



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

ADVISORY COUNCIL MEETING

WEDNESDAY
NOVEMBER 13, 2013
9:00 A.M.

7TH FLOOR BOARD ROOM
939 ELLIS STREET
SAN FRANCISCO, CA 94109

AGENDA

CALL TO ORDER

Opening Comments
Roll Call

Robert Bornstein, Ph.D., Chairperson
Clerk

PUBLIC COMMENT PERIOD

Public Comment on Non-Agenda Items, Pursuant to Government Code Section 54954.3. The public has the opportunity to speak on any agenda item. All agendas for Advisory Council meetings are posted at the Air District, 939 Ellis Street, San Francisco, at least 72 hours before a meeting. At the beginning of the meeting, an opportunity is also provided for the public to speak on any subject within the Advisory Council's purview. Speakers are limited to three minutes each.

CONSENT CALENDAR

1. Approval of Minutes of the October 9, 2013 Advisory Council meeting.

DISCUSSION

2. Discussion, Recommendation and Selection of Slate of Officers for 2014.

The Advisory Council will discuss, recommend and select a Slate of Officers for 2014.

3. Approval of draft report on the Advisory Council's September 11, 2013 meeting.

The Advisory Council will finalize the draft report on the September 11th meeting on Black Carbon: Health Effects of Exposure with Air District staff.

OTHER BUSINESS

4. Council Member Comments/Other Business

Council Members may make a brief announcement, provide a reference to staff about factual information, or ask questions about subsequent meetings.

5. Chairperson's Report

Robert Bornstein, Ph.D., Chairperson

6. Council Member Comments/Other Business

Council Members may make a brief announcement, provide a reference to staff about factual information, or ask questions about subsequent meetings.

7. Time and Place of Next Meeting

Wednesday, January 8, 2014 at 9:00 a.m. at 939 Ellis Street, San Francisco, CA 94109.

8. Adjournment

CONTACT CLERK OF THE BOARDS - 939 ELLIS STREET SF, CA 94109

(415) 749-5073
FAX: (415) 928-8560
BAAQMD homepage:
www.baaqmd.gov

- To submit written comments on an agenda item in advance of the meeting.
- To request, in advance of the meeting, to be placed on the list to testify on an agenda item.
- To request special accommodations for those persons with disabilities notification to the Clerk's Office should be given in a timely manner, so that arrangements can be made accordingly.
- Any writing relating to an open session item on this Agenda that is distributed to all, or a majority of all, members of the body to which this Agenda relates shall be made available at the District's offices at 939 Ellis Street, San Francisco, CA 94109, at the time such writing is made available to all, or a majority of all, members of that body. Such writing(s) may also be posted on the District's website (www.baaqmd.gov) at that time.

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET, SAN FRANCISCO, CALIFORNIA 94109
FOR QUESTIONS PLEASE CALL (415) 749-5016 or (415) 749-4941**

**EXECUTIVE OFFICE:
MONTHLY CALENDAR OF AIR DISTRICT MEETINGS**

NOVEMBER 2013

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
Advisory Council Regular Meeting <i>(Meets on the 2nd Wednesday of each Month)</i>	Wednesday	13	9:00 a.m.	Board Room
Board of Directors Executive Committee <i>(Meets on the 3rd Monday of each Month)</i>	Monday	18	9:30 a.m.	4 th Floor Conf. Room
Board of Directors Stationary Source Committee <i>(Meets on the 3rd Monday of each Month)</i>	Monday	18	10:30 a.m.	Board Room
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	20	9:45 a.m.	Board Room
Board of Directors Climate Protection Committee <i>(Meets on the 3rd Thursday of every other month)</i>	Thursday	21	9:30 a.m.	4th Floor Conf. Room
Board of Directors Budget & Finance Committee <i>(Meets on the 4th Wednesday of each Month)</i>	Wednesday	27	9:30 a.m.	4 th Floor Conf. Room
				<u>And via videoconference at Santa Rosa Junior College Doyle Library, Room 4243 1501 Mendocino Avenue Santa Rosa, CA</u>
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month) – CANCELLED AND RESCHEDULED TO DECEMBER 5, 2013 AT 9:30 AM</i>	Thursday	28	9:30 a.m.	Board Room

