CLEAN FUELS FOR A CLEAN MALAYSIAN ENVIRONMENT

By

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Abstract

The major air pollution source in Malaysia are the mobile sources which produces mainly CO, NOx, SO_2 as well as particulate matter(PM10). In order to reduce the vehicular emission, Department of Environment Malaysia has taken a few initiatives which includes the introduction of National Biofuel Policy. One of the strategy is to encourage the public to utilise the alternative fuel as a clean fuel source. New fuel specifications which adopts the European Fuel Quality Standards will also be introduced and will help to improve the air quality with to the utilization of better fuel quality which will emit less harmful smoke. PETRONAS as a national oil company will always take initiatives to enhance and improve its fuel quality to help keep Malaysian environment clean.

Presentation Outline

- To share some of the Malaysian Government (DOE) Initiatives in the Malaysian Air Quality improvement
- To share the current and future Malaysian Fuel Quality
- To share PETRONAS initiatives in clean fuel offerings to the Malaysian public/ consumer

General Information

MALAYSIA

Total area: 329,750 sq km Total States : 13

Climate: Tropical

Population: 23,953,136 (July 2005)

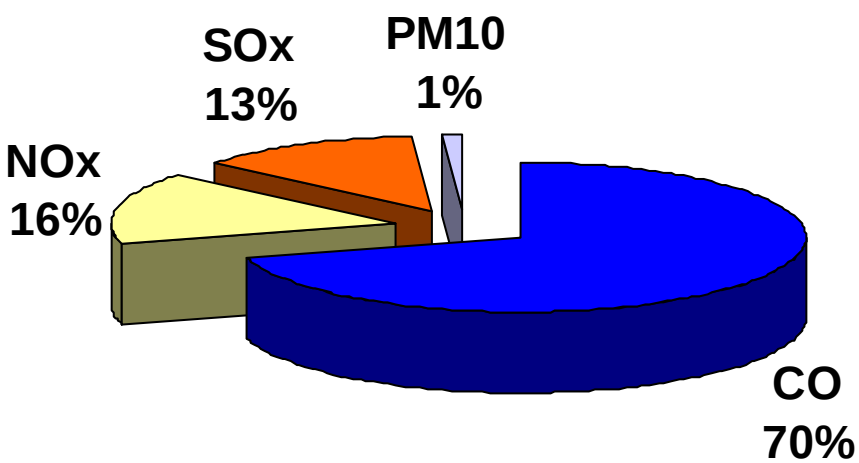
Oil Production: 600,000 bbl/day (2003)

Refineries:

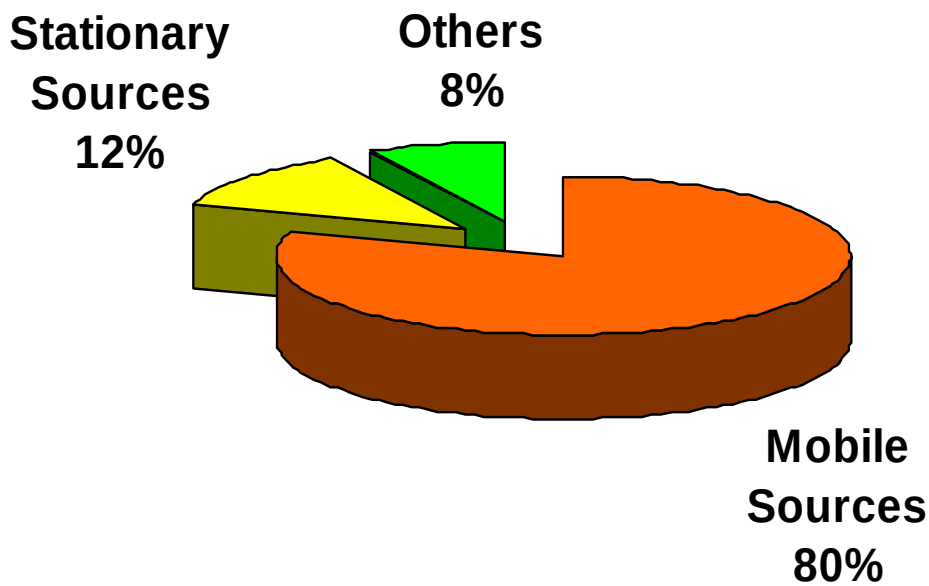
- **Petronas Penapisan Terengganu, Kerteh (~ 40K bpd)**
- **Petronas Penapisan Melaka, Melaka. (~ 220K bpd)**
- **Shell Refining Co. Bhd, Port Dickson (~ 155K bpd)**
- **Esso Malaysia Bhd, Port Dickson (~ 85K bpd)**

