Federal Advisory Committee Act
Clean Air Act Advisory Committee

Mobile Sources Technical Review Subcommittee

Co-Chairs: Mr. Michael Walsh and Ms. Merrylin Zaw-Mon Designated Federal Official: Mr. John Guy

Minutes of the Subcommittee's Meeting on September 19, 2007
Arlington, VA

Introduction/Opening Remarks

Ms. Merrylin Zaw-Mon (EPA, Co-Chair) called the meeting to order at approximately 9:00 a.m. With Mr. Michael Walsh (Consultant, Co-chair) she welcomed attendees, approved the March 28th MSTRS meeting minutes as final, and reviewed the day's agenda. Ms. Zaw-Mon acknowledged Ms. Tina Vujovich (Cummins) substituting for member Terry Goff (Caterpillar), and Rich Bell (Ford) substituting for member Robert Brown (Ford).

Ms. Zaw-Mon also mentioned that this meeting is in conjunction with the Clean Air Act Advisory Committee (CAAAC), parent committee to the MSTRS, and acknowledged Don Clay (Koch) and Dennis McLerran (Puget Sound Clean Air Agency) as members of the CAAAC. Ms. Zaw-Mon thanked Mr. Clay for reminding the MSTRS co-chairs of previous recommendations on how to improve MSTRS meetings, namely to have more non-EPA stakeholder involvement and more networking time. Other recommendations included having a balance of technical and policy discussions, and cross-stakeholder topics.

Presentations and meeting topics outlined in the agenda were as follows:

- Workgroup Reports
  - MOVES Work Group—Matt Barth, UC Riverside
  - Retrofit Work Group—Gay MacGregor, EPA
- Remarks and Updates—Margo Oge, EPA
- GHG Session
  - Analyses Planned or Underway for EPA's GHG Rulemaking—Sarah Dunham , EPA
  - HD Fuel Economy Measurement Protocol --Cheryl Bynum, EPA
  - LD Industry Perspective—David Raney,Honda
  - HD Industry Perspective—Tina Vujovich, Cummins Inc.
  - Oil Industry Perspective—Don Clay, Koch Industries
  - Renewables Perspective—Christopher Standlee, Abengoa and RFA
  - Enviro Perspective—Rich Kassel, NRDC

Presentations are posted online at the MSTRS website:
http://www.epa.gov/air/caaac/mobile_sources.html

Workgroup Reports

MOVES Model Review Workgroup

Mr. Matthew Barth (University of California-Riverside) opened by presenting an update on the Motor Vehicle Emission Simulator (MOVES) Model. Specifically, Mr. Barth discussed 2 issues: the process, objectives, and framework of the MOVES Review Workgroup, and the differences between the MOVES Model versus current models (e.g., Mobile6 and NONROAD).

Under the MSTRS, the MOVES Review Workgroup is responsible for evaluating and providing recommendations for emission rates, activity and fleet inputs, and fuel and additional adjustments using readily accessible data. Mr. Barth highlighted the MOVES Workgroup process, along with 2007 meeting dates and topics. He also acknowledged both the development team and workgroup members.

According to Mr. Barth, the MOVES model is more comprehensive and user-friendly than existing data analysis models, even though some degree of training would be required for those who wish to use the model, particularly States/Local/Tribes (SLTs). For instance, the MOVES model is capable of analyzing large amounts of in-use data obtained from numerous sources including real-world vehicle studies and the Freeway Performance Measurement System (PeMS) hosted by UC-Berkeley.[a] Other attributes of MOVES includes:

- Java platform
- Relational database-driven
- Load-based emission factors using vehicle-specific power
- Binning techniques

Although the model allows for greater capabilities, Mr. Barth listed four areas that need to be addressed: data holes that have arisen due to the extensive MOVES framework development, data limits regarding the prediction of future years, MOVES maintenance, and maintaining ongoing relationships with appropriate stakeholders. Mr. Barth recommended that these obstacles be addressed as follows: focus on "hole filling" during early stages of development, develop a data collection plan, develop a validation plan, and ensure future funding. He also mentioned that a method needs to be developed to maintain model versions and updates, as differences in model versions has created problems in the past.

Discussion

Mr. Walsh commented that MOBILE6 has straightforward data needs, and asked if MOVES will require more specific data inputs at a local, or micro level. Mr. Barth replied that there will be default values built into the model, but if a user knows certain fleet characteristics and has the ability to update them, they can be used. He added that it is hard to estimate the effort needed to use MOVES, but a person creating an emissions inventory will have to know what data is available. John Koupal (EPA, MOVES Work Group Co-chair) added that the developers tried to pattern MOVES after MOBILE6 so users can use existing data in the new model if they don't want to get into a lot of detail.

[a] https://pems.eecs.berkeley.edu/

Mr. Walsh inquired on the comparability between MOVES and existing models, particularly MOBILE6 and EMFAC, regarding emissions estimation. Mr. Barth stated that there was still an uncertainty on whether the models are comparable. He noted that a new MOVES demo version is out that will give users a feel for how the model works. Mr. Koupal added that the demo is based on MOVES2004. The new model version will be available and compared to existing models in 2008.

Mr. McLerran asked what was being done to address biofuels in the model. Mr. Koupal stated that biofuels would be included in the model. He said that 483 different combinations of fuel effects will be incorporated in the model, including fuel types, Reid Vapor Pressure (RVP), percent ethanol penetration, etc. Mr. Koupal added that the model's capabilities regarding the analyses of biofuels would largely depend on available research. He noted that the Workgroup is working closely with involved stakeholders to ensure information collected is accurate. Mr. Bell commented that it would also be important to address evaporative emissions of ethanol in the model.

Richard Kassel (Natural Resources Defense Council (NRDC)) asked how MOVES is capable of providing localized data (i.e., intersection-specific), given that most current model capabilities are limited to county-levels and coarser resolution. He gave an example of New York City's effort to develop a congestion price scheme, and NRDC is working with the city to determine what data should be collected to get approval from the legislature. The program would need to meet air quality and energy goals and comply with environmental impact statement (EIS) requirements.

Mr. Barth explained that MOVES is capable of performing at different scales, including micro, where scenarios can be evaluated using the traffic simulation tool. MOVES is also capable of adjusting for factors like fleet characteristics and vehicle miles traveled (VMT).