DECEMBER 2013

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	4	9:45 a.m.	Board Room
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i>	Thursday	5	9:30 a.m.	Board Room
Board of Directors Executive Committee <i>(Meets on the 3rd Monday of each Month)</i>	Monday	16	9:30 a.m.	4 th Floor Conf. Room
Board of Directors Stationary Source Committee <i>(Meets on the 3rd Monday of each Month)</i>	Monday	16	10:30 a.m.	Board Room
Board of Directors Regular Meeting <i>(Meets on the 1st & 3rd Wednesday of each Month)</i>	Wednesday	18	9:45 a.m.	Board Room
Board of Directors Budget & Finance Committee <i>(Meets on the 4th Wednesday of each Month)</i>	Wednesday	25	9:30 a.m.	4 th Floor Conf. Room
				<u>And via videoconference at</u> Santa Rosa Junior College Doyle Library, Room 4243 1501 Mendocino Avenue Santa Rosa, CA
Board of Directors Mobile Source Committee <i>(Meets on the 4th Thursday of each Month)</i>	Thursday	26	9:30 a.m.	Board Room

MM – 11/6/13 (3:19 p.m.)

P/Library/Forms/Calendar/Calendar/Moncal

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Robert Bornstein, Ph.D. and Members
of the Advisory Council

From: Jack P. Broadbent
Executive Officer/Air Pollution Control Officer

Date: October 31, 2013

Re: Draft Minutes of the Advisory Council Meeting of October 9, 2013

RECOMMENDED ACTION

Approve the attached draft minutes of the Regular Meeting of the Advisory Council on October 9, 2013.

DISCUSSION

Attached for your review and approval are the draft minutes of the Regular Meeting of the Advisory Council on October 9, 2013.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Gallagher
Reviewed by: Rex Sanders

Attachment

AGENDA: 1

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
(415) 749-5073

DRAFT MINUTES

Advisory Council Regular Meeting
Wednesday, October 9, 2013

Note: An audio recording of the meeting is available on the website of the Bay Area Air Quality Management District at <http://www.baaqmd.gov/The-Air-District/Board-of-Directors/Advisory-Council/Agendas-and-Minutes.aspx>.

CALL TO ORDER: Chairperson Bornstein called the meeting to order at 9:01 a.m.

ROLL CALL

Present: Chairperson Robert Bornstein, Ph.D.; Vice-Chairperson Sam Altshuler, P.E.; Secretary Liza Lutzker, M.P.H.; and Members Jennifer Bard, Benjamin Bolles, Jeffrey Bramlett, M.S., C.S.P., Harold Brazil, Jonathan Cherry, A.I.A., LEED A.P., Heather Forshey, Stan Hayes, John Holtzclaw, Ph.D., Kraig Kurucz, Rick Marshall, P.E., P.L.S., Jessica Range, LEED A.P., and Murray Wood.

Absent: Members Ana M. Alvarez, D.P.P.D., Gary Lucks, J.D., C.P.E.A., Kathryn Lyddan, J.D., Timothy O'Connor, J.D., and Estes Al Phillips.

Also Present: None.

OPENING COMMENTS:

Chairperson Bornstein thanked Vice-Chairperson Altshuler for his service as Chairperson at the last meeting of the Council.

PUBLIC COMMENT PERIOD: None.

CONSENT CALENDAR

- 1. Approval of the Minutes of the Advisory Council meetings of July 10, 2013, and September 11, 2013**

Council Comments: None.

Public Comments: None.

Council Action:

Member Holtzclaw made a motion to approve the minutes of July 10, 2013; Member Kurucz seconded; and the motion carried unanimously.

Member Holtzclaw made a motion to approve the minutes of September 11, 2013; Member Lutzker seconded; and the motion carried with Chair Bornstein and Members Bramlett and Marshall abstaining.

The Council discussed whether the current format of minutes is in need of adjustment. Chair Bornstein noted the general agreement of those members present that no further adjustments are needed at this time.

DISCUSSION

2. Approval of draft report on the Advisory Council's September 11, 2013, meeting

Public Comments:

Taylor Hawke, 350 Bay Area and 350 Marin, addressed to Council in support of the draft report, particularly the emphasis on the health impacts associated with climate change, and urged a revision be made to Recommendation #2 to include the development of a comprehensive regional climate plan and supplied material in support of his comments.

Robert Gould, M.D., Physicians for Social Responsibility addressed the Council in support of the Recommendations on page 8 of the draft report.

Member Holtzclaw thanked the public speakers and invited them to engage the Board of Directors.

Chairperson Bornstein echoed Member Holtzclaw.

Member Altshuler notified the public speakers of the impending vacancies on the Council.

NOTED PRESENT: Member Brazil was noted present at 9:30 a.m.

Council Comments:

Member Range made introductory comments regarding the drafting of the report.

The Council deliberated upon proposed revisions to the draft report on the Advisory Council meeting on September 11, 2013.

Council Action: None; informational only.

