



A Monthly Publication by
Asian Clean Fuels Association
Vol. 8 Issue 3 - March 2010

India Working to Improve Its Air & Fuel Quality

The Republic of India is the second most populated country with 1.18 billion people (2010 estimate), and the fourth largest in purchasing power parity at \$3.30 trillion. However, on a per capita basis, India ranks far lower at only \$1,017 (based on nominal GDP of \$1.24 trillion).

Consisting of 28 states and 7 union territories, India is a widely diverse cultural, ethnic and geographic society that has become one of the fastest growing economies in the world. Furthermore, its historic trade routes, commercial ties and lower costs encourage business and enterprise development. This investment, plus expanding domestic and foreign demand, has allowed for substantial expansion of India's refining industry. This expansion as brought with it national efforts to improve transportation fuel qualities and reduce vehicle emissions to address air pollution concerns in India's large urban centers and rural communities.

IMPLEMENTATION OF NEW FUEL SPECIFICATIONS

Fuel quality standards for transport fuels in India are developed through the Auto Fuel Policy, legislated under the Environmental Protection Act and classified under the Bureau of Indian Standards. The Ministry of Petroleum and Natural Gas implements these standards with the assistance of the oil industry.

For the most part, India's fuel requirements are modeled after the European Union specifications, and are implemented in Bharat stages. New specifications usually get introduced in two phases, first applied in 13 major cities¹ and then followed by nationwide implementation.

India has used unleaded gasoline nationwide since 2000. The four gasoline grades available in the country are RON 88, 91, 93 and 95 – RON 88 (regular) and RON 93 (premium) are marketed nationwide, whereas RON 91 (as regular) and RON 95 (as premium) are in the selected cities. The current key gasoline specifications set under the Bharat III norms

¹ Cities included Delhi, Mumbai, Kolkata, Chennai, Bangalore, Hyderabad, Ahmedabad, Pune, Surat, Kanpur, Agra, Lucknow and Sholapur.

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(Euro III-equivalent) for nationwide use and Bharat IV (Euro IV-equivalent) in the 13 cities are given in Table I.

The government set 1 April 2010 as the implementation date for vehicle emissions standards under Bharat IV in major cities and Bharat III in the rest of the country. To meet these standards, petroleum companies agreed to supply Bharat III compliant fuel nationwide and Bharat IV for the 13 cities. The move to Bharat IV for the cities is expected to be achieved within the timetable, however, *(Continued on p4)*

Table I – Select Current Gasoline Specifications in India

	Nationwide	Metro
Implementation	April 2010	
Specification	Bharat III	Bharat IV
Grade	Regular/Premium	Regular/Premium
RON, min.	91/95	91/95
Sulphur, ppm, max.	150	50
Benzene, vol%, max.	1.0	1.0
Aromatics, vol%, max.	42	35
Olefins, vol%, max.	21/18	21/18
Oxygen Content, wt%, max.	2.7	2.7
Oxygenates		
Ethers (5 or more C), vol%, max.	15	15
Ethanol, vol%, max	5	5
Tert-butyl alcohol, vol%, max.	7	7
Others, vol%, max.	8	8
RvP @ 37.8°C, kPa, max.	60	60

Source: International Fuel Quality Center based on BIS regulation, 2010

CLEAN AIR THROUGH CLEAN FUELS



EXPERT TALK

Interview with Mr W. C. Mok, Assistant Director, Air Policy Division, Hong Kong Environmental Protection Department (EPD)

Q. Could you briefly describe for us the primary mission of EPD for air quality and air pollution control programs, and about your key responsibilities with the department?

The EPD's primary mission for air quality is to achieve the relevant air quality objectives (AQOs) established under the Air Pollution Control Ordinance (APCO). These AQOs are carried out as soon as is reasonably practicable and, thereafter, to maintain the quality so achieved.

Our key responsibilities at the Air Policy Division include:

- Implementing a wide range of measures to control emissions from motor vehicles, power plants, and industrial and commercial processes locally;
- Working with our Guangdong Provincial Authorities counterpart to implement a joint plan to tackle the regional smog problem; and
- Promoting collaborative efforts to reduce air pollution through regional and international co-operation.

