



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

## ADVISORY COUNCIL MEETING

WEDNESDAY  
APRIL 9, 2014  
9:00 A.M.

7<sup>TH</sup> FLOOR BOARD ROOM  
939 ELLIS STREET  
SAN FRANCISCO, CA 94109

### AGENDA

#### CALL TO ORDER

Opening Comments  
Roll Call

Sam Altshuler, 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 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 Council's purview. Speakers are limited to three minutes each.*

#### CONSENT CALENDAR

1. Approval of Minutes of the March 13, 2014 Advisory Council meeting.

#### DISCUSSION

2. Discussion and finalization of draft report on the Advisory Council's February 13, 2014 meeting.

*The Advisory Council will discuss and finalize the draft report on the February 13, 2014 meeting on The Path Forward for the Energy Sector to Meet 2050 Green House Gas Goals with Air District staff.*

#### PRESENTATION

3. Air District staff will present information on programs and activities involving climate protection.

*Air District Staff will present information on programs and activities involving climate protection.*

## **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. Report of the Executive Officer/APCO

### 6. Time and Place of Next Meeting

*Wednesday, May 14, 2014 at 9:00 a.m. at 939 Ellis Street, San Francisco, CA 94109.*

### 7. Adjournment

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

**(415) 749-5073  
FAX: (415) 928-8560  
BAAQMD homepage:  
[www.baaqmd.gov](http://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](http://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**

**APRIL 2014**

<b><u>TYPE OF MEETING</u></b>	<b><u>DAY</u></b>	<b><u>DATE</u></b>	<b><u>TIME</u></b>	<b><u>ROOM</u></b>
<b>Advisory Council Regular Meeting</b> <i>(Meets on the 2<sup>nd</sup> Wednesday of each Month)</i>	Wednesday	9	9:00 a.m.	Board Room
<b>Board of Directors Regular Meeting</b> <i>(Meets on the 1<sup>st</sup> &amp; 3<sup>rd</sup> Wednesday of each Month)</i>	Wednesday	16	9:45 a.m.	Board Room
<b>Ad Hoc Building Committee</b> <i>(At the Call of the Chair)</i>	Wednesday	16	Immediately following the Regular Board meeting	4 <sup>th</sup> Floor Conf. Room
<b>Board of Directors Executive Committee</b> <i>(Meets on the 3<sup>rd</sup> Monday of each Month) - CANCELLED</i>	Monday	21	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room
<b>Board of Directors Stationary Source Committee</b> <i>(Meets Quarterly At the Call of the Chair)</i>	Monday	21	9:30 a.m.	Board Room
<b>Board of Directors Budget &amp; Finance Committee</b> <i>(Meets on the 4<sup>th</sup> Wednesday of each Month)</i>	Wednesday	23	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room
				<b><u>VIDEOCONFERENCE LOCATION:</u></b>  Santa Rosa Junior College Doyle Room 4243 1501 Mendocino Avenue Santa Rosa, CA 95401
<b>Board of Directors Mobile Source Committee</b> <i>(Meets on the 4<sup>th</sup> Thursday of each Month)</i>	Thursday	24	9:30 a.m.	Board Room

## MAY 2014

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
<b>Board of Directors Regular Meeting</b> <i>(Meets on the 1<sup>st</sup> &amp; 3<sup>rd</sup> Wednesday of each Month)</i>	Wednesday	7	9:45 a.m.	Board Room
<b>Advisory Council Regular Meeting</b> <i>(Meets on the 2<sup>nd</sup> Wednesday of each Month)</i>	Wednesday	14	9:00 a.m.	Board Room
<b>Board of Directors Climate Protection Committee</b> <i>(Meets 3<sup>rd</sup> Thursday of every other month)</i>	Thursday	15	9:30 a.m.	Board Room
<b>Board of Directors Executive Committee</b> <i>(Meets on the 3<sup>rd</sup> Monday of each Month)</i>	Monday	19	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room
<b>Board of Directors Stationary Source Committee</b> <i>(Meets Quarterly at the Call of the Chair)</i>	Monday	19	10:30 a.m.	Board Room
<b>Board of Directors Regular Meeting</b> <i>(Meets on the 1<sup>st</sup> &amp; 3<sup>rd</sup> Wednesday of each Month)</i>	Wednesday	21	9:45 a.m.	Board Room
<b>Board of Directors Mobile Source Committee</b> <i>(Meets on the 4<sup>th</sup> Thursday of each Month)</i>	Thursday	22	9:30 a.m.	Board Room
<b>Board of Directors Budget &amp; Finance Committee</b> <i>(Meets on the 4<sup>th</sup> Wednesday of each Month)</i>	Wednesday	28	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room

