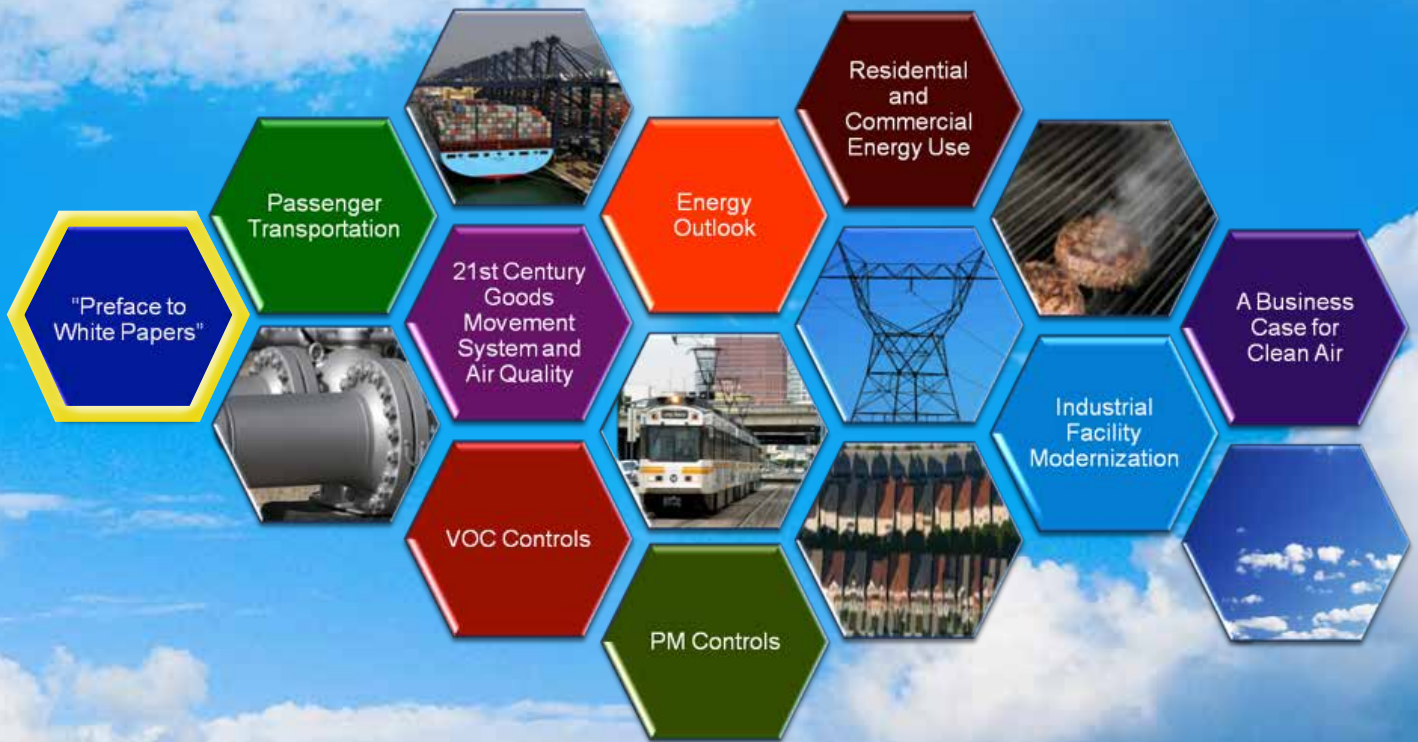


# PRELIMINARY DRAFT



SOUTH COAST  
AIR QUALITY  
MANAGEMENT DISTRICT

# BLUEPRINT FOR CLEAN AIR



APRIL 2015

PREFACE



THIS IS THE FIRST WHITE PAPER IN A SERIES IN PREPARATION FOR