

*Country Report*  
**Implications of Oil Price Increase  
on the Malaysian Food System<sup>1</sup>**

by

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## **Introduction**

Like any other developing countries, the recent hike in the fuel prices caused a number of macro-economic adjustments all across the sectors in the Malaysian economy. As shown in Figure 1, the benchmark Brent crude oil prices increased from US\$ 31.29 per barrel in the beginning of 2003 to US\$ 53.08 in March 2005, and in the beginning of 2006 it went up to US\$ 63.57 per barrel (indicating an increase of more than 100%). The increase was largely attributed to the imbalanced of supply and demand. The market is relatively tight due to the small margin between production (83.0 million barrels per day (bpd)) and demand (82.5 million bpd). On the demand sector, the rapid economic growth in China and India caused demand for fuel to soar much more than the supply could match. On the supply side, the political uncertainty in the OPEC (Organization of Petroleum Exporting Countries) resulted in unstable production. Besides, the adverse weather conditions such as Hurricane Emily in Mexico and Katrina in USA are also affecting oil production. The uncertain market fundamentals are further aggravated by price speculative activities.

High oil prices have the potential of retarding the growth of an economy in particular if it is a net oil-importing country. Increasing oil prices squeeze income and demand, present an inflationary threat and cause serious fiscal consequences. International Energy Agency (IEA) predicts that an increase of USD10 per barrel will lead to 0.4% decrease in GDP (IEA, 2006). Being a net oil-exporting country, the consequences of higher oil prices to Malaysia may differ somewhat though not necessarily the mirror image of those felt by oil importers. The fuel price increase is a boon to the country's oil export but it is being undermined by the heavy cost of fuel subsidies to producers and consumers alike which are eroding the government's coffers. The supported prices of fuel products such as petrol, diesel and cooking gas in Malaysia are among the lowest in the ASEAN region. Hence, the fiscal cost of insulating the economy from the price hike is reasonably high.

The level of energy intensity in Malaysia is the third highest in the ASEAN region after Vietnam and Indonesia (Hishamudin, 2005). Clearly, the price hike of fuel will affect the industries that depend on fuel as direct and indirect inputs to production. In the case of the Malaysian agriculture and food sectors, the fuel price increase

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pushes up prices of other energy-related inputs. Direct energy inputs into agricultural production include oil-based fuels, used for transport and cultivation, and electricity. Indirect energy inputs include fertiliser, chemicals and capital energy costs. However, the understanding of the dynamics of relationships between fuel prices and the agricultural input sectors has not been an easy exercise (FAO, 2006). This is partly due to the complexity of matrices that are affecting the relationship, the structural changes that have taken place and the complicated linkage between domestic and international economic variables where repercussions in one country are likely to spill over and affect others (ADB, 2006). Despite the difficulty, there is a need to examine the implications of fuel price increase on the agriculture and food sectors to seek alternative strategies to reduce dependency on this non-renewable resource.

This paper intends to examine the implications of fuel price hike on the Malaysian food sector and identify the prospect of an alternative source of energy for food production. The outline of the paper is as follow. The following paragraphs provide a brief discussion on the background of the petroleum industry. This is followed by a discussion on the impact of price hike on the food prices and marketing system. The prospect of biodiesel as an alternative is examined in the consequent paragraphs. The conclusion wraps up the discussion of the paper.

## **Brief Overview of the Malaysian Petroleum Industry**

### ***Petroleum Industry***

In term of world ranking, Malaysia ranked fourteenth and ninth in oil and gas reserve respectively (Mohd. Farid Mohd Amin, 2005). The reserve life of Malaysian oil and gas is estimated to be 19 and 33 years respectively. It is estimated that Malaysia contains proven oil reserves of 3.0 billion barrels down from a peak of 4.3 billion barrels in 1996. Despite this trend toward declining oil reserves, Malaysia's oil production has been rising since 2002 as a result of new offshore development. In 2005, the country' total oil production averaged 871,000 bbl/d, from an average of 622 000 bbl/d in 1990. Natural gas liquids production contributed 84,000 bbl/d of that amount in 2005. Malaysia contains 75 trillion cubic feet (tcf) of proven natural gas reserves. Natural gas production has been rising steadily in recent years, reaching 1.9 tcf in 2003.

The share of the oil and gas sector from the country's GDP has declined from 37% in 1980 to 7.2% in 2005. Malaysia exports her crude oil and condensates and liquefied natural gas (LNG) and natural gas. In 1980, these accounted for 24.5% of the country's export but by 2005, they have declined to 7.2%. Export destinations include the far eastern countries, Australia and USA. While the oil consumption ratio has dropped, investment in exploration has on the other hand, maintained oil production growth at 2.4% for the past 10 years. This has sustained the amount of light sweet Tapis crude which commands price premium over heavy sour oil in the export market.

In 2005, LNG accounted for 55.3% of the quantity of petroleum export (as compared to 48% in 2000). The major market destinations for Malaysian petroleum export are far eastern countries, Australia and USA. Malaysia accounted for approximately 16% of total world LNG exports in 2004. Malaysia ia a net oil-exporting country as shown in Table 1.

Malaysia consumes about 69% of domestic oil production in 2004 (Figure 2). Malaysia's oil demand has been growing at a much slower rate than its economic output, due to largely to the conversion of oil-fired power plants to natural gas. The intensity of oil use in energy consumption index<sup>4</sup> for Malaysia which is estimated at 0.445 is comparable to Japan (0.505) but higher than USA (0.395). In terms of the energy intensity for the entire economy<sup>5</sup>, the figure for Malaysia is still on the high side i.e., at 0.254 kg per \$ of GDP (energy) and 0.124 kg per \$ of GDP (oil) (ADB, 2005) compared to 0.156 and 0.077 respectively in Japan. In other words, there are rooms for further increase in energy efficiency. The extent of energy efficiency is largely attributed to the energy tax and subsidy policies. In countries where fuel prices are closer to those implied by the world market, such as US, Western Europe and Japan, the energy efficiency is high. In the case of Malaysia, the impact of higher prices has been delayed somewhat because of significant government intervention in the energy markets. The supported prices of petrol lead to market distortion and encourage wasteful consumption of oil products.

The last two decades saw a change in the composition of primary supply of commercial energy (Table 2). There is a significant shift in terms of energy mix as the country shifted from oil to natural gas. In the 1980, crude oil accounted for about 63.1% of the supply. However its share has reduced to 44.6% in 2004. The share of natural gas has increased significantly from 7.4% to 43% in the said period.

In terms of energy use by sector, industrial and transportation sectors are the largest users accounting for 79% of total consumption. Agriculture sector only accounted for about 3% in 2002 (Table 3). The composition of commercial energy use by fuel type has changed with a significant increase in natural gas consumption. As shown in Table 4, the share of natural gas has increased from 0.5% in 1980 to 17% in 2003 while petroleum products reduced from 86.9% to 61.2% during the stated period. Electricity has also registered an increase in share from 11.7% to 18.3%. The reduction on the dependency on petroleum products was attributed to the fuel-diversification policy of the government.<sup>6</sup>

Final demand for petroleum products is shown in Table 5 and Figure 3. It is clear from the diagram that the demand for motor petrol has increased from 23.9% in 1980 to 40.3% in 2003 indicating the increase in transportation or vehicle sector. Diesel oil demand reduced from 42.9% to 34.8% while demand for LPG increased from 2.2% to 6.8%.

### ***Petroleum Price Subsidy***

Being a net oil exporting economy in the Asia/Pacific region (besides Brunei), the increase in oil prices is expected to improve the country's export earnings and hence reduce the country's budget deficit. However this is not the case as the country is heavily involved in massive subsidies to all the sectors in the economy. The higher the price of oil the higher is the financial burden to sustain the support prices to the producers and consumers.

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<sup>4</sup> The intensity of oil use in energy consumption index measures the share of oil in an economy's primary energy consumption.

<sup>5</sup> Energy consumption divided by GDP.

<sup>6</sup> The Malaysian government adopted National Depletion Policy in 1980, Four-Fuel Diversification Policy in 1981 and Five-Fuel Diversification in 1999.

The Malaysian government ensures low price of petrol, diesel and cooking gas in Malaysia by exempting sales tax on diesel and petrol and providing subsidies for all these products. From 1994 to 1999, the government has supported the prices premium, regular and LPG at RM1.10, RMRM1.06 and RM1.18 per litre respectively (Figure 4). However since 2000, the supported prices have been revised nine times (Table 6). As at May 2006, the retail prices of petroleum products are supported at RM1.92 per litre (or USDO.50/litre) indicating an increase of 74.5 % between 2000 and 2005 (Table 7).

The supported prices are the second lowest in the ASEAN region, 21% below the market price (for premium petrol) diesel (35.5%) and LPG (28.6%). The premium petrol is 32.5% lower than the retail price in the USA.<sup>7</sup> The total petroleum subsidies and revenue lost to the government in 2005 was estimated at RM14.5 bn which is about 3.1% of the GDP (Table 8).

The beneficiaries of subsidised fuel cut across all sectors. For instance, subsidised diesel benefit land transportation, fisheries sector, government and river passenger boats in Sabah and Sarawak. As for subsidised gas, it benefits the power sector and certain categories of manufacturing sector. The consumers (residential sector) on the other hand are protected from price increase of LPG. Based on the 2004 total fuel subsidy breakdown, diesel subsidy accounts for 70% of the total fuel subsidy, followed by LPG (16.4%) and petrol (13.3%). It appears that the subsidies are skewed towards producer-subsidy more than consumer-subsidy.

### **Implications on the Malaysian Food System**

Malaysia is a net-food importer despite being endowed with rich resources and biodiversity. The agriculture focus of the country has been towards the development of cash or industrial crops such as palm oil, rubber, cocoa. As shown in Table 9, about 84% of the land in the country are allotted to the said industrial crops. The production of food commodities and the level of self sufficiency commodities in Malaysia are presented in Tables 9 and 10. Malaysia depends on imports for her supply of food. With the exception of fruits, poultry (and eggs) and pork meat, there are inadequate production of rice, vegetables, mutton and milk to fulfil domestic demand. This is despite the call for increase in food production under the National Agricultural Policy III (1998-2010).

The share of agriculture exports (agricultural and agro-based products) from the country's total export accounted for 14% in 2005 (Table 12). The share of agricultural products from the total exports was 7% in the same year. The major components of agricultural exports are industrial commodities in particular palm oil and rubber products. Food commodities such as fish, fruits and vegetables only accounted about 15.8% of the country's agricultural exports.

The net food trade balance is depicted in Table 13. Between 2000 and 2005 the country's food deficit increased from RM5.2 bn to RM7.4 bn. The major imported food items are animal feed, cereals, diary products, vegetables, meat and meat preparations.

