



Board of Directors Retreat/Special Meeting

January 17, 2018

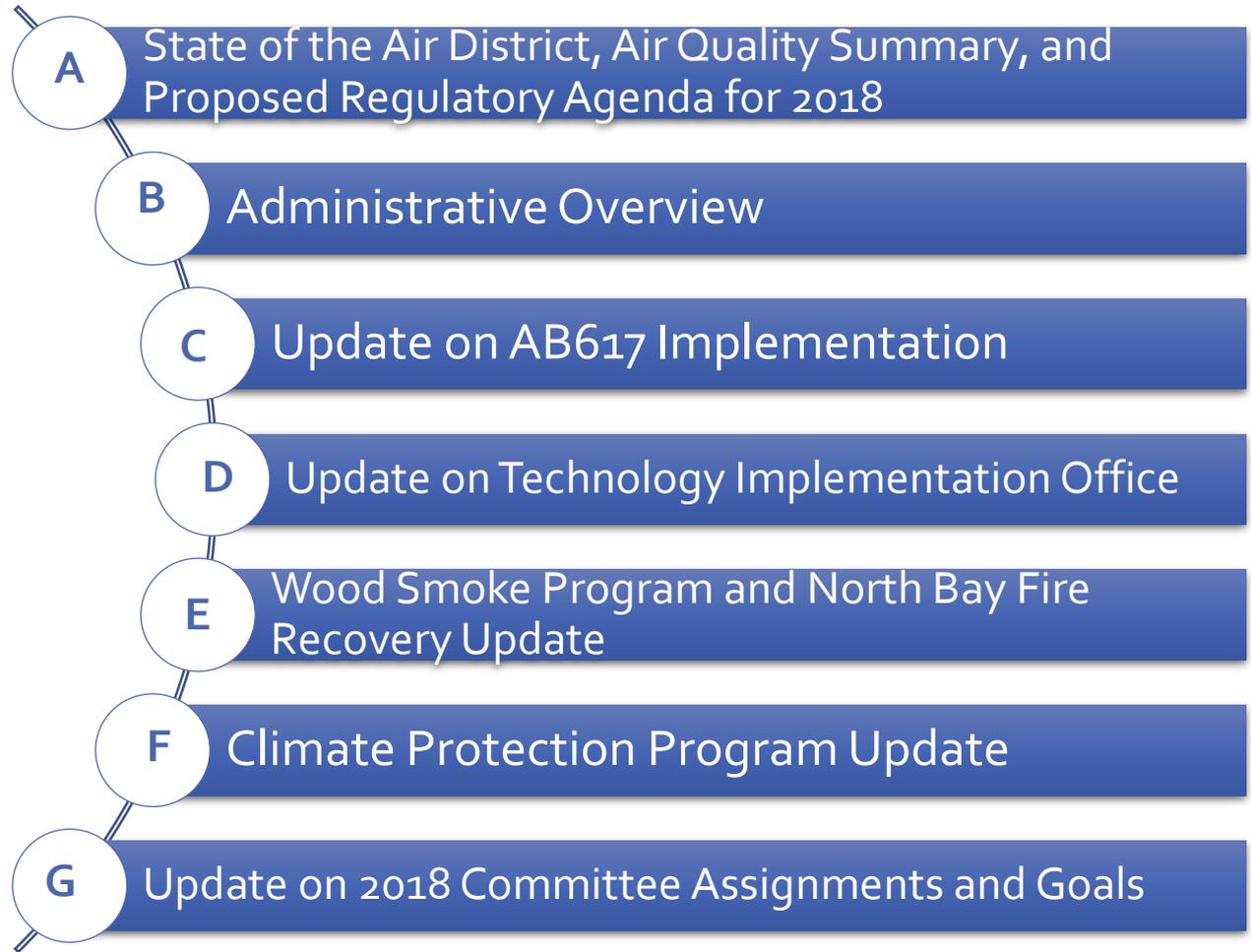
Jack P. Broadbent



BAY AREA AIR QUALITY
MANAGEMENT DISTRICT



Overview



Opening Comments by Board Chair

Chairperson Dave Hudson

Board of Directors



State of the Air District, Update on Air Quality, and Key Rulemaking Efforts

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Agenda: 8A



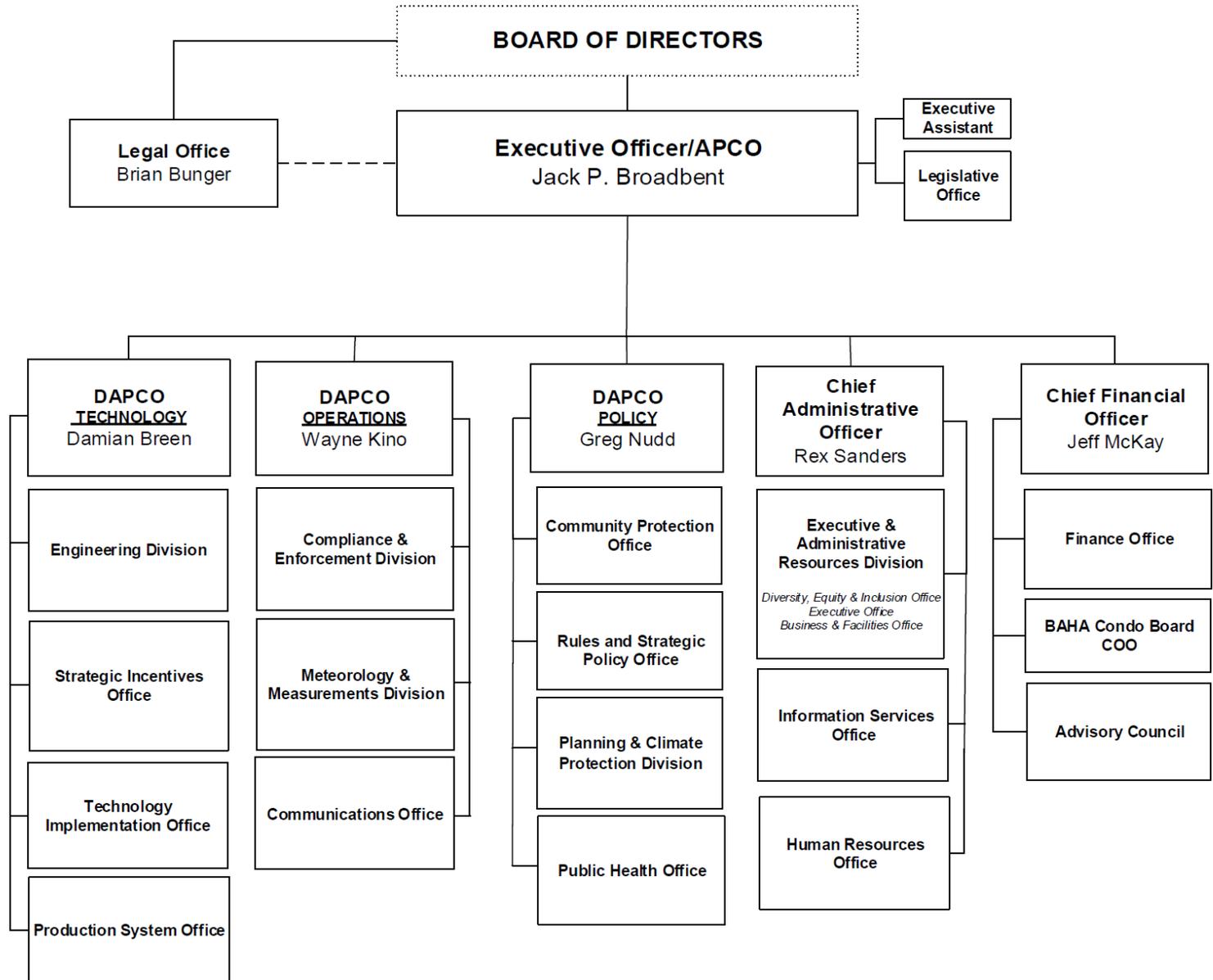
State of the Air District



- Much Accomplished
- Continued leadership critical
- Significant challenges remain
- Financially secure, need to remain mindful of resources
- Implementation efforts crucial
- Key Policy Initiatives



