </ul>	1.1
Recycling and Waste (landfill methane capture)	1.0
<b>TOTAL REDUCTIONS COUNTED TOWARDS 2020 TARGET</b>	<b>174</b>
<b>Other Recommended Measures</b>	<b>Estimated 2020 Reductions (MMTCO<sub>2</sub>E)</b>
State Government Operations	1-2
Local Government Operations	2.6
Green Buildings	2.6
Recycling and Waste <ul style="list-style-type: none"> <li>Mandatory Commercial Recycling</li> <li>Other measures</li> </ul>	9
Water Sector Measures	4.8
Methane Capture at Large Dairies	1.0

Regional transportation related GHG targets (placeholder)

Local government operations

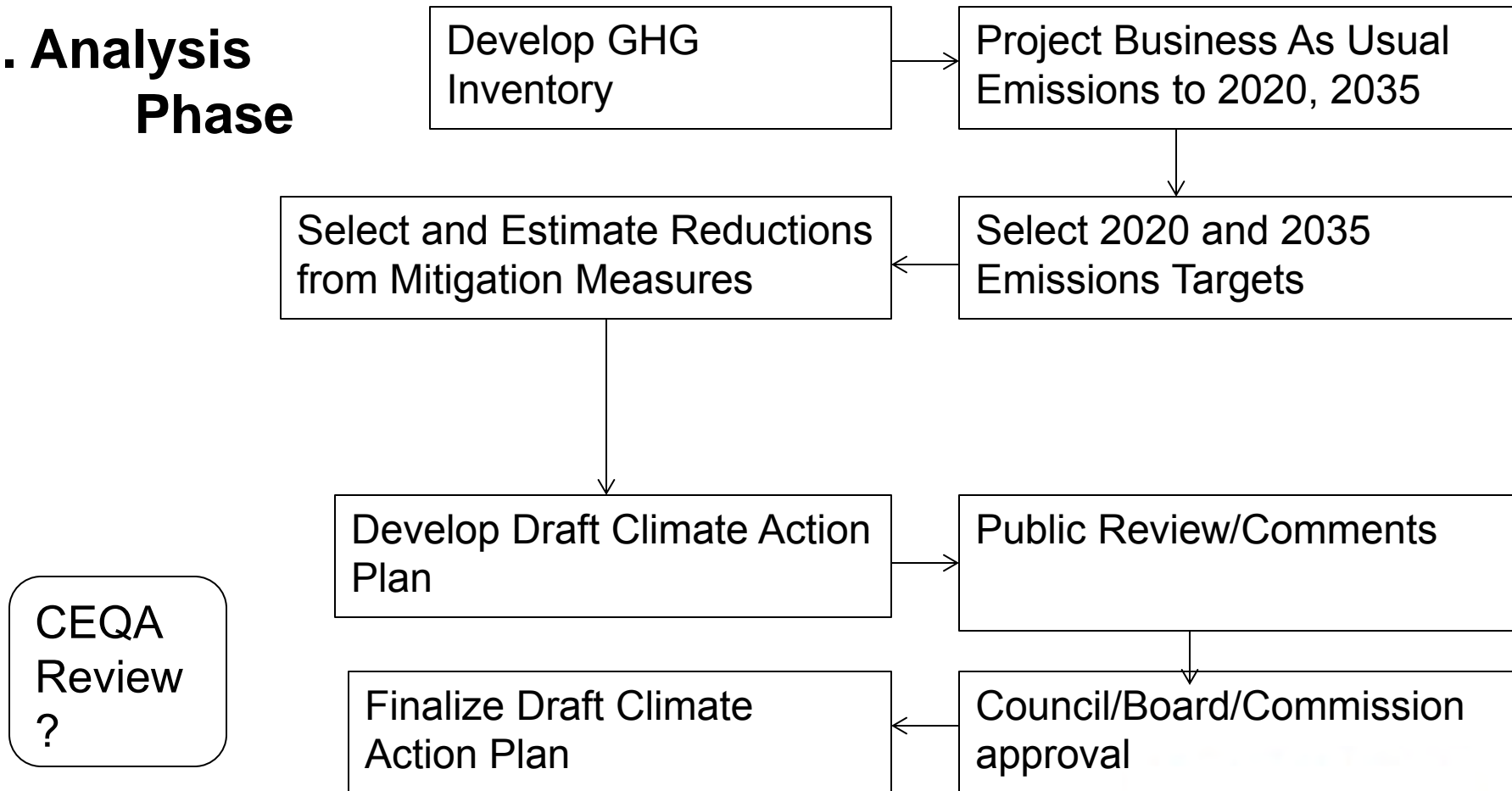


**Typical GHG planning process today**



# Climate Planning Process

## 1. Analysis Phase



## 2. Implementation Plan

## 3. Monitoring Plan

# Climate Planning Process

## 1. Analysis Phase

Develop GHG Inventory

Project Business As Usual Emissions to 2020, 2035

Select and Estimate Reductions from Mitigation Measures

Select 2020 and 2035 Emissions Targets

Develop Draft Climate Action Plan

Public Review/Comments

Finalize Draft Climate Action Plan

Council/Board/Commission approval

CEQA Review ?

2. Implementation Plan

3. Monitoring Plan

# Guidance from the State + Courts....

## Governor's Office of Planning and Research (OPR) /Air Resources Board

- Many tools - by ICLEI, EPIC, others
  
- For projections, apply federal and state measures **now** in place
  - Renewable Portfolio Standard (33% by 2020)
  - Fuel Efficiency Standards (54.5 mpg new passenger vehicles by 2025)
  - Low-Carbon Fuel Standard (10% GHG intensity reduction by 2020)
  
- **Court's directions:**
  - Enforceable mitigation measures through 2020 or through life of GP
  - Demonstrate progress toward 2050 goal



# Climate Planning Tools (EPIC)



# EPIC Climate Planning Tool

## Inventory Sectors for Cities

- **Electricity and Natural Gas**
- **Transportation**
- **Solid Waste**
- **Wastewater Treatment**
- **Water Use Energy**

# EPIC Climate Planning Tool

## Data

- Vehicle miles traveled (VMT) from SANDAG per year
- CO<sub>2</sub>e/VMT intensity from EMFAC 2011 for our region
- Electricity Intensity calculated from actual power plants emissions and load data
- Electricity and NG usage from SDG&E
- Waste disposed from CalRecycle
- Urban Forestry Data
- Forecasts based on SANDAG and CEC

# Inventory and BAU

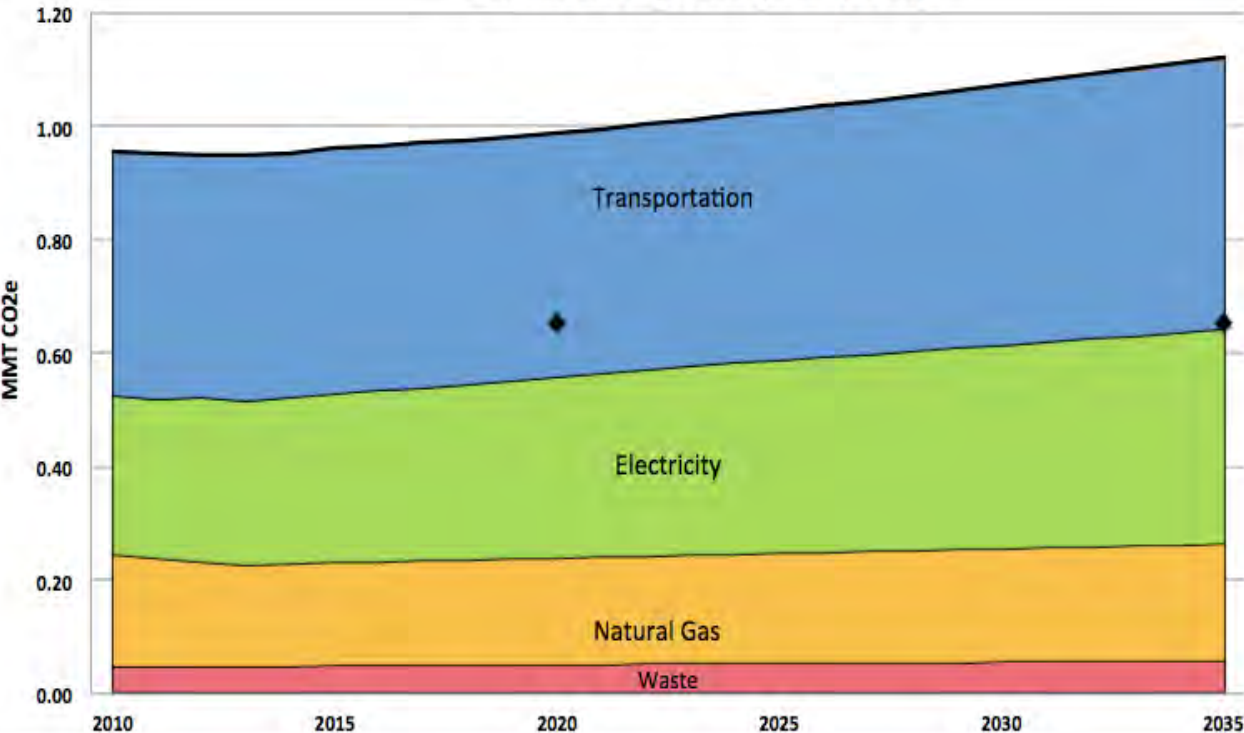
## Community Scale Greenhouse Gas Emissions Model