Q. Would you tell us about the development of AQOs for Hong Kong and process for implementation?

The Government commissioned a consultancy study in 2007 to review the air quality objectives (AQOs) taking into account the World Health Organisation (WHO) guideline and the practices of other advanced countries. The Review was completed in 2009 and proposed a new set of AQOs alongside a host of emission control measures to achieve the proposed new AQOs. Many of the measures target at the emissions from motor vehicles and include early retirement of aged/heavily polluting vehicles, wider use of hybrid/electric vehicles or other environment-friendly vehicles, setting up low emission zones to restrict the entry of more polluting vehicles, etc. We have completed a public consultation on the recommendations of the AQO Review and are considering the findings of the consultation for deciding on how best to take the recommendations forward.

Q. What are the major programmes currently underway at the EPD to further address air emissions concerns from the transport sector?

Since 2000, we have been implementing a host of motor vehicle emission control measures to improve roadside air quality. We have a standing policy to tighten the emission standards of new vehicles when it is practicable to implement them. The major programmes include:

- Implementing Euro IV-equivalent emission standards for newly registered vehicles in tandem with the European Union from 1 January 2006;
- Mandating all pre-Euro diesel vehicles to be retrofitted with an emission reduction device;
- Incentivising the replacement of pre-Euro and Euro I diesel commercial vehicles with new commercial vehicles;
- Encouraging the use of environment-friendly vehicles by providing a reduction in the first registration tax; and
- Offering concessionary duty for early introduction of Euro V-equivalent diesel fuel for the marketplace.

Furthermore, we are working to implement the following measures to further reduce motor vehicle emissions:

- Tightening the standard of motor vehicle fuels to Euro V-equivalent requirements in 2010;
- Propose enabling legislation to ban unnecessary idling of vehicles;
- Setting up a \$300 million Pilot Green Transport Fund that encourages the transport sector to test out green and low-carbon transport technologies; and
- Incentivising the replacement of Euro II-level diesel commercial vehicles by new commercial vehicles.

Q: Hong Kong has moved forward to implement very strong clean fuel and vehicle requirements similar to Euro-standards. Why has Hong Kong taken this approach to adopt Euro-equivalent standards for its fuel and vehicles programs?

The vehicle emission and fuel standards of the European Union (EU) are amongst the most stringent practicable international standards. We have therefore adopted the standards. However, we also accept standards of equivalent or higher stringency.

Q. In developing new clean fuels and emission standards, how does the EPD coordinate with industry and key stakeholders to ensure such standards are effective?

The EPD and Air policy Division will fully consult the local oil companies, vehicle suppliers and the transport trades for working out a practicable way forward when new emissions standards or fuel quality specifications are needed to help achieve AQOs.

Q. What hurdles has the EPD encountered to implementing these stricter fuel quality standards, and how have they been successfully addressed?

(Continued on p6)



Refining Outlook – Update for 2010

The global economy is expected to show extreme contrasts in 2010 – stagnant growth anticipated in Organization for Economic Cooperation and Development (OECD) countries but resumed, and even strong, growth in many transitional and developing regions. The oil production and refining industry is likewise expected to see the same contrasts. For example, the former Soviet Union is projected to have a 34 million ton per year (t/y) surplus of fuel oil by 2015, whereas the North American region is projected to experience a 6.1 million t/y deficit in the same timeframe. Gasoline demand will slowly recover in North America, whereas very strong demand is expected in many Asian region countries and in the Middle East.

Crude oil prices are also demonstrating a steady rise even though the global downturn is expected to continue in the energy industry through this year. Many oil refining planners have based business models for investment projects on a \$60 per barrel (/bbl) minimum crude oil price – yet recently prices are going over \$80/bbl without concurrent increased conversion and upgrading project investments.

The reasons most likely are refinery overcapacity, shrinking margins and tightened capital access that have all become key factors to postponement or cancellation of upgrades and product diversification during the economic recession. Yet, in some regions, the need for improved refinery complexity and product demands provided opportunities for improvements and expansions, as seen in India and the Middle East.

Another important factor is that historically the refining industry tends to be reactive to the market, such as with the narrowing light/heavy spread or depressed distillate margins, prompting refinery planners to take a conservative approach toward increasing capacity to meet projected increases in demand beyond 2015.

While alternative fuels, biofuels, natural-gas based liquid fuels production will continue to grow over the five years (indeed throughout the decade), crude oil-based fuels consumption will increase significantly in Asia, the Middle East, Africa and Latin America – commensurate with expected economic expansions. Europe and North America will see much more restrained demand for crude oil-based fuels, especially with carbon emissions controls. But once again, niche opportunities may be found in these two regions if current diesel fuel supplies (Europe) or gasoline markets (East Coast U.S.) remain tight.

