



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 12

Protecting Refinery Communities from Air Pollution

**Board of Directors Meeting
September 20, 2017**

**Greg Nudd, Acting Rules and Strategic Policy Officer
Office of Rules and Strategic Policy**



Overview

- Three-pronged approach:
 - Direct regulation of criteria pollutants (20% by 2020)
 - Capping risk from toxic air contaminants (Rule 11-18)
 - Monitoring crude oil inputs and refinery air pollution (Rule 12-15)
- Next steps
 - Risk-based controls on emergency diesel generators
 - Risk values for fine particulate matter
 - Assembly Bill 617 impacts:
 - Best Available Retrofit Control Technology Review
 - Community Emission Reduction Plans

The image shows a portion of the Golden Gate Bridge in San Francisco, California, extending across the water. The bridge's iconic orange-red towers and suspension cables are visible against a clear blue sky. In the foreground, there's a body of water and some greenery on the left side.

Direct Regulation of Criteria Pollutants

Legal/Regulatory Background

- Best Available Retrofit Control Technology (BARCT)
 - Requirement of the California Health and Safety Code
 - Legal basis for much of our rulemaking to address PM_{2.5} and ozone pollution
- Criteria Pollutants: particulate matter (PM_{2.5}), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), reactive organic gases (ROG)
- Applies to all sources in the relevant category (e.g. gas turbines)



Direct Regulation of Criteria Pollutants

BARCT Rules Impacting Refineries

Number	Source Category	Pollutant	Estimated Reductions [tons/year]	Date Approved
Rule 6-5	Fluid Catalytic Cracking Units	PM _{2.5}	223	Dec. 2016
Rule 8-18	Equipment Leaks	ROG	1,228	Dec. 2016
Rule 11-10	Cooling Towers	ROG	861	Dec. 2016
Rule 9-14	Coke Calcining	SO ₂	430	Apr. 2017
<i>Rule 9-1</i>	<i>Refinery Fuel Gas Sulfur Limits</i>	<i>SO₂</i>	<i>245</i>	<i>Q1 2018</i>
<i>Rule 9-1</i>	<i>Gas Turbines</i>	<i>NO_x</i>	<i>211-277</i>	<i>Q2 2018</i>



Direct Regulation of Criteria Pollutants

Progress Toward 20% Reductions

	PM _{2.5}	ROG	NO _x	SO ₂	Total	% Red
Baseline Emissions	1,359	5,178	4,375	4,250	15,162	-
After Adopted Rules	1,136	3,089	4,375	3,820	12,420	18%
After Adopted & 2018 Rules	1,136	3,089	4,164	3,575	11,964	21%