Air Pollutants and Its Sources

Percentage of Pollutants Emitted to the Atmosphere, 2003

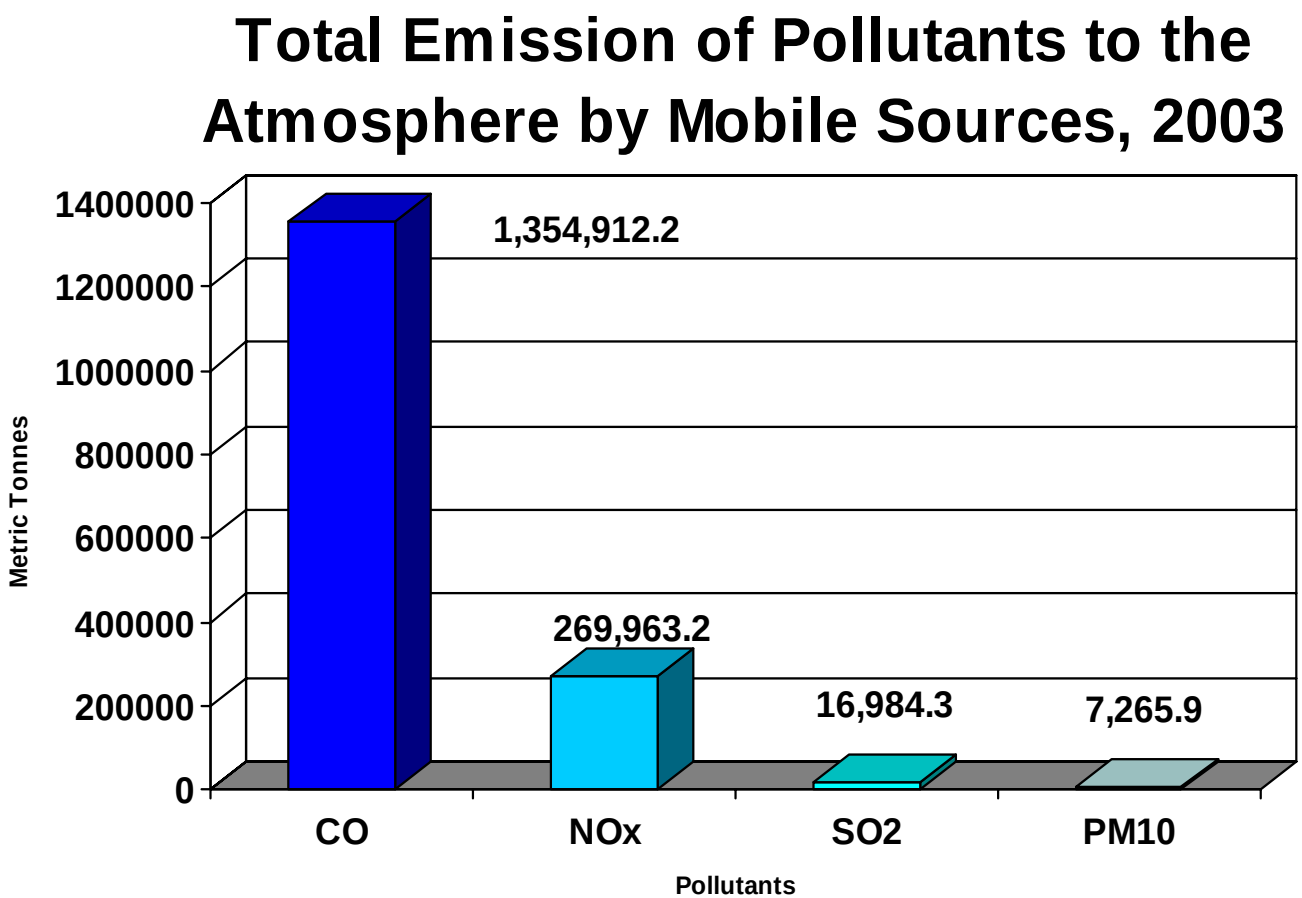


Emissions of Pollutants to Atmosphere by Source, 2003



* Source from Compendium of Environment Statistics, Malaysia 2004

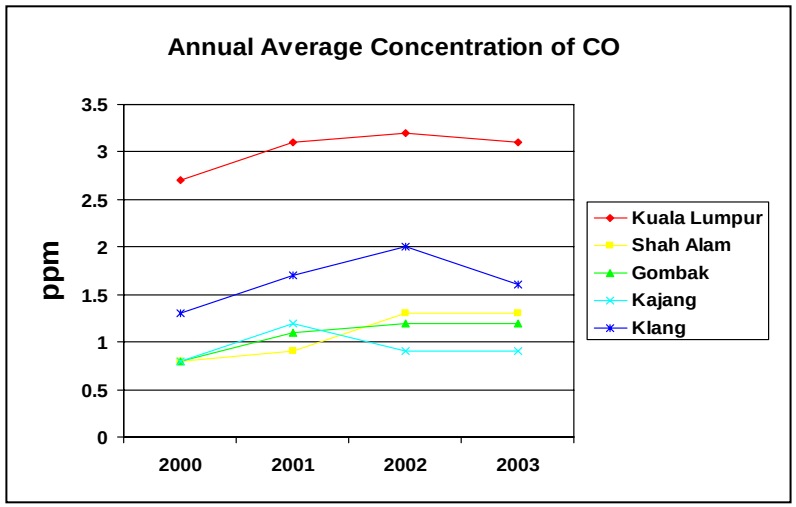
Emissions By Mobile Sources

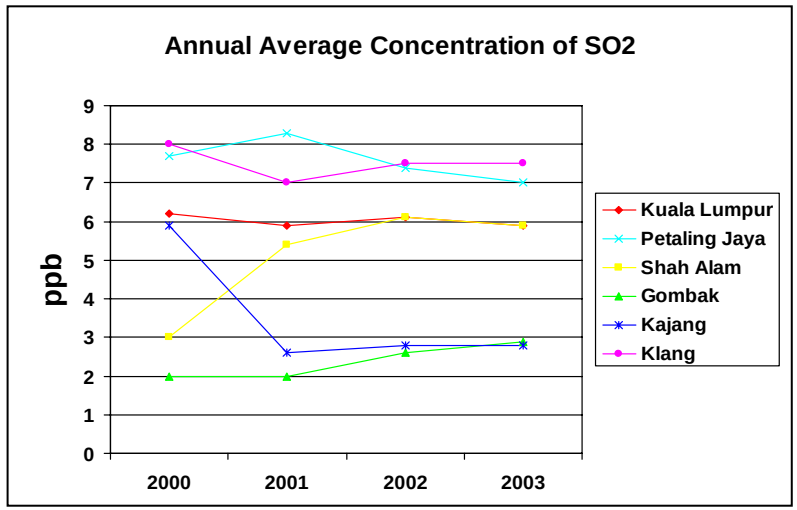


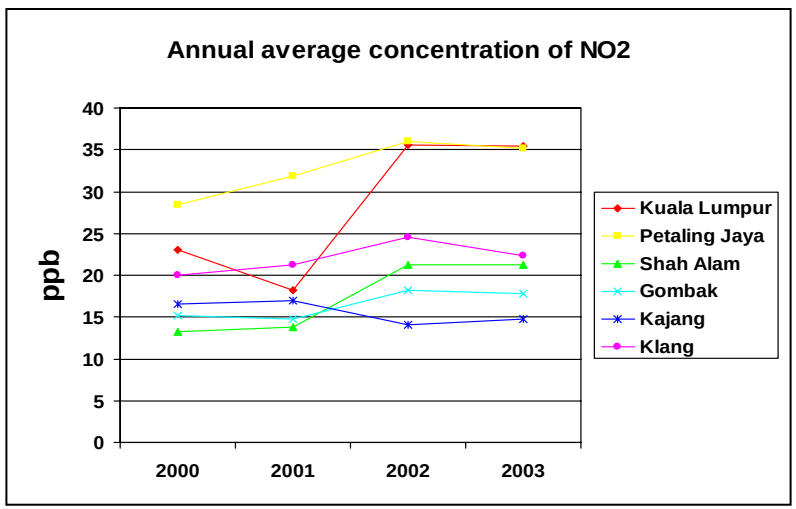
* Source from Compendium of Environment Statistics, Malaysia 2004

