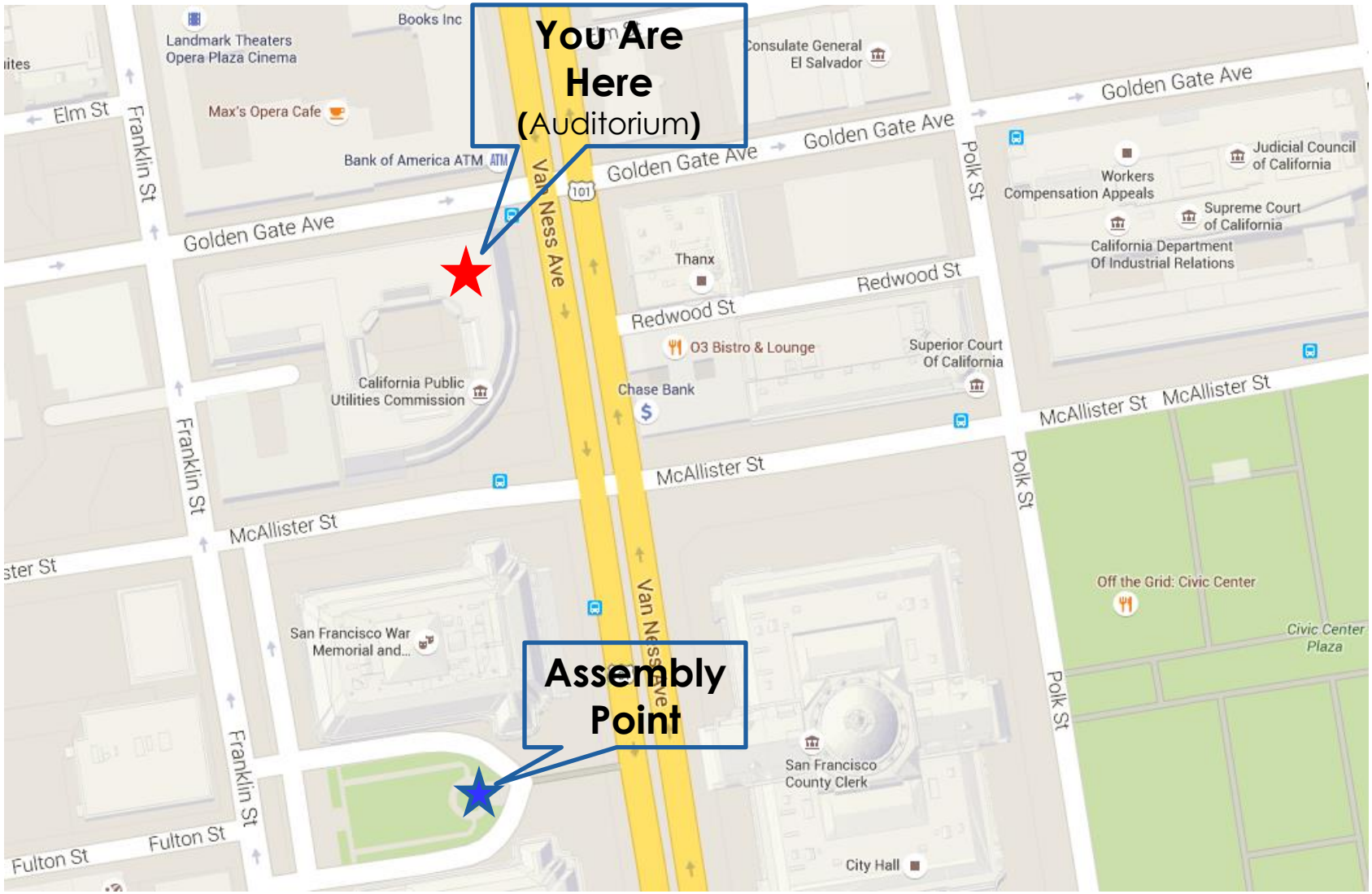
Public Workshop on the Energy Sector to Inform Development of the 2030 Target Scoping Plan Update

August 23, 2016

Evacuation Map



Introductions and Welcome

Commissioner Liane Randolph
California Public Utilities Commission

Rob Oglesby, Executive Director
California Energy Commission

Edie Chang, Deputy Executive Officer
California Air Resources Board

Workshop Outline

- Introduction and Welcome
- 2030 Target Scoping Plan Overview & Progress Update
- Power Sector: Vision, Goal, and Current Efforts
- Lunch
- Natural Gas: Current Efforts to Reduce GHG Emissions
- Cross-Sector Impacts
- Open Discussion Period