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

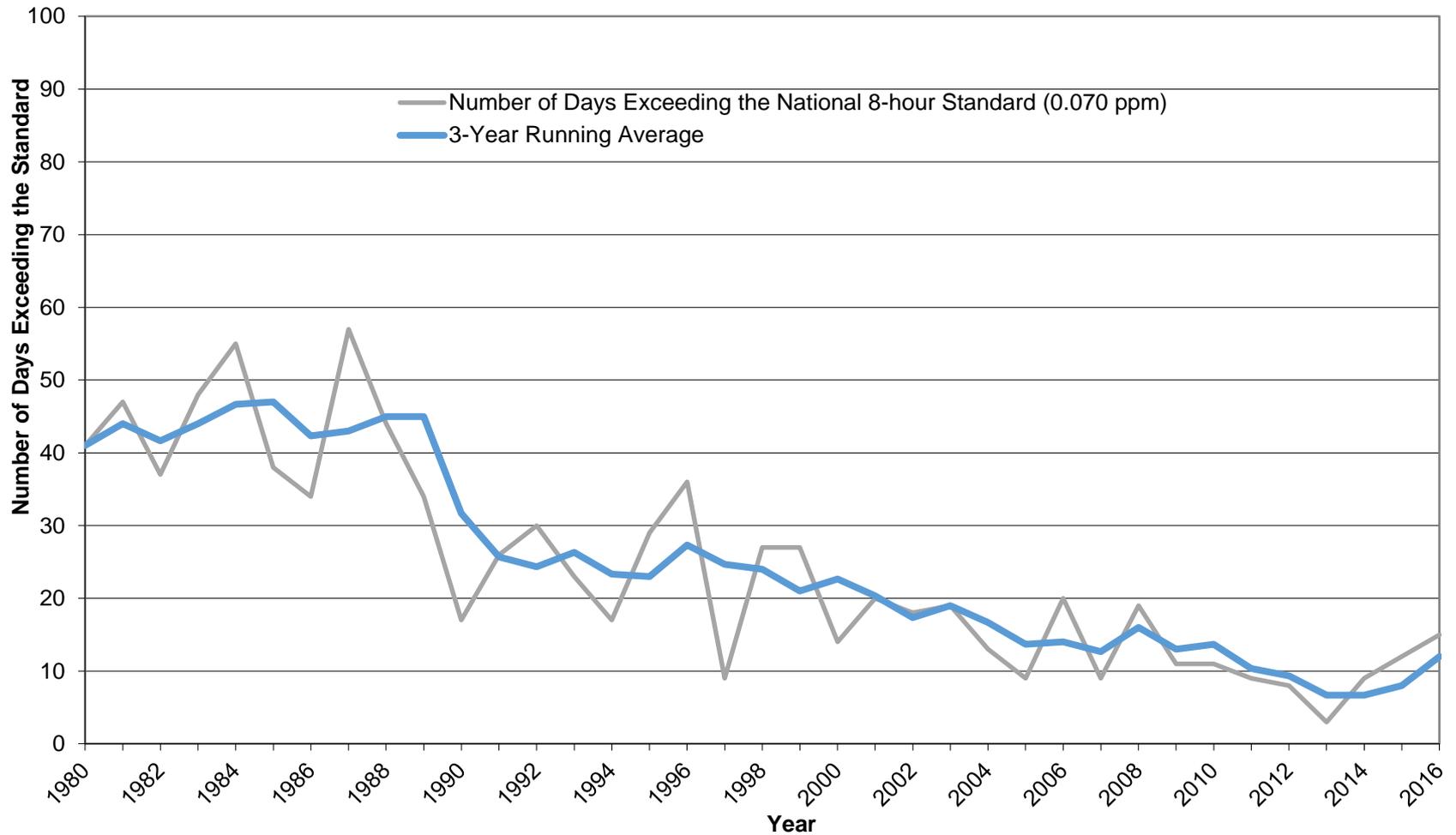


Update on Air Quality



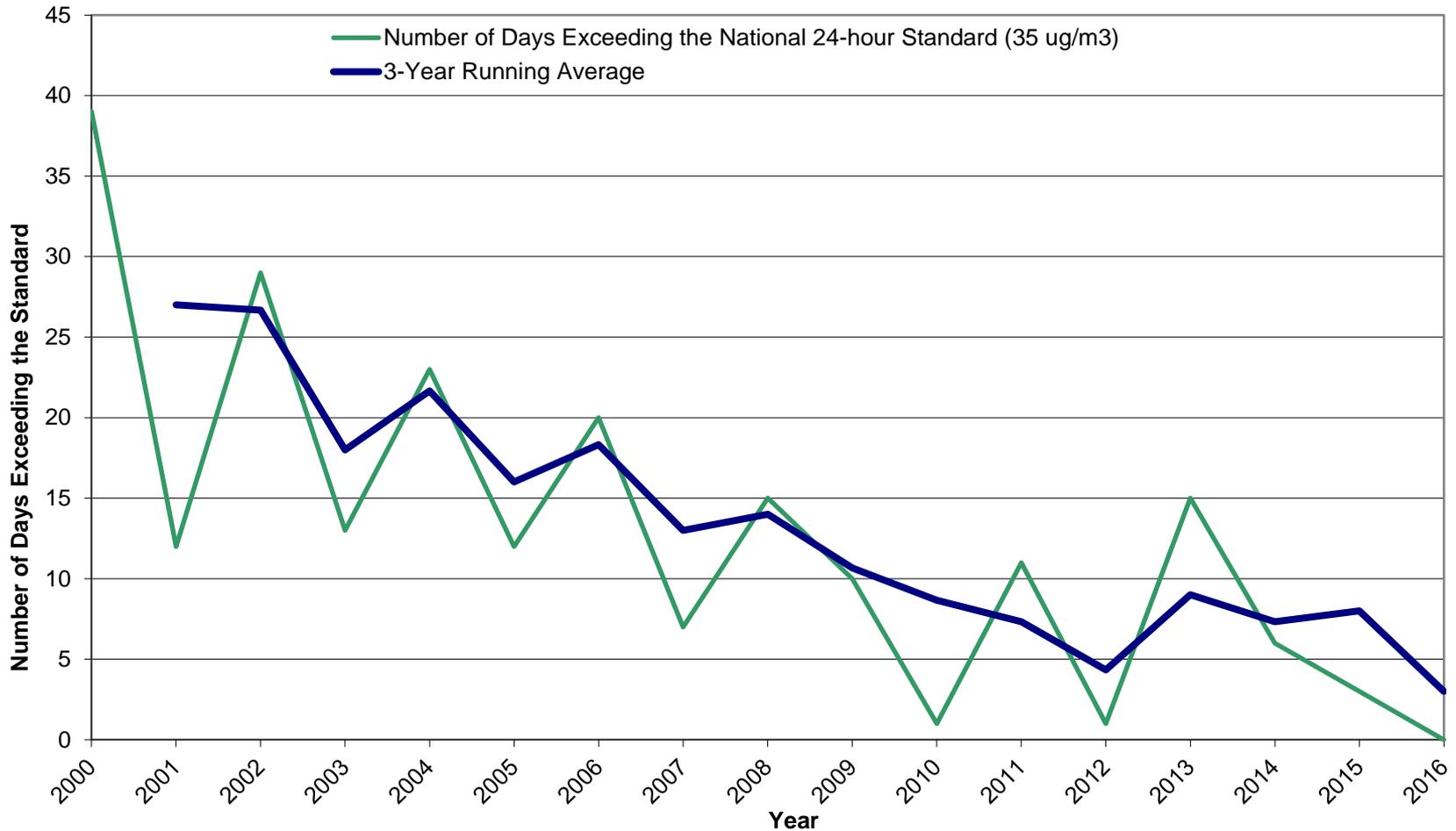
- Traditional Regional Pollutants
 - Ozone (O₃)
 - Fine Particulate Matter (PM_{2.5})
 - Toxic Air Contaminants (TACs)
- Climate Pollutants (e.g. GHGs)
- Focus on local exposure
- Monitoring technology evolving quickly
- Public support and interest growing

OZONE EXCEEDANCE TRENDS 1980 to Present



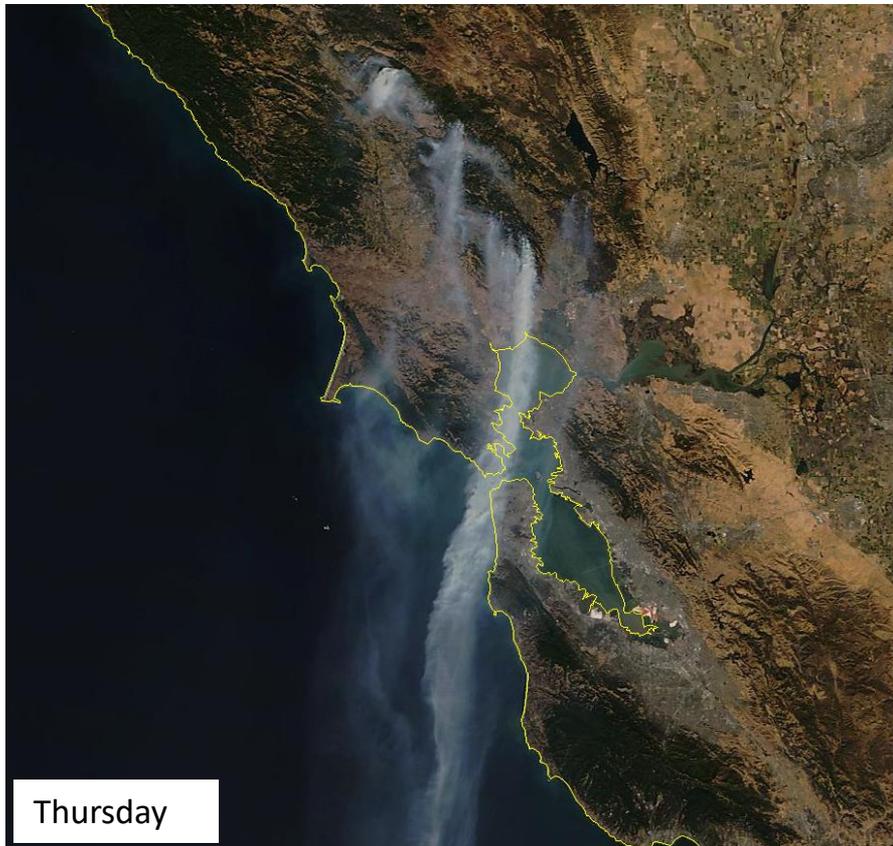
PM_{2.5} EXCEEDANCE TRENDS 2000 to Present

Bay Area PM_{2.5} Trend (March to February)