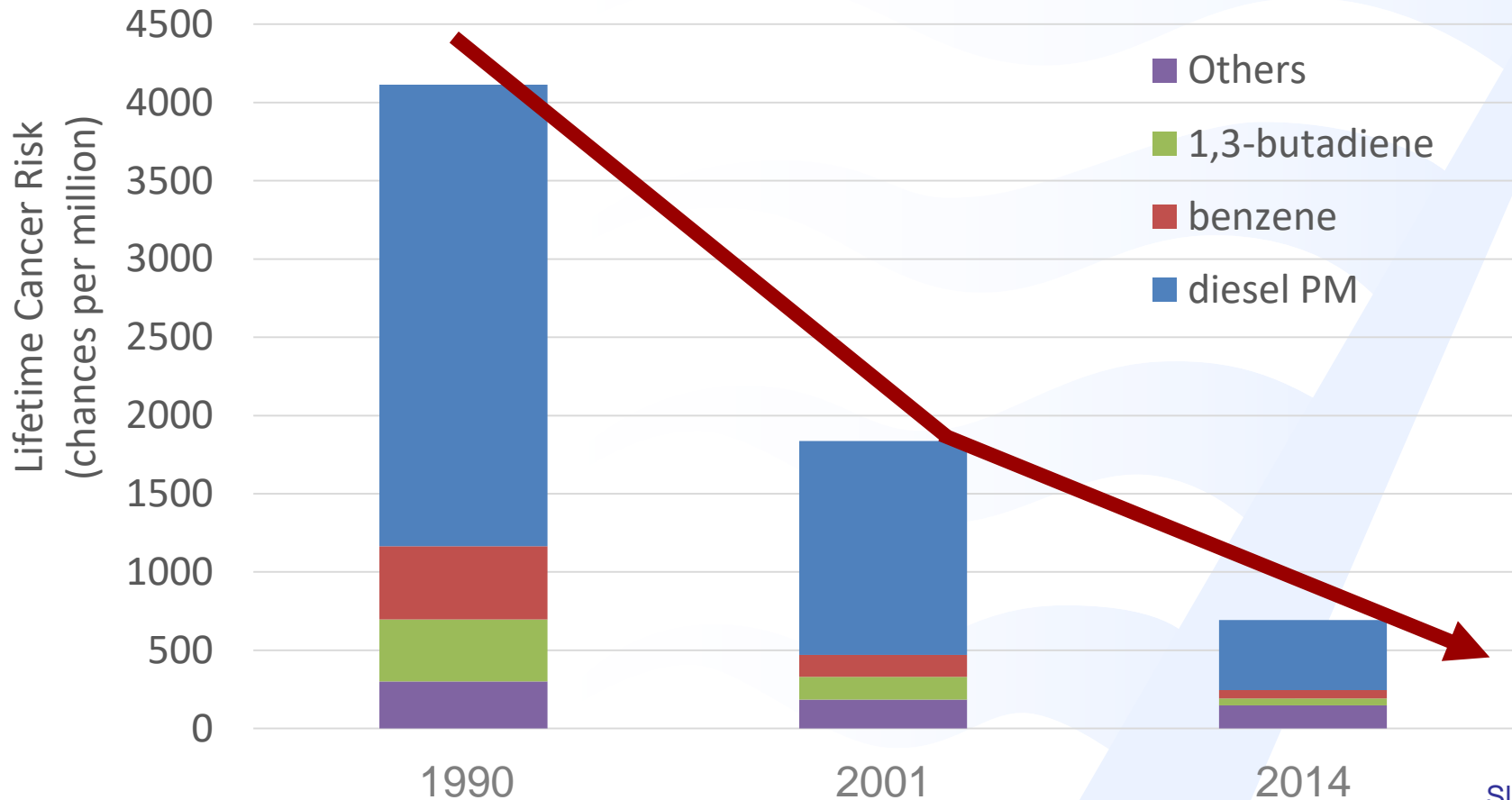
Direct Regulation of Criteria Pollutants

Next Steps

- Follow-up rulemaking for Fluid Catalytic Cracking Units (Rule 6-5):
 - Reviewing results of optimization studies to see if $PM_{2.5}$ can be substantially reduced by operational changes
 - Additional controls may be needed to further reduce $PM_{2.5}$ and SO_2 from these sources
- Assembly Bill 617
 - Control technology review of thousands of sources in the refining sector (roughly 1/3 of the sources being reviewed)
 - May require additional reductions to meet BARCT or community emission reduction requirements