OTHER BUSINESS

3. Chairperson's Report:

Chairperson Bornstein announced the term expirations of Members Wood and Lucks on December 31, 2013, and asked Eric Stevenson, Director of Technical Services, to explain the categories of the seats and the recruitment process, which information was provided by Mr. Stevenson and Jean Roggenkamp, Deputy Air Pollution Control Officer. The Council and staff discussed the recruitment process.

Chairperson Bornstein announced he will be presenting a Council update to the Board of Directors' Executive Committee on October 21, 2013, and that the annual Council presentation to the Board of Directors will likely occur on December 4, 2013. Chairperson Bornstein tasked Member Altshuler with the assembly of the presentation team and the development of the material for presentation to the Board.

Chairperson Bornstein urged members to consider potential topics for next year with the intention of asking the Council to make a selection at its next meeting.

The Council and staff discussed the process for the nomination and appointment of Council officers for 2014. Member Altshuler nominated Member Range for Secretary. Ms. Roggenkamp asked the Council to submit any additional nominations to the Clerk of the Boards, who will prepare a ballot, if necessary, for the next meeting of the Council.

The Council discussed the possibility of and logistics related to an informal social gathering of the Council at the end of the year. Ms. Roggenkamp cautioned the Council to heed the limitations of the event under the Brown Act.

4. Council Member Comments/Other Business:

Member Hayes encouraged the members to remain vigilant in their use of microphones.

5. Time and Place of Next Meeting:

Wednesday, November 13, 2013, Bay Area Air Quality Management District Headquarters, 939 Ellis Street, San Francisco, CA 94109 at 9:00 a.m.

6. Adjournment: The meeting adjourned at 12:26 p.m.

Sean Gallagher
Clerk of the Boards

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

Memorandum

To: Chairperson Robert Bornstein, Ph.D., and Members
of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: October 31, 2013

Re: Discussion, Recommendation and Selection of Slate Officers for 2014

RECOMMENDED ACTION

The Advisory Council will consider approving a Slate of Officers for 2014.

BACKGROUND

The Advisory Council will discuss a Slate of Officers for 2014.

BUDGET CONSIDERATION/FINANCIAL IMPACT

None.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Maricela Martinez
Reviewed by: Rex Sanders

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Robert Bornstein, Ph.D., and Members
of the Advisory Council

From: Jack P. Broadbent
Executive Officer/Air Pollution Control Officer

Date: October 10, 2013

Re: Discussion of Draft Report on the Advisory Council Meeting on October 9, 2013

The attached draft report of the September 11, 2013, Advisory Council Meeting on Black Carbon: Health Effects of Exposure was discussed with Air District staff and revised by the Council at its meeting on October 9, 2013. The Council will finalize the recommendations at its meeting on November 13, 2013.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Sean Gallagher
Reviewed by: Rex Sanders

Attachment

DRAFT REPORT ON THE SEPTEMBER 11, 2013 ADVISORY COUNCIL MEETING ON BLACK CARBON: HEALTH EFFECTS OF EXPOSURE

SUMMARY

The following presentations were made at the September 11, 2013 Advisory Council meeting on Black Carbon and Climate Change- Health Impacts:

1. Health Impacts Associated with Climate Change by Dr. Linda Rudolph, MD, MPH. Dr. Rudolph is co-director of the Climate Change and Public Health Project at the Public Health Institute in Oakland, CA. She is also principal investigator on a Public Health Institute project to advance integration of health into all policies in local jurisdictions around California. She holds an MD from the University of California at San Francisco and a Master of Public Health from the University of California at Berkeley. Previously, Dr. Rudolph served as the Deputy Director of the California Department of Public Health in the Center for Chronic Disease Prevention and Health Promotion and as the Health Officer and Public Health Director for the City of Berkeley.
2. Black Carbon- Health Effects of Exposure by Professor Michael Kleinman. Dr. Kleinman is Professor of Occupational and Environmental Medicine in the Department of Medicine at the University of California at Irvine. He is also Co-Director of the Air Pollution Health Effects Laboratory in the Department. He holds a Master in Chemistry from the Polytechnic Institute of Brooklyn and a Ph.D. in Environmental Health Sciences from New York University. He has published more than 100 articles in peer-reviewed journals dealing with environmental contaminants and their effects on cardiopulmonary and immunological systems, and has directed more than 50 controlled exposure studies of human volunteers and laboratory animals to ozone, particulate matter (PM), and other pollutants.

This is Prof. Kleinman's second presentation to the Advisory Council in two years. On October 12, 2011, he discussed his research on neurological and cardiopulmonary effects of inhaled particles on humans and laboratory animals. In that presentation, Prof. Kleinman demonstrated that semi-volatile components of PM_{2.5} and ultrafine particles (UFP) can promote airway allergies and accelerate development of cardiovascular disease, and that they can increase production of inflammatory mediators, damaging brain cells. The September 11th presentation provided an update on Prof. Kleinman's research, including the unique effects of nanoparticles.