As stated earlier the share of agriculture sector in the utilisation of energy is relatively small (Table 3). In the year 2000, the agriculture accounted for 1.37% of the diesel consumption in the country. More than half of the diesel was used by the transport sector followed by the manufacturing sector (43.7%) (NEB, 2001). As for LPG, the

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<sup>7</sup> As at may 2006, the average retail price in USA is reported to be USD2.80/gallon.

residential and commercial users are the major users (accounting for 60.2% of the total utilisation).

The petrol price hike is inflationary in effect. Despite the supported price of petrol products, the general price level of has increased in the late 2004 onwards (Figure 5). In the year 2005, the CPI has increased 3.5 which is above the average increment of CPI during stable fuel prices. Food items which accounted for 31% of the CPI (Consumer Price Index), also registered an increasing trend. Among the major components of CPI, both food items and transportation and communication have increased more than 8% between 2003 and 2005. Though petrol and petroleum products have a weight of only 5.1% in the total CPI, the three hikes in retail process of petroleum products, together with pass-through increases in transportation cost (bus, taxi fares, and truck fees) have been the caused of the acceleration for the transportation and communication component in particular and the general price level in general. The CPI for fuel and power has merely increased by 3.42% as the fuel prices have been heavily subsidised.

The composition of food items in the CPI are depicted in Table 14. Some of the food items have shown an increase of more than 10% which include fish, meat, and eggs between 2000 – 2005. Coffee, tea and beverages increased by 5%, fruits and vegetables 7% and food away from home 9% (Figure 6).

These data suggest that the oil price hike has brought in inflationary pressures on the economy although the increase is within the “reasonable” limit allowed by the government.

The impact of an increase of petrol price on the food sector is transmitted through the cost of inputs. Direct energy inputs into agricultural production include oil-based fuels, used for transport and cultivation, and electricity. Indirect energy inputs include fertiliser, chemicals and capital energy costs. As shown in Table 15, a simulation using an input-output analysis on the impact of increase in oil prices by 30%, 60% and 90% on the 17 sub-sectors in agriculture indicates that the fisheries and rubber sectors appear to be directly affected by the increase. The plausible explanation for this is that the fisheries sector utilises petrol products at every level of the supply chain particularly diesel for boats, fish processing and transportation from landing centres to terminal markets.

Fertilizer is an important component in the cost of production of food in Malaysia. As depicted in Tables 16 and 17, its share of the total cost is relatively high. For instance, in the case of 13 selected fruits (see Fatimah et al., 2005), the average share of fertilizer cost from the total cost is about 25.9%. Fertilizer accounted for 63.6% of the input costs while insecticide accounted for 17%. The labour cost for fertilising function accounted for 21% of the labor cost. Clearly an increase in energy price will increase the input cost and hence total cost accordingly.

The marketing cost of food is expected to increase as transportation is a component as food commodities are transferred from the source to the retail market. The marketing channel for Malaysian food is undergoing a structural change as a result of the retailing innovation that has taken place particularly direct involvement of hypermarkets in sourcing of local and imported fresh food. Contract marketing is becoming the popular mechanism for these hypermarket chains to ensure consistent supply of high quality of fresh food from the farm to the retail. This method however is not widespread as majority of farmers are not able to comply with the strict quality requirement of the retailers. It is reported that Giant hypermarket chains have to reduce their number of potential suppliers from 300 to only 30 due to the failure of the

producers to meet their quality demands. Hence, majority of the food commodities are marketed through the traditional channel.

The marketing system of fruits in Malaysia is generalised in Figure 7. Most of the food commodities in Malaysia such as vegetables have an almost similar distribution system. The “modern” system involves a shorter flow of produce from the farm to processor or packer or wholesaler and to the retailers or hypermarkets. The flow of commodities is short, efficient and some additional value is added along the chain such as branding, grading, packaging and processing. The increase in oil price may affect the processing cost and retailing cost at the consumer end. However, there are not enough data available to verify this statement.

The traditional system involves a number of market intermediaries at various levels such as assembling points, secondary wholesale market and terminal market centres (Figure 7). Generally the traditional marketing system incurs multi-stage transportation cost before the produce reaches the consumers. In addition the post-harvest handling is not efficient which results in high post harvest losses. The high marketing cost is normally borne by the consumers.

It is highly probable that with the increase in oil and diesel prices, the transportation cost will increase accordingly. However, the impact is too early to show some significant change. One of the food commodities that is showing an impact in term of increase in cost of production is fish products as proven by the largest increase in consumer price relative to other food products. This is expected as transportation is a major marketing cost component in fish distribution as the landing centres are normally located at the shores which are a long distance from the consumer markets.

### **Alternative bio-energy**

Malaysia's energy sources primarily comprise oil, natural gas, hydro power and coal, although renewable energy (RE) sources such as solar power and biomass are currently being exploited. The country has abundant biomass wastes resources coming mainly from its palm oil, wood and agro-industries, and has a big potential to be utilized as biofuel. Initiatives have been taken towards intensifying the development of RE, particularly biomass, as the ‘fifth fuel’ resource under the country's Fuel Diversification Policy, announced in 2000. The policy set a target of 5% of the nation's electricity production (about 600 MW of installed capacity) to come from renewable energy source by 2005. The policy has been reinforced by fiscal incentives such as investment tax allowances and the Small Renewable Energy Program (SREP), which encourages the connection of small renewable power generation plants to the national grid.

Biofuel/biodiesel is renewable sources of energy that are receiving attention worldwide, not only from the environment perspective, but also from the economic point of view. In seeking cheaper alternative to fossil fuel, biodiesel is the most viable alternative so far, and with strong support from the government and availability of technology to extract diesel from vegetables. As of April 2006, there are 11 biodiesel plants to be built in Malaysia (Table 19) Licenses have been given to these plants to produce biodiesel for export mostly to European Union, which has mandated that all fuels should contain 5.75% bio-fuels by 2010.

To spur the development of the biofuel industry in Malaysia, the National Biofuel Policy was announced in August 2005. The policy entails a four-prong strategy which encompasses the production of a biofuel blend of 5% processed palm oil and 95% diesel (or B5), encouraging the use of B5 among the public, establishing an industry

standard for palm oil biodiesel quality, and the setting up of biodiesel plants in Malaysia for exports. Thus far three companies have palm oil diesel plant, each with an annual capacity of 60,000 tonnes.

## Conclusion

Being a net oil exporter of premium crude oil, the net effect of the oil price hike on the Malaysian economy is still positive, although much lower than it should be without subsidies. The benefits of oil price increase are being offset by the large fiscal burden to subsidise the prices about a third lower from the free market. There is a possibility that the net benefit to the economy is much lower if the cost of inefficiency of energy use and the hazards to environment are taken into account. Subsidies underwrite fuel and energy inefficiency, retard the development and diffusion of cleaner technologies, and contribute to harming the environment. The artificially low petroleum product prices reduce the incentive to conserve oil and explore the use of oil substitutes. The rent created by subsidies also encourages fuel smuggling and other illegal activities that occur across Malaysian borders. Subsidies also represent an opportunity cost in terms of the alternative uses to which scarce fiscal resources could have been put.

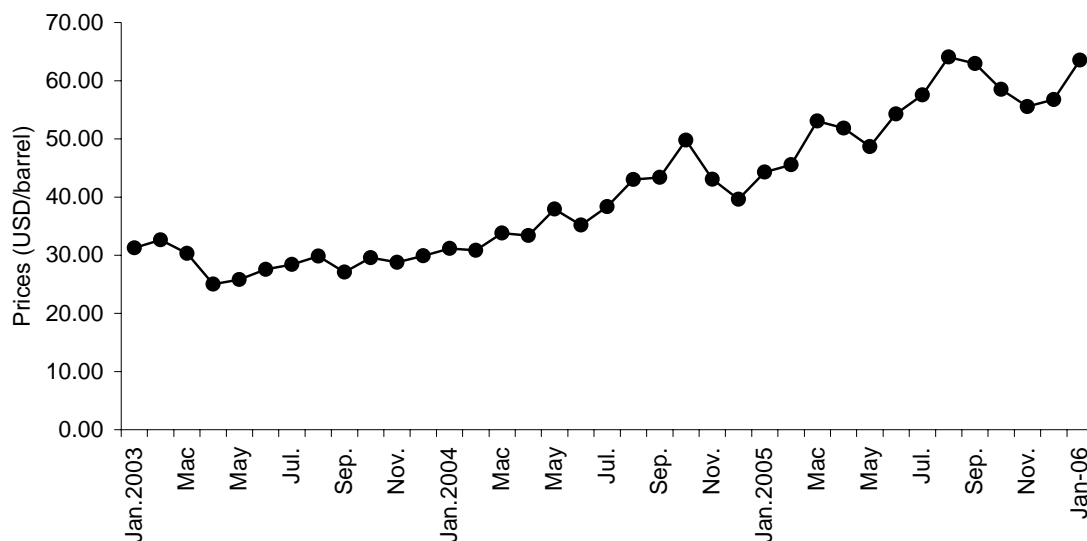
Although Malaysia supported the second lowest of fuel prices in the world, it failed to insulate the negative effects of inflation and higher cost of production of food commodities. Since oil price hike is a global phenomenon, import prices of food are expected to rise accordingly. Since Malaysia depends on food import for selected items, the increase in import prices would mean an outflow of foreign reserves. Likewise, cost of production of food commodities at home will also increase directly through transportation and indirectly through fertilizer and chemicals. The oil price increase definitely pushes up cost of production as reflected in the increase in CPI. In the short term, the current price increases may not represent a major increase in the costs of production. However, the intermediate and long term costs increases could be considerably higher if the oil prices continue to accelerate.

Under the new Ninth Malaysia Plan (2006-2010), food sector has been given a new lease as a major source of foreign exchange to the country. Malaysia aims to achieve a surplus in food trade by 2010. With this policy being set, it is clear that continuous instability and acceleration of oil price could hinder the growth of the food sector specifically and the economy at large. With higher input and marketing costs, the already backward food industry may not be able to progress as expected. Hence the dependency on the oil has to be minimised both through efficient energy utilisation and biofuel or renewable energy alternative. As mentioned earlier the major instrument that leads to efficient energy is a closer "free market" pricing which is an unlikely options to Malaysia in the short term at least. However in the long term, this policy has to be adopted to better cope with the vagaries of oil markets. On the other hand, the renewable energy source alternative of converting palm oil to biodiesel has to deal with the "food OR fuel" dilemma as the land for food is getting scarce.