San Diego Region

### Module I: Part A - Business-As-Usual Projection

**Step 1:** From the dropdown menu below, select a city within the San Diego Region

**Business-As-Usual Total CO<sub>2</sub>e Emissions Projection (MMT/Year)**



Business-As-Usual Emissions by Sector (MMT CO <sub>2</sub> e)			
	2010	2020	2035
<b>Transportation</b>			
	0.43	0.43	0.48
<b>Electricity</b>			
	0.28	0.32	0.38
<b>Natural Gas</b>			
	0.20	0.19	0.21
<b>Waste</b>			
	0.045	0.050	0.057
<b>Water</b>			
	0.004	0.002	0.003
<b>Total BAU Emissions</b>			
	0.96	0.99	1.12

# Set Targets, Calculate Reductions Needed

**Step 2:** choose baseline year by selecting from dropdown menu below

Baseline Year
2005

**Step 3:** choose default baseline emissions value

2005 Baseline CO2e Emissions
0.94

**Step 4:** choose target reductions for 2020 and 2035 by selecting from dropdown menus below

Target Reductions	
2020	2035
30%	30%

[Step 5: move to next tab to select mitigation measures](#)

Target CO2e Emissions Levels	
2020	2035
0.66	0.66

[Link to Mitigation Calculators](#)

# Select Mitigation Measures

## Jurisdiction/Authority

- Who has jurisdiction or authority to implement and enforce a measure?

## Potential to reduce emissions

- How much emissions can a measure reduce?
- What participation or activity level is required?

## Cost to implement

- How much does a measure cost?

EPIC Climate Planning Tool

# Mitigation Model

## Electric + Natural Gas

		User Defined Inputs		Annual Emissions Reductions: (MMT CO <sub>2</sub> e)	
		2020	2035	2020	2035
<b>Statewide Measures</b>					
<a href="#">Renewable Portfolio Standard</a>	<b>2010</b>	<b>2020</b>	<b>2035</b>	<b>0.08</b>	<b>0.09</b>
% of Sales	-	33%	33%		
<a href="#">Title-24 (2013) Standards</a>	-	-	-	<b>0.001</b>	<b>0.001</b>
<b>Local Measures</b>					
<a href="#">Community Choice Aggregation</a>	<b>2010</b>	<b>2020</b>	<b>2035</b>	<b>0.05</b>	<b>0.06</b>
Renewable Portfolio Standard (% of Sales)	-	50%	50%		
% of Population Participating	-	80%	80%		
Renewable Portfolio Standard (% of Sales)	-	100%	100%		
% of Population Participating	-	10%	10%		

EPIC Climate Planning Tool

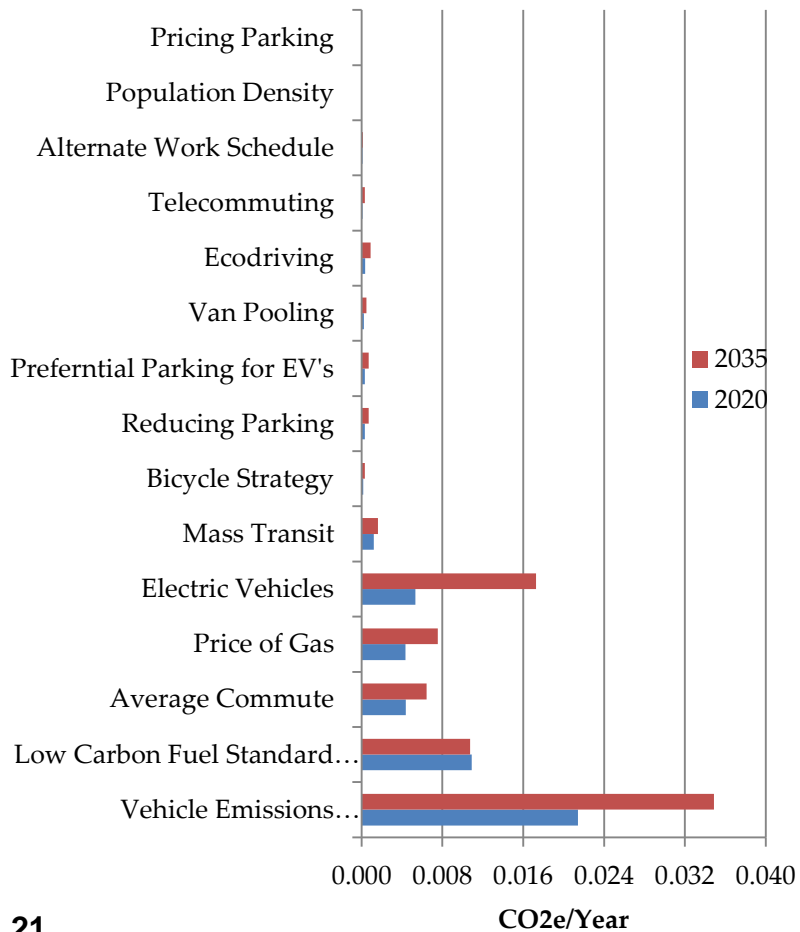
# Mitigation Model

		User Defined Inputs		Annual Emissions Reductions:	
		2020	2035	(MMT CO <sub>2</sub> e)	
		2020	2035	2020	2035
73	<b>Statewide Measures</b>				
74	<a href="#">Vehicle Fuel Efficiency Improvements</a>	2010	2020	2035	0.03 0.05
75	User Defined Total Fleet CO <sub>2</sub> e/Mile (Grams/Mile)	499.5	381.5	347.0	
76	<a href="#">Low Carbon Fuel Standard (LCFS)</a>	2010	2020	2035	0.04 0.04
77	User Defined Emissions Reduction Factors	-	10%	10%	
78	<a href="#">Electric Vehicles</a>	2010	2020	2035	0.01 0.02
79	% of Total VMT Driven By Electric Vehicles	0.5%	4.0%	11.0%	
95	<a href="#">Mass Transit</a>	2010	2020	2035	0.01 0.02
96	Commuter Ridership (%)	5.7%	6.9%	8.7%	
111	<a href="#">Bicycle Strategy</a>	2010	2020	2035	0.002 0.004
112	Bicycle Lane Miles/Square Mile	1.1	4	8	
113	<a href="#">Retiming Traffic Signals</a>	2010	2020	2035	0.0014 0.0015
114	Numer of Traffic Retimed Traffic Signals	-	25	30	
115	<a href="#">Roundabouts</a>	2010	2020	2035	0.0003 0.0004
116	Number of Roundabouts Installed	-	5	8	