2030 Target Scoping Plan Overview

CALIFORNIA AIR RESOURCES BOARD

CALIFORNIA CLIMATE STRATEGY

An Integrated Plan for Addressing Climate Change

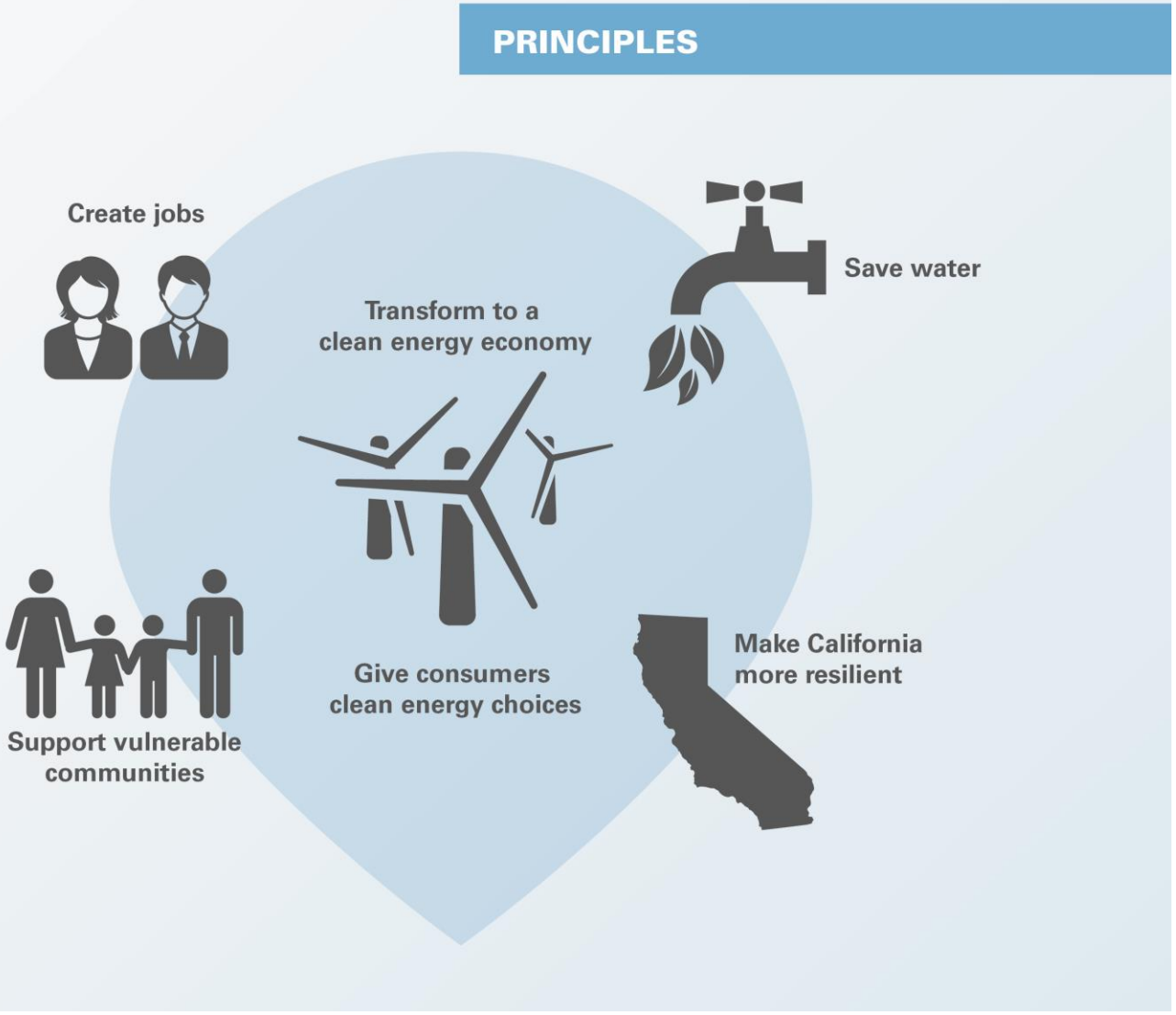
VISION

Reducing Greenhouse Gas Emissions to 40% Below 1990 Levels by 2030

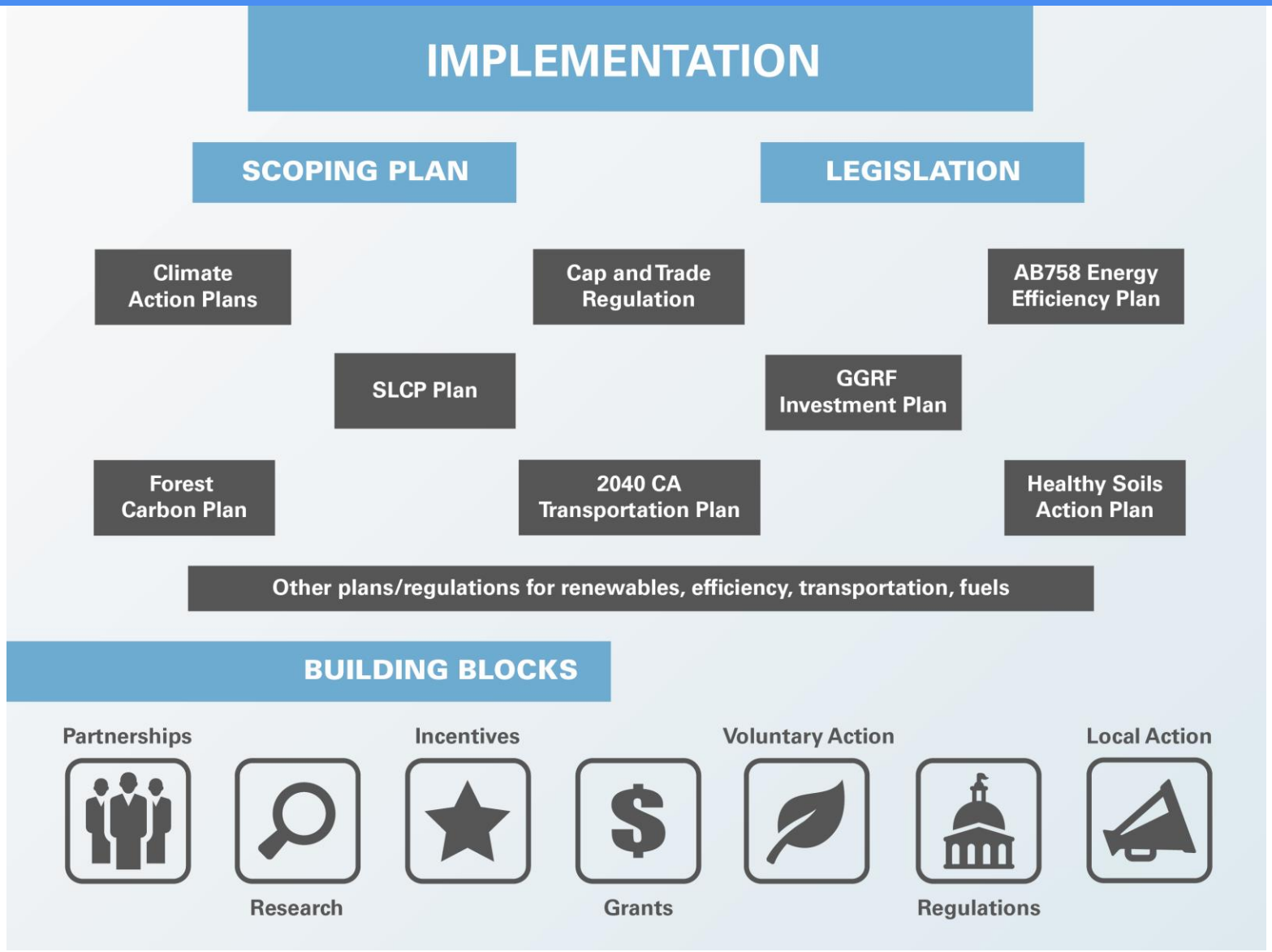
GOALS

- 50% renewable electricity
- 50% reduction in petroleum use in vehicles
- Double energy efficiency savings at existing buildings
- Carbon sequestration in the land base
- Reduce short-lived climate pollutants
- Safeguard California

CALIFORNIA CLIMATE STRATEGY



CALIFORNIA CLIMATE STRATEGY



Prior Scoping Plans

- First Scoping Plan required by AB32
- Established new paradigm for climate mitigation
- First economy-wide climate change plan
- Pioneered the concept of a market-based program supplemented with complementary measures
- Sector-by-sector approach
- Public outreach and education
- Must be updated at least every 5 years

Executive Order B-30-15

- Reduce greenhouse gas emissions to 40% below 1990 levels by 2030
- Update the AB 32 Scoping Plan to incorporate the 2030 greenhouse gas target

2030 Target Scoping Plan Development

- Collaborate with State Agencies
- Engagement with Legislature
- Coordination with other plans (i.e. 111(d), Cap & Trade, SIP, Freight Strategy, etc.)
- Public Process: Workshops
- Economic Analysis with Expert Reviewers
- Environmental Justice Advisory Committee Engagement
- Environmental Analysis (CEQA)
- Draft Report / Final Report (targeted measures and estimated emission reductions)

Elements of 2030 Strategy

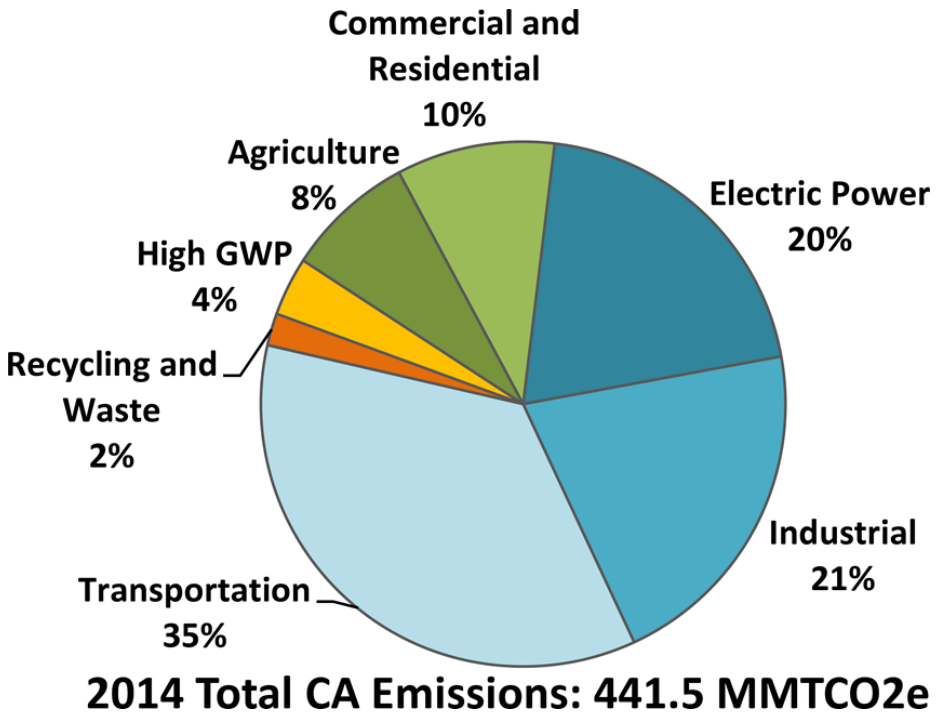
- Focus areas within the pillars framework
  - Energy
  - Green buildings
  - Transportation
  - Water
  - Natural and working lands/Agriculture
  - Waste management
  - Short-lived climate pollutants
  - Industry
- Maximize synergies among sectors

Policy Drivers for GHG Reductions in Energy Sector

- Senate Bill 350 (RPS and doubling energy efficiency savings)
- Governor's call to make heating fuels cleaner
- Reduce dependence on fossil fuels.
- Address fugitive fossil methane emissions
- Short-Lived Climate Pollutant (SLCP) Strategy proposed actions

Energy Sector

- Consideration of emission sources when identifying opportunities for policies and programs