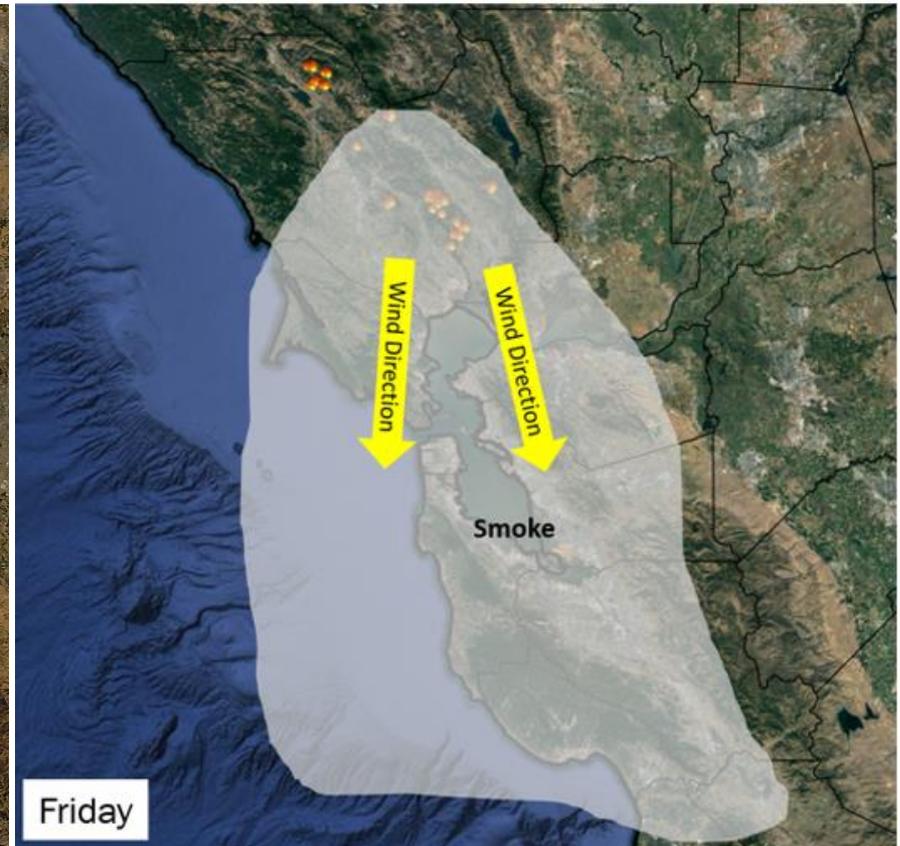


Sonoma/Napa wildfire smoke impacts

Thursday, October 12



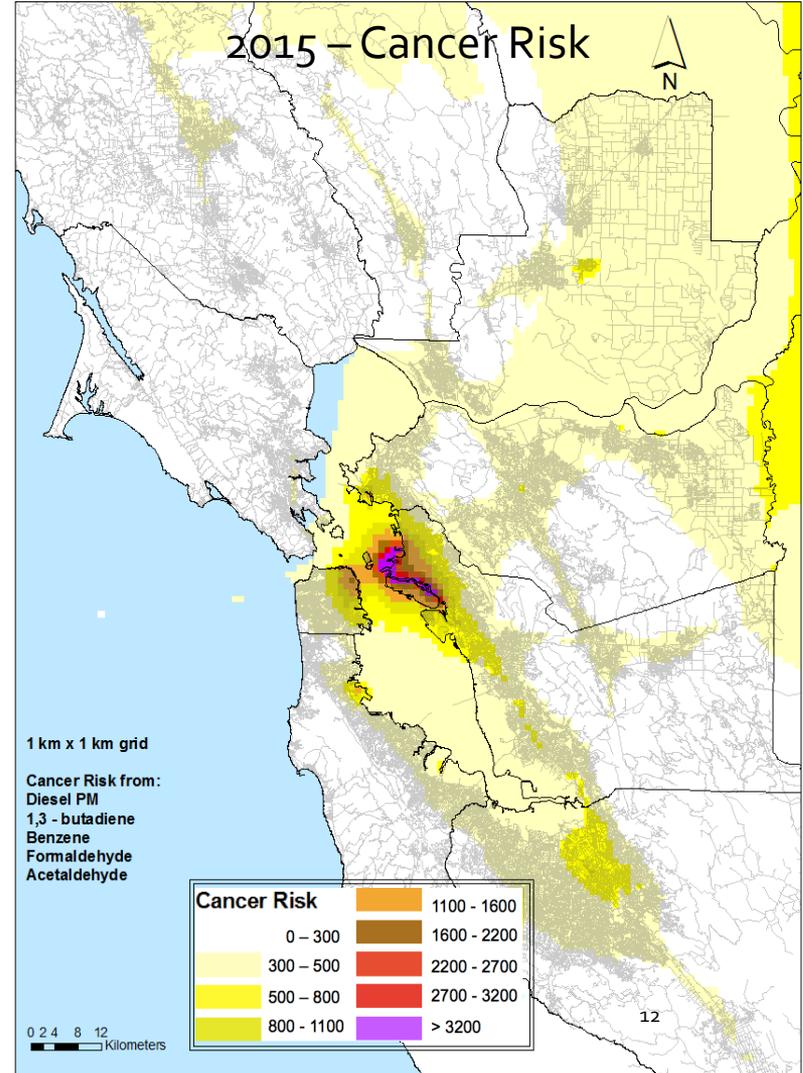
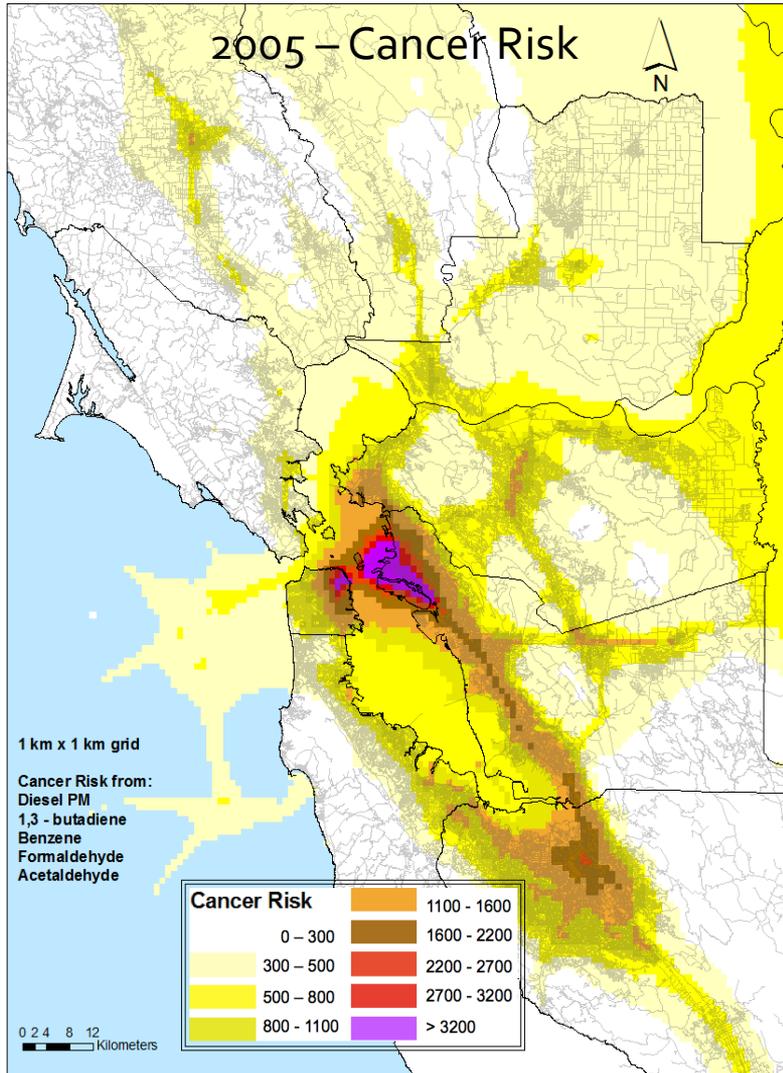
Plume Friday, October 13



Sonoma/Napa wildfire smoke impacts



Community Air Risk Evaluation Program



Key Rulemaking Efforts



- AB 617 Implementation
- Refinery Focused Rules
- Groundbreaking methane rules

Questions & Discussion

Jack P. Broadbent

Agenda: 8A



Air District Administrative Overview

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Jeff McKay

Deputy Air Pollution Control Officer

Rex Sanders

Chief Administrative Officer





Facility Update

- 375 Beale Street Additional Purchase
- Air District East Bay Facility



Staffing Update

- Recruiting Update
- Labor Organization Update

Fiscal Update

FYE 2018 Budget & 2019 Challenges

- 381 positions (up from 359 in prior year)
- Reserves Healthy
- Demands on Reserves
- CalPERS Challenges
- OPEB Challenges
- Diversification of Investments



Advisory Council

- Two Year Terms Completed
- Two Members Declined Continuation
- Recruitment in Process
 - ❑ Personnel Committee
 - ❑ Stakeholder Input
- Joint Meeting: Executive Committee and Advisory Council
(March 18)

Update on AB617 Implementation

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Greg Nudd

Deputy Air Pollution Control Officer





AB617

Protecting Community Health

**Board Retreat
January 17, 2018**

**Greg Nudd
Deputy Air Pollution Control Officer**



**BAY AREA
AIRQUALITY
MANAGEMENT
DISTRICT**

AB 617 background

- Originated in negotiations regarding the extension of Cap & Trade program (AB 398)
- Responds to advocates' concerns with continued high levels of air pollution in local communities
- Directly addresses toxics and criteria pollutants in the most impacted communities

AB 617
program
components

- Community selection
- Monitoring
- Emission reduction action plans
- Emissions inventory
- Incentives
- BARCT Update/Clearinghouse