## JUNE 2014

<u>TYPE OF MEETING</u>	<u>DAY</u>	<u>DATE</u>	<u>TIME</u>	<u>ROOM</u>
<b>Board of Directors Regular Meeting</b> <i>(Meets on the 1<sup>st</sup> &amp; 3<sup>rd</sup> Wednesday of each Month)</i>	Wednesday	4	9:45 a.m.	Board Room
<b>Advisory Council Regular Meeting</b> <i>(Meets on the 2<sup>nd</sup> Wednesday of each Month)</i>	Wednesday	11	9:00 a.m.	Board Room
<b>Board of Directors Executive Committee</b> <i>(Meets on the 3<sup>rd</sup> Monday of each Month)</i>	Monday	16	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room
<b>Board of Directors Stationary Source Committee</b> <i>(Meets Quarterly at the Call of the Chair)</i>	Monday	16	10:30 a.m.	Board Room
<b>Board of Directors Regular Meeting</b> <i>(Meets on the 1<sup>st</sup> &amp; 3<sup>rd</sup> Wednesday of each Month)</i>	Wednesday	18	9:45 a.m.	Board Room
<b>Board of Directors Budget &amp; Finance Committee</b> <i>(Meets on the 4<sup>th</sup> Wednesday of each Month)</i>	Wednesday	25	9:30 a.m.	4 <sup>th</sup> Floor Conf. Room
<b>Board of Directors Mobile Source Committee</b> <i>(Meets on the 4<sup>th</sup> Thursday of each Month)</i>	Thursday	26	9:30 a.m.	Board Room

**BAY AREA AIR QUALITY MANAGEMENT DISTRICT**

Memorandum

To: Chairperson Sam Altshuler and Members  
of the Advisory Council

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

Date: March 26, 2014

Re: Approval of Minutes of the Advisory Council Regular Meeting on March 12, 2014

RECOMMENDED ACTION

Approve the attached draft minutes of the Regular Meeting of the Advisory Council on March 12, 2014.

DISCUSSION

Attached for your review and approval are the draft minutes of the Regular Meeting of the Advisory Council on March 12, 2014.

Respectfully submitted,

Jack P. Broadbent  
Executive Officer/APCO

Prepared by: Sean Gallagher  
Reviewed by: Rex Sanders

Attachment

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

**DRAFT MINUTES**

Advisory Council Regular Meeting  
Wednesday, March 12, 2014

*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 Sam Altshuler called the meeting to order at 9:01 a.m.

**Roll Call:**

Present: Chairperson Sam Altshuler, P.E.; Vice-Chairperson Liza Lutzker, M.P.H.; and Members Ana M. Alvarez, D.P.P.D., Benjamin Bolles, Jeffrey Bramlett, M.S., C.S.P., Jonathan Cherry, A.I.A., Heather Forshey, Stan Hayes, John Holtzclaw, Ph.D., Kraig Kurucz, Rick Marshall, P.E., P.L.S., Bruce Mast, SaraT L. Mayer, M.P.P., Timothy O'Connor, J.D., Estes Al Phillips, and Laura E. Tam.

Absent: Secretary Jessica Range, LEED A.P.; and Members Robert Bornstein, Ph.D., Harold Brazil, and Kathryn Lyddan, J.D.

Also Present: Board Director Brad Wagenknecht (in the audience).

**Opening Comments:**

Chairperson Altshuler gave opening comments regarding the successful draft report writing process, delivered the *Summary of 2009 – 2010 Advisory Council (Council) Presentations*, and noted the summary of Council survey results for later discussion.

NOTED PRESENT: Member O'Connor was noted present at 9:04 a.m.

**PUBLIC COMMENT PERIOD:** There were no requests for public comment.

**CONSENT CALENDAR**

**1. Approval of the Minutes of the February 13, 2014 Advisory Council Meeting**

Council Comments: None.

Public Comments: There were no requests for public comment.