THE 2016 AIR QUALITY MANAGEMENT PLAN

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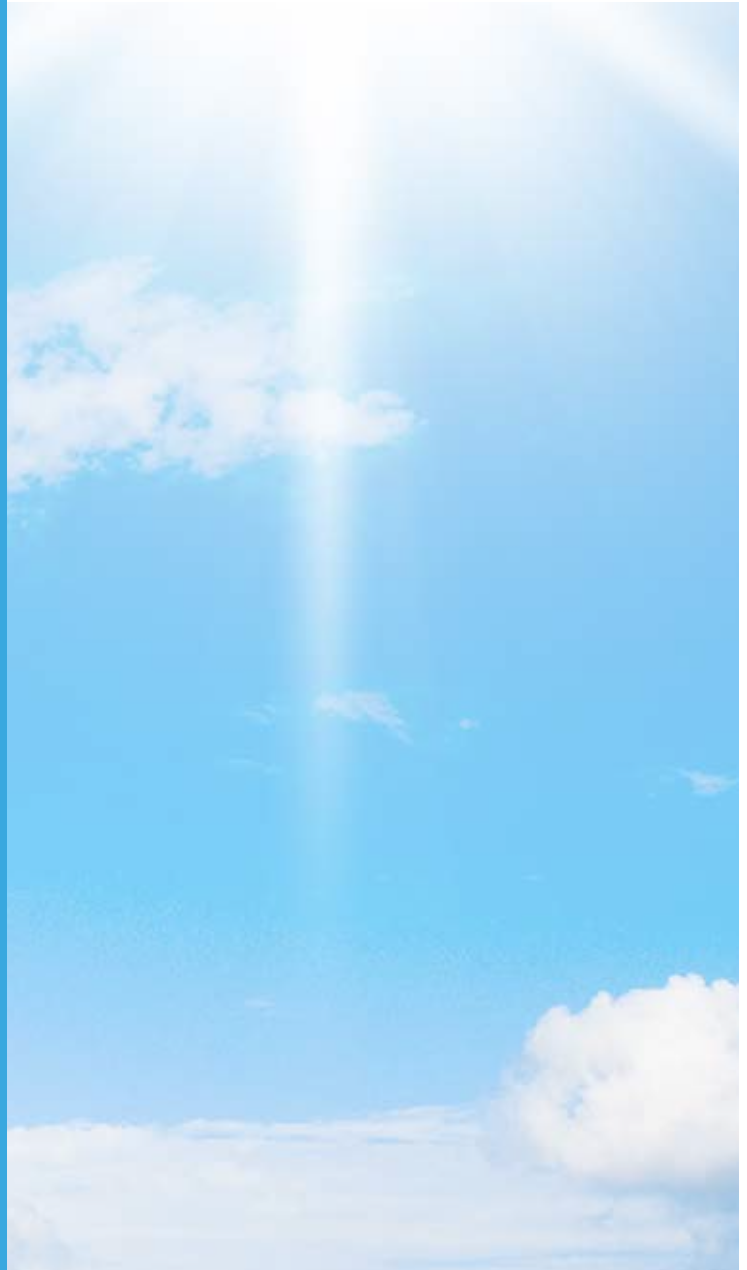
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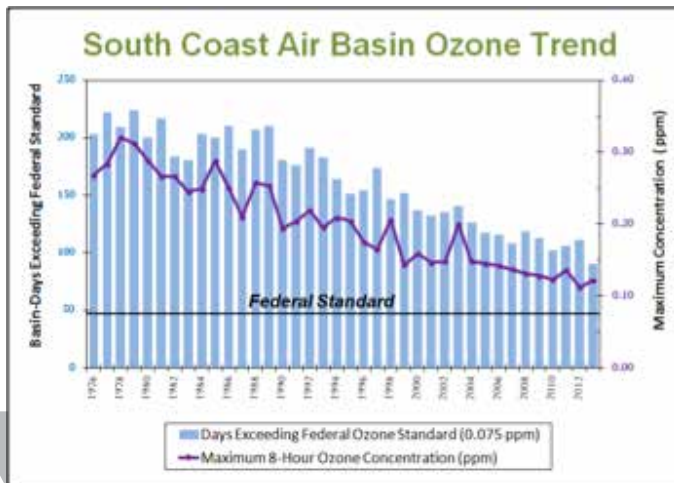