Capping Risk from Toxic Air Contaminants

Bay Area risk levels decline since 1990





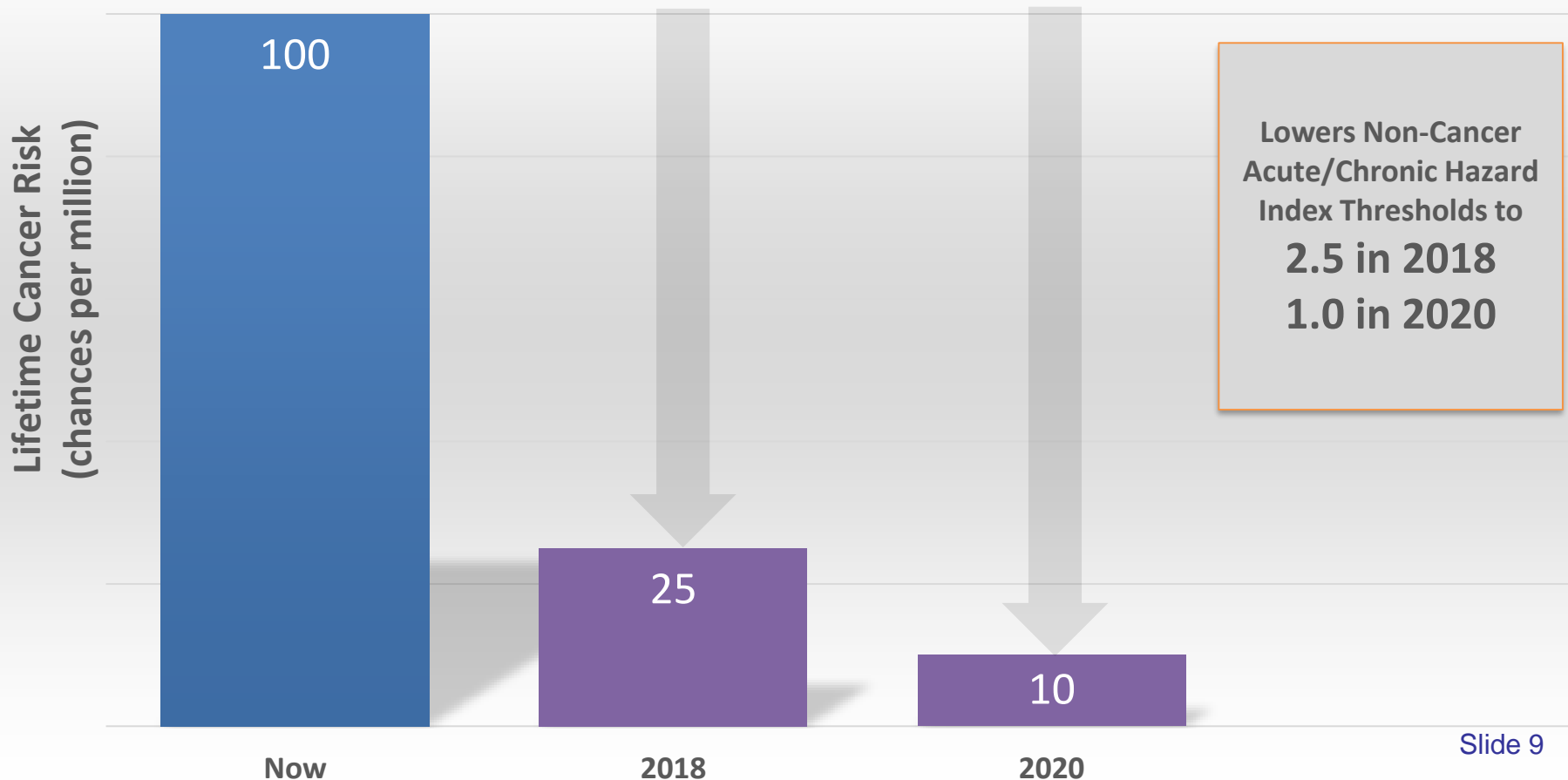
Capping Risk from Toxic Air Contaminants

Rule 11-18

- Reduces Risks from TACs to the lowest achievable levels
- Particularly benefits CARE areas
- Incorporates latest health risk methodologies
- Promotes continuous improvement
- Ensures public transparency
- Provides greater flexibility

Capping Risk from Toxic Air Contaminants

Rule 11-18: Risk Action Thresholds





Capping Risk from Toxic Air Contaminants

- **Air District staff will conduct health risk assessments**
- **Facilities above Risk Action Levels must:**
 - Develop a risk reduction plan for Air District approval
 - Plan must get down below 2020 Risk Action Levels (10/million)
 - Execute plan according to plan schedule
- **Risk reduction measures include:**
 - Installation of **Best Available Retrofit Control Technologies for Toxics (TBARCT)**
 - Modification of operating hours and activity levels
 - Modification of emissions point characteristics