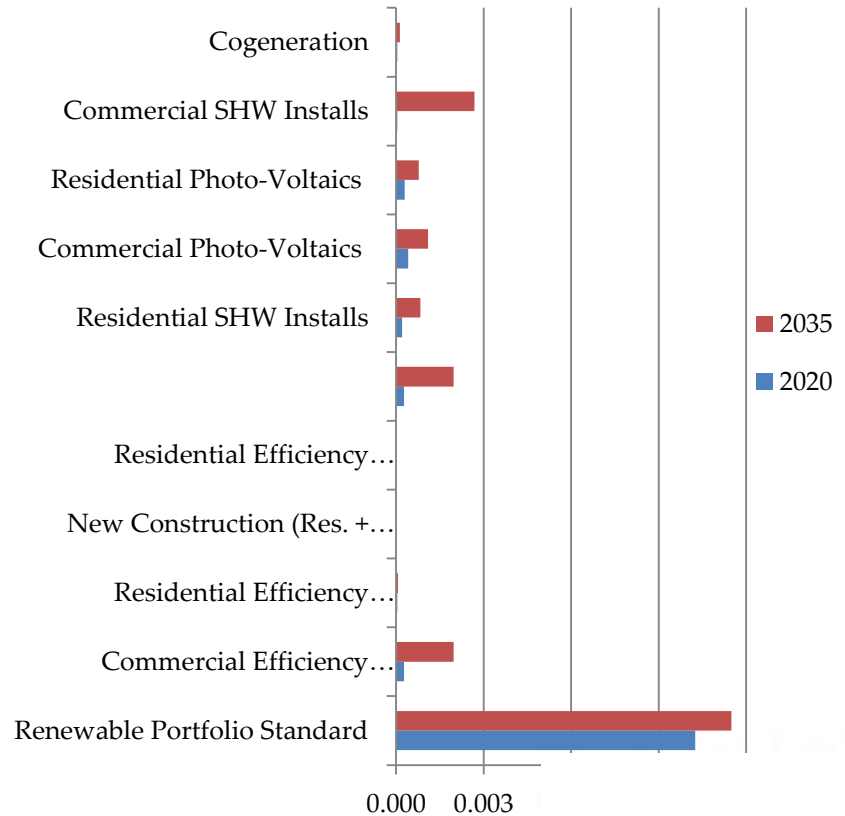


# GHG Mitigation Measures Summary

## Emissions Reductions Transportation



## Emissions Reductions Electricity + Natural Gas



# Results

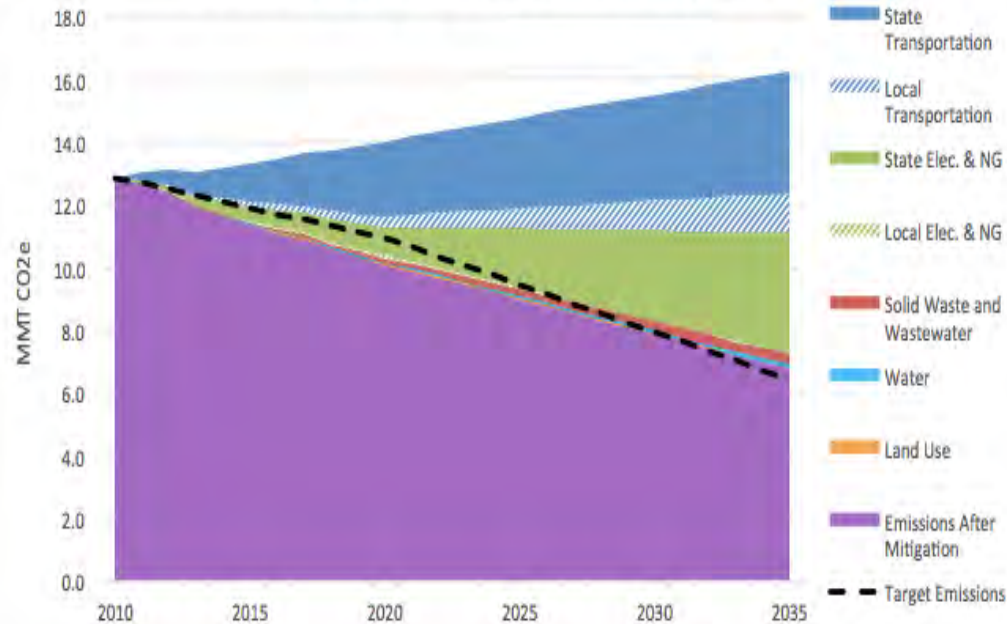
## Community Scale Greenhouse Gas Emissions Model

### Module II: Mitigation Measures Calculator

Baseline Emissions (MMT CO<sub>2</sub>e) **12.86**

Year	Targets	Target Emissions (MMT CO <sub>2</sub> e)	Emissions after Mitigation (MMT CO <sub>2</sub> e)	Target Achieved
2020	15%	10.93	10.05	Yes
2035	50%	6.43	6.58	No

Business-as-Usual and Mitigated Emissions Projections



# Cities involved in climate action planning

<b>San Diego</b>	1,356,000
<b>Encinitas</b>	61,588
<b>Del Mar</b>	4,278
<b>Solana Beach</b>	13,236
<b>Chula Vista</b>	256,780
<b>Lemon Grove</b>	26,141
<b>La Mesa</b>	58,642
<b>Oceanside</b>	172,794

Thank You!

Nilmini Silva-Send  
University of San Diego  
silvasend@sandiego.edu  
619-260-2957





## Mike Hansen

City of San Diego Director of  
Land Use and  
Environmental Policy, Office  
of Mayor Kevin Faulconer



City of San Diego  
Draft Climate Action Plan Overview

# Climate Action Planning Background

- 2005 – City Approves First Climate Protection Action Plan
- 2006 – AB 32 Sets GHG Targets
- 2008 – General Plan Comprehensive Update and EIR
- 2012 – Mayor Sanders Releases Draft Climate Mitigation and Adaptation Plan
- 2013 – Interim Mayor Gloria Releases Working Draft Climate Action Plan
- 2014 – Mayor Faulconer Releases Draft Climate Action Plan



# Policy Objectives

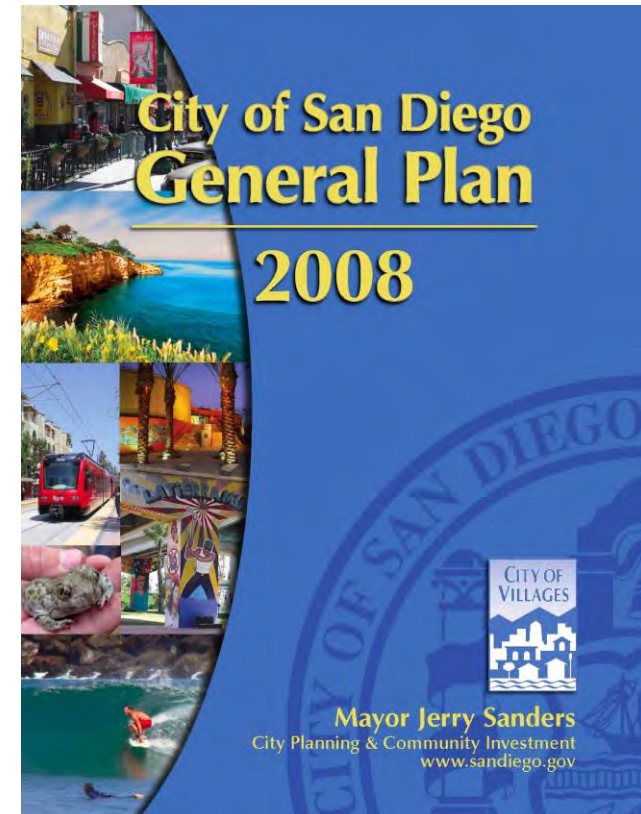
- Reduce GHG while strengthening economy and improving quality of life
- Provide roadmap to meet targets from AB 32 and Exec. Order S-3-05
- Enhance leadership position in Cleantech
- Achieve broad community support



# Implements the General Plan

## Climate Action Plan Supports General Plan:

- Conservation Element – A.13 – Regularly monitor, update, and implement the City's Climate Action Plan to ensure compliance with all applicable federal, state and local laws.
- Conservation Element -A.2 – Reduce the City's Carbon Footprint
- City of Villages Strategy - Promote the integration of land use planning and transit.
- Mobility Element – Increase multi-modal transportation choices in a manner that strengthens the City of Villages land use vision and helps achieve a clean and sustainable environment.