## INTRODUCTION

The South Coast Air Quality Management Plan (SCAQMD) is preparing a 2016 Air Quality Management Plan (AQMP) to demonstrate how the region will reduce air pollution to meet federal health-based standards for ground-level ozone and fine particulates (PM2.5). As part of this process, SCAQMD staff in conjunction with stakeholders input is preparing a series of 10 white papers on key topics to provide for better integration of major planning issues regarding air quality, climate, energy, transportation, and business needs. The Blueprint for Clean Air provides background information about the 2016 AQMP as well as basic information about the other white papers.

## SETTING THE SCENE

Southern California's air is much cleaner today than it was 20 years ago. Air pollution has declined in spite of significant long-term growth of the population, economy and driving. This is due to the fact that our region has adopted some of the strictest air pollution regulations in the nation. As a result, almost every source of emissions has been dramatically reduced.



However, due to a combination of factors (including a population of more than 16 million people, 11 million vehicles, the largest marine port complex in North America and climate and geography favorable to the formation and trapping of smog), Southern California still has some of the worst air quality in the nation. The region fails to meet federal health-based standards for ground-level ozone on more than 90 days each year.

Ongoing medical research indicates that the health effects of air pollution have been previously underestimated. Due to those findings the U.S. Environmental Protection Agency has lowered air quality standards for the PM2.5 standard and is planning to

do the same this year for the ozone air quality standard.

In order to achieve these standards by federally mandated deadlines over the next two decades, Southern California must significantly accelerate its pollution reduction efforts. Continuing the Basin's progress toward clean air is a challenging task that combines science and policy. Air quality officials must understand the complex interactions between emissions and resulting air quality and use this information to pursue the most effective possible set of strategies to improve air quality. At the same time, officials need to help maintain a healthy economy and coordinate efforts with other key public policy objectives including transportation, energy and climate goals.



## THE 2016 AIR QUALITY MANAGEMENT PLAN (AQMP)

The 2016 AQMP will represent a regional blueprint for achieving healthful air. It will focus on demonstrating attainment of the National Ambient Air Quality Standards for 8-hour ozone levels (75 parts per billion, set in 2008) and the annual PM<sub>2.5</sub> standard (12 µg /m<sup>3</sup> set in 2012). The plan is going to require steep emissions reductions to meet these health-based standards. These reductions come on top of decades of air pollution controls for both stationary and area sources as well as mobile sources.



### WHAT WILL IT TAKE TO ACHIEVE THE STANDARDS?

Previous analyses have indicated that this air basin will require up to a 75 percent further reduction in nitrogen oxide (2NO<sub>x</sub>) emissions – above and beyond all currently adopted measures -- to meet current ozone and PM<sub>2.5</sub> standards. These reductions will require widespread deployment of existing clean air technology and further commercialization of advanced technologies. Achieving clean air will require help from all stakeholders including businesses, manufacturers, agencies and the general public.

The 2016 AQMP will include emission control strategies for all categories of emission sources: stationary sources, area sources, mobile sources, and transportation control measures. The majority of emission reductions must come from mobile sources, which are generally divided into two main categories: on-road mobile sources which typically include automobiles and trucks that operate on public roadways; and off-road mobile sources which include aircraft, ships, trains, and construction equipment that operate off public roadways. The authority to regulate these different emission sources is primarily divided between the California Air Resources Board (ARB) and the US EPA. The SCAQMD does, however, have some limited authority to regulate mobile sources but will continue to concentrate its efforts on stationary sources.