Council Action:

Member Marshall made a motion to approve the minutes of February 13, 2014; Member Mast seconded; and the motion carried by the following vote of the Council:

AYES: Altshuler, Alvarez, Bolles, Bramlett, Hayes, Kurucz, Lutzker, Marshall, Mast, O'Connor and Tam.

NOES: None.

ABSTAIN: Forshey, Mayer and Phillips.

ABSENT: Bornstein, Brazil, Cherry, Holtzclaw, Lyddan and Range.

## **DISCUSSION**

### **2. Discussion of Draft Report on the Advisory Council's February 13, 2014 Meeting**

Council Comments:

Chairperson Altshuler and Member Hayes made introductory comments regarding the drafting of the report.

The Council and staff deliberated upon proposed revisions to the draft report on the Advisory Council meeting on February 23, 2014.

NOTED PRESENT: Member Holtzclaw was noted present at 9:20 a.m.

NOTED PRESENT: Member Cherry was noted present at 10:29 a.m.

Public Comments: There were no requests for public comment.

Council Action: None; receive and file.

## **OTHER BUSINESS**

### **3. Council Member Comments/Other Business:**

Vice-Chairperson Lutzker delivered *Summary – BAAQMD AC Survey Responses* and made comments on the same.

Vice-Chairperson Lutzker summarized the action items from today's meeting as member responses to an upcoming staff invitation to the 2014 Annual Air & Waste Management Association (AWMA) Conference; further revisions to the report writing guidelines, if any; the three lists of interest items noted by the Clerk, as requested by Chairperson Altshuler; a report from staff on the number of permitted backup generators, including various metrics to provide a

snapshot of the current state, the permitting outlook, and how many old versus new generators are in use; and the delivery of the Air District organizational chart.

The Council and staff discussed potential items for the April agenda, including delivery of a staff report regarding activities relating to the May presentations; staff presentations previously made to the Board of Directors that may be of interest to the Council; staff comments on the February 2014 draft report; and a discussion with District Counsel's office regarding the Air District's role/authority from a legal perspective.

**4. Report of the Executive Officer/Air Pollution Control Officer (APCO):**

Jean Roggenkamp, Deputy Air Pollution Control Officer, presented a summary of Air District activities, including the initiation of the Air District budget cycle, the slow filling of staff vacancies, Senate Bill 1415 (Hill) regarding the composition of the Council; and the development of the Clean Air Plan along with the related regional climate strategy.

The Council and staff discussed the effect of unexpected, significant events on air quality and how they are assimilated into reports to the U.S. Environmental Protection Agency; how the Council's work fits with that of the Air District on matters such as the Clean Air Plan; Air District coordination on planning efforts at the state and federal level; and AWMA critical review subjects in the past, present and future.

**5. Time and Place of Next Meeting:**

Wednesday, April 9, 2014, 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 11:19 a.m.

Sean Gallagher  
Clerk of the Boards



**BAY AREA AIR QUALITY MANAGEMENT DISTRICT**

Memorandum

To: Chairperson Sam Altshuler and Members  
of the Advisory Council

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

Date: March 26, 2014

Re: Discussion of Draft Report on the Advisory Council Meeting on February 13, 2014

The attached draft report of the February 13, 2014, Advisory Council Meeting on The Path Forward for the Energy Sector to Move Towards the 2050 Greenhouse Gas Goals, as revised at the Advisory Council meeting on March 12, 2014, will be discussed with Air District staff and finalized for approval at its meeting on April 9, 2014.

Respectfully submitted,

Jack P. Broadbent  
Executive Officer/APCO

Prepared by: Sean Gallagher  
Reviewed by: Rex Sanders

Attachment

**REPORT ON ADVISORY COUNCIL ACTIVITIES IN FEBRUARY-APRIL 2014:  
THE PATH FORWARD FOR THE ENERGY SECTOR TOWARD  
CALIFORNIA'S 2050 GREENHOUSE GAS (GHG) GOAL**

EXECUTIVE SUMMARY

This report summarizes ongoing activities of the Advisory Council during February-April 2014, consolidating presentations received, and subsequent discussion and consideration by Council members during this period. It is the intent of the Council to continue study of this topic throughout 2014. As more information is received and evaluated by the Council, conclusions and recommendations are expected to evolve, and will be documented in future reports.