Presentation 2

2030 Target Scoping Plan Progress

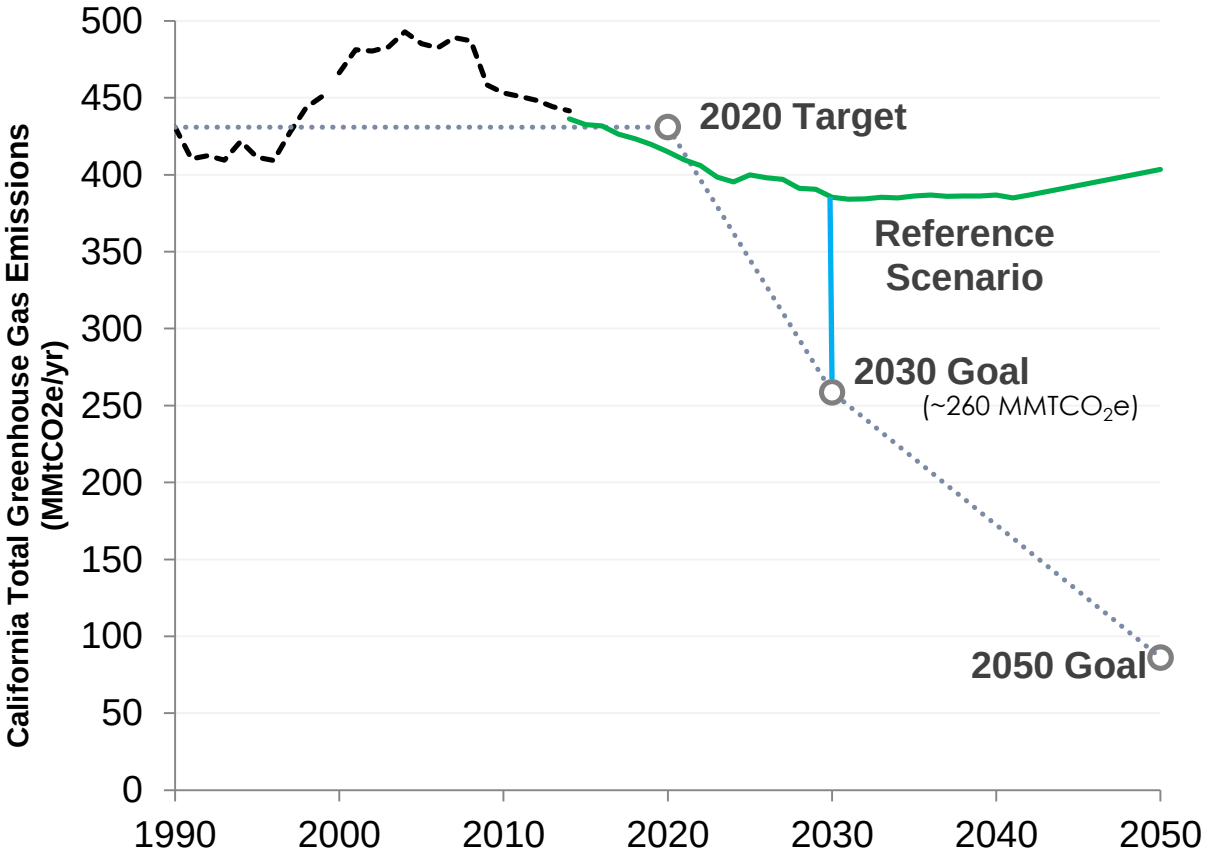
Objectives for Scoping Plan

- Meet 2030 target
- Integrated system, acknowledging trade-offs
- Establish range of planning targets for electricity sector
- Flexible framework for implementation
- Promote resilient economic growth
- Protect, enhance, innovate, and increase sequestration in the natural environment
- Improve public health
- Environmental justice
- Rely on sound science and research
- Set the path to 2050

Achieving the Target

- Need to understand amount of GHG reductions needed between now and 2030
- Draft reference case ("Business as Usual" or BAU)
  - Potential inputs and models discussed at January 15, 2016 public workshop
  - Presents pre-SB 350 current policies to estimate GHGs in 2030
  - Draft reference scenario modeled

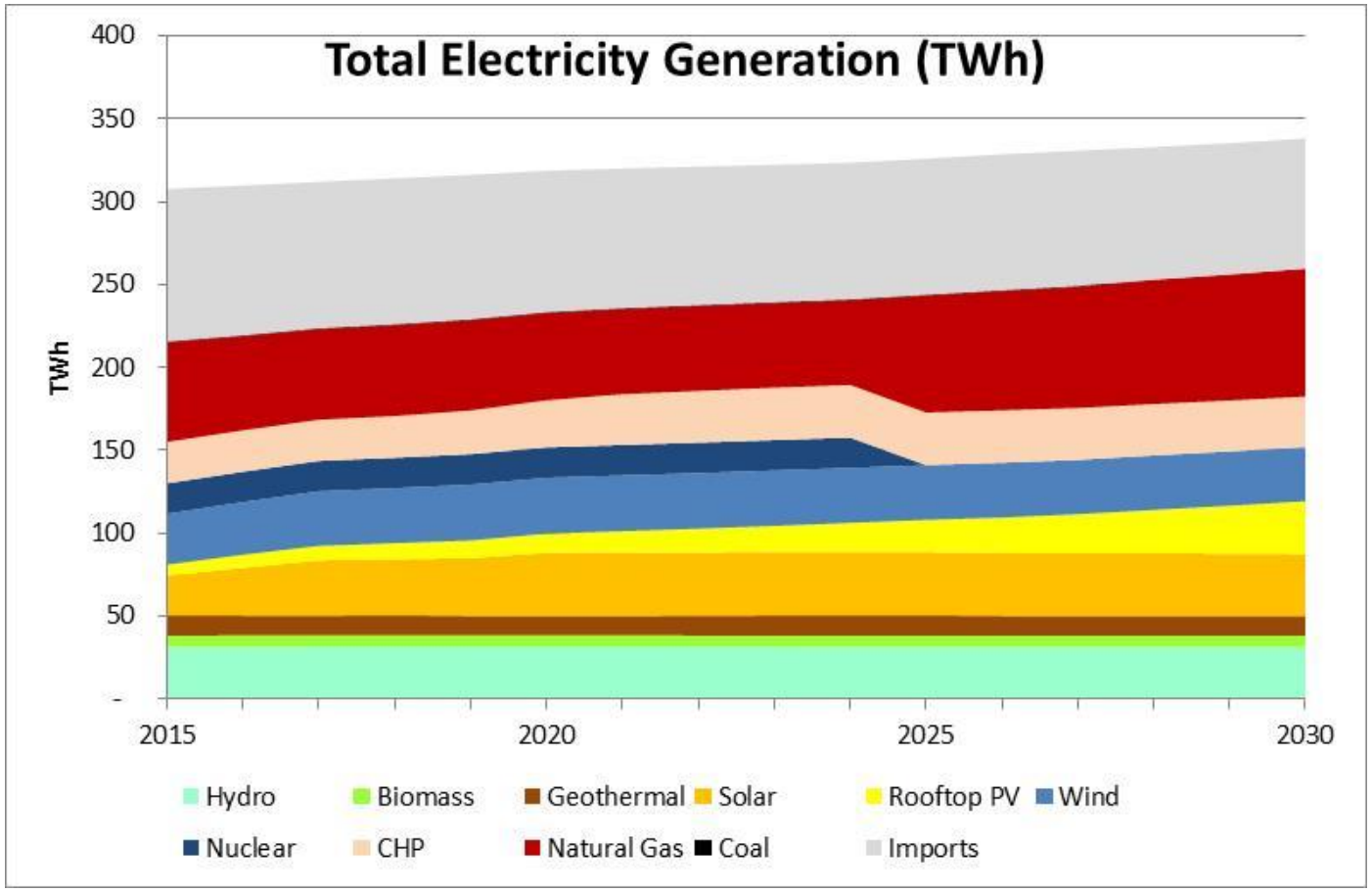
Draft Reference Scenario



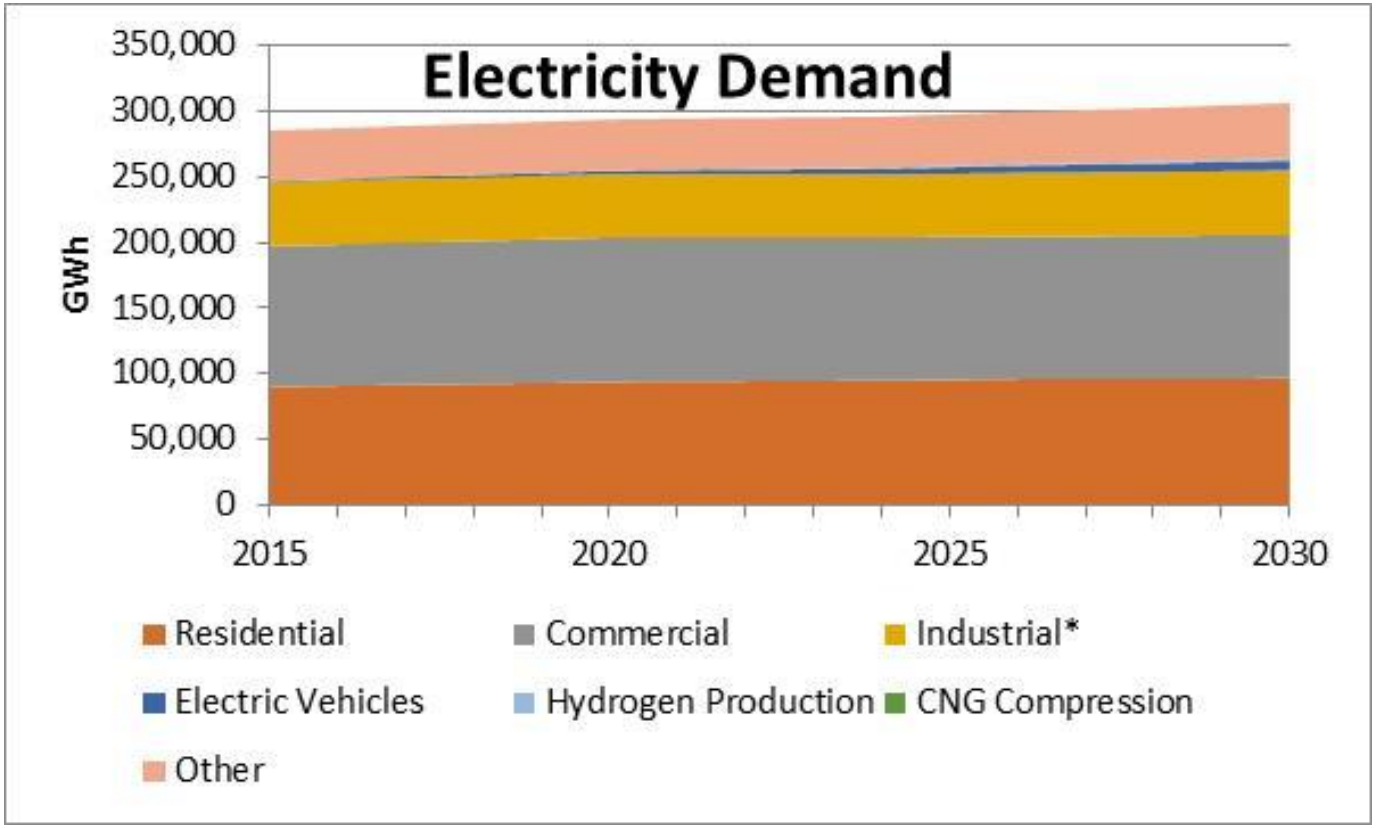
Draft Reference Scenario
Assumptions

- Electricity supply
  - 33% RPS by 2020, maintained through 2030
  - Diablo Canyon retires in 2025
  - Hydro-generation based on average historical generation
  - Ending of purchases from Intermountain Power
- Rooftop PV is based on mid 2015 IEPR case
  - Reduces retail sales but not counted towards meeting RPS
- Electricity demand
  - CEC IEPR 2015 mid-AAEE scenario