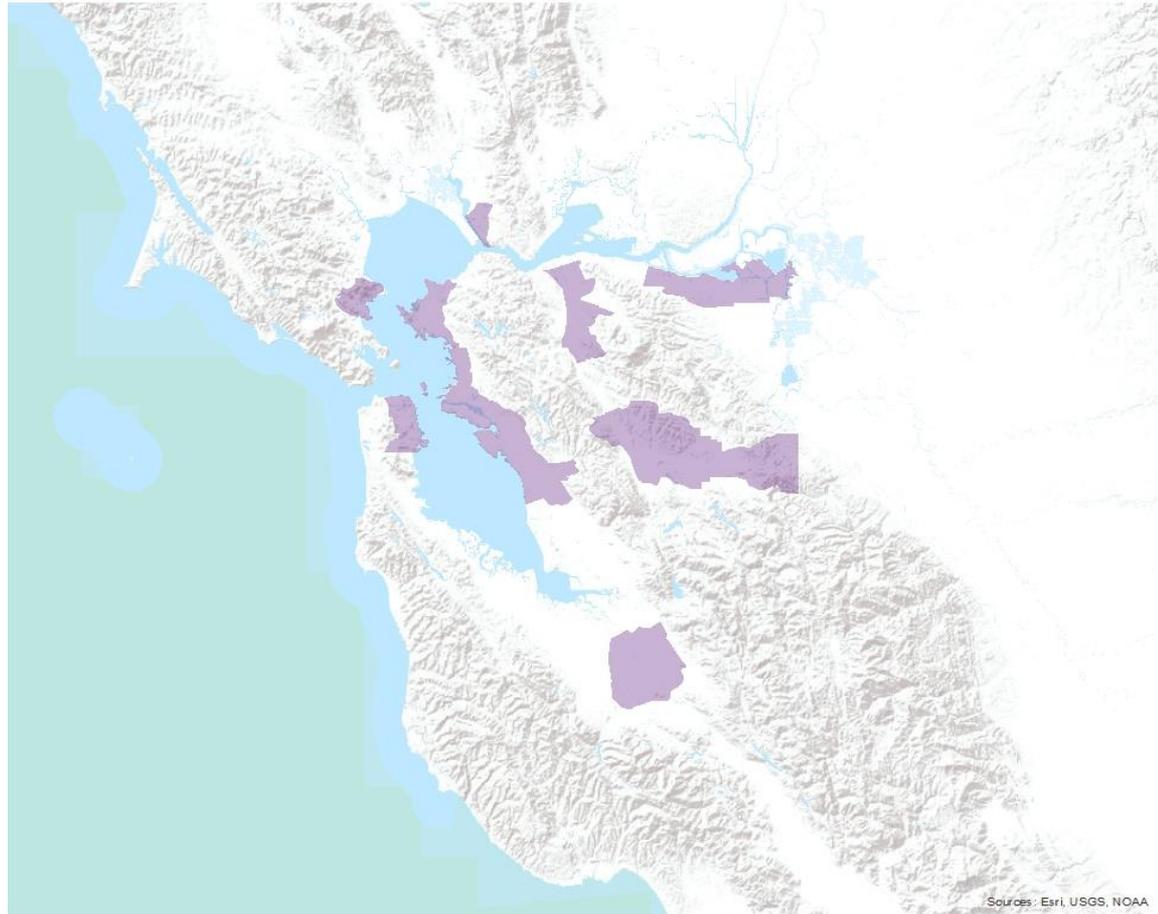
Community Selection

State requires districts to work with communities to select all areas in the region that have a “high cumulative exposure burden” and therefore require community monitoring and/or actions plans.



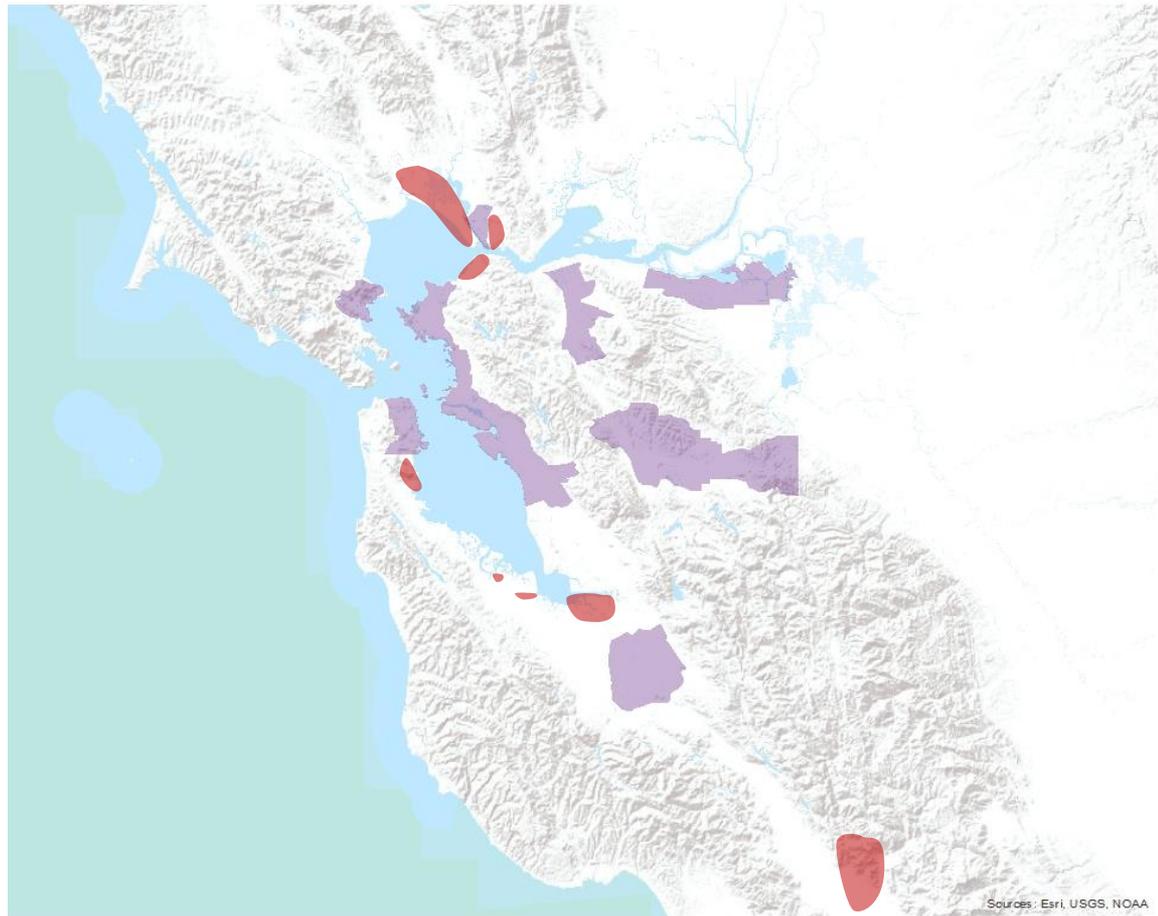
Community Selection – Criteria Under Consideration

- CARE



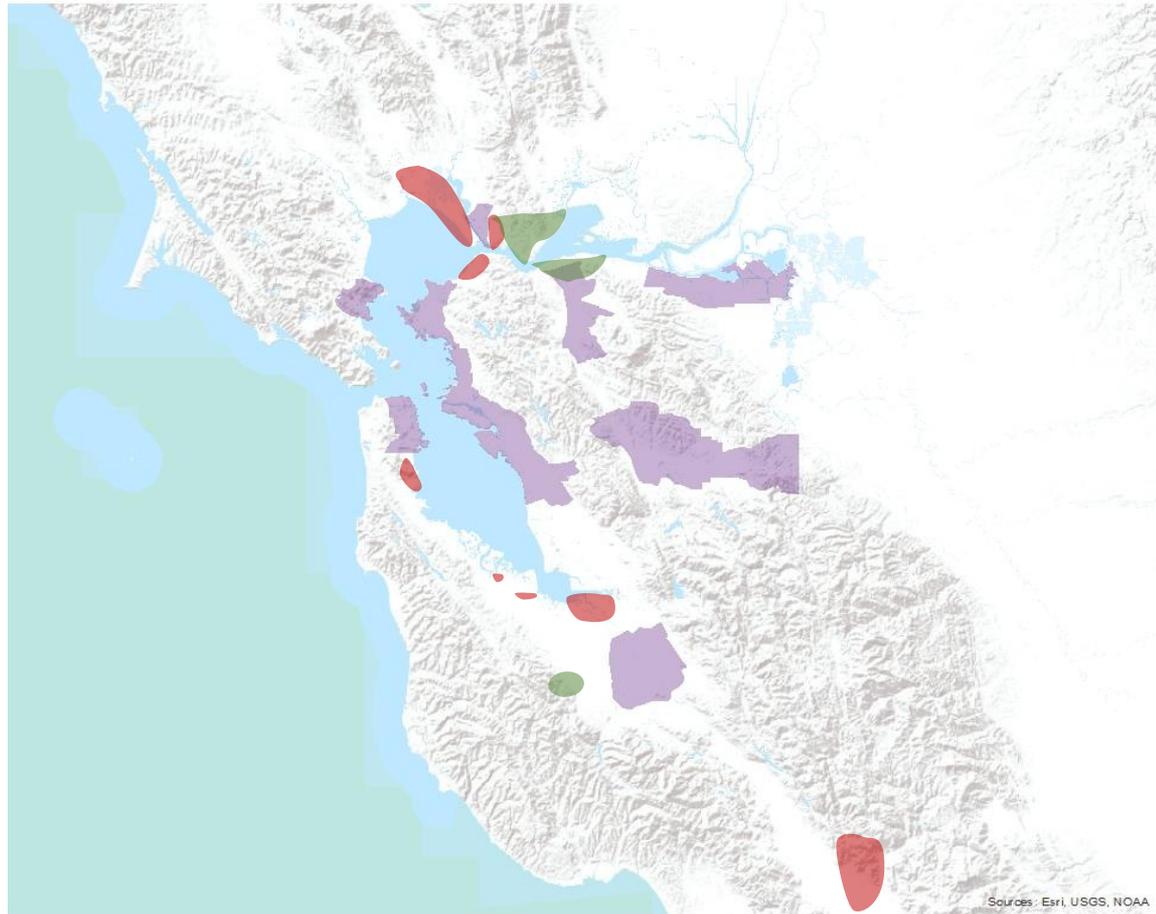
Community Selection – Criteria Under Consideration