According to a Deutsche Bank report released early this year, the refining industry is working off its inventory overhang, particularly as demand improves in recovering regions, including in Europe and the U.S. As this global demand recovers, Organization of

Petroleum Exporting countries (OPEC) production will need to increase, and likely with it the heavy-to-light crude price spread.

The lack of an international agreement out of the Copenhagen climate change conference this past December diminishes (somewhat) for now direct impacts to refined product supply and diversification due to greenhouse gases (GHG) emissions controls. In the U.S., GHG cap-and-trade legislation being passed this year is remote, limiting the prospects for successful international negotiations leading up to the next convention at the end of the year.



Margins for refined products will greatly depend on regional demand and supply balances. Regions where oil demand is expected to grow after 2010 will see a renewed interest in conversion projects once crack spreads and price differentials between lighter and heavier crudes begin to widen. Pricing control policies imposed in various countries will also influence demand curves,

and adjustments (increased consumer prices) are likely to occur as crude prices increase.

But whether or not refinery conversion projects resume over the next couple of years is unclear. Desulphurization projects may already have peaked in 2009, will more modest expansions taking place in 2010 through 2014, according to surveys reported at the end of last year. Implementation of stricter fuel quality specifications are expected to continue in the Asia region to help combat persistent air pollution problems in cities.

Octane improvements will also occur in many countries as vehicle fleets expand and modernize. Higher RON in these countries, whether by specification requirements or consumer demands, will result in refinery units for octane components or purchase of merchant blending products.

Shifts in refinery configuration will move some previously postponed project forward. In South America (Brazil), Petrobras has committed to building five hydrocracking-based refineries by 2015. In the U.S., closure of two major East Coast refining facilities will not soak up overcapacity that currently exists. But other major expansions are ongoing in the U.S. (Motiva Port Arthur).

Product diversification into petrochemicals (e.g., propylene, polymers, octane components, and aromatics) will influence certain projects due to technology improvements and shifting market demands. Asia's petrochemical industry will continue to expand to supply the growing demand for plastics, polymers and other materials required by consumers and export manufacturing industries.

In general, 2010 could be a pivotal year for many refiners as economic activity strengthens and expansions pick up momentum.



India Working to Improve Its Air & Fuel Quality

(continued from p1) distribution difficulties for the nationwide implementation of Bharat III compliant fuel is being experienced. Consequently, the full implementation is expected to be delayed as the higher sulphur content Bharat II fuel is phased out and replaced with the Bharat III fuel.

Currently, India mandates ethanol blending (5 vol% or E5) nationwide, excluding six states where the product cannot be made available due to distribution limits. Further studies are being undertaken this year to determine if higher blending of E10 is compatible with existing vehicles.

REFINING EXPANSIONS MAY BRING DOMINANCE AS REGIONAL SUPPLIER

India's proven oil reserves are estimated at 725 million metric tons. Currently, more than 70% of processed crude oil is imported, and oil and gas account for over 45% of India's total energy demand.

There are 19 refineries in India, with 17 of them owned by the public sector. Indian Oil Corporation (IOC) is the largest public-sector downstream oil company in India, followed by Bharat Petroleum Corporation Limited. Reliance Petroleum Limited established the first private sector refinery in the country and has since substantially expanded capacity.

India's refiners are expected to achieve 256 million tons per year crude processing capacity by 2012 due to about 6% per year expansion over the next two years. Recent expansions, such as the Reliance's second refinery at Jamnagar in Gujarat with 29 million tons capacity that started in late 2008, have substantially added to outputs. Additional construction projects are ongoing with much of the added capacity slated for potential export markets.

AIR QUALITY STANDARDS BEING TIGHTENED

In late 2009, India's Ministry of Environment and Forests issued notice of the Revised National Ambient Air Quality Standards 2009 (NAAQS) that tighten these limits following a 15-year gap since the levels were last set 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.

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 NO₂ and SO₂ standards set for ecologically sensitive areas.
- Standards for particulate matter (PM₁₀) and carbon monoxide (CO) are now uniformly applied, and more stringent limits for lead, SO₂, and NO₂ are set for residential areas.
- Fine particulate matter (PM_{2.5}) 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.