Capping Risk from Toxic Air Contaminants

Proposed Rule 11-18

- Publish Final Hearing Package (September 2017)
 - Proposed Rule
 - Staff Report
 - Socioeconomic Analysis
 - Recirculated Draft Environmental Impact Report (CEQA)
 - TBARCT Workbook
 - Public Comments Due: **October 16th**
- Board Hearing for Adoption (November 15, 2017)

Capping Risk from Toxic Air Contaminants

Example Timeline for Refineries, Foundries and Forges

DATE	MILESTONE
January 2018	Air District Initiates Determines Priority Score
July 2018	Air District Initiates Health Risk Assessments
October 2018	Air District Notifies Facilities Rule 11-18 Applies
January 2019	Facilities Develops Draft Risk Reduction Plans
2020 – 2025	Facilities Implement Risk Reduction Plans



Capping Risk from Toxic Air Contaminants

Next Steps

- Implement Rule 11-18 starting Jan. 2018
 - Highest emitting facilities first (included refineries)
- Develop rule for backup generators at lower risk facilities
- Work with OEHHA on risk levels for fine particulate matter
- Assembly Bill 617
 - Expanded community monitoring
 - May require additional reductions to meet community emission reduction requirements

The background of the slide features a photograph of the Golden Gate Bridge in San Francisco, with a refinery building visible in the foreground on the left. The bridge's orange-red towers and suspension cables are prominent against a clear blue sky. The refinery building is a large, multi-story structure with a flat roof and several windows.

Monitoring Refinery Inputs and Air Pollution

Rule 12-15

- Approved April 2016
- Monitors crude slate changes and refinery emissions
- Rule requirements:
 - Reporting of crude oil properties for baseline period and every month
 - Improved emissions inventories
 - Fence-line monitoring systems



Monitoring Refinery Inputs and Air Pollution

Rule 12-15: Crude Slate Data

- Air District engineers have reviewed crude slate data from 2013-2016
- Initial findings:
 - Heavier crude oil is correlated with higher CO₂ emissions, but not strongly correlated
 - Some refinery crude slates are consistent, others are highly variable
- Ongoing monthly reports will detect significant changes in key crude properties
- Canadian crude imports are not significant in the Bay Area
 - Historically less than 2% of crude input
 - Air District staff will continue to coordinate with the California Energy Commission to monitor this issue



Monitoring Refinery Inputs and Air Pollution

Rule 12-15: Fence-Line Monitoring

- Important for monitoring toxic emissions
 - Benzene is a key driver of toxic risk in refinery communities.
 - Benzene usually comes from equipment leaks or tanks, these emissions can't be directly measured at the source
 - Monitoring confirms accuracy of emissions calculations, and identifies significant unknown leaks
- Complements community monitoring
 - Community monitors measure pollution from a mix of sources (refineries, cars, trucks, ships, cooking)
 - Fence-line monitoring directly address refinery pollution



Monitoring Refinery Inputs and Air Pollution

Fence-Line Monitoring Plans

- Draft plans are on the Air District Web site for review and comment
- Plans cover the following:
 - Establishing and operating system to monitor pollutants in real time
 - Detailed information describing the equipment and reporting system
 - Procedures for data quality assurance and quality control
- Accepting comments until October 23rd



Recap: Three-Pronged Approach

Direct regulation of criteria pollutants

- On track for 20% reduction
- More regulations for further reductions in development

Capping risk from toxic air contaminants (proposed Rule 11-18)

- Risk reduced to lowest feasible level
- Start with refineries and other high emitting facilities

Monitoring crude oil inputs and refinery air pollution (Rule 12-15)

- Ongoing review of crude oil characteristics
- Better emissions estimates
- Fence-line monitoring to verify emissions and find leaks
- Regular reports to Board on crude slate changes and impact on emissions



