

Fuel Economy: Towards a Global Framework

Better Air Quality 2008 Conference

Pre-event Summary

11 November 2008

Table of Contents

SUMMARY	2
I. RATIONALE	3
II. OBJECTIVES	3
III. PROCEEDINGS.....	4
IV. PRESENTATIONS FROM ASEAN COUNTRIES	8
V. OPEN FORUM.....	9

SUMMARY

A one-day workshop on vehicle fuel economy organized by the FIA Foundation, International Energy Agency (IEA), and the Clean Air Initiative for Asian Cities (CAI-Asia) Center was held on 11 November 2008 in Bangkok as a pre-event to the Better Air Quality 2008 conference. The workshop attracted over 50 participants, including representatives from five ASEAN countries (Indonesia, Malaysia, Philippines, Thailand, and Viet Nam), and experts from around the world.

The workshop developed a basic understanding of fuel economy; its potential to help in cutting fuel use and CO₂ emissions in Asian countries; and to share experiences from other countries that have adopted fuel economy policies, like China and Japan.

Presentations from Indonesia, Malaysia, Philippines, Thailand and Vietnam indicated that all five countries have an interest in improving the fuel economy of vehicles in their respective countries but they have few or no measures in place to do so. Only Thailand appears to have made a comprehensive analysis of possible policy options.

Ms. Anneli Lontoc, the current Chair of the ASEAN Senior Transport Officials Meeting (STOM) and the main reactor of the pre-event, mentioned that ASEAN will conduct more activities related to transport, energy, and environment, and that a better understanding of fuel economy and how this can be achieved in ASEAN countries would fit well in these plans. She also indicated ASEAN's interest to cooperate on this issue involving member countries and various stakeholder groups.

There appeared to be enthusiasm for creating an ongoing dialogue within the region and working together on the various building blocks toward developing fuel economy policies. This includes data collection and analysis, and better understanding of the various policy options available. Global Fuel Economy Initiative partners (represented by FIA Foundation and IEA) pledged to stay engaged, work with ASEAN member countries, and make progress on this issue in the coming 12 months.

I. RATIONALE

The Asian region in the past decade has seen an upward surge in urbanization with rapid economic growth, resulting in a rapid increase in the demand for personal mobility and the number of motorized 2-3 wheelers and cars. So far, in developing Asia, only China has developed and implemented fuel economy standards while India is in process to develop such standards. Other Asian countries have developed and implemented a variety of vehicle-related policies, including taxation; however, none appears to have issued policies that require or encourage CO₂ reduction or fuel efficiency improvement in new cars and other light-duty vehicles.

Based on expected growth scenarios, the ASEAN vehicle fleet will continue to be larger than that of India's vehicle fleet and in the next ten years remain almost equal to the size of China's. If no comprehensive measures are taken, emissions of both criteria air pollutants and carbon dioxide will increase exponentially because of increasing demand for mobility and energy. Transport has been one of the key sectors of discussion in ASEAN since its establishment. However, the environment has only been gradually and partially become part of the ASEAN transport agenda. ASEAN, at the 13th ASEAN Summit in Singapore (2007), adopted the *ASEAN Declaration on Environmental Sustainability*. This declaration recognized the adverse impacts of climate change caused by global emissions of greenhouse gases, particularly to developing countries. The declaration emphasized that the ASEAN would work through bilateral, regional and global partnership to promote the development and transfer of low carbon technologies including cleaner and climate friendly technologies; and work with international financial and development cooperation institutions to encourage innovative financing options to stimulate investment in climate-friendly technology and development.

The ASEAN countries will be part of a Ministerial Conference on Global Environment and Energy in Transport (MEET) in Tokyo in 2009. As G8 chair, Japan will invite G8 member countries and the European Commission to the MEET to facilitate further efforts in the transport sector, based on the agreements of relevant previous G8 meetings. Japan supports fuel economy and energy efficiency as an important issue for Asian countries in the Asia-Pacific region, i.e., ASEAN member countries, Australia, China, India, and Korea. A ministerial declaration on global environment and energy in transport is being prepared.