Mr. Tim Johnson commented that existing models underestimate emissions. He asked why and what measures have been taken to address and correct for data gaps. Mr. Barth explained that new research and data sources have been used in MOVES that did not exist when MOBILE was developed. For instance, Coordinating Research Council, Inc. (CRC) research has helped fill heavy-duty diesel in-use gaps.

Mr. Barth commented that some pollutant emissions may actually be overestimated. Specifically, VOC and NO_X trends have been unclear in the past, and some new research conducted by CRC indicates that those emissions have been overestimated. Mr. Walsh added that forecasting accurate data is challenging, partly because information regarding factors like the operation of trucks has been limited in the past. He noted that these unknown factors are the reason why underestimates occur. Mr. Michael Rodgers (Georgia Technical University) added that inventory models like MOBILE could only be validated at the city level, because they are not designed to estimate emissions from a set of vehicles given a specific time and place. This is in contrast to the current MOVES model, which is verifiable and allows users to make predictions and identify gaps.

Mr. Reg Modlin (Chrysler LLC) expressed his concern over the lack of available data regarding the use of mid-level blends of ethanol and gasoline and how this limitation affects State Implement Plans (SIP) compliance. Mr. Modlin challenged the MSTRS to address the issue of mid-level blends on the nation's inventory and SIP compliance. Mr. Koupal commented that a presentation had been given addressing mid-level blends at the MOVES work group meeting on September 18, 2007. He noted mid-level blends testing would be conducted over the next 2 years.

Clean Diesel and Retrofit Workgroup

Ms. Gay MacGregor (EPA) presented information on the Clean Diesel and Retrofit Workgroup. The Clean Diesel Workgroup is responsible for evaluating in-use retrofit technology performance, educating the public on emission reduction strategies, and determining national incentives for cleaner diesel. Ms. MacGregor highlighted the Diesel Emission Reduction Program's budget for Fiscal Year 2008.

In 2006, EPA was awarded the Clean Diesel Collaborative Award for the 7th time. Ms. MacGregor presented information on the National Clean Diesel Campaign, regarding the campaign's new non-road verifications (for a total of 27 verified technologies), in-use effective field technology , the Diesel Emissions Quantifier (a web-base calculator), workshops and conferences, an interagency proposal to the International Maritime Organization (IMO) for Ocean Going Vessel emission reductions, and marketing and outreach activities (e.g., the *Magic School Bus* children's book).

In addition, Ms. MacGregor presented information on the SmartWay program. Currently, SmartWay has 625 partners (330,000 driven trucks). SmartWay's initiatives include the SmartWay Truck Designation, SmartWay Grow and Go Initiative, and Heavy Duty Fuel Economy Test Protocol Development. SmartWay tractor-trailers are an estimated 20 percent more efficient than non-SmartWay trucks. The SmartWay tractor models are offered by every major manufacture and two manufacturers offer SmartWay trailer models.

Ms. MacGregor also presented information on the Hydraulic Hybrid Demonstration Project. Hydraulic Hybrids offer higher fuel economy levels, low incremental costs, low emissions, and high-efficiency engines.

Ms. MacGregor concluded her presentation with highlights and recommendations from the NYC September 5-6, 2007 2nd Annual Regional Leadership Forum on Ports.

Discussion

Mr. McLerran commented on the significant progress made by the workgroup. He did note, however, that the budget language used regarding nonattainment areas was unacceptable, because it eliminated large areas of the country in need of retrofit funds.

Mr. John Johnson (Michigan Technical University) asked what was being done to address nitrogen dioxide (NO_2) emissions. He referenced a paper in Europe that demonstrated a decrease in nitrogen oxide (NO) and an increase in NO_2. Ms. MacGregor noted that the

Workgroup has not addressed NO2 reductions, as of yet. Mr. Jim Blubaugh (EPA) added that over the last 6-9 months the level of interest in verifying NO_X control technologies in the nonroad sector has increased. He added that the EPA's staff report, which they released approximately 1-2 months ago, began the National Ambient Air Quality Standards (NAAQS) review process to include NO_2. Ms. Zaw-Mon added that efforts have been taken to harmonize the verification process with California, including new technologies aimed at reducing both NO_2 and NO.

Ms. Patricia Monahan (Union of Concerned Scientists (UCS)) inquired on the type of emerging control technologies being verified. Mr. Blubaugh noted that an estimated 10 percent of funds allocated in the Diesel Emission Reduction Act (DERA) were designated for the promotion and utilization of emerging technologies. He added that there was no clear definition or criteria to meet emerging technologies. Mr. Tom Cackette (CARB) asked if any criteria were being considered, particularly regarding emerging technologies' performance levels. Mr. Blubaugh stated that a set of criteria has not been compiled. He explained that at this time, EPA is trying to determine what might be available and viable for the future. There is also an effort to focus on non-traditional controls. EPA is waiting to see what response they will get when they put out a national solicitation for new technology.

Mr. Tim Johnson commented on the productivity of the Workgroup. He noted that the initial tasks of the workgroup have been completed, and meetings are now reduced to annual updates. He encouraged the EPA to reevaluate their needs for and the responsibilities of the Workgroup for the future. Ms. Zaw-Mon agreed with Mr. Johnson that the Workgroup's responsibilities have diminished. She noted that the diminishment of their responsibilities is not a reflection of their value. Ms. Zaw-Mon added that there was still work that needed to be completed by the group. Unfortunately, the delegation of additional task has been postponed until EPA receives the budget allocation. Ms. MacGregor added that the interest to participate in the Workgroup was still present by Workgroup members.

Innovation Financing for EPA SmartWay and Retrofit Programs Part II-Bonds for Low Cost

Mr. Michael Curley (International Center for Environmental Finance (ICEF)) presented information on innovative financing for EPA SmartWay and Retrofit Programs. He noted that the EPA is home to two of the most innovative water finance programs: Clean Water ($60 billion and growing at a rate of $5 billion per year) and Drinking Water ($11 billion and growing). Mr. Curley noted that an estimated $100 billion is set aside for water regulatory development and programs; meanwhile, similar programs addressing air quality are almost nonexistent.

Mr. Curley outlined several differences in financing water programs versus potential air programs. First, participants in air financing programs like SmartWay borrow an average of $40,000, which is an estimated 200 times less than borrowers for water programs. Second, Mr. Curley explained that truck owners are mainly small businesses and privately owned, and do not have good credit when compared with large corporations like IBM or Microsoft. Third, when a government agency builds a sewer plant it is often financed with tax-exempt bonds, assuming it is being used for governmental purposes. This funding option is not available for small and privately owned businesses.