KEY POINTS

Dr. Linda Rudolph

1. Climate change is the greatest public health challenge of the 21st century. Climate change will continue to result in direct and indirect health impacts, including: heat-related illness and death, asthma and other respiratory disease, cardiovascular disease, vector-borne disease, water- and food-borne disease, increased allergies from increased pollen counts, other infectious disease (e.g., valley fever), mental health disorder, malnutrition, and food insecurity (see Glossary).

2. The Intergovernmental Panel on Climate Change (IPCC) in their *Managing the Risks of Extreme Events and Disasters to Advance Climate Change*,¹ predict that extremes in some weather events will increase in frequency and intensity under projected climate change scenarios. Severe climate events have already been shown to result in significant negative health effects. Examples include:
 - a. During the 2006 heat wave in California, 650 excess deaths occurred, and an even greater number of excess emergency room visits and hospitalizations resulted. A large number of excess deaths occurred in areas typically cooler and lacking air conditioning; about 45% of those who died lived alone.²
 - b. Acute health care costs from just six major climate events (i.e., from heat waves, wildfires, ozone pollution, hurricanes, flooding, and infectious disease) in the U.S. between 2000 and 2009 totaled \$14 billion and led to 1,699 premature deaths.³
3. Climate change threatens our survival by disrupting systems upon which humans depend, such as water, food, shelter, peace, and social stability. Faster and more aggressive action is needed to avert the worst effects of climate change and to avoid catastrophic impacts on future generations.
4. Climate change will impact vulnerable populations to the greatest extent. Those already most at risk for adverse health problems (e.g., poor, young, old, and disenfranchised) may not be as resilient at responding to climate events (e.g., due to lack of air conditioning or transportation).
5. The effects of climate change may overwhelm ongoing air quality improvement efforts. For instance, warmer temperatures throughout California are expected to result in up to 30 more days per year of unhealthy ground-level ozone concentrations. This is known as a “climate penalty.”
6. According to Dr. Dan Cayan, Director of the Climate Research Division at the Scripps Institution of Oceanography, annual average temperatures in the Bay Area are expected to increase 3.5-11⁰F by 2050, depending on the specific location within the Bay Area,

¹ IPCC, 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp. Also available online at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#SREX. Accessed October 15, 2013.

² Hoshiko S, English P, Smith D, Trent R. A simple method for estimating excess mortality due to heat waves, as applied to the 2006 California heat wave. *Int J Public Health*. 2010 Apr; 55(2):133-7. doi: 10.1007/s00038-009-0060-8. Epub 2009 Aug 13. PMID: 19680599.

³ Knowlton K, Rotkin-Ellman M, Geballe L, Max W, Solomon GM. Six climate change-related events in the United States accounted for about \$14 billion in lost lives and health costs. Health and Environment Program, Natural Resources Defense Council, New York City, NY, USA. *Health Aff (Millwood)*. 2011 Nov; 30(11):2167-76. doi: 10.1377/hlthaff.2011.0229.

with inland areas most affected. The Bay Area may be particularly vulnerable because the population is not well-adjusted to high temperatures and its existing infrastructure is not well suited for adaptation (e.g., buildings are designed for coastal mild climates and lack air conditioning systems).

7. A public health climate strategy requires dramatic reductions in greenhouse gas (GHG) emissions, preparation, and building climate resilient communities. Strategies should include greater energy efficiency standards (especially for buildings and vehicles), greater use of pervious surfaces, cool roofs, urban greening, and development of plans to protect vulnerable populations from extreme heat and other weather events.
8. Many climate-focused efforts have health co-benefits and many health-focused efforts also have climate co-benefits:
 - a. GHG reduction measures as outlined in California's Assembly Bill 32 Scoping Plan are expected to result in measurable health co-benefits, including a reduction of PM and oxides of nitrogen (NOx) emissions. A recent study estimates these reductions by 2030 as 1 and 15%, respectively, when compared to business as usual.
 - b. Changing transportation modes to active transportation (i.e., cycling, walking, and transit), not only reduces GHG emissions and other air pollutants, but also provides other health benefits. Maizlish et al., 2011,⁴ using ITHIM (an active transportation computer model), predicted that if active transportation in the Bay Area were to increase from the current average of four minutes a day to 15 minutes (from a 2 to 15% mode share), not only would there be a 14% reduction in GHG emissions, but dramatic health benefits could be expected due to the increase in exercise and physical activity (benefits equal in magnitude to those achieved by California's Tobacco Control Program, which has averted one million excess deaths since implementation 25 years ago). These benefits include:
 - A 14% reduction in heart disease, stroke, and diabetes
 - A 6-7% reduction in depression and dementia
 - A 5% reduction in breast and colon cancers
 - An additional 9.5 months of life expectancy per person
 - An annual health cost savings of \$1.4 to \$22 billion within the Bay Area