FUTURE – EXPANSION & EXPORT

India's economic growth was averaging 7.5% annually prior to the global recession. Hourly wages have more than doubled over the past decade. And marketplace competitiveness, technology innovation and business outsourcing to India have supported this economic development. The auto industry continues to expand to supply domestic and export demand and the world's least expensive car – the Tata Nano – is produced in India. This economic growth can help India address its poverty levels, rural development, infrastructure and energy needs, and urban air quality.

India's Tata Nano Car



Source: Google Image



13th Annual ARTC Held in Singapore

The 13th Annual Asian Refining Technology Conference (ARTC) took place on March 9th and 10th in Singapore this year. Asia is seeing both economic recovery and expanding demand supported by adequate supplies of petroleum and refined products. ARTC brought together leading experts in the industry to share best practices and exchange ideas on how advancing technologies and improving market trends impact business throughout the region. The exhibition showed examples of the latest technologies being offered and provided networking opportunities for attendees across the globe.

This year's programme included presentations on automotive and refining industry challenges and opportunities, developments in key economic sectors and countries, upstream optimisation and refining and petrochemical feedstock outlooks. The second day programme provided dual concurrent sessions that covered refining, environmental issues, energy efficiency, petrochemical technologies and process management. Several of the key presentations at ARTC are summarized below.

Mr Narayanaswamy Ravivenkatesh, principal with Purvin & Gertz, Inc., provided an opening presentation on the medium-term outlook for refining and petrochemical feedstock. As the economic recovery expands over the coming years, global petroleum demand is forecast to increase by about 18 million barrels per day (b/d) from 2008 to 2030 timeframe. Non-OECD share of the growth is expected to increase from the current 43% to over 53% by 2030. The Asian region, lead by China and India, will experience substantial improvement in petroleum intensity and efficiency. Mr Ravivenkatesh further indicated that the Asia Pacific region is expected to account for 55% and the Middle East to account for 20% of global refined product demand growth during the time (Figure 1). To meet this demand by 2030, he noted that about 45 million b/d of crude oil production needs to be developed from new fields.

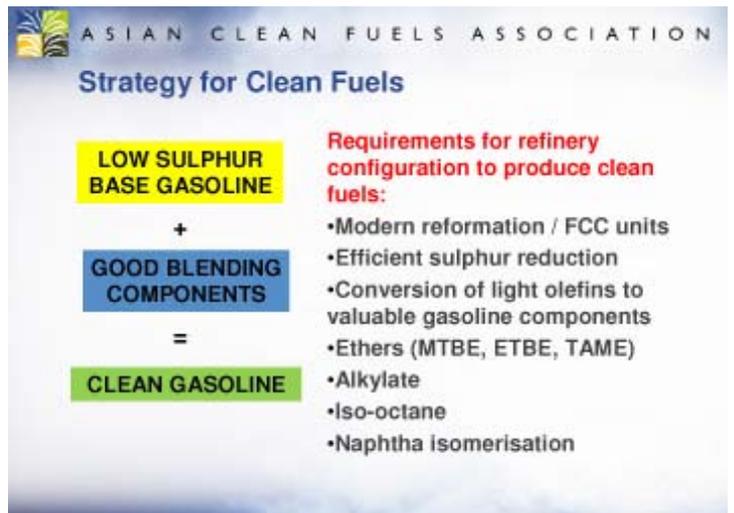
Mr Clarence Woo, executive director at Asian Clean Fuels Association, presented on "Clean Fuels Trends in Asia and Challenges for Refiners." He indicated that, unlike in some other areas, fuel quality standards are not harmonized across the Asia region which results in inconsistent fuel conditions for the marketplace. He explained that the drivers for fuel quality change in the region are higher incomes, increasing vehicle numbers, expanding travel opportunities and accompanying higher demands for fuel. As vehicle and fuel use grows, emissions increase and pressures mount on air quality protection. Mr Woo demonstrated the elements to a successful strategy to improve fuel quality (Figure 2) needed for modern cleaner vehicle engines. He reviewed the challenges for refiners to provide high quality fuels and blending components, including operational costs that can tighten margins, regulatory deadlines, policy changes to address CO2 emissions, and alternative fuels mandates. An important part of meeting the

Figure 1 – Projected Demand Growth of Global Refined Product



Source: N. Ravivenkatesh, Purvin & Gertz, 13th ARTC, Singapore, March 2010

Figure 2 – Successful Approach for Clean Fuels Strategy



Source: C. Woo, Asian Clean Fuels Association, 13th ARTC, Singapore, March 2010

challenges will be international partnerships and harmonization of fuel specifications.

