



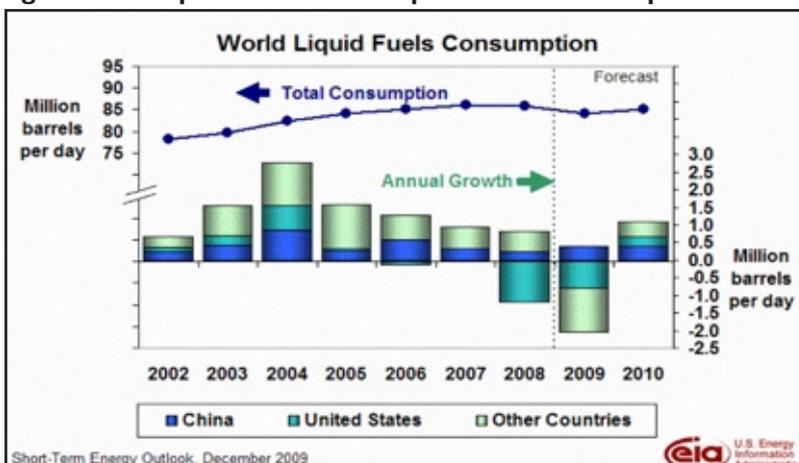
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## China Vehicle & Fuels Policy: Expansion Continues

As the world's most populous country and the second largest energy consumer behind the United States, China continues to have rapid economic growth with annual GDP projected to grow by 8% in 2009. With this expanding economy, rising oil demand and product imports have made China a significant factor in world oil and energy markets. China's oil consumption was over 7.8 million barrels per day (bbl/d) in 2008, down from about 8.5 million bbl/d due to the global economic downturn. Forecasts indicate that oil consumption in China will generally recover during 2009 and 2010, with annual increases of nearly 400,000 bbl/d, or about 31% of projected world oil demand growth, as illustrated in Figure 1.

Part of the reason for this expansion is the ever growing number of vehicles in the country. Automobile production in China is estimated to exceed 12.5 million units by year's end, up over 32% from the previous year. Most vehicle production in the country remains in the domestic fleet. China became the world's second-largest auto making country in 2008, passing the U.S., and will surpass Japan this year to become the largest vehicle manufacturing country. Presently, there are over 70 million vehicles in use in China, with about 30 million being automobiles for civilian use.

Figure 1: Comparative World Liquid Fuels Consumption



Source: U.S. Energy Information Administration

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On the national level, fuel quality and vehicle emission standards are formulated by the Ministry of Environmental Protection (MEP) in consultation with the oil industry. The standards are then approved by the State Council and are jointly released by the Standardization Administration of China (SAC) and the General Administration of Quality Supervision, Inspection and Quarantine (AQSIQ). Figure 2 shows the general timeline for fuel quality developments in China, which sets national fuel specifications with a number of major cities (Beijing, Shanghai, Guangzhou, Shenzhen) setting stricter fuel quality requirements.

There is one national gasoline standard in China, designated GB 17930-2006, together with 4 city gasoline standards applicable for Beijing, Shanghai, Guangzhou, Shenzhen. The national gasoline standard sets the current sulfur limit at 500 ppm max, whereas the city standards currently set a stricter sulfur limit of 150 ppm max in the southern cities of Guangzhou and Shenzhen, and 50 ppm max in Beijing and Shanghai.

China will require 150 ppm sulfur gasoline nationwide by Dec. 31, 2009. Following Beijing and Shanghai, Guangzhou is expected to move to 50 ppm sulfur gasoline around 2010. There are no near-term plans to introduce Euro IV-equivalent gasoline standards in the rest of the country at this stage.

There is a separate E10 (ethanol blended at 10 vol. % into gasoline) standard, design- (Continued on p3)

CLEAN AIR THROUGH CLEAN FUELS



# Global Gasoline Demand Drops Short-term - Asia Still Dominates Growth



A new study finds that the Asia-Pacific region will dominate world growth in gasoline and middle distillates demand, accounting for more than 60% of the global growth from 2009 to 2030. The regional and global supply-demand report was released by Hart Energy Consulting in mid-December.

The report states that “(a)lthough aggressive refinery expansions have led to a short-term capacity surplus in the (Asia-Pacific) region, strong growth in refined product demand will gradually absorb the surplus.” The Asia-Pacific region accounts for about 30% of total global demand, and growth will add another 16.6 million barrels per day to demand by 2030. China is expected to need more than 60% of this increased demand.