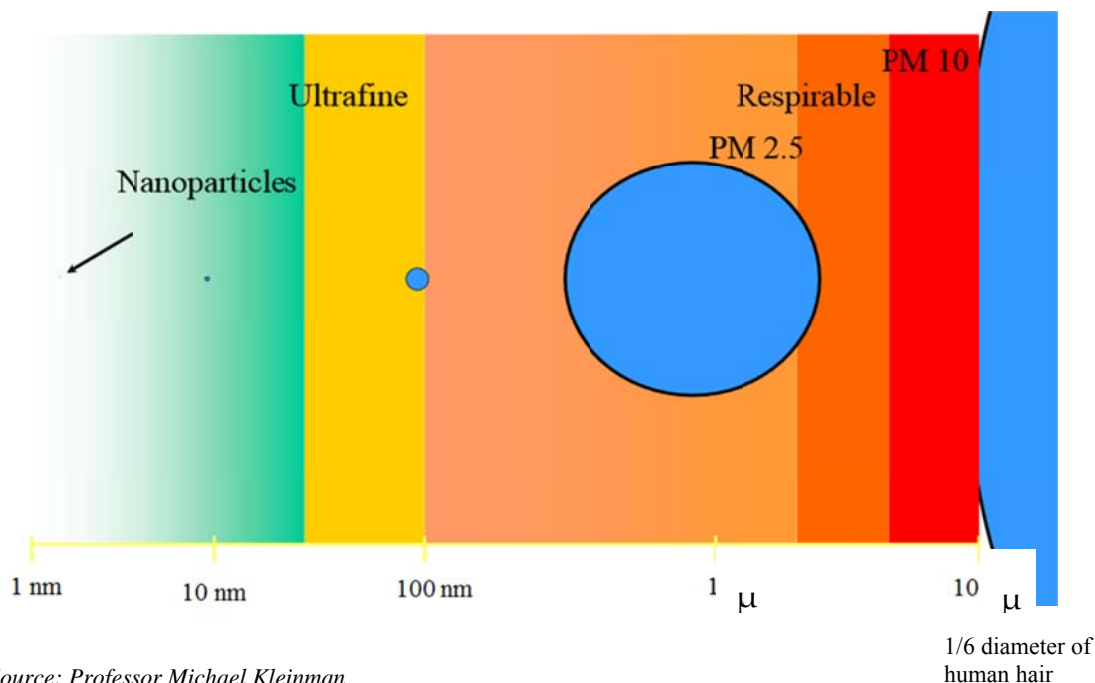
It is important to note, however, that the ITHIM model also predicts a 19% increase in avoidable bicycle and pedestrian injuries due to increased potential for conflicts with vehicles. Therefore, in promoting active transportation it is important to identify measures that also address bicycle and pedestrian safety.

⁴ Maizlish N, Woodcock J, Co S, Ostro B, Fanai A, Fairley D. Health Cobenefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the San Francisco Bay Area. *Am J Public Health*. 2013 Apr;103(4): 703-9. doi: 10.2105/AJPH.2012.300939. PMID: 23409903. Technical Report available online at: http://www.cdph.ca.gov/programs/CCDPHP/Documents/ITHIM_Technical_Report11-21-11.pdf. Accessed October 15, 2013.

Prof. Michael Kleinman

1. Brown Carbon (BrC) and Black Carbon (BC) aerosols are present in the nanoparticle size range. Figure 1 illustrates the size of nanoparticles compared to larger particles. The 10 micron (μ) particle size shown on the left of Figure 1 is approximately one-sixth the diameter of a human hair.

Figure 1. Particle Scale



Source: Professor Michael Kleinman

2. Combustion processes result in the formation of nanoparticles. Studies of roadways in Southern California show that the majority of particles measured were < 1 micron in diameter and that those closest to the source were even smaller and ranged between 70 and 80 nanometer (nm).
3. More recently, nanoparticles are being manufactured for use in electronics, grinding during finishing processes, and research, including medical research. Engineered nanoparticles can have a similar structure to diesel exhaust particles and can be inflammatory in the human body.
4. The surface area per unit mass of nanoparticles is greater than that of larger particles. This allows for a greater number of potentially toxic particles to attach to nanoparticle surfaces, and subsequently be inhaled.
5. Due to the small size of nanoparticles, they can be transported deep into the lung, bloodstream, and across cell membranes, resulting in a wide range of adverse health effects. These include severe effects on cardiovascular and pulmonary function, as well as cellular and DNA damage. While most toxic materials present on BrC and BC aerosol particles are generally insoluble, these particles may accumulate in the lymph nodes and over time dissolve and travel to other organs, affecting the lungs, liver, brain, and heart.

