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 March 28, 2007
Arlington, VA
FINAL September 25, 2007

Introduction/Opening Remarks

Mr. Michael Walsh (Co-chair) called the meeting to order at approximately 9:00 a.m. With Margo Oge (EPA), he welcomed attendees, introduced new members, and reviewed the day's agenda.

Presentations and meeting topics outlined in agenda were as follows:

- Formation of new workgroup for MOVES model review
- Report out on the Transitioning I/M Workgroup
- Update on NOx reflash
- Panel 1-Federal and State Activities
- Panel 2- Potential for Fuels and Technology
- Panel 3-Renewable Fuels—Ensuring a Sustainable Path Forward

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

Opening Remarks/Updates

Mr. Bill Wehrum (EPA) opened by presenting an update on mobile sources. In his presentation he addressed 5 key priorities; the Locomotive and Marine rule, the Mobile Source Air Toxics (MSAT) rule, Fuel Economy Labeling rule, the Renewable Fuels Standard (RFS) program, and the Small Engine rule.

EPA proposed a Locomotive and Marine Rule on March 2, 2007.[1] Locomotives and marine engines are the last two mobile sources to be evaluated for after treatment-based national standards. This rule is predicted to reduce particulate matter (PM) and nitrogen oxide (NO_2) emissions from locomotive and marine engines by an estimated 90 and 80 percent, respectively. Consequently, annual health benefits have been estimated to be $12 billion for 2030. Mr. Wehrum highlighted opportunities in the South Coast Air Quality Management District in California.

EPA's MSAT rule was proposed on February 9, 2007, and contains regulations for vehicles, gas cans, and fuel. The fuels portion is predicted to reduce approximately 61,000 tons of benzene by 2030. Likewise, the vehicle and gas can standards are predicted to reduce VOC

[1] Information on the locomotive and marine rule can be found at www.epa.gov/otaq/locomotv.htm

emissions by an estimated >1 million tons.[2] Mr. Wehrum explained that compliance flexibility for approved refiners and credit programs for vehicle manufacturers will help insure implementation.

EPA proposed the Fuel Economy Labeling rule on December 11, 2006. This rule will generate fuel economy labels from vehicle-specific data from tests designed to replicate three real-world conditions, which can significantly affect fuel economy: high speed/rapid acceleration driving, use of air conditioning, and cold temperature operation.[3] Mr. Wehrum commented that methods have been revamped due to concerns that the old labeling methods were not accurately estimating actual fuel economy.

The RFS was created in response to the Energy Policy Act of 2005, which states that EPA is responsible for promulgating regulations to ensure that gasoline sold in the United States contains a minimum volume of renewable fuel.. One goal of the RFS program is to have approximately 3.71 percent of the gas sold/dispensed in the U.S. be renewable (starting in 2007).[4] Mr. Wehrum also added that EPA drafted and submitted Alternative Fuels Standards (AFS) to Congress on March 19th, 2007. The AFS requires that the transportation sector use 35 billion gallons of renewable gasoline. This transfer of nonrenewable fuels to renewable (a 15 percent conversion) is expected to be completed by 2017. Currently, the alternative fuels standards proposal includes, but is not limited to fuels listed under RFS.

In April 2007, EPA proposed a new emission control program that would reduce hydrocarbon emissions from small spark-ignition engines by about 35 percent beginning in 2010-2012, and also include evaporative emission standards.[5] Mr. Wehrum commented that the concerns over the danger of catalytic converters on small engines were addressed in a report entitled "EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower." The report concluded that engines would be as safe as or safer than engines without emission controls.[6]

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[2] Information on the MSAT rule can be found at http://epa.gov/otaq/toxics.htm

[3] Information on the fuel economy labeling program can be found at http://www.epa.gov/fueleconomy/index.htm

[4] The percentage presented was based on annual EIA predictions and applies to a wide-range of sectors, including, but not limited to refiners, importers, and gasoline blenders. For more information, see http://www.epa.gov/otaq/renewablefuels/index.htm

[5] For more information, see http://epa.gov/otaq/equip-ld.htm

[6] "EPA Technical Study on the Safety of Emission Controls for Nonroad Spark-Ignition Engines < 50 Horsepower." Assessment and Standards, Division Office of Transportation and Air Quality, U.S. Environmental Protection Agency. EPA420-R-06-006 March 2006 Available: http://epa.gov/otaq/regs/nonroad/equip-ld/phase3/420f06029.htm

Discussion

Regarding fuel economy labeling, Don Clay (Koch Industries) asked how fuel blends requiring Flexible-Fuel Vehicles (FFV) would be handled, such as ethanol blends greater than 10 percent. Ms. Oge responded that EPA has made a commitment to examine the issue. She added that issues also remain with the layout and presentation of the label itself.

A comment was made about whether the AFS considered climate change. Mr. Wehrum replied that the bill is silent on the issue except for assigning credit for the use of various fuels, which at this time is based on the energy content of the fuel. The credit program could also consider greenhouse gases in its weighting system, which would incentivize the use of fuels with less greenhouse gas potential.