Mr. Curley highlighted the obstacles faced by "bad credit" borrowers. He explained that these borrowers are often required to pay back their loans with a short time frame (e.g., 3-5 years) and at a high interest rate (e.g., nearly 15%). . He argued that in finance, thousands of small truckers who are identified as high-risk individuals (likely to default on loan) are not high-risk when aggregated. Mr. Curley acknowledges that a small percentage will default, but not everyone.

Mr. Curley promoted the idea of State Air Quality Finance Authorities as a way to finance mobile source programs. These State authorities could finance SmartWay kits, diesel retrofits, and other programs at extended loan terms and lower interest rates by aggregating hundreds of small loans.

State Air Authorities could be funded through taxable bonds instead of tax-exempt bonds. Taxable bonds are easier to implement, partly because exempt bonds often require more paperwork. To ensure lenders do not lose money on defaults, Mr. Curley suggested the use of a 1 percent loan guarantee fee. The fee could also help State Air Authorities pay back loans they may acquire for startup purposes. He provided the example of New York's bank loan for $38 million, which was quickly paid back using the 1 percent guarantee fee concept.

Mr. Curley concluded his presentation by announcing that the final report detailing the recommendations of the Environmental Financial Advisory Board (EFAB) will be submitted to the EPA Administrator in the next couple of weeks. The report will then be available for comment.

Discussion

Ms. Zaw-Mon stated that EPA is moving away from the use of Federal grants and looking into additional sources of funding. She appreciates the efforts of EFAB in promoting other funding options.

Mr. McLerran commented that a few States, like Washington, have local air agencies that are larger than State air programs. Mr. McLerran encouraged the EPA to consider including a recommendation for local programs to get enabling authority from their State's legislature in order to establish local Air Authorities in the final report. Mr. Curley agreed and added that he believed the final rule included language regarding local programs.

Ms. Vujovich commented that fleet operations are usually interested in purchasing equipment to improve their bottom line more than purchasing emission control technologies. She asked what suggestions have been made to ensure that fleet owners and operators will embrace these opportunities to reduce emissions. Mr. Curley acknowledged that the promotion of alternative financial solutions could be difficult. Mr. Tim Johnson recommended further promotion of the SmartWay program, which has been shown to minimize costs and save truck drivers and companies money.

Mr. Tim Johnson asked Mr. Curley at what level (e.g., Regional, State, or local) did Mr. Curley anticipate for the development of the programs. Mr. Curley stated that ideally the programs are to begin at the lowest possible level. Although this sounds counter-intuitive, Mr.

Curley explained that lenders should be readily available, because truckers are not likely to drive to Regional Offices in order to apply for a loan. Mr. Johnson suggested that regional diesel stakeholders collaborate with localities.

Mr. Curley noted that the report included a section on truck stops, particularly dealing with alternative power units and truck stop electrification (APU/TSEs). TSEs could be prohibitively expensive if the only loan option is high-interest and short-term, because truck stop owners would have to charge higher rates for truckers to use the TSE than for truckers to idle and pay for diesel fuel. However, if the loans were low-interest and long term, TSEs would become a more attractive alternative for both truck stop owners and truckers.

Mr. Cackette agreed that getting to the trucker was the key to these programs. Mr. Cackette mentioned the nonprofit organization, Cascade Sierra Solutions (CSS), as an example of a loan-providing agency with offices located at truck stops. Mr. McLerran added that CSS collaborated with brokers, like CSS to make the contracts locally. He inquired on the feasibility of utilizing brokers at the State level. Mr. Curley noted that a State broker could be used to finalize contracts.

Mr. Rodgers inquired on the security of loans as they relate to the present day mortgage crisis. Mr. Curley assured Mr. Rodgers that the utilization of guarantee fees would significantly reduce lenders' chances of losing money due to defaults, because approximately 1 percent revenue would be collected from all participating parties.

The New Ozone NAAQS Proposal: Mobile Source Measures

Mr. Ron Evans (EPA) and Mr. Ken Adler (EPA) presented information on the Ozone NAAQS proposal for more stringent mobile source standards. Mr. Evans noted that mobile sources were a large contributor of Ozone-Depleting Substances (ODS) and a major driver behind the efforts in establishing tighter standards. Mr. Evans highlighted existing regulations (e.g., Clean Air Interstate Rule) that laid the groundwork for the development of the proposed standard. Mr. Adler noted that the current ozone standard is 0.080 part per million (ppm) for attainment areas. In order to generate a proposed standard, a Regulatory Impact Analysis (RIA) was conducted, and modeled hypothetical control scenarios. The cost and benefits of these scenarios were evaluated.

Although there has been scientific disagreement in how to present the costs and benefits identified, a proposed standard of 0.070 ppm was chosen.[b] Mr. Adler explained that some areas (e.g., parts of California and Texas) would have difficulties in complying with the proposed standard because they are presently not meeting the existing standard. Consequently, additional mobile source control strategies are needed to assist these areas in their efforts in reaching attainment status. Mr. Adler concluded the presentation by summarizing key points (e.g., State not meeting current ozone standard) and providing recommendations (e.g., utilize existing federal mobile source programs to help States reach attainment).

Discussion

[b] The proposed standard had commensurate costs and benefits.

Ms. Monahan inquired about the monetary amount associated with benefits, particularly portions reflecting the avoidance of premature deaths. The presenters noted that approximately 85-90 percent of the dollar benefits mentioned reflected avoiding premature death. They explained that the range was based on the assumptions used from the concentration response functions. The presenters added that some existing studies have demonstrated that pollutants like PM are harmful to vulnerable individuals, like the elderly, while other studies do not show as much support for this concept. Consequently, additional information is needed to gain a better understanding of how to present benefits. The analysis is more complex than in previous years because we are trying to calculate uncertainty.