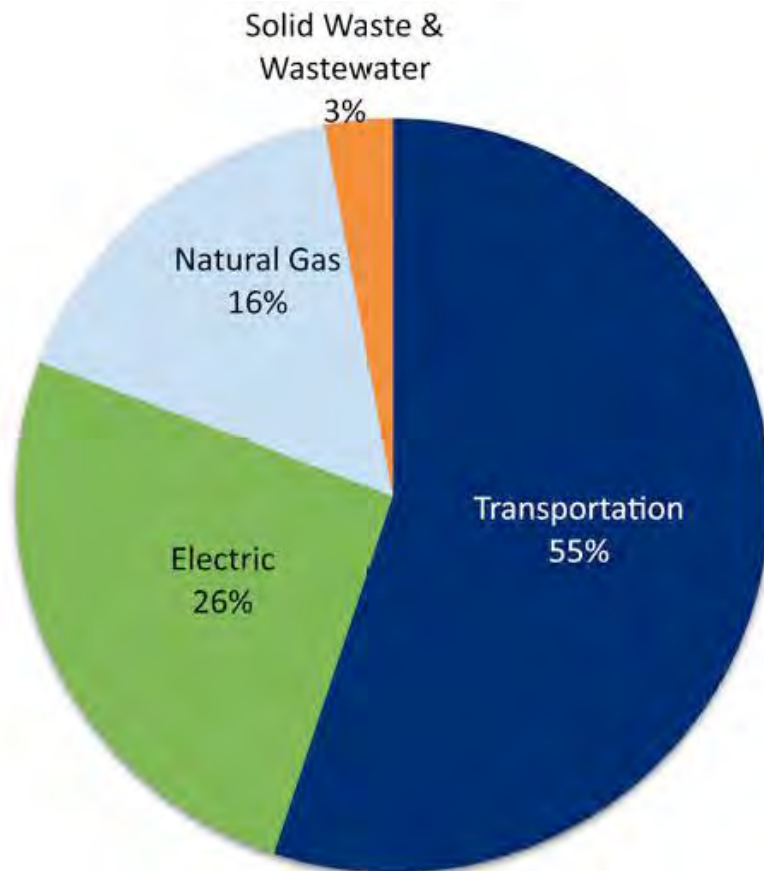




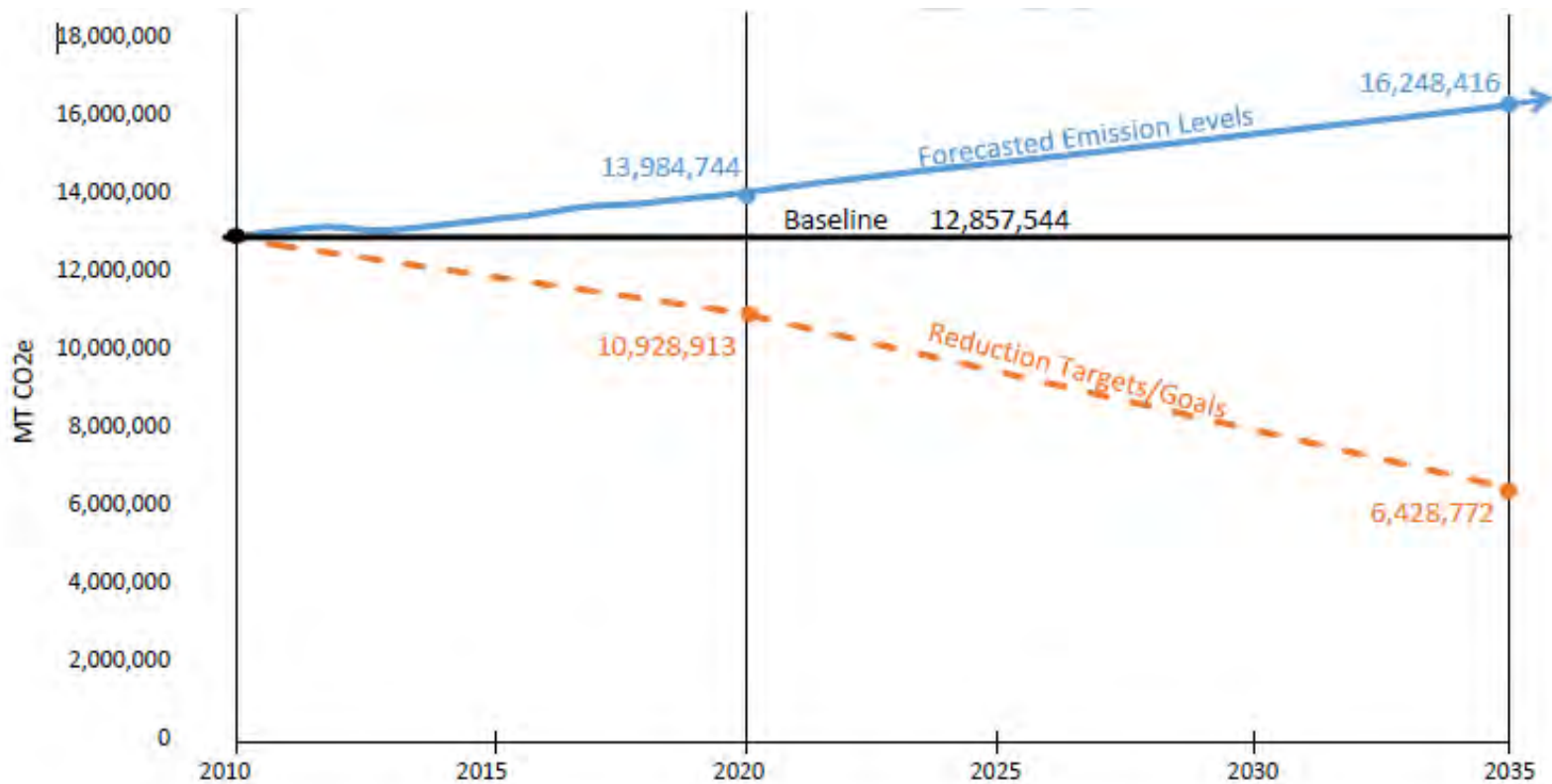
# Robust Community and Stakeholder Outreach Guided CAP Development

- Public Forums and Comments
  - Over 30 public presentations since 2011
- Environmental & Economic Sustainability Task Force
  - Independent advisory body formed solely for CAP
- City of San Diego Hearings and Workshops
  - Environment, Planning Commission, TAC, CPC
- Extensive Outreach to Business and Environmental Organizations and Leaders

# Community Baseline 2010 Inventory



# Projected GHG Emission Levels and Reduction Targets

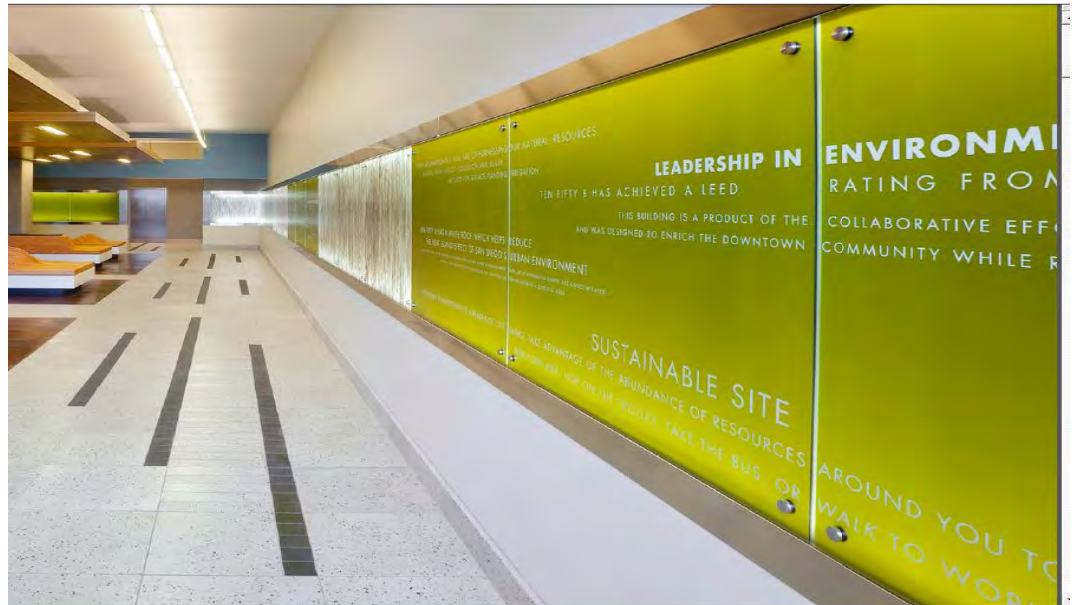


# **Five Bold Strategies for GHG Emissions Reductions**

- 1. Energy & Water Efficient Buildings**
- 2. Clean & Renewable Energy**
- 3. Bicycling, Walking, Transit, and Land Use**
- 4. Zero Waste**
- 5. Climate Resiliency**

# Energy & Water Efficient Buildings

- Energy/Water Conservation & Disclosure Ordinances
- Municipal Energy Strategy
- Design Rate Structures to Conserve Water
- Outdoor Landscaping Ordinance



# Clean and Renewable Energy



- Renewable Energy Program (100% Renewable Target for 2035)
- Rooftop Solar and EV Charging Station Ordinance

# Bicycling, Walking, Transit, and Land Use

- Increase Transit, Bike and Pedestrian Mode Share in Transit Priority Areas

- Convert Municipal Fleet to Zero & Low Emission Vehicles

- Electric Vehicle Charging Siting Plan



# Zero Waste and Climate Resiliency

- 90% Waste Diversion by 2035 through Zero Waste Plan
- Increase Methane Gas Recapture at Landfills and Wastewater Facilities
- Urban Tree Planting Program
- Future Standalone Climate Adaptation Plan



## Next Steps

1. Environmental & Economic Sustainability Task Force
2. Prepare Draft Environmental Document
3. Review Public Comments
4. Finalize Plan and CEQA Document for City Council Consideration
5. Future Council actions on incentives, ordinances, and programs

## Next Steps

6. Long term commitment to implementation and monitoring
7. Broad-based participation
  - No single organization or institution can achieve targets on its own
  - Challenge must be shared by the entire community
8. Flexibility to make adjustments over time

# Lead City Staff and Consultant Team

- Mike Hansen (Mayor's Office)
- Brian Schoenfisch (Planning Dept)
- Nancy Bragado (Planning Dept)
- David Weil (Environmental Services Dept)
- Scott Anders (EPIC)
- Nilmini Silva-Send (EPIC)