Other high-growth areas include the Middle East and Latin America. Africa is also expected to rebound from the recent economic downturn. In general, virtually all global gasoline demand growth to 2030 will occur in developing areas.

Worldwide recession has significantly impacted the global refining and fuel markets, with 2.5% overall decline in 2009. However, 2010 is expected to begin recovery for the refining industry. The report indicates that the greatest decline in gasoline demand will take place in North America (mostly the U.S.) and in Europe. North American gasoline demand will go down by 7% by 2020 and by another 16% between 2020 and 2030. The combination of lower demand and increasing biofuel use mandates will reduce refinery throughput by more than 1 million barrels per day, according to the analysis.

In the short term, the Middle East will continue to be short on gasoline supply and net exports of other products will experience some decline. Over time, as major refinery projects in the region get completed, the Middle East will emerge as the primary global refined product exporter. The changes in regional product demand, product quality and refinery utilization expected through 2030 are likely to result in major shifts of product trade patterns between regions, with the Middle East becoming a major exporter of refined products.

Refining capacity will need to respond to the growing volume and demand for cleaner-burning fuels in the developing economies. The developed, industrialized countries will focus on rebalancing demand and product shifts that are expected to occur.

The report also examines other refined product supplies and demands, such as naphtha, jet fuel, kerosene, diesel fuel and other distillates. It includes analyses of current and projected transportation fuel quality and public policy requirements, such as renewable and alternative fuels impacts. The report also looks at emerging electric-vehicle battery technology and the growing role of natural gas. Policy issues, such as the impact of climate-change legislation and regulation, are incorporated into the analyses.

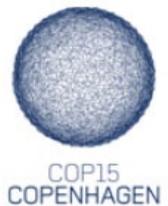
Further information on the “World Refining and Fuels Services: A Global Crude, Refining and Clean Transportation Fuel Outlook through 2030” report is available at [www.hartwrfs.com](http://www.hartwrfs.com)

# UNCCC Comes to Close with Copenhagen Accord

On December 18th – the last day, delegates at the United Nations Convention on Climate Change (UNCCC) agreed to a three-page political statement termed the “Copenhagen Accord.” Announced just before the closing deadline, the accord is far less ambitious than what was originally desired when the talks convened on December 7th. With over 190 nations represented by more than 15,000 official delegates, and 119 heads-of-state attending at some point during the proceedings, the climate change negotiations were unable to broker a legally binding agreement for reducing greenhouse gases (GHG) emissions to succeed the Kyoto Protocol, which is scheduled to expire after 2012.

Rather than setting specific emissions reductions limits, the Copenhagen Accord allows each country to state its own targets for lowering GHG outputs. The agreement “recognizes the scientific view” that the global rise in temperature should not exceed 2° Celsius compared to pre-industrial levels. It also states that countries should “enhance long-term cooperative action to combat climate change.”

Recognizing that the agreement was unenforceable legally, the accord calls for the language to be changed into legal language for members of the UNCCC. It does not, however, set a timetable for that change to occur.



For all its shortcomings, the accord does make significant progress in other areas. It calls for worldwide emissions to be reduced by 50% by mid-century and for emissions to be reduced by at least 80% by industrialized countries. The biggest success was that the accord appears to require developing countries to accept international monitoring and record keeping for their emissions levels.

The implications for the energy and petroleum energy sectors are unclear. The document does not directly address the energy sector except for domestic targets already announced for individual countries.

*(Continued on p3)*



## UNCCC Comes to Close with Copenhagen Accord

(continued from p2) Responses from delegates about the Copenhagen Accord indicated that they believed it raised the stakes for negotiations in 2010 by leaving so much undone. The next major UNCCC negotiation session is scheduled for Mexico City from 8-19 November 2010. Additional interim sessions will take place leading up to the larger convention late next year.

As the Copenhagen convention moved to its conclusion, once it became clear that a comprehensive and legally binding agreement

originally contemplated was no longer viable, two points of view became apparent on how the rest of the proceedings could play out. The Group of 77 developing countries took the position that “no deal was better than a flawed deal.” In contrast, the U.S. President Barack Obama stated in his December 18th address to the plenary session that the world needed a deal to come out of Copenhagen even if it was “imperfect.” As last minute negotiations took place, including between heads-of-state, it could be argued that both positions were the outcome.