Ms. Monahan asked if EPA considered smart growth, as the RIA seemed largely technology-based. Mr. Adler replied that they did consider it as much as they could, but could not find any quantitative analyses that would be approved by the Office of Management and Budget (OMB). He noted that an estimated $350 million in grants were allocated to New York City so that they could to do congestion pricing. Mr. Adler explained further that this practice, although it appears to have air quality (AQ) benefits, does not provide usable concrete numbers. Ms. Monahan asked if scrappage could be considered in the benefits analysis, particularly for heavy duty vehicles. The presenters explained that by 2020, scrapped cars would be so clean that the benefits received would not be significant. In regards to heavy duty vehicles, the presenters explained that that strategy has not been reviewed. In addition, they noted that California showed that longevity is higher for vehicles than expected. Therefore, it is important to understand the assumptions used in determining scrappage benefits.

Mr. David Raney (Honda) asked the presenters to explain further the option of installing "improved catalysts" as a future control. Mr. Adler explained that improved catalysts may utilize different metal loadings, which could result in a better performance. He added that the examples of future controls are illustrative, and have not been quantified.

Mr. Raney asked what estimates were used for light-duty diesel market penetration, and the impacts of light-duty diesel growth on NO_X emissions. He also asked about assumptions made for the third generation of On-Board Diagnostics (OBD) installed on future vehicles. Mr. Adler replied that no changes were made in the model to reflect different penetration rates than are currently assumed.

Mr. Tim Johnson commented that atmospheric models and regions being HC or NO_X-limited is still a dynamic understanding. He asked about the latest information on whether NO_X or HC reductions were being targeted to reach attainment. Mr. Evans noted that NO_X is the primary target for most areas. Some areas (e.g., Chicago), place more importance on VOC, and as areas draw nearer to the attainment limit, the mix of NO_X and VOC is important.

Remarks and Updates

Ms. Margo Oge (EPA) opened the afternoon session by presenting an overview of OTAQ's work on reducing greenhouse gases (GHG) in mobile sources , and increasing the use of alternative and renewable fuels in accordance with the President's State of the Union address

(i.e., the "Twenty in Ten" plan). Ms. Oge outlined the 3 elements to be included in the development of the proposal:

1. Endangerment Finding for GHG: Title 2 of the Clean Air Act requires EPA to demonstrate that GHG emissions could endanger public health or public welfare.
2. Reducing vehicle GHG emissions in the light-duty sector: Under the proposed rule, the EPA expects an estimated 4 percent reduction in emissions between 2010 and 2017 for light-duty vehicles. EPA expects this reduction in heavy-duty vehicles between 2013 and 2017.
3. GHG reductions through the use of renewable fuels and alternative fuels.

To ensure that the proposal is completed within the limited timeframe, the EPA has brought in top experts and developed partnerships with appropriate government stakeholders (including the Department of Transportation, Department of Agriculture, EPA's Office of General Council, and EPA's Atmospheric Division) and agencies, as well as the regulated community, non-profit organizations, and fuel providers.

Although OTAQ's attention has presently shifted toward the completion of the GHG proposal, Ms. Oge emphasized EPA's commitment to the completion of existing proposals and projects. These include:

- Implementation of the 2007 Heavy-duty Diesel and Fuels Rule[c]: Ms. Oge congratulated the industry, noting extraordinary successes in the marketplace in both ultra low sulfur diesel fuel production and distribution, as well as installation of PM and NO_X controls on new trucks.
- Finalizing the Locomotive and Marine Rule[d]: Ms. Oge commented that this is the last big program that will reduce PM and NO_X from mobile sources.
- Finalizing the Small Engine Rule[e], which addresses engines 50 horsepower or less.
- Supporting the International Maritime Organization (IMO), working toward establishing a SECA, and developing more stringent standards for C3 Ocean-Going Vessels (OGV)[f].

Ms. Oge noted that EPA is committed to making a decision on the California waiver by the end of the year.

Discussion

Mr. Cackette asked about the timeline of the GHG rule. Ms. Oge replied that a proposed rule would be out by the end of this year, and the public comment process would commence at the beginning of next year. The rule will be final by the end of 2008.

[c] http://www.epa.gov/otaq/highway-diesel/index.htm
[d] http://www.epa.gov/otaq/locomotv.htm
[e] http://www.epa.gov/otaq/regs/nonroad/marinesi-equipld/420f07032.htm
[f] http://epa.gov/otaq/oceanvessels.htm

Mr. Kassel inquired on the Agency's Endangerment finding and urged EPA to base the Endangerment Finding on public health as well as welfare. He noted that while EPA could proceed on the basis of either one, the proposed rule would be much stronger if based on both. Mr. Kassel also asked what metric would be used in the vehicle and fuel standard. Ms. Oge replied that the metric would be GHG pollutant reductions.

Mr. McLerran applauded the EPA for their efforts in addressing GHGs. He expressed his concern over the lack of momentum by Congress in implementing legislation, like the C3 Marine Program. He asked what was being done to create momentum and how can MSTRS members participate. Ms. Oge noted that there is no hurdle to overcome with Annex VI, and EPA would like to see significant progress over the next year, so she would welcome any strategies. She asked Mr. McLerran to contact her to discuss this issue. Ms. Oge mentioned at least one IMO study dealing with sulfur content in bunker fuels, and urged the participation of States and other groups such as CARB and ICCT, to provide support and assist with the determination of costs. It is important for the U.S. to get involved in the studies and express our point of view.

Ms. Monahan commented on the EPA limited timeframe for the proposal of the GHG rule and asked how the Agency anticipated including public comments, workshops, and meetings. Ms. Oge reiterated EPA's efforts in collaborating and reaching out to involved stakeholders and confirmed their importance in the rule making process. Ms. Oge also mentioned the importance of using accurate information and the best analytical approach (e.g., using the GREET model) available for addressing land use issues, particularly regarding corn/ethanol production. Ms. Oge added that the public hearings would be held and approximately 60-90 days will be set aside for public comments.

Mr. Tim Johnson commented on CO_2 technology found and used in Japan and Europe. Mr. Johnson noted that technologies, like lean-burn direct injection gasoline engines are not used in the U.S. due to the high sulfur content in gasoline. While the standard for sulfur in Japan and Europe is 10 ppm, the maximum allowable in the U.S. is 8 times higher (80 ppm). He asked if it might be time to revise existing sulfur standards. Ms. Oge agreed that technologies, like lean-burn direct injection gasoline engines are helpful in reducing CO_2 emissions. Ms. Oge notes that the EPA is willing to explore issues with technologies, like lean-burn direct injection gas engines. However, she notes that there are technologies available that provide similar reductions cost-effectively.