To achieve federal ozone standards, a 75% reduction in NO<sub>x</sub> emissions from a 2023 baseline is needed

Goods movement – the transportation of goods by ship, railroad, truck and aircraft -- is a major source of regional NO<sub>x</sub> and PM<sub>2.5</sub> emissions. The San Pedro Bay Ports anticipate cargo volumes will grow to 43 million containers annually by 2035, more than tripling from today's levels. The 2012 AQMP emissions inventory for goods movement from port-related sources such as heavy-duty trucks, freight locomotives, cargo handling equipment, commercial harbor craft, and commercial ocean-going vessels were estimated to be 51 tons per day for NO<sub>x</sub> and 1 ton per day for PM<sub>2.5</sub> in 2014. Due to this anticipated growth, goods movement sources will continue to be a significant source of emissions in the future.

The San Pedro Bay Ports anticipate cargo volumes to grow to 43 million containers annually by 2035: more than tripling from today's levels.

The 2016 AQMP will use a variety of implementation approaches such as use of available cleaner technologies, best management practices, incentive programs, as well as development and implementation of zero- and near-zero technologies and control methods. Many of the same technologies will address both air quality and climate needs, such as increased energy efficiency.

## THE NEED FOR ZERO- AND NEAR-ZERO TECHNOLOGIES

The 2016 AQMP will strongly rely on a transition to zero- and near-zero emission technologies in the mobile source sector to meet the air quality standards. The plan will not only focus on existing technologies and energy sources that provide emission reduction benefits, but will also focus on emerging technologies which are still maturing based on demonstration programs and limited test markets. To accomplish this, the SCAQMD will continue to support technology demonstration projects for both mobile and stationary sources.

For mobile source projects, the SCAQMD will target zero- and near-zero technologies and control methods in automobiles, transit buses, medium- and heavy-duty trucks, and off-road applications. These will include vehicle-related efforts on such things as advancements in engine design, electric power trains, and energy storage/conversion devices (e.g., fuel cells and batteries); and implementation of clean fuels (e.g. natural gas, propane, and hydrogen), including their supporting infrastructure. Stationary source projects will include a wide array of advanced low-NOx technologies, low-VOC coatings and processes, and clean energy alternatives, such as fuel cells, solar power, and other renewable energy systems.

## THE PATH TO CLEAN AIR REQUIRES A GOOD BALANCE

In designing the control strategy needed to achieve the ozone and PM2.5 air quality standards, special consideration must be taken regarding the economic vitality of the Region, community needs, and business needs. The SCAQMD staff believes that air quality standards can be achieved while maintaining a healthy economy. The 2016 AQMP will have to be designed to help decision-makers and stakeholders arrive at a clean air blueprint that lays out a strong path toward meeting the air quality standards while at the same time maintaining economic strength and long-term regional sustainability.

## HEALTH BENEFITS OF CLEAN AIR

Air pollution has serious health repercussions for Southern Californians. Exposure to fine particulate pollution causes a myriad health impacts, particularly to the respiratory and cardiovascular systems. Exposure to fine particulates aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease (COPD). A broad body of scientific research has also linked PM2.5 exposure to cardiovascular diseases.

According to the most recent calculations from the California Air Resources Board, exposure to current levels of PM2.5 is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the South Coast Air Basin. Improving our air quality will save lives.

A recent study by USC scientists responsible for the landmark Children's Health Study found that lung growth improved as air pollution declined for children aged 11 to 15 in five Southern California communities.



## 2008 8-HOUR OZONE STANDARD

On March 12, 2008, U.S. EPA strengthened its national ambient air quality standards for ground-level ozone, designed to protect public health, to a level of 0.075 ppm (75 ppb) from the previous standard of 0.08 ppm (80 ppb), set in 1997. Under U.S. EPA's implementation rule released in May 2012, the South Coast Air Basin was classified as Extreme non-attainment and as such the U.S. EPA required that all areas with an Extreme classification meet the 2008 ozone standard by July 20, 2032.