## China Vehicle & Fuels Policy: Expansion Continues

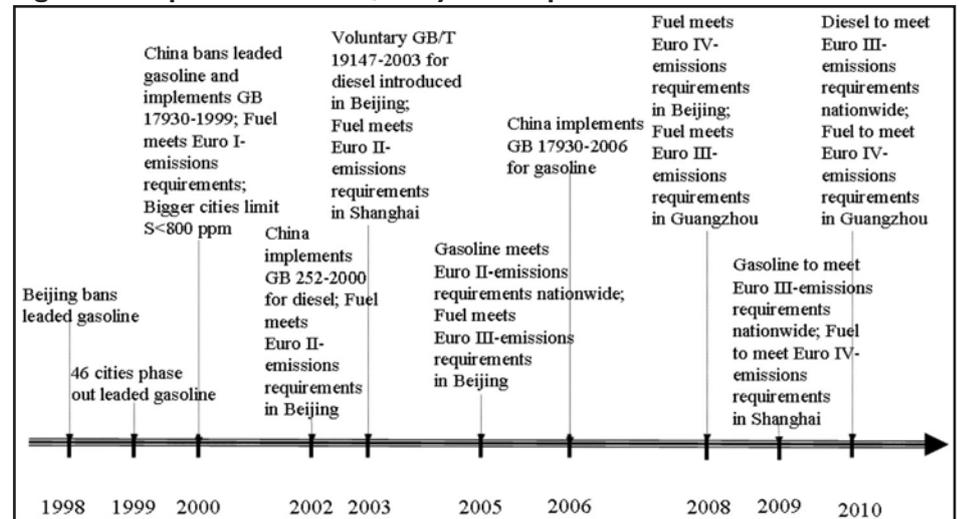
(continued from p1) nated GB 18351-2004, in China, which shares similar limits with the national gasoline standard, except that the E10 standard mainly allows 10±2 vol% ethanol to be blended into gasoline.

Some current national gasoline quality specifications are given in Table I.

The National Energy Administration (NEA), part of the National Development and Reform Commission, provides centralized management of the various aspects of the country’s energy sector. The NEA portfolio includes management of energy resources, strategic petroleum reserve management, international cooperation, and developing and proposing specific policy measures on energy, including elements of transportation. This government action demonstrates the importance of coordinating energy, fuel quality and environmental management policies.

The Ministry of Environmental Protection recently indicated in press accounts that China is working to move to Euro V-equivalent fuel quality specifications of 10 ppm sulphur levels in the 2015 to

Figure 2: Sequence of Fuel Quality Developments in China



Source: IFQC, June 2009

2016 timeframe. Similar to previous strategy, the stricter standards would be first implemented in the major cities.

As China’s rapid pace of economic growth continues, its significance as an environmental player and energy consumer will also rise. China’s challenges will likewise increase, and the country will need to move further towards full participation in the massive global transition toward sustainable growth.

Table I: China National Gasoline Quality Specifications (Select Parameters)

Property	Specification <sup>(1)</sup>
Grade	90# / 93# / 97#
RON, min	90/93/97
Sulphur, ppm, max.	150
Manganese, g/l, max.	0.016
Benzene, vol%, max.	1.0
Aromatics, vol%, max.	40 <sup>(2)</sup>
Olefins, vol%, max.	35
Oxygen Content, wt%, max.	2.7
Methanol, wt%, max.	0.3
RvP @ 37.8°C, kPa, max.	72 (summer) / 88 (winter)

(1) SEPA issued limits for gasoline specifications starting December 2009.  
 (2) If total aromatics and olefins content is controlled, the maximum allowable aromatics limit is 41 vol%.