Tom Cackette (CARB) noted that coal-to-liquids is included in the list of alternative fuels even though the carbon dioxide emissions are extremely high. Mr. Wehrum responded that the AFS is written from a national security standpoint (to reduce the nation's dependence on foreign oil). From an environmental standpoint, coal-to-liquids would not be considered a viable alternative.

Nancy Siedman (Massachusetts) congratulated EPA on the locomotive and marine rule. She mentioned an opportunity to coordinate with the International Maritime Organization (IMO) and take an aggressive stand in regulating C3 marine engines. She also added that many other state and local agencies besides the SCAQMD are involved in port and rail emission reduction programs. Mr. Wehrum replied that the Agency plans to coordinate and leverage off of the IMO in regulating C3 engines in the U.S. The question remains whether the U.S. has the authority to regulate international C3 engines in U.S. waters.

A subcommittee member asked if further explanation could be given regarding international activities with harmonizing test protocols for heavy-duty highway diesels. Mr. Wehrum stated that efforts are underway to establish universal environmental/health standards. For instance in Mexico, particularly the border areas, work has been done to encourage the Mexican Government to adopt fuel and emissions standards that are compatible with U.S. EPA regulations.

Ms. Oge stated that EPA currently does have a proposal, which can be provided to the members, stating the U.S. position on this issue. Ms. Oge added that organizations, including Caterpillar, were going to be part of a U.S. delegation in April supporting the U.S. proposal. For the harmonization chart, Ms. Oge stated that EPA was very close to putting together the final data that would allow harmonization of test procedures between U.S., Mexico, and Canada. Karl Simon will be leading this effort**.**

Mr. Walsh added that the International Council for Clean Transportation (ICCT), has developed a model rule for heavy duty vehicle emission standards, including low sulfur fuel, that

could be adopted by developing countries. Mr. Walsh noted that encouraging developing countries to embrace universal standards requires collaboration between developed countries. The EU is in the process of developing their Euro 6 emission standards proposal, and efforts have been made to encourage them to harmonize, as much as they can, with the U.S. program. Harmonization between these two unions (EU and U.S.) improves the feasibility of marketing the harmonization of environmental standards to developing countries that are moving forward.

Mr. Tim Johnson (Corning) asked if further comments could be made regarding EPA's diesel retrofit programs, particularly funding and timing issues. Mr. Wehrum stated that diesel retrofits remain a top priority for EPA. He further explained that diesel retrofits were a cost effective way to get reductions and an important element in reducing emissions in persistent nonattainment areas. Mr. Wehrum added that available diesel retrofit funding for FY2007 were more constrained than in other previous years. Changes made in funding, however, do not reflect a lack of commitment by the Agency to diesel retrofits. The goal is to try and spend that money in the most cost-effective way possible.

Mr. Johnson also asked Mr. Wehrum to comment on the new selective catalytic reduction (SCR) guidance document. The document discusses the Agency's thinking on using SCR systems to reduce diesel NO_X emissions. These systems require a reducing reagent, usually urea, to be injected in the exhaust upstream of the catalyst. The reagent needs to be replenished periodically, and there have been concerns that the system would require more frequent maintenance than is currently allowed by the Agency.

Mr. Wehrum commented that it is very important to replenish the urea without creating safety concerns or operability issues. So there is not a lot of talk of shutting down the systems or having governors in place to limit the operability of the vehicle once the urea is close to being expended. Mr. Wehrum would like to see the agency adopt a way to create incentives to using the SCR system without creating safety and operability concerns. The Agency wants to allow for flexibility for companies who want to try and use strategies that are successful. In essence, performance standards are established instead of particular equipment standards. Ms. Oge reiterated that this document is not a regulation, and added that for the most part comments are driving the agency to be a bit more specific. EPA has asked CARB to provide their input for the guidance to clear up any remaining issues.

Formation of new workgroup for Motor Vehicle Emission Stimulator (MOVES) model review

Ms. Megan Beardsley (EPA) presented information on the Motor Vehicle Emissions Simulator (MOVES) model. Specifically, she discussed two issues: the MOVES revised schedule, and a proposal for a new MOVES Review Workgroup. The revised schedule highlighted MOVES key activities from 2007 to 2010. A demo will be released in the next few weeks. Ms. Beardsley also addressed software improvements (the addition of pollutants, like HC, CO, NOx, etc.) and identified development areas to be addressed (light and heavy duty PM, HC, CO, and NOx).

Formed under the MSTRS, the MOVES Review Workgroup will be created as an advisory group. The purpose of the MOVES Review Workgroup will be to evaluate available

data in order to generate emission rates, developing fleet and activity inputs, fuel adjustments and/or other inputs and output structures. Ideally, MOVES Review Workgroup members will include representatives from various stakeholder groups experienced in highway/non-road vehicles and modeling. Matt Barth of the University of California – Riverside and John Koupal (EPA) have been named as co-chairs. The first meeting will be held at the Ann Arbor lab on May 18, 2007. Volunteers may email Ms. Beardsley at mobile@epa.gov, or contact John Guy.