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Source: International Financial Statistics online databases at <http://www.imfstatistics.org/imf/logon.aspx> , (accessed on 16th, April, 2006)

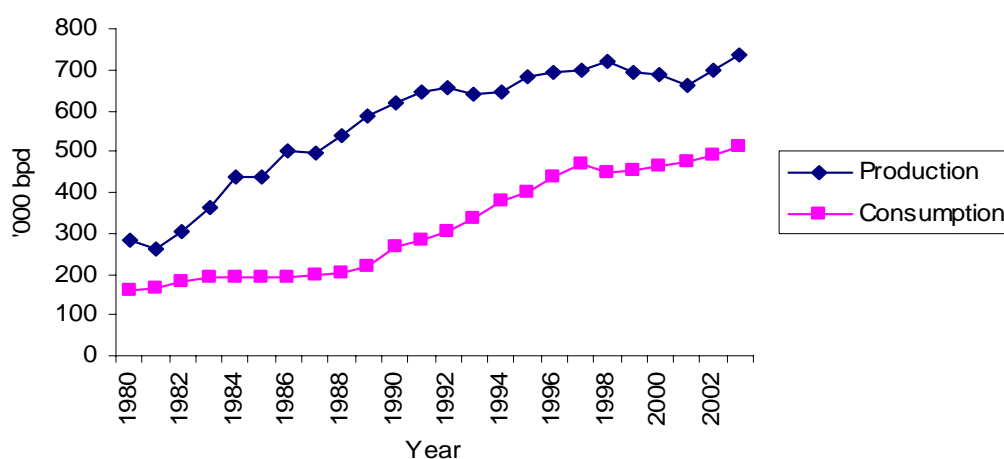
Figure 1: Petroleum Prices, Jan 2003 – Jan. 2006 (UK Brent USD/ Barrel)

Table 1: NEB: Net Export of Crude Oil, LNG, Natural Gas and Electricity (ktoe)

Item	1980	1985	1990	1995	2000	2001	2002	2003
Crude Oil	7,585	15,036	21,902	18,518	10,036	9,128	11,017	10,826
LNG	0	5,658	8,686	10,790	16,633	16,636	17,803	18,965
Natural Gas	0	0	0	1,474	1,198	1,178	1,098	-99
Electricity	-7	-5	5	2	negl	negl	negl	17
Total	7,578	20,689	30,593	30,784	27,867	26,942	29,916	29,709
Petroleum products	-2,495	-2,113	-2,618	-150	1,914	2,019	936	1,856
Coal and Coke	-23	-362	-1,396	-1,538	-1,924	-2,631	-3,405	-5,232

Source: Bank Negara Malaysia, monthly Statistical Bulletin, various issues

Figure 1: Crude Oil Production and Petroleum Consumption, 1983-2003



Source: International Energy Agency, 2003



Figure 3: Final Demand for Petroleum Products, 1980 - 2003

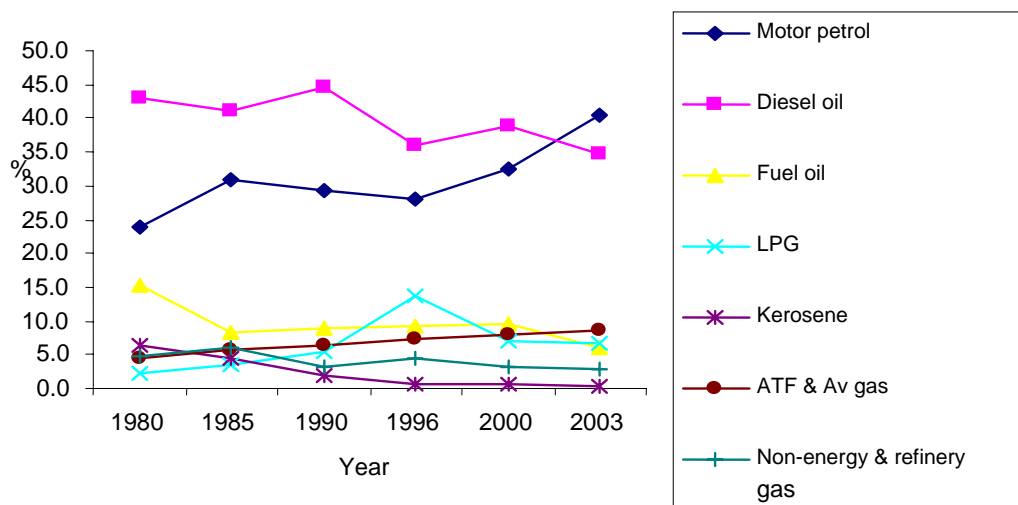
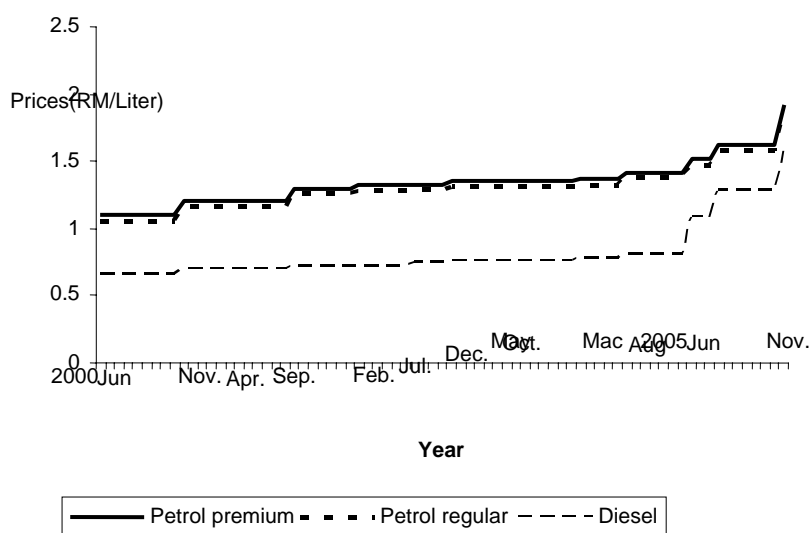


Figure 4: Prices of Petroleum Products in Malaysia, Jan. 2000- March 06



Source: Ministry of Domestic Trade and Consumer Affairs

Table 6: Increments in Retail Prices of Petroleum Products in Malaysia, 2000-2006 (RM/ litre)

Date	Petrol premium	Petrol regular	Diesel	Liquefied petroleum gas
1 <sup>st</sup> October 2000,	0,1	0,1	0,05	0,1
20 <sup>th</sup> October 2001	0,1	0,1	0,01	0
1 <sup>st</sup> May 2002	0,02	0,02	0,02	0,01
1 <sup>st</sup> November 2002	0,01	0,01	0,01	0,02
1 <sup>st</sup> March 2003	0,02	0,02	0,02	0,02
1 <sup>st</sup> May 2004,	0,02	0,02	0,02	0,02
1 <sup>st</sup> October 2004	0,05	0,05	0,05	0,05
1 <sup>st</sup> March 2005	0	0	0,05	0
5 <sup>th</sup> May 2005	0,1	0,1	0,2	0
31 <sup>st</sup> July 2005	0,1	0,1	0,2	0,05
28 <sup>th</sup> February 2006	0,3	0,3	0,299	0,3

Source: Malaysia, Ministry of Domestic Trade and Consumer Affairs

Table 7: Comparison of Petrol Prices in ASEAN Region, 2005  
(RM per litre)

Country	Petrol	Diesel	LPG
Malaysia	1.92	1.58	1.75
Thailand	2.37	2.08	1.65
Singapore	3.91	2.61	-
Phillipines	2.21	1.95	1.25
Indonesia	1.68	0.96	
Brunei	1.22	0.71	1.4

Source: Malaysia (2005).National Economic Action Council

Table 8: Total Petroleum Subsidies and Revenue Lost, 2001-2005  
(RMbn)

Item	2001	2002	2003	2004	2005
Subsidy	2.4	0.92	1.82	4.7	6.63
Revenue lost	5.08	3.31	4.76	7.15	7.85
Total	7.48	4.23	6.58	11.85	14.48

Source: Malaysia (2005).National Economic Action Council

Table 9: Land Utilisation in Malaysia, 2000 and 2005

Crop	2000	2005
Palm oil	3377	4049
Rubber	1431	1250
Paddy	478	452
Fruits	304	330
Coconuts	159	180
Cocoa	76	33
Vegetables	40	64
Tobacco	15	11
Pepper	13	13
Total	5893	6382
% industrial crop	82.9	83.5
% food crop	17.1	16.5

Source: Malaysia, Ninth Malaysia Plan

Table 10: Production of Food Commodities in Malaysia, 2000 and 2005 (MT)

Commodity	2000	2005
Paddy	2141	2400
Fisheries	1454	1575
Marine	1286	1325
Aquaculture	168	250
Livestock		
Beef	17.5	28.5
Mutton	0.9	1.5
Pork	159.8	209
Poultry	714.3	980.1
Eggs	399	443
Milk <sup>1</sup>	29.5	41.1
Others		
Pepper	24	19.1
Pineapples	265.7	407.6
Tobacco	7.4	14
Flowers <sup>2</sup>	120.4	126.4
Fruits	993	1586.9
Vegetables	404	771.3
Coconut	475.7	602

Note: 1 - mn litre, 2 - mn stalks

Source: Malaysia (2006), Ninth Malaysia Plan

Table 11: Self Sufficiency Level of Food in Malaysia, 2000 and 2005

Commodity	2000	2005
Rice	70	72
Fruits	94	117
Vegetables	95	74
Fisheries products	86	91
Beef	15	23
Mutton	6	8
Poultry	113	121
Eggs	116	113
Pork meat	100	107
Milk	3	5

Source: Malaysia (2006): Ninth Malaysia Plan (2006-2010).

Table 12: Performance of the Agricultural and Food Exports, 2000 and 2005 (%)

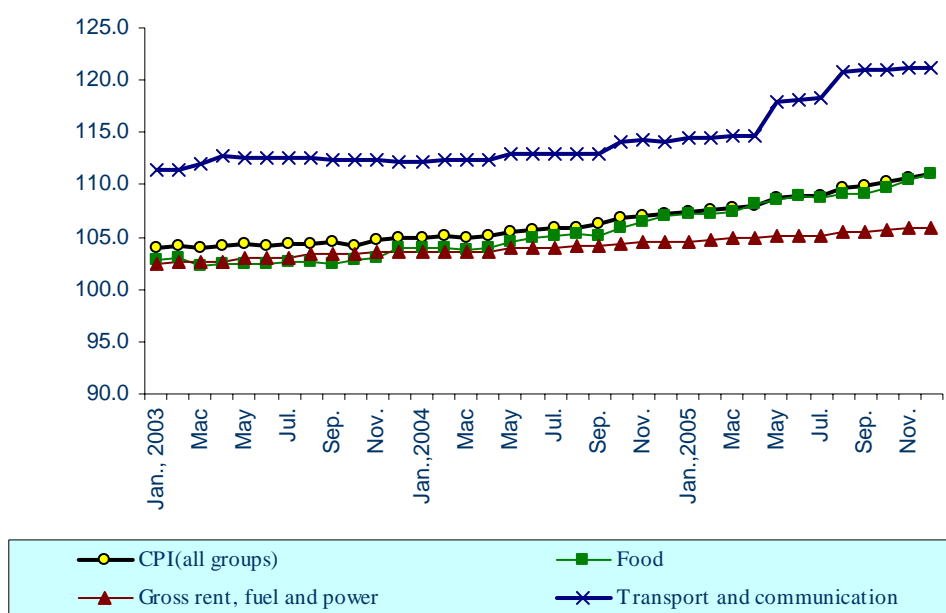
Item	2000	2005
Share of total agriculture exports (agriculture and agro-based products) from total exports (%)	12.7	14.0
Share of agriculture from total exports (%)	6.1	7.0
Agriculture products from total exports of agriculture and agro-based products	48.11	49.99
Agro-based products from total exports of agriculture and agro-based exports	51.89	50.01
Industrial commodities from agriculture export	80.50	84.20
Food commodities from agriculture export	19.50	15.80

Source: Malaysia (2006): Ninth Malaysia Plan (2006-2010).