GHG Session

Analyses Planned or Underway for EPA's GHG Rulemaking

Ms. Sarah Dunham (EPA) presented information on EPA's GHG rule. She highlighted the President's 2007 State of the Union Address, which announced the Twenty-in-Ten plan (20 percent reduction in petroleum based gasoline consumption by 2017). Ms. Dunham then discussed the 2007 Supreme Court ruling, *Massachusetts vs. EPA*, which resulted in 3 elements: the State's lawsuit was valid, CO_2 emissions can be regulated under the CAA, and EPA must create a alternate set of criteria to base regulatory decisions. As a response to the Supreme Court ruling, in May 2007 the President signed an Executive Order directing EPA to develop GHG

regulations by using existing CAA regulations, using the Twenty-in-Ten framework, and collaborating with appropriate departments (e.g., DOE) and agencies.

Ms. Dunham highlighted EPA's overall approach for the development of the GHG proposal, which was based on the rule-making process used during the creation of EPA's Renewable Fuels Standard. The approach included 3 major areas of work: Endangerment finding, vehicle regulations, and fuel regulations. Ms. Dunham explained that due to limitations in time the EPA would rely on existing consensus-based, peer reviewed assessments and reports. Ms. Dunham noted that GHG emissions from vehicles (i.e., cars and trucks) would be regulated for the first time by EPA, under the authority granted by the CAA. She also mentioned that Section 211(c) and Section 211(o) of the Act included language regarding fuel emissions and efficiency, although these statutes do have limitations. For instance, Section 211(o) does not account for alternative fuels. Several key analyses were also mentioned, along with a list of affected stakeholders for each area of work.

Discussion

Mr. Raher asked if the Agency had any thoughts on how it will use the National Academy of Science (NAS) recommendations for fuel efficiencies for automobiles. In addition, Mr. Raher noted that information presented reflected both national and international benefits. Ms. Dunham stated that the NAS study would be included in the final rule, but not before the proposal is completed. Mr. Raher also asked if the Agency is looking at international benefits of GHG emission reductions. Ms. Dunham replied that they could look at international benefits, and noted that criteria pollutants are evaluated for domestic benefits, but GHG pollutants are a different issue.

Mr. Modlin commented that there seems to be increasing interest in mid-level ethanol blends of gasoline, but the information available regarding emissions and local air quality is limited. Ms. Dunham explained that additional work was needed to address these issues and as a result, the EPA has developed a partnership with appropriate departments, like the Department of Energy (DOE). She added that additional alternative fuels have been reviewed, but action regarding this issue will not take place in the proposed rule. Mr. Modlin challenged the MSTRS to address the issue as it related to SIP compliance during the next 5 to 15 years.

Mr. Skelton (NESCAUM) asked if fuel economy was the driver in vehicle regulation. Ms. Dunham explained that an estimated 95 percent of CO_2 impacts are a result of vehicle emissions, and that these emissions directly relate to fuel economy. The same technologies that address fuel economy also address GHG emissions.

Mr. Tim Johnson commented that existing CAFÉ standards have been around for 30 years. He added that Congress has passed a 35 mpg bill, however the standard is not included in the analysis. He asked if the EPA and Congress were heading in similar directions as it relates to CAFÉ standards. Ms. Dunham replied that the authority granted by the CAA to regulate vehicle emissions was the only regulatory authority that EPA felt comfortable in using. Ms. Dunham also noted that EPA is working closely and meeting regularly with DOT to resolve differences in standards promoted. She added that the Energy Policy and Conservation Act (EPCA) still existed, and other regulations are moving forward dealing with fuel economy standards.

Mr. Kassel asked if EPA will consider both public health and welfare in its Endangerment Finding. Mr. Kassel argued that using mid-blend ethanol blends becomes easier when public health is ignored. He commented on the importance of a public health finding and urged the EPA to include both analyses even though they are only required to complete one.

Ms. Sally Vance Allen (Gary-Williams Energy) acknowledged and applauded the collaboration between the EPA and small refiners for the rule. She asked what progress had been made to address economic impacts on small businesses. Ms. Dunham noted that additional work was needed to evaluate these impacts and unfortunately, the framework of the proposal does not permit time to do a formal Small Business Regulatory Enforcement Fairness Act (SBREFA) process. Ms. Dunham will meet with Ms. Allen to discuss what will be done to address small businesses.

HD Fuel Economy Measurement Protocol

Ms. Cheryl Bynum (EPA) presented on the SmartWay Get Green Trucking Summit and fuel economy test procedures for HD trucks. The SmartWay Get Green Trucking Summit's goal was to reach out to owners/operators and small fleets by recognizing SmartWay Grow and Go partners; highlighting SmartWay loans for APUs, tires, and aerodynamic fairings; and increase fleet turnover by showcasing new SmartWay-certified tractors and trailers.

Ms. Bynum summarized the scope and context of the HD fuel economy measurement protocol. Ms. Bynum also provided an overview on in-use test methods, including the selection process, preparation, and testing and calculating results. She also addressed technical areas of interest, including drive cycles, testing needs, and affected stakeholders. Ms. Bynum concluded her presentation with recommendations that allow for the measurement of fuel economy for any HD vehicles.

Discussion

Ms. Monahan asked if it was possible for MSTRS members to review the hybrid and fuel economy draft report. Ms. Bynum explained that EPA would first finish their internal review and then distribute it to stakeholders.

Ms. Monahan inquired on EPA's efforts in the integration of cabs and trailers for a SmartWay designation. Ms. Bynum noted that for the initial designation, cabs and trailers were tested separately. Moving forward, the combination of cab and trailer will be tested for a SmartWay designation. However, Ms. Bynum noted that the test will use default trailers with tractors. Ms. Bynum added that EPA needs to collaborate with specific trailer manufacturers in order to more accurately test fuel economy. This is challenging because most trailer suppliers are small, family-owned businesses.

Ms. Vujovich applauded the EPA for their work. She asked how robust the program would be, given that it is a voluntary effort. Ms. Bynum commented that the technical challenges faced by the Agency would be dealt with as thoroughly as possible. She added that they are required to make the program as robust as possible.

Ms. Zaw-Mon added that programs like SmartWay are voluntary but really look to ensure that projected benefits actually do materialize, especially when States want credit for their SIPs. She noted that there is accountability, as well as partners committed to emission reductions.