Discussion

Mr. Walsh commented that this workgroup will be important for improving the model. He asked if emission factors for elemental carbon or global warming potential (GWP) measurements were going to be included. Ms. Beardsley stated that the 2004 model used does have some potential to evaluate 2004 GWP emissions, and the demo will have a CO2 equivalent output. There are no factors for organic or elemental carbon as of yet, and those pollutant emissions may be overwhelmed by other pollutants.

Ms. Seidman commented that travel support will be an important consideration for potential volunteers. Ms. Beardsley replied that the budget for the workgroup is still being planned.

Mr. Eric Skelton (Northeastern States for Coordinated Air Use Management (NESCAUM)) stated that the current mobile model (MOBILE6) does not account for in-use deterioration of aftertreatment technology for heavy duty engines. He inquired whether or not MOVES will have a deterioration factor included and if these issues were to be considered by the newly established workgroup. Ms. Beardsley stated that work was being done to identify deterioration factors. She continued to explain that there was a place for that factor in the model and topics like this would be within the purview of the workgroup.

Mr. Cackette asked what was being done to address future performance and emission factors of MY2007 and later heavy-duty diesel vehicles, given the uncertainty of how aftertreatment technology would perform down the road. Ms. Oge explained that a team of experts are studying and talking to the companies to study a 2007 vehicle prototype to develop new fleet data. Mr. Cackette added that CARB is working with manufacturers on existing data sets for on-road engines and questioning whether they represent proper emission rates for in-use vehicles. However, that data set is probably inferior to the CRC data. CARB has also published predictions from future engines, especially for NO_X, and the results seem more optimistic about performance. California's State Implementation Plan (SIP) includes large 2020 NO_X emissions because the on-board diagnostics (OBD) for heavy-duty vehicles are not yet effective. Emissions also reflect short life expectancy of controls due to high deterioration factors.

Mr. Johnson asked for a historic view on what happens when model upgrades are made. Ms. Beardsley replied that during the transition from MOBILE5 to MOBILE6, they found that past emissions estimates were higher with MOBILE6 and future emissions were lower in comparison to MOBILE5. Hydrocarbons and NO_X emissions were comparable between model versions, but modeled CO emissions were too high when compared with ambient monitored data. A committee member commented that within each step of the modeling process the previous models understated the emissions. Mr. Cackette added that overestimates are often

made when determining future success. Ms. Oge added that the model is very important, but inputs are more important.

Ms. Oge urged the newly established workgroup to include issues surrounding the last discussion on deterioration of aftertreatment technology. She also highlighted evaluating the data the Agency has collected in updating gasoline PM emissions.

Mr. Michael Rodgers (Georgia Institute of Technology) brought to the group's attention that the purpose of converting to MOVES is to have a more flexible model, and that will require more detailed guidance. He recommended adding the development of guidance to the workgroup charge.

Ms. Oge stated that one of the lessons learned from MOBILE6 was that the model was very complicated. EPA has the following two parallel efforts aimed at making MOVES more user-friendly: (1) make accessible demonstrations of the model, and (2) establish this workgroup early in the process to provide feedback. To increase user-friendliness, Ms. Oge stated that EPA plans on having training courses available by the end of 2008.

Report out on the Transitioning I/M Workgroup

Mr. Gene Tierney (EPA) gave a brief progress report on the Transitioning Inspection and Maintenance (I/M) Workgroup. The goal of this workgroup is to evaluate the transition from 1990 I/M programs to OBD testing. The I/M workgroup hopes to establish a universal standard for protocols, data, and communication. Instituting universal standards improves efficiency by reducing the number of relocating vehicles (moving from one state to another) having to be "re-equip" in order to comply with emission standards.

Mr. Tierney presented three innovative approaches to OBD testing that could eliminate an inspector: an automated data logger that a user would submit periodically, a self-serve kiosk, and remote onboard control devices (OCD). The group's report will be released sometime in mid-2007.

Discussion

Ms. Seidman inquired on an update to Appendix D.[7] Mr. Tierney stated that data from five state I/M programs have been analyzed. Currently they are looking at data to assess the problems associated with readiness of on-board diagnostics (OBD) monitors on cars and trucks. When a vehicle goes into the program for an OBD test, guidelines say all but 2 out of 11 sensors must be ready on MY 1996-99 cars, and 1 out of 11 on MY 2000 and newer cars, to continue with a valid test. A large percentage of vehicles are frequently not ready. Mr. Tierney listed several reasons why cars are not ready, such as scan tool or OBD problems. To address ongoing readiness problems, a working group was established. According to Mr. Tierney, it will take approximately 1 year to review vehicles listed. Mr. Tierney mentioned that the number of vehicles listed will likely be reduced, due to the fact that some states submitted duplicate information.

David Raney (Honda) asked about the robustness of the data used to create Appendix D. Mr. Raney also commented that the three testing approaches in the draft report have different levels of stringency. Mr. Tierney replied that the data set contained 10 million records from five different state programs, and represented different scan tools and calendar years. He added that paring down the list would entail looking for technical bulletins from manufacturers, and determining whether a problem is localized (e.g., common to one state).