**Questions? Send to [CAP@SANDIEGO.GOV](mailto:CAP@SANDIEGO.GOV)**

port of san diego

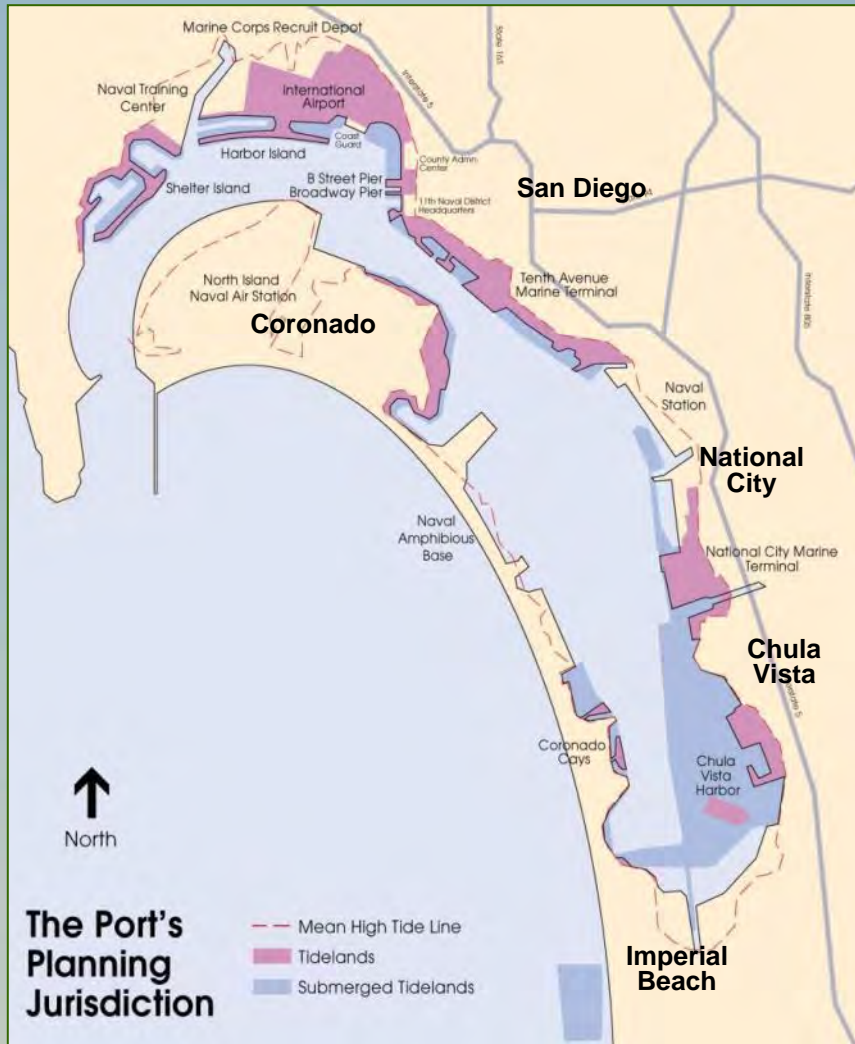
# climate action plan 2013

Cody Hooven

November 21, 2014

Unified Port of San Diego

# Port of San Diego Background



## Established in 1962 by Legislature to:

- Manage San Diego Harbor
- Administer public lands along the bay

## Governed by Seven Commissioners

- Appointed by five city councils of neighboring cities
  - San Diego
  - Coronado
  - National City
  - Chula Vista
  - Imperial Beach

# Climate Action Plan






Emission Inventories  
Baseline and Projections

Goals

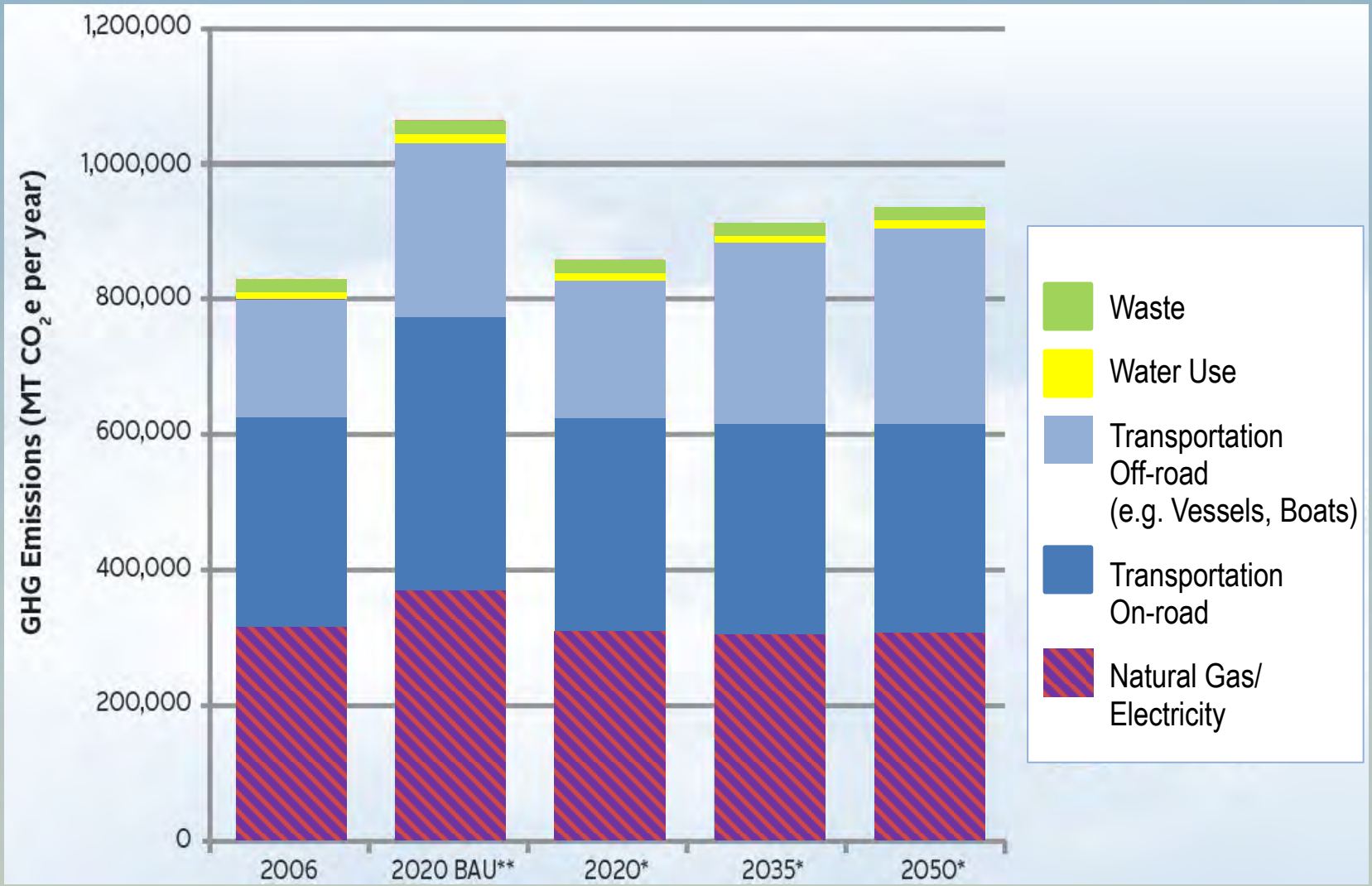
Policies

Measures

# Inventory Scope – Standard CAP Inventory Categories

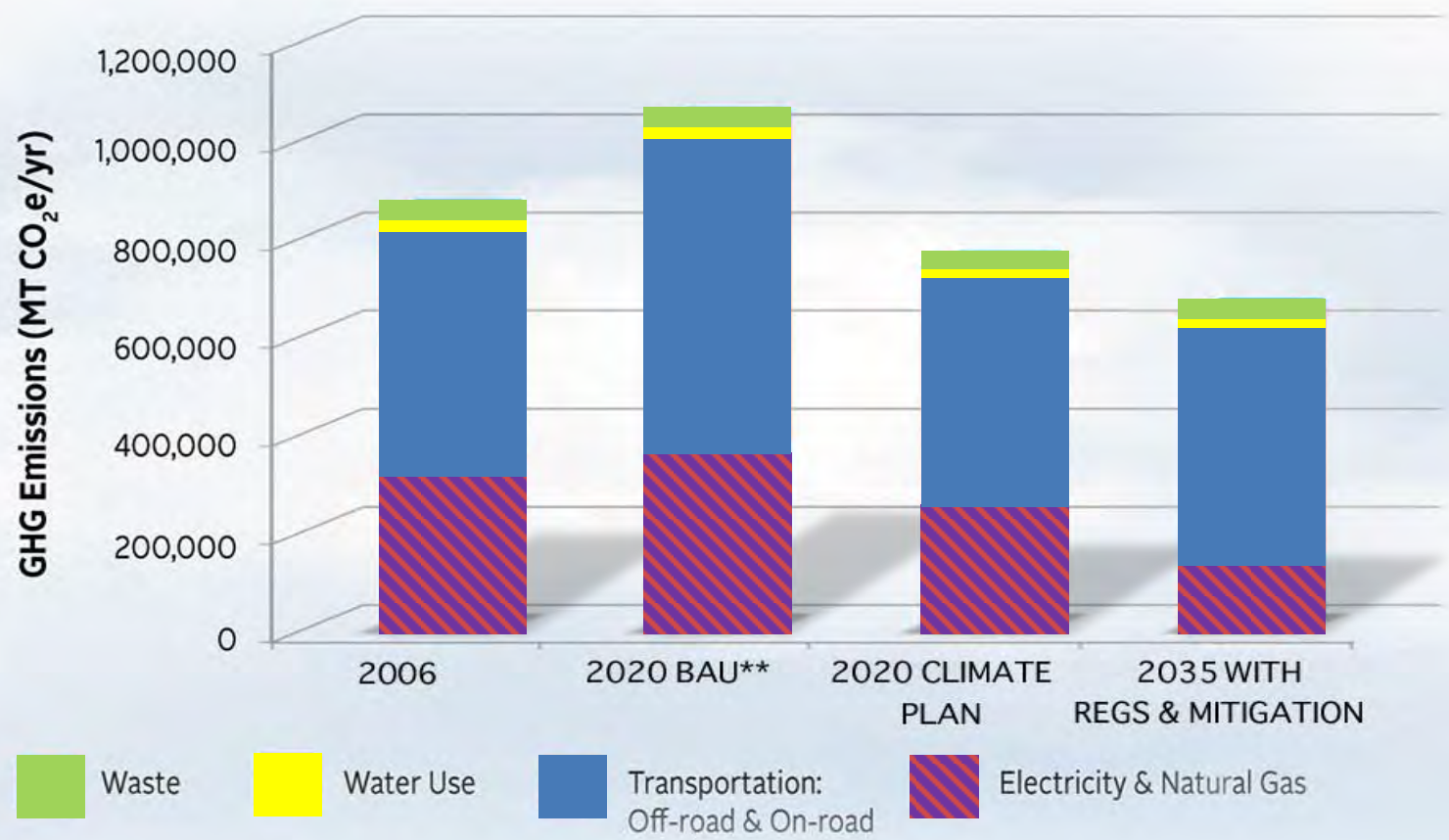
Category	Description
<b>Energy</b> 	<ul style="list-style-type: none"> <li>•Electricity and natural gas usage within jurisdiction</li> </ul>
<b>Transportation: On-Road Vehicles</b> 	<ul style="list-style-type: none"> <li>•Trips originating or terminating within jurisdiction</li> <li>•Exclude pass-by trips</li> </ul>
<b>Transportation: Off-Road</b> 	<ul style="list-style-type: none"> <li>•Consistency with Maritime inventory               <ul style="list-style-type: none"> <li>•Locomotives</li> <li>•Ocean-going vessels and harbor craft</li> <li>•Trucks</li> <li>•Cargo handling equipment</li> <li>•Cruise Terminal Transportation</li> </ul> </li> </ul>
<b>Water Use</b> 	<ul style="list-style-type: none"> <li>•Usage within jurisdiction</li> </ul>
<b>Waste</b> 	<ul style="list-style-type: none"> <li>•Solid Waste - Transport to landfill and direct landfill emissions</li> <li>•Wastewater – Treatment plant</li> </ul>