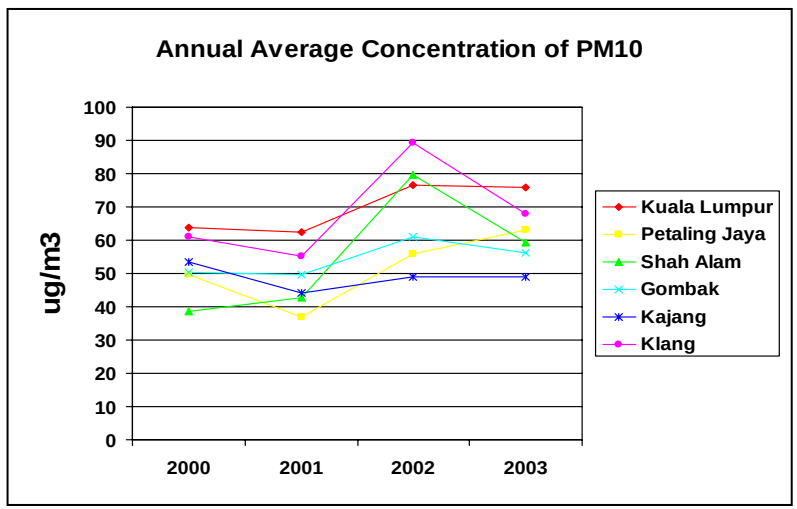
Outlook of Malaysian Air Quality

(KLANG VALLEY AREA) 2000-2003







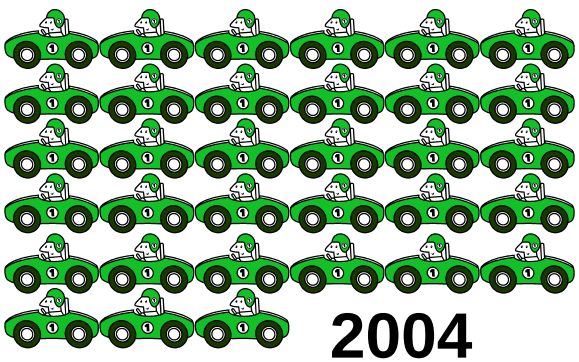


* Source from Compendium of Environment Statistics, Malaysia 2004

DOE Initiatives

Reduction of Vehicular emission

Alternative Fuels	Car Pool & Improvement In Public Transport	Adoption of European Fuel Quality Standards	Adoption of Stringent Engine Emission Standards	Regulations Enforcement