Source: International Fuel Quality Center, 2009

### Upcoming Conferences & Events

**2nd Middle East Refining Conference**  
 22-23 Feb 2010  
 Bahrain

**3rd Indo Oil, Gas & Power Conference**  
 3-4 Mar 2010  
 Indonesia

**Energy World Expo 2010**  
 10-13 Mar 2010  
 Mumbai, India

**7th Middle East Refining & Petrochemicals Conference**  
 24-26 May 2010  
 Bahrain



# National Workshop on Clean Fuels & Vehicles Held in Manila

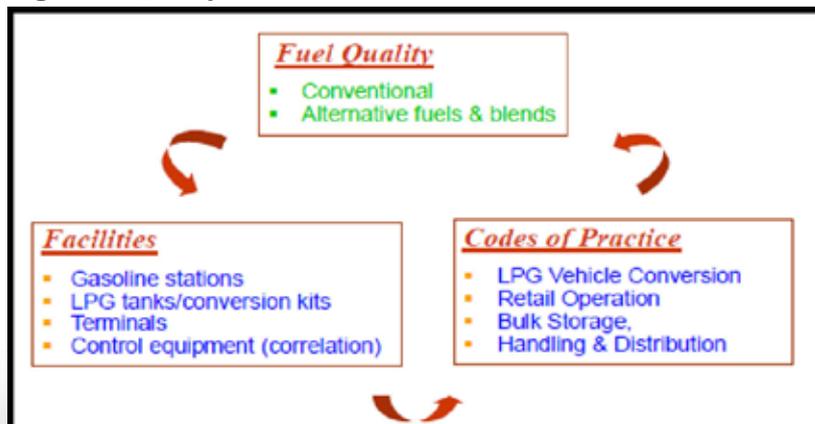
The Philippines Department of Energy recently sponsored a National Workshop on Clean Fuels and Vehicles at the Astoria Plaza Hotel in Manila. The program was supported by the Clean Air Initiative for Asian Cities and the Partnership for Clean Fuels and Vehicles. The workshop objective was to develop an action plan for achieving cleaner fuels and vehicles in the Philippines with the aim of adopting Euro IV-equivalent standards or specific parameters for Euro IV standards. Mr Bert Fabian, CAI-Asia Center, served as moderator during the workshop.

Mr Matanog Mapandi, assistant secretary for the Philippines Department of Energy (DOE), provided opening remarks for the workshop. He reviewed the workshop's objective and commented on current DOE efforts to improve fuel, vehicle and air quality. Ms Sophie Punte, executive director for CAI-Asia Center, also gave welcome remarks.

Zenaida Monsada, director of Oil Industry Management Bureau at DOE, presented an "Overview of Philippine Fuels Quality Standards and Thrusts." She highlighted that fuels and vehicles are critical to improved air quality – it is essential to coordinate advances in both. She summarized the Philippine energy policy that also takes into consideration economy and environment. The Clean Air Act establishes the standard setting mechanism, including enforcement systems to ensure compliance with requirements. She explained the integration for quality standard harmonization, illustrated in Figure 3. Ms Monsada also discussed fuel quality challenges in the Philippines, including supply availability and accessibility.

Mr Bert Fabian presented "Rationale for Cleaner Fuels and Vehicles for the Philippines and National Workshop Objectives." He showed data on the explosive growth in vehicles in the Asian region – essentially the motorization of society. This expanding vehicle fleet also creates greater emissions and air quality impacts. These impacts lead to challenges for improving public health. Mr Fabian discussed strategies to achieve sustainable transport and implementation of cleaner fuels and vehicles programs.

Figure 3: Quality Standard Harmonization



Source: Z. Monsada, Oil Industry Management Bureau, Philippine Department of Energy National Workshop on Clean Fuels & Vehicles, Nov. 2009

Ms Manwipa Kuson, from the Pollution Control Department of Thailand, spoke about the "Experience of Thailand on Moving Towards Cleaner Fuels and Vehicles." She presented data on vehicle growth and distribution in Thailand and reviewed elements of a comprehensive vehicle emissions control strategy. Emissions standards for new vehicles, including for motorcycles, were summarized. Ms Kuson highlighted fuel quality standards implemented in Thailand and the improvements in air quality as a result.

Ms Lucky Nurafiatin, research manager with Hart Energy Consulting, presented on "Fuels Quality Outlook and Supply in Asia Pacific Region." She noted that 40% of urban air pollution comes from the transport sector. She summarized gasoline sulphur reduction efforts in the region and showed future steps to further reduce fuel sulphur levels. Ms Nurafiatin showed projected fuel supply and demand for the region and highlighted challenges to refiners in ensuring fuel quality improvements.

Mr Eric Holthusen, fuel quality manager with Shell Global Solutions, and Mr Benito Aganda, with Pilipinas Shell, presented "Fuel Properties and Their Impact on Emissions and Air Quality in a Philippines Context." They focused on key challenges to addressing air quality and fuel quality improvements. They emphasized that engine and fuel technology work together to reduce emissions at each level of quality standards. Fuel specifications must also be based on a sound science approach that considers the local condition. They reviewed the need for clarity on specifications, adequate lead time for implementations and recognition of timelines for refinery upgrades. They concluded with recommendations on specifications and implementation.

Following presentation of a draft action plan by Jean Rosete, chief of Air Quality Management Section, the workshop participants split into two working groups:

- Technical & Policy Concerns Work Group to look at which parameters are affected by cleaner fuels and key implementation steps, and
- Financing Cleaner Fuels & Vehicles Work Group to consider incentives and other mechanisms to allow funding of cleaner fuels and vehicles programs.