## 2012 ANNUAL PM2.5 STANDARD

In 2012, U.S. EPA strengthened its national ambient air quality standards for its annual PM2.5 standard from 15.0 µg/m<sup>3</sup> to 12.0 µg/m<sup>3</sup>. The PM2.5 standard is attained when the 3-year average of the annual arithmetic means does not exceed 12.0 µg/m<sup>3</sup>. States would have until 2021 to meet the new 2012 PM2.5 standard, and if necessary, a 5-year extension may be granted extending the deadline to 2026.

Even though the ozone strategy will have significant PM2.5 benefits, only specific measures adopted at the time of the 2016 AQMP submittal can be credited towards the PM2.5 attainment demonstration.

## ADDITIONAL ANALYSIS NEEDED FOR 2016 AQMP

The 2016 AQMP will also provide an update to the attainment demonstration of the 2006 (35 µg /m<sup>3</sup>) 24-hour PM2.5, 1990 1-hour ozone (120 ppb), and 1997 8-hour ozone (80 ppb) standards.

Nonattainment areas such as the Basin still have some continuing obligations under the 1997 8-hour ozone standard and 1979 1-hour ozone standard. In order to show continued progress towards meeting the 1997 8-hour ozone standard by 2024, the 2016 AQMP will also include additional analysis on the adoption, implementation, and effectiveness of control measures committed to in the approved 8-hour and 1-hour ozone State Implementation Plans (SIPs). As a result, additional analysis will be included in the 2016 AQMP in order to demonstrate continued progress towards meeting the reduction goals by 2023/2024 for the 1990 and 1997 ozone standards.

In general, the AQMP is updated every three to four years. However, the air quality planning process for the AQMP is continuous and each iteration is an update of the previous plan.

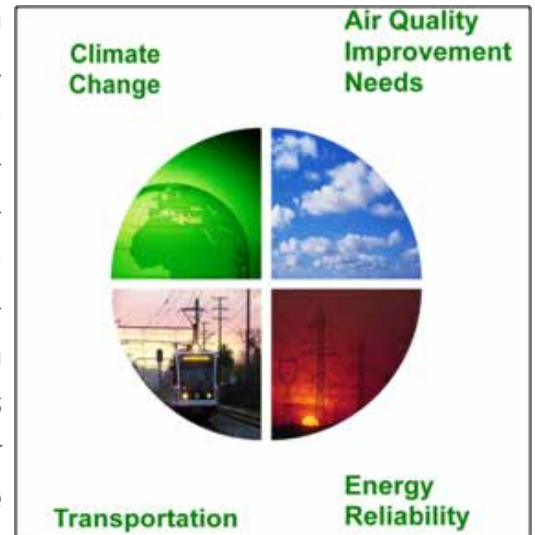
## OPENING THE "BLACK BOX"



The approved ozone SIPs for the South Coast Air Basin include emissions reductions relying on advancement of technologies. These measures have come to be known as the "Black Box." Section 182(e)(5) of the federal Clean Air Act authorizes regions classified as extreme nonattainment for the federal ozone air quality standard to rely on advancement of technologies to achieve emission reductions needed to meet federal air quality standards. A key to the 2016 AQMP policy discussion is the potential need for "back-up" measures for PM2.5 given that the attainment demonstration cannot include the "black box" advanced technology emissions reductions that are used to demonstrate attainment of the ozone standard under CAA section 182(e)(5).

## NEED FOR INTEGRATION

The 2016 AQMP will need significant integration and coordination with other agencies in order to successfully meet the Basin's clean air goals. This integration should not only include the traditional collaboration between the SCAQMD, ARB, and Southern California Association of Governments (SCAG,) but also include partnerships with all levels of governments. Agencies that normally do not directly or indirectly participate in the AQMP planning process need to be more fully engaged. Such agencies should include at the state level the California Energy Commission (CEC) and California State Transportation Agency, regional governments such as county agencies and other regional entities such as other air districts, and local city jurisdictions. These various agencies should be approached regarding an integrated planning process. Such a process would be useful in proposing and implementing strategies that could be incorporated into other agency planning documents which assist and are consistent with the strategies and goals of the 2016 AQMP.



