BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

ADVISORY COUNCIL
REGULAR MEETING

WEDNESDAY
MAY 12, 2010
9:00 A.M.

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

AGENDA

CALL TO ORDER

Opening Comments — Jeffrey Bramlett, Chairperson
Roll Call — 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 and Committee 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 or Committee's purview. Speakers are limited to five minutes each.*

CONSENT CALENDAR

1. Approval of Minutes of the April 14, 2010 Advisory Council Meeting

DISCUSSION

2. Continued discussion of draft report on the Advisory Council's March 10, 2010 Meeting on California's 2050 GHG emission reduction target of 80% below 1990 levels – Industrial Sector

   The Advisory Council will discuss the draft report on the March 10, 2010 meeting with Air District staff and finalize the recommendations.

OTHER BUSINESS

3. Council Member Comments/Other Business

   Council or staff members on their own initiative, or in response to questions posed by the public, may: ask a question for clarification, make a brief announcement or report on their own activities, provide a reference to staff about factual information, request staff to report back at a subsequent meeting concerning any matter or take action to direct staff to place a matter of business on a future agenda.

4. Time and Place of Next Meeting

   9:00 a.m., Wednesday, June 9, 2010, 939 Ellis Street, San Francisco, CA 94109

5. Adjournment

CONTACT EXECUTIVE OFFICE - 939 ELLIS STREET SF, CA 94109

(415) 749-5130
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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
(415) 771-6000

EXECUTIVE OFFICE:
MONTHLY CALENDAR OF DISTRICT MEETINGS

MAY 2010

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Advisory Council Regular Meeting	**Wednesday**	**12**	**9:00 a.m. – 11:00 a.m.**	**Board Room**
Board of Directors Stationary Source Committee *(At the Call of the Chair)*	**Thursday**	**13**	**9:30 a.m.**	**Board Room**
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)* **CANCELLED**	**Wednesday**	**19**	**9:45 a.m.**	**Board Room**
Board of Directors Climate Protection Committee Meeting *(At the Call of the Chair)*	**Wednesday**	**19**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Budget & Finance Committee *(At the Call of the Chair)* **CANCELLED**	**Thursday**	**20**	**9:30 a.m.**	**4th Floor Conf. Room**
Joint Policy Committee	**Friday**	**21**	**10:00 a.m.**	**MTC Auditorium 101 – 8th Street Oakland, CA 94607**
Board of Directors Executive Committee (At the Call of the Chair)	**Monday**	**24**	**9:30 a.m.**	**4th Floor Conf. Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday each Month)*	**Thursday**	**27**	**9:30 a.m.**	**4th Floor Conf. Room**

JUNE 2010

TYPE OF MEETING	DAY	DATE	TIME	ROOM
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**2**	**9:45 a.m.**	**City of San Jose Chambers 200 East Santa Clara St. San Jose, CA 95113**
Advisory Council Regular Meeting	**Wednesday**	**9**	**9:00 a.m. – 12:00 a.m.**	**Board Room**
Board of Directors Regular Meeting *(Meets 1st & 3rd Wednesday of each Month)*	**Wednesday**	**16**	**9:45 a.m.**	**Board Room**
Board of Directors Mobile Source Committee *(Meets 4th Thursday each Month)*	**Thursday**	**24**	**9:30 a.m.**	**4th Floor Conf. Room**

LH – 5/6/10 (7:53 a.m.)
P/Library/Forms/Calendar/Calendar/Moncal

AGENDA: 1

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Bramlett and
Members of the Advisory Council

From: Jack P. Broadbent
Executive Officer/APCO

Date: May 5, 2010

Re: Advisory Council's Draft Meeting Minutes of April 14, 2010

RECOMMENDED ACTION

Approve attached draft minutes of the Regular Advisory Council's meeting of April 14, 2010.

DISCUSSION

Attached for your review and approval are the draft minutes of the April 14, 2010 Advisory Council meeting.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

AGENDA: 1

Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109
(415) 749-5000

DRAFT MINUTES

Advisory Council Regular Meeting
9:00 a.m., Wednesday, April 14, 2010

CALL TO ORDER

Opening Comment: Chairperson Bramlett called the meeting to order at 9:00 a.m.

Roll Call: Chairperson Jeffrey Bramlett, M.S., Vice Chairperson Ken Blonski, M.S.; Secretary Stan Hayes; Council Members Jennifer Bard, Benjamin Bolles, Robert Bornstein, Ph.D., Harold Brazil, John Holtzclaw, Ph.D., Robert Huang, Ph.D., Rosanna Lerma, P.E., Jane Martin, Dr.Ph.H., Kendal Oku, Jonathan Ruel

Absent: Council Members Louise Bedsworth, Ph.D., Kraig Kurucz, M.S., Gary Lucks, JD, CPEA, REA I, Debby Mytels, and Dorothy Vura-Weis, M.D., M.P.H.