The following presentations were made at the February 13, 2014 Advisory Council meeting:

1. *Roadmaps for Transitioning California and the Other 49 States to Wind, Water and Solar Power for All Purposes* by Dr. Mark Jacobson, Professor of Civil and Environmental Engineering and Director of the Atmosphere/Energy Program at Stanford University.
2. *California's Transition to a Low Carbon Economy: Infrastructure, Regulation, and Local Action* by Dr. Jim Williams, Chief Scientist at Energy + Environmental Economics, and until recently, an associate professor of international environmental policy at the Monterey Institute of International Studies.

A video recording of these presentations and the Council's discussion can be reviewed at [baaqmd.granicus.com/MediaPlayer.php?publish\\_id=081f9418-e64b-1031-927d-78be5054b89b](http://baaqmd.granicus.com/MediaPlayer.php?publish_id=081f9418-e64b-1031-927d-78be5054b89b)

Based on these presentations, the Council has identified several key emerging issues. Primary among these is the need for further investigation and definition of the most appropriate role for the District, both in its own activities and working in collaboration with other agencies also involved in the future of energy use and production in the Bay Area.

From its activities in February-April 2014, the Advisory Council has developed the following preliminary draft recommendations for further consideration during the year:

1. Planning: The District should work with other regional agencies to develop and adopt a ***Bay Area Energy Futures Plan*** to guide, facilitate, and coordinate energy-related regional actions to achieve California's target of 80 percent reduction in GHG emissions from 1990 levels by 2050.
2. Coordination: The District should collaborate with other public agencies to develop the coordinated regulatory and legislative framework required for transition to greater electrification of energy sectors along with increased de-carbonization of electricity.
3. Grants: The District should further incorporate into its grant programs criteria that incentivize outcomes that are called for in the Bay Area Energy Futures Plan.
4. Education: The District should adopt an aggressive public education campaign that stresses the economic, health, and resiliency co-benefits of a shift to a low-carbon economy.

## BACKGROUND

### **Professor Mark Jacobson**

1. Jacobson has developed a 50-state roadmap for transforming the U.S. from dependence on fossil fuels to 100% renewable energy by 2050. Each state has the opportunity to transition to renewable wind, water, and solar (WWS) power for all purposes.<sup>1</sup>
2. A comprehensive approach to future energy sector planning would consider more than carbon reduction. A 100% WWS strategy would consider all aspects of climate change and also minimize negative externalities associated with air pollution, public health impacts, and resource availability. According to Jacobson, the benefits of such a transition in California would be thousands fewer air pollution deaths per year, tens of billions of dollars in reduced global climate costs, tens of thousands of new jobs, and reduced future energy costs.
3. Given the scale and complexity of this transformation, action needs to begin. Reasons for needing this transition include the impacts of climate change, the health effects of air pollution (which Jacobson estimated kills 2.5 to 4 million people worldwide each year), and the risk that rising fossil fuel prices lead to economic, social, and political instability.
4. While often considered to be cleaner than current fossil fuel energy technologies, some non-WWS energy technologies may themselves present significant adverse climate, environmental, and/or health effects, as compared to WWS sources. According to Jacobson, these “not recommended” fuel sources include natural gas, “clean coal” with carbon capture, nuclear, soy/algae biodiesel, and ethanol (corn, cellulosic, sugarcane).
5. Jacobson illustrated the land use impacts of a 100% WWS scenario for California. In this example scenario, existing WWS sources would be retained, with improved efficiency. New WWS sources to replace existing non-WWS sources would be a mix of 35% from wind, 55% from solar, and 10% from other sources (geothermal, hydro,<sup>2</sup> tidal, wave). The footprint of the total energy supply portfolio in this scenario would be less than 1% of the state’s land area (or ~2.7% including the open space between wind turbines). This scenario would require tens of thousands of new on- and offshore wind turbines, millions of residential roof photovoltaic (PV) systems, several thousand large-scale solar plants, and a number of geothermal, hydro, tidal, and wave plants and devices.
6. While the intermittent nature of renewables is sometimes cited as a barrier to high levels of renewable electricity integration, Jacobson stated that over 99.8% of California’s energy needs can be supplied from WWS (without over-sizing) using real-time demand-response or energy storage to match power generation to daily and time-of-day demand.