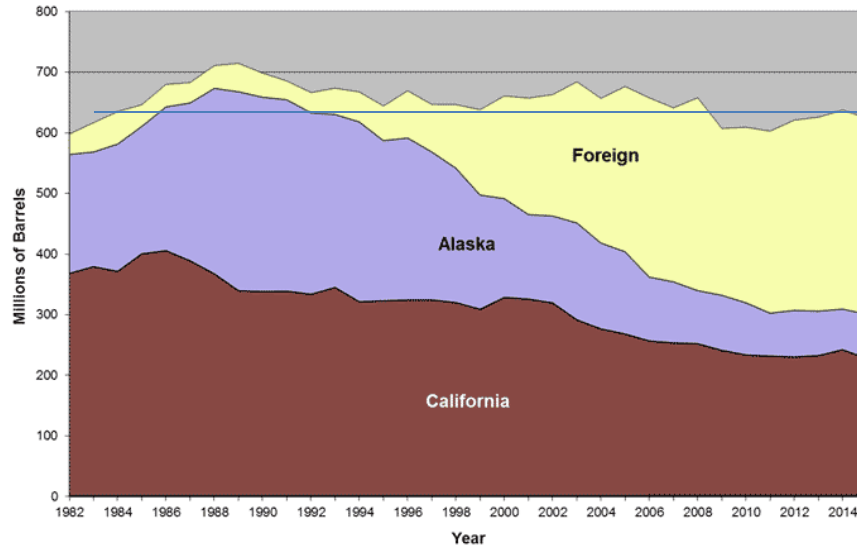
Next Steps

- Two more criteria pollutant rules in 2018
- Possible further controls on Fluid Catalytic Cracking Units
- Work with Office of Environmental Health Hazard Assessment (OEHHA) on risk values for fine particulate matter
 - Incorporate into Rule 11-18 or
 - Develop PM_{2.5} risk cap rule
- AB 617 Requirements:
 - Expanded BARCT review
 - Enhanced Community Monitoring
 - Community Emission Reduction Plans



Importance of Blending

Crude Oil Supply Sources to California Refineries



- Alaska North Slope (ANS) oil production has been declining
- Source of oil for California refineries has dropped from 46 percent in 1991 to 12 percent by 2015
- Blending crude oils with different properties can produce “look-alike” mixtures that mimic the product yields of crude oils that are having to be replaced
- Flexibility of crude oil supply options increases capability to maintain stable refinery operations