Introductory of New Advisory Council Members:

Chairperson Bramlett introduced new Advisory Council Members, Alexandra Desautels (*Public Health*) and Michael Sandler (*Community Planning*) and gave a background of each new member. Council Members welcomed both new members.

Oath of Office:

Oaths of Office were given to Alexandra Desautels and Michael Sandler.

Public Comment Period: There were no public comments.

Consent Calendar:

1. Approval of Minutes of the March 10, 2010 Advisory Council Meeting

Advisory Council Action: Member Holtzclaw made a motion to approve the minutes of March 10, 2010; Vice Chairperson Blonski seconded the motion; unanimously carried without objection.

DISCUSSION:

2. Discussion of Draft Report on the Advisory Council's March 10, 2010 Meeting on California's 2050 GHG emission reduction target of 80% below 1990 levels – Industrial Sector

Mr. Hayes, reporting on behalf of lead author, Mr. Kurucz, noted that he and members Kurucz, Brazil, Bolles and Bornstein worked on developing the Draft Report. The work group received comments which

were incorporated into the report, and he suggested the Council focus on the body of the report and to forward any minor, non-substantive typographical corrections to Mr. Kurucz after the meeting.

Summary Section:
Advisory Council Members began review of the Draft Report and indicated they had no changes to the Summary.

Key Points Section:
Members agreed that Key Points should be clear and short; they should identify whether they represent a synthesis between speaker ideas and members' additions, and suggested enumerating them similar to what had been done in previous reports.

Members requested revision of the Calcination process equation by placing a "+" after $CaCO_3$ and capitalizing the "o" in "Cao" to "CaO".

Members acknowledged that while hearing from industry representatives is very important, two of the three speakers did not provide recommendations. It was suggested that additional information be asked to further consider issues of concern to the Advisory Council. Members generally agreed that the section on key points expressed the views of speakers and not necessarily the views of the Advisory Council.

Staff indicated that working with industry is fundamental to the work of the Air District; while speakers' statements may be viewed as biased, their perspectives need to be heard and discussed, and the Advisory Council needs to balance what is heard. Staff also noted that the Advisory Council can politely point out that the information is not helpful in achieving the Advisory Council's goal.

Emerging Issues Section:
There were no comments.

Discussion Section:
Members noted that producing cement requires "creation" of a CO_2 molecule, questioned the reference to a 30% reduction, requested clarifying percentages relating to 2020 and 2050, and requested adding verbiage to the paragraph regarding specific reductions. Members also asked to remove the last paragraph regarding a comment from the public ahead of Recommendations and moving it to the section which summarizes the process, under Discussion Meeting.

Recommendations # 1, 2 and 3:
Member Hayes indicated one take-home message he had was that carbon capture and sequestration was an essential piece of a strategy to successfully reach an 80% goal by 2050, which will take enormous resources, and said the group tried to be mindful of the District's authority.

Dr. Martin requested some mention of public health benefits and maximizing public health, in particular, to vulnerable communities. She suggested some examples to be included in Recommendation #2.

Dr. Bornstein referred to Recommendation #1 and believed that the paragraph seems like the industry perspective. He questioned whether the end users' perspective be the focus and not the manufacturers of energy, as it seems to take the onus off of industry and place it on the end user. He commented that in today's news, a recommendation came from a group that the trade part of cap and trade not apply to large sources in poor neighborhoods. Ms. Bard noted that this was the report she had distributed to all members at the onset of the meeting.

Secretary Hayes noted that the intent was that if criteria are used as additional criteria in deciding who to award grants to, and he asked to be mindful of who is using the most energy. Members suggested and agreed to eliminate "within the industrial sector" and remove the last sentence and Table 2.

Secretary Hayes said if grants are targeted to the industrial sector, it would be useful to take into account their energy use. Dr. Bornstein suggested adding in the word, "industrial" before end users; however, Secretary Hayes suggested leaving in the "within the industrial sector". Chairperson Bramlett asked that the question be recorded and suggested that the group rework the paragraph to more clearly bring out the intent and identify what the operative control the group was trying to embark upon.

Dr. Holtzclaw noted that Recommendation #3 ends abruptly and it was suggested removing "so BAAQMD can". Dr. Bornstein referred to Recommendation #2 and asked to insert the word "industry" into the paragraph. Chairperson Bramlett suggested that if the word is inserted into the first paragraph, it would generally intend to apply to all recommendations.