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<sup>1</sup> “All purposes” as used here refers to electricity, transportation, building heating and cooling, and industry. For more details and the illustrative plans developed by Professor Jacobson and his collaborators for California and other states, see [www.thesolutionsproject.org](http://www.thesolutionsproject.org).

<sup>2</sup> The scenarios assume that existing large hydro supplies would remain in place.

7. According to Jacobson, WWS energy technologies are in many cases cost-competitive with conventional sources today when life-cycle costs are considered. Including a conservative estimate of fossil fuels' negative externalities would make WWS sources even more cost effective. By 2020-2030, WWS sources will be less expensive than conventional supplies, even without accounting for externalities.
8. Jacobsen also spoke about using excess electricity to generate hydrogen as an energy storage mechanism. Energy storage is a key element in the use of renewable power.

**Dr. Jim Williams**

1. California's climate goals include the AB 32 requirement to reduce statewide GHGs to 1990 levels by 2020, along with the goal of reducing GHGs to 80% below 1990 levels by 2050 (Executive Order S-3-05).
2. Beyond 2020, Williams believes the California policy approach is likely to follow a similar framework to AB 32, but a transformation of the energy system is required to meet the 2050 goal. Williams identified three primary strategies related to energy:
  - a. Reduce energy use through efficiency (in buildings and vehicles) and smart growth. Examples include achieving "zero net energy" in new homes beginning in 2020, and over the next 20 years from now, the retrofit of the majority of existing homes.
  - b. Decarbonize both electricity (away from natural gas) and transportation fuels. The state's loading order<sup>3</sup> may need to be modified to integrate greater concentrations of renewables. However, Williams stated that some low carbon electricity resources will still be needed to maintain grid reliability.
  - c. Electrification of transportation, building heating/cooling and industrial processes. Over the next 20 years, examples include the replacement of 70% of gasoline and diesel light-duty vehicles with EVs or PHEVs, as well as the replacement of 75% of existing gas water heaters with electric heat pump water heaters.
3. The scale of up-front investment needed statewide by 2050 is quite large,<sup>4</sup> but variability in fossil fuel costs also presents a cost risk for inaction. Decarbonization and electrification will shift the energy economy to be dominated by fixed (capital) costs rather than variable (fuel) costs. In addition, there will be co-benefits (climate, health, etc.) that come with this shift.
4. The extent of the transformation requires solutions to a variety of technical and planning challenges. In addition, achieving these goals will require better coordination across state and regional agencies and sectors that have typically operated in silos, as well as the establishment of clear GHG mandates to guide the actions of each agency.

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<sup>3</sup> The loading order defines the priority that utilities must assign to different types of electric supply, with efficiency and demand response coming first, followed by renewables and then other supplies.

<sup>4</sup> There is a large uncertainty in both technology costs and fuel costs, but the net cost increase could be on the order of ~\$500 billion by 2050. The cost estimates presented did not provide a value for the co-benefits (reduced externalities) of shifting away from polluting fuels.

5. Of particular note for the District, as transportation is electrified, emissions from the transportation sector (regulated by the State) will shift more and more toward stationary sources (regulated by the District).
6. Williams argued that public support and politics are bigger obstacles than technical abilities in reducing our GHG emissions for the future.

### KEY EMERGING ISSUES

1. Further definition of the Bay Area's role. Further investigation is needed to identify, evaluate, and prioritize policies and measures that the District and other regional agencies can implement to support and advance attainment of the District's 2050 GHG reduction goals. Policies and measures need to be developed that are effective, efficient, and feasible, and they need to be coordinated across agencies, accounting for each agency's mission and authorities.
2. Further evaluation of the District's role. To achieve 2050 GHG reduction goals, a fundamental transition in energy sources and usage will need to be made across California and thus the Bay Area. This transition affects a number of areas that are within the District's ability to regulate, as well as other areas that are outside the District's current authority. Further evaluation of the District's evolving role is needed, including its authority and capacity to regulate and/or permit stationary sources that emit GHGs (with a long-range goal of reducing use of carbon fuels and their impacts on climate, air quality, and public health), influence indirect GHG emissions associated with energy consumed within the District, continue to educate the public, and coordinate with other agencies or expand its role in areas that the District has not traditionally pursued, including:
  - a. Energy efficiency (e.g., codes, financing, retrofits)
  - b. Energy use (e.g., choice of supply, rates, reliability)
  - c. Energy generation (e.g., distributed energy, on-site renewable, CCS)
  - d. Sources of energy use and emissions in buildings (e.g., water heaters, furnaces)
  - e. Planning (e.g., zoning, density, infill)
  - f. Transit (e.g., mode shifting, biking, walkable cities)
  - g. Vehicles and goods movement (e.g., infrastructure, consumer choices, technology development)
  - h. Non-energy/non-CO<sub>2</sub> GHGs (e.g., methane, HFCs, SF<sub>6</sub>)
  - i. Waste (e.g., waste management, landfill gases)
  - j. Agriculture (e.g., animal feedlots, agricultural tillage, forestry)
  - k. Tailpipe emissions from vehicles
  - l. Upstream/life-cycle impacts (e.g., emissions over life cycle, not just in the District)
  - m. Water (e.g., use, pumping, efficiency)
  - n. Climate change adaptation
  - o. Carbon sequestration
  - p. Parks and public lands