ANS BLENDING

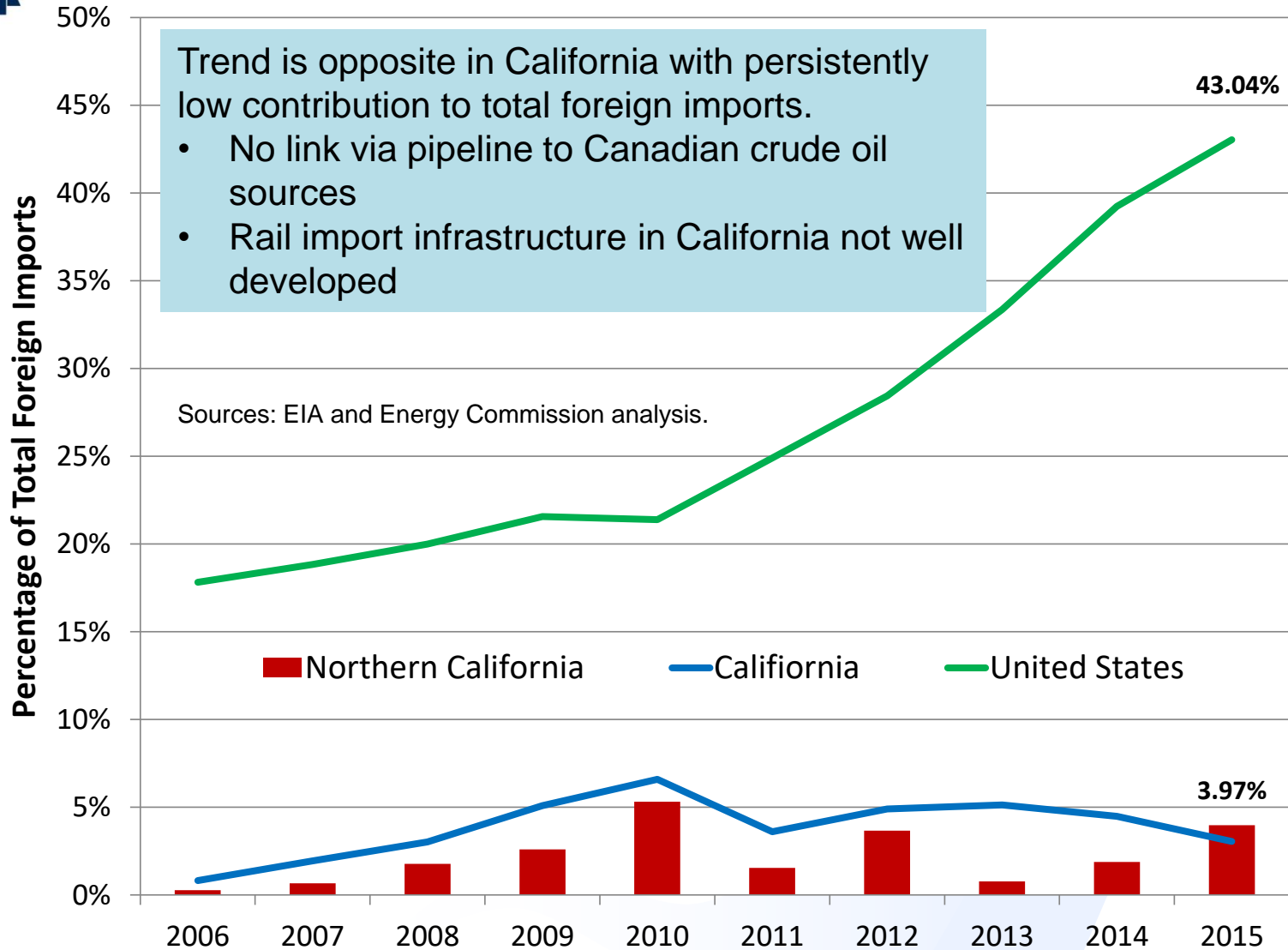
Table 1

	55% Bakken; 45% WCS	ANS	Difference
Gravity, °API	32.1	32.1	—
Sulfur, wt %	1.4	0.9	0.5
Total acid no., mg KOH	0.6	0.1	0.5
Liquid volume yields			
C ₄ -, %	3	4	-1
Naphtha, %	26	26	—
Kerosine-diesel, %	27	27	—
Gas oil, %	28	27	+1
Resid, %	16	16	—

Source: Oil & Gas Journal.



Canadian Crude Oil Imports - California





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AGENDA 13

Update on Assembly Bill 617 (AB 617)

Board of Directors Meeting September 20, 2017

Eric Stevenson, Director of Technical Services
Meteorology, Measurement and Rules



Overview

- Assembly Bill 617 (AB 617) Requirements
- AB 617 Air District programs already in place addressing issues
- Collaborations and timelines
- Next Steps

The top left of the slide features a photograph of the Golden Gate Bridge in San Francisco, showing its iconic orange-red towers and suspension cables against a clear blue sky. The bridge spans across a body of water, with a building and some greenery visible on the left side.

AB 617 Components

- Require additional air monitoring in impacted communities
- Develop methods to reduce air pollution in impacted communities
- Develop clearinghouse for Best Available Retrofit Control Technology; air districts adopt additional BARCT rules
- Require uniform reporting of emissions inventories
- Increase allowable fines (\$5,000 per day)



Air Monitoring in Impacted Communities

AB 617 Requirement – State/air districts to enhance air monitoring in impacted communities.