Mr. Cackette asked if states would consider conducting tailpipe exhaust tests on vehicles listed in Appendix D. Ms. Seidman replied that some states are doing that, but there is a need to identify the readiness issues behind specific vehicle models.

Updates on NO_X Reflash

Ms. Anne Wick (EPA) presented information on the Diesel Engine Consent Decree (DECD) Low NO_X Rebuild program. The program targets engine manufacturers that designed their heavy-duty diesel engines with advanced electronic controls that cause the engines to switch to a more fuel-efficient driving mode during "off-cycle" steady highway cruising, but also cause the engines to emit excessive levels of NO_X. The consent decree requires the manufacturers to provide their dealers with modified software ("Low-NOx Rebuild Kit" or "chip reflash") that reduces the excess emissions, and to install the kits free of charge at the time of engine rebuild or upon owner/operator request..

Discussion

In regard to installation of reflash kits, a committee member asked if there could be further explanations on California's legal situation. Mr. Cackette stated that CARB implemented a regulation which required truck owners to seek the reflashes. He explained that there was already an interpretation of this rule which required kits to be applied upon request. He noted that initially the regulation began as a voluntary program. When results did not meet

[7] Appendix D is located in EPA's I/M guidance. It provides a list of cars and trucks which have demonstrated sensor "readiness" problems. The list contains approximately 800 vehicle models that have met the criteria of at least 8% of all vehicles being "not ready" for a minimum of 50 tests.

expectations they converted to mandates. Shortly after converting they were sued by engine manufacturers, etc. and lost. Courts stated that the mandated rule violated the existing DECD.

Ms. Seidman commented that the result of the DECD Low NOx reflash program was unacceptable. States are faced with hundreds of thousands of tons of lost NO_X benefits. Ms. Wick responded that calculations of engines eligible for rebuild may be lower than 1.1 million. The expectation of the program was that every engine be rebuilt fairly soon after the decrees were signed. The reality is that every engine does not undergo rebuilding. Ms. Wick asked if voluntary programs could be encouraged. Mr. Skelton noted the obstacles associated with voluntary programs. He mentioned it was hard for states to identify affected vehicles. In addition, owners do not have an incentive to reflash their engines. Therefore, there needs to be economic incentives in order to ensure participation. Unfortunately, states will probably have to bear the burden of any incentives.

Panel 1-Federal and State Activities

Ms. Sarah Dunham (EPA) presented information on low carbon fuel and vehicle pathways. Currently, OTAQ is conducting several analyses (inventories, modeling, and more), as well as developing newer (hybrid) technologies, promoting the use of renewable fuels, and/or participation in voluntary programs (e.g., SmartWay). Ms. Dunham also reiterated that the RFS would be finalized shortly. She highlighted potential usable renewable fuels and acknowledged the variation in each of their lifecycles. Ms. Dunham also provided an overview on the RFS provisions, potential fuel sources, infrastructure, and other potentially usable fuel blends. Ms. Dunham concluded with a list of existing and available renewable sources/work and conducted analyses.

Ms. Cheryl L. Bynum (EPA-SmartWay) presented information on EPA's SmartWay Transport Partnership Program. She addressed two topics: SmartWay's goal for having cleaner and more efficient heavy-duty trucks, and fuel economy test procedures for heavy-duty trucks. To date, SmartWay, along with participating manufacturers, have created a list of equipment specifications and developed guidelines regarding logo use. In the future, EPA plans on increasing and promoting community outreach through press releases aimed at highlighting upcoming public events. As of January 2007, fuel economy test procedures for heavy-duty trucks have been outlined. The completion date for the final draft is estimated for spring 2007.

Mr. Cackette presented information on climate change and low carbon fuel standards. Changes in climate have impacted California's environment significantly. The most recent Intergovernmental Panel on Climate Change (IPCC) report indicated that climate change is occurring faster than predicted. At the behest of California's Governor, Arnold Schwarzenegger, CARB has taken steps towards reducing and/or preventing these impacts. One of their goals is to reduce emissions levels by an estimated 174 MMT CO_2E by 2020. Similar measures will be taken to ensure an estimated 341 MMT CO_2E (an estimated 80 percent reduction from baseline levels) reduction by 2050.

Mr. Christopher Recchia (Executive Director, Ozone Transport Commission) presented information on regional control measures and attainment planning efforts within the OTC. Mr. Recchia listed a wide range of potential point, area, and mobile sources to be evaluated, along

with their mobile sector measurements. Actions already taken by OTC included collaborating with states and completing a memorandum of understanding (MOU) 06-01, which deals with chip reflashing and portable fuel containers. Mr. Recchia also outlined other measures implemented through the OTC Clean Corridor Initiative that will deal with mobile source emissions.

Mr. Recchia concluded by addressing and summarizing pending actions. On June 15, 2007 states are required to submit an Ozone SIP. It has been predicted that the 2009 attainment goal set will not be met. Significant reductions in emissions as a result of EPA's On-Road Rule are not predicted until 2012.