II. OBJECTIVES

Motorization and demand for energy in the Asian region will continue to grow exponentially. With international crude prices fluctuating from \$120 to \$140 a barrel earlier this year before dropping to \$50 a barrel in recent weeks, economists still expect that fuel prices will be higher in the future. Countries will seek ways to reduce fuel consumption in the transport sector. Exploring opportunities for and approaches to achieving fuel economy improvement will help in reducing consumption and cutting oil-related costs. At the same time, this will make an important contribution to reducing the carbon footprint in the Asian region.

Information from the IEA countries and from China indicates that the benefits of a strong fuel economy program are enormous and could be replicated in the ASEAN region. The CAI-Asia Center and the BAQ

2008 organizers worked with the IEA, ITF, UNEP and FIA Foundation to organize a one-day workshop on fuel economy, as a pre-event to BAQ 2008 in Bangkok and certain related activities.

The workshop had the following objectives:

- Facilitate the sharing of experiences of OECD countries (Europe, USA and Japan) on developing and implementing fuel efficiency measures, such as fuel economy standards and various other types of measures;
- Present and review experience of Asian countries especially China and India in the formulation and implementation of fuel economy measures;
- Provide ASEAN representatives with an opportunity to share their concerns and priorities as related to fuel use and vehicle fuel economy;
- Conduct discussions on possible national and regional measures to promote fuel economy, and design follow up activities to promote fuel economy measures in Asia in the context of various international initiatives and agreements, including the MEET process; and
- Assess the potential value added that FIA Foundation and its partners (United Nations Environment Programme, International Energy Agency and International Transport Forum), the CAI-Asia Center, and other agencies and stakeholders, could have in such a follow-up process.

III. PROCEEDINGS

A. Introduction

The workshop started with opening remarks from **Mr. Cornie Huizenga**, Executive Director of the CAI-Asia Center. He introduced the CAI-Asia Partnership and the air quality management (AQM) community that has been established. He also emphasized the role of CAI-Asia as a regional convener on AQM issues in the region.

He emphasized that due to the current and future motorization indexes in ASEAN countries, the sub-region deserves equal attention as China and India in terms of reducing air pollutant and CO₂ emissions. As such, an integrated manner in addressing the issues of transport, air quality, and climate change and a stronger institutional framework to tackle these matters are needed.

He cited the experience of several Asian countries, including those in the ASEAN that heavily subsidize transportation fuel, and the money that can be saved if governments reduce or remove these subsidies. The money saved can then be allocated to improvement of the overall urban transport system and reduce both air pollution and CO₂ emissions, in the near term and in the long run.

Mr. Lew Fulton of the IEA provided a comprehensive overview on fuel economy and the requirements for establishing fuel economy standards. His talk was divided into three parts – an overview of the transport energy scenario and the current and CO₂ forecasts of the IEA, the role of fuel economy improvement and considerations in setting policy.

He pointed out that conventional oil supply is not looking good and once oil demand increases, prices are expected to go up again. High fuel prices are not enough to reduce fuel demand and there is a need for stronger government intervention in order to optimize efforts and make certain that efforts are sustained long-term. A new initiative that aims to work with governments to promote a better fuel economy framework will be launched in the succeeding months with support from the FIA Foundation. The global target is to achieve 4 liters of fuel per 100 km by 2030.

He cited that energy efficiency improvements are the cheapest option and the most important in the near term. Electric and hydrogen power are important but it will take more time before mainstream commercial distribution becomes available. He also said that biofuels could play an important role but only if biofuels are sustainable and can deliver actual CO₂ reductions.

Many light-duty vehicles in Asian countries are still small and consume less fuel; however, there is a growing trend that cars in developing countries become bigger and faster, and hence consumes more fuel. In recent years, most improvements have focused on the power and weight of vehicles to achieve better fuel mileage.

