

Federal Advisory Committee Act  
Clean Air Act Advisory Committee

## **Mobile Sources Technical Review Subcommittee**

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Co-Chairs: Mr. Drew Kodjak and Ms. Gay MacGregor

Designated Federal Official: Ms. Elizabeth Etchells

### Summary of the Subcommittee's Meeting on December 13, 2012 Washington D.C.

#### **Introduction/Opening Remarks**

Mr. Drew Kodjak (ICCT, Co-Chair) and Ms. Gay MacGregor (EPA, Co-Chair) called the meeting to order at approximately 9:00 am. Mr. Kodjak and Ms. MacGregor welcomed attendees, reviewed the day's agenda and noted a few switches in the order of the speakers. Ms. MacGregor asked for a vote on the minutes of the April 19, 2012 Mobile Sources Technical Review Subcommittee (MSTRS) meeting (approved). Mr. Kodjak and Ms. MacGregor asked for all members present to introduce themselves.

Presentations and meeting topics for this meeting are as follows:

- Office Director Comments – Chris Grundler, EPA
- Presentation: SmartWay Legacy Fleet Work Group Meeting Summary – Terry Goff, Caterpillar and Buddy Polovick, EPA
- Presentation: Consumer Acceptance of Electric Vehicles in the US – Drew Kodjak, ICCT
- Presentation: Consumer Acceptance of Advanced Electric Vehicles – Tom Balon, MJ Bradley
- Presentation: – PEVs and the Consumer – Bob Wimmer, Toyota
- Presentation: Will They or Won't They? Consumer Adoption of High Fuel Economy Vehicles, 1999-2012, and the Role of the 2025 Standards in Speeding Diffusion of Advanced Technology – Mark Cooper, Consumer Federation of America
- Presentation: U.S. Emission Control Areas – Bill Charmley, EPA
- Future of Natural Gas in Transportation – Alison Bird, FedEx
- Presentation: Natural Gas Vehicles: Opportunities and Challenges in the Transportation Sector – Kathryn Clay, American Gas Association

- Presentation: U.S. Natural Gas Emissions – Pamela Franklin, EPA
- Presentation: Honda’s Experience and Perspective on CNG Powered Vehicles – Ichiro Sakai, Honda
- Presentation: Natural Gas and Transportation: Diesel, Gasoline, Natural Gas, and Efficiency – Pam Campos, EDF

Presentations are posted online at the MSTRS website: [http://www.epa.gov/air/caaac/mobile\\_sources.html](http://www.epa.gov/air/caaac/mobile_sources.html). As the presentations are posted for public view, the notes below primarily reflect the discussions that occurred in response to the presentations.

**Comments from the EPA’s Office of Transportation and Air Quality Director – Chris Grundler, EPA**

Chris Grundler began by thanking the MSTRS members for their participation and by welcoming the new members. Mr. Grundler noted that he is the new director of the EPA’s Office of Transportation and Air Quality (OTAQ) and summarized his work experience at the EPA. Mr. Grundler then provided a brief overview of the programs currently ongoing in the OTAQ. The EPA is working to propose the Tier 3 standards in the next few months and finalize them by the end of 2013 and is beginning to implement the regulations for ocean-going vessels in the Emission Control Areas (ECAs). Mr. Grundler is still formulating the priorities for OTAQ, but he believes working on the Tier 3 standards and working on the second phase of greenhouse gas (GHG) standards will be priorities for the office. The OTAQ will also be working on issues with ports, where there may be real opportunities to reduce risk to the communities in port areas. They will also be working to implement and enforce the rules that are in place. He noted that the rules are expensive to comply with, and the EPA wants to make sure that all manufacturers comply to ensure fair competition. He also noted that a person had made counterfeit renewable fuel credits, associated with the renewable fuel standards (RFS), which froze the market for the credits. The EPA will be adding voluntary programs through rule amendments to allow buyers an affirmative defense from fraudulent credits, if they agree to undergo a third-party quality assurance verification. They also will be working to develop new ways to implement the rules regarding fuels, which may require rule revisions. The EPA has received nearly 30 petitions on the RFS, and efficiencies need to be found for the annual RFS rulemaking process. Mr. Grundler ended his remarks by allowing time for questions.