One example of the need for integration between government planning agencies is the planning for transportation, energy, air quality, and climate change that went into the development of the 2012 update to the Regional Transportation Plan (RTP) adopted by SCAG. The RTP included actions to develop a zero- and near-zero emission freight transport system, including needed infrastructure that was able to maximize co-benefits from individual investments.

In addition to an integrated planning process with other agencies through public partnerships, the 2016 AQMP development process will have to incorporate collaborative efforts by a wide range of non-government stakeholders. These efforts will focus on business, environmental community, health organizations, and academia stakeholders.

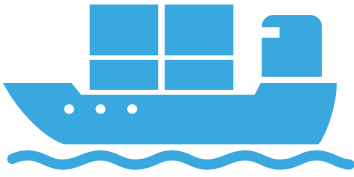
<b>Coordination with Other Agencies</b>	<b>Demonstration &amp; Commercialization Projects</b>	<b>Private and Public Funding</b>
<i>Integrated planning with various agencies is needed to implement 2016 AQMP.</i>	<i>Implement demonstration projects for mobile and stationary sources to help commercialize new technologies.</i>	<i>Use private and public funding sources to help implement advanced technologies.</i>

## ACHIEVING CLEAN AIR GOALS

While the challenges of designing, adopting and implementing the 2016 AQMP are many, there are further actions which need to be incorporated into the planning process to ensure that the plan will meet the Basin's attainment and clean air goals. Demonstration and commercialization projects will be crucial to help to commercialize near-zero and zero emission technologies. Another key element to plan implementation will be private and public funding to help further the development and deployment of advanced technologies.

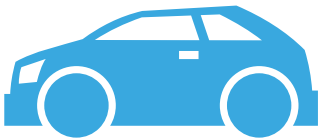
## 2016 AQMP WHITE PAPERS

As a prelude to the 2016 AQMP, the following white papers are being developed to begin the dialogue of key policy issues surrounding the development of the plan. A brief summary of each white paper is provided below. For more information on each white paper, please visit the SCAQMD website at <http://www.aqmd.gov>.



### 21ST CENTURY GOODS MOVEMENT SYSTEM AND AIR QUALITY

The 21st Century Goods Movement System and Air Quality White Paper will likely be the centerpiece of the 2016 AQMP. Advanced technologies will be needed to achieve clean air goals. This white paper will evaluate all goods movement sectors such as ships, locomotives, and trucks and will analyze a variety of advanced technologies such as hybrid-electric, advanced natural gas, fuel cells, and electric, as well as potential infrastructure needs and commercialization schedules. This white paper will also create scenarios that will assume different mixes of advanced technologies.



### PASSENGER TRANSPORTATION

The Passenger Transportation White Paper will examine advanced technologies and operational efficiency opportunities, as well as programs that can help accelerate fleet turnover. Advantages could be gleaned from the implementation of other programs such as SB 375.



### ENERGY OUTLOOK

The 21st Century Goods Movement White Paper will be evaluating various types of advanced technologies – some of these advanced pollution control technologies for mobile sources will be based on traditional energy sources while others will rely on different energy sources such as electricity or hydrogen. The Energy Outlook white paper will evaluate the demand and supply of all energy sources for the South Coast Air Basin. In addition, this white paper will evaluate the existing and needed infrastructure for various energy sources. This white paper will also evaluate the cost of these energy sources – including cost of distribution of the energy source, cost impact or benefit to the end user, and infrastructure costs, if any.



### RESIDENTIAL AND COMMERCIAL ENERGY USE

Reducing, managing, and changing the way energy is used in the commercial and residential sectors can provide emission reductions, reduced energy costs and can provide cross sector benefits such as reduced water consumption along with impacts on transportation emissions. The Residential and Commercial Energy White Paper will provide insight and analysis on energy and water use while reviewing resulting emissions within the residential and commercial sectors.