3. Decarbonization of energy used in the District. For the Bay Area to achieve long-term climate goals in the energy sector, a fundamental transition must be made to lower per capita GHG emissions. Although it will require cooperation and coordination with the California Public Utilities Commission (CPUC) and California Energy Commission (CEC), further investigation is needed in the District to develop and deploy major improvements in energy efficiency in all sectors, including transportation. Attainment of the District's 2050 GHG reduction goals will require more than just energy efficiency. Energy supply will need to be decarbonized, and energy demand will need to be supplied through low and no-carbon resources. How this will be done -- what policy choices, regulatory approaches, technology developments, and implementation measures will be needed -- is a major and critically important emerging issue. Further investigation is needed to identify, develop, and deploy measures to reduce the carbon intensity of energy (imported and produced within the Bay Area) used in residential, commercial, and industrial applications, as well as in the transportation sector.
4. Resiliency. Further investigation is needed to better understand how the shift to low-carbon energy supply and demand might help insulate California from the worst impacts of climate change, including drought, reduced snow pack, sea level rise, heat waves, and energy price volatility.
5. Grid reliability. Further investigation is needed to identify means by which grid reliability and back-up power generation can be ensured while also transitioning from fossil fuels to low carbon energy sources. Zero (or minimum) emission energy source dispatching strategies and tools for implementing those strategies need to be developed, demonstrated, and deployed.
6. Financing availability. Further investigation is needed to identify, evaluate, and demonstrate the availability and feasibility of mechanisms necessary to finance the measures required to achieve the District's 2050 GHG reduction goals, including additional innovative financing measures that provide benefits for all interested stakeholders.

## RECOMMENDATIONS

While additional information will be received and evaluated by the Council on this topic and resulting conclusions and recommendations may evolve as a result, based on information presented at the February 13, 2014 meeting of the Advisory Council, as well as member input, the Advisory Council offers the following preliminary draft recommendations for further discussion and consideration throughout 2014:

1. Planning. The District should work with other regional agencies to develop and adopt a ***Bay Area Energy Futures Plan*** to be included within the regional climate protection strategy to guide, facilitate, and coordinate energy-related regional actions to achieve California's target of 80 percent reduction in GHG emissions by 2050.
  - a. This Plan should adopt policy recommendations for prioritizing Bay Area energy supply options, based on a combination of climate, air quality, public health, water, and economic factors.

- b. The Plan should incorporate core principles to guide prioritization that recognize the following:
    - i. Greater electrification of energy use across all sectors, including transportation, will be necessary.
    - ii. Lower-carbon energy sources should be encouraged where electrification is not feasible.
    - iii. Decarbonization of electricity supply will have to occur, resulting in a fundamental shift from reliance on fossil fuels to renewable sources.
    - iv. Diversification of energy sources, biological resources, and economic investments is necessary, and will lead to strength, sustainability, and stability in each area.
    - v. All key externalities (e.g., climate, air quality, health, water) should be included, not just dollar cost.
  - c. The Plan should integrate high-priority energy supply actions into:
    - i. Other District air quality and climate planning efforts, including the District's multi-pollutant planning approach.
    - ii. The District's permitting program, including such aspects as the following:
      - 1. Evaluation of stationary sources for their potential to meet such goals as reduced health impacts, lower carbon fuel, and energy availability and stability.
      - 2. Streamlining of the permit approval process for wind, water, and solar (WWS) power generation projects, including small-scale solar and wind installations.
      - 3. Continued encouragement of infill development, mode shift, and public transit.
    - iii. The District's CEQA guidelines.
2. Coordination. The District should:
- a. Encourage and support legislative and other efforts that transition to progressively greater electrification of energy sectors, accompanied by increasing decarbonization of electricity supply.
  - b. Collaborate with the CPUC and other responsible agencies to investigate:
    - i. Policy options for pursuing decarbonized electricity supply.
    - ii. Substation-level grid reliability requirements.
  - c. Coordinate energy supply policies with statewide and regional agencies, including water districts and the Regional Water Quality Control Board, to account for water supply and water quality constraints.
  - d. Support establishment of standards for energy efficiency and electrification to ensure that housing inventory turnover works for clean air the way fleet turnover has for vehicles.