- CARE
- Additional health impacted areas



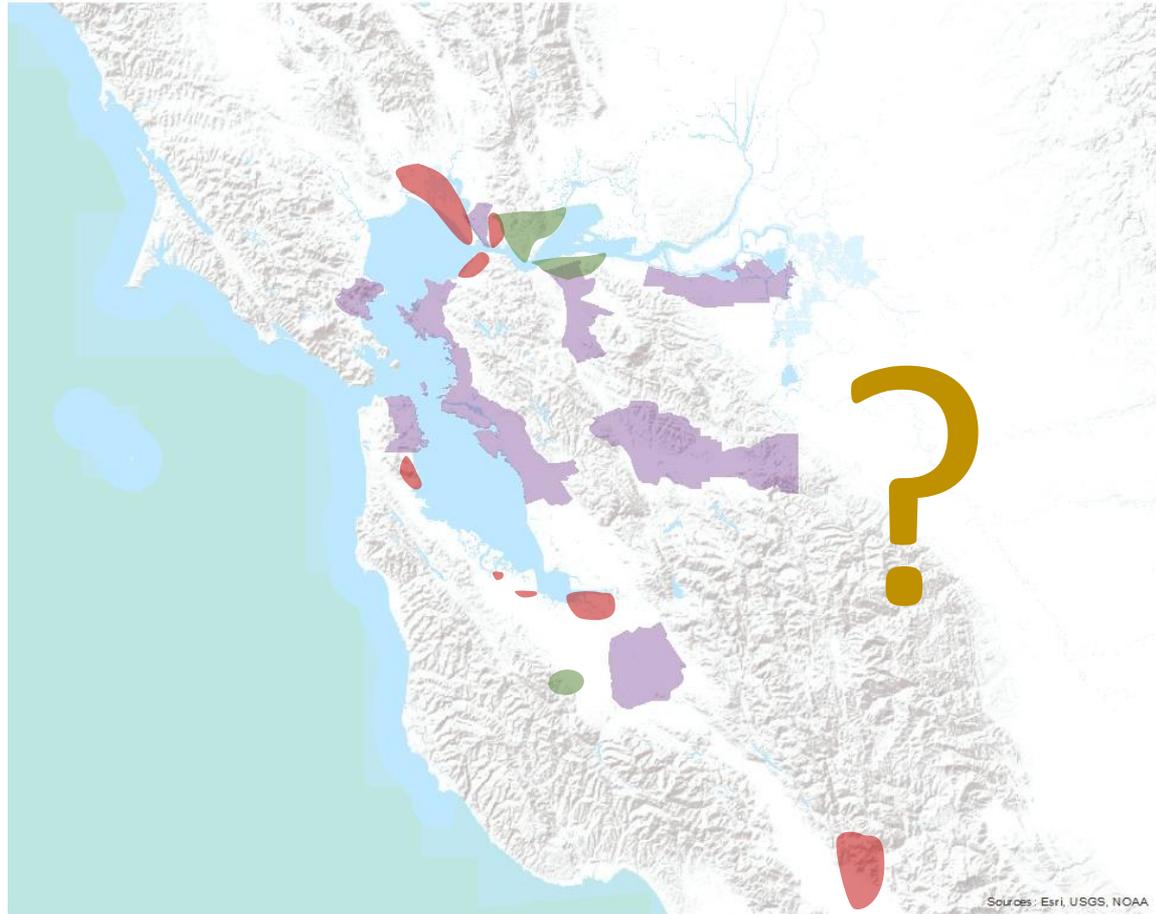
Community Selection – Criteria Under Consideration

- CARE
- Additional health impacted areas
- Other areas with large facilities



Community Selection – Criteria Under Consideration

- CARE
- Additional health impacted areas
- Other areas with large facilities
- Self-nominated



Examples of Potential Communities

West Oakland

✓ CARE
✓ Add'l Health
Large Facility

- High PM_{2.5} concentrations
 - Very high mobile source emissions
 - Port of Oakland largest single source of DPM
 - Roadways contribute significantly to PM_{2.5}
 - Low stationary source emissions
- High health burden
 - High socio-economic vulnerability
 - Concerns about new development at Port of Oakland and Oakland Army Base



Richmond

- ✓ CARE
- ✓ Add'l Health
- ✓ Large Facility

- Moderate PM_{2.5} concentrations
- Very high stationary sources emissions
 - Chevron refinery, chemical plant, landfills, water treatment facility
- High mobile source emissions
- High health burden
- High socio-economic vulnerability

Eastern SF

- ✓ CARE
- ✓ Add'l Health Large Facility

- Moderate PM_{2.5} concentrations
- High mobile source emissions
- Low stationary source emissions

- High health burden; especially in Bay View and Market / Van Ness
- Very high socio-economic vulnerability; especially in Bay View, Chinatown, Tenderloin

livermore

✓CARE
Add'l Health
Large Facility

- High O₃ concentrations; moderate PM_{2.5} concentrations
- Moderate mobile source emissions

- Low health burden
- Low socio-economic vulnerability

Vallejo

- ✓ CARE
- ✓ Add'l Health Large Facility

- High PM_{2.5} concentrations
- Low mobile and stationary source emissions
 - Mobile source emissions higher than stationary
- Very high health burden
- High socio-economic vulnerability

Community Plans

- Local air quality conditions and impacts
- Emission reduction targets
- Sources
 - stationary
 - mobile (including indirect/magnet)
- Emissions inventory by source
- Specific emission reduction strategies
- Implementation schedule
- Enforcement plan
- Method for tracking progress



Air Pollution Monitoring

Levels of air pollution in a community are affected by

- Natural background
- Emissions from a combination of sources
- Transport from other areas in our air basin and outside our air basin
- Meteorology
- Chemical reactions
- Topography

Air pollution levels are a complex mixture that changes widely in time and location

Air pollution monitoring needs to be designed around a specific question to increase the likelihood of success



Air Pollution Monitoring

- Monitoring approach is linked to specific objective
- Current monitoring is to characterize regional population exposure, including the effect of common nearby sources (e.g. gas stations, freeways)
- Communities that have a unique source or combination of sources that could lead to elevated air pollution above the normal urban levels, need more monitoring
- Identifying persistent and intermittent hot spots and teasing apart contributing sources quantitatively robustly requires a combination of monitoring methods



Community Monitoring Methods

Screening to identify issues

- Conducted by district and communities
- Mobile monitoring
- Dense network of low-cost sensors
- Satellite and other remote observations
- Observations other than pollution concentrations
- May help track progress

Special studies to quantify contribution of sources

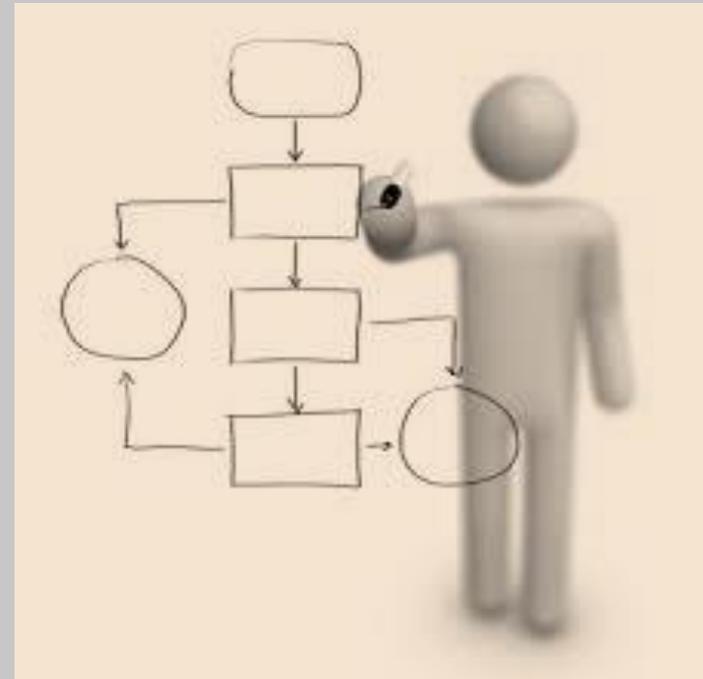
- Advanced techniques to isolate and quantify source contribution
- need speciation of PM or toxics to differentiate sources
- combination of ambient and source monitoring

Fixed sites using well-documented methods are still needed to anchor screening, track regional air quality and meet state and federal requirements



Community Monitoring

- Needed for input in community action plans and to track their effectiveness
- Must be done in addition to existing regional monitoring efforts (more resources)
- Other new challenges and opportunities
 - Each community needs a unique plan design based on community-identified concerns.
 - Data must be available and meaningful to the public
 - More data = more problems with data collection, communications, and management
 - Requires ongoing planning and evaluation to ensure effectiveness
- Expect CARB's statewide monitoring plan in October 2018



Emissions Inventory

- Annual stationary source emissions reporting for facilities:
 - already subject to mandatory GHG reporting
 - emits 250 tons/year or more of any nonattainment pollutant/precursor
 - has an “elevated prioritization score” based on cancer or noncancer impacts
- Uniform statewide annual reporting for criteria and toxic emissions
- Direct reporting to state of stationary sources emissions
- Third party verifier



Incentives

\$50 Million:

- Reduce diesel from mobile sources
- Prioritize impacted communities
- Dirty fleet replacement
- Voluntary participation
- Under contract by June 30, 2019
- Funds spent by June 30, 2021



Best Available Retrofit Control Technology

- Non-attainment pollutants
- Determine Best Available Retrofit Control Technology
- Coordinate with state and other districts
- Adopt BARCT implementation schedule by Dec. 2018
 - include Cap & Trade sources
 - consider:
 - benefits to local community
 - cost effectiveness
 - air quality attainment benefits
 - Implementation deadline is Dec. 31, 2023



Best Available Retrofit Control Technology

- Carbon Calciner
 - NO_x : low NO_x burners
- Cement Manufacturing
 - PM: baghouses
 - SO_2 : hydrated lime injection
- Fiberglass Manufacturing
 - PM: wet gas scrubber & baghouse
- Storage Tanks
 - ROG: domes on high volatility sources
 - ROG: flares or thermal oxidizers
- Landfills
 - PM: best practices
 - ROG: flares, improved capture efficiency



Best Available Retrofit Control Technology

- Marine Terminals
 - ROG: flares or thermal oxidizers
- Refinery FCCU/CO Boilers
 - PM: ammonia injection optimization or wet gas scrubber
 - SO₂: wet gas scrubber or optimized DeSO_x additive
- Refinery Fuel Gas Combustion
 - PM: good combustion practice
 - SO₂: caustic treatment or hydrotreatment
- Sulfuric Acid Plants
 - SO₂: cesium-promoted catalyst



AB 617 Statutory & Program Deadlines

DATE	MILESTONE
March 9, 2018	Deadline for communities to self-nominate
April 18, 2018	Initial list of all possible impacted communities submitted to ARB
July 31, 2018	Final submittal of list of communities for monitoring and plans to ARB – ranked for year 1; years 2 through 6
October 1, 2018	ARB selects Year 1 communities for monitoring and/or planning
June 30, 2019	Initial round of grant funds contracted out
July 1, 2019	Air District deploys community monitors
October 1, 2019	Air District adopts community action plan(s)
December 31, 2023	BARCT must be implemented