# Current and Projected Emissions by Source Categories



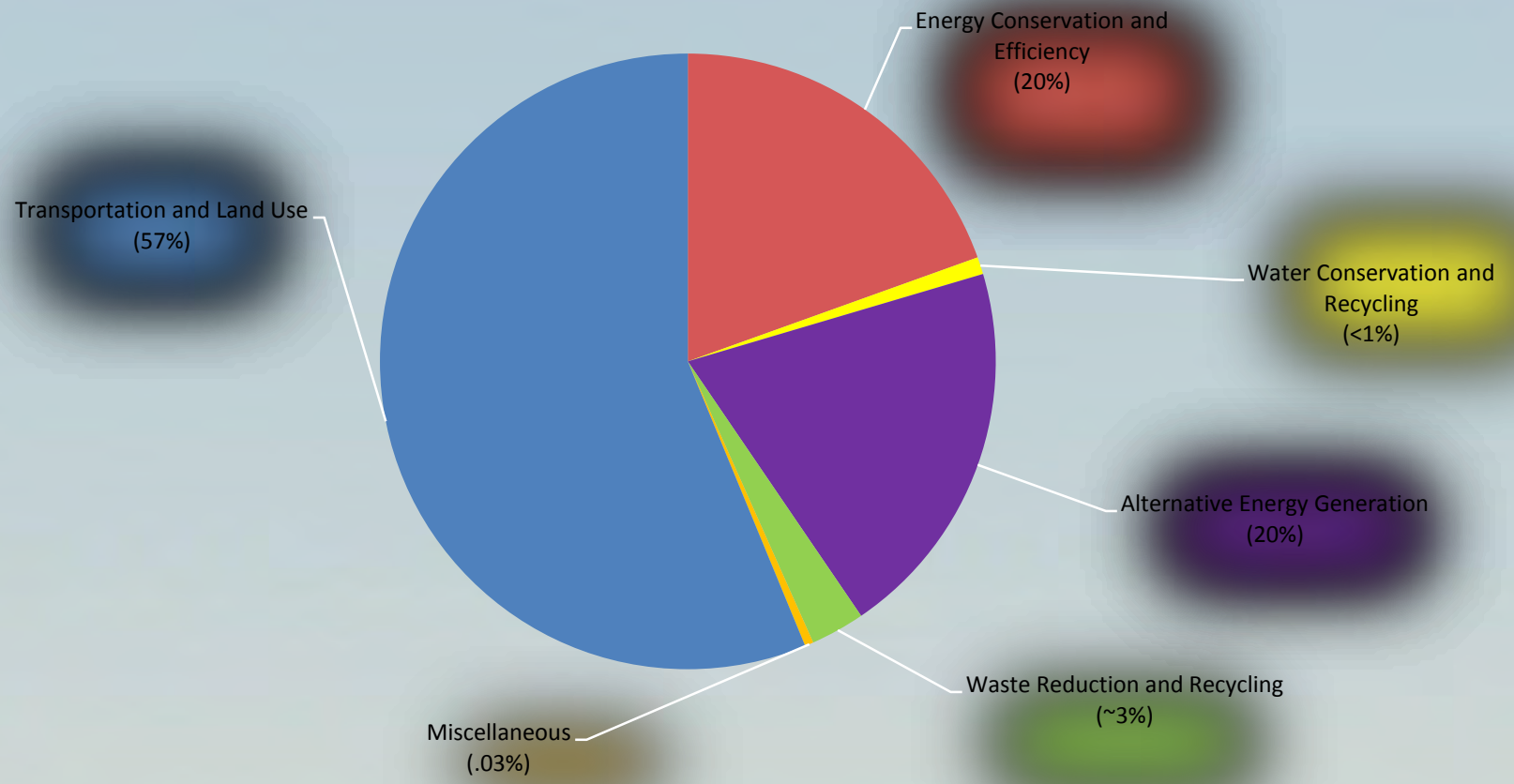


# GHG Reduction Goals Set by Board



- 10% by 2020
- 25% by 2035

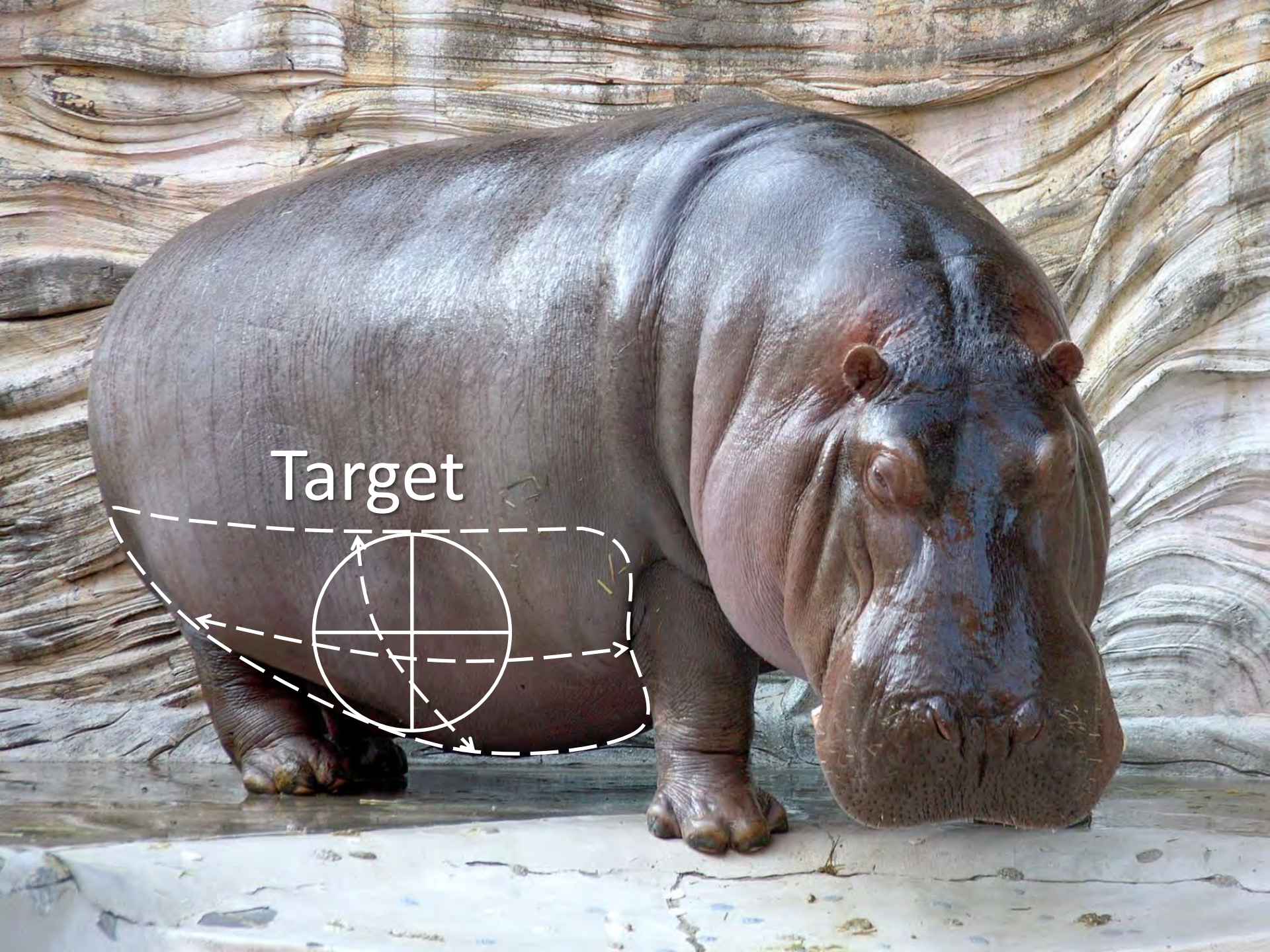
# 2020 GHG Emissions Reduction Target Categories