Mr Clive Gibson, principal with Nexant ChemSystems, spoke on "A New Decade – Familiar Challenges, Changing Priorities." He provided a comparison of industry conditions and performance between the 1990s and 2000s decades. He noted that the past decade saw refining capacity additions outstrip demand during this past decade, mainly due to the global economic recession that started in 2008. The Asia region accounted for two-thirds of net demand growth and on-half of net capacity growth since 2000. One area that he highlighted was how crude oil prices have been "predictably unpredictable" and consequently so to were price crack spreads and refinery margins. Mr Gibson believes that, for the future, structural Asian (Continued on p6)



13th Annual ARTC Held in Singapore

(continued from p5) trends remain firmly in place, and therefore demand growth to fully resume and Asia expected to lead the recovery. He further noted that, with refinery expansions, India is becoming a dominant regional supplier of transportation fuels.

Mr Xiangchen Fang, president at SINOPEC, Fushun Research Institute of Petroleum and Petrochemicals, presented on “Technological Developments in Solving China’s Transportation Fuel Qualities.” He highlighted the changing crude properties being processed by SINOPEC, and the need to increase light liquid yield by 2020 to meet requirements for transportation fuels and petrochemical feeds. As a result, Chinese refiners need to develop innovative technologies to convert heavy, lower-quality crudes to high quality light products. He summarized the improvements and tightening of gasoline specifications in China, starting with the major cities, and reviewed the process steps being taken to produce cleaner burning fuels. Mr Xiangchen noted

the challenges for making ultra-low sulphur diesel (USDL) fuel, and identified the new developments for hydrotreating process and catalyst improvements necessary to meet these standards.

Mr Anders Røj, from Volvo Technology Corporation Fuels and Lubricants Group, talked about “Challenges for the Automotive Industry & Impact on Fuel Regulations.” He stressed the importance of fuel quality to ensure good performance throughout the whole engine life. He reviewed the efforts for global fuel standard harmonization, such as the World Wide Fuel Charter (WWFC). Mr Røj noted that the latest WWRC revisions are under review, with planned completion by September 2010. He also examined the issue of “well-to-wheel” energy and GHG emissions assessments.

The 13th Annual ARTC programme provided key insights into the challenges, trends and fuel technology developments for the Asian region.

Interview with Mr W. C. Mok, Assistant Director, Air Policy Division, Hong Kong Environmental Protection Department (EPD)

(continued from p2) Hong Kong does not have its own fuel refineries and all of our fuels are imported from other countries. To facilitate oil companies to make preparations, we will inform oil companies of our plan to tighten the standard well in advance so as to work out a practicable plan and achievable schedule. To offer incentives to bring in cleaner diesel fuels (such as Euro IV or V-equivalent diesel) earlier and encourage drivers to use them, we have offered concession in fuel duty to companies providing such fuels.

Q. Presently, what are the main issues to be addressed for continued improvements for fuel quality?

We are making preparations to tighten the statutory requirement for motor vehicle fuel to Euro V-equivalent levels. Subject to the approval of our Legislative Council, the Euro V motor vehicle fuel standard will become mandatory from 1 July 2010.

Q. Finally, what guidance would you suggest to other government agencies that are working to improve fuel quality and vehicle standards?

We believe dialogues with all the stakeholders, from producers, distributors, auto makers, to consumers, will help the introduction of more stringent fuel and vehicle emission standards.

If you have any enquiries or feedback on ACFA News, please contact us at info@acfa.org.sg



You may also Contact Joanne Chong at (+65) 6866 3209 or email joanne@acfa.org.sg. Visit us online at www.acfa.org.sg