*Discussion*

Robert Jorgensen (Cummins) remarked that the EPA is ranked in the top 5 large government agencies for employee satisfaction. Mr. Grundler was happy to hear this and noted that part of his role is to work on human resources, and he feels he has a responsibility to help people within OTAQ find interesting and fulfilling work.

Mr. Jorgensen commented that some companies in China are making products for import to the U.S. using fake labels to make it look like the products are from his company. These products typically do not meet U.S. standards and are cheaper than equipment that does meet the standards. Mr. Grundler replied that it is important that the EPA have the latest information and stay current so that products that have not met the U.S. standards do not enter the market here.

### **SmartWay Legacy Fleet Work Group Meeting Summary – Terry Goff, Caterpillar and Buddy Polovick, EPA**

Mr. Polovick and Mr. Goff provided a summary of the third face-to-face meeting of the SmartWay work group. Mr. Goff reviewed the three subgroups of the work group and the charge of each. The three subgroups focus on (1) accelerating and sustaining SmartWay in the trucking and rail sectors, (2) opportunities for supply chain fuel and emissions reductions in freight modes, such as marine vessels and air transportation, and (3) opportunities in the nonroad sector. Mr. Polovick reviewed the workgroup process for developing recommendations and summarized the themes of the workgroup recommendations. For subgroup 1, the themes included the importance of considering the sectoral aspects of expanding the program, recognizing the impact of operator/driver training, considering the impact of the 2014 heavy-duty GHG rule on SmartWay, and considering the advantages of increasing intermodal capacities. For subgroup 2, the themes included the importance of recognizing that there are only 2 or 3 meaningful players in the air cargo sector, considering integrating the EPA Ports Initiative with the marine sector, and recognizing that other carbon accounting systems are in place for these sectors. For Subgroup 3, the topics include the importance of recognizing that the nonroad sector is diverse, considering creation of an alternate brand for the nonroad sector, and that the sector should be divided and priorities assigned, perhaps based on fuel usage and/or emissions. Mr. Goff and Mr. Polovick noted that the work group will be providing a draft recommendation report well in advance of the MSTRS meeting next fall so the members will have time to read and comment on it before voting.

#### *Discussion*

Phil Heirigs (Chevron) asked how close SmartWay trucks are to complying with the new 2014 standards. Mr. Goff replied that the 2014 rule does not apply to trailers, so SmartWay will continue to drive improvements there.

Mr. Grundler asked whether the work group considered the budget when discussing possible recommendations for the SmartWay program. Mr. Goff replied that the work group had considered what should be done within constrained resources.

### **Consumer Acceptance of Electric Vehicles in the US – Drew Kodjak, ICCT**

This presentation covered electric vehicle (EV) consumer profiles, sales forecasts, market barriers and public policy. The profile of the typical EV early adopter is a young, high income person using an EV as a second vehicle, living in an area with good weather and a recharging infrastructure, such as Southern California. The demographics of the early majority include those with higher-than-average income, living in an urban or suburban area, having a private

garage and driving low miles weekly. This group also is typically environmentally sensitive and/or concerned about the country's dependence on foreign oil. Hybrid electric vehicle (HEV) buyers are also less concerned with interior comfort and exterior styling, and they are more concerned about mileage, environmental impacts and owning advanced technology than most buyers. While there are several EV models available, sales projections for EVs amount to 1% of light duty vehicle sales by 2020. There is a gap between consumer expectations and EV performance. Consumers are not willing to accept the current range limitations, the long recharge times and the vehicle price premiums. In addition, as the gasoline powered fleet reaches 50 mpg, consumers show less interest in EVs. Based on a global study by Deloitte, the EV market size is limited to 2 to 4% of the population. In the U.S., EV advocates are concentrated in the Northeast and the West Coast. The price premium for current EVs is a major barrier to sales, and while battery prices are expected to decrease, those decreases may be offset by price increases required to increase vehicle range. Studies have suggested that for the majority to accept EVs there need to be ubiquitous public charging stations, charge times of less than 2 hours (some places in the world this number is much less than 2 hours), and range needs to be about 300 miles. Due to these barriers, government policies as much or more than EV technology, will determine consumer adoption rates over the next decade. It may also be that innovators and early adopters do not require incentives to buy EVs, but that government incentives would be better spent on the early majority.

### *Discussion*

Due to time constraints, questions were held until after the last presentation in this group of presentations about consumer acceptance of advanced technology vehicles.

