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Panel on Economic Development
Meeting on 19 July 2010

Background brief on introduction of
petrol of lower octane numbers

Purpose

This paper provides background information on octane number of petrol, and summarizes concerns raised by members on issues relating to the introduction of petrol of lower octane number.

Background

Octane number

2. Octane number of petrol is a measure of the fuel's tendency to burn in a controlled manner, rather than exploding in an uncontrolled manner. It also reflects the petrol's ability to resist "engine knock"¹, and the higher the octane number, the more resistant it is to "engine knock". Petrol with high octane number is therefore more expensive. It is essential and important to match the correct octane number of the petrol with the engine design to enable a complete combustion of petrol for maximum fuel efficiency and minimum emissions.

3. In most vehicles, no benefit is gained from using petrol that has a higher octane number than is needed to prevent "engine knock". On the other hand, a vehicle using petrol with an octane number lower than that recommended by its manufacturer may consume more fuel, lower engine performance and, as a result of premature ignition of petrol, reduce fuel efficiency and render engine operation less than optimal. In this case, more pollutants, such as hydrocarbons, carbon monoxide and carbon dioxide, may be emitted, affecting air quality. From the perspective of environmental protection, using petrol with an octane number that fits the engine performance

¹ Engine knocking is a sharp, metallic-sounding noise that results from uncontrolled combustion. Severe knocking over an extended time may damage pistons and other engine parts.

of vehicles can help reducing air pollution.

Octane numbers available in Hong Kong and other regions

4. The Air Pollution Control (Motor Vehicle Fuel) Regulation (Cap 311L) specifies that the octane level of petrol for motor vehicle should not be lower than 95. The unleaded petrol first introduced into Hong Kong in April 1991 was of an octane number of 95. According to the petrol suppliers, they introduced 98-octane unleaded petrol in October 1991 in response to consumers' demand. Between October 1991 and March 1992, consumers could choose petrol with octane numbers of 95 or 98 available in the market at the same time. Subsequently, 95-octane was withdrawn from the market.

5. According to a survey published by the Consumer Council in April 2010², among 550 models of petrol vehicles available in the Hong Kong market, 337 models (61.3%) could use, for optimal efficiency, 95-octane petrol, as recommended by vehicle manufacturers. As revealed by the Consumer Council, petrol stations in the United States, the United Kingdom, France, Germany, Spain, Japan, Singapore, Taiwan and the Mainland have in supply simultaneously two or even three unleaded petrol of different octane numbers. Statistics also showed that sales of 92-octane and 95-octane unleaded petrol in Singapore jumped by 13% and 14% respectively in 2008 accounting for 8.9% and 55.6% of total sales, while 98-octane unleaded petrol shrank by 18% representing only 35.5% of total sales. In the European Union, 85% of total sales in 2007 were 95-octane petrol. In Singapore and Taiwan, the difference in retail price between 95-octane and 98-octane petrol was as much as 4% to 5%. Octane numbers of petrol available in different regions are given in **the Appendix**.

Previous discussions

Former Panel on Economic Services

6. At the meeting of the former Panel on Economic Services³ (the ES Panel) held on 20 October 2005, members considered that consumers should be given more choices of unleaded petrol of different octane numbers. The Administration responded that according to the oil companies, since 98-octane petrol was more popular among motorists and due to the small size of the petrol filling stations (PFSs), they had difficulties in supplying two types of unleaded petrol.

7. During the briefing on the findings of the consultancy study on the

² No. 402, CHOICE, April 2010.

³ The Panel on Economic Services was renamed as the Panel on Economic Development from the 2007-2008 session.

Auto-fuel Retail Market at the meeting on 24 April 2006, the ES Panel noted that the cost difference between unleaded 98-octane and 95-octane petrol was approximately \$0.2/litre. Some members requested that a choice of different and cheaper petrol with lower octane numbers should be made available in the local market to benefit consumers. The Consultant highlighted the physical constraints of PFSs and the small scale of the Hong Kong market, which made it commercially not viable for importers and retailers to provide a wider choice of fuel types.

Council meetings

8. At the meeting on 12 November 2008, the Council passed a motion with amendments on "Alleviating the burden of fuel costs on the public and relevant trades" which urged the Government to, inter alia, request the oil companies to re-introduce 95-octane petrol, so as to provide more choices for consumers and reduce their unnecessary burden. The Administration responded that owing to the small size of PFSs, it might not be possible to have various kinds of fuel products on sale at one and the same filling station.

9. At the Council meeting on 5 May 2010, when responding to a Member's question on offering petrol of lower octane numbers, the Administration referred to the consultancy report on the Auto-fuel Retail Market issued in 2006 which had explored the suggestion of supplying petrol with different octane numbers. Having considered the size of PFSs as well as the scale of the Hong Kong market, the report did not recommend requiring retailers to simultaneously provide petrol of two different octane numbers.

Latest development

10. At the meeting of the Panel on Economic Development on 26 April 2010, some members expressed concern that vehicles owners had to pay for the more costly 98-octane petrol despite their vehicles could already attain optimal efficiency by using 95-octane petrol. The Panel agreed to invite the Administration and the oil companies to exchange views with members on the introduction of petrol of lower octane numbers at the meeting on 19 July 2010.