6. Both BrC and BC contain organic carbon. Prof. Kleinman conducted a study on mice that evaluated health effects from the organic components of BrC and BC. The study exposed mice over an eight week period to particles containing organic components and to particles stripped of semi-volatile organics, including highly toxic organic compounds, such as Polycyclic Aromatic Hydrocarbons (PAHs). The following results were observed:
 - a. Mice exposed to particles without semi-volatile organic components showed an increase in cholesterol, as well as cell wall thickening, which restricts air flow.
 - b. Mice exposed to particles with semi-volatile organic components also showed an increase in cholesterol and cell wall thickening, but further showed an increase in arterial plaque, and a measurable decrease in heart rate variability (an adverse health effect).
7. Prof. Kleinman's studies concluded:
 - a. While the adverse health effects from nanoparticles stripped of organics still remain important, it appears that the semi-volatile fraction of particulates may be the key contributor to development of atherosclerosis and heart disease;
 - b. Thermal emission control technologies that remove semi-volatile organics not only reduce PM pollution, but may reduce the toxicity of residual particles (e.g., by removing PAHs, oxygenated hydrocarbons, and free radicals); and
 - c. Exposure to laboratory concentrated ambient particles (CAPs) increases inflammatory responses in the brain and is associated with damage to dopamine producing brain cells (same as in degenerative nerve diseases, such as Parkinson's).⁵

EMERGING ISSUES

1. Global climate change is happening faster than expected and is at the upper end of IPCC scenario projections. Aggressive measures are needed to address climate change.
2. The recent Yosemite Rim Fire may provide an opportunity to further examine the health impacts of large wildfires, anticipated to increase with climate change.
3. Air quality has and will continue to improve, but these improvements may be partially offset by effects from climate change (climate penalty). In the Bay Area, the potential for effects caused by the climate penalty may be mitigated by coastal cooling, an expected result of climate change.⁶

⁵ This information appeared in Dr. Kleinman's presentation materials, but was not orally presented to the Advisory Council.

⁶ Lebassi, B., J. Gonzalez, D. Fabris, E. Maurer, N. Miller, C. Milesi, P. Switzer, and R. Bornstein, 2009: Observed 1970-2005 cooling of summer daytime temperatures in coastal California. *Journal of Climate*. 22, 3558-73.

4. Preparation for the public health implications of climate change requires:
 - a. Identification of vulnerable populations and development of policies to protect them, such as strengthening social support networks; and
 - b. Designing communities that:
 - i. Enhance walking, cycling, and public transit
 - ii. Improve energy efficiency
 - iii. Adapt to, and recover from, the impacts of heat, drought, floods, and sea level rise.
5. Public health climate strategies should take full advantage of both climate and health strategies that provide co-benefits. Metrics can be used to assess the relative health benefits of climate policies. Some strategies may reduce both GHGs and other pollutants, but may present potential conflicts and may need further policy development, including:
 - a. Spare the Air Day alerts recommend that the public bicycle and walk on days when air quality is poor, potentially exposing sensitive groups to higher levels of air pollution.
 - b. Building high density development in high traffic areas may result in greater pedestrian and cycling injuries and may increase risks from higher levels of air pollutants.
6. Removal of highly toxic organics, including PAHs, from particles before inhalation can have substantial health benefits by reducing build-up of arterial plaque and its resulting adverse effects on the cardiovascular system. Processes for removing organic toxins are similar to engine afterburner technologies, which not only reduce pollution, but may also reduce the toxicity of residual particles.
7. The use of nanoparticles in products (engineered nanomaterial) and manufacturing has increased with little safety research and regulation. The unique properties of some engineered nanotubes (see glossary; which may have a similar structure as diesel particles) pose special challenges, ranging from the effects of occupational exposures to the final disposition of discarded products. The National Institute of Occupational Safety and Health (NIOSH) are currently proposing regulations to address workplace safety issues resulting from the use of carbon nanotubes. Such regulations present challenges because the current proposal is to regulate nanotubes and nanofibers at one $1 \mu\text{g}/\text{m}^3$, the quantification limit in air samples.