Draft Reference Scenario
Electricity Generation Mix

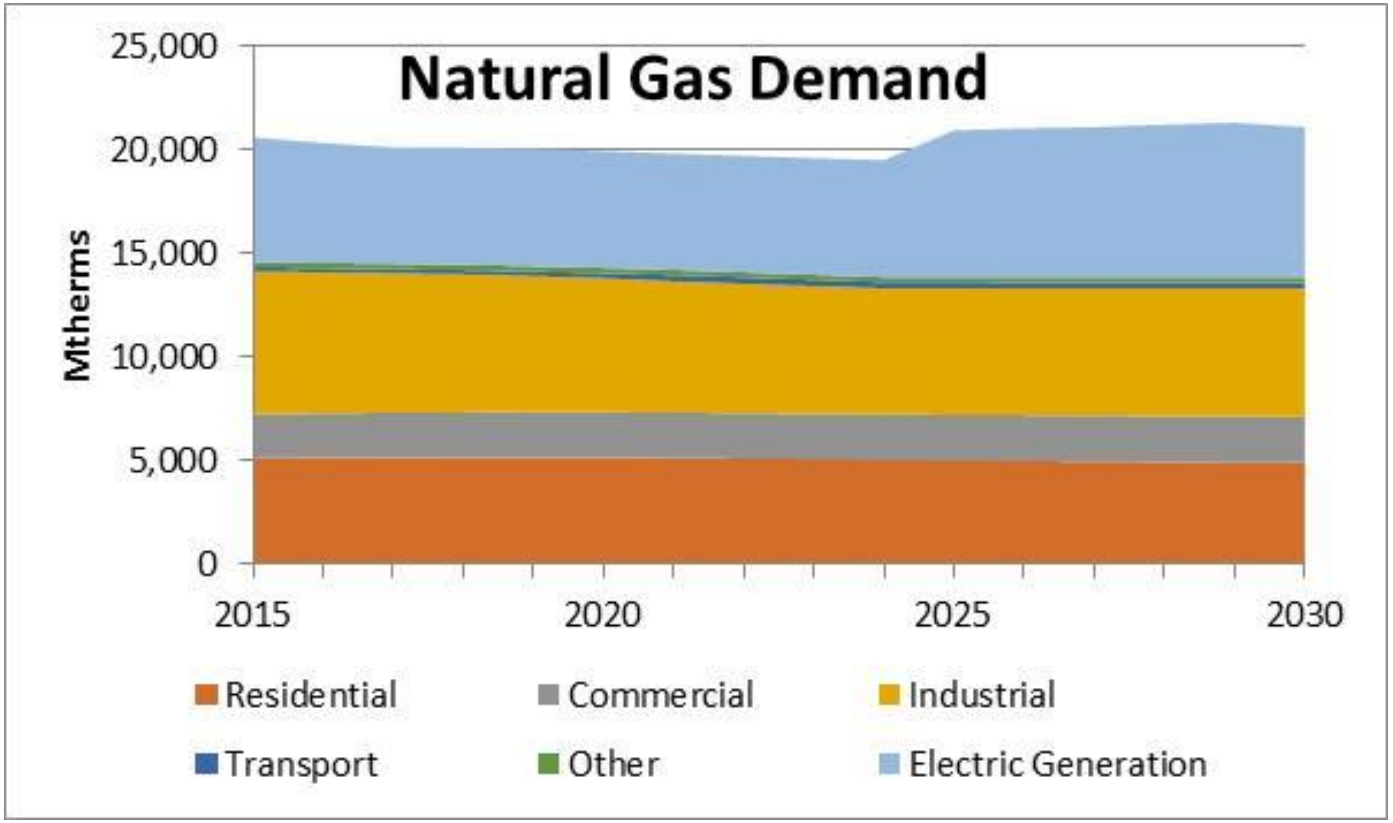


Draft Reference Scenario
Electricity Demand



*Industrial, Oil & Gas Extraction, and Refining

Draft Reference Scenario
Natural Gas Demand



Closing the Gap

- Many policies that will be included in the 2030 Target Scoping Plan are known commitments
- Set of core complementary policies common across all scenarios
  - SB 350 by 2030
  - Mobile Source Strategy
  - Implement Draft Short-Lived Climate Pollutant Strategy
  - SB 375 targets
  - Natural & Working Lands targets, etc.

Closing the Gap, cont.

- Even with the known commitments the State does not achieve the 2030 limit
- Need additional reductions to achieve the 2030 limit
- Potential options to fill remaining gap:
  - Enhance and extend existing programs
  - New policies and prescriptive regulations
  - Will be weighed against Scoping Plan objectives

Next Steps

- Hold regional public workshops on specific topics
- Continue coordination with CA Dept. of Public Health on Scoping Plan Public Health Analysis
- Hold technical and economic workshops on economic analysis
- Meet with stakeholders as requested

Next Steps: Tentative Schedule

- Technical and Economic Workshops – Summer/Fall 2016
  - Economic/environmental analyses
- Sector-specific Public Workshops – Summer
- Draft 2030 Target Scoping Plan – Fall 2016
- Regional workshops – Winter 2016/Spring 2017
  - Bay Area, Los Angeles, Central Valley
- Draft 2030 Target Scoping Plan presented to Board – November 2016
- Final 2030 Target Scoping Plan presented to Board – Spring 2017

Public Comments

- Please provide comments on this workshop by September 7, 2016 at 5:00 p.m.
- Links to submit both written comments and view all comments received can be found at: http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm
- Additional opportunities to comment will be available at subsequent workshops

Power Sector – 2030 Vision & Goals Current State Agency Efforts

California Energy Commission

Rob Oglesby, Executive Director

Electricity Sector - Context

- 20% of statewide GHG emissions from electricity.
- Statewide GHG Emission Reduction Goals:
  - Below 1990 levels by 2020
  - 40% below 1990 levels by 2030
  - 80% below 1990 levels by 2050
- Electricity Sector is currently about 20% below 1990 GHG emission levels.

Electricity Sector - Context

- Since 2008:
  - Renewable generation almost doubled
  - Coal generation reduced by more than half
  - GHG emissions reduced by a quarter
- GHG Reduction Programs:
  - Renewables Portfolio Standard
  - Energy efficiency
  - Customer-side distributed generation programs
  - Cap-and-Trade
  - Combined heat and power programs

Electricity Sector Goals

- SB 350
  - 50% renewable procurement by 2030
  - Double statewide energy efficiency savings in end uses by 2030
- AB 802
  - Energy performance benchmarking for large buildings
  - Increased energy usage data access for CEC to improve forecasting capabilities

SB 350 Elements

- Renewable energy
- Energy efficiency
- Integrated Resource Plans
- Grid regionalization
- Barriers studies

SB 350 Implementation - Renewables

- "to increase from 33% to 50% the procurement of our electricity from renewable sources."
- Energy Commission is developing amendments to our regulations – anticipated for Commission vote in March 2017
- Docket number 16-OIR-01.

SB 350 Implementation - Efficiency

- "to double the efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation."
- Energy Commission is working with ARB, CPUC, and CaISO to develop baselines and set energy efficiency targets.
- Docket number 16-OIR-01.

SB 350 Implementation – Integrated Resource Plans

- For larger POUs, the Energy Commission "shall review the integrated resource plans and plan updates. If the Energy Commission determines an integrated resource plan or plan update is inconsistent with [SB 350], the Energy Commission shall provide recommendations to correct deficiencies."
- Energy Commission is developing guidelines. Docket number 16-OIR-04 .
- POU IRPs are due to the Energy Commission on January 1, 2019.

SB 350 Implementation – Grid Regionalization

- "It is the intent of the Legislature to provide for the transformation of the Independent System Operator into a regional organization to promote the development of regional electricity transmission markets in the western states…"
- Joint agency workshops on regionalization studies and various governance proposals to accomplish the transition. Docket Number 16-RGO-01 .

SB 350 Implementation – Barriers Studies

- Energy Commission to "conduct and complete a study on both of the following:
  - (1) Barriers to, and opportunities for, solar photovoltaic energy generation as well as barriers to, and opportunities for, access to other renewable energy by low-income customers; and
  - (2) Barriers to contracting opportunities for local small businesses in disadvantaged communities."
- Extensive public outreach and stakeholder engagement. Docket number 16-OIR-02 .
- Anticipated report publication in December 2016.

AB 802 Implementation

- Energy Commission will establish a statewide program to benchmark and publicly disclose energy usage information for certain buildings.
- Utilities maintain energy use data for all buildings to which they provide service.
- Utilities provide energy usage data to a building owner, owner's agent, or operator on request.
- Pre-rulemaking currently; Rulemaking beginning this fall.
- Building Docket number 15-OIR-05 .

SB 350 and AB 802 Data Collection

- Facilitate data collection to implement the goals and objectives of SB 350 and AB 802.
- Expand data collection efforts to improve energy demand forecasts.
- Rulemaking underway to revise existing data collection regulations, anticipated adoption next year.
- Docket number 16-OIR-03 .