2004

Quotable Quotes:

“ IT TAKES 33 NEW TIER-2 CARS TO EQUAL THE POLLUTION OF JUST A SINGLE 1970 VEHICLE”

1970’s

Regulation Enforcement

Laws and Regulations to Control Motor Vehicle Emission	
1985	Environmental Quality Regulations (Control of Lead Concentration in Motor Gasoline)
1995	Motor Vehicles Rules (Periodic Inspection Equipments and Inspection Standard)
1996	Environmental Quality Regulations (Control of Emission from Diesel Engines) and (Control of Emission From Petrol Engines)
2003	Environmental Quality Control of Emissions from Motorcycles Regulations
Motor Vehicle Emission Control Programme	
1995	Control of Black Smoke Emission From Diesel Vehicles - AWASI Programme
1995	Periodical Inspection (in line with the 1995 Motor Vehicles Rules - Periodic Inspection Equipments and Inspection Standard

Gasoline Specifications

Properties	Current	Euro 2M	Euro 4M
Research Octane Number	97 min	97	97
Colour	Yellow	Yellow	Yellow
Lead, g/l	0.013 max	0.013 max	0.013 max
Existent Gum, mg/100ml	4 max	4 max	4 max
Copper Corrosion,	1 max	1 max	1 max
Distillation			
IBP, ° C	40 max	40 max	40 max
T10, ° C	74 max	74 max	74 max
T50, ° C	75 – 115	75 – 115	75 – 115
T90, ° C	180 max	180 max	180 max
FBP, ° C	215 max	215 max	215 max
Residue, vol%	2 max	2 max	2 max
Density, kg/L	To be reported	0.725 – 0.780	0.725 – 0.780
Reid Vapour Pressure, kPa	**70 max**	**65 max**	**65 max**
Total Sulphur, ppm	**1000 max**	**500 max**	**50 max**
Benzene, vol%	**-**	**5.0 max**	**1.0 max**

Diesel Specifications

Properties	Current	Euro 2M	Euro 4M
Colour (ASTM)	2.5 max	2.5 max	2.5 max
Ash, wt%	0.01 max	0.01 max	0.01 max
Pour Point, ° C	15 max	15 max	15 max
Flash Point, ° C	60 min	60 min	60 min
Kinematic Viscosity @ 40° C,	1.6 - 5.8	1.6 - 5.8	1.6 - 5.8
Copper Corrosion	1 max	1 max	1 max
Water by Distillation, vol%	0.05 max	0.05 max	0.05 max
Sediment by Extraction, wt%	0.01 max	0.01 max	0.01 max
Micro Carbon Residue, wt%	0.10 max	0.10 max	0.10 max
Density, kg/L	To be reported	To be reported	To be reported
Total Acid Number, mg KOH/g	0.25 max	0.25 max	0.25 max
Cetane Index	**47 min**	**-**	**-**
Cetane Number	**45 min**	**49 min**	**51 min**
Distillation, T90, ° C	**370 max**	**-**	**-**
Distillation, T95, ° C	**-**	**370 max**	**360 max**
Total Sulphur, ppm	**3000 max**	**500 max**	**50 max**

Gasoline in Malaysia – Typical (2004)

	Unit	A	B	C	D	E	F
Density	Kg/L	0.7651	0.7700	0.7670	0.7670	0.7613	0.7505
RVP	kPa	77.0	61.0	73.0	64.5	54.5	66.0
RON	-	97.4	97.2	97.3	97.7	96.4	97.4
Sulphur Content	ppm	16	33	134	57	78	104
Benzene Content	%	5.72	2.93	1.64	2.30	5.07	2.61

Data: March 2004

Note:

1. Other than RVP, all the fuels in Malaysia are able to meet the proposed Malaysian Euro 2 gasoline specification.
2. In order to meet the proposed Malaysian Euro 4 gasoline specification, the refineries needs to install new hardware, e.g benzene extraction unit and etc.

Diesel in Malaysia - Typical (2004)

	Unit	A	B	C	D	E	F
Density,	Kg/L	0.8500	0.8257	0.8491	0.8180	0.8499	0.8526
Cetane Number	-	55.4	66.8	55.1	65.3	55.7	55.4
Distillation, T90	° C	358.4	357.2	364.9	352.4	366.6	368.8
Distillation, T95	° C	376.2	376.9	384.1	370.9	383.0	384.0
Sulphur Content	ppm	2800	300	500	200	260	260

Data: March 2004

Note:

1. In order to meet the proposed Malaysian Euro 2 diesel specification, the refineries needs to install new hardware, e.g Distillate HydroTreater unit etc

National Bio-fuel Policy

Draft Bio-fuel Policy submitted to Attorney General for vetting. To be proposed to Parliament by 1st Quarter 2006.