RECOMMENDATIONS

The following recommendations are based on the presentations given at the September 11, 2013 meeting of the Advisory Council, as well as from Advisory Council input:

1. The Air District should continue, and consider additional, climate strategies to reduce GHG emissions, and within its authority, provide guidance to protect vulnerable populations and promote the building of resilient communities. The Air District should consider the following strategies:
 - a. Compile and supplement (as needed) specific research⁷ and analyses to spatially and temporally understand the effects of climate change, air pollution, and health in the Bay Area and for vulnerable populations.
 - b. An outreach program that includes education to the public to understand climate change impacts on local health and air quality.
 - c. Develop a regional GHG emission reduction plan to demonstrate how the Bay Area will meet targets set forth in California's Executive Order S-3-05 to reduce GHG emissions by 80% below 1990 levels by 2050.
 - d. Develop health metrics to evaluate the relative co-benefits of different climate strategies.
 - e. Identify climate adaptation strategies and work with applicable agencies and municipalities to incorporate those policies as part of land use planning.
2. The Air District should support all necessary strategies that promote active transportation. Examples include:
 - a. Increased funding for transit operations and alternative (to solo driving) transportation choices (e.g., transit, vanpools, carpools, car sharing, bicycle sharing) as funds become available, including funds from cap and trade, toll increases, high occupancy toll lane revenues, and tax measures.
 - b. Increased funding and promotion of improved roadway designs for safer walking and cycling infrastructure (i.e., complete streets; see Glossary) to maximize health co-benefits of reduced air pollution and increased physical activity (see the National Association of City Transportation Officials' Urban Bikeway Design Guide at: <http://nacto.org/cities-for-cycling/design-guide/>).
 - c. Continued and expanded funding for bicycle infrastructure, with a focus on secure bicycle parking near transit, workplaces, and schools. Consider incentive funding

⁷ There are at least two existing reports that have explored the vulnerability of the Bay Area to climate events. These reports are referenced below:

1. Jerrett, Michael, Jason G. Su, Colleen E. Reid, Bill Jesdale, Alberto M. Ortega Hinojosa, Seth B. Shonkoff, Edmund Seto, Rachel Morello-Frosch (University of California, Berkeley). 2012. Mapping Climate Change Exposures, Vulnerabilities, and Adaptation to Public Health Risks in the San Francisco Bay and Fresno Regions. California Energy Commission. Publication number: CEC-500-2012-041. Available online at: <http://www.energy.ca.gov/2012publications/CEC-500-2012-041/CEC-500-2012-041.pdf>. Accessed October 16, 2013.
2. Cooley, H., E. Moore, M. Heberger, and L. Allen (Pacific Institute). 2012. Social Vulnerability to Climate Change in California. California Energy Commission. Publication Number: CEC-500-2012-013. Available online at: http://www.pacinst.org/wp-content/uploads/2013/02/full_report31.pdf. Accessed October 16, 2013.

for bicycle purchases and/or subsidized bicycle sharing, especially for low income populations.

- d. Ensuring that the 2016 Regional Transportation Plan maximizes health benefits from active transportation.
3. The Air District should evaluate the climate benefits and relative health benefits and risks (e.g., exposure to air pollutants, pedestrian/cycling injuries) from infill development and identify appropriate policies to address them.
4. The Air District should work with other agencies to prioritize indoor air quality for new development, in particular development in proximity to air pollution sources. While tighter building envelopes in new construction improves energy efficiency and reduces infiltration of external pollutants, pollutants generated indoors become increasingly important and require adequate filtration and ventilation.
5. The Air District should further investigate the relative health risks and benefits from recommending walking and cycling on high air pollution days, particularly with respect to sensitive populations. Some Air recommendations may require reformulation, with a goal of promoting active transportation, while providing appropriately protective recommendations for sensitive populations.
6. The Air District should monitor research on the impacts of coastal cooling on maximum ozone concentrations in the Bay Area.
7. The Air District should monitor and support research on combustion engineering processes that reduce emissions of the semi-volatile organic fraction of UFPs generated in a wide range of combustion engines.
8. The Air District should continue to monitor and support responsible regulation at the federal level related to the use of nanoparticles in industrial and consumer products, including, but not limited to: standardized research, toxicological testing, biomonitoring, and product labeling.

In addition, the Advisory Council's October 13, 2010 report identifies strategies for aggressively reducing GHG emissions to meet California's 2050 GHG target of an 80% reduction in GHG emissions below 1990 levels. That report includes a number of recommendations, incorporated into this report (see Attachment A for recommendations specifically applicable to this report) and should be reviewed by the Air District for incorporation, as appropriate, to meet long-term GHG reduction goals.