### **Consumer Acceptance of Advanced Electric Vehicles– Tom Balon, MJ Bradley**

To advance consumer acceptance of EVs, the range must be extended to approximately 200 miles and battery costs need to come down. Range is important to consumers, whose average commuting day trips are less than 40 miles and make up 80% of the total trips, but these trips only account for 40% of the vehicle's total annual mileage. However, approximately 95% of all day trips are 200 miles or less. Battery cost is primarily what hinders the range and accounts for the largest incremental costs of current EVs. The target would be that by 2030, batteries would be 40 kWh with a \$4,000 incremental cost for a \$100/kWh battery cost. These batteries would presumably be lithium air (LiAir), and would provide adequate range, cost and battery life. At this level, it is anticipated that incentives would not be required to spur consumer purchases. Market research has also shown that fuel costs on the new EPA fuel economy labels, which are based on annual and 5-year fuel costs, are too long-ranged for average consumers, which prefer monthly cost summaries. Along with the extension of range and reduction in cost, it is important to convey to consumers that the cost of electricity can be cheap in comparison with gasoline and that fast charging is not really necessary. For the cost of electricity to be cheaper than gasoline, slow charging (over 6 hours) per day will be necessary.

## *Discussion*

Due to time constraints, questions were held until after the last presentation in this group of presentations about consumer acceptance of advanced technology vehicles.

### **PEVs and the Consumer – Bob Wimmer, Toyota**

Toyota has had over a decade of history of providing commercially available hybrid and electric vehicles. The Toyota Prius has been available since 2000 and an EV version of the RAV4 was available in limited quantities between 1998 and 2004. In total, global sales of Toyota and Lexus hybrids is now over 4.2 million, with 1.8 million of those sold in the U.S. In comparing the sales of hybrid vehicles in their first 18 months on the market with plug-in hybrid electric vehicles (PHEVs) and plug-in EVs (PEVs), PHEV and PEV sales out-paced hybrids. This difference may be accounted for by the increased cost of gasoline now compared with that a decade ago and also the Federal and state incentives available for PHEV and PEV that were not available for hybrids. To compare EVs with other vehicle types, for every PEV sold in 2012, 4 PHEVs are sold, 55 hybrids are sold and 1,550 conventional vehicles are sold. The buyers of EVs tend to be in their 50's and 60's, have an advanced degree, are affluent, and for PEVs, are predominantly male. Most buyers of PEVs are already owners of hybrids, and not many owners of conventional vehicles are buying PEVs. While EV sales are increasing, they are still in the early adoption phase and are not yet mainstream. The growth of the market for PEVs will require time, expansion of the models available, and will require greater appeal to a broader demographic.

## *Discussion*

Due to time constraints, questions were held until after the last presentation in this group of presentations about consumer acceptance of advanced technology vehicles.

### **Will They or Won't They? Consumer Adoption of High Fuel Economy Vehicles, 1999-2012, and the Role of the 2025 Standards in Speeding Diffusion of Advanced Technology– Mark Cooper, Consumer Federation of America**

In the traditional model of technology adoption, the first 2.5% of users are classified as “innovators,” the next 13.5% of users are “early adopters,” the following 34% of users are the “early majority,” the subsequent 34% are the “late majority,” and the last 16% of users are the “laggards.” With hybrids, excluding the recession, the number of vehicle models and vehicle sales increased substantially over the years and were highly correlated with each other. Over that same period of time, more consumers bought four-cylinder vehicles, due to increases in gas prices and increases in the horsepower of these vehicles. Comparing the early market for PEVs in 2012 with the early market for hybrids in 2003, sales are nearly the same, but more makes, models, and body styles of PEVs are available. Industry projections have shown that by 2025, there could be over 7,000,000 sales of hybrids and nearly 4,000,000 sales of PEVs, but when factoring in the effects of the recession, these values could be much less.

## *Discussion*

Pam Campos (EDF) observed that the regional market differences for EVs in the U.S. are remarkable and asked whether the automakers had thought about appealing to the markets in these regions differently, such as appealing to the “buy American” aspect of the fuel. Mr. Balon responded that the utilities are not doing this kind of marketing. Mr. Wimmer replied that there are many messages to get across. Some messages may resonate with the early adopters, and Toyota is struggling to connect with different types of consumers. Mr. Cooper replied that the automakers ought to sell cars and not sell public policies. He noted that there are huge differences in the priorities people have and how they spend money in different parts of the country.