SB 350/2030 Planning Activities

California Public Utilities Commission

SB 350 Cross-Cutting Requirements

- Requires the CPUC develop an **Integrated Resource Planning** (IRP) process for load-serving entities
- Requires implementation of an IRP process for the planning and procurement of an optimal state-wide resource and infrastructure portfolio that includes among many other elements:
  - Consideration of all CPUC-jurisdictional LSEs
  - Consideration of fair cost allocation and no cost-shifting among customers
  - Coordination with existing resource programs
- Must consider **disadvantaged communities** in CPUC decision-making process

Integrated Resource Plans (IRP)

- February: CPUC opened a rulemaking to develop the IRP process
- August: CPUC staff issued a concept paper to solicit feedback on options for implementing the IRP process
  - Staff to host a webinar on **August 24th**
  - Informal comments are due **August 31st**
  - Workshop on concept paper on **September 26th**
- December: Staff proposal on IRP framework
- April 2017: CPUC will issue a decision on guidance to LSEs on IRPs

Renewables Portfolio Standard

- The IOUs must procure at least 50 percent of their resources from eligible renewable energy resources by 2030.
  - Must consider the State's GHG limits and system reliability to least-cost, best-fit methodology
  - Must establish procurement expenditure limits that prevent disproportionate rate impacts.
- April: Ruling on new RPS requirements
- June and August: Rulings on Least Cost Best Fit reform issued
- September: Ruling on Procurement Expenditure Limits

Energy Efficiency

- SB 350: CPUC must at a minimum authorize the following IOU programs:
  - Existing conditions baseline
  - Behavioral, Retrocommissioning, and Operational programs
  - Market Transformation programs
  - Pay-for-Performance programs

- AB 802: By September 1, 2016, CPUC must authorize electrical or gas corporations to provide financial incentives, rebates, technical assistance, and support to their customers to increase the EE of existing buildings based on all estimated energy savings and energy usage reductions.

- April: Staff white paper on existing baseline conditions

- July: Proposed decision existing conditions baseline and Program Administrators' Business Plan filings

Disadvantaged Communities

- Requires the CPUC to consider disadvantaged communities in its decision-making processes
  - CPUC and CEC to establish an advisory group of representatives from disadvantaged communities to provide advice on clean energy and pollution reduction programs and determine whether they will benefit disadvantaged communities
- CPUC coordinating with the CEC on disadvantaged communities studies and development of a disadvantaged communities advisory council

Transportation Electrification

- CPUC required to order the IOUs to propose transportation electrification programs and investments.
  - Transportation electrification programs must target charging infrastructure, underserved communities and vehicle grid-integration opportunities.
- March: CPUC issued an amended scoping ruling providing preliminary guidance on the IOUs' forthcoming transportation electrification plans
- April: Workshop on future transportation electrification plans
- September: Ruling providing guidance on transportation electrification plans

Regional expansion

- June: Joint CAISO/CPUC/CEC workshop on Regional Expansion
- CPUC coordinating with the CAISO on regional expansion efforts

Natural Gas Sector: Research and Development Efforts to Reduce GHG Emissions

Aleecia Gutierrez

California Energy Commission,
Energy Research and Development Division

August 23, 2016

Discussion Topics

- Background
- Past and Current Research and Development Efforts
- Future Activities
- Contacts

Background

- Since 2005, the Energy Commission has administered the Natural Gas Research and Development Program
- Funded by a surcharge on all natural gas consumed in California ≈ $24 million/year
- Natural Gas R&D projects must:
  - Focus on energy efficiency, renewable technologies, conservation and environmental issues
  - Support state energy policy
  - Offer reasonable probability of providing public benefits
  - Consider opportunities for collaboration and co-funding

Past and Current Research

- Greenhouse gas mitigation
  - Energy Efficiency
  - Solar Thermal
  - Renewable Energy and Advanced Generation
- Methane measurement research
- Pipeline safety

Energy Efficiency

Improving energy efficiency of homes, businesses and industries is the most important strategy to reduce energy use and cost and GHG emissions

- Improvements in natural gas using technologies, such as more effective water and space heating, building envelopes and food service equipment
- Technological improvements to reduce natural gas consumption in industries through improvements in processes or equipment

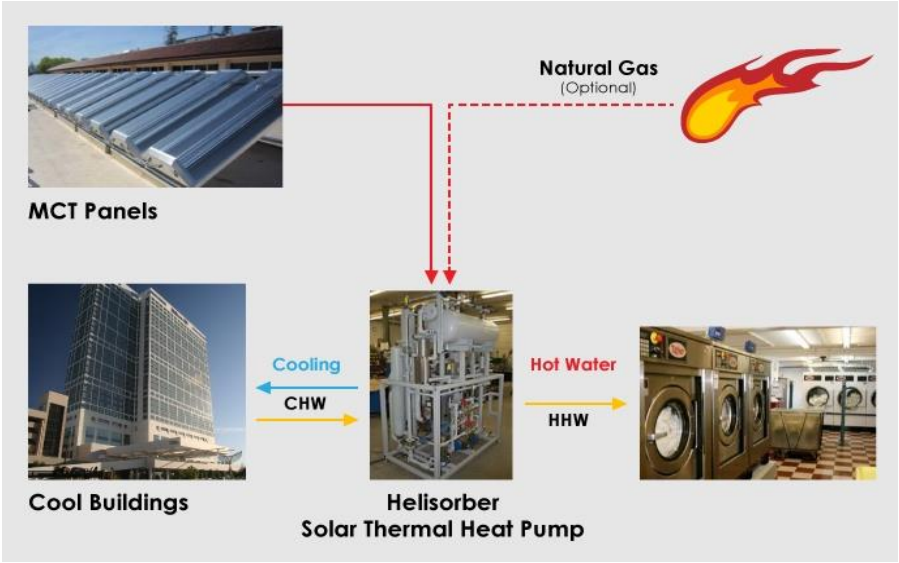
Sealed leak in between manual caulk application at the Honda Smart Home

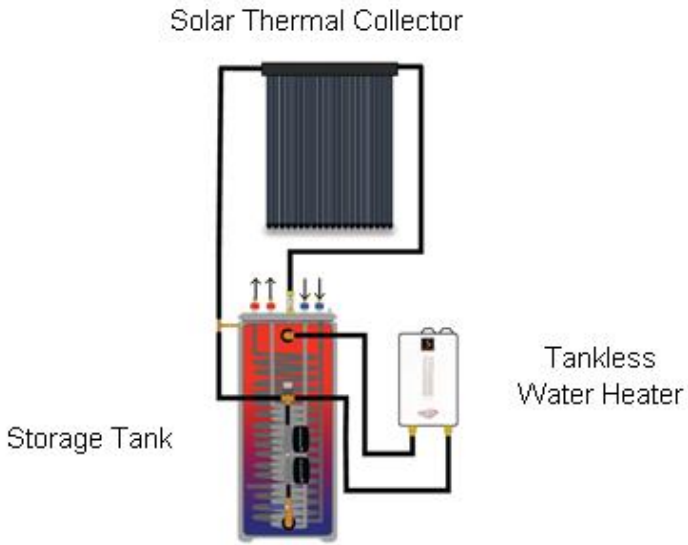
Large sealed leak on a ceiling beam at the Honda Smart Home

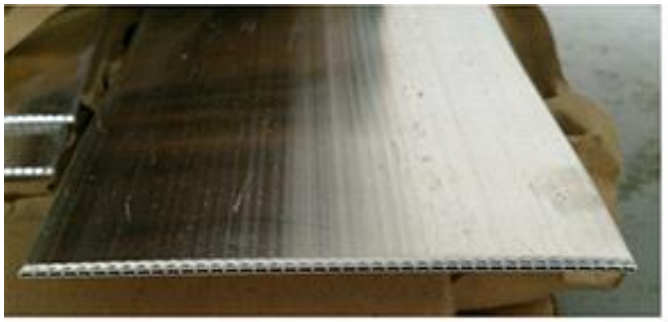
Solar Thermal

Solar thermal offers the potential for reducing the need for natural gas for water heating systems.

- Lower system cost and demonstrate the cost effectiveness
- Demonstrate reliable performance



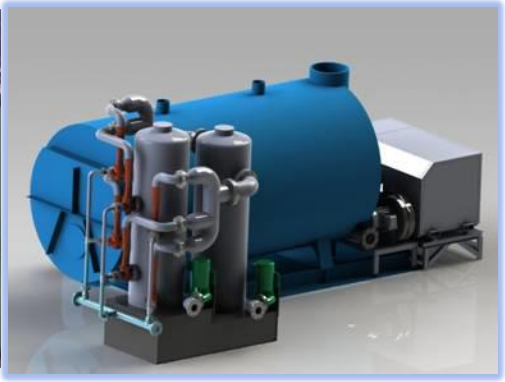




Renewable Energy and Advanced Generation

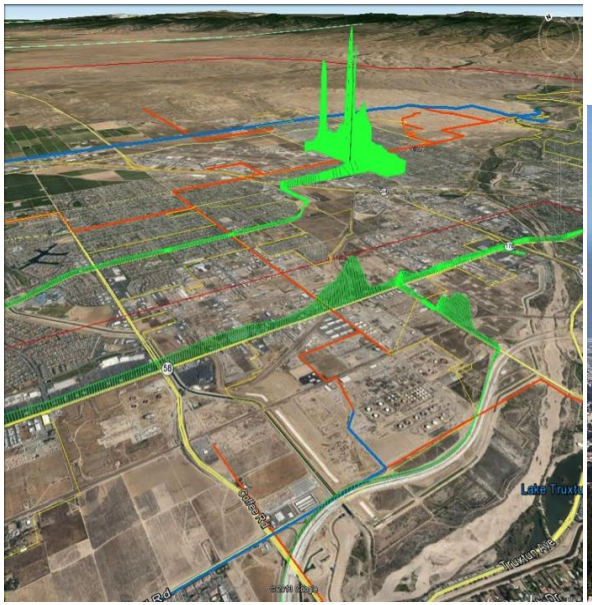
Research to accelerate deployment of innovative technologies, address environmental barriers, and lower the cost of clean energy.