Panel Discussion

Mr. Terry Goff (Caterpillar) inquired about the economic sustainability of the RFS; specifically, if and when it would be able to stand on its own. Ms. Dunham agreed that an economic analysis is important, but the focus now is on the regulatory side. Currently, an extensive agriculture analysis is being conducted. A committee member asked if the analysis was limited to U.S. or is there an international dimension. Ms. Dunham acknowledged the need for an international component, although there is not one at the present time.

Mr. Johnson asked what the Agency's perspective was on plug-in hybrid vehicles, and what the implications were for CO_2 emissions, electric utilities, and criteria pollutant emissions. Ms. Dunham replied that IPM was used to model a scenario of using plug-in hybrids charged with electricity from coal-fired utilities, and results indicated a net positive impact on greenhouse gases.

Mr. Cackette reiterated that in January 2007, the President announced a 4 percent improvement per year on fuel economy for light-duty passenger vehicles. He was interested in learning if any analysis was being conducted that addressed the technology and the climate standpoint. Ms. Dunham acknowledged that this is an ongoing issue and stated that analyses were being conducted from a technical standpoint. Ms. Oge added that EPA has submitted a legislative proposal to Congress**.**

In regard to SmartWay's improvements, a subcommittee member inquired if the percentages estimated used a conservative analysis to compare 2007 trucks with improved trucks. Ms. Bynum explained that the analysis was done using 2007 truck engines without all improvements.

Mr. Johnson asked for a panel perspective on criteria pollutants and the impact(s) they will likely encounter as Air Resource Board (ARB) staff shift from a low emission vehicle (LEV3) focus to greenhouse gas initiatives. Mr. Cackette stated that there will be absolutely no reduction in the efforts on criteria pollutants. New resources are being used to implement climate change initiatives. Mr. Cackette continued to explain that there is a relationship between climate activities and side benefits for criteria pollutants, although the relationship does not always exist. Ms. Oge rebutted a statement that EPA will shift it's focus exclusively to greenhouse gases, and will not attempt to control criteria pollutants beyond 2010. She added that there was a budget available that specifically dealt with climate. Part of EPA's efforts were to

perform and promote the following three types of work: (1) voluntary work (e.g., SmartWay), (2) modeling and inventories, and (3) advanced technology. Ms. Oge commented that not all programs will have greenhouse gas and criteria pollutant co-benefits.

Mr. Tierney inquired to the extent at which CARB will be looking at vehicle miles traveled (VMT) controls for 2020 and 2050 goals. Mr. Cackette explained that predicted measurements for 2020 included a measurement for VMT reduction, but the extent of the reduction is not known. To get to the 2050 goal of an 80 percent reduction, one path could be to decrease VMT by 20 percent, fuel consumption by 75 percent, and have at least half of remaining vehicles operate on renewable fuels. It will be a radical transformation of the way we do business.

In regards to low carbon fuel standards, Ms. Jill Hamilton (Biodiesel Board) asked for an update/status report regarding the identification of greenhouse gases emissions, reductions, and impacts. Mr. Cackette mentioned that the California Universities (Berkeley and Davis) are currently working on the technical core structure, such as reductions in CO_2 emissions for various feed stocks, as well as ideas on how the regulations may work. They are also working on a comprehensive study of alternative fuels and their life cycle emissions. Mr. Cackette continued to explain that a draft of the study would not be available until July, and workshops are regularly available to discuss these issues.

Panel 2- Potential for Fuels and Technology

Mr. Michael Walsh (Co-chair, Consultant) presented an update regarding the status of zero emissions vehicles (ZEV) technology on behalf of his team, Dr. Fritz R. Kalhammer, Brice M. Kopf, Dr. Vernon P. Roan, and Dr. David H. Swan. The team's primary objective is to conduct an assessment on ZEV and near ZEV vehicles. The assessment focuses on technological potential and costs. Mr. Walsh identified ZEV and near ZEV that would be including the analysis, along with team specified tasks (e.g., meetings, questionnaires, and follow-ups). Mr. Walsh outlined specific tasks based on the team's desired areas of focus.

Mr. Walsh concluded with an update on the panel's progress. To date, a majority of the data analysis has been completed. Preliminary presentations to ARB staff, along with a draft report have been submitted. Meanwhile, a final report and presentation is being prepared.

On behalf of Mr. Bob Dinneen, Ms. Samantha Slater (Renewable Fuels Associations) presented an overview on the fuel ethanol industry in the in the U.S. The ethanol industry has not reached its full production potential . As of 2006, the capacity of the industry to produce ethanol was estimated to be 5.3 billion gallons per year (bgy). However, Mr. Walsh highlighted that actual production reached only 4.9 bgy, while the demand for ethanol was estimated to be 6 billion gallons. Ms. Slater mentioned that gasoline production and consumption (140 billion gallons) still dominate today's transportation fuels. However, there are 19 states (114 plants) with a 5.6 bgy capability for producing ethanol. The industry is expected to grow further (an additional 6 bgy) once 80 plants currently under construction, along with 8 expansions are completed. Industry growth can be attributed to the RFS, high oil prices, and State implemented ethanol programs. Ms. Slater listed a variety of local and national benefits that can be attributed

to demand and industry growth of ethanol, ranging from job creations to a reduction in foreign fuels.

