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Sectoral Performance

Gross Domestic Product

The Malaysian economy is expected to sustain its strong growth in 1994 with real gross domestic product (GDP) expanding at a slightly higher rate of 8.5% compared with the 8.3% achieved in 1993. The main stimulus to growth is expected from the manufacturing, construction and services sectors. The manufacturing and construction sectors are projected to maintain their double-digit growth rates at levels higher than that attained in 1993, while the services sector is expected to sustain strong, albeit, slower growth. In contrast, growth in the agriculture sector is expected to moderate, while output in the mining sector is expected to turn around to record positive growth. The biggest contributors to GDP growth are the manufacturing (48.5%) and the services (47.4%) sectors.

Reflecting the strong demand in both the domestic and external sectors, value added in the manufacturing sector is estimated to increase by 13.6% in 1994 (1993: 12.9%). Growth in the sector is anticipated to be mainly supported by higher output in the export-oriented industries of electrical and electronics, textiles, rubber products and wood products. The domestic-oriented industries are also expected to sustain their performance, supported by the strong growth in the fabricated metal products, chemical and chemical products and non-metallic mineral industries. On the other hand, growth of output of the non-ferrous metal industry is expected to moderate. The better overall performance of the manufacturing sector is, thus, expected to increase its contribution to real GDP growth from 44.6% in 1993 to 48.5% in 1994, therefore increasing its share of GDP from 30.1% to 31.5%.

The construction sector is expected to maintain its double digit growth for the sixth consecutive year. The strong growth (13%) of the sector is attributed largely to the higher spending on infrastructure, particularly for alleviating infrastructural bottlenecks, as well as the increase in residential and industrial construction activities. The contribution of the sector to GDP growth is estimated to increase from 5.2% in 1993 to 6.1% in 1994, while its share of GDP is expected to increase marginally to 4.2% (1993: 4%).

As a result of the steady conversion of agriculture land for non-agricultural activities and as the agricultural sector continues to face labour shortages, its output growth is expected to decline to 0.5% in 1994 (1993: 3.9%). The slower growth is mainly due to the decline in the production of major agricultural commodities of palm oil, sawlogs and rubber. The production of sawlogs is expected to decline in consonance with the stricter enforcement of conservation targets by the relevant state governments, while the decline in palm oil output is due to the cyclical effects of tree stress brought about by a bumper harvest in 1993. In tandem with the slowdown in growth in the agriculture sector, its contribution to total GDP growth is expected to contract significantly from 7.8% in 1993 to 0.9% in 1994, while its share of GDP is expected to decline to 14.8% in 1994 (1993: 15.9%).

Output in the mining sector is expected to turn around to register a growth of 1.8% in 1994 (1993: -0.5%) mainly due to the anticipated 0.9% increase in the production of crude oil and to some extent the 15% growth in natural gas production. However, the production of tin is expected to decline by 37.5% due to prolonged poor prices and the depletion of easily accessible tin deposits.

Table 4.1
GDP: Sectoral Performance
(%)

	1993			1994 ^e		
	<i>Growth</i>	<i>Share of GDP</i>	<i>Contribution to growth</i>	<i>Growth</i>	<i>Share of GDP</i>	<i>Contribution to growth</i>
Agriculture, forestry and fishing ¹	3.9	15.9	7.8	0.5	14.8	0.9
Mining (of which: petroleum)	-0.5 (-1.7)	8.0 (6.7)	-0.6 (-1.5)	1.8 (0.9)	7.5 (6.2)	1.7 (0.7)
Manufacturing	12.9	30.1	44.6	13.6	31.5	48.5
Construction	11.2	4.0	5.2	13.0	4.2	6.1
Services	10.0	44.4	52.2	9.0	44.6	47.4
<i>Less</i> Imputed bank service charges	19.3	6.4	13.3	13.0	6.6	9.8
<i>Plus</i> Import duties	8.4	4.0	4.1	11.0	4.1	5.2
GDP	8.3	100.0	100.0	8.5	100.0	100.0

¹ Includes livestock and horticulture.