Air District efforts already under way

- Identifying additional air monitoring locations in refinery communities.
- Assembling available data to help identify additional locations for potential monitoring (health outcomes, modeling, short term studies, etc.).
- Working with equipment manufacturers, Non-Governmental Organizations (NGOs), South Coast AQMD, universities and other groups to identify cutting edge equipment.



Emission Reduction Plans

AB 617 Requirement – Identify areas impacted by criteria pollutants and Toxic Air Contaminants (TACs) and develop Emission Reduction Plans to reduce those impacts.

Air District efforts already under way

- Continued reduction of criteria pollutants
- Regulation 11, Rule 18 will require existing stationary sources to reduce risk from TACs to the lowest levels in the State
- Already adopted Regulation 2, Rule 5 to reduce TACs from new sources.
- CARE Program/Community Risk Reduction plans
- Planning Healthy Places Guidebook



BARCT Requirements

AB 617 Requirement – State to develop a clearinghouse to define BARCT for stationary sources. Air districts to enact additional BARCT rules.

Air District efforts already under way

- The 2017 Clean Air Plan evaluated all rules to determine which needed to be updated.
- Staff currently reviewing and prioritizing rules to ensure that this requirement is met.



Emissions Inventory Reporting

AB 617 Requirement – State to develop uniform emissions inventory reporting requirements for criteria pollutants and TACs and require sources to submit this information to the State.

Air District efforts already under way

- Regulation 12, Rule 15 requires the use of uniform reporting of emissions inventories based on guidance produced and updated to incorporate the latest emissions information available.
- Regulation 11, Rule 18 will result in accurate, uniform emissions inventory for TACs to ensure health risk to the lowest levels achievable.

Working with Partners and Timelines in AB 617

- Conference calls every week with CARB and South Coast AQMD to discuss issues and develop plans forward.
- Working with other agencies, NGOs, universities and communities to hear ideas and receive feedback.

Timelines for implementation are extremely aggressive and will require a refocus of Air District resources

- Air monitoring – deploy first stages by July 1, 2019 (Additions possible by Jan. 1, 2020 and annually thereafter).
- Emission Reduction Plans - Once an area is identified as being impacted, a reduction plan must be in place within one year
- BARCT Rules – Adoption of rules by Jan. 1, 2019 and implemented by Dec. 31, 2023



Next Steps

- Continue to work with partners to implement AB 617.
- Timelines and legislative requirements will result in a need for an increase in resources.
 - Staff is working to identify appropriate staffing increases and capital needs.
 - Working with the State and other air districts to receive appropriate reimbursement for expected expenses.
- Continue to reach out to communities and other partners to identify needs, address issues and improve air quality.

Summary of Ozone Seasons

Year	National 8-Hour	State 1-Hour	State 8-Hour
2014*	5	3	10
2015*	5	4	11
2016	15	5	15
2017	6	6	6

Spare the Air Alerts: 5/3/17, 5/22/17, 6/18/17, 6/22/17, 6/23/17, 8/1/17, 8/26/17, 8/27/17, 8/28/17, 8/31/17, 9/1/17, 9/2/17, 9/3/17, 9/4/17

Days > 0.070 ppm 8-hour NAAQS: 8/26/17, 8/28/17, 8/31/17, 9/1/17, 9/2/17, 9/3/17

***Based on NAAQS of 0.075 ppm that was in place during those years**

Winter PM_{2.5} Seasons

Year	Days > 35 µg/m ³	Winter Spare the Air Alerts
2013/2014	15	30
2014/2015	6	23
2015/2016	0	1
2016/2017	0	7

- **Spare the Air Alert Called for:** 12/19/16, 12/20/16, 12/21/16, 12/22/16, 1/17/17, 1/30/2017, 2/1/2017
- **Days > 35 µg/m³ 24-hr NAAQS:**