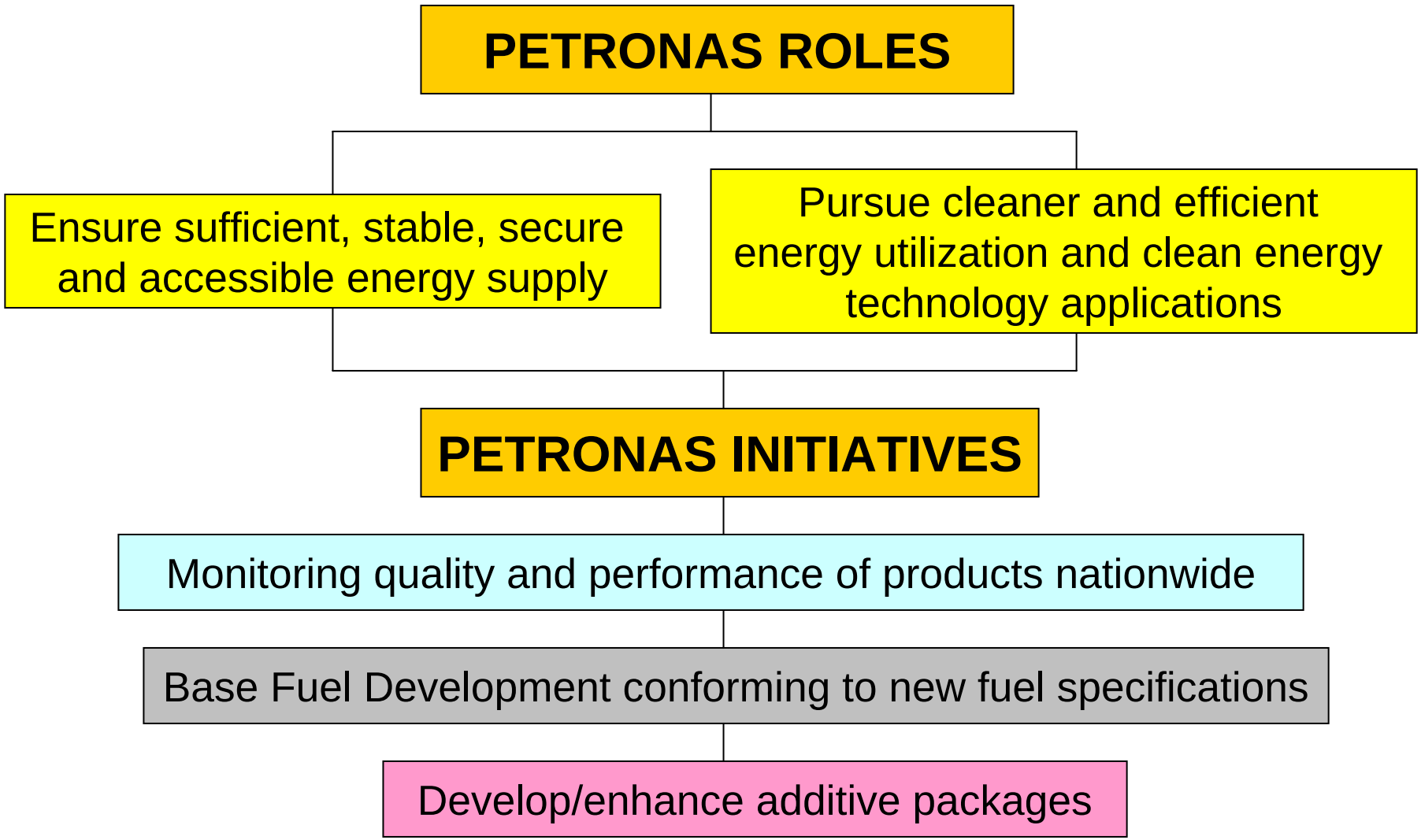
Policy's Strategy:

- Producing bio-diesel fuel blend of 5% processed palm oil with 95% petroleum diesel
- Encourage the utilisation of bio-fuel among the public
- Establishing an industry standard for bio-fuel quality
- Setting up a palm oil bio-diesel plants