The workshop outcome was preparation of workable action plan, implementation schedule and financial mechanism for the Philippines to move towards Euro IV-equivalent standards. The draft action plan is being evaluated by workshop participants and officials in the Philippines DOE and other departments.

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## Fuels Industry Updates

### STUDY LINKS CHILDHOOD LEAD EXPOSURE TO BRAIN DAMAGE

Research recently reported in the United States found that childhood exposure to lead causes permanent brain damage. The study, conducted by the Cincinnati (Ohio) Children's Hospital Medical Center, looked at the impacts of long-term exposure during childhood to higher lead levels on brain activity as adults. The findings demonstrated that the increased lead exposures were associated with decreased brain function in such areas as attention control, decision making and impulse control.

The researchers used a database of infants from high-risk areas of the city that underwent behavioural testing and blood analyses. Brain scans were carried out on them as adults while performing tasks designed to require inhibition or to test attention. The scans showed that the areas of the brain damaged by lead exposure had decreased activity and required compensation by other parts of the brain. This damage persists throughout the person's life since brain development occurs at different rates, and those parts maturing last demonstrate persistent impacts.

The results of the study were presented at the annual meeting of the Radiological Society of North America. The findings support previous studies that link behavioural and cognitive problems to the neurological effects of lead exposures to children.

### INDIA REVISES NATIONAL AIR QUALITY STANDARDS

The Ministry of Environment and Forests last month issued notice of the Revised National Ambient Air Quality Standards 2009 (NAAQS) that tighten limits after a 15-year gap to previous levels set in 1994. The announcement provides a legal framework for air pollution controls and for improved public health protection.

Like the previous NAAQS, the new limits were reviewed by the Central Pollution Control Board (CPCB) in association with the Indian Institute of Technology, Kanpur. The resulting notification was made under the Environmental Protection Act, 1986 to ensure efficient implementation of the new standards.

According to the Ministry notification, the revised NAAQS were developed in concordance with global best practices and in keeping with the latest advancements in technology and research. Key aspects of the new standards include:

- Area classifications for industrial areas must conform to the same standards as residential areas (land-use based classifications eliminated).
- Standards are uniformly applicable, except for more stringent NO<sub>2</sub> and SO<sub>2</sub> standards set for ecologically sensitive areas.

- Standards for particulate matter (PM<sub>10</sub>) and carbon monoxide (CO) are now uniformly applied, and more stringent limits for lead, SO<sub>2</sub>, and NO<sub>2</sub> are set for residential areas.
- Fine particulate matter (PM<sub>2.5</sub>) replaces the previous suspended particulate matter standard to better protect public health.
- Limits on ozone, benzene and other air toxics are included in the NAAQS, and are based on CPCB research, World Health Organization guidelines and other international standards and practices.

The CPCB is in the process of creating a roadmap for setting up databases, air quality monitoring infrastructure, and procedures and protocols to implement the standards. Enforcement procedures under the National Environmental Protection Authority and the National Green Tribunal are also being established.

### ETHANOL RESULTS IN HIGHER OZONE CONCENTRATIONS

A new study led by Stanford University researchers and funded by the U.S. Environmental Protection Agency, U.S. Department of Energy, and National Aeronautics and Space Administration determined that ethanol would likely cause more ozone-related air pollution than when just gasoline is used, especially during colder conditions. The study compared gasoline-only emissions to E85 (blend of 85 vol.% ethanol with 15 vol.% gasoline) for combustion by-products using vehicle emissions data and computer models developed for the Los Angeles area. The researchers determined that the E85 generated substantially more aldehydes that are more reactive precursors to ozone. The health impacts from increased ozone levels would be felt most at temperatures below freezing due to the great vehicle emissions that occur. This is due to the additional time needed for catalytic converters to reach full efficiency. The study estimated that other pollutants would also be increased from E85 use, but the aldehydes-ozone increase was the greatest concern. The study was carried out to help evaluate the impacts of increased flex-fuel vehicle (FFVs) use expected over the coming decade.

### JAPAN SETS FINE PARTICULATE MATTER STANDARD

Japan's Ministry of Environment recently set the country's first air quality standard for fine particulate matter (PM<sub>2.5</sub>) to protect public health. The new standard establishes a 24-hour limit of 35 µg/m<sup>3</sup> and an annual average limit of 15 µg/m<sup>3</sup>. The PM<sub>2.5</sub> levels must be measured at locations other than in industrial centers or along major highway systems where people do not live. The Ministry did not establish final timelines for non-compliant areas to meet the standards; however indicated that PM<sub>2.5</sub> level should be lowered as soon as possible.