Mr. Rodgers asked if there were any provisions to include in-use testing, voicing concern that in a "flat world," effects on hybrids may not be realized. Ms. Bynum stated that there is an incline on the track test and the effects of altitude and incline are being evaluated, but in-use tests are not being used at this time.

LD Industry Perspective

Mr. David Raney (Honda) presented a manufacturer's perspective on LD vehicles, as they relate to GHG emissions reduction. He presented information on four topics: critical assumptions, opportunities and challenges, technology possibilities and pathways, and policy mechanisms.

Mr. Raney commented on the 1.6 to 1.7 percent annual increase in mobile source CO_2 emissions by 2025 and noted that stabilization would not occur without a significant reduction in GHG emissions. He argued that these reductions would be driven by advances in mobile source control technology and low carbon fuels.

Mr. Raney listed several opportunities and challenges ranging from improvements in fuel efficiency to market feasibility. Potential technologies and pathways were divided into 2 groups: near term and long term. Near term, technologies included LD diesel and hybrid electric vehicles (not plug-ins), while long term technologies included plug-in hybrids and hydrogen fuel cells. Mr. Raney briefly discussed the market potential for proposed technologies (e.g., biodiesel and fuel cells), along with potential obstacles (e.g., uncertain market).

In addition, Mr. Raney summarized the NAS 2002 study on the effectiveness and impacts of CAFÉ standards. The study concluded that changes in technology require long lead times, and policy implemented too aggressively could potentially harm involved stakeholders. Mr. Raney highlighted the success of mandates established in Japan and Europe, and urged policy makers to not push beyond the 2 percent per year threshold for improvements.

Mr. Raney listed 3 strategies for stabilizing mobile source(s) of GHG emissions: improving vehicle fuel efficiency, reducing carbon in fuel, and reducing VMT. Mr. Raney then provided an overview of continuous efficient incentive programs (feebates). Feebates can be an effective means of encouraging technology innovation and market penetration. Mr. Raney concluded his presentation by listing a series of recommendations that ranged from the role of technology to policy synergy.

Discussion

Mr. Brock Nicholson (NC Division of Air Quality) commented on future technologies, including hydrogen-fueled internal combustion engines (H_2ICE). He inquired on the utilization of hydrogen in fuel cells rather than hydrogen combustion, and why fuel cells were preferred.

Mr. Raney explained that Honda has chosen not to utilize H_2ICE because the efficiency of the ICE is less than half that of the fuel cell, mitigating the benefits of hydrogen and resulting in extremely limited range. Companies like Ford are following in BMW's footsteps of producing H_2ICE vehicles.

Mr. McLerren commented on Mr. Raney's perceived pessimism on the efficiency of battery technology, and asked him to expound on his view of the Lithium Ion battery technology. Mr. Raney explained that it may be too soon to try national penetration of this type of vehicle technology. In addition, the Nickel/Metal Hydride battery costs are overwhelming right now, and are not being absorbed by consumers. There are also durability and safety concerns, and little knowledge about the discharge cycles in the real world.

Mr. Modlin commented that Chrysler is not pessimistic about battery technology, but added that unfortunately, the battery technology is not expected to improve significantly in order to become a major market player for the deadline established by the President. Mr. Raney noted however that Honda was a strong supporter of battery technology development and they will continue to work with the battery industry on critical issues of power and energy density, cost, and packaging.

Mr. John Johnson commented on the use of the term consumption and fuel economy by stakeholders, particularly politicians. He added that standards are often based on calculations of fuel economy, but he would like to see a resource-consumption based metric. Mr. Raney noted that he is a strong supporter of changing to a resource consumption-based metric.

HD Industry Perspective

Ms. Vujovich presented information on the HD perspective on GHG reductions. She opened her presentation with an overview of the commercial vehicle industry. More than 90 percent of the freight transportation sector is powered by diesel fuel. These trucks are not capable of downsizing, unlike passenger/commercial vehicles. Ms. Vujovich commented on the U.S. consumption of surface transportation fuel (11.7 million barrels per day (MBPD)) and noted that class 8 trucks are the largest consumers of fuel.).

Ms. Vujovich said that commercial customers demand fuel economy, and fleet decisions are often made by comparing fuel economy (a 1.5 to 2 percent difference can influence a decision). She commented that it is important to recognize that engine manufacturers are a very small piece of the pie in improving fuel economy. Tractor and trailer design are a large part, and drive train manufacturers do not have a lot of input. The industry is not integrated among drive train, cab, and trailer suppliers.

Ms. Vujovich commented on the appropriateness of public/private partnerships (e.g., 50 percent of costs shared by the engine industry) as well as significant GHG emissions reduction outcomes (e.g., 45 to 50 percent of systems are expected to demonstrate emission efficiency by 2010) that are generated from collaboration efforts with appropriate departments (e.g., DOE) and agencies.

Discussion

Mr. Cackette commented that the original engine manufacturers (OEMs) look at aerodynamics when trying to improve cabs. He asked what was being done to improve trailers. Ms. Vujovich noted that these manufacturers have not yet been included in a regulatory scheme that would require them to make trailers more aerodynamic. She added that it is difficult for manufacturers to produce items that are not requested by consumers.

Mr. Walsh asked why the market does not drive production of aerodynamic trailers. Ms. Vujovich stated that drivers often do not own their trailers. Consequently, they may change their trailers an estimated four or five times while on route. She added that there was lack of accountability to how trailers were configured.

Mr. Rodgers asked, from an economics perspective, why do we not have an integrated solution if the industry is driven by fuel economy? Ms. Vujovich noted that the industry is not integrated. Consequently customers' preferences are influential, and they often prefer what they already know and what feels right, as opposed to new trailer designs that don't handle the same as what they've always used.

Mr. Rodgers asked if there is a hidden set of factors that keeps integration from occurring, and how would regulations remove those barriers. Ms. Vujovich commented on the level of communication between parties. She noted that until the fuel was regulated there was not a lot of talk between original equipment manufacturers and fuel providers.

Mr. McLerran commented on existing fleets and their primary challenge of how to improve fuel economy in future. He noted that partnerships among stakeholders were occurring, but how can manufacturers support improvements to existing fleets? In addition, he asked if industry plays a role to get regional distributors involved. Ms. Vujovich replied that there was a huge opportunity to improve fleets with improved technology like electronic engines as existing fleets age. She thinks the industry should discuss potential opportunities together.