## INDUSTRIAL FACILITY MODERNIZATION

The Industrial Facility Modernization White Paper will identify the barriers to and incentives for clean equipment technologies and modernization, along with retrofitting equipment and the use of emissions offsets.



## VOC CONTROLS

The VOC Controls White Paper will study the role VOCs play in the ozone and PM<sub>2.5</sub> attainment strategy. The potential contribution of intermediate and semi-volatiles will be explored as well as potential VOC-reduction approaches.



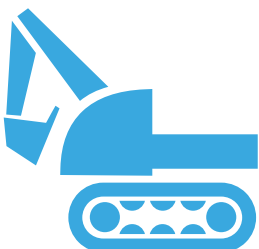
## PM CONTROLS

The PM Controls White Paper will continue to evaluate feasible control technologies for commercial cooking, fugitive dust, ammonia and SO<sub>x</sub> sources. Modeling will assist in demonstrating the benefits from implementing strategies targeting sources of directly emitted PM<sub>2.5</sub> as well as precursor emission sources. The white paper will address each of these elements, including source categories for potential control through traditional approaches as well as seasonal, episodic or geographically focused controls.



## BUSINESS CASE FOR CLEAN AIR

The Business Case for Clean Air White Paper will discuss the costs and benefits to achieving clean air. While a socioeconomic analysis will be conducted for the 2016 AQMP, this white paper will provide an early forum to discuss the regional economy, balancing the need for growth and how best to capture the clean air mandate holistically. The white paper could discuss targeting mobile versus stationary sources and strategies that are most cost effective. Another theme involves the creation of “green jobs” as well as an opportunity to provide early ideas and control measure suggestions.



## OFF-ROAD COMMERCIAL/INDUSTRIAL EQUIPMENT

The Off-Road Commercial/Industrial Equipment White Paper will examine advanced technology opportunities as well as programs to accelerate the transition to newer equipment. This category consists of a wide variety of emission sources including construction and mining equipment such as forklifts, cranes, and portable engines. The focus will be on advanced control technologies that go beyond current emission standards and what efforts will be needed to further reduce emissions from these sources.

## PARTICIPATE IN THE CLEAN AIR DISCUSSION

Public input is an integral part of the planning process and the SCAQMD staff relies on input from all stakeholders. There are a variety of ways to participate in the development of the 2016 AQMP. SCAQMD staff is working with an advisory group which represents over 50 stakeholders from the business community, environmental and community groups and other agencies. Members of the advisory group generally represent an organization and are approved by the SCAQMD's Governing Board Chairman. The White Paper Working Group members include representatives from the advisory group as well as other technical experts. The public is invited to attend AQMP Advisory Group and White Paper Working Group meetings.

You can follow the development of the 2016 AQMP on SCAQMD's website at [www.aqmd.gov](http://www.aqmd.gov) and on social media including Facebook and Twitter. The SCAQMD's website includes meeting dates and information about the AQMP Advisory Group, White Paper Working Group, public workshops and public hearings. The website also includes presentations and documents as they become publicly available. In addition, throughout the development of the 2016 AQMP, organizations can request a meeting with SCAQMD staff to receive an update on the 2016 AQMP. This provides the opportunity for SCAQMD staff to have a more intimate dialogue with specific business groups or organizations.

If you are interested in participating in the clean air discussion and would like to be added to the mailing list, have questions or comments, or would like to schedule a meeting with SCAQMD staff to discuss the 2016 AQMP with your organization, please e-mail SCAQMD at [aqmp@aqmd.gov](mailto:aqmp@aqmd.gov)

**Reaching Further**  
The SCAQMD staff is looking for ways to outreach further. If you have ideas on new organizations to participate in the clean air discussion and/or ideas to enhance





**SOUTH COAST  
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