**Table 13: Malaysia: Net Trade Balance of Food (RM '000)**

Item	2000	2005
Total	-5,274.60	-7,448.20
Live animals	202.80	247.70
Meat and meat preparations	-706.80	-968.70
Diary	-766.30	-1,331.90
Vegetables	-745.20	-1,128.60
Fruits	-49.20	-223.00
Sugar	-731.50	-926.80
Cereals	-1,228.30	-1,350.50
Fish, crustaceans, mollusc	177.50	414.00
Animal feed	-1,553.10	-2,291.10
Others	125.50	110.70

Source: Malaysia (2006): Ninth Malaysia Plan (2006-2010).



Source: Malaysia (2006): Department of Statistics, Malaysia Consumer Price Index, Various Issues

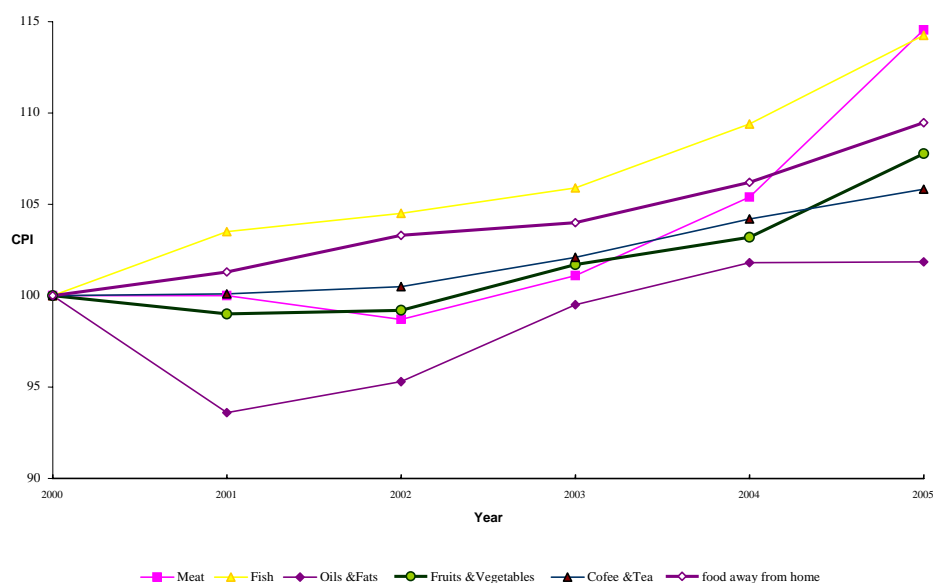
Figure 5: Consumer Price Indices, Jan 2003 – Dec 05

Table 14: Food Component of Malaysian CPI, 2005

Item	% of CPI	% of food
Rice bread & other cereals	4.6	15
Meat	2.9	9
Fish	4.5	14
Milk & eggs	1.8	6
Oils & fats	0.6	2
Fruits & Vegetables	3.7	12
Sugar, Coffee & Tea	2.1	7
Other food	0.8	3
Food away from home	10.4	32
Total	31.4	100

Source: Malaysia (2006): Department of Statistics, Malaysia Consumer Price Index, 2005

Figure 6: Price Indices for Different Food Items(Base Year 2000=100)



Source: Department of statistics Malaysia, Malaysia Consumer Price Index, Various Issues

Table 16: Input – Output Analysis of the Malaysian Agriculture Sector, 2001

Sectors	Simulations of domestic petroleum price changes						
	Initial effect	Simulation 1		Simulation 2		Simulation 3	
		Cost	Changes (%)	Cost	Changes (%)	Cost	Changes (%)
Others Agriculture	0.0522	0.05259	0.80	0.05301	1.59	0.05342	2.39
Rubber Plantation	0.1155	0.11631	0.68	0.11709	1.36	0.11788	2.04
Oil Palm	0.1019	0.10567	3.67	0.10942	7.34	0.11316	11.01
Livestock	0.1192	0.11964	0.39	0.12010	0.78	0.12057	1.17
Forestry	0.0237	0.02518	6.36	0.02669	12.73	0.02820	19.09
Fishing	0.0829	0.09244	11.45	0.10194	22.90	0.11143	34.34
Dairy Product	0.2217	0.22221	0.25	0.22277	0.50	0.22332	0.75
Vegetables and Fruit	0.5141	0.51514	0.21	0.51621	0.41	0.51727	0.62
Oil & Fats	0.0224	0.02279	1.56	0.02314	3.12	0.02349	4.68
Grain Mill	0.3942	0.39568	0.38	0.39720	0.77	0.39871	1.15
Baker Confectionery	0.2672	0.26808	0.32	0.26893	0.63	0.26977	0.95
Other Foods	0.1552	0.15641	0.76	0.15758	1.51	0.15876	2.27
Animal feeds	0.3641	0.36474	0.17	0.36535	0.34	0.36597	0.51
Beverages	0.2827	0.28329	0.22	0.28391	0.44	0.28454	0.66
Tobacco	0.4429	0.44359	0.15	0.44426	0.30	0.44493	0.45
Rubber Process	0.3389	0.33966	0.24	0.34046	0.47	0.34126	0.71
Rubber Product	0.1078	0.10914	1.22	0.11046	2.45	0.11178	3.67
<i>Average</i>	<i>0.2122</i>	<i>0.21368</i>	<i>1.70</i>	<i>0.21521</i>	<i>3.39</i>	<i>0.21673</i>	<i>5.09</i>

Note: Simulations on 30%, 60% and 90% increase on fuel prices were made.

Source: IKDPM (2006).

Table 17. Quantities of input use (per ha) on selected vegetables and rice in Malaysia

Crop	Labor (person per day)	Seed (kg)	Fertilizer (t)	Organic manure	Pesticide (RM)	Others (RM) <sup>b</sup>
Cabbage	184	0.2	2.8	5	935	0
Chinese mustard	222	1.5	1	3	300	0
Cucumber	229	3.2	1.6	5	292	3683
Lady's finger	277	6	2.7 <sup>a</sup>	2.5	317	0
Long bean	276	8	1.4	3	375	5538
Kangkong	155	26	0.5	3	174	120
Rice	37	100	0.5		207	515

a: including 2.5 of lime

b: Others include farm machinery, water, etc

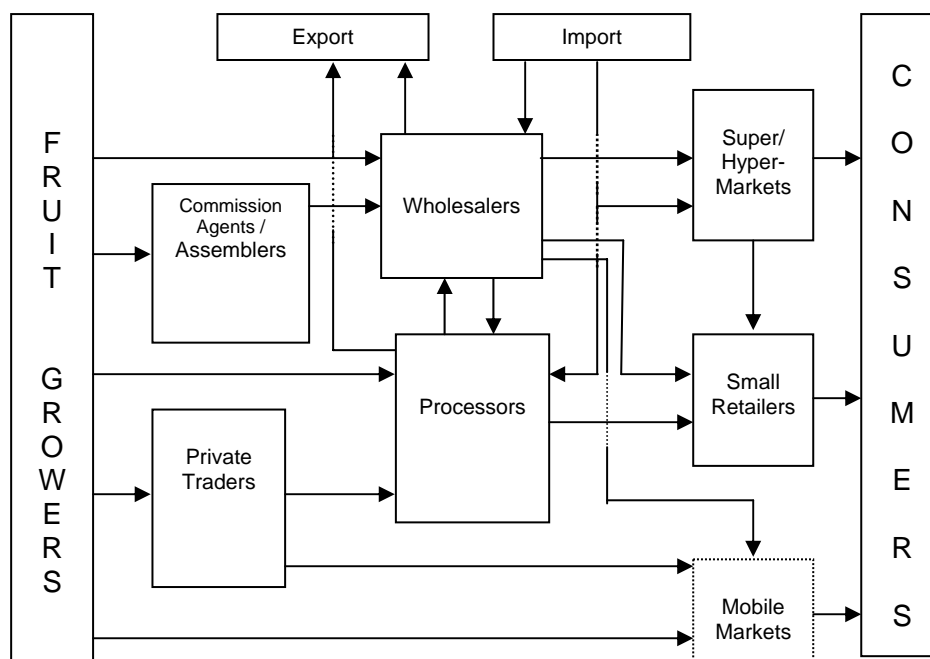
Source MARDI (1994)



Table 18: Cost Structure of Fruits Production (%)