The cost of improvements to fuel economy can be mostly or completely offset by the value of the fuel saved – for example, in OECD countries, a 50% improvement in fuel economy can be fully repaid in either of these two scenarios:

- On a “social/resource cost basis”, i.e., with oil at \$60 per barrel and a low discount rate (reflected as 200,000 km of driving)
- On a “private/taxed cost basis”, i.e., with oil at \$100/barrel and a \$0.25 per liter tax and higher discount rate (reflected as 100,000 km of driving)

In setting policies for Asian countries, Mr. Fulton suggested the following goals: (i) economic efficiency, (ii) encouraging new technologies, (iii) discouraging or preventing shift to larger, heavier, and more powerful vehicles, (iv) fairness, and (v) encouraging safety. These can be achieved using taxation and regulatory instruments (i.e. taxes based on maximum cost per unit of fuel economy improvement and regulatory measures setting fuel economy outcome like setting fuel economy standards per type of vehicle). Using domestic production and import restrictions can provide an effective way to force fuel economy on new and used vehicles. A similar policy approach among countries in the ASEAN region would have a greater impact on manufacturers and vehicle markets.

Another important element is to ensure that information gaps and baseline information such as vehicle stock and emissions are available. This information is relevant in assessing the costs and benefits as well impacts on setting targets and shaping policies in the region and for each country.

Finally, without policy interventions, oil use in many countries will expand by an order of magnitude by 2050. The IEA, along with the FIA Foundation, ITF and UNEP, will launch the *Global Fuel Economy Initiative* in Paris in January 2009 and this workshop is a first step in engaging countries around the world.

The goal of this initiative is a 50% reduction in vehicle energy intensity by 2050 for all vehicles. For new cars, the goal is 30% improvement by 2020 and 50% by 2030. For the remaining vehicle fleet, the goal is 30% improvement by 2035 and 50% by 2050.

B. Experience from US and Europe

Dr. Lee Schipper, a Project Scientist in the Global Metropolitan Studies of University of California, Berkeley, and Senior Research Engineer of the Precourt Institute for Energy Efficiency in Stanford University, US, provided an overview of the experience in the US and Europe. He started his presentation by saying that the US is still the “big kid in the block” in terms of per capita GDP, fuel consumption, and total emissions. He provided information comparing global trends on motorization, fuel consumption, and emissions. He suggested that the emissions per capita are decreasing in US but increasing in India and China. He indicated that it is necessary to demarcate the differences between economy and efficiency in order to solve the problem.

Dr. Schipper further suggested that standards on fuel economy alone are not sufficient and that vehicle use, size/weight/power play an important role. He captured the various experiences in fuel economy, noted that complementary transport and pricing measures are also needed to reduce absolute emissions, and provided a good overview on regulatory and voluntary standards. The taxation system in EU for fuel is as much as the current price in the US emphasizing that the US can do more in terms of raising fuel tax in order to influence travel behavior.

He outlined important steps for future action. These are: (i) down-sizing and depowering new vehicles, (ii) use of taxation to encourage fuel economy measures, and (iii) better understanding of the problem by monitoring real utilization of vehicles, local drive cycles, etc., and (iv) the need to involve other stakeholders into the discussion. He cited, for example, the lack of understanding of test protocols and drive cycles and the fuel economy standards, and differences can be as much as 20-30% in terms of estimated and actual emissions.

Questions raised by participants related to current actions in Europe on fuel efficiency, and comparison with other countries/regions. The EU has implemented very strict guidelines for car manufacturers and the proposed standard for CO₂ limit for cars is 120g/km. It covers fuel economy standards for both fuels.

C. Experience from Japan

Mr. Akihiko Hoshi, Deputy Director, Environment Division, Road Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, (MLIT) Japan, started his presentation with a thought-provoking question as to what exactly is the "Best Practice" in fuel economy.

He reiterated that automobile markets and circumstances differ widely between individual countries, and they have complicated and multilayered system of energy consumption and CO₂ emissions in the road transport sector. He further highlighted that economic growth can be delinked with the transport demand and best practice for fuel economy needs to include model mix, fleet age, fuel price, geographical issues, etc.