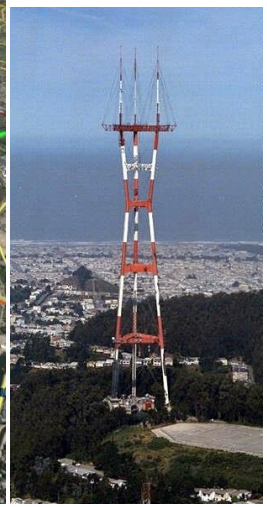
- Develop low cost steam jet refrigeration system that uses waste heat (no CFCs or HFCs)
- Demonstrate economical operation of CHP with thermal energy storage
- Demonstrate Organic Rankine Cycle Technology to convert waste heat to power

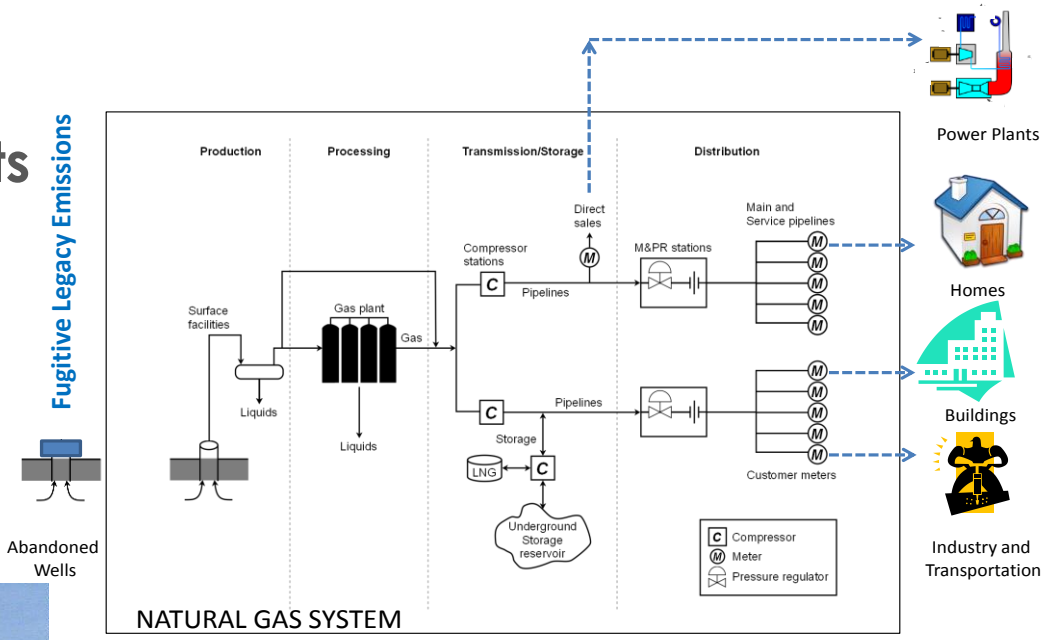


Methane Measurement Research

Research to evaluate and resolve environmental effects of energy production, delivery and use & explore new applications and approaches.





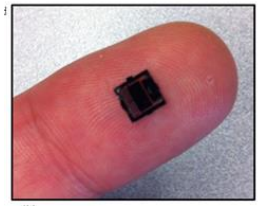


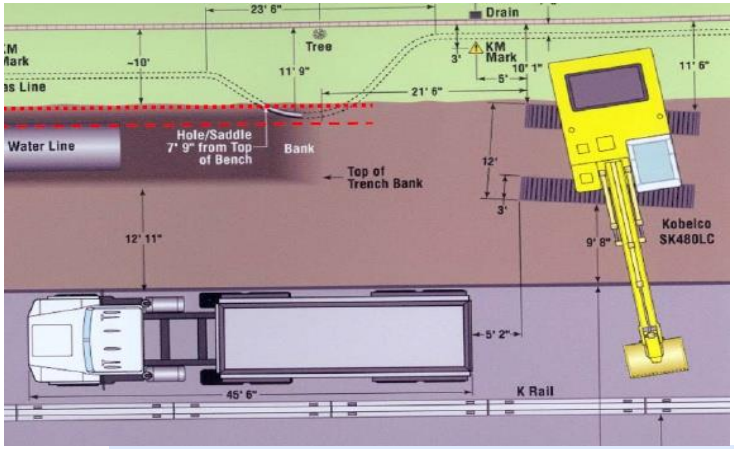
- Identification of main sources of emissions
- Characterize CH4 emissions from the natural gas system, homes and buildings and from biogenic sources

Natural Gas Infrastructure Safety and Integrity

Research to increase safety and enhance transmission and distribution capabilities of the natural gas system.

- Developed innovative monitoring technologies
- Develop technologies monitor and report encroachments on the pipeline right of way





Current Natural Gas R&D Solicitations

Solicitation Title	Deadline for Applications	Program Area	Funding (million)
Novel Solutions to Accelerate Deployment of Small and Micro-Scale Combined Cooling Heating & Power Systems (GFO-16-503)	9/30/2016	Renewable and Advanced Generation	$5.2
2016 Natural Gas Energy Efficiency Research Grants for Residential & Commercial Buildings (GFO-16-502)	Phase 1: 8/19/2016 Phase 2: 9/30/2016 Phase 3: 1/17/2017	Buildings Energy Efficiency	$5.6
Off-Road Heavy-Duty Natural Gas Vehicle R&D (GFO-16-501)	9/9/2016	Energy Infrastructure Transportation	$4
Natural Gas Energy-Related Environmental Research (GFO-15-507)	10/3/2016	Energy-Related Environmental Research	$5.7

Additional Information

- Energy Commission's R&D Program: http://www.energy.ca.gov/research/
- Information on the Natural Gas Research Funding Opportunities: http://www.energy.ca.gov/contracts/pier.html
- Energy Innovation Showcase: http://innovation.energy.ca.gov/
- Sign up for List Servers http://www.energy.ca.gov/listservers/
  - ☑ Commission General Lists – Opportunity
  - ☑ Research & Development Lists-epic, naturalgas

Natural Gas Sector + GHG Issues

CPUC

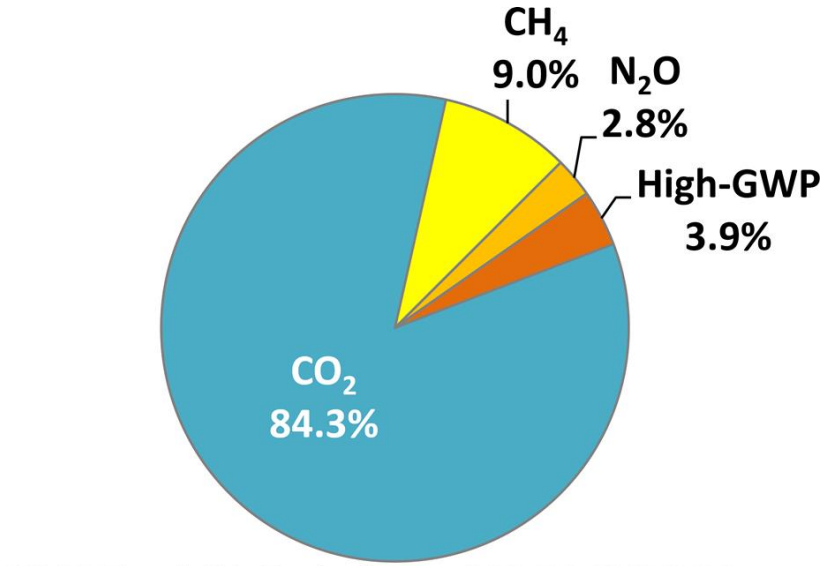
Key GHG Issues in Natural Gas

- CPUC is addressing GHG considerations for NG in various venues, including:
  - R.15-01-008 - Rules and Procedures for Pipelines and Facilities to Reduce Natural Gas Leakage in conjunction with ARB (SB 1371)
  - Prioritizing long-term strategic planning in the Natural Gas R&D Program (CEC)
  - Coordinating with key agencies on targeted studies stemming from the Aliso Canyon leak (with CCST)
  - Working with other agencies on biomethane, and addressing interconnection issues in incentive program