	Star Fruit	Ram- butan	Mango	Pomelo	Guava	Durian	Durian Belanda	Jackfruit (Nangka)	Papaya	Ciku	Jackfruit (Cem- pedak)	Mangos- teen	Mandarin Orange	Average
<b>Fixed cost</b>														
Land preparation	18.83	43.6	43.17	33.78	25.86	47.04	41.33	44.44	21.98	49.67	44.1	38.79	30.28	37.1
Lining and planting	15.11	13.36	14.21	23.99	17.13	13.44	18.6	13	76.24	6.62	12.9	5.17	15.06	18.8
Seedling	66.06	43.05	42.62	42.23	57.01	39.52	40.08	42.56	1.78	43.71	43	56.03	54.66	44.0
Total	8.99	8.89	7.78	4.68	10.97	6.94	12.12	8.07	10.47	4.74	7.61	8.03	13.15	8.6
<b>Input cost</b>														
Fertilizer	61.32	68.79	58.48	85.48	73.29	64.09	44.7	70.22	72.13	60.18	71.03	66.8	29.81	63.6
Insecticide	23.88	15.14	30.94	7.67	11.79	28.22	24.36	14.8	16.22	14.7	13.78	9.22	14.83	17.4
Weedicide	10.86	16.07	10.58	4	14.92	7.69	3.55	14.98	11.64	11.23	15.19	16.67	0	10.6
Others	3.94	0	0	2.84	0	0	27.39	0	0	13.89	0	7.31	55.35	8.5
Total input cost	34.1	22.81	33.53	56.93	31.25	33.14	42.32	27.84	51.87	39.17	25.4	33.96	7.25	33.8
<b>Labour cost</b>														
Fertilizer	8.92	12.58	9.15	13.25	10.39	13.4	26.65	12.24	11.6	4.8	10.88	7	57.01	15.2
Insect & disease control	20.3	22.13	30.66	22.41	27.86	38.68	13.26	21.24	20.62	10.82	20.61	9.47	18.69	0.0
Weed control	18	34.76	27.16	31.33	30.29	26.07	18.2	31.47	24.16	11.33	26.06	17.13	6.28	23.2
Harvesting	52.79	30.28	32.78	9.57	31.04	21.57	22.45	34.8	42.5	60.26	42.23	65.06	18.02	35.6
Other Cost	0	0.25	0.26	23.44	0.42	0.29	19.44	0.24	1.11	12.79	0.22	1.34	0	4.6
Total labour cost	39.37	39.02	33.19	19.73	34.14	32.17	23.6	36.66	20.97	35.94	38.57	31.47	49.48	33.4
<b>Other Cost</b>														
Rental	43.09	59.15	58.81	37.4	52.93	59.34	46.8	57.73	30.06	45.87	52.12	60.28	63.06	51.3
Interest rate	5.64	10.77	5.65	16.31	10.04	8.7	16.52	11.49	6.42	12.45	17.46	9.74	10.28	10.9
Others	51.27	30.08	35.54	46.29	37.03	31.96	36.69	30.78	63.52	41.67	30.43	29.98	26.66	37.8
Total other cost	17.55	29.27	25.5	18.66	23.64	27.75	21.96	27.42	16.7	20.14	28.42	26.55	30.11	24.1
<b>TOTAL COST</b>	100	100	100	100	100	100	100	100	100	100	100	100	100	100.0

Source: Fatimah Mohamed Arshad et al., (2005).



Source: Fatimah Mohamed Arshad et al., (2005)

Figure 3: Marketing Channel of Fruits in Malaysia

Table 19: Malaysia: Biodiesel Plants, 2006

Country/Company	Capacity (tonnes/year)	Feedstock	Commencing Year
<b>Malaysia</b>			
Bio Energy International	300,000	Palm Oil	2008
Carotech	110,000	Palm Oil	2007
Carotino Sdn Bhd	60,000	Palm Oil	2007
Golden Hope	300,000	Palm Oil	2007
IOI Corporation	150,000	Palm Oil	2007
Kulim	200,000	Palm Oil	2007
Kumpulan FIMA	60,000	Palm Oil	2007
IJM Plantation	na	Palm Oil	2007
POIC	300,000	Palm Oil	2007
Mission Biofuels	na	Palm Oil	2007
Peter Cremer	120,000	Palm Oil	2007
<b>Singapore</b>			
Peter Cremer	120,000	Palm Oil	2007
Wilma Group	150,000	Palm Oil	na
<b>Indonesia</b>			
3 produce ethanol	150,000	Sugar Cane	na
8 produce biodiesel	400,000	Palm Oil	na

Source: Equity Focus, Mayban Securities, April 2006

# Implications of Oil Price Increase on the Malaysian Food System

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**Fatimah Mohamed Arshad**  
**Mad Nasir Shamsudin**  
**Universiti Putra Malaysia**

*Country paper presented at the Pacific Food System Outlook 2006-7  
Organised by Pacific Economic Cooperation Council, Singapore, May 17 – 19, 2006*



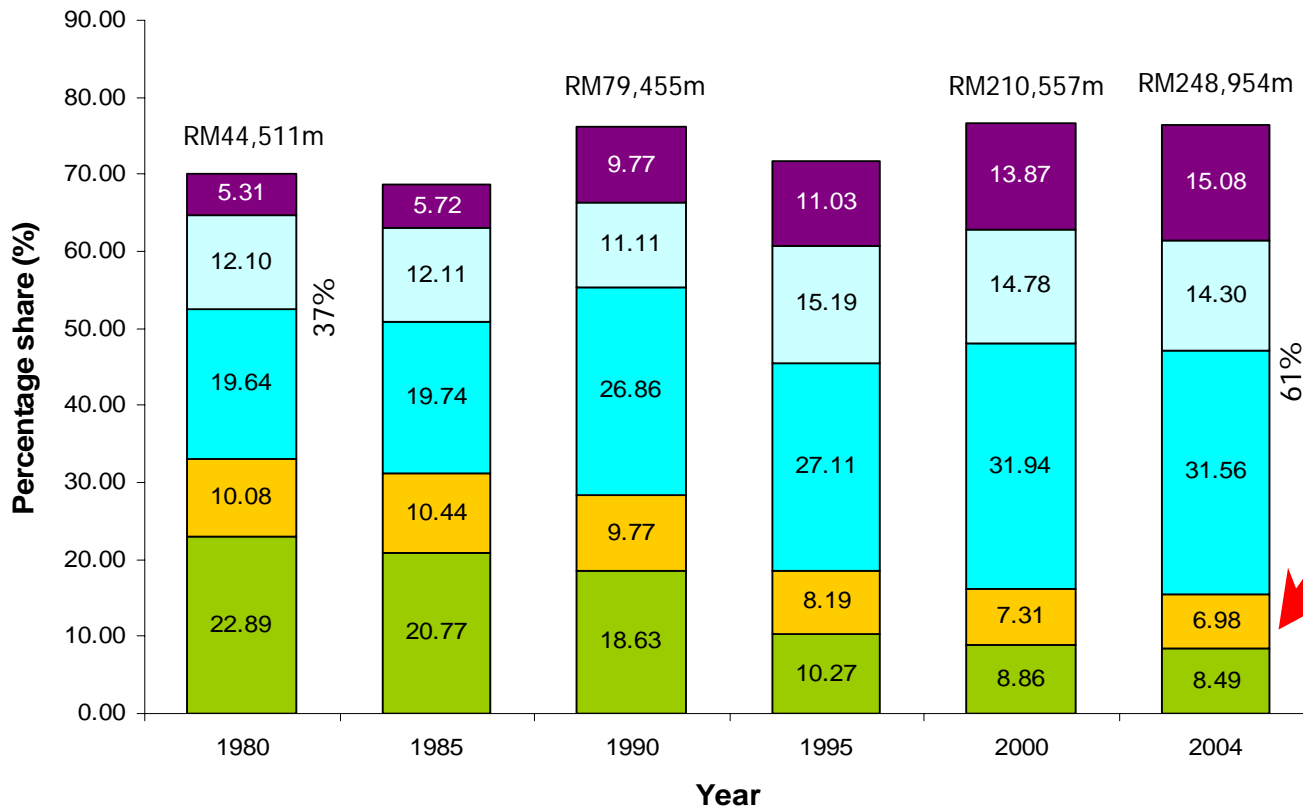
# Objective

- to examine the implications of fuel price hike on the Malaysian food sector; and
- to identify the prospect of an alternative source of energy for food production.

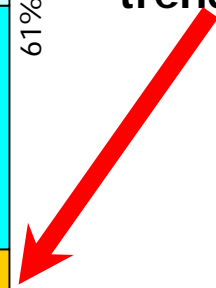
# *Approach of discussion..*

- Issues of the petroleum industry;
- Implications on food prices and marketing system; and
- The prospect of biodiesel as an alternative source of energy

# Malaysia: Contribution of Selected Sectors to GDP (%), 1980-2004



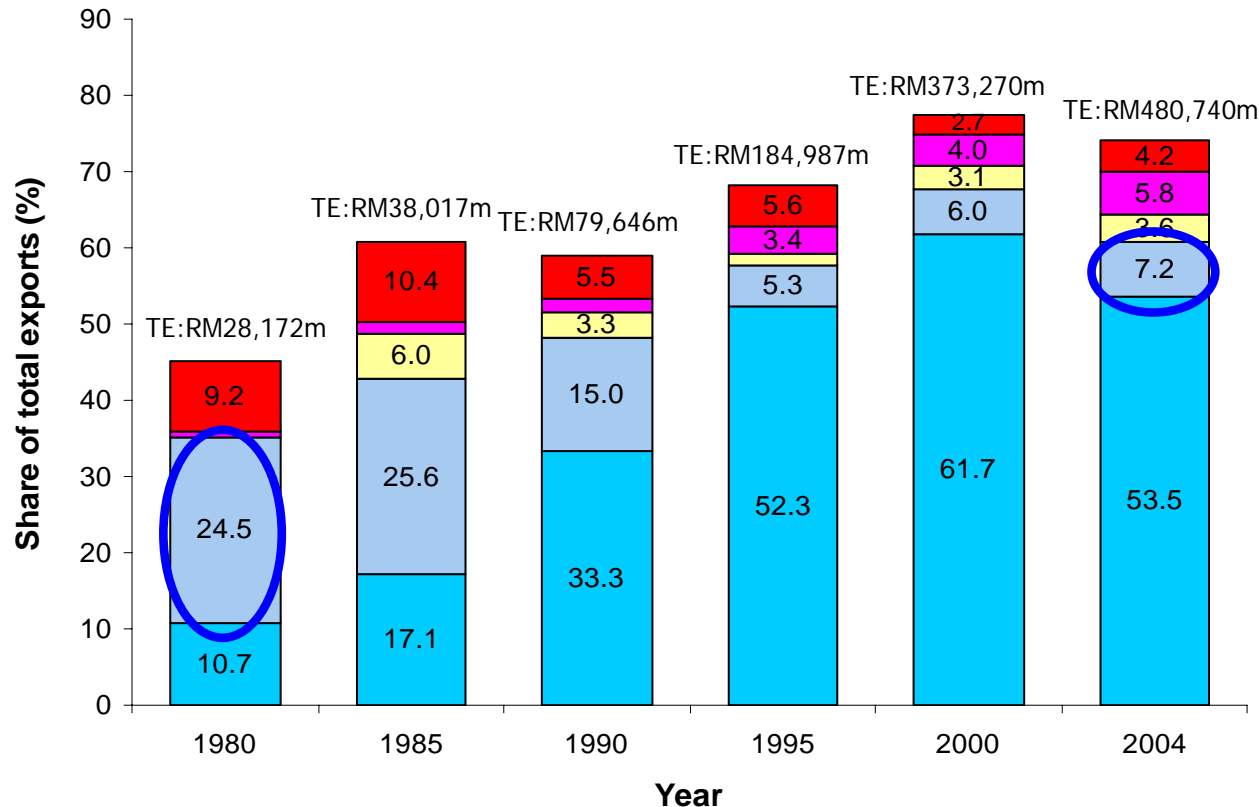
Share of the oil and gas sector (mining and quarrying sectors) has been exhibiting a declining trend ...