During the course of his presentation, he highlighted the Japanese "integrated approach" based on the top runner system and explained its framework. He emphasized that the best way forward is to make best use of resource in international organizations, have reliable national statistics, share information and outcomes and develop a "common", "user friendly" and "transparent" model /module for evaluation of effectiveness of policy options.

D. Experience from China

Mr. Huiming Gong, Transportation Program Officer, Energy Foundation highlighted that China could be the largest new vehicle market by 2015 and the current transport fuel consumption may further increase from 30% at present. He indicated that the current weight-based standard, which was introduced in 2004, ensured savings of nearly 1.18 million tons of gasoline with a possible reduction of 3.7 million tons of CO₂. He indicated that 76 % of current models already satisfy the next phase of implementation. He indicated that vehicle excise duty was also modified in order to reduce the SUV growth.

He mentioned that in China there are 100 car manufacturers and it is prudent to work closely with these manufacturers in order to achieve the standards set. He concluded that fuel economy standards should be implemented together with fiscal policies and that China intends to catch up with international best practice by 2020, which requires the establishment of a new institutional structure.

E. Experience from India

Mr. Sanjivi Sundar, a Distinguished Fellow of The Energy and Resources Institute (TERI) and the Environmental Theme Champion of the Global Transport Knowledge Partnership, indicated that high urbanization coupled with raise in private automobile use (particularly SUVs) are the main cause of concern in India. He emphasized that the BAU scenario indicates that the sectoral share of transport in petroleum consumption would increase from 36% in 2001 to 64% in 2030. He pointed out that India's Integrated Energy Policy 2006 had recommended that 50% improvement in vehicle fuel economy by 2030 would ensure estimated oil saving of 86 million tons. He cited that the Committee on Auto Fuel Policy in 2002 also included the issue of fuel efficiency for the development of new vehicle models.

He concluded that the best way forward for India is to not only set mandatory fuel efficiency standards but also to ensure that the standards cover all vehicles types, take into account reference weight, provide fiscal incentives for small and fuel efficient vehicles, promote hybrids and introduce energy labeling.

F. Discussion

Questions and comments raised from the various country presentations on the experiences on fuel economy included:

- The important of fuel quality as an essential element in addressing issue such as fuel economy (specifically for enabling more advanced engine technology)
- There seems to be more focus on efficiency and less on air quality in China
- In India, Euro II applies nationwide and Euro III will soon be implemented
- Levels of sulphur in fuel only marginally affect fuel economy
- Which test processes are employed – NEDC is used in China and India for 4-wheelers – others may be developed for application elsewhere

- The issue of class-based/weight-based versus fleet average – would a combination of the two work?
- Regulation and differentially-based taxation – need to be mixed as a policy strategy in order to create a set of incentives
- The involvement of vehicle manufacturers and their potential to address the problem of fuel economy standards
- Instead of looking at specific details, it is necessary to focus on the actual reductions as a first step, and then look at test methods etc.

IV. PRESENTATIONS FROM ASEAN COUNTRIES

A. Indonesia

Ms. Dollaris Riauaty Suhadi, Project Manager of Swisscontact Indonesia and **Ms. Linda Krisnawati**, Head of the Alternative Fuels Development of the Ministry of Environment delivered the presentation for Indonesia. Ms. Suhadi provided an overview of the country's motorization, including the consumption of liquid fuel. She also showed the fuel subsidies used for liquid fuels and that transportation fuel receives about 67% of fuel subsidies.

It is interesting that the presentation proposed that the introduction of fuel economy standards should be aligned with current and planned goals for fuel savings and air pollution controls. The proposed policy actions include vehicle taxation, increase in fuel tax and differentiated fuel tax for public and private vehicles, and the certification of CO₂ emissions or level of fuel consumption of new vehicles.

The initial cost-benefit analysis conducted by the World Bank already showed high returns in terms of improving transport fuel efficiency by 10% and fuel savings amounting to \$150 million per year.