Mr. Jorgensen commented that the removal of the need to go to the gas station when EVs are used is something that could be highlighted in marketing campaigns.

Deborah Bakker (Hyundai) asked whether the monetary incentives discussed in the presentation included manufacturer incentives or just governmental incentives. She also asked about the number of vehicles Toyota expected to sell. Mr. Wimmer offered to have a discussion with her to address her specific questions outside of the MSTRS meeting.

John Viera (Ford) stated that it would be good to know more about fuel availability in the future and how this would affect EV sales.

## **U.S. Emission Control Areas – Bill Charmley, EPA**

Certain areas along the coasts of North America and the Caribbean have been designated as Emission Control Areas (ECAs) to address NO<sub>x</sub>, SO<sub>x</sub> and PM emissions, primarily from large marine engines. The ECAs are designated by the International Maritime Organization (IMO) through an amendment to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL). Annex VI first went into effect in 2005 and was amended in 2008 to reflect current engine emissions control technology and to require more stringent fuel sulfur limits. The amendments include more stringent global NO<sub>x</sub> and fuel sulfur limits and created the ECAs, which have more stringent limits for fuel sulfur and NO<sub>x</sub> than the global limits. In the U.S., the estimated impact of ECA requirements dwarfs the impact from the already successful programs addressing trucks, nonroad diesel engines, locomotives and smaller marine engines. As a result of the ECA requirements, ozone and PM<sub>2.5</sub> are projected to be reduced well into the interior of the country. Beginning in August 2012, fuel used in the North American ECA cannot exceed 1% sulfur, which costs approximately 15% more than non-low-sulfur fuel in most places and up to 40% more in some areas. Some companies concerned about the costs of the compliant fuel have asked for alternative compliance approaches through trial programs, which is an approach allowed under the Annex VI regulations. In one instance, a company is switching to LNG engines and can use fuel with up to 2.2% sulfur until the retrofits are complete. In another instance, a company is proposing to use a population-weighted emissions averaging scheme to allow it to use low-sulfur fuels when near high-population areas and higher sulfur fuels when not close to populated areas within the ECA. The EPA, several Native American Tribes, and the Canadian government are concerned that this raises

environmental justice concerns for people in less populated areas. In the summer of 2012, the House Appropriations Committee passed a rider that allows for a 48-month pilot program for companies to opt into using an emissions averaging approach. The EPA estimates that the effect of this program could be up to a 50% loss in the projected emissions reductions within the ECAs.

### *Discussion*

Barry Wallerstein (SCAQMD) noted that many areas of the country would not be able to reach attainment without the benefits of the ECA. He asked what the MSTRS group could do, on the technical side, to communicate the importance of the ECA to the CAAAC and others. Mr. Kodjak asked Mr. Charmley whether there was a technical question the group could address. Mr. Charmley responded that the EPA is being pressured to allow population weighting, and he noted that this approach and whether it is a good approach for the EPA to consider on a technical basis, is a question the group could address. Ms. MacGregor noted that the MSTRS could decide they would like to investigate the technical impacts of population weighting in the ECA and provide recommendations. Several MSTRS members were interested in this topic and the role the group could have regarding this issue. As Mr. Charmley needed to leave the meeting, Ms. MacGregor suggested that she, Mr. Kodjak and Mr. Charmley discuss possible roles for the group after the meeting and report back to the group with suggestions at a later time.

### **Future of Natural Gas in Transportation – Alison Bird, FedEx**

In the 1990's FedEx Express performed tests using compressed natural gas (CNG) and propane-powered vehicles and decided that neither fit their business at that time. Since then, technology has advanced, and FedEx began recent tests with CNG again. From these tests, it does not appear that CNG vehicles are a good fit for FedEx at this time. Drivers have reported that they did not like the CNG vehicles due to decreased vehicle maneuverability and breaking responsiveness, and because the trailers need to be decoupled from the cab of the truck to refuel. FedEx faces other issues with switching to CNG vehicles because their vehicles are generally housed indoors when not being driven. The buildings where the vehicles are parked are typically leased and not owned by FedEx, and the buildings would need to have upgrades to the ventilation systems in order to keep CNG vehicles in them. CNG trucks also have a reduced range, so they require more frequent fueling. FedEx drivers fuel their vehicles, and FedEx does not do central fueling or own its own fueling stations, which puts pressure on the driver to find fueling stations that are convenient to their routes. The CNG vehicles are also more expensive, similar to a HEV in price markup. At this point in time, in comparing CNG vehicles to PEVs, PEVs look easier to bring into the fleet, based on driver acceptance and economics.