- Finance, Insurance, Real Estates and Business Services
- Wholesale and Retail Trade, Hotels and Restaurants
- Manufacturing
- Mining and Quarrying
- Agriculture, Forestry and Fishing

Source: BNM

# Malaysia: Contribution of Selected Exported Products to Total Exports (%), 1980-2004

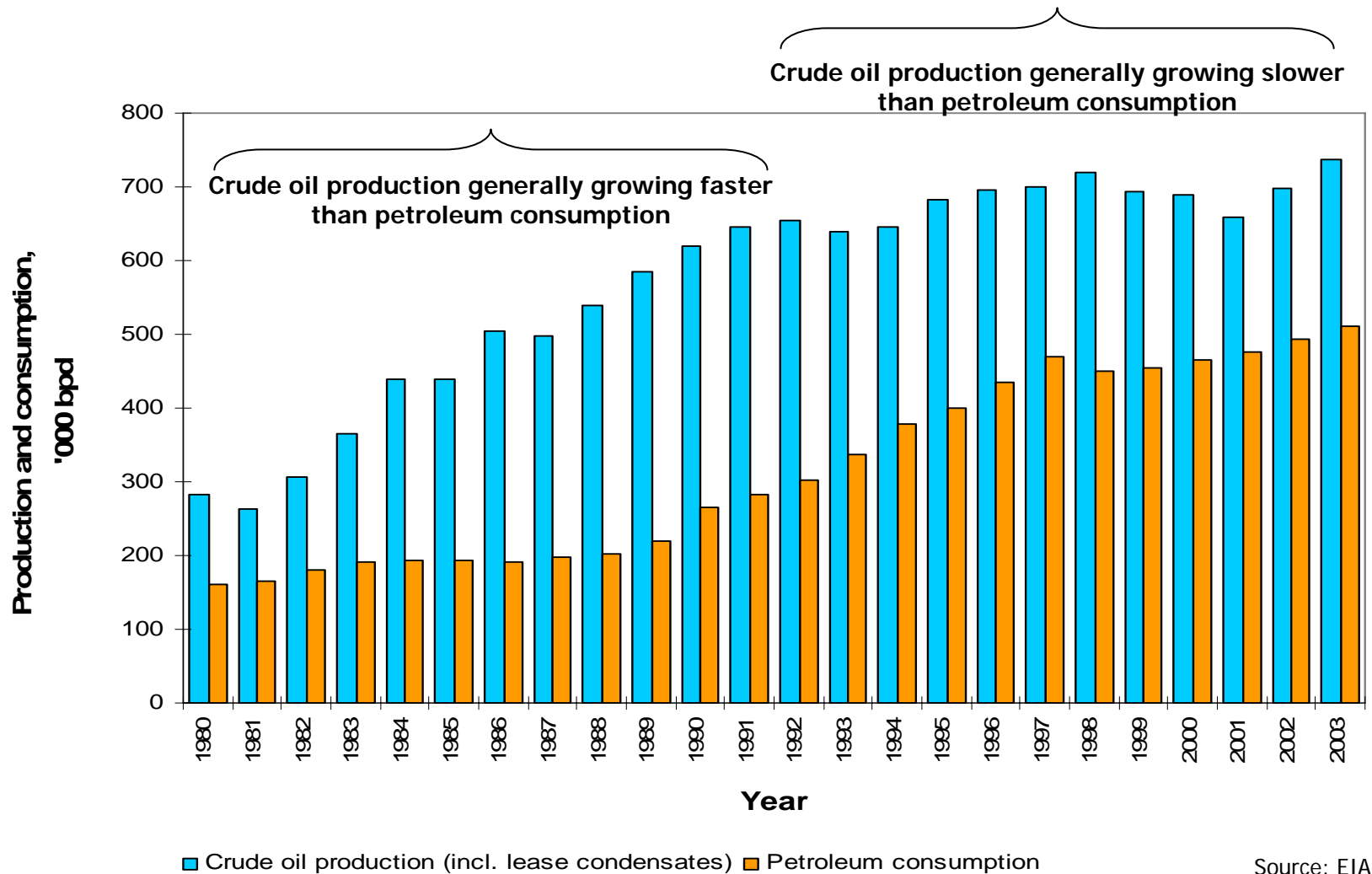


**In 1980, it contributed 24% to total exports; by 2004, it has shrunk by over three folds to about 7%.**

- Electronics & electrical products
- Crude oil and petroleum products
- Liquefied natural gas
- Chemicals and chemical products
- Palm oil

Source: BNM

# Malaysia: Crude Oil Production and Petroleum Consumption, 1980-2003



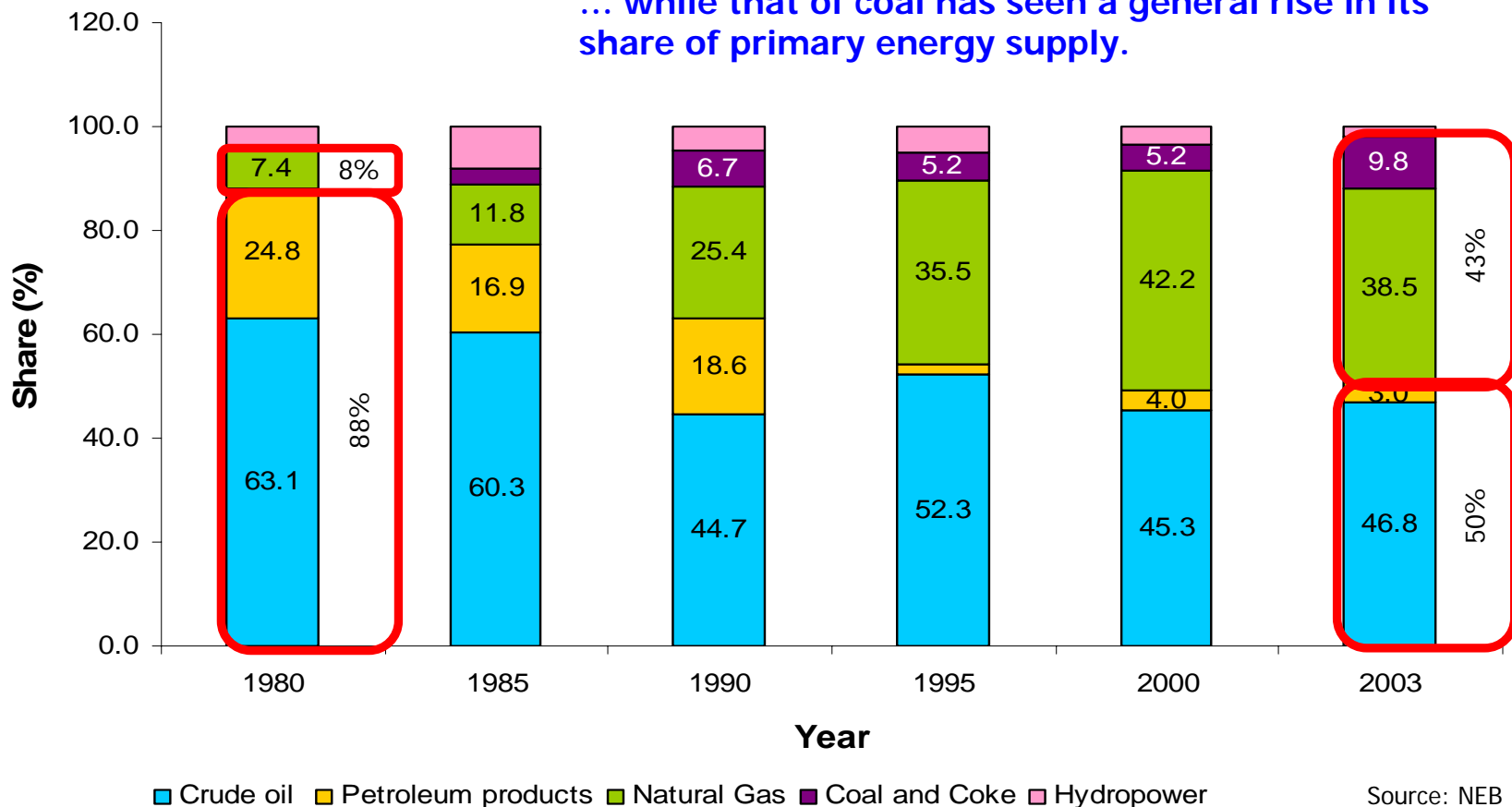


# Malaysia: Share of Fuel Type of Primary Supply of Commercial Energy, 1980-2003

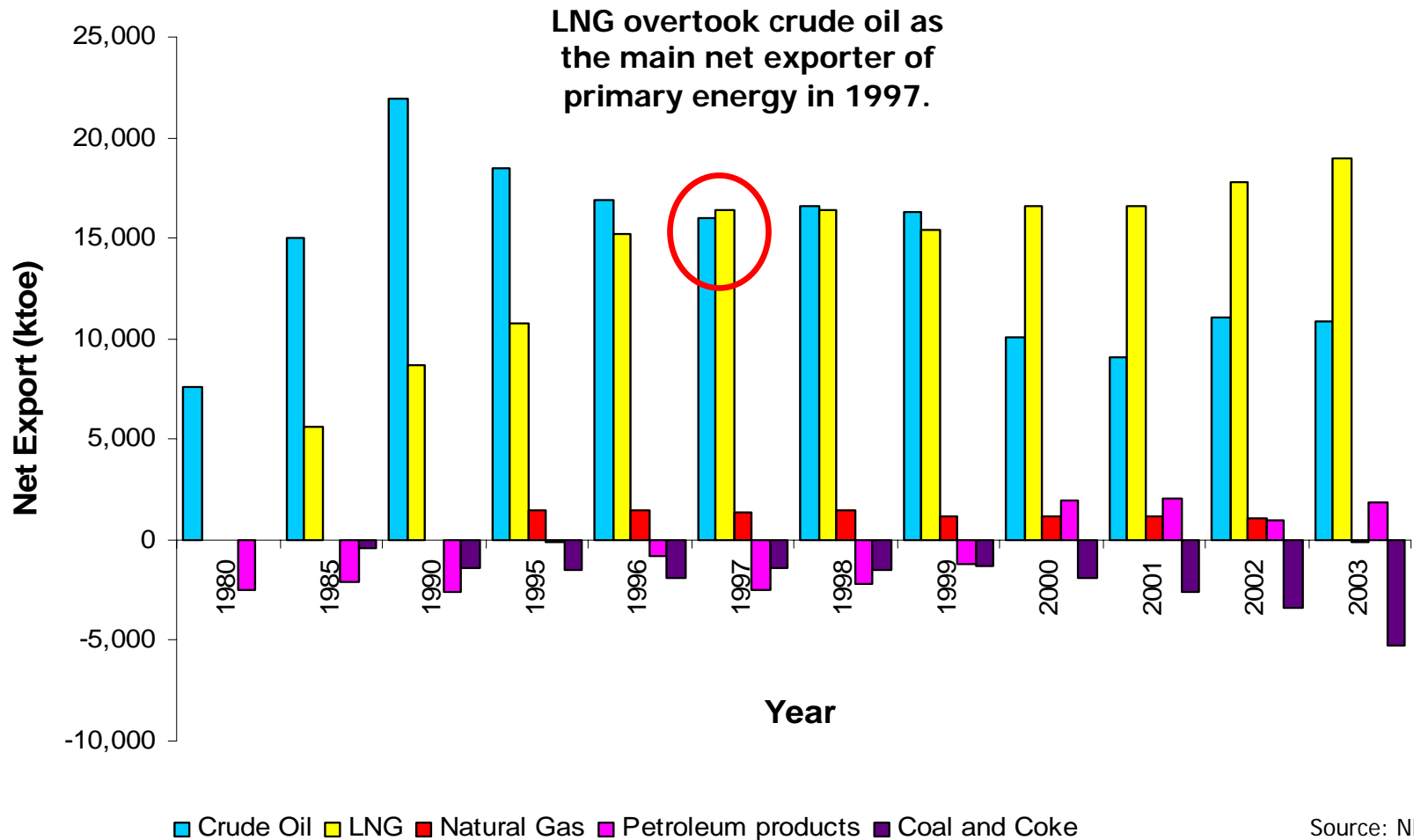
Share of crude oil as a primary energy supply is falling

