



California's F-Gas Mitigation Program

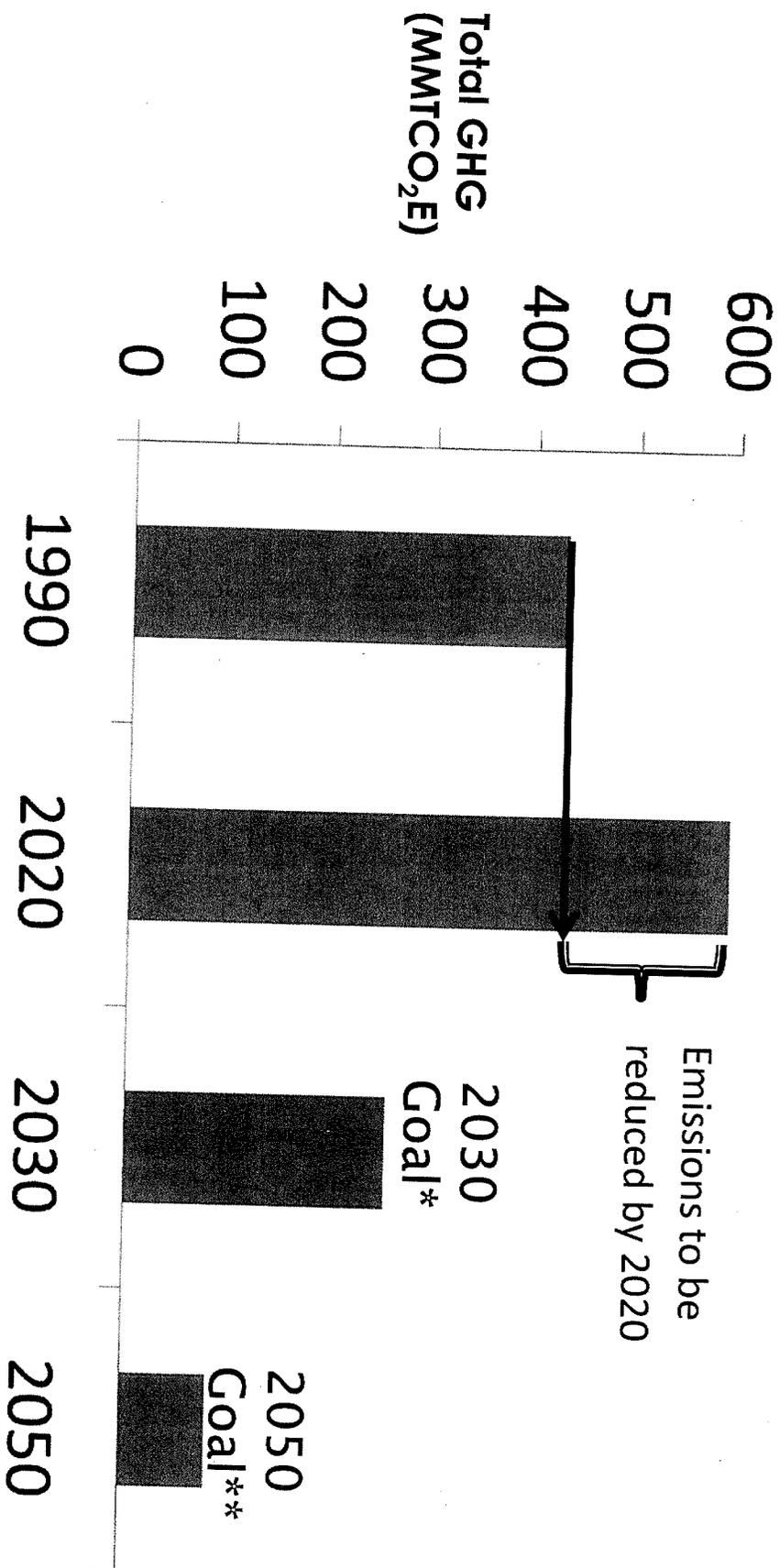
ARAP - ARB Meeting
July 30, 2015

California Environmental Protection Agency



Air Resources Board

GHG Emission Reduction Goals



* Executive Order B-30-15 and pending legislation

** Executive Order S-3-05

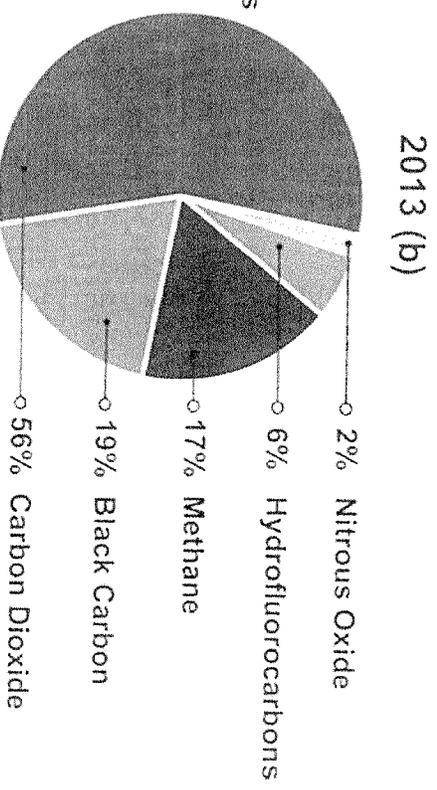
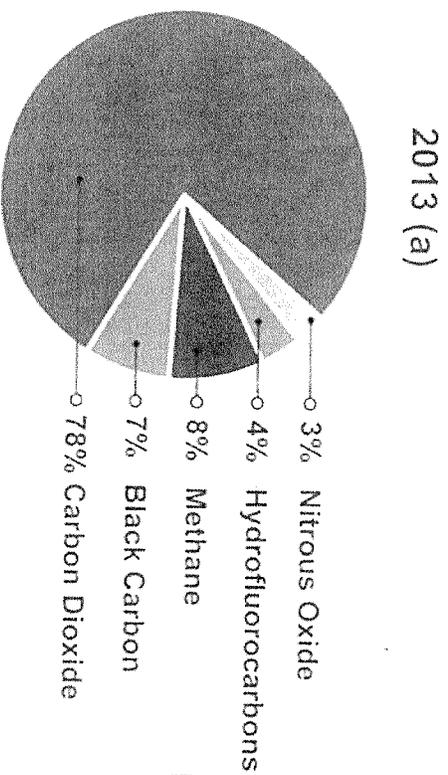
Existing Regulations and Policies

- ▶ Cap and trade program for all large sources (cap drops 2–3% per year)
 - Offset protocols for ODS, forestry, urban forestry, dairy digesters, mine methane
- ▶ Transportation
 - 54.5 mpg fleet average by 2025
 - 1.5 million zero emission vehicles by 2025
 - 10% lower carbon intensity for fuels by 2020
 - ~7.6% per capita VMT reduction by 2020, ~12% by 2035 (SB 375)
- ▶ Electricity generation and energy efficiency
 - 33% renewable by 2020, energy efficiency audits
 - No imported coal power after 2025 (SB 1368)
 - 12,000 MW renewable self-generation by 2025
 - Appliance standards
 - \$2.5B for school retrofits (Prop 39), retrofit existing buildings (AB 758)
 - Zero energy new residential buildings by 2020, commercial by 2030
- ▶ Short-lived climate pollutants
 - Six regulations covering all F-gases (CFC, HCFC, HFC, SF₆, PFC, NF₃)
 - Methane controls on landfills, oil and gas production (pending)
 - Diesel retrofit/repower requirements, local fireplace controls
- ▶ Water and waste
 - 20% per capita water consumption reduction by 2020
 - 75% waste diversion by 2020 (AB 341)