 = 10% reduction by 2020

Baseline





Target









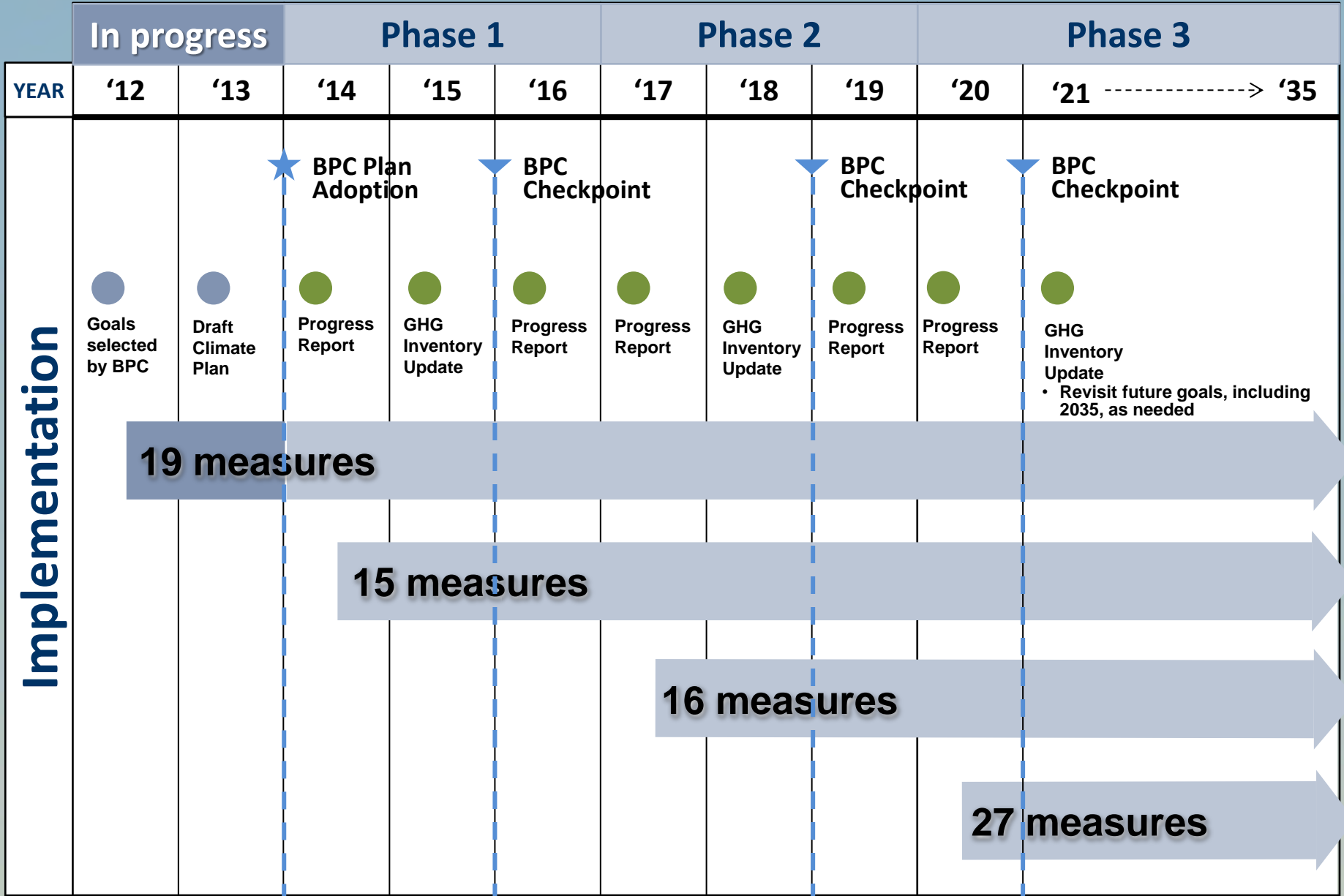




# Implementation Criteria

- Authority
- Cost
- Cost effectiveness
- Potential funding
- Implementability
- Measurable results
- Key measure
- Timeframe
- Reduction potential
- Technical feasibility
- Existing agreement/law
- Co-benefits

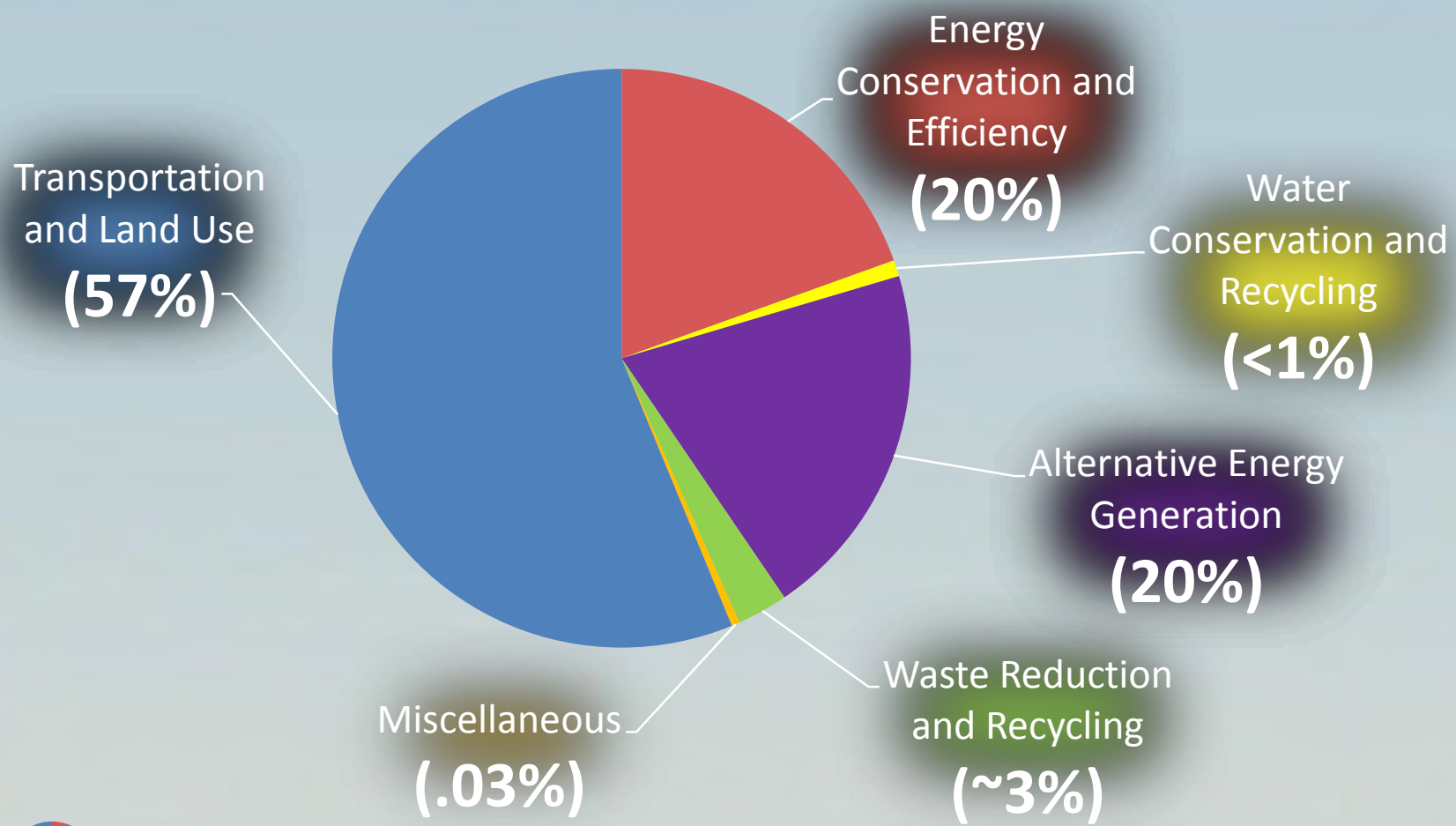
# Approach to Implementation



# FY14/15 Proposed Implementation Plan

	Port Funded	Grant/SDG&E Funded
<b>21 Measures In Progress</b>	<b>\$665,000</b>	<b>\$285,000</b>
<b>8 New Measures</b>	<b>\$70,000</b>	<b>\$140,000</b>
<b>TOTAL</b>	<b>\$735,000</b>	<b>\$425,000</b>
<b>Total Full-Time Equivalent Staff</b>	<b>3.5 FTE across 6 departments</b>	