Member Bard requested adding a statement in the Discussion section that references the report and their findings which she distributed to Advisory Council members. Ms. Roggenkamp asked Members to check ahead of time with the Chairperson if they want to distribute something to the Council in order to provide time for review and consideration. Chairperson Bramlett suggested adhering to the process, and possibly bringing the report to a subsequent meeting.

Member Bard suggested an added recommendation that should research and implement best practices in control technologies, monitoring, regulations and policies to reduce GHGs from the refinery sector that have co-benefits of reducing air toxics and criteria pollutants. Chairperson Bramlett said he would prefer that if members had additional suggestions, that they be submitted to the author in the manner discussed and approved. He recognized another meeting most likely would need to be held, and the work group can consider the request.

Member Sandler said in encouraging the Air District to expand its grant approach, he questioned where the money would come from. One idea would be to continue with a polluter-pays principle, and he suggested adding something to indicate that it could be funded through carbon pricing strategies.

Dr. Holtzclaw supported Ms. Bard's recommendation and also Dr. Martin's concerns which express that these are the most heavily impacted communities, so co-benefits are also benefitting the area geographically where they are most needed.

Secretary Hayes suggested Ms. Bard work to incorporate her recommendation into Recommendation #3, as it speaks specifically to technology transfer, and more than just efficiency improvements could be referenced in the paragraph.

Dr. Martin said the Council heard that consumer demand will drive production from industry representatives, yet they employ so many people and economic impacts may decline. She suggested addressing economic impacts somewhere in the recommendations and suggested retraining people in clean energy jobs rather than petroleum industry jobs. She noted she had also forwarded information to the author regarding occupational training programs for people in industries that may be displaced; however there was no mention of this.

Dr. Bornstein said he finds the industry perspective throughout the document, noting that Recommendation #2's statement projects to "reduce risk from adopting under-utilized new technologies", and he questioned whether the Council wants to reduce their risk if they spend money on technologies. Member Hayes noted the thinking was that financial risk is a disincentive to people being innovative by adopting technologies that might not be proven. They were trying to say, is there anything we can do to

help incentivize companies to be willing to take the risk associated with the more aggressive technologies. He suggested deleting "reduce risk" and replacing it with "provide incentives."

Ms. Roggenkamp noted that the District funds projects for advance technologies demonstration projects to show new technologies can work. However, currently the District does not have funding sources for industrial uses. If the District should, it might be interested in the same kind of thing.

Mr. Hayes referred to Recommendation phrasing for numbers 2, 3, 4 and 5, and questioned what the Council was suggesting the District do as, as it takes billions to fund carbon sequestration work. The same might be true of helping fund the development of new technologies. He said he liked Recommendation #4's first sentence of encouraging and monitoring R&D on alternative motor vehicle fuels by ARB and other agencies, but questioned whether funding it was realistic.

District Counsel Bunger reminded the Council that fees can only be used to fund stationary source related regulatory activities.

Dr. Bornstein suggested rewording of Recommendation #3's last sentence, stating that if something new comes on line, the District cannot be expected to adopt each new innovation. He suggested removing the last sentence, stating that capital equipment is not the District's business. Secretary Hayes stated that the District can incentivize these things by the definitions for Best Available Control Technology (BACT), which will provide some teeth in the desire to provide some new technologies. Mr. Hayes asked to maintain the last sentence, and indicated he believed it was important.

Mr. Sandler referred to Recommendation #2; "grants should be available for demonstration projects to provide incentives to industry", and he suggested adding a period and add "Along side increasing a carbon price signal, this would". He said in the absence of a carbon price, a grant will get one demonstration project built, and you have to have the carbon price to move the entire industry to a new way of doing business. Dr. Martin asked to end the sentence at "technologies" and add, "Grants should be targeted…"

Member Bard suggested moving the last sentence of Recommendation #3 to the Discussion section.

Member Hayes suggested all recommendations start with "BAAQMD should encourage", and members agreed.

<u>Recommendation #4:</u>
In discussing Recommendation #4, Secretary Hayes said for the refining industry, it is not just the GHG emissions from facility operations which are the biggest part of the carbon impact that carbon will have on their operations. It is the fuels piece as the third leg of the three-legged stool. To the extent that fuels changes, which will be mandated by the Governor or other agencies, this will have implications for permitting, and he thinks it is important for the District to monitor progress on the fuels side.