Mr. Skelton commented on auto-shutoff idling standards for 2008 and later engines. He noted that California's engine standard varies slightly from the already established 49-state engine standards. He asked if industry, as a whole, has made a decision regarding which approach they would be using to ensure compliance. Ms. Vujovich noted that industry stakeholders would make different decisions. She stated that Cummins has made a decision, but cannot discuss it.

Mr. Tim Johnson observed that heavy-duty engines in Japan and the European Union are less fuel-efficient and still have large NO_X emissions. In the U.S., engines are required to meet more stringent NO_X emission limits, yet they are more fuel efficient.

Oil Industry Perspective

Mr. Clay presented an oil industry's perspective on EPA's GHG proposed rule. Mr. Clay announced that the oil industry would like to collaborate and assist the EPA with the GHG rule making process, even though they do not support EPA's efforts in implementing mandates or the

President's Twenty-in-Ten plan. Mr. Clay highlighted several characteristics needed to ensure compliance, such as include tiered regulatory programs, and realistic parameters.

Mr. Clay concluded his presentation by encouraging EPA to set realistic goals, use tiered approaches, use sound science, and collaborate with involved stakeholders.

Discussion

Mr. Becker (STAPPA/ALAPCO) commented on the State's preemption opportunity and noted that the Koch Industries did not agree with nor want mandates. Instead the company prefers that the market dictate the program. However, Mr. Becker pointed out that mandates are wanted by the company regarding States' ability to preempt. Mr. Becker then inquired on the ability for local governments to utilize preemptions. Mr. Clay explained that the issue at hand is a global problem that should be addressed globally and not locally.

Mr. Tim Johnson asked Mr. Clay's opinion on a carbon tax. Mr. Clay replied that the National Petrochemical and Refiners Association (NPRA) does not have a position right now nor is there an industry consensus. Mr. Johnson then inquired on the timeframe established for a reduction of sulfur levels to 10 ppm for gasoline. Mr. Clay stated that he was not sure of the timeframe. He added that many people are coming off a series of large-scale investments for sulfur reduction for diesel fuels.

Renewables Perspective

Mr. Christopher Standlee (Abengoa and RFA) presented his perspective as a renewable fuels producer on the GHG rule. Abengoa is a technology company present in more than 70 countries. Its main objective is to provide environmental and energy sectors with innovative solutions for sustainable development. Mr. Standlee compared Europe's alternative fuel demands and opportunities in the U.S. He noted that both countries are implementing and defining policies to address and promote biofuels. He added that the demand for biofuel is driven by 4 main factors: policy, GHG reduction incentives, oil prices, and global oil production. Mr. Standlee argued that biomass fuels would be a viable alternative to conventional gasoline by 2017, due to technological advances and the marketability of crops (e.g., corn for ethanol).

Mr. Standlee also mentioned additional areas of concern that should be taken into account when promoting biofuels, such as international growth and interest (e.g., China's growing transportation sector).

Mr. Standlee also presented information on bio-refineries, a stage in the development of technology based on biomass as feedstock. Abengoa's objective for feedstock is to develop customized crops for different energy conversions through enzyme mix research and advances in sugar fermentation to ethanol.

Mr. Standlee highlighted several active projects, including York Pilot Plant (pilot scale), BCyL biomass plant (demo scale), and hybrid DOE project (commercial site), and provided an overview of present day biomass gasification and synthesis (BtL) technology. He also listed

several changes, like plant design and harvesting systems, that need to be evaluated in order to ensure that alternative fuels (e.g., cellulosic ethanol) are more competitive in the market.

Discussion

Mr. Modlin applauded Mr. Standlee on his presentation. He commented that challenges, including achieving the Congressional goal, would require stakeholders to take the challenge seriously. Meaning, stakeholders have to look instantly beyond what current technology gives us. Mr. Modlin added that unfortunately, there is currently not enough production capacity to reach the President's goal. Mr. Modlin inquired on future engineering challenges and resources needed for the production of ethanol.

Mr. Standlee noted that a lot of improvements are needed regarding resources and demands. He noted that production of ethanol is estimated at 12 billion gallons/yr . Mr. Standlee added that 15 billion was easily achieved without significantly impacting corn prices or other corn uses. He noted that cellulose technology was already being used on a pilot plant basis. Mr. Standlee acknowledged obstacles associated with cost and added that the DOE estimated that costs for ethanol production are $2/gallon (g). He explained that the biomass pilot plant has been able to reduce operational costs to $1/g. He further added that cellulosic ethanol, as a commodity in today's market, can be viable, assuming the correct incentives are utilized.

Mr. Modlin inquired on the sustainability of ethanol in the future and asked if Mr. Standlee believed that the cost of ethanol at the pump without subsidy would be equal or better than gasoline. Mr. Standlee noted that ethanol, unlike conventional gasoline, was a young industry. He added that incentives were needed to ensure it is competitive in the market in short term.

Mr. Modlin inquired on how members of the MSTRS can assist in the efforts of making ethanol a viable commodity. Mr. Standlee stated that the biggest way to contribute to the sustainability of ethanol is to improve and support the production and generation of new technology

Mr. Tim Johnson commented on the limitation of biomass plants due to transportation delivery costs, particularly regarding feedstocks. He asked what could be done to promote generating lots of fuel versus having small and efficient plants. Mr. Standlee noted that efficient plants are not necessarily small. He added that a plant needed to have all materials available to within 50 miles.

Mr. Rodgers asked how much of an impact will glycerin and other low value co-products have. Mr. Standlee replied that the impact of products like glycerin, was unknown.

Environmental Perspective

Mr. Kassel presented on the environmental perspective regarding EPA's GHG proposed rule. He opened his presentation with an overview of this year's regulatory actions (i.e., President's 2007 State of the Union Address, US Supreme Court Ruling, in *Massachusetts versus EPA*, and the District Court ruling affirming Vermont's plan to adopt California's A.B.

1493 regulations). Mr. Kassel posed 4 questions to be considered when developing the proposal: will EPA make a public health endangerment finding as well as a public welfare finding, what metric will be used (i.e., pollutant measurements, MPG, or BTUs), will the GHG rule consider U.S. and/or global benefits, and finally when will California (plus 14 other states) get its waiver.