...

... while that of coal has seen a general rise in its share of primary energy supply.

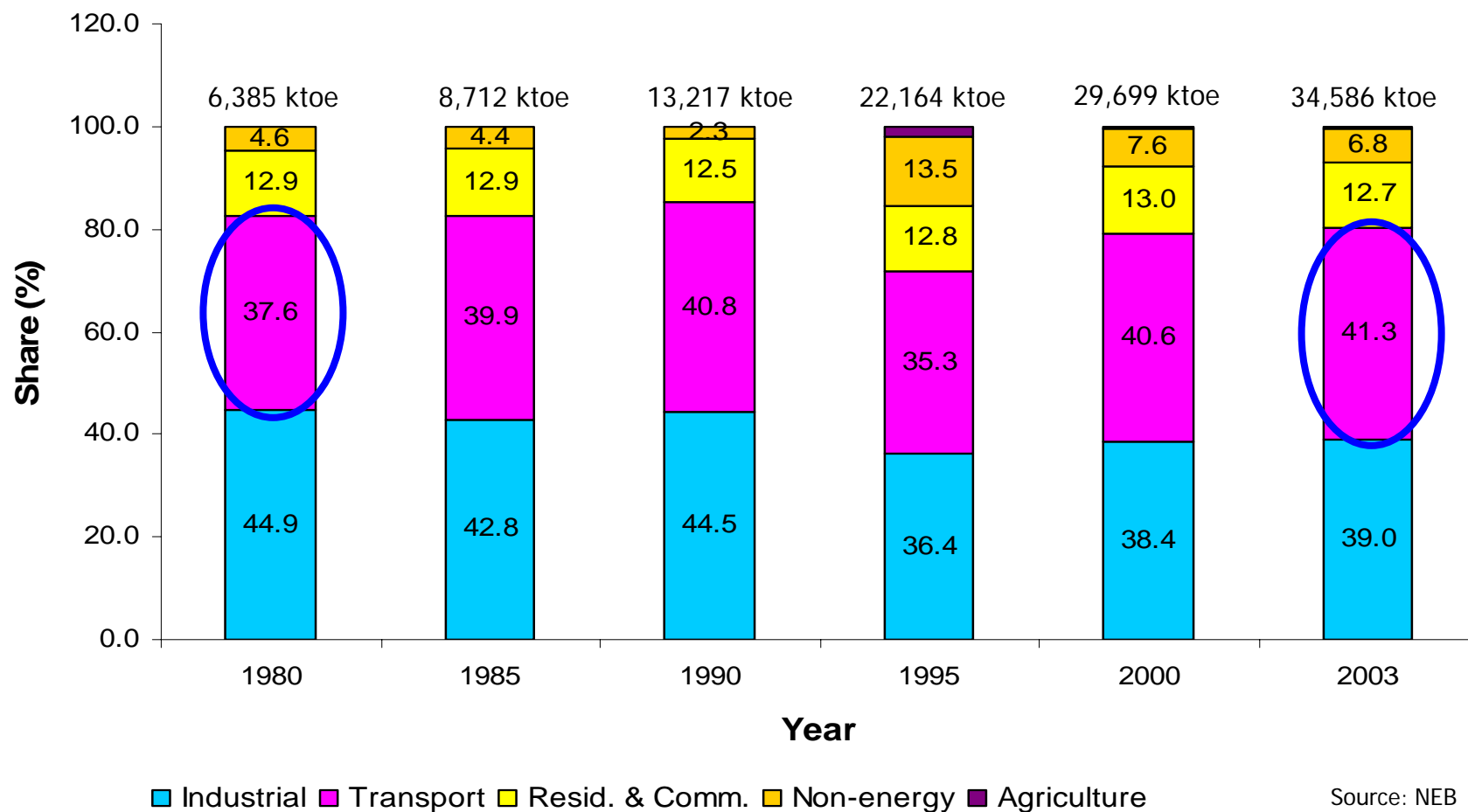


# Malaysia: Net Export and Import of Primary Energy, 1980-2003



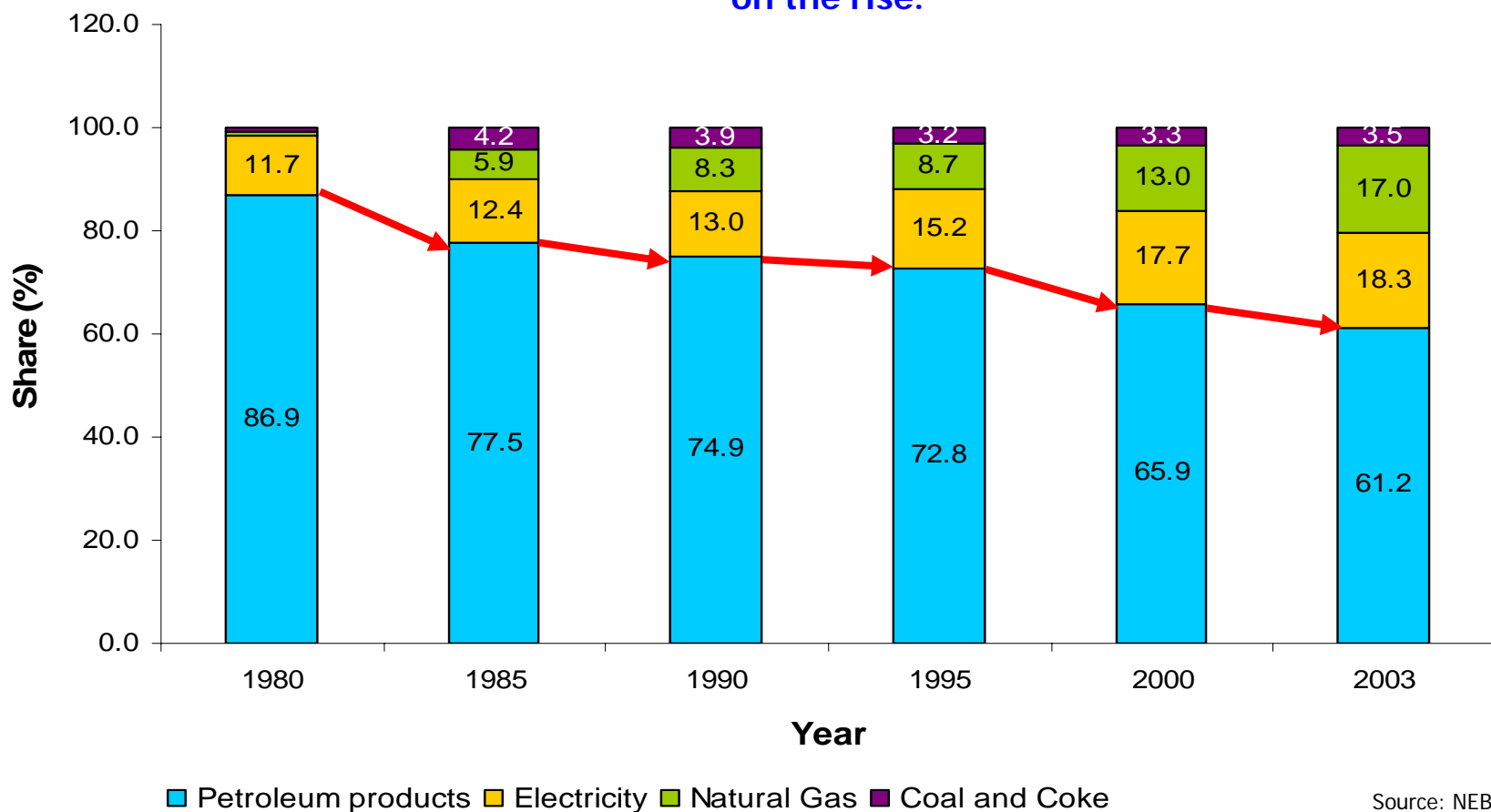
Source: NEB

# Malaysia: Share of Final Energy Use by Sector, 1980-2003



# Malaysia: Share of Final Energy Use by Fuel Type, 1980-2003

Key trend: *Share of natural gas demand and electricity demand is on the rise.*



# *Issues of petroleum industry..*

- 14<sup>th</sup> in the world – oil reserve;
- 9<sup>th</sup> in the world – gas reserve;
- Exports high quality oil, imports oil, petroleum products, coal and coke,
- Is a net oil-exporting country

# Malaysia: Oil & Energy Industry Performance

Indicator	Status
Oil self-sufficiency level	Malaysia 0.64
	Singapore -0.9
	G7 -0.59
Intensity of oil use in energy consumption	Malaysia 0.445
	Singapore 0.88
	G7 0.4
Energy intensity of GDP	Malaysia 1.21
	Singapore 2.14
	G7 1.0
	USA 1.15
Oil consumption per capita (barrels)	Malaysia 7.5
	Singapore 60.5
	G7 18.6

## Comparison of Petrol Prices in ASEAN Region, 2005 (RM per litre)

Country	Petrol	Diesel	LPG
Malaysia	1.92	1.58	1.75
Thailand	2.37	2.08	1.65
Singapore	3.91	2.61	-
Phillipines	2.21	1.95	1.25
Indonesia	1.68	0.96	
Brunei	1.22	0.71	1.4

About 30% below market price..  
The 2<sup>nd</sup> lowest in the world..