Dr. Bornstein referred to the last sentence and said it is not the role that is not important; it is changes in the refining industry that can reduce important reductions. He recommended changes to the second and third sentences to remove: "three legged stool including", "the role of" and "are" and add "can produce" after the word "equipment". He also asked to replace "monitor" with "track".

Member Ruel referred to Recommendation #4 and said after hearing from WSPA, he thinks the future of fuels cannot be petroleum-based, which should be made more clearly. He did not believe the statement should be how to fix the refining industry. The other half of the battle is what to do without petroleum, as it is not sustainable to just be more efficient in how we produce petroleum. While the District cannot regulate mobile sources, refineries or production plants for alternative fuels could stationary sources, a

facility which the District could permit. He suggested reframing the recommendation to embrace alternative fuels and indicate that changes to the petroleum industry and refining are not going to be enough.

Chairperson Bramlett clarified that the Council has covered transportation, will be covering carbon sequestration and capture in the near future, and he suggested putting that context into this report so the three-legged stool can be shown in other ways.

Ms. Bard stated that Recommendation #4 brings up general monitoring and encouragement of good policy and development of tools the District can use going forward. She suggested monitoring and researching power plants and refineries' best practices that are transforming themselves.

Recommendation #5:
Dr. Holtzclaw said the big polluters of coal, petroleum and even natural gas have huge financial incentives to put big money into carbon capture and sequestration or they will go out of business, and members agreed that funding it was not the District's role.

Dr. Bornstein questioned what areas the District wants them to expand into rather than make fewer restrictions. Regarding funding, he suggested targeting research and change "fewer" to "expanded". Dr. Holtzclaw suggested the District act in a role to support any good legislation. Ms. Roggenkamp noted it would be a significant departure for the District to fund fundamental research. The District funds best practices research, but the District is not a research agency.

Member Hayes noted there was a lot of discussion regarding Recommendation #5, agrees the District does not have the money, and he would favor rewording the recommendation to: "BAAQMD should encourage and monitor development in carbon capture and sequestration and facilitate permitting of associated infrastructure as appropriate." He noted the many life-changing events needed in the future, and he questioned whether a recommendation be that the District should continue in its efforts to define the place where large ticket issues intersect with the District's authority and mission. Dr. Bornstein believed this could serve as an introduction.

Mr. Bunger noted the District does monitor and track new technologies and advancements in control technologies and impose those in permitting systems as new sources come on line or are brought up to date.

Member Bard suggested removing Recommendation #5 and consider it during the carbon sequestration discussion in June, and members agreed.

Dr. Huang noted the scarcity of funding and that three of the seven recommendations require significant funding. He asked to narrow them down to no more than one or two.

Member Sandler said his understanding is that there are different types of sequestration; industrial capture and agricultural soil carbon sequestration. He was not sure if this was on the agenda. He was more interested in the agricultural soil sequestration, or bio char, and he was more worried about the industrial sequestration because you may end up with large carbon storage facilities in the impacted communities next to refineries which would just be one more climate gap. If we are looking at assisting in increasing this technology, we should be mindful of that potential disproportionate impact if this is what we end up with.

Dr. Bornstein agreed with Dr. Huang's suggestion, but he would leave all three recommendations in and let the Board of Directors decide, knowing that realistically, not all three can be funded, which could be part of the preamble.

Recommendation #6:
Dr. Holtzclaw suggested holding off on this recommendation for the June meeting recommendation regarding carbon capture and sequestration.

Recommendation #7:
Dr. Bornstein suggested removing the recommendation, noting that the paragraph serves as a recommendation to the Council and not to the Board. Member Brazil questioned the reason three years was included, and group authors believed it was a reasonable period of time to revisit the topic. Ms. Roggenkamp suggested making the general point that advances in this area are happening rapidly and worthy of re-examination in the near term.

Ms. Bard agreed and suggested adding, "recognizing the District's leadership in Clean Air and regulatory policy and the ability to adopt technologies of the rapidly changing advancements." Secretary Hayes suggested there be a preamble to the recommendations, which should indicate and acknowledge that the District has been out in front on all issues, and members agreed.

Chairperson Bramlett said most recommendations all exemplified a current inadequacy to actually achieve any of the goals, and he suggested adding that context to the item, as well.

Ms. Roggenkamp indicated that this is a hard area to look at, that the District likes to look to the future where there is not a clear path and appreciated the discussion. She knows that what is in place now is not going to get us to 2050, and we are trying to figure out paths to increase the thinking of people to get there.

Chairperson Bramlett reported that comments were received from Dr. Vura-Weis that he would pass onto author Kurucz. The Council agreed that any members wanting to submit comments to the group should do so expeditiously, or by next week. The group will review comments and submit the final draft a week prior to finalization of the May Advisory Council packet.