Early Actions

- Risk Reduction Action Plans in West Oakland and San Francisco - *leveraging their experience for future plans*
- Community monitoring in Richmond – *characterize exposure and determine pollutant sources*



Jan 31 2018
Regional Public Workshop



Feb 2018
Outreach Plan



Feb 2018
Begin Community Meetings
Air District Board Meeting



April 18 2018
Final Selection of ALL
Possible Communities



Update on Technology Implementation Office

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Damian Breen

Deputy Air Pollution Control Officer



TIO Team

Steering Committee

Dave Hudson

Air District Board of Directors, Councilmember City of San Ramon

Cindy Chavez

Air District Board of Directors, Santa Clara County Supervisor

Bud Beebe

California Hydrogen Business Council, Sacramento Municipal Utility District (retired)

Mark Gupta

Prelude Ventures

Ahmad Ganji

San Francisco State Industrial Assessment Center

Janea Scott

California Energy Commission

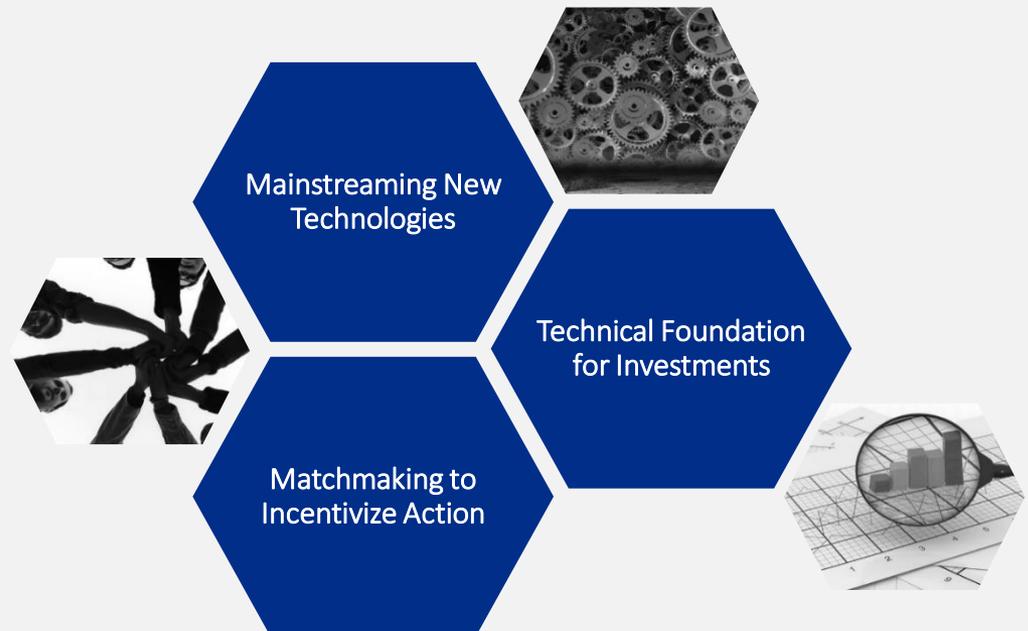
Technology Implementation Office

Mission Statement

Catalyze innovation to combat climate change by incentivizing disruptive, low-cost technologies that reduce greenhouse gas emissions for mobile and stationary sources

3 priorities

identified through stakeholder engagement w/ researchers, technologists, incubators, utilities, facilities, partner agencies, financing authorities

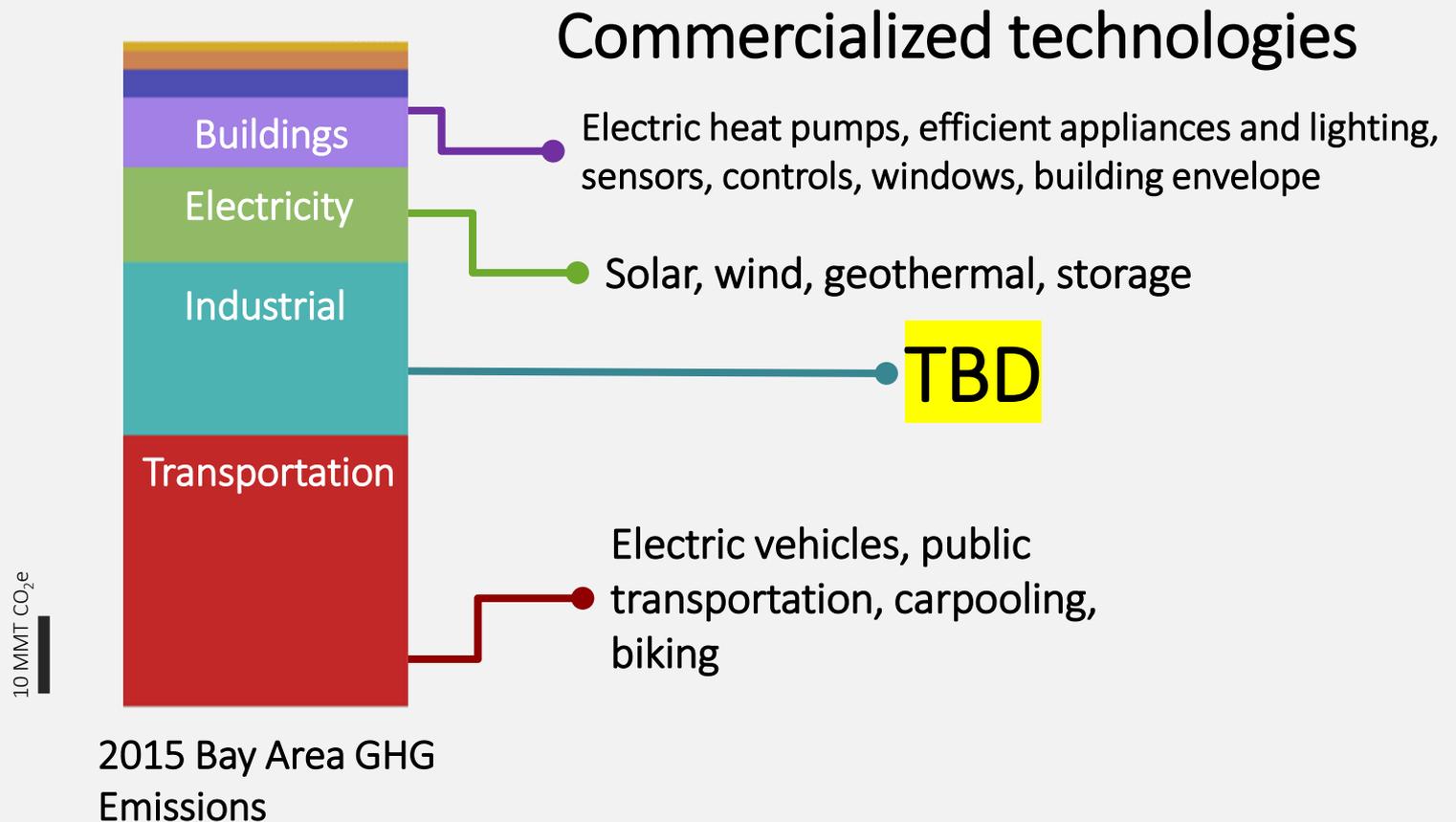


Mainstreaming New Technologies



Get technologies to the point where they are adopted because it makes good business sense, even in regions without strong climate motivation or policies

Currently commercialized technologies not enough to address all GHG emissions



We also need to mainstream technologies beyond the Bay Area

Bay Area GHG emissions are

1.3%
of US emissions



0.2%
of global
emissions

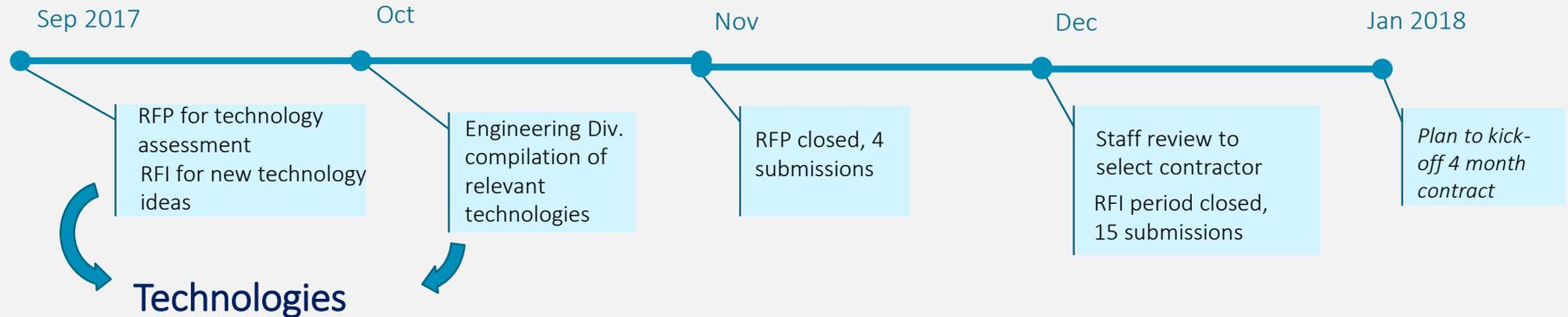
Technical Foundation for Investments



Need a reliable science, engineering, and economic foundation for Air District to identify technologies with potential for impact and scale...