Ms. Slater identified potential obstacles faced by the ethanol industry, particularly those producing cellulosic ethanol. Presently, the costs associated with the production of cellulosic ethanol are considerably higher (4 times greater than dry mill ethanol). Enzymatic processes for ethanol production may provide lower prices, but the process has not been commercialized. In short, Ms. Slater expects the production of cellulosic ethanol to occur at a larger scale in the future, however a specific timeframe cannot be established.

Ms. Slater concluded with a highlight of ethanol related legislation, priorities, and goals. Suggestions have been made to continue and maintain the Volumetric Ethanol Excise Tax Credit (VEETC) initiative and the credit offset tariff in the hopes of expanding the ethanol market. In order to maximize ethanol potential and achieve ethanol commercialization, funding must be increased for EPAct 2005 programs, research and development, and grants and loans.

Ms. Hamilton presented information on biodiesel production, current programs administered by the National Biodiesel Board (NBB), and issues associated with future production and quality. Ms. Hamilton outlined three points that made-up the NBB's Original Equipment Manufacture (OEM) program: (1) B20 in existing vehicles, (2) B20 in new vehicles, and (3) B20 in retrofits for existing vehicles. The goal of the program is to evaluate the impact of biodiesel blends including, but not limited to B20, on engines and emission control technology. She agreed with Ms. Slater that legislative action (biodiesel blender tax credit, RFS, and small agri-biodiesel income tax credits) have encouraged progress within the industry.

To date, there are an estimated 105 plants with a capacity of 864 million gallons/year, producing biodiesel nationally. The majority of these establishments are located in the Northeast and Eastern U.S. Increases in biodiesel fuels can also impact other industry's ability to produce (feedstock supplies). Ms. Hamilton explained that an analysis will be needed to address the impact of biodiesel on industry procedures. This analysis will identify national and international drivers, estimate available supply of raw materials, identify methods aimed at increasing the supply of raw materials, document international actions affecting the U.S. biodiesel market, and provide feasible recommendations.

Ms. Hamilton concluded by noting that the quality of fuel produced is an important issue when trying to achieve confidence and promote biodiesel fuels among consumers and/or producers. The NBB has taken several positive approaches aimed at addressing this issue. For instance, NBB's National Quality Program (BQ-9000), along with its fuel quality seals notify consumers that fuel produced and consumed meets certain environmental standards (ASTM D 6751). She emphasized the need to coordinate with EPA to ensure that ASTM standards would be enforced.

Mr. Les Wolf (BP) presented information on 1-butanol as a gasoline blending bio-component. BP and DuPont are collaborating on plans for developing, producing, and marketing the fuel. Presently, biotechnology for spark ignition engines is limited to only bioethanol processes. Biobutanol production can enhance yields, reduce associated costs, and enhance versatility within fuels. In order to make biofuels more competitive and marketable in the U.S.,

BP and DuPont are evaluating evaluating international biobutanol markets, particularly in Europe. Tests indicated that butanol was a more compatible, efficient, and versatile fuel than ethanol, partly due to its higher energy content. Mr. Wolf highlighted that gasoline emissions for CO, HC, and NO remained constant, with or without butanol. Mr. Wolf concluded with a list of health and environmental effects, which were a result of ethanol consumption and production.

Mr. Reg Modlin (Chrysler Group) presented information on the reduction of petroleum consumption based on technology and alternative fuels. Reducing petroleum requires a solid commitment from involved stakeholders to continue to develop and implement effective and efficient alternative fuels and policies. According to DOE, petroleum consumption and production are predicted to increase by 25 percent over the next 20 years. This increase is partly due to an increase in population, but more significantly impacted by an increase in VMT.

Mr. Modlin noted that measures must be taken to reduce consumption in other areas to counteract increases in petroleum. Some measures mentioned included converting gasoline to E10, using B20 diesel fuels, and converting 50 percent of vehicles to FFV with 100 percent E85 use by 2012. Mr. Modlin mentioned several challenges, including cost inequality of renewable fuels to gasoline, tax exemptions, and consumption/production incentive limitations. Regardless of the obstacles faced, the Chrysler Group is committed to reaching its goal by 2012. To ensure success, a market must exist which makes alternative fuels competitive with conventional gasoline.

Mr. Bob Holycross (Ford) presented information on energy efficiency and advanced technology pathways taken by Ford. Ford perceives sustainable performance as a potential and profitable business opportunity. Thus, Ford's vision for the future is to improve vehicle performance by focusing on sustainable mobility. Currently, Ford offers 13 model vehicles that achieve 30 mpg or better. Ford's ability to be successful is partly dependent on energy issues, including foreign oil dependency. Energy consumption has been predicted to increase an estimated 71 percent by 2030. Alternative fuels like ethanol have been marketed and available for approximately 10 years. Mr. Holycross concluded by saying significant emissions reductions can be achieved assuming involved stakeholders (auto industry, fuel industry, government, and consumers) collaborate.