Mr. Kassel commented that NRDC welcomes the opportunity to work with involved stakeholders (e.g., EPA), answer outlined questions, and find a resolution for obstacles hindering the adoption of a national program. Mr. Kassel recommended that the EPA use a CO_2 or GHG metric, set regulations to protect public heath and welfare, assess benefits globally and domestically, and grant awaiting States waivers.

Discussion

Mr. Tim Johnson asked how Mr. Kassel viewed biofuel mandates. Mr. Kassel noted that biofuels could play a role in weaning ourselves off petroleum and helping to fight global warming. He explained that fuel economy by itself cannot get us where we want to go. Mr. Kassel added that the promotion and implementation of biofuels has to be done correctly, meaning the following factors must be taken into consideration: what are the collateral environmental impacts, and what are the life cycle emissions. Mr. Kassel gave the example of biodiesel generated from palm oil and commented on its inefficiencies. He added that setting of a series of performance-based standards is one approach to ensure success. In addition, Mr. Kassel urged the allowance of competition and innovation among companies.

Ms. Zaw-Mon commented on the need to reduce VMT. She asked what the environmental perspective was on promoting smart growth and land-use patterns. Mr. Kassel explained that he could not speak on the behalf of the entire environmental community, in regard to this issue. However, NRDC agrees that land-use change, smart growth, and green buildings are important factors to consider.

General Discussion

Mr. Nicholson commented on the State perspective in response to State preemption. He argued that for fuels, there was logic for a national program, but States would have a problem with preemption. Many programs have been kicked off by State initiatives or groups of States. To take that away would be wrong. Mr. Nicholson added that most States recognize that across the board standards are needed, but do not want to preempt from the outset. Mr. Clay suggested grandfathering existing programs and forbidding the creation of new ones. Mr. Nicholson responded noting that preempting potential future programs would not sit well with States.

Mr. McLerran added that in terms of fuels and auto standards, we have seen people coalesce around a national approach. He noted that California is taking a lead in the field and EPA should follow their lead and reduce carbon content in fuels. Mr. McLerran noted that ideally, we want to see one national standard to have States rally around. Mr. Walsh stated that to the extent that the national requirement satisfies requirements of localities, States would not need to develop their own programs.

Ms. Vujovich added that strong federal programs would carry their own merits, but as a legal matter to take innovation off the table does a disservice to the concept of federalism. A lot of work on climate issues is exciting, because it provides opportunities for the Federal Government to address air quality using multi-pollutant methods. To have categorical preemptive approaches would be a setback in Air Quality Management (AQM).

Wrap-Up

Mr. Walsh provided a brief summary of the information presented and thanked everyone for attending the meeting, as well as Mr. John Guy and the EC/R contractors for putting the meeting together. Ms. Oge briefly discussed the importance of the GHG regulation and noted the additional work that still needed to be done.

Mr. Tim Johnson asked where the MSTRS needed to go next with the Retrofit Workgroup, and what were the new challenges. One member noted that the largest challenge faced by the Workgroup would be addressing the tightening of ozone standards in the motor vehicle sector.

Mr. Rodgers commented on the urgent need to look at issues that would come up with the GHG proposed rule. He suggested meeting prior to May to discuss the proposed rule.

The meeting was adjourned at approximately 4:00pm.

Mobile Sources Technical Review Subcommittee
September 19, 2007
Attendance Sheet

Presenters and Subcommittee Members

Name	Organization
Mike Walsh*	Consultant, Co-Chair
Merrylin Zaw-Mon*	EPA, Co-Chair
Margo Oge	EPA
Ken Adler	EPA
Sally Vance Allen*	Gary-Williams Energy
Matt Barth	UC Riverside
Rich Bell (sub for Robert Brown*)	Ford
Cheryl Bynum	EPA
Tom Cackette*	CARB
Nick Cernansky*	Drexel University
Don Clay*	Koch Industries
Michael Curley	ICEF
Sarah Dunham	EPA
Ron Evans	EPA
Herb Fox*	Murphy Oil Corporation
John Johnson*	Michigan Tech University
Tim Johnson*	Corning
Richard Kassel*	NRDC
Gay MacGregor	EPA
Dennis McLerran	Puget Sound Clean Air Agency
Reg Modlin*	Chrysler LLC
Patty Monahan*	USC
Brock Nicholson*	NC Division of Air Quality
Vickie Patton*	Environmental Defense
David Raney*	Honda
Mike Rodgers*	Georgia Tech
Dave Sander (Sub for Hugh Dickey*)	Chevron
Eric Skelton (sub for C. Cooper*)	NESCAUM
Christopher Standlee	Abengoa & RFA
Tina Vujovich	Cummins Incorporated (sub for Terry Goff*, Caterpillar)
Attendees	
Matt Kuryla	Baker Botts
Dave Cetola	Johnson Matthey
Joe Kubsh	MECA
Deb Stackhouse	US EPA
Steve Flint	NYS DEC
Terry Levinson	Argonne National Labs

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Presenters and Subcommittee Members

Name	Organization
John Campbell	Caterpillar
Dylan Fuge	Latham & Watkins LLP
Roger Fairchild	Independent Consultant
Aari Savani	Perrin Quarles Associates (PQA)
Doug Lawson	NREL
David Patterson	Mitsubishi Motors
Jessica Robinson	Mitsubishi Motors
Robert Maxwell	Consultant for AIAM
Jeff Clarke	NGVA
Igaue Post	NADA
David Pell	ITEC
Martin Jeter	VA DEQ
Tod Wickershan	Emisstar LLC
Catherine Magloicchetti	EPA- R3
John Cabaniss	AIAM
Dave Gelman	New West Technologies
Monika Chandra	PQA
Joseph Bachman	EPA
Sandra Franco	Bingham McCutcher
Patrick Raher	Hogan & Hartson
Greg Dana	Auto Alliance
Tim Hogan	NPRA
Cass Andry	Alliance
Olkeye	HEI
Dennis Leaf	EPA
John Koupal	EPA
David Schanbacker	TCEQ
Press	
Doug Obey	Inside EPA
Jen Johnson	Inside EPA
Peter Rohde	Energy Washington
Steve Cook	BNA
Technical Staff	
John Guy	U.S. EPA, Designated Federal Official
Kathy Boyer	EC/R
Nanishka Albaladejo	EC/R

*Denotes Subcommittee Member