...and to be a resource for others

Technology Assessment to Identify Technologies Poised for Impact and Scale



- Alternatives to gas turbines and diesel internal combustion engines
- Cooling and heating
- Energy efficiency measures
- Smart/connected technologies
- Methane capture and use
- Waste-to-energy
- Carbon sequestration and use

Assessment Criteria

Technology Readiness Level

Technological barriers, dependencies, risks

Economic barriers, dependencies, risks

Relevance to Bay Area (and beyond) emissions

Feasible emissions reductions

Additional environmental, social, economic benefits

Costs (installation, operation, payback periods)

Opportunities to catalyze systems change

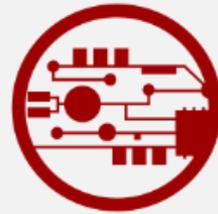
Matchmaking to Incentivize Action



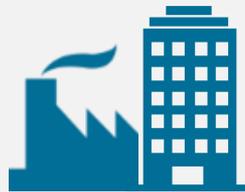
Leverage Air District experience with Bay Area stationary facilities to connect facilities, technologies and financing to accelerate GHG reductions

Results of Stakeholder Input: 3 Isolated Communities

Technology Developers & Companies



**Stationary
Facilities**



**Financing
Authorities**

Benefits to Partners with Air District TIO

Technology Developers & Companies

Accelerated awareness and
mainstreaming of new technologies



Stationary Facilities

Information about technology and
financing opportunities

Access loans for technology upgrades

Getting out in front of permitting and regulatory
requirements

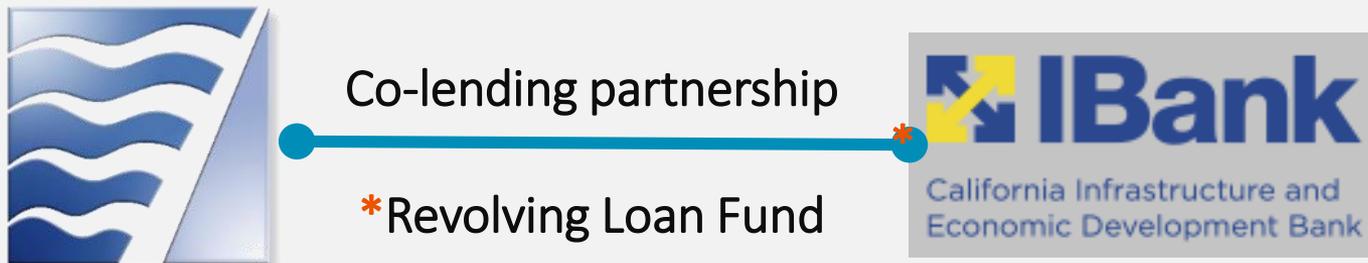
Financing Authorities

Expanded customer base

Co-funding to cover higher risk or newer
technologies

Increased confidence in project
technical viability and payback periods
to enable more investment

Example of TIO Finance Program



- Fund newer technologies
- Provide connections to additional customers
- Leveraging program administration
- *First In First Out
- Leverage existing program: California Lending for Energy and Environmental Needs (CLEEN)
- Funds reporting
- Project/GHG reporting

*Will be negotiated and finalized in 2018

Technology Implementation Office



Putting all the pieces together...

3 TIO Pillars and Next Steps



Stationary

Technology demonstration projects (FYE 2017)

Incentive program(s) for permitted facilities (to be finalized 2018)



Mobile

EV Infrastructure

EV Fleets

EV and transportation incentives for low income consumers (EFMP+Up)



Partnerships

Partnerships with other agencies, lenders, investors

Connect facilities, technologies, and available financing

Outreach to increase uptake and impact of incentives

Evaluation and scale up

Wood Smoke Program and the North Bay Fire Recovery Update

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Wayne Kino

Deputy Air Pollution Control Officer



Wood Smoke Enforcement

	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
WSTA Alerts	15	10	30	23	1	7	18
PM_{2.5} Excesses	11	1	15	6	0	0	7
Complaints	3,777	2,316	5,091	3,834	1,302	1,564	1,816
Info Packets	11,476	3,720	1,768	2,029	577	577	1,051
Violations	359	178	267	155	1	91	112
Exemptions	76	91	150	193 + 23 Seasonal	215 + 1 Seasonal	129 + 1 Seasonal	122 Registered

Enforcement Highlights

- Violations: 110

- 109 - 1st NOV Wood Smoke Awareness Course or \$100 penalty
- 1 - 2nd NOV \$500 (increased with additional NOVs)
- Total Exemptions – 122 registered EPA Certified Devices,

- Complaints: 1,816

- 37 addresses with 5 or more complaints
- 10 addresses with 10 or more complaints
- 2 addresses with 20 or more complaints



General vs Wood Smoke Complaints

Procedure	General	Wood Smoke
Complaints received via phone and online system.	✓	✓
Complaint system directs inspector patrol routes.		✓
Complaints received during business hours are immediately assigned a priority and dispatched to field inspectors.	✓	
Information packet mailed to address identified as potential source.		✓
Complainants can be anonymous or leave contact information for follow-up from inspector.	✓	✓
Complaints are assigned a priority when complaint is received.	✓	

Wood Smoke Reduction Incentive Program



\$750 to
Decommission



\$1,000 for
natural gas
device



\$3,500 for
electric heat
pump

40% of funding reserved for applicants who meet one or more Highly Impacted Resident (HIR) criteria:

High wood-smoke area

Sole source of heat

Low-income

North Bay Fires Background Information

- In October 2017, wildfires affected the North Bay.
- Approximately 8,000 structures were affected by the fires.
- In Santa Rosa, approximately 3,000 houses (~5% of local housing stock) were destroyed.
- Clean-up and rebuilding process has started in the affected areas.
- Opportunities to:
 - Promoting energy-efficient dwellings.
 - Reduce future air emissions in the region.

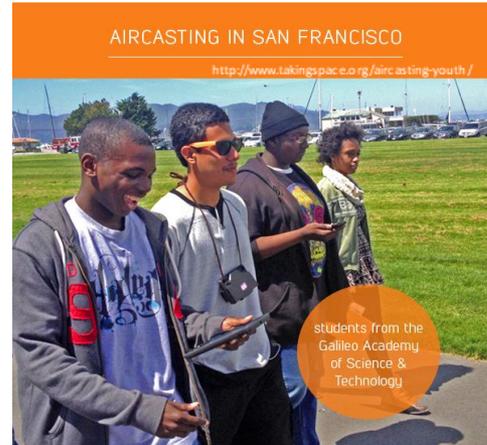
North Bay Fire Recovery Efforts

- Request \$3 million to fund/seed a program for Sonoma and Napa Counties.
 - Natural Gas or propane heating devices.
 - Heat pumps.
- Provide money with distribution criteria to the counties so that residents can get funding from a single source.
- Looking to partner to obtain funding for a temporary incentive program.
- Exploring other methods to reduce all emission types and demonstrate leadership.

New and Expanding Air Quality Information

Increasing amounts of data will be generated.

- Screening and additional studies associated with AB 617.
- Data from low cost sensors operated by the public.



Make Information of Maximum Use

- Work with manufacturers and other partners to develop standards of data quality and communication
- Determine and develop storage and software needs
- Determine how to make data comparable and display it so it is understandable and relevant
- Develop and provide public health information that is actionable
- Leverage information to improve air quality for all

Climate Protection Program Update

Jack P. Broadbent

Executive Officer/Air Pollution Control Officer

Greg Nudd

Deputy Air Pollution Control Officer





BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 8F

Update on the Climate Protection Program

Board of Directors Retreat

January 17, 2018

Henry Hilken
Director of Planning & Climate Protection

Long-range Vision to Low-Carbon Future

The 2017 Clean Air Plan defines a regional climate protection strategy to put the Bay Area on a pathway to achieve ambitious GHG reduction targets



100% renewable electricity



Buildings and cars are fossil-free



Half of commutes are via transit, biking, and/or walking



Organics are put to productive use



Agriculture and diets have smaller carbon footprints



Climate Protection Strategy & Targets

Greenhouse gas reduction targets

- Reduce GHG emissions 40% below 1990 by 2030
- Reduce GHG emissions 80% below 1990 by 2050

Basic strategy

- Near-term focus on reducing “super-GHGs” with powerful global warming impact:
 - methane, black carbon, fluorinated gases
- Sustained long-term effort to reduce CO₂ emissions by decreasing demand for fossil fuels and decarbonizing our energy system



Implementing the Climate Protection Program

The District is using all available tools and resources to implement the climate program





Basin-Wide Methane Strategy

Laying the foundation

Updating Methane Emissions Inventory

Techniques include source-specific measurements via research van & facility-scale measurements via aircraft



- Revising emissions from refinery, landfill and wastewater sectors



Air District's Waste Strategy in Development

- Interdivisional strategy to address waste GHG/VOC emissions
- Upcoming External Stakeholder meeting to share strategy

Methane Expert Panel

Gathered technical advice from experts on Methane Strategy topics

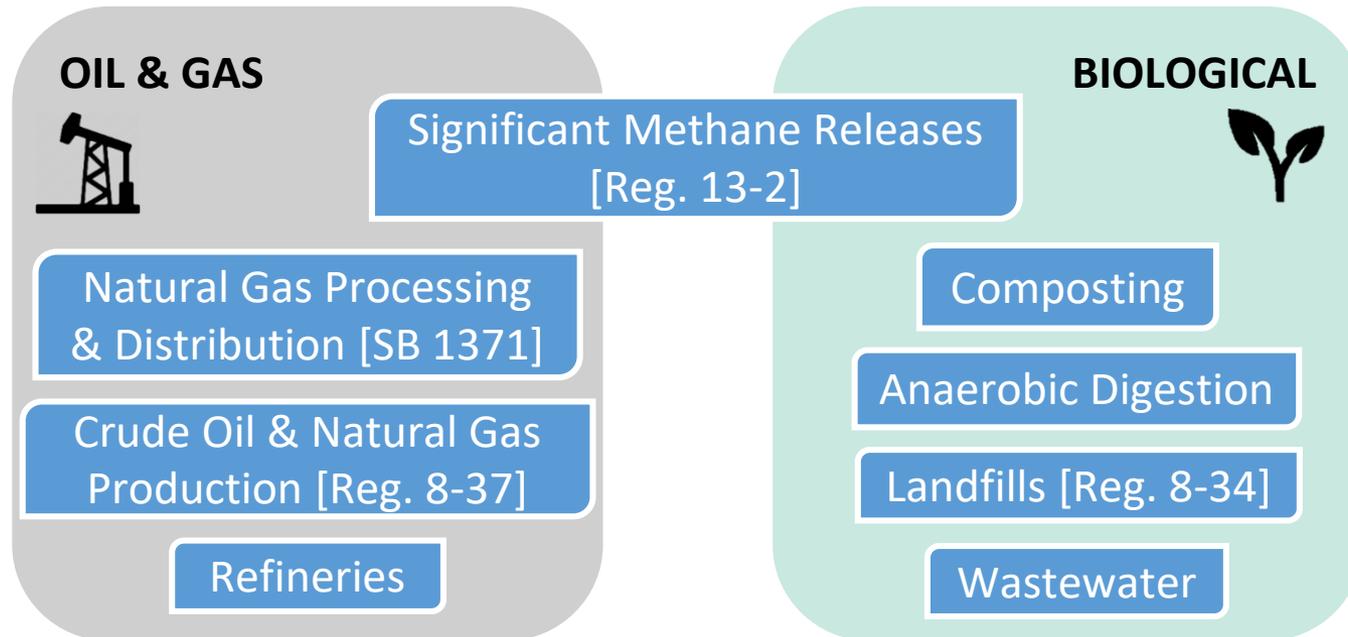
- Significant methane leaks and detection – Sept 26, 2017
- Composting and anaerobic digestion – Nov 6, 2017
- Upstream oil and gas production – Jan 16, 2018