### *Discussion*

In response to a question regarding FedEx's motivation for the CNG trials, Mr. Bird responded that Fred Smith, the FedEx CEO, is concerned about the environmental and national security aspects of the company using petroleum-based fuels. For FedEx, the decision about whether to use CNG, hybrids, PEVs or conventional vehicles will consider these aspects but must also ultimately be cost-effective.

## **Natural Gas Vehicles: Opportunities and Challenges in the Transportation Sector – Kathryn Clay, American Gas Association**

There are several shale gas fields in the continental U.S., with the largest being the Marcellus Shale in the Northeast U.S. Crude oil production in the U.S. has declined since 1970, and reliance on imported oil from unstable nations has increased. Until 2009, natural gas prices and crude oil prices were linked, but since then, the prices have decoupled, and natural gas prices are now lower, due to the abundance of natural gas now available from the shale fields. Although there is a potential abundance of natural gas, there are fewer than 140,000 natural gas-powered vehicles (NGVs) in the U.S, compared with over 4 million NGVs in South America and over 8 million NGVs in Asia and the Middle East. Several manufacturers are now bringing NGVs to the North American market for the light, medium, and heavy-duty vehicle categories. Some heavy-and medium-duty fleets, such as garbage trucks and city buses are beginning to adopt NGVs in earnest. Also, some natural gas-powered light-duty pick-up trucks have just been introduced, which represent a large share of the light-duty fleet. The fueling infrastructure for NGVs is also expanding and CNG stations are available at many nodes along the interstate highway system. Challenges for NGVs include developing the home refueling infrastructure, improving vehicle range, improving fuel quality and uniformity, and emissions data for these vehicles is needed.

### *Discussion*

Ichiro Sakai (Honda) asked what mitigation technologies would be needed, as mentioned in related to fuel quality in the presentation. Ms. Clay responded that the gas moisture content can be a problem for NGVs if it is too high, and some technologies may be needed to reduce moisture.

Mr. Kodjak asked whether it would be better for natural gas to displace coal first rather than petroleum. Ms. Clay replied that a choice between displacing coal or petroleum is not needed because the gas is very abundant, however, there may be greater climate benefits to displacing coal.

Mr. Kodjak asked why there were price premiums for NGVs over conventional vehicles. Ms. Clay answered that the price premium was primarily related to the fuel tank. She also noted that the total cost of ownership of these vehicles with current gas prices is lower than conventional vehicles, with a pay-back period of less than two or three years for certain vehicle types.

## **U.S. Natural Gas Emissions – Pamela Franklin, EPA**

Natural gas systems encompass wells, gas gathering and processing facilities, storage, and transmission, and distribution pipelines. There are methane emissions from these systems, primarily from production, which represents 32% of the total U.S. methane emissions and 3% of U.S. GHG emissions. The U.S. government submits an annual GHG inventory report to the United Nations Framework Convention on Climate Change and is working to complete the 2012 inventory. Certain categories of emissions sources are also required to report GHG emissions to



the EPA through 40 CFR Part 98, the Greenhouse Gas Reporting Rule. Subpart W of 40 CFR Part 98 requires GHG reporting by oil and gas facilities emitting over 25,000 metric tons of carbon dioxide equivalent (CO<sub>2</sub>e) per year. The EPA has a website to share GHG reporting data at <http://ghgdata.epa.gov/>. The EPA has a partnership program called the Natural Gas STAR Program to help natural gas companies reduce methane emissions in a voluntary manner, through information sharing and individual assistance. This program has annually reduced methane emissions by over 90 billion cubic feet (Bcf). In 2012, the EPA issued a New Source Performance Standard for VOCs for the oil and gas sector, and this rule is estimated to produce a co-benefit of methane emissions reduction of 1.0 to 1.7 million tons per year.

### *Discussion*

A member of the audience pointed out that the methane emissions from liquids unloading mentioned in the presentation may be double what it actually should be, based on some revised estimates that have been made. Ms. Franklin responded that the inventory is undergoing review and may yet change. A final inventory will be published in April 2013.