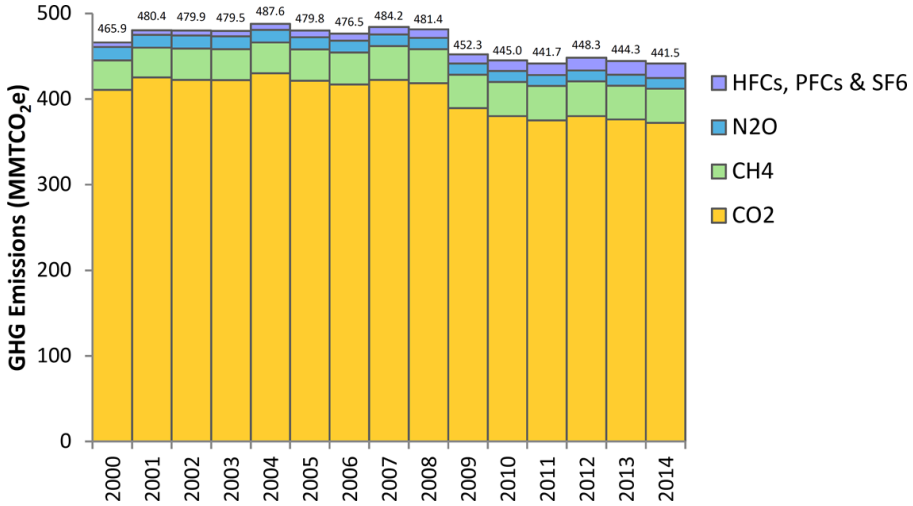
Natural Gas Sector – Current Agency Efforts to Reduce GHG Emissions

California Air Resources Board

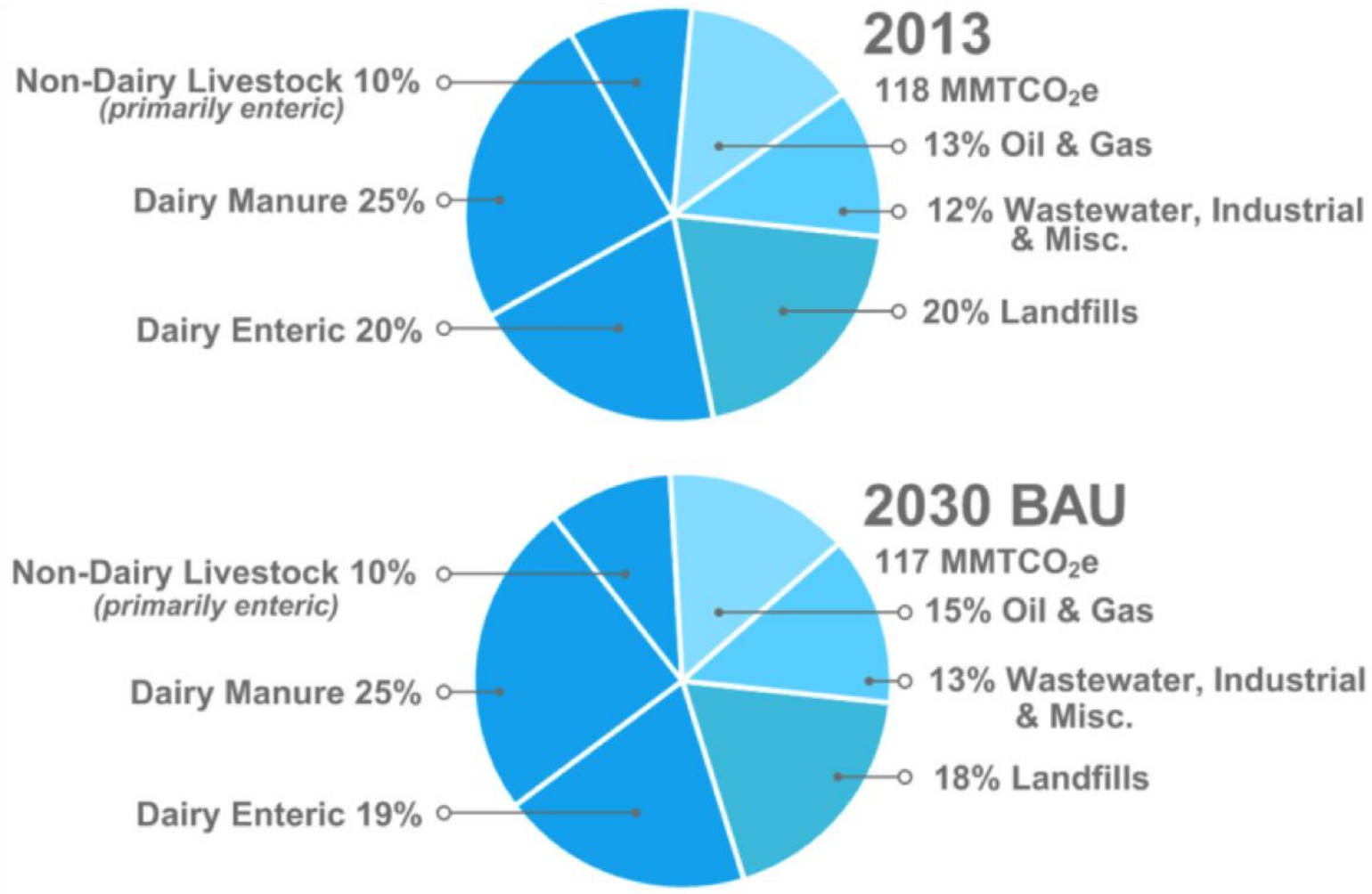
California GHG Inventory



2014 Total CA Emissions: 441.5 MMTCO2e



Methane by Source in California



Policy Drivers

- Prior Scoping Plans identify oil & gas sector as large source of GHG emissions
- Reduction of short-lived climate pollutants (SLCP) one of Governor's "pillars" to meet 2030 target of 40 percent below 1990 levels
- SLCP Reduction Strategy required by Senate Bill 605
- SLCP Strategy includes 40-45 percent reduction in methane from oil & gas sector as a whole by 2025

SLCP & Natural Gas

- Methane reduction strategies
  - Minimize fugitive emissions
  - Improve efficiency to avoid emissions
  - Consider options to accelerate biogas projects and access to pipeline
  - RNG as clean fuel alternative
  - Transition from use of oil and natural gas

State Efforts to Reduce Methane Emissions from Natural Gas Sector

- Improve monitoring to detect and minimize emissions
- Adopt regulation for GHG emissions monitoring for crude oil and natural gas facilities
- Assist CPUC in implementing SB 1371 to reduce pipeline emissions
- Consider out-of-state emissions from gas consumed in California (AB 1496 efforts)

Oil and Gas Efforts

- Oil and Gas Regulation and SB 1371 pipeline efforts cover in-state emissions
- Efforts under AB 1496 examine and consider out-of-state emissions through life-cycle assessment

Proposed Oil and Gas Regulation

- Addresses fugitive and vented methane emissions from new and existing oil and gas facilities
- Addresses early detection and emission reductions for gas storage facilities
- Emissions of covered sources reduced by 64% (sector emissions reduced by 44%)

Proposed Oil and Gas Regulation

Overview

Emission Source	Proposed Control
Uncontrolled separators and tanks	Vapor recovery
Leaking connections and equipment	Leak detection and repair (LDAR)
Underground storage facilities	Additional monitoring beyond LDAR
Compressors and pneumatic devices	Leak standards and LDAR

State Monitoring and Research Efforts

Broad Goals for Methane

- Improve understanding of emissions
  - Inform our inventories
  - Provide emission factors for sectors that are poorly understood
- Find opportunities for emission reductions
  - High emitters
  - Unknown or under-represented sources

State Monitoring and Research Efforts

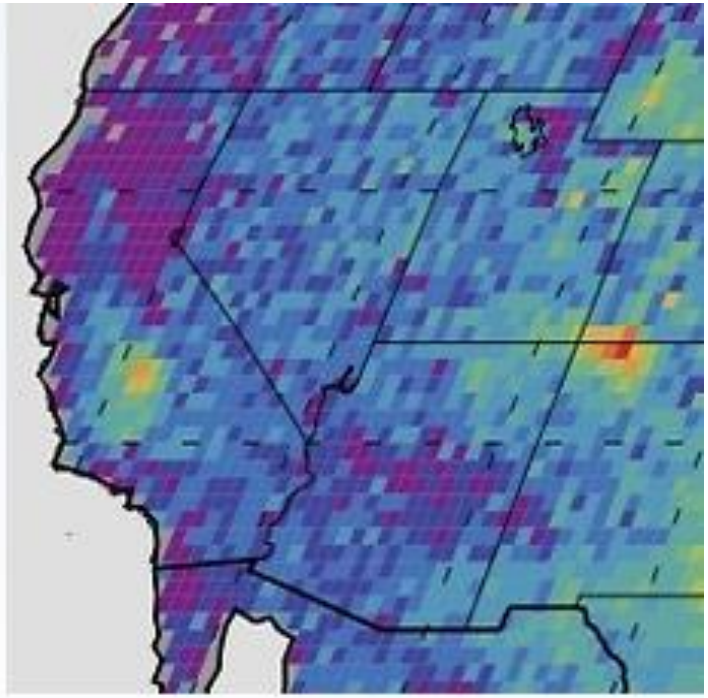
- Methane monitoring network since 2010
- Ambient measurements have consistently suggested methane inventory to be underestimated by approximately 30%
- Work continues to improve the network and the utility of the modeling