Basin-Wide Methane Strategy

Regulatory Efforts

METHANE RULE DEVELOPMENT MAP



Basin-Wide Methane Strategy

2018 Methane Rules

REG 13-2 SIGNIFICANT METHANE RELEASES

PURPOSE Allow the Air District to compel facilities to fix major leaks; will act as *backstop* while source-specific rules are adopted

CONCEPT Prohibits methane releases > 10,000 ppm throughout District

SCHEDULE

WORKSHOPS
WINTER 2018

TO BOARD
MAY 2018



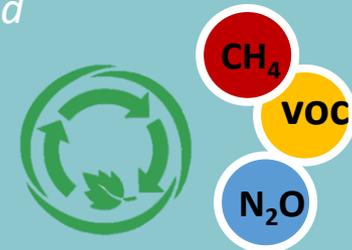
NEW RULES COMPOSTING & ORGANIC WASTE OPERATIONS

CONCEPT Adopt a suite of rules that address emissions from storing, transferring and processing organic waste at composting, anaerobic digestion and other waste-related facilities such as landfills.

SCHEDULE
(first rule)

WORKSHOPS
SUMMER 2018

TO BOARD
OCT 2018



Basin-Wide Methane Strategy

2018 Methane Rules (cont'd)

SB 1371 NATURAL GAS LEAK ABATEMENT PROGRAM

PURPOSE *Prevent methane leaks from the natural gas distribution system*

WORK WITH CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC)
during Phase II to achieve quantifiable methane emissions reductions

SCHEDULE

PHASE I

Completed 2017

PHASE II

2018 – 2020



REG 8-37 CRUDE OIL AND NATURAL GAS PRODUCTION

PURPOSE *Address emissions from smaller oil and gas production facilities exempted by Air Resource Board's Oil & Gas Rule*

CONCEPT *Consider a lower leak threshold to achieve cost-effective methane and VOC emissions reductions and protect public health*

SCHEDULE

OIL & GAS STUDY

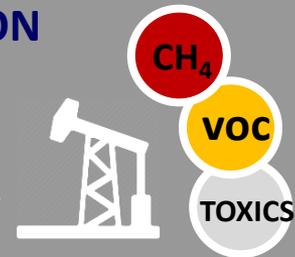
WINTER 2018

WORKSHOPS

SUMMER 2018

TO BOARD

NOV 2018





Climate Protection Grant Program

District will launch \$4.5 million Climate Protection Grant Program in spring 2018

Objectives:

- Support implementation of 2017 Clean Air Plan
- Accelerate implementation of local climate action plans

Program Categories:

- Reduce emissions from existing buildings
- Foster innovative strategies with potential for replication & long-term GHG reduction impact

Schedule:

- Release call for projects by late March
- Recommend grant awards to Board in June



Support for Local Climate Action

- GHGs will be a key focus of revisions to CEQA guidelines
 - Revised thresholds of significance for evaluating post-2020 GHG impacts
 - Guidance for next-generation (post-2020) local climate plans
- Continue developing model ordinances & best practices
 - Require EV charging in new construction
 - Promote cool paving
- Continue technical & policy support for local climate plans and programs
- Support Community Choice Energy programs
 - increase participation & maximize renewable content



Grant Programs

In 2018 District will award up to \$108 million to projects to reduce emissions from mobile sources

- Reduce motor vehicle travel
- Promote light-duty electric vehicles:
 - Enhanced Fleet Modernization Plus-up Program to help low-income residents replace their old vehicles with advanced technology vehicles
- Heavy-duty diesel: trucks, buses, marine vessels, off-road equipment, locomotives





Partnerships

- Technology Implementation Office will promote EVs and help to commercialize new technologies to reduce GHG emissions from stationary sources
- Spare the Air Resource Teams:
 - “Idle Free Bay Area” campaign with schools & other partners
 - Promoting new carpool apps in San Mateo & Santa Clara
- Convening Youth for Environment & Sustainability (YES) Conference: Feb 24 in Oakland
- Working w Sustainable Silicon Valley & partners to improve energy efficiency in multi-family residential buildings
- Continue support for efficient land use, active transportation, and other Plan Bay Area initiatives





Communications & Outreach

- Pilot project to engage opinion leaders in Santa Clara & San Mateo counties to promote our climate protection vision
- Developing tools to educate and motivate Bay Area residents and communities to reduce their GHG footprint
- Helping to organize a fall 2018 conference to focus on reducing GHG emissions from food production, distribution, and consumption



Working to Realize the Vision

The regional climate protection strategy defined in the 2017 Clean Air Plan describes a long-range vision for a carbon-free Bay Area

District activities support state, regional and local climate programs

In 2018 the District will use all the tools and resources at our disposal to implement the climate strategy:

- Rule-making
- Collaboration with local governments
- Grants & Incentives
- Partnerships
- Communications and Outreach

Update on 2018 Committee Assignment and Goals

Chairperson Dave Hudson
Board of Directors

Agenda: 8G



Budget and Finance	Executive	Mobile Source
<i>4th Wednesday of each month at 9:30 a.m.</i>	<i>3rd Monday of each month at 9:30 a.m.</i>	<i>4th Thursday of each month at 9:30 a.m.</i>
Carole Groom (C)	Dave Hudson (C)	Scott Haggerty (C)
Karen Mitchoff (VC)	Katie Rice (VC)	David Canepa (VC)
Margaret Abe-Koga	John Gioia	Margaret Abe-Koga
David Canepa (P)	Carole Groom	Pauline Russo Cutter
Cindy Chavez	Scott Haggerty	Carole Groom
Pauline Russo Cutter	Liz Kniss (P)	Dave Hudson (P)
Liz Kniss (P)	Nate Miley	Tyrone Jue
Doug Kim	Mark Ross	Doug Kim (P)
Katie Rice	Rod Sinks	Nate Miley
Mark Ross	Jim Spering (P)	Karen Mitchoff
Brad Wagenknecht	Brad Wagenknecht	Jim Spering

Stationary Source	Climate Protection	Legislative
<i>3rd Monday of every other month at 10:30 a.m.</i>	<i>3rd Thursday of every other month at 9:30 a.m.</i>	<i>At the call of the Chair</i>
John Gioia (C)	Theresa Barrett (C)	Scott Haggerty (V)
Pete Sanchez (VC)	Hillary Ronen (VC)	Doug Kim (VC)
David Canepa	John Gioia	Margaret Abe-Koga
Carole Groom	Scott Haggerty	David Canepa
Scott Haggerty	Rebecca Kaplan	John Gioia
Dave Hudson (P)	Doug Kim	Dave Hudson (P)
Nate Miley	Rod Sinks (P)	Rebecca Kaplan
Karen Mitchoff	Katie Rice (P)	Karen Mitchoff
Rod Sinks (P)	Mark Ross	Jim Spering (P)
Brad Wagenknecht	Brad Wagenknecht	Brad Wagenknecht
Shirlee Zane	Shirlee Zane	Shirlee Zane

(P) – board member who will join the Committee after Amendment to the Administrative Code.

<u>Personnel</u>	<u>Public Engagement</u>	<u>Bay Area Regional Collaborative (BARC)</u>
<i>At the call of the Chair</i>	<i>At the call of the Chair</i>	<i>Set by BARC</i>
Jim Spering (C)	Brad Wagenknecht (C)	Cindy Chavez (C)
Doug Kim (VC)	Rebecca Kaplan (VC)	Nate Miley
Theresa Barrett	Theresa Barrett	Dave Hudson
David Canepa	David Canepa	Katie Rice
John Gioia	Scott Haggerty (P)	
Carole Groom	Doug Kim	
Scott Haggerty	Liz Kniss (P)	
Dave Hudson (P)	Nate Miley	
Liz Kniss	Mark Ross	
Karen Mitchoff (P)	Pete Sanchez	
Brad Wagenknecht	Jim Spering	

<u>Ad Hoc Building Oversight</u>	<u>Ad Hoc Refinery Oversight</u>	<u>Advisory Council</u>
<i>At the call of the Chair</i>	<i>At the call of the Chair</i>	<i>Board Liaison/Ex-Oficio</i>
Mark Ross (C)	Cindy Chavez (C)	Rod Sinks
David Canepa (VC)	Nate Miley (VC)	
Pauline Russo Cutter	Margaret Abe-Koga	
Scott Haggerty	Pauline Russo Cutter	<u>TIO Steering Committee</u>
Liz Kniss	Carole Groom	<i>Board Liaison/Ex-Oficio</i>
Karen Mitchoff	Hillary Ronen (P)	Cindy Chavez
Jim Spering	Mark Ross	Dave Hudson
	Pete Sanchez	
	Rod Sinks (P)	
	Jim Spering	
	Shirlee Zane	

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