- e. Support incentives for property owner installation of renewable energy infrastructure.
3. Grants. The District should further incorporate into its grant programs criteria that further incentivize:
    - a. Development of infrastructure to support electrification (e.g., EV charging stations, solar PV, electrical heating and cooling), including enhancement of incentives for residents and building owners.
    - b. Clean-energy backup emergency power systems, rather than diesel/gasoline generators, at both individual building and community levels.
    - c. Promotion, through municipal financing, incentives, and rebates, of energy efficiency measures in buildings, appliances, and processes, considering building performance, potential unintended adverse health consequences, and measures to minimize such consequences.
  4. Education. The District should:
    - a. Integrate into its public education programs further recognition of energy choices and their public health, air quality, and climate benefits.
    - b. Develop outreach strategies that further stress economic, health, and resiliency co-benefits of a shift to a low-carbon economy, and that use bottom-line metrics that best appeal to issues about which people care most (e.g., personal and family health and cost).
  5. Operations. The District should evaluate further steps to reduce the carbon footprint of its operations and facilities.

## GLOSSARY

Carbon intensity – The average emission rate of grams of carbon dioxide released per unit of energy produced.

CCS (Carbon Capture and Sequestration) – The process of trapping carbon dioxide at its emission source, transporting it to a usually underground storage location, and isolating it there.

Cellulosic ethanol – Ethanol produced from biomass of various kinds, including waste from urban, agricultural, and forestry sources.

Clean coal with carbon capture – see CCS, above.

Decarbonization – The declining average carbon intensity of primary energy over time.

Electrification – To supply (a region, community, building, etc.) with electric power.



Energy source dispatching strategies – Strategies for controlling energy flows to “the grid” from numerous energy sources (such as a combination of wind, water and solar) to balance the temporally-variable availability of each source with the total overall energy demand.

EV – Electric Vehicle

Externalities – External effects, often unforeseen or unintended, accompanying a process or activity.

GHG (Greenhouse Gases) – A gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Other greenhouse gases include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

HFC (Hydrofluorocarbon) – A suggested replacement for the chlorofluorocarbon (CFC) coolant gas used in chillers and air conditioners.

Low-carbon – Minimal output of greenhouse gas (GHG) emissions.

PHEV (Plug-in Hybrid Electric Vehicle) – A hybrid vehicle which utilizes rechargeable batteries, or another energy storage device, that can be restored to full charge by connecting a plug to an external electric power source (usually a normal electric wall socket).

PV (Photovoltaic) – Producing electric current or voltage caused by electromagnetic radiation, esp visible light from the sun.

SF<sub>6</sub> (Sulfur hexafluoride) – An inorganic, colorless, odorless, non-flammable, extremely potent greenhouse gas which is an excellent electrical insulator.

Soy/algae biodiesel – Biodiesel refers to a vegetable oil- or animal fat-based diesel fuel consisting of long-chain alkyl (methyl, ethyl, or propyl) esters. Biodiesel is typically made by chemically reacting lipids (e.g., vegetable oil, animal fat) with an alcohol producing fatty acid esters. Biodiesel is meant to be used in standard diesel engines and is thus distinct from the vegetable and waste oils used to fuel converted diesel engines. Biodiesel can be used alone, or blended with petrodiesel in any proportions. Biodiesel can also be used as a low carbon alternative to heating oil. A variety of oils can be used to produce biodiesel. These include algae, which can be grown using waste materials such as sewage and without displacing land currently used for food production.

Zero-carbon – Zero output of greenhouse gas (GHG) emissions.