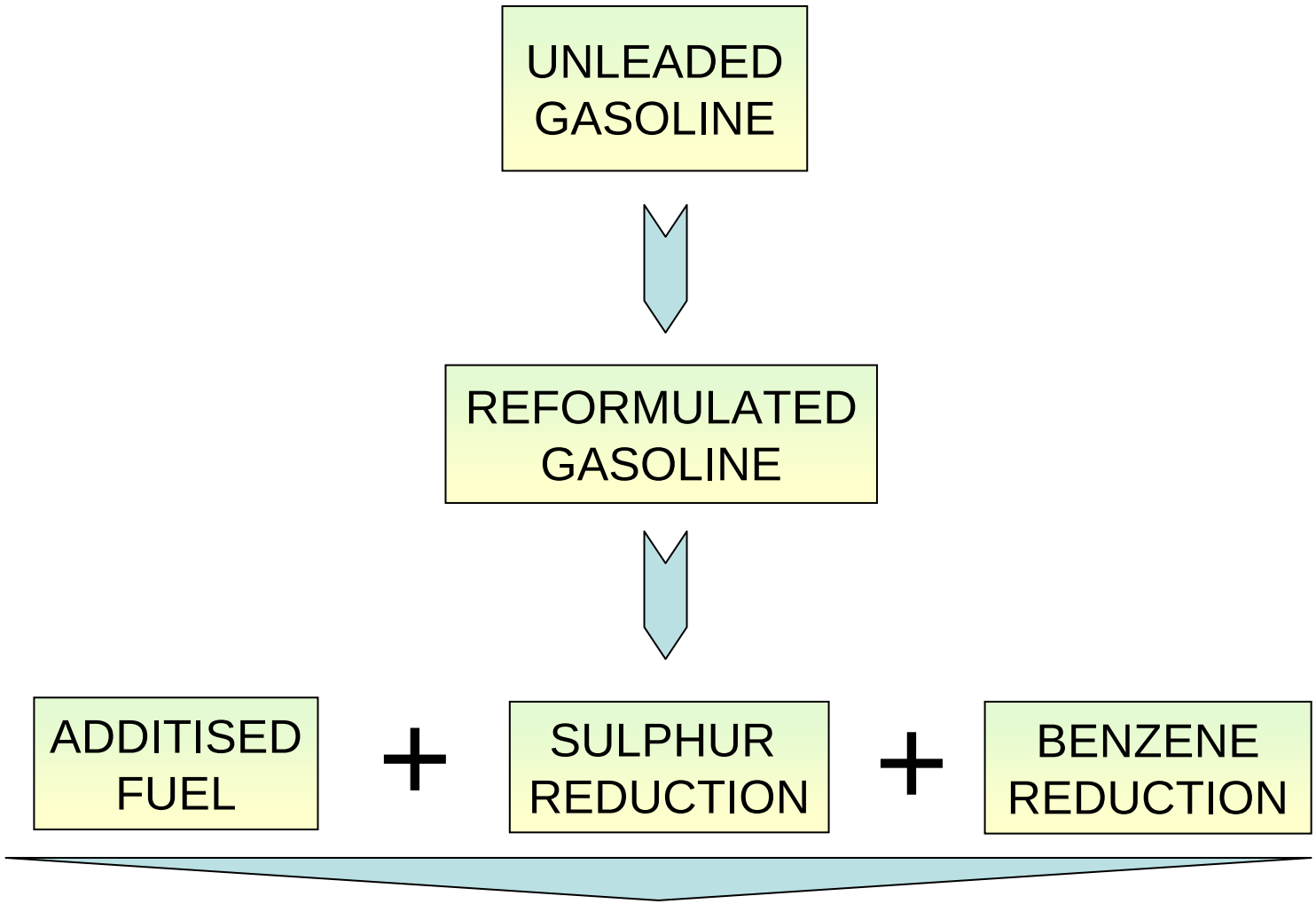
Initial introduction to government fleets by 2006.

Tentative schedule for commercial introduction by 2007 – started with Klang Valley.