B. Malaysia

The Malaysian presentation by **Mr. Mohamad Zaihan Lek**, Environmental Control Officer, Department of Environment Ministry of Natural Resources and Environment, showed that the country is currently applying Euro 1 standards and plan to introduce Euro 2 in 2009 for both gasoline and diesel. The country also plans to leapfrog to Euro 4 in 2011 pending approval by the Malaysian government. The current energy efficiency policies in the transport sector focused on the promotion of urban reform and land-use planning, which has been included in the Ninth Malaysia Plan (2005-2010). Approximately \$10 billion has been allocated by the government for the promotion of integrated transportation planning. Current policies of the government related to fuel economy include tax exemption for hybrid cars starting in 2009, for research and development by the Malaysian car manufacturer (PROTON) and oil company (PETRONAS).

C. Thailand

Mr. Sarawoot Wetchagit, Deputy Dean for Public and Special Activities of Mahidol University delivered a comprehensive overview of the work done on fuel economy for Thailand. The Department of Energy Development and Alternative Energy prepared a draft royal decree for highly efficient vehicles based on the “Top Runner” approach. Other efforts on this issue include a voluntary program launched in 2005 by the Pollution Control Department limiting the level of CO₂ emissions and the National Energy Policy Office for a Voluntary Labeling Program in 2006.

The presentation showed the steps in the development of the proposed standards and flagged issues with the testing protocol including the drive cycles used. The New European Driving Cycle used in the protocol does not reflect the driving behavior of Thai people. He also cited the issue on weight-based and performance-based fuel economy standards.

D. Philippines

Mr. Jesus Anunciacion, Chief of the Energy Efficiency and Conservation Division of the Department of Energy in the Philippines, provided a general overview on the current regulations on fuel quality including the National Energy Efficiency and Conservation Program of the Department of Energy. Its major components are the information, education, and communication campaign and the fuel economy runs.

The fuel economy runs include the testing of commercial passenger cars by running a pre-set route and distance at the same time and computing the time and fuel use for each model. Results are published in various media.

The current National Energy Efficiency and Conservation Program, although comprehensive does not include the setting up of fuel economy standards.

E. Viet Nam

Nguyen Hoai Anh, the assistant to the Director General of Viet Nam Register showed an overview of Viet Nam’s transport system and highlighted that in Viet Nam the major problem is motorcycles – 95% of all vehicles are motorcycles and only 5% are cars. The current fuel regulations in Viet Nam are Euro 2 and the plan for stricter emissions standards is Euro 4 by 2012. There are currently no plans in place for implementing fuel economy standards.

V. OPEN FORUM

Ms. Anneli Lontoc, the Undersecretary of the Department of Transportation and Communications in the Philippines, was the main reactor in her capacity as the Chairperson of the ASEAN Senior Transport Officials Meeting (STOM).

She said that the ASEAN Transport Ministers meeting (6 November 2008, Manila) affirmed the importance of pursuing sustainable transport programs to improve road safety, as well as increasing energy efficiency and reducing consumption and emissions in the transport sector. ASEAN, through the activities of the STOM and the Land Transport Working Group, will be working on more activities to

promote sustainable urban transportation issues in 2009. She said that activities on vehicle fuel economy would be a logical fit to this.

She added that fuel economy is very important and future activities should include (i) awareness raising and better understanding of fuel economy for ASEAN countries, (ii) concrete steps on how to improve the fuel economy in ASEAN countries, and (iii) a pilot study on how this can be integrated and implemented in the transport plans of the countries. She said that this may be pursued under Viet Nam's chairmanship of the STOM in the latter half of next year.