Chairperson Bramlett noted that the Council had also voiced interest in a field trip and members discussed opening the May meeting to finalize the report and then hold a field trip. However, they decided against it given logistics and time constraints.

Vice Chairperson Blonski discussed involvement of the Richmond neighborhood councils and local representatives taking field trips to visit Chevron and Simms Metals. He indicated how valuable they were for the group and encouraged the scheduling of a future field trip. Dr. Holtzclaw suggested considering a visit to a solar or wind generating facility.

3. Discussion of Advisory Council Members attending the Annual Air & Waste Management Association (AWMA) meeting in June

Chairperson Bramlett reported that three Advisory Council Members have been approved to attend the Air and Waste Management Association Conference. He is not able to attend, and stated that he would consider previous attendance in determining the third member's attendance. Ms. Roggenkamp noted that some District staff will be presenting papers and speaking, as well as Advisory Council Members. Dr. Bornstein and Mr. Brazil voiced interest in attending the conference.

OTHER BUSINESS

4. Council Member Comments/Other Business

Ms. Bard announced that on April 22, 2010, the League of California Cities Board of Directors will be voting on a motion forwarded by four committees to rescind AB 32 and SB 375. She distributed a list of members of the Board, member cities, and original supporters of AB 32. She encouraged members to contact the League Board and urge a neutral position.

5. **Time and Place of Next Meeting -** 9:00 a.m. – 12:00 noon, Wednesday, May 12, 2010, 939 Ellis Street, San Francisco, CA 94109.

6. **Adjournment:** The meeting adjourned at 11:05 a.m.

Lisa Harper
Clerk of the Boards

AGENDA: 2

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
Memorandum

To: Chairperson Jeffrey Bramlett and
Members of the Advisory Council

From: Jack P. Broadbent, Executive Officer

Date: May 3, 2010

Re: Continued Discussion of Draft Report on the Advisory Council's March 10, 2010 Meeting on California's 2050 GHG Emission Reduction Target of 80% Below 1990 Levels – Industrial Sector

The attached *revised* draft Report on the March 10, 2010 Advisory Council Meeting on California's 2050 GHG emission reduction target of 80% below 1990 levels – Industrial Sector was prepared and edited by Advisory Council members Kraig Kurucz, Stan Hayes, Harold Brazil, Benjamin Bolles, and Robert Bornstein.

The Advisory Council will discuss the *revised* draft report with Air District staff and finalize recommendations and report.

Respectfully submitted,

Jack P. Broadbent
Executive Officer/APCO

Prepared by: Gary Kendall
Reviewed by: Jean Roggenkamp

AGENDA: 2

REVISED DRAFT REPORT ON THE MARCH 10, 2010 ADVISORY COUNCIL MEETING ON CALIFORNIA'S 2050 GHG EMISSION REDUCTION TARGET – INDUSTRIAL SECTOR FOR DISCUSSION BY THE ADVISORY COUNCIL AT THE MAY 12, 2010 MEETING

SUMMARY

The following presentations were made at the March 10, 2010 Advisory Council meeting on California's 2050 GHG emission reduction target of 80% below 1990 levels – industrial sector:

1. ***GHG Emission Reduction Strategies for Oil/Gas Production & Refining*** by Joe Sparano, Executive Advisor to the Chairman of the Board of the Western States Petroleum Association (WSPA). Mr. Sparano advises the Chairman and supports WSPA's President on matters related to the trade organization's operations and advocacy in six Western states. He was previously WSPA's President for almost seven years and provides WSPA with the benefit of 41 years experience in the petroleum industry. He has played a key role in formulating WSPA's positions on GHG emissions policies in the Western United States.

2. ***GHG Emission Reduction Strategies for Industrial Energy Use*** by Dr. Eric Masanet, Principal Scientific Engineering Associate in the Energy Analysis Department at Lawrence Berkeley National Laboratory (LBNL). His research areas at LBNL include life-cycle assessment of energy-using products, industrial energy efficiency analysis, emerging technology assessment, modeling of industrial greenhouse gas emissions, greenhouse gas mitigation strategies, and sustainable design and manufacturing. Dr. Masanet also works with the U.S. EPA's ENERGY STAR for Industry program, researching and co-authoring energy efficiency guides for plant managers in various industrial sectors.

3. ***GHG Emission Reduction Strategies for the Cement Industry*** by Greg Knapp, Director, Environmental Safety & Health West Region, Lehigh Hanson. Mr. Knapp has been managing Environmental, Safety, and Health issues for major natural resource-based corporations in the Western US for over 28 years. In the last four years, Mr. Knapp has been a leader in the California cement industry's effort to develop a workable solution to the challenge of climate-change here in California.