Mr. Viera noted that methane leakage from vehicles appears to overwhelm the emissions benefits seen by using NGVs and asked whether there were any studies about NGV leakage rates. Ms. Clay noted that West Virginia University (WVU) and the Environmental Defense Fund (EDF) are working on NGV emissions studies. Ms. Campos stated that it was important to have several groups investigating this issue. Mridaul Gautam (WVU) noted that there has been a massive improvement in the NGVs offered today over those that were available in the 1990's, but many emissions rate assumptions are based on these older vehicles.

### **Honda's Experience and Perspective on CNG Powered Vehicles – Ichiro Sakai, Honda**

CNG is a great transportation fuel because the price has dropped significantly in recent years, while the number of fueling stations is gradually increasing. For a typical mid-sized car, CO<sub>2</sub> emissions are lower than conventional vehicles, and emissions of CO, NO<sub>x</sub> and non-methane organic gases are 90% lower than the light-duty ultra-low emissions vehicle (ULEV) levels. Honda has had the Civic available as a NGV since 2006 (Honda Civic GX). The real range of this vehicle is approximately 234 miles per tank. Many sales of these vehicles are fleet sales. For retail consumers, there are some state and local rebates that can make the vehicle more attractive to buyers. Based on research, another big incentive would be the ability to use carpool lanes, which is currently an incentive being offered in California. Honda is offering a \$3,000 free fuel card promotion to help encourage sales of the Civic GX. With this incentive, the payback period for the Civic GX is 3 years, given current gas and CNG prices. Without the incentive, the payback period would be 10 years using CNG stations, but it could be shorter with home refueling. Shale gas has a higher moisture content than convention gas, and standards are needed to guarantee that fuel delivered to homes, and even to CNG stations, is not too wet. Sales of the Civic GX have been under 2000 vehicles per year in the U.S. To get further market penetration, more CNG fueling stations and greater guarantees of moisture content are needed.

## *Discussion*

Mr. Kodjak asked how much a home refueling system would cost. Mr. Sakai stated that a typical system is about \$2,500.

Luke Tonachel (NRDC) asked where vehicle cost reductions could occur. Mr. Sakai replied that the CNG tank is very expensive, but there are no easy ways to make the tank less expensive at this point.

Mr. Kodjak asked about the home use fuel quality problems. Ms. Clay responded that the moisture content does need to be made more uniform, but she cautioned that the tighter the specifications get, the more the fuel will cost. She noted that the American Gas Association is working with the Coordinating Research Council (CRC) to do a fuel quality survey. She noted that there are issues with compressor oil getting into the fuel at CNG stations. For home refueling, it may be that an on-site dryer is needed.

## **Natural Gas and Transportation: Diesel, Gasoline, Natural Gas, and Efficiency – Pam Campos, EDF**

The EDF believes using natural gas rather than coal and petroleum could be good for the environment, if proper actions are taken. These actions include mandating greater transparency in the natural gas industry operations, modernizing rules for well construction and operation, strengthening regulations for waste and water management, improving regulations to protect local and regional air quality and developing strategies to reduce community impacts. Through regulation, emissions of NO<sub>x</sub> and PM from heavy-duty diesel engines have decreased dramatically. However, GHG emissions from these engines have not decreased and may increase in the coming years. Yet, the GHG emissions from low-sulfur diesel engines are only marginally higher than the GHG emissions from CNG and LNG engines when looking at emissions over the long-term (100 years). The EDF is also concerned that the term “global warming potential” is inadequate to capture time-dependent climatic consequences of fuel and technology choices involving emission streams of multiple GHGs, and suggests using the term “technology warming potential” to address these deficiencies. Due to the natural gas leak rate for the whole well-to-wheels system, it will take 80 years to see a beneficial effect from a fleet conversion from gasoline to natural gas, and converting a fleet from diesel to natural gas may never see a benefit in the technology warming potential. However, technology warming potential benefits of switching from coal to natural gas-fired power plants could be realized immediately.

## *Discussion*

Mr. Kodjak asked why using “technology warming potential” as a metric was necessary. Ms. Campos responded that the natural gas leakage rate negatively affects the time it takes to see benefits in global warming potential by switching to technologies that use natural gas, and this is not adequately addressed by the “global warming potential” metric.