Senate Bill 605

Develop SLCP reduction strategy by Jan 1, 2016

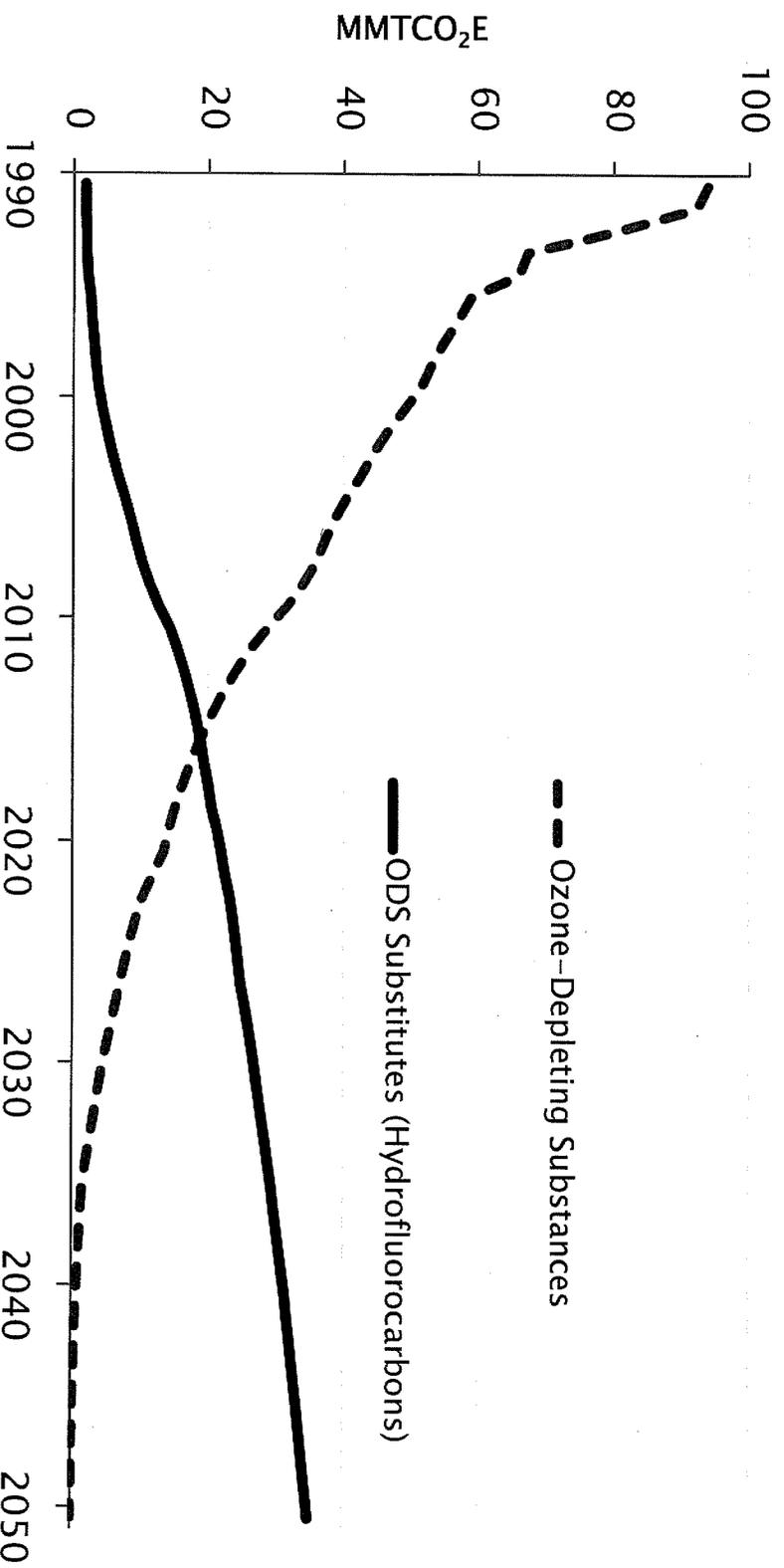
- Concept paper released May 7, 2015
- Draft plan in Aug 2015
- Board consideration in Nov 2015
- Final in Spring 2016



(a) 100-year and (b) 20-Year Global Warming Potential Values

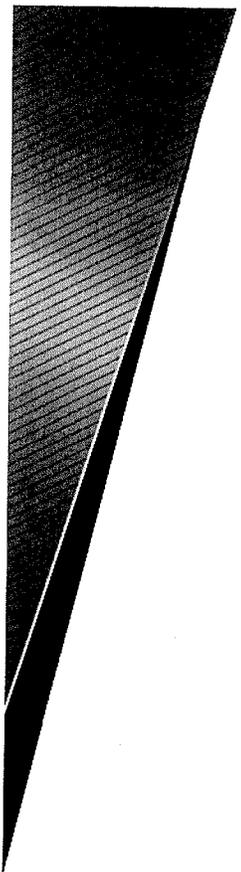
F-gas emissions are growing

Total Fluorinated (F-gas) Emissions Trends and BAU Projections in California 1990 to 2050 (MMTCO₂E)