Panel Discussion

In regard to the growth of the ethanol industry and consumption, Mr. Walsh asked if further explanation could be given on when cellulosic ethanol could be commercially available. Ms. Slater stated that the answer to that question was still unknown. She explained that the President's 2006 State of the Union Address led to the creation of the Advanced Energy Initiative (AEI), which set 2 achievable goals: (1) make cellulosic ethanol cost competitive by 2012, and (2) reduce gasoline consumption by 30 percent by 2030, through the promotion of renewable fuels. Ms. Slater noted that achieving the second goal largely depends on technology. She added that the demonstration facilities monitored by DOE will likely provide informative results.

Mr. Johnson inquired whether or not there was any consideration to use bio-diesel as a feed substitute in refineries. This would minimize those quality issues and let the refineries take

care of it. Ms. Hamilton explained that this type of "renewable diesel" will not achieve the emission reductions or provide tax credits to the agriculture industry as biodiesel, as we define it. The biodiesel tax credit was not intended to be used for refinery-based feedstock.

Nathanael Greene (NRDC) inquired whether 100 percent butanol could be used in existing motor vehicles. Mr. Wolf explained that some people have taken vehicles and fueled them with 100 percent butanol, and although the vehicle would run, eventually the catalytic converter would fail. Today's vehicles are conditioned to use up to 3.6 percent oxygen (which equates to an estimated 10 percent ethanol). Consequently, 50 percent or less of butanol can be used as fuel without causing damage to the vehicle.

Mr. Greene also asked if upstream compatibility was a criterion for assessing biobutanol, and if there was a promotion for pipeline distribution of butanol. Mr. Wolf stated that transferring 100 percent butanol through the pipeline was a possibility. He further explained that the initial objective was to attempt to demonstrate pipeline transportation using a typical 10 percent butanol blend. This objective is currently being tested in the UK. Mr. Greene observed that the justification for exploring different fuels other than ethanol was to make it easier for traditional vehicles to burn higher blends, but it does not sound like butanol was the answer. Mr. Wolf replied that butanol has demonstrated better fuel economy than ethanol, so there would still be benefits to using it in FFVs.

In regard to EPA-submitted legislation to Congress, Mr. Walsh asked if there was any disagreement on whether the comparison between fuels should be energy-based or carbon-based. Mr. Modlin stated that the ultimate goal of the AFS is to reduce petroleum usage, and explained that the perception of fuel economy today will have to be altered to focus more on emissions and renewable energy benefits.

Ms. Hamilton addressed the panel regarding the long-term platform for hybrid vehicles and biofuels Mr. Holycross remarked that a portfolio perspective is currently being used. Economic challenges for hybrid vehicles have been difficult to overcome, however the commitment to keeping the technology still remains strong. In response to bio-fuels and FFV challenges, vehicle improvements are the first step, but vehicle manufacturers need assurance from the fuel industry that the demand for alternative fuels will be met.

Mr. Nicholson commented that Ford's H_2ICE engine was a logical bridge to hydrogen-fueled vehicles, and asked if it would be promoted more extensively. Mr. Holycross replied that he wants to see the results from the demonstration vehicles before evaluating future roles for H_2ICE.

Panel 3-Renewable Fuels—Ensuring a Sustainable Path Forward

Mr. Karl Simon presented on the importance of biodiesel fuels and discussed EPA's role in the regulation and promotion of these fuels. ASTM D6751 has been labeled as the industry and EPA standard for testing biodiesel. Mr. Simon announced that studies have shown that excessive glycerin and biodiesel stability have resulted in some commercial biodiesel not meeting ASTM D6751 specifications. To evaluate biodiesel fuels more effectively and

efficiently, EPA has established a variety of regulations, ranging from biodiesel registration to approved usage.

Mr. Simon concluded with the importance of harmonizing fuel standards and EPA's progress in promoting it. Basic principles of fuel standards harmonization include using existing framework, addressing operational and environmental performance concerns, ensuring high quality fuel, and harmonizing performance standards to ensure acceptable emission levels. EPA has participated in several DOE/American National Standard Institute (ANSI) workshops. These workshops address biodiesel quality concerns, and allowed participants the opportunity to assist in the development of ASTM D6751 standards for biodiesel and petroleum diesel blends.

Mr. Roger Conway (Director, Office of Energy Policy New Uses/USDA) presented information on ethanol production, markets, costs, and its impact on agriculture, particularly corn prices. Mr. Conway outlined 11 conclusions concerning ethanol: (1) production is exceeding expectations, (2) prices are likely to remain high enough to sustain ethanol expansion, (3) investment returns are such that corn ethanol plants can be profitable over a wide range of corn prices, (4) prices of corn may increase to record highs over next 5-6 years, (5) due to ethanol plants' abilities to bid corn away from other uses, ongoing operations are likely to continue to operate, even if corn prices hit record highs (6) additional land for ethanol production could be made available by the Conservation Reserve Program (CRP), (7) international competition is likely to increase as the demand for corn increases, (8) the corn sectors will be more susceptible to market disruptions due to tight market, (9) corn ethanol alone can not greatly reduce U.S. national dependency on oil, (10) cellulosic ethanol appears to be the best renewable alternative fuel for reducing foreign dependency, and (11) ethanol growth could potentially introduce additional future costs for some sectors and therefore, requires long-term monitoring.