# 2020 GHG Emissions Reduction Target Categories

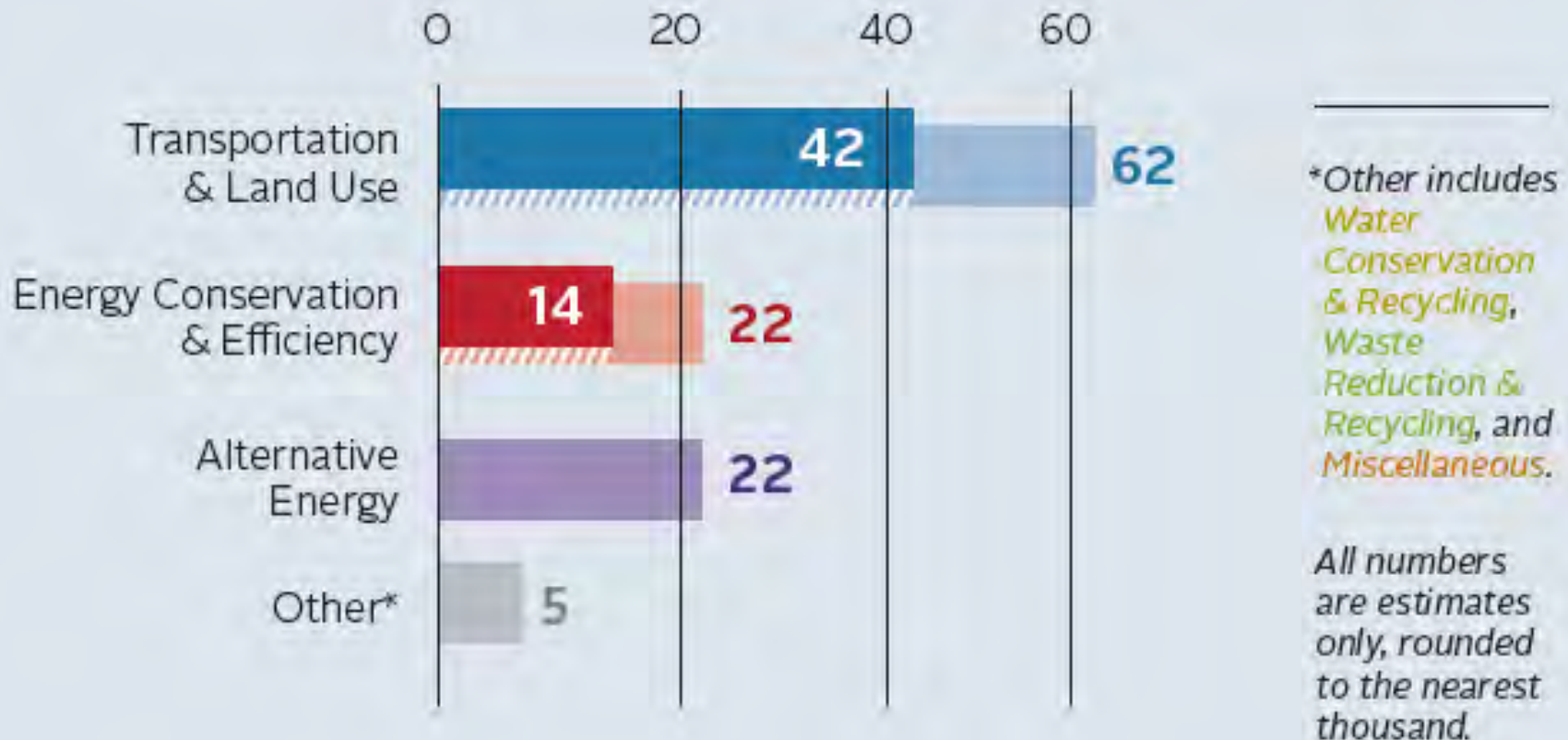


 = 10% reduction by 2020

# 2014

## REDUCTION PROGRESS VS. GOALS

All GHG numbers in 1,000 metric tons CO<sub>2</sub> equivalents per year



# Climate Adaptation for a Port: Considerations

- Newer concept
- Different approach than typical planning process
- Long planning horizon – 50yr and 100yr
- No “low-hanging fruit” for adaptation (unlike GHG mitigation)
- Requires multi-jurisdictional coordination

# Process

- Existing conditions – what tidelands look like now
- Vulnerabilities – what is most vulnerable to sea level rise
- Risk analysis – where we should focus our priorities
- Adaptation strategies – overarching goals, toolbox and recommended next steps





# Key Vulnerabilities

- Quantitative sea-level rise (SLR) impacts
  - Land Use (Port and tenant activities)
  - Stormwater
  - Natural Resources
  - Other (e.g. goods movement, safety, etc.)
- Qualitative vulnerabilities
  - Temperature Increases
  - Other Impacts



# Chula Vista Bayfront Master Plan

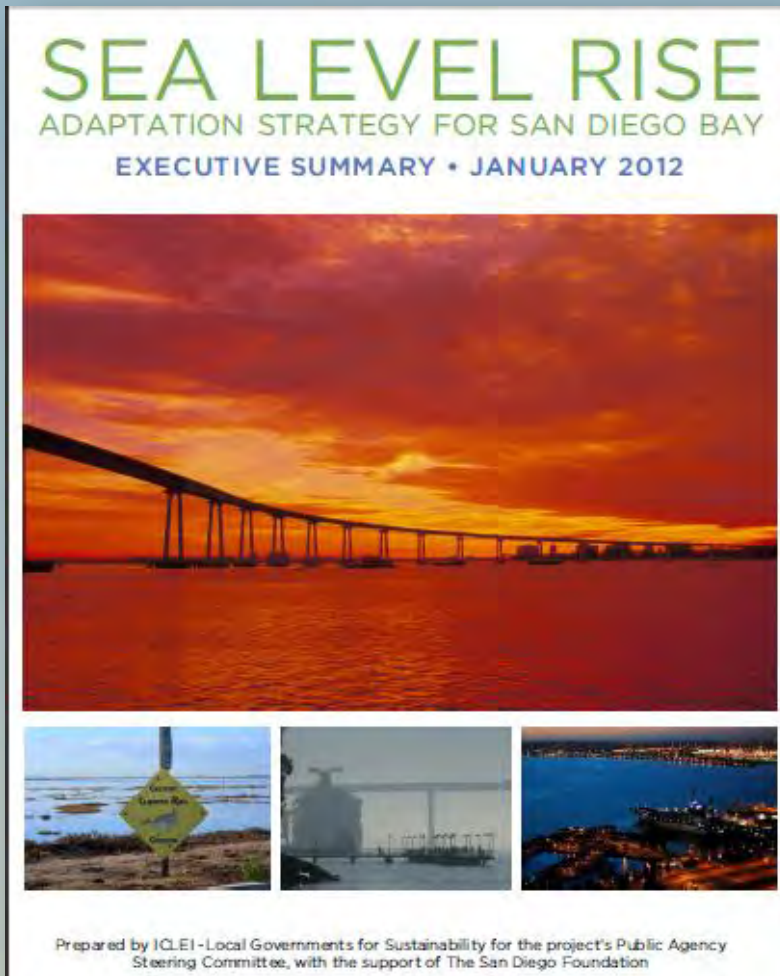


Adaptation strategies incorporated



# Regional Collaboration

## *San Diego Bay*



*Develop actionable recommendations for adapting to sea level rise and associated impacts*

*Funded by  
The San Diego  
Foundation*



*Technical support  
by ICLEI*



# Regional Collaboration

## *San Diego Bay*

### **Public Agency Steering Committee**

*Port of San Diego, 5 member cities, Airport Authority*

### **Stakeholder Working Group**

*Representatives from local, state, and federal public agencies, private and public land managers, business and community groups*

### **Technical Working Group**

*Scientists and technical experts from regional universities, city staff, engineering and environmental consulting firms*





## Keeping it Clean, Green and Growing

Discover local groups working to reduce the effects of climate change in the San Diego region.

[MEET THE COLLABORATIVE \[+\]](#)

**Purpose:** a regional forum for public agencies to share expertise and leverage resources to facilitate climate action planning

**Partners:** academia, non-profit organizations, businesses and community leaders

1. Address and prevent the harmful effects of climate change;
2. Promote a high quality of life for the San Diego region; and
3. Foster a green and growing economy



# Progress To-Date:

- Reports:
  - Climate Action Planning Progress in the San Diego Region
- Represented at:
  - Alliance of Regional Collaboratives for Climate Adaptation
- Workshops:
  - CERES Workshop (Mar. '13)
  - Climate Leadership Conference (Feb. 2014)
  - NOAA Costal Services Center Adaptation Training (Nov. '14)
  - Planning/Facilitating Public Meetings (Jan. '15)
- Other Work
  - CCSE Residential Retrofits
  - Regional Green Business Efforts





# Port of San Diego