References

Press release on "LCQ1 - Octane number of petrol" dated 1 March 2000
<http://www.info.gov.hk/gia/general/200003/01/0301136.htm>

Minutes of the Panel meeting on 20 October 2005
<http://www.legco.gov.hk/yr05-06/english/panels/es/minutes/es051020.pdf>

Administration's paper on "Findings of a Consultancy Study on the Local Auto-fuel Retail Market" (LC Paper No. CB(1)1303/05-06(03))

<http://www.legco.gov.hk/yr05-06/english/panels/es/papers/es0424cb1-1303-3e.pdf>

Minutes of the Panel meeting on 24 April 2006

<http://www.legco.gov.hk/yr05-06/english/panels/es/minutes/es060424.pdf>

Motion on "Alleviating the burden of fuel costs on the public and relevant trades" at the Council meeting on 12 November 2008

http://www.legco.gov.hk/yr08-09/english/counmtg/motion/m_papers/cm1112cb3-122-e.pdf

Press release on call to introduce supply of 95-octane petrol in Hong Kong issued by Consumer Council on 15 April 2010

http://www.consumer.org.hk/website/ws_en/news/press_releases/p40201.html

Minutes of the Panel meeting on 26 April 2010

<http://www.legco.gov.hk/yr09-10/english/panels/e/dev/minutes/e/dev20100426.pdf>

Press release on "LCQ1 - Offering petrol of lower octane numbers" dated 5 May 2010

<http://www.info.gov.hk/gia/general/201005/05/P201005050174.htm>

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Regional variations

The selection of octane ratings available at the pump can vary greatly from region to region.

- [Australia](#), "regular" unleaded fuel is 91 RON, "premium" unleaded with 95 RON is widely available, and 98 RON fuel is also reasonably common. Shell used to sell 100 RON petrol from a small number of service stations, most of which are located in capital cities (stopped in August 2008).
- [Germany](#), "Normal" 91 RON, "Super" 95 RON and "Super Plus" 98 RON is practically available everywhere. Big suppliers like [Shell](#) or [Aral](#) offer 100 RON gasoline ([Shell V-Power](#), Aral Ultimate) at almost every fuel station. "Normal" 91 RON is more and more disappearing, because lower production amounts make it more expensive than "Super" 95 RON, so it is often not offered any more.
- [Hong Kong](#), only 98 RON and 99 RON are available in the market. There have been calls to re-introduced 95 RON, but the calls have been rejected by all petrol station chains, citing that 95 RON was phased out because of market forces.
- [Italy](#), 95 RON is the only compulsory gasoline offered (verde), only few fuel stations (Agip, IP, IES, OMV) offer 98 RON as the premium type, many Shell and Tamoil stations close to the cities offer also V-Power Gasoline rated at 100 RON
- [India](#) India's Ordinary And Premium Petrols are of 89-91 RON. The premium petrols are generally ordinary fuels with additives, that do not really change the octane value. Two variants, "Speed 93" and "Speed 97" were launched, with RON values of 93 and 97, but Speed 97 was discontinued. India's vehicles usually have compression ratios under 10:1, thus enabling them to use lower quality petrols without engine knocking.^[*citation needed*]
- [Indonesia](#) Indonesia's "Premium" petrol rated at 88 RON and being subsidized it cost only about US\$ 0.50/liter. Other options are "Pertamax" rated at 92 RON and the "Pertamax Plus" rated at RON 95, which is the highest octane available for automotive gasoline in Indonesia.
- [Malaysia](#), the "regular" unleaded fuel is 95 RON, "premium" fuel is rated at 97 RON (but for Shell 97 RON is V-Power), and Shell's V-Power Racing is rated at 99 RON.
- [Netherlands](#); 95 RON "Euro" and 98 RON "Super" are sold at practically every station. Shell V-Power is a 97 RON (labelled as 95 due to the legalities of only using 95 or 98 labelling), whereas in neighbouring Germany Shell V-Power consists of the regular 100 RON fuel.

- [New Zealand](#); 91 RON "Regular" and 95 RON "Premium" are both widely available. 98 RON is available instead of 95 RON at some service stations in larger urban areas.
- [Ireland](#), 95 RON "unleaded" is the only petrol type available through stations, although E5 (99 RON) is becoming more commonplace.
- [Russia](#) and [CIS](#) countries, 80 RON (76 MON) is the minimum available, the standard is 92 RON.
- [South Africa](#), "regular" unleaded fuel is 95 RON in coastal areas with most fuel stations optionally offering 97 RON. Inland (higher altitude) "regular" unleaded fuel is 93 RON, once again most fuel stations optionally offer 95 RON.
- [United Kingdom](#), 'regular' petrol has an octane rating of 95 RON, with 97 RON fuel being widely available as the *Super Unleaded*. [Tesco](#) and [Shell](#) both offer 99 RON fuel. [BP](#) is currently trialling the public selling of the super-high [octane petrol](#) *BP Ultimate Unleaded 102*, which as the name suggests, has an octane rating of 102 RON. Although BP Ultimate Unleaded (with an octane rating of 97 RON) and BP Ultimate Diesel are both widely available throughout the UK, BP Ultimate Unleaded 102 is (as of October 2007) only available throughout the UK in 10 filling stations, and is priced at about two and half times more than their 97 RON fuel. Also offered Shell V-Power, but in a 99 RON octane rating, and [Tesco](#) fuel stations also supply the [Greenergy](#) produced 99 RON "Tesco 99".