Ms. Campos noted that the natural gas leak rate must be less than 1% in order to get immediate benefits from switching to CNG from gasoline and diesel-powered vehicles. Pam Lacey (AGA) stated that the 2.5% leak rate currently assumed is based on inventory data, which may change when better data is available. Mr. Kodjak added that West Virginia University is currently conducting studies on vehicle leakage rates, and there is another study in Texas on natural gas production and distribution leakage.

## **Adjournment**

Ms. MacGregor informed the Subcommittee that she and Mr. Kodjak will be conducting telephone interviews of new members to ask about interests and expectations from their involvement in the Subcommittee. She next mentioned that she will be sending everyone a Doodle poll to ask about availability for the next meeting. She asked that anyone interested in discussing the ECA issues contact her by phone or e-mail. With no further comments or questions from the MSTRS member, speakers, or audience, the meeting was adjourned.

## Mobile Sources Technical Review Subcommittee

December 13, 2012

### Presenters and Subcommittee Members in Attendance

Name	Organization	Organization Abbreviation (as used in this document)
Reynaldo Agama*	Caterpillar, Inc.	Caterpillar
Robert Babik*	General Motors Corporation	GM
Deborah Bakker*	Hyundai	Hyundai
Thomas Balon*	MJ Bradley and Associates, LLC	MJ Bradley
Allison Bird	Fed Ex	Fed Ex
Pamela Campos*	Environmental Defense Fund	EDF
Lindsay Chason*	Home Depot	Home Depot
Bill Charmley	US Environmental Protection Agency	EPA
Kathryn Clay	American Gas Association	AGA
Mark Cooper	Consumer Federation of America	CFA
Elizabeth Etchells	US Environmental Protection Agency, Designated Federal Official	EPA
Pamela Franklin	US Environmental Protection Agency	EPA
Mridul Gautam*	West Virginia University	WVU
Terry Goff	Caterpillar, Inc.	Caterpillar
Jacky Grimshaw*	Center for Neighborhood Technology	CNT
Chris Grundler	US Environmental Protection Agency	EPA
Phil Heirigs*	Chevron Corporation	Chevron
Luke Tonachel for Roland Hwang*	Natural Resources Defense Council	NRDC
Robert Jorgensen*	Cummins, Inc.	Cummins
Drew Kodjak*	International Council on Clean Transportation, Co-chair --MSTRS	ICCT
Joseph Kubsh*	Manufacturers of Emissions Controls Association	MECA
Michael Leister*	Marathon Petroleum Company LLC	Marathon
Gay MacGregor*	US Environmental Protection Agency	EPA
Arthur Marin*	Northeast States for Coordinated	NESCAUM

	Air Use Management/ Northeast States Center for a Clean Air Future	
Buddy Polovick	US Environmental Protection Agency	EPA
Ichiro Sakai*	American Honda Motor Company, Inc.	Honda
Christopher Standlee*	Abengoa Energy	Abengoa
Christine Tennent*	Corning, Inc.	Corning
John Viera*	Ford Motor Company	Ford
Barry Wallerstein*	South Coast Air Quality Management District	SCAQMD
Bob Wimmer	Toyota	Toyota

\* Denotes Subcommittee Member or alternate

#### **Attendees**

Lauren Bailey	National Automobile Dealers Association (NADA)
Julie Becker	Alliance of Automobile Manufacturers
Jim Blubaugh	US Environmental Protection Agency
William Chernicoff	Toyota
Jessica Coomes	BNA News
Ed Crupi	Environment Canada
Chuck Freed	Consultant
Doug Greenhaus	National Automobile Dealers Association (NADA)
John Guy	US Environmental Protection Agency (retired)
Joanne Howard	Deere & Company
Nancy Kruger	NACAA
Pam Lacey	American Gas Association (AGA)
David Lax	American Petroleum Institute (API)
Mark Monohon	NGK/NTK
Richard Murphy	American Gas Association (AGA)
David Patterson	Mitsubishi Motors
Tim Siuhz	IWP News
Julia Rege	Global Automakers
Nicola Scahill	Environment Canada
Stephen Sinkez	BMW of North America
Matt Solomon	NESCAUM
Patty Strabbing	Chrysler
Arman Tanman	US Environmental Protection Agency

#### **EPA Contractor Support**

Lesley Stobert	EC/R Incorporated
Alden West	EC/R Incorporated