## Malaysia: Total Petroleum Subsidies and Revenue Lost, 2001-2005 (RMbn)

Item	2001	2002	2003	2004	2005
Subsidy	2.4	0.92	1.82	4.7	6.63
Revenue lost	5.08	3.31	4.76	7.15	7.85
Total	7.48	4.23	6.58	11.85	14.48

RM14.5 bn = 3.1% of Malaysia's GDP..



# *Total effect of*

Oil price boom =

Boon > bane

*but a thin one*

# *Implications to Food System*

Malaysia is a net food importer

- Energy utilised in agriculture is relatively small - 1.4% of diesel consumption in the country
- Half of the diesel is used by transport
- Transportation is an important marketing cost item
- Transmitted or passed through the consumers

# *Inflationary effect (CPI), 2003 - 2005*

2005 CPI increased by 3.5% compared to average increase of 2% in the "normal" years

Food items increased > 8%

Transportation and communication increased >8%

AMONG food items

Fish, Meat, eggs increased >10%

Tea and beverages 5%

Fruits and vegetables 7%

# *Effects on agriculture..(cost of production)*

Direct energy inputs = oil-based fuels (transport & cultivation)

Indirect energy inputs= fertiliser, chemicals and energy capital costs

Fisheries sector is highly susceptible to oil price increase (Table 15)

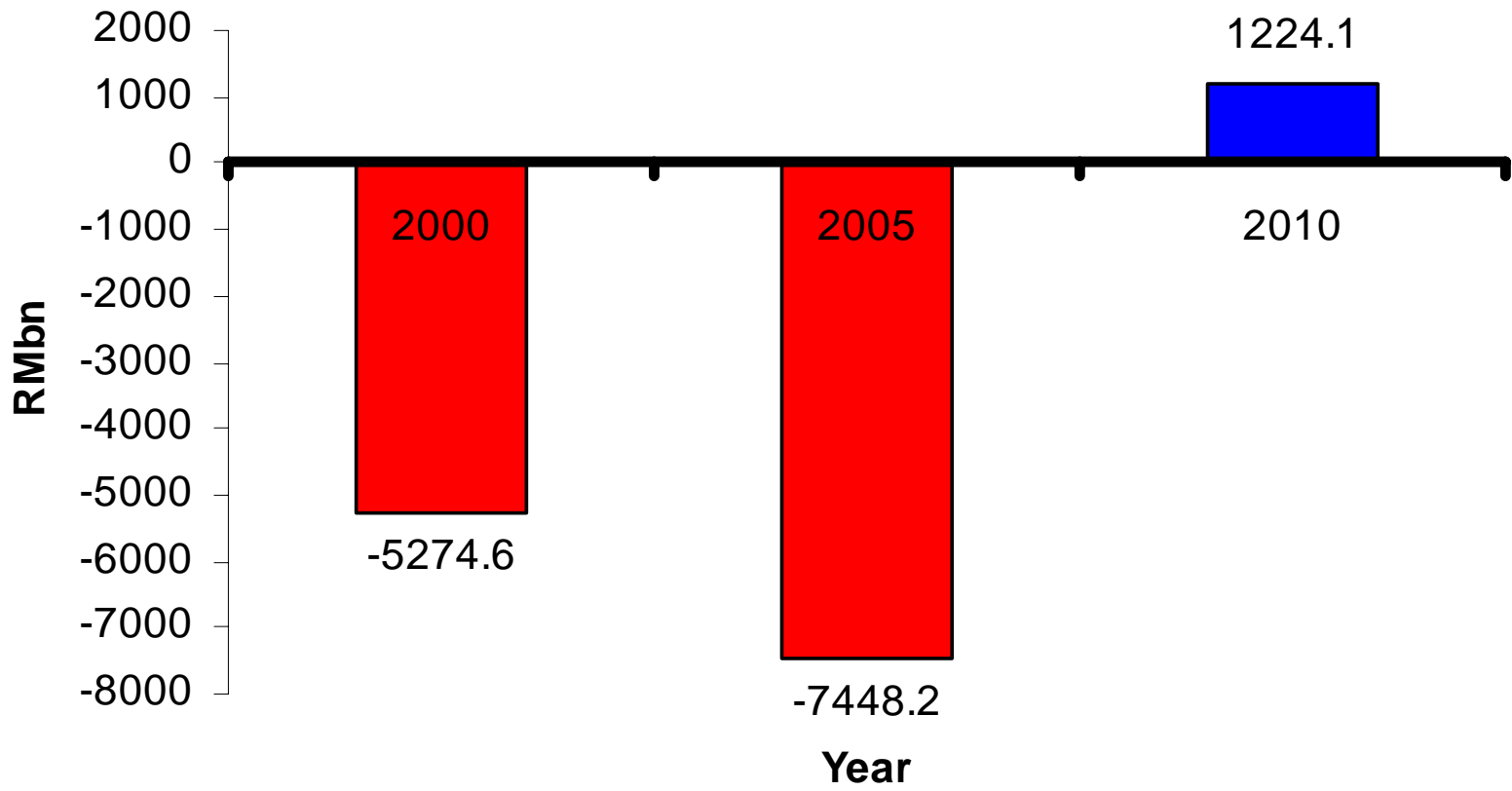
Fertilizer accounted for 2/3 of input cost, 1/4 of total cost (based on 13 types of fruits study)

# *Effects on agriculture..(cost of production) (contd.)*

Oil price increase is not a major increase in cost of production in the short run...

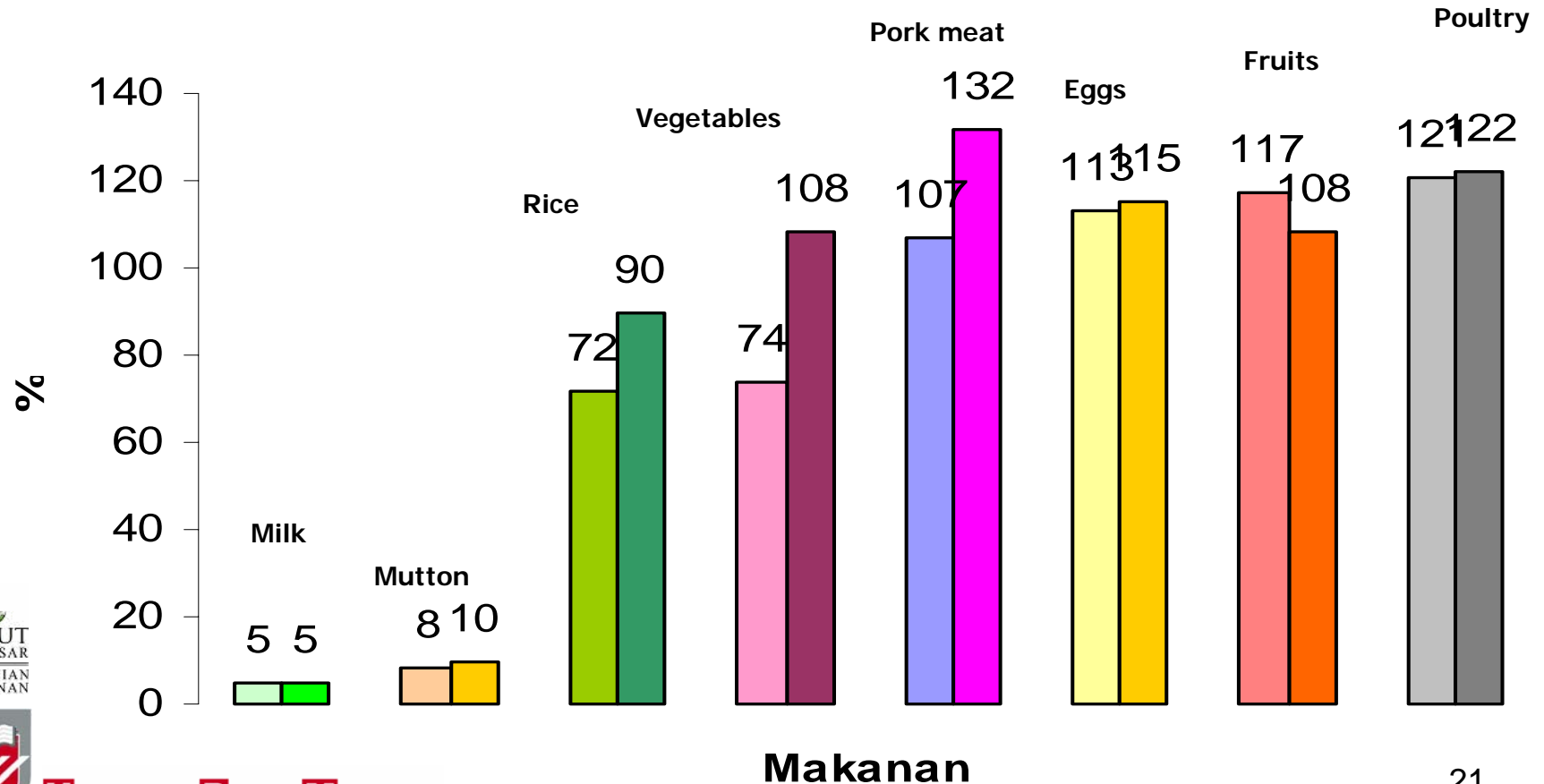
However, in the oil price increase is persistent, the medium and long term increase in cost could be considerable..

# Positive Food Trade Balance by 2010...



# Self sufficiency level of food commodities, 2010

## Self sufficiency level, 2005 & 2010



# *Food sector is THE agenda for 9MP (2006-2010)*

Clearly heavy dependency on fuel based energy has to be minimised.

Palm oil looks like the obvious alternative ....BUT shouldn't we go for food rather than oil as good soil is scarce?

The dilemma is real...



# *Addressing food system involves a bigger picture; i.e. the oil sector itself...*

The proven panacea is the taxation and pricing policy....

The hidden cost of subsidies are higher than the financial..

- (i) Underwrite fuel efficiency
- (ii) Retard the development of & diffusion of cleaner technology
- (iii) Environmental cost
- (iv) Rent – encourage fuel smuggling
- (v) Opportunity cost of development

# *Options for Malaysia..*

Conservation

Diversification of energy

“Correct” taxation and pricing policy of energy

Farm level adjustment – less dependent on fuel energy and fuel based inputs – organic farming?

Efficient marketing: Involves the whole paradigm-infrastructures, market incentives, product development and so on.

Thank You