DISCUSSION MEETING

Discussion meetings were held April 14 and May 12. The Minutes of those meetings are attached.

The Air District benefits from hearing the perspectives of a wide spectrum of stakeholders, including interest groups and representatives of regulated industry. The purpose of the presentations to the Advisory Council was to gain an understanding of the magnitude and composition of emissions from the industrial and commercial sector. Those presentations and subsequent discussion focused on two key subsectors of the industrial sector: cement plants and refineries. The representatives from industry and Lawrence Berkeley National Laboratory gave their perspectives on actions required to achieve AB 32 GHG reduction goals and the challenges that their sub sector may have in meeting those goals. We also were presented with the results of a study on the potential benefits of wide spread adoption of technologies to improve energy efficiency.

KEY POINTS

The challenges of reducing GHG emissions to meet California's 2020 and 2050 goals are large. One speaker noted that the UC Institute for Energy and Environment concluded that reductions required for meeting the 2050 goal are "massive" and would require eliminating GHG emissions from virtually all electricity production and non-aviation transportation sources and two-thirds or more of the carbon from all other sources. To reach the 80% GHG reduction goal by 2050 will require that every sector of the economy reduce emissions. Key points based on the presentations to us, and our assessment of them, are summarized as follows:

Energy Efficiency

- Energy efficiency improvements alone will not be sufficient to meet the 2050 GHG reduction goal; however, efficiency improvements must be a major part of the plan. It is important to encourage development and adoption of advanced technologies that reduce emissions.
- Electrification of processes, if coupled with lower-carbon sources of electricity, can reduce GHG emissions.
- From data presented by District staff, the Industrial/Commercial and Transportation sectors each contribute 36.4% of the 95.8 million tons of CO_2 equivalents in the 2007 Bay Area GHG emission inventory.
- The industrial, commercial, and electrical generation sectors together comprise 42.8% of total GHG emissions. These sectors cannot meet the GHG reductions required to meet the 2050 goal without carbon capture and sequestration (CCS), a complex topic that will get a full review at a future advisory council meeting. The speakers presented a few potential technologies for capture and sequestration that may be of interest for an appropriate agency to test or develop. Because of the large R&D costs involved, however, CCS testing and development must be done by other agencies (e.g., U.S. Department of Energy) with substantial funding resources, and is not the role of BAAQMD.

- An opportunity exists to combine reinjection of liquid CO_2 into wells that require tertiary oil extraction. More than a billion tons of CO_2 storage capacity may exist in local California oil fields, which have about 57 billion barrels of stranded oil resources. CO_2 for injection could also come from other industries. Studies have indicated that, throughout California, 1.7 billion tons of CO_2 storage may exist in gas reservoirs and 3.6 billion tons in oil reservoirs. Connecting sources of CO_2 emissions to possible injection reservoirs, however, will be a major challenge.

- Future energy efficiency measures can be implemented that will reduce 2050 demand below present use to 2006 levels, but efficiency gains alone are not enough to reach the 80% reduction goal by 2050. Population growth will offset efficiency gains.
- All organizations that purchase equipment that use electricity or fuel, such as boilers, HVAC equipment, fans, pumps, and motors, make strategic capital planning decisions on replacements based on expected lifetimes. When purchasing this equipment, lower emitting or higher efficiency purchases are more likely to be made if BAAQMD, state agencies, and others send the right signals. For example, boilers last 15-30 years and can be maintained to last even longer, but several generations of new technology could be developed over that lifetime. The District is encouraged to use regulatory strategies that look at a strategic horizon of approximately 10 years and to encourage better replacement choices.
- The largest industrial sector end uses of electricity and natural gas are listed in Table 1, helping to identify those uses where technology improvements can have the greatest impact. The possibility of improving a technology and sharing it across industries can also foster greater adoption of new technologies.

Table 1. End uses for electricity and natural gas within all industrial subsectors

Electricity (83% of total use)	**Natural gas (44% of total use)**
Motors (54%)	Steam systems (26%)
Drives (19%)	CHP (10%)
Pumps (18%)	HVAC (8%)
Compressed air (9%)	
Fans (8%)	
HVAC (12%)	
Refrigeration (9%)	
Lighting (8%)	

- An important key to future success will be to encourage greater adoption of under-utilized technologies for common applications, such as motor systems, steam systems, process heating systems, and lighting systems, i.e., a super boiler can save 15% on fuel for food processing steam. Solar thermal concentration can someday replace up to 100% of steam system fuel demand. Process

electrification, coupled with advances in low-carbon electricity sources, can lead to additional reductions.