Mr. Nathanael Greene presented an environmental perspective on the needs and demands for biofuels and how they are impacted by global warming. NRDC recognizes that the success of the fight against global warming is dependent on stakeholders including, but not limited to federal, state, and local governments. In order to impact global warming trends, the U.S. is encouraged to reduce its GHG emissions by 60-80 percent by 2050. Renewables are predicted to account for one-fifth of the reduction expected, while biofuels will likely account for the remaining half.

Mr. Greene concluded his presentation cautioning against heavy reliance on corn ethanol as an alternative to gasoline/oil. Mr. Greene explained that increases in the demand of corn will likely increase the price of corn. Consequently, higher corn costs will likely increase the cost of compatible products (animal feed).

Panel Discussion

In regard to biodiesel, Mr. Nicholson inquired about ASTM certification of biodiesel and engine manufacturers. Mr. Simon explained that some manufacturers have put language in their owner's manuals, which would allow use for up to B20 blends. John Wall (Cummins) commented on the durability of an emission control systems on vehicle running on biodiesel, and emphasized that the need for certification testing is imperative to insure the quality of the fuel.

Ms. Vickie Patton (Environmental Defense) commented on the overall environmental framework of implementing a diverse range of alternative fuels. She emphasized the need to insure that the investments made in alternative fuels are as durable and leveraged as possible. Ms. Oge thanked Ms. Patton for posing a challenge to the subcommittee. She added that it was very crucial that as the committee moved forward when addressing issues like climate change, that we do not sacrifice any other environmental or public health benefits.

In regard to the export of goods (soybeans), Mr. Skelton asked to what extent countries depend on U.S. exports and is there a potential shift from food to energy. Mr. Conway explained due to feed used in diets for livestock for animals, corn cannot be used exclusively for ethanol. Overall, to avoid potential risk to livestock and international competition, a commitment to an estimated 50 percent or less would be needed. Although the U.S. is currently a major exporter of corn, that may change as we depend more on corn for fuel.

Wrap-Up

Mr. Walsh thanked everyone for attending the meeting, as well as Mr. John Guy for putting the meeting together. The meeting was adjourned at approximately 4:00pm.

Mobile Sources Technical Review Subcommittee March 28, 2007 Attendance Sheet	
Presenters and Subcommittee Members	
Name	**Organization**
Michael Walsh, Co-Chair*	Consultant
Sally V. Allen*	Gary-Williams Energy
Megan Beardsley	U.S. EPA
Robert Brown*	Ford
Cheryl L. Bynum	U.S. EPA-SmartWay
Tom Cackette*	CARB
Don Clay*	Koch Industries
Roger Conway	U.S. DOA
Sarah Dunham	U.S. EPA
Nathanael Greene *	NRDC
Terry Goff*	Caterpillar
Jill Hamilton	NBB
Bob Holycross	Ford
Tim Johnson*	Corning
Reg Modlin*	Chrysler
Brock Nicholson*	NC DAQ
Vickie Patton*	Environmental Defense
David Raney*	Honda
Chris Recchia	OTC
Michael Rodgers*	Georgia Institute of Technology
Margo Oge	U.S. EPA
Nancy Seidman*	Massachusetts
Karl Simon	U.S. EPA
Eric Skelton*	NESCAUM
Samantha Slater	Renewable Fuels Associations
Gene Tierney	U.S. EPA
John Wall*	Cummins
Bill Wehrum	U.S. EPA
Anne Wick	U.S. EPA
Les Wolf	BP
Technical Staff	
John Guy	U.S. EPA, Designated Federal Official
Nanishka Albaladejo	EC/R
Kathy Boyer	EC/R

*Denotes Subcommittee Member or Alternate

Public Observers/Attendees	
Name	**Organization**
Cass Andary	Alliance
Joseph Bachmen	U.S. EPA
Steve Brantz	UCS
J. David Cetola	Johnson Matthey
Steve Cook	BNA
Dawn Fenton	Diesel Technology Forum
Steven Flint	New York State DEC
Chuck Freed	Consultant
Doug Greenway	NAMA
Marilyn Herman	Merman & Associates
Dale Kardos	DKA Inc.
Koji Kawazoe	Mitsubishi Motors R&D of America
Judy Kosovick	Capital Sun Group
Joe Kubsh	MECA
David Lax	API
Nicole Lents	U.S. EPA-OTAQ
Sonya Lewis-Cheatham	VDEQ
Jessica Robinson	Mitsubishi Motors R&D of America
Lucas Wall	U.S. EPA
Rebecca White	U.S. EPA