Upcoming Conferences & Events

Green Fuels & Vehicles China
8 Apr 2010
Shanghai

8th APTC
20-21 Apr 2010
Kuala Lumpur

DeWitt Asia Methanol & MTBE Conference,
19-21 April 2010
Hong Kong

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

15th Asia Oil Week 2010
19-23 Apr 2010
Singapore



Fuels Industry Updates

GUANGDONG PROVINCE TO MOVE TO 50 PPM SULPHUR

Following Beijing and Shanghai implementing lower sulphur content limits, Guangdong Province in southern China will move 50 ppm sulphur gasoline and diesel fuel starting 1 July 2010. The province contains the Pearl River Delta and major cities of Guangzhou, Shenzhen and Huizhou. The Guangdong Environmental Protection Bureau and Guangdong Quality and Technical Supervision Bureau jointly released the new gasoline standard, DB44/694-2009, and diesel fuel standards, DB44/695-2009, to replace the existing standards the limit sulphur to 150 ppm in gasoline and 350 ppm in diesel fuel. The gasoline specification will also include several additional changes:

- Requiring antiknock index of RON 97 gasoline no lower than 90
- Reducing manganese content from 0.016 g/l to 0.008 g/l max
- Changing vapour pressure (RVP) from 65 kPa max in summer (88 kPa max in winter) to an all year-round limit of 45-60 kPa
- Introducing an olefins limit of 25% max.

Air pollution continues to be a serious concern for cities in the province. Last year, an average of more than 75 hazy days was experienced. And surveys have found that more than 41% of people in the Pearl River Delta have felt sick or uncomfortable due to air quality problems.

KIDNEY FUNCTION HARMED BY LOW LEVELS OF LEAD IN BLOOD

Recently published finding indicate that lead levels well below that previously thought to cause concern could harm kidney function of adolescents. Research was published in the Archives of Internal Medicine, and conducted by Johns Hopkins University Children's Center (Baltimore, USA) scientists. Using two different kidney function tests, the researchers found that adolescents with blood lead levels above 2.9 micrograms per deciliter ($\mu\text{g}/\text{dL}$) had lower filtration rates than those with lead levels at or below 1 $\mu\text{g}/\text{dL}$. Previously health experts believed that blood lead levels below 10 $\mu\text{g}/\text{dL}$ did not cause concerns. The researchers note that this slightly decreased kidney function in healthy children could add to problems when they get older and encounter additional risk factors for kidney disease (high blood pressure or diabetes, for example). The study could not confirm that the blood lead levels measured caused the diminished kidney function, thus warranting further research. High lead exposures are established to cause kidney damage, and this study underscores the need to minimize sources of lead exposure.

AUSTRALIA PROPOSES MOVING TO EURO V AND EURO VI SPECS

Australia's Federal Transport Minister recently announced proposals to introduce Euro 5-equivalent standards from 2012 and Euro 6-equivalent standards from 2016. Public comments on the draft Regulation Impact Statement were solicited prior to the government finalizing its decision on implementation. The government recognizes improvements in air quality in major cities over the past decade, however expected growth in the vehicle fleet calls for continued progress. The draft RIS notes that cleaner fuels and stricter emissions standards are among the most cost effective ways to help improve urban air quality. The Minister also announced that new regulations are being developed to reduce CO₂ emissions from new vehicles, and a separate RIS for this control would be released later this year.

EU REACH DOSSIERS NEED IMPROVEMENTS

The European Union's chemical agency (ECHA) has issued a progress report of its 2009 efforts to review registration dossiers in accordance with the EU's Registration, Evaluation, and Authorization of Chemicals (REACH) regulation. REACH is the chemicals safety regulation implemented in mid-2007 to improve the protection of human health and the environment. The ECHA indicates in the report, Evaluation under REACH: Progress Report 2009, that chemical manufacturers should improve their descriptions of chemical identities, justify proposed waivers for animal tests, and provide more comprehensive summaries for research results used to provide conclusions about chemical toxicities and related properties. The ECHA received 406 dossiers during 2009, and conducted preliminary evaluations of 35 submissions to evaluate if they comply with REACH's requirements and what testing was being proposed by registrants. More detailed analysis of the dossiers' content will be conducted after 2011.

In the report, the ECHA concluded that the identity of chemicals was "insufficient for a significant proportion of evaluation dossiers." The report also indicates that inadequate justification for waiver of certain types of animal tests (mainly repeated dose toxicity and reproductive toxicity) was determined. Under REACH, animal testing is required only as a last resort for evaluating toxicity, however must not be waived if would compromise the safe use of chemicals. Also the agency found inadequate summaries were being presented when the "weight-of-evidence" approach was being applied to assess chemical safety properties. The weight-of-evidence approach must be highlighted in the dossier when relied upon for the assessment. The ECHA REACH progress report is available at http://echa.europa.eu/doc/progress_report_2009.pdf