Petroleum

- Weaning ourselves off of petroleum and phasing in other fuels will take a long time, perhaps decades, because even the closest alternatives are still distant as full replacements. Biofuels, wind, and solar are not projected to come on-line fast enough to meet 2020 GHG reduction goals. Alternative fuels for transportation are also more costly than today's fuels.
- As a practical matter, we are a long way from a full replacement of diesel and gasoline. The U.S. buys 200 billion gallons of oil annually and California produces 43 million gallons of fuel per day. A recent large cellulosic ethanol plant will produce only 250,000 gallons/day. U. S. DOE indicates that in 2008, 16% of the U.S. energy mix was renewable and 84% was coal, gas, and oil. In 2035, DOE projects that only 22% will be renewable.
- Petroleum production is projected to grow only slightly by 2050. Cement and glass usage will grow more than 50%, and usage by other sectors will grow even more through 2050. Efficiency gains are possible, and become more important to implement as sectors grow.

Cement Production

- Cement and its use in construction is a fundamental part of society. It is inherent in the chemical reactions required to make cement that its production creates large amounts of CO_2. To reduce that CO_2, an alternative chemical process must be found or the CO_2 must be captured and sequestered.
- Cement production also requires use of fuel to heat raw materials, which also produces CO_2. Fuel used in a cement kiln can be coal, coke, tire derived, or biomass, which is starting to be used as a fuel in cement making. A change from more traditional fuels to biomass will have a positive impact on atmospheric CO_2 levels. While it does not change the product emissions (i.e., from the basic chemistry of making cement), use of biomass does offset the use of the fossil fuels that release sequestered carbon. A facility near Redding is using 5-10% biomass as a replacement. There are limits to overcome, but 60 to 70% replacement of the fossil fuel portion of CO_2 from cement production may be possible.
- Table 2 shows possible energy efficiency improvements projected in the cement industry. These improvements, while important, will not be sufficient to reduce GHG emission from the cement industry by percentages anywhere comparable to California's 80% GHG reduction goal by 2050.

Table 2. Expected energy efficiency gains in cement industry

Source of efficiency gain	2005-2030	2030-2050	Total
Fuel mix (8%)	8%	8%	11%
Thermal energy efficiency	2.5%	2.5%	5%
Electrical efficiency	5%	5%	10%

- The challenges to cement replacement are many, e.g., building codes may be overly specific of clinker content and cement type. Clinker content of 71-93% in cement is based on California design requirements. Changing cement specifications will require establishment of new knowledge of performance. Fly ash based cement is being looked at as a low carbon alternative. Mirant Corp. will soon ask Maryland authorities for permission to construct a coal-ash recycling facility that would allow it reduce its disposal of coal ash in landfills. Proponents claim it would be a replacement to Portland cement, while emitting one-quarter of the carbon dioxide generated in the production of Portland cement.
- A cap and trade system will be required to accomplish GHG emission reductions in the most cost-efficient manner. As these trading plans are established and put in place, however, local impacts and cross-pollutant impacts should be considered (such as is being done with the District's multi-pollutant strategy).
- Presenters made strong recommendations for use of oil and gas fields for sequestration and for development of new technologies in cement production. Alternative energy can also be further investigated. Because of the importance of these issues and of the rapid changes occurring, the topic of how to best reduce GHG emissions from the industrial sector will need to be revisited.
- Just as with more traditional air pollution problems like ozone, there are no silver bullets. We will need to adopt a large number of many small measures to achieve large GHG emission reductions, starting with the most cost effective reductions and by implementing them fully and early, at the same time developing and implementing new and innovative technological solutions and fundamentally changing individual behavior. Each sector of the economy will need to participate in meeting GHG reduction goals.

EMERGING ISSUES

1. Fugitive emissions of high global warming potential. Fugitive emissions of high global warming potential refrigerants are expected to grow significantly in the coming decade. Preventing or reducing these emissions is a potential topic for a future meeting.

2. Impact of carbon pricing on low income people. Any consideration of a "carbon signal," pricing or taxes, should consider the impact of carbon pricing on low income people.

3. Availability of small business funding support. Small businesses have been selected to receive nearly $5.4 billion from the U.S. Department of Energy (DOE) via grants, contracts, loans, loan guarantees, and tax credits for clean energy technologies under the stimulus program enacted in 2009, the Obama administration said March 17th. According to a report released by the department, about a third of its funding from the American Recovery and Reinvestment Act has been directed so far to small companies of less than 500 employees.