GHG Monitoring Stations

State Monitoring and Research Efforts

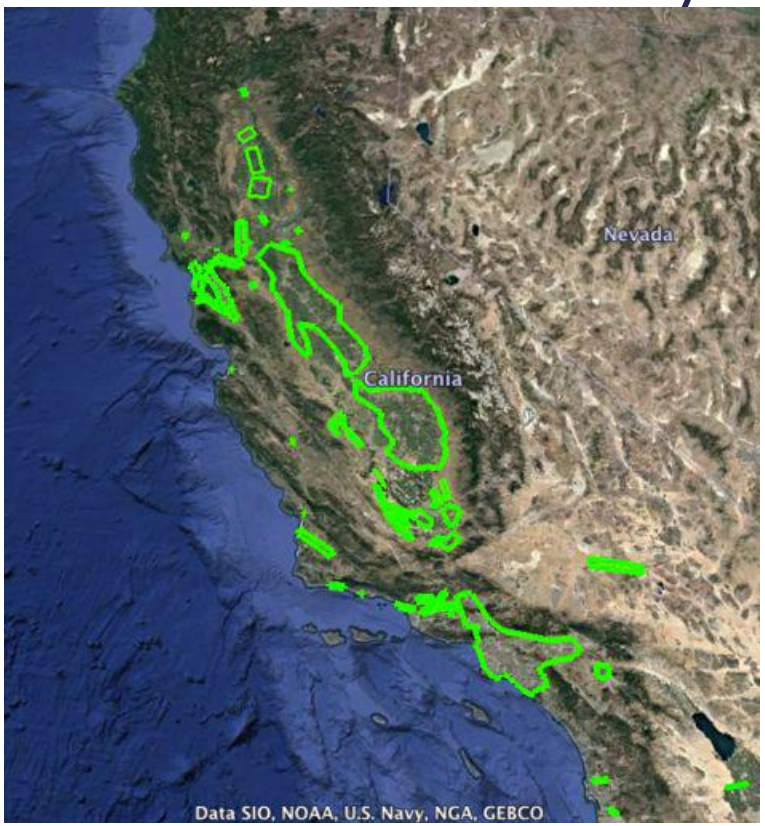
- AB 1496 – Methane Emissions
  - Methane Hot Spot Analysis
  - Life-cycle greenhouse gas emissions analysis of natural gas produced and imported into California
  - Review and assess the atmospheric reactivity of methane as a precursor to the formation of photochemical oxidant

Kort et al 2014
(2003-2009 SCIAMACHY data)



Methane hotspots in Southwest USA

NASA/CEC/ARB Statewide Methane Airborne Survey



Platforms

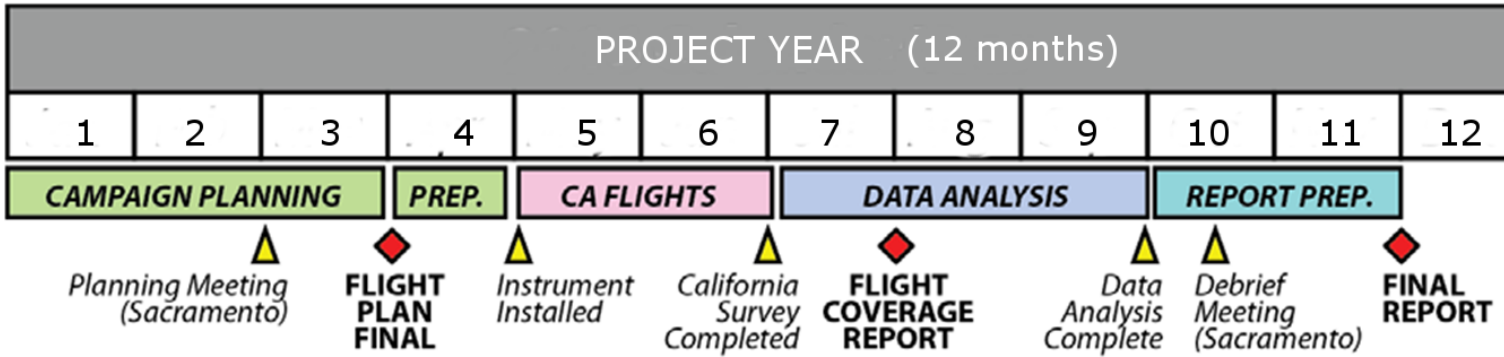
Hyperspectral Thermal Emission Spectrometer
1km alt, 1km swath

Airborne Visible Infrared Imaging Spectrometer
3km alt, 2km swath

Measurements

Remote-sensing: High sensitivity, high spatial resolution (1-2m) Thermal Infrared imaging of CH4, NH3, H2S, NO2, SO2; quantitative CH4 retrievals

Remote-sensing: High spatial resolution (1-3m) Near Infrared imaging of CH4; real-time onboard CH4 plume display



Specific Oil and Gas Efforts

- Well stimulation treatments (fracking)
  - DOGGR requires permits for well stimulation treatments
  - ARB staff reviewing permits and recommending air monitoring for a subset of operations to acquire emissions data across the range of operational conditions
- Oil and gas testing programs to be initiated this year
  - Produced water ponds
  - Community air monitoring
  - Customer meter testing

Specific Oil and Gas Efforts (cont.)

- Pipeline fugitive emissions testing completed
- Life-cycle modeling including out of state emissions
- Methane Symposium

U.S. EPA Actions on Oil and Gas

- June 2016, US EPA finalized methane rules for new sources and is working on guidelines and rules for existing sources
- ARB proposed oil and gas regulation covers new and existing sources and is generally more stringent and broader than US EPA's
- ARB working with US EPA and air districts to harmonize federal, State and local regulations as much as possible

More Information

- Short-Lived Climate Pollutant Reduction Strategy
  - www.arb.ca.gov/cc/shortlived/shortlived.htm
- ARB Crude Oil and Natural Gas Facilities Regulation
  - www.arb.ca.gov/cc/oil-gas/oil-gas.htm
- ARB's Statewide Greenhouse Gas Monitoring Network
  - www.arb.ca.gov/research/ghgnetwork.htm

Energy Sector Cross-Sector Impacts

California Air Resources Board

2030 Target Scoping Plan – Current Thinking

Transportation Sector

- Improve Increase Low Carbon Fuel Standard
  - Carbon Intensity Reduction: >10%
- Mobile Source Strategy
  - ZEV and PHEV
  - Advanced Clean Transit: new urban buses
  - Increased stringency of SB 375 Sustainable Communities Strategy – 2035 targets
  - Proposed Low-Emission Diesel Requirement
- Draft California Sustainable Freight Action Plan
- Demand Reduction/VMT Strategies

2030 Target Scoping Plan – Current Thinking

Natural and Working Lands

- Each year, increased acres of nonfederal forest lands included in restoration plans oriented towards forest health & carbon storage
- More infill and revitalization of urban core areas
- Land preservation policies
- Increase habitat acreage protected or restored

2030 Target Scoping Plan – Current Thinking

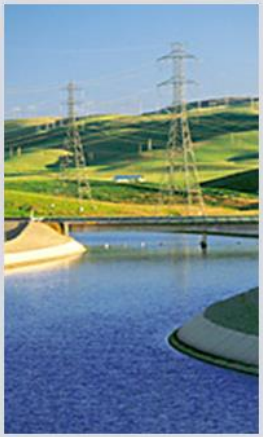
Agricultural Sector

- Short-Lived Climate Pollutant Reduction Strategy
  - Methane reductions from dairy manure management
  - Methane reductions from dairy cow enteric fermentation
- Healthy Soils Initiative
- Employ Management Practices
  - Reduce emissions and sequester carbon

2030 Target Scoping Plan – Current Thinking

Water Sector

- Multiple State efforts guided by California Water Action Plan
- Efficient use of water supplies
  - Greater water conservation, recycling & reuse
- Reduce carbon footprint of water systems & water uses (e.g., renewable energy)
- SLCP Strategy 40 percent methane reduction target
  - Develop regional opportunities to co-digest waste at existing and new digester facilities
  - ARB and other agencies to assess actions to require capturing and utilizing methane



2030 Target Scoping Plan – Current Thinking

Waste Management Sector

- AB 341 goal of diverting 75 percent of solid waste from landfills by 2020
- Mandatory Commercial Recycling
- SLCP Strategy
  - Develop regulation with CalRecycle by 2018
    - Virtually eliminate organics disposal in landfills by 2025
    - Includes food waste prevention and rescue programs

2030 Target Scoping Plan – Current Thinking

Green Buildings Sector

- Build upon ZNE and green building programs
- Expand voluntary efforts
- Advance green building rating systems
- Expand emphasis of existing buildings
- Augment existing incentive programs
- Continue research activities

Synergies with Energy Sector

- Demand reduction through energy efficiency
  - Green buildings (infrastructure/appliance standards, solar thermal heating, cool roofs, living roofs)
  - NWL (urban forestry to reduce UHI)
  - Water (improve pump/turbine efficiencies, conservation targets)
  - Agriculture (invest in irrigation systems that reduce GHGs and save water)
- Substitution of fossil resources with renewables
  - Water (small hydropower, WWTP biogas, solar thermal heating, increase purchases of renewable electricity resources, on-site renewable energy at DWR facilities)
  - Waste (landfill biogas, organic waste-derived biogas)
  - NWL/Agriculture (biomass feedstocks for electricity generation and heating fuels)
  - Green buildings (clean on-site DG)

Impacts and Trade-Offs

- Increased grid demand from fuel switching (transportation and stationary combustion)
- Acreage for utility scale renewables for higher RPS vs. Natural & Working Lands conservation targets and Transportation land use infill development and smart growth objectives
- Biomass feedstock trade-offs
  - Electricity generation, natural gas substitution
  - Transportation alternative fuels
  - Compost for soil amendments (vs. synthetic fertilizer production) and water conservation
- Water supplies that require higher energy loads

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Environmental Justice Advisory Committee (EJAC)

Public Discussion

Email questions and comments to:
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