PETRONAS Roles & Initiatives

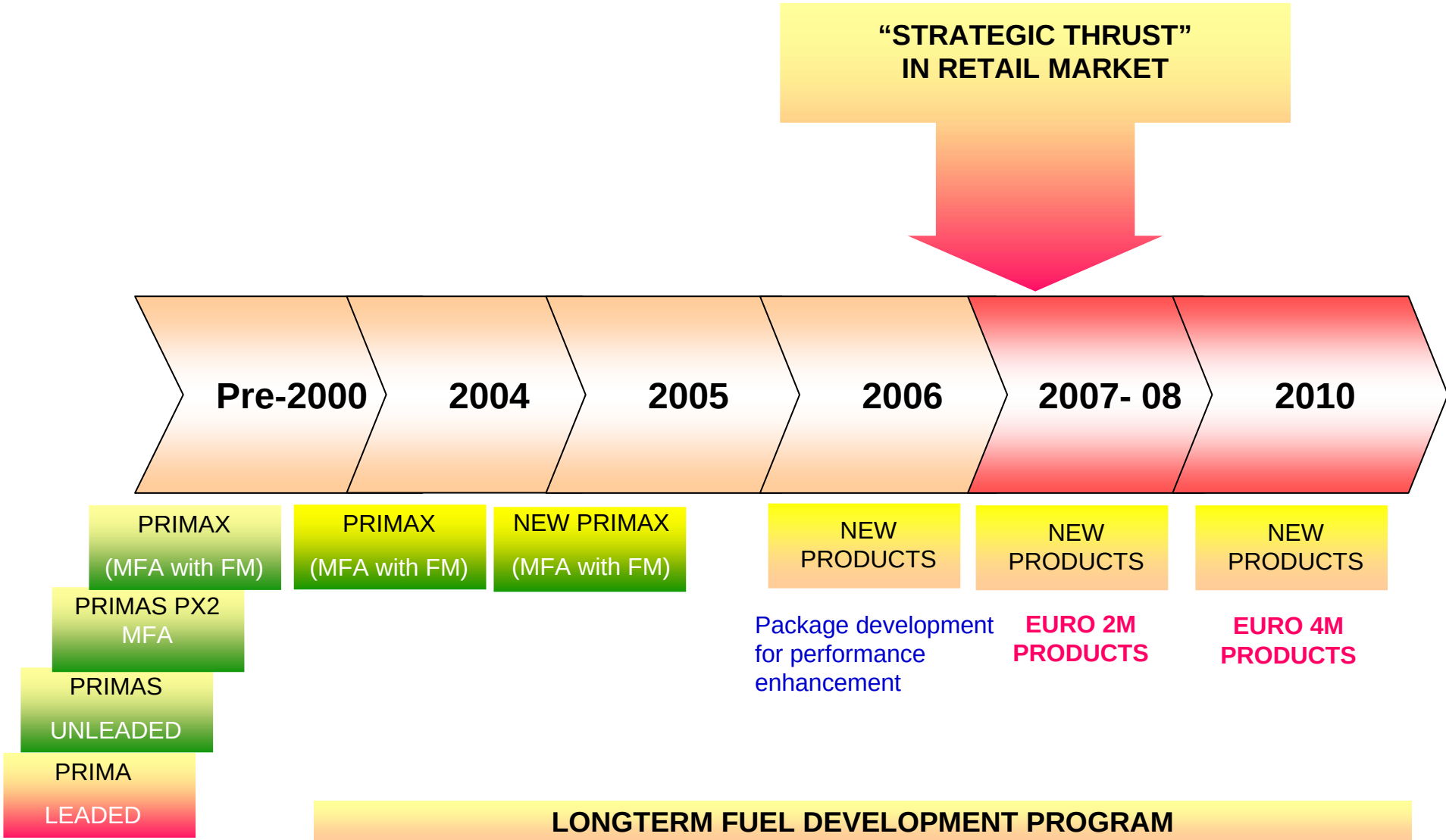


PETRONAS Clean Fuels

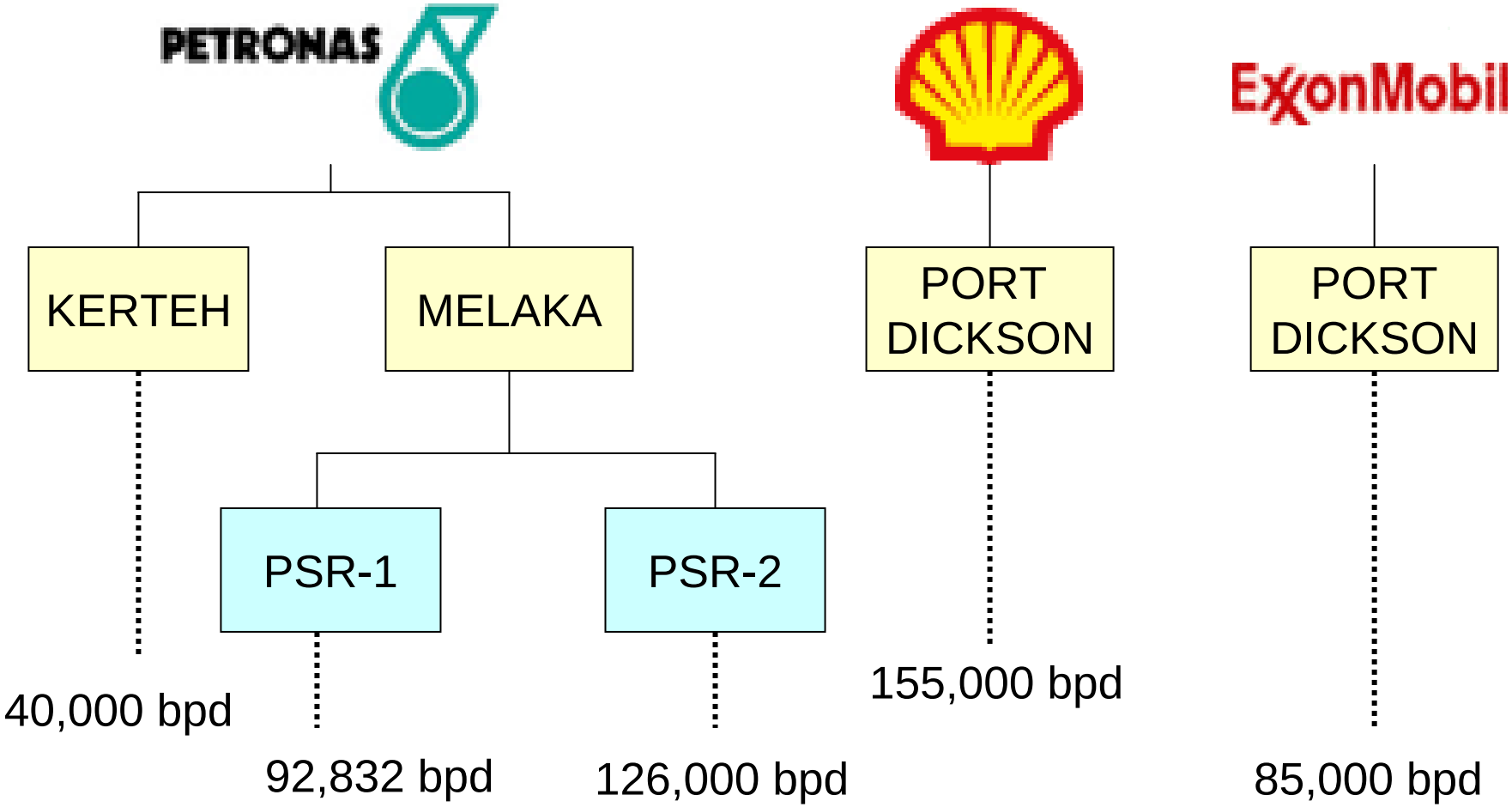


GENERATION OF PETRONAS CLEAN FUELS

PETRONAS Fuel Products



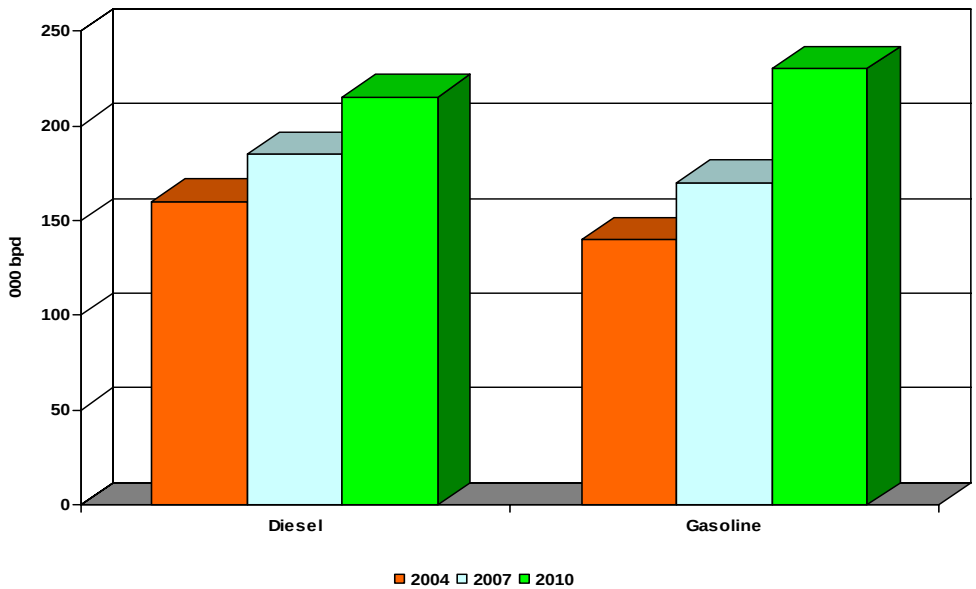
Refineries in Malaysia



* Source from 2004 Worldwide Refining Survey, Oil and Gas Journal

Fuel Supply – Present Situation

- Total crude and condensate refining capacity of 580 kbpd from PETRONAS, Shell, ConocoPhilips and ExxonMobil, processing a mix of local and imported crudes



Projected demand growth at 2.8 – 4.4%

* Source from Regional Influence of Local Refineries – Impact in the Global Market and Meeting Product Quality, 2004 World Fuel Conference

Fuel Supply – Issues & Plan

- Gasoline import requirement shall widen from 64 kbpd in 2004 to 100 kbpd by 2010

- Malaysia will continue to import about 30 kbpd finished diesel to cover the diesel shortfall

- Alternatively, all the refineries in Malaysia has to put additional new facilities to generate more products, i.e. gasoline and diesel, at the same time meeting the incoming stringent specs.

* Source from Regional Influence of Local Refineries – Impact in the Global Market and Meeting Product Quality, 2004 World Fuel Conference

Conclusion

- Total emission on the rise with the increase energy demand e.g. increase in the volume of vehicle sales and utilisation of fuels
- The Malaysian Government continuously introducing new initiatives in order to help keep its environment clean.
- All the refineries in Malaysia needs to install new hardware to be able to generate more products and meet new specifications.
- PETRONAS will always enhance and improve its fuel quality for a better public health.

Thank you

AIR POLLUTION CONTROL PROGRAM