4. Development of new biofuel production techniques. Solazyme, Inc., a California company that produces biodiesel, jet fuel, and bio crude oil from algae and plant material, announced they have received a $22 million grant to build its first commercial algae-fuel refinery in Pennsylvania. Solazyme's bio fuel process can reduce greenhouse gas emissions by about 80 percent, compared with petroleum-based diesel, according to the company.

5. Movement to roll back AB 32. There is a move to roll back AB 32 until specific economic indictors are achieved. Studies of the costs of AB 32 range across the board and use different scenarios to predict future impacts and effectiveness. Better studies will be required to predict the costs to small business and households. The California Legislative Analysts Office (LAO) was extremely critical of the two studies produced by Varshney and Associates regarding the costs of AB32 to small business and households. In the report, Legislative Analyst Mac Taylor stated: **"**Our review of this study indicates that it contains a number of serious shortcomings that render its estimates of the annual economic costs of state regulations essentially useless."

6. Job growth from innovative technology. Other studies, such as a report from the Natural Resources Defense Council, United Auto Workers union, and Center for American Progress released March 16th state that efforts to build more fuel-efficient vehicles have the potential to provide jobs for thousands of Americans, provided the government adopts policies that encourage manufacturers to create those jobs.

7. Role of industry to reduce GHG's. Companies in the Bay Area are manufacturing solar panels, electric cars, and cleaner diesel generators, to name but a few products will be required to meet the 2050 goals and to continue to clean our air. Industry will also be asked to manufacture and provide additional energy saving, energy storage, and more efficient devices in the future.

8. Evolving sense of future technology possibilities. A comment from the public urged the Council to not be limited by our present views on what is possible. Many examples of past failures to predict future technology breakthroughs exist, and as technology advances, the low hanging fruit grows back.

RECOMMENDATIONS

The District has taken an important and widely recognized leadership role in climate protection, and we strongly support those efforts and encourage the District to continue and expand them. The District has always been out in front of other agencies, states, and the federal government by taking actions and adopting policies to address climate protection.

Understanding the nature, causes, and measures for reduction of industrial GHG emissions, including the progress made in developing improvements in efficiency, alternatives, and new strategies, is difficult and complex. As a result, the Advisory Council should continue to revisit these topics periodically. Advances are occurring

sufficiently rapidly that the District may benefit from the Council's re-examination of these issues in the future.

It appears from the testimony presented to us that many new technologies and potentially life-style changing events will be needed in the future to achieve California's 80% GHG reduction goal by 2050. The District should thus continue its efforts to define those places where "large ticket issues" intersect with the District's authority and mission.

The following Advisory Council recommendations to the Board are based on the above presentations and subsequent discussions among Advisory Council members:

1. BAAQMD should continue to explore avenues for expanding the scope of grant funding. The Advisory Council supports and encourages the District's use of innovative methods, such as the District's establishment of a foundation, to enable funding of a broader range of opportunities. Such methods can provide incentives for advances in energy efficiency and reductions in GHG emissions. Where feasible, and within legal constraints and limited funding resources, grants should be made available for advanced technology demonstration projects to provide data and to reduce risks from adopting under-utilized new technologies. Grants that will also reduce other emissions, such as air toxics and criteria pollutants, could be targeted at communities with the poorest air quality and at technologies that use the most energy or produce the most air toxins in addition to CO_2.

2. BAAQMD should focus grants and regulations for the industrial sector on those types of equipment common to many sub sectors that use the largest amounts of natural gas (e.g., improvements in HVAC efficiency can have a greater impact when adopted on many systems across multiple industries).

3. BAAQMD should encourage organizations to make decisions best for climate protection and air quality when selecting future equipment by setting forward looking standards based on such factors as energy efficiency research and development at agencies such as the DOE and the California Energy Commission. The District should also work with other agencies to ensure, where appropriate and feasible, the continuation of favorable tax treatment and state or federal incentive programs to incentivize investment in new lower emitting, more efficient equipment.

4. BAAQMD should encourage and track Research & Development by ARB, DOE, and other agencies on alternative fuels with lower carbon intensity for industrial processes and motor vehicles. Since emissions from transportation are also significant, changes in the refining industry, and the subsequent combustion of these fuels in vehicles and equipment, can produce important emission reductions.

5. The agency should consider sponsoring legislation to incentivize the purchase of and establishment of related infrastructure for, fully electric vehicles.

6. The District should continue its integrated approach to multi-pollutant planning, rule development, and stationary source permitting by consideration of the combined effects of criteria pollutants, air toxics, and GHGs.