ACRONYMS

BC: black carbon

BrC: brown carbon

CAP: concentrated ambient particles

EPA: (United States) Environmental Protection Agency

GHG: greenhouse gases

HEPA: high efficiency particulate air

IPCC: Intergovernmental Panel on Climate Change

ITHIM: Integrated Transport and Health Impact Model. For more information see:

http://www.cdph.ca.gov/programs/CCDPP/Documents/ITHIM_Technical_Report11-21-11.pdf

Micrometer (μm): one millionth of a meter or 1,000 nanometers

Nanometer (nm): one billionth of a meter

NIOSH: National Institute of Occupational Safety and Health NO_x: oxides of nitrogen

PAH: polycyclic aromatic hydrocarbon

PM: particulate matter

UFP: ultrafine particles

GLOSSARY

Complete Streets: Transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient, and comfortable travel, and to provide access for users of all ages and abilities, regardless of their mode of transportation. Focus should be on separating pedestrians and cyclists from motor traffic and slowing traffic to safe speeds. Complete Streets is intended to allow for safe travel by those walking, bicycling, driving automobiles, riding public transportation, or delivering goods.

Food Insecurity: Limited or uncertain availability of nutritionally adequate and safe foods, or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

Nanoparticles: Particle having one or more dimensions of the order of 100 nanometers or less.

Nanotubes: A hollow cylindrical carbon structure used in nanotechnology

Attachment A

Recommendations from the Advisory Council Report from the October 13, 2010 Meeting Strategies and Technologies for the Transportation Sector

The Air District should:

1. Work with MTC and ABAG to condition transportation and development investments and grants upon implementation of parking reform. The Air District should also include parking reform policies in development of an indirect source rule.
2. Work with MTC to analyze induced demand impacts from MTC's HOT Lane network expansion (study being done by MTC consultant Parsons Brinkerhoff). Modeling does not currently, but should, include a range of impacts of induced demand or increased housing at suburban fringe. The Air District should specify that net revenues from HOT lanes be used for expanded non-highway transit and transit choices, rather than expansion of the highway system.
3. Work with MTC to consider adoption of a quantification tool that evaluates a broad range of public health impacts and benefits from transportation and land use policies and decisions. The Air District should also encourage MTC to conduct a performance-based analysis of transportation projects to ensure investments are cost effective.
4. Through the Air District's role in the Joint Policy Committee, encourage MTC to evaluate all transportation projects, including projects in previous Regional Transportation Plans (RTP), for impacts on VMT and potential to induce growth. The air district should encourage MTC to only include SCS/ RTP projects that do not increase personal VMT and do not induce sprawl. Additionally, the air district should implement the relevant Transportation Control Measures and Leadership Platform* in the 2010 Clean Air Plan to address those issues.
5. Develop a social marketing campaign to increase walking, cycling, and transit, based on latest research of proven strategies that affect behavior change, including comparison-with-neighbor policies.
6. Seek state legislation requiring CMAs to expand their mission statement from primarily "congestion management" to include a major emphasis on reducing-GHG and to enable a focus on: health; increasing mode share of walking, cycling, and transit; and on reducing VMT, rather than managing congestion.
7. Develop a toolkit for planners, local agencies, and CMAs for land use and transportation policies that have the greatest public health, air quality, and GHG reduction benefits.

8. Require use of cool paving materials, such as high albedo materials, for future outdoor surfaces, such as parking lots, median barriers, and roadway improvements to reduce urban heat island effects and to save energy.
9. Use MTC's SB 375 implementation planning funds for local community planning processes.
10. Build upon SB 535 (Yee) to support development of a strong statewide ZEV mandate and incentives to help the state reach aggressive GHG reduction goals.
11. Continue to work with other agencies in regional efforts to fund and accelerate EV charging infrastructure and streamline residential charging station installation and permitting, including incentives to promote solar EV charging installations. In addition, work with cities, counties, and utility districts to assist property owners in funding charging stations through Property Assessed Clean Energy (PACE) bonds, pursuant to SB 1340 (Kehoe).
12. Promote expansion of congestion toll pricing to all other regional bridges. Revenues raised should be used to improve public transit service in those corridors.
13. Develop and promote policies and programs, including securing necessary legislative authority, to achieve significant reductions in employer-related vehicle miles traveled, including mandating employer transportation demand management plans, such as have been adopted by Oakland (GreenTRIP) and San Francisco. Additionally, the air district should implement the relevant Transportation Control Measures and Leadership Platform in the 2010 Clean Air Plan to support these policies.
14. Support establishment of a VMT fee or gasoline tax in the Bay Area to achieve GHG, criteria pollutant, and air toxics reductions goals, and implement the relevant Transportation Control Measures and Leadership Platform* in the 2010 Clean Air Plan to support this recommendation.