Key issues and points raised in the open forum:

- Issues around sharing good experiences and building capacity – possibly workshops within specific countries
- Fuel economy standards are a central policy approach but flanking measures such as fuel economy or CO₂-based vehicle taxes can be important complements, as can measures affecting in-use fuel economy like eco-driving training
- The issue of weight-based and performance-based fuel economy standards
- What to do with countries that import cars? (unclear how policies should be similar or different than for countries that mainly manufacture their own cars, research is needed in this area)
- What is the link to fuel quality? (generally thought to be not strongly related, though high sulfur fuels might restrict the use of some technologies)
- What is the link to energy security? (basically cutting oil demand both lowers import bills and vulnerability to oil price shocks)
- Is the policy development process for fuel quality a model for an initiative to promote greater fuel economy?
- ASEAN can provide the platform to pursue a common means to push forward fuel economy improvements, though countries must make individual choices on policies.
- To what extent can regulation prompt adoption of new technologies? (generally thought to be effective, but the specific impacts depend on the specifics of regulation and technologies affected – more work needed on this for each country)
- How do we address stakeholder issues? Is there a global way in? How does one engage the stakeholders in each country? Auto sector, environmental groups, others?
- Which government agency should the issue of fuel economy standards reside? Ministry of Transport? Ministry of Trade and Industry? Ministry of Energy?
- Each country needs to do its own full analysis of fuel economy policy, cost, etc. – and develop specific proposals for policy makers to consider.

ANNEX 1: PROGRAM

Introduction		
9:00-9:05	Objectives and Rationale – Why fuel economy?	Cornie Huizenga, Executive Director, CAI-Asia Center
9:05-9:25	What is fuel economy policy and what does it take to establish one? Summary of Fuel Economy Meeting Paris	Lew Fulton, Senior Transport Energy Specialist, International Energy Agency (IEA)
Session 1	Experience in countries with fuel economy programs under implementation or development	
9:25-9:45	<ul style="list-style-type: none"> ▪ Europe and USA 	Lee Schipper, Project Scientist, Global Metropolitan Studies, UC Berkeley and Senior Research Engineer, Precourt Institute for Energy Efficiency, Stanford University, USA
9:45 – 10.05	<ul style="list-style-type: none"> ▪ Japan 	Akihiko Hoshi, Deputy Director, Environment Division, Road Transport Bureau, Ministry of Land, Infrastructure, Transport and Tourism, (MLIT) Japan
10:05-10:30	Discussion	
10:30-11:00	Coffee Break	
11:00-11:20	<ul style="list-style-type: none"> ▪ China 	Huiming Gong, Transportation Program Officer, Energy Foundation
11:20-11:40	<ul style="list-style-type: none"> ▪ India 	Sanjivi Sundar, Theme Champion for Environment and Climate Change, Global Transport Knowledge Partnership and Distinguished Fellow, TERI
11:40-12:30	Open forum on experiences Europe, Japan and USA and relevance for Asia	
12:30 -1:30	LUNCH	
Session 2	ASEAN Countries' Presentations	
1:30-2.45	<ul style="list-style-type: none"> ▪ Indonesia, Malaysia, Thailand, Philippines and Viet Nam (10 minute presentations each followed by brief Q+A) 	<ul style="list-style-type: none"> ▪ Dollaris (Waty) Suhadi, Project Manager, Swisscontact and Linda Krisnawati, Head, Sub Division for Alternatives Fuel Development, Ministry of Environment, Indonesia ▪ Mohamad Zaihan Lek, Environmental Control Officer, Department Of Environment Ministry of Natural Resources and Environment, Malaysia ▪ Sarawoot Wetechagit, Deputy Dean for Public and Special Activities, Mahidol University, Thailand ▪ Jesus Anunciacion, Chief, Energy Efficiency and Conservation Division, Department of Energy, Philippines ▪ Nguyen Hoia Anh, Assistant to General Director, Viet Nam Register
2:45-3:00	Coffee Break	
3:00-4:00	Open Forum on possible regional and national measures to promote fuel economy, and design follow up activities to promote fuel economy measures in Asia.	Reactor: Anneli Lontoc, Undersecretary, Department of Transportation and Communications, Philippines and Chairperson, ASEAN Senior Transport Officials Meeting
4:00 – 4.15	Wrap-up and Next Steps	Sheila Watson, Environment Director, FIA Foundation