SLCP Targets

- ▶ Reduce black carbon emissions 50% below 2012 levels from transportation sources by 2020, and from all sources by 2030
- ▶ Reduce methane emissions 20% by 2020, and 40% by 2030 below forecasted emission levels
- ▶ Reduce F-gas emissions 25% by 2020, and 50% by 2030 below forecasted emission levels



Mitigation Options

Measure name	Proposed Start Date
Financial Incentive for Low-GWP Refrigeration Early Adoption	2017
HFC Supply Phasedown in CA (aligns w/ North American Proposal to Mont. Protocol)	2018
Upstream High-GWP Fee	2019
Advanced Recycling Fee on F-gases in pre-charged equipment	2019
Sales Ban of Very-High GWP Refrigerant (GWP \geq 2500)	2020

Mitigation Options (cont.)

Measure name	Proposed Start Date
Restrictions on New Stationary Refrigeration Equipment w/ GWP \geq 150	2021
Restrictions on New Insulating Spray Foam w/ GWP \geq 150	2021
Restrictions on New Heavy-Duty Mobile Vehicle Air-conditioning (MVAC) w/ GWP \geq 150	2021
Restrictions on New Stationary AC equipment w/ GWP \geq 750	2022
Restrictions on New TRUs and Refrigerated Shipping Containers w/ GWP \geq 1000	2025

Policy Design Considerations

- ▶ Meet the California GHG reduction targets
- ▶ Move enforcement upstream
- ▶ Ensure timely transition of HCFC-22 systems to lowest possible GWP alternative
- ▶ Incentivize improved energy efficiency and prevent lower energy efficiency
- ▶ Cost-effective and provide flexibility to industry to minimize costs.

Policy mix needed to meet Targets

- ▶ 25% by 2020:
 - Incentives for low-GWP + Sales Ban on high-GWP refrigerants (>2500) + beginning stages of HFC phasedown
- ▶ 50% by 2030:
 - HFC phasedown + high-GWP ban on new commercial refrigeration
- ▶ 80% by 2050:
 - HFC phasedown or high-GWP bans in all sectors

Timeline

Task	Date
Release Concept Paper	May 7, 2015
Public Workshop for Concept Paper	May 27, 2015
Release Draft Plan	Aug 31, 2015
Public Workshops (Sacramento, Bay Area, Southern CA, San Joaquin Valley)	Sept, 2015
Proposed Strategy to Board	Nov, 2015
Release Final Plan	Spring, 2016
Developing Potential Measures or Regulations is a separate process after Final Plan Approval	To be determined

Montreal Protocol HFC Phasedown Proposals

- 5 proposals: North American (slowest), EU, African States, Pacific States (most aggressive)
- Example: North American vs. Pacific States

90% cap in 2018	vs.	85% in 2017
65% cap in 2024	vs.	65% in 2021; 45% in 2025
30% cap in 2030	vs.	25% in 2029
15% cap in 2036	vs.	10% in 2033

Other F-Gas Regs in Development

- ▶ Canada: F-gas regs in 2015-2016, HFC phasedown likely to be proposed
- ▶ Japan: F-gas reg in development since last year, HFC phasedown is possible
- ▶ U.S: Additional U.S. EPA SNAP proposal for specific end-use sectors and allowable HFCs (timing is not known)
- ▶ EU: HFC phasedown and sector specific GWP limits in place

Latest on the SLCP Strategic Plan:
<http://www.arb.ca.gov/cc/shortlived/shortlived.htm>

Contact Information

Glenn Gallagher (Staff Lead)
Glenn.gallagher@arb.ca.gov
916-327-8041

Pamela Gupta (Manager)
Pamela.gupta@arb.ca.gov
916-327-0604