^e Estimate

The continued expansion in the leading sectors of the economy is expected to support a growth of 9% in the services sector, though at a slightly lower level than that attained in 1993 (10%). However, the sector's contribution to GDP growth is projected to remain significant at 47.4% (1993: 52.2%) while its share of GDP is expected to increase slightly to 44.6% in 1994 (1993: 44.4%). Higher growth is anticipated from the sub-sectors of wholesale and retail trade, hotels and restaurants; transport, storage and communications; and electricity, gas and water, mainly due to the expansion in the productive capacity of these services in response to increasing demand. A moderation in growth is, however, expected in the finance, insurance, real estate and business services and government services sub-sectors.

Manufacturing Sector

The **manufacturing sector** will continue to be one of the leading growth sectors in 1994. Value added in manufacturing is estimated to increase by 13.6% in 1994 compared with 12.9% in 1993. The strong growth is due to the robust expansion in both the domestic market-oriented industries (estimated to increase by 10.6% in 1994 compared with 9.8% in 1993) as well as the export-oriented industries (estimated to expand at 17.5% as against 15.8% in 1993). The strong growth in the domestic market-oriented industries is expected to be generated by the rapid growth in the fabricated metal products, chemical and chemical products, and the non-metallic mineral industries. This expansion reflects largely the significant growth

in local demand brought about by the expansion in construction and industrial activities. In the case of the export-oriented industries, the rapid expansion is attributed to the significant growth expected in the electronic and electrical, the non-electrical machinery, textiles as well as the wood and rubber products industries. The robust performance of these industries is expected to be generated by strong external demand, following economic recovery in a number of the major industrial countries, as well as increases in exports to non-traditional markets.

Since the early eighties, the manufacturing sector has undergone substantial **structural transformation**. In 1980, manufacturing output accounted for about 20% of GDP. In 1994, however, the sector will account for 31.5% of GDP. Census data in 1981 showed that the processing of estate-type agricultural products and the food industries accounted for about 10.3% of total value added in the sector, with the electrical, electronic and machinery industry contributing only 13% of value

added. By 1993, however, the electrical, electronic and machinery industry increased its contribution to about a quarter of total value added in the sector, while that of the estate type processing and food processing industries decreased to less than 10%. Other industries like petrochemicals, non-metallic mineral products and fabricated metal products have also become important industries.

While the nation's industrial base has undergone significant structural changes, the manufacturing sector continues to be narrowly based with a few industries, that is the electrical and electronic, textiles, rubber products and wood products industries dominating the sector's output. Therefore, there is a need to further diversify and broaden the industrial base and several industries have been identified to be given greater attention. These include the chemical and chemical products, the fabricated metal, the transport and the machinery industries.

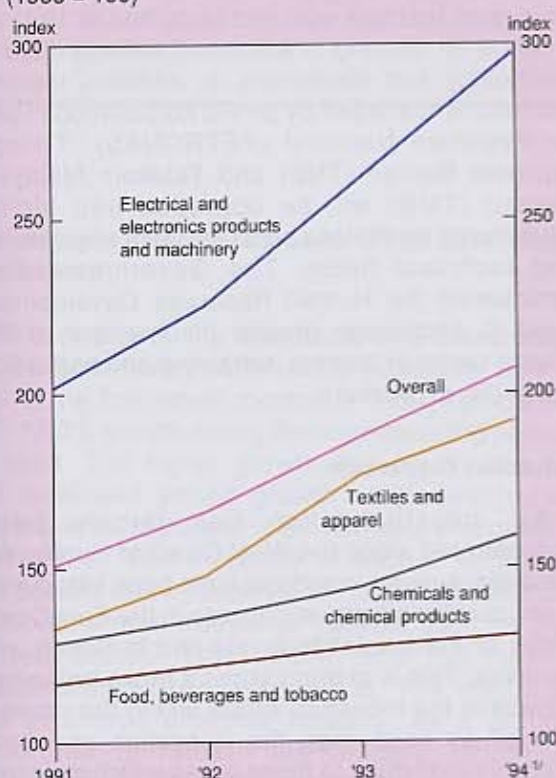
Domestic Investment Initiative

With the rapid changes in the global environment and the opening up of new labour surplus economies like China and Vietnam, the Malaysian manufacturing sector continues to face greater competition for direct foreign investment. In view of this greater competition, the Government launched the **Domestic Investment Initiative (DII)** to encourage greater domestic investment. Thus, several strategies have been evolved under the DII which include ensuring increased domestic content in manufacturing output, strengthening and deepening the local capital market to support domestic investment, developing domestic anchor companies which have the capability of becoming multinational corporations and developing the small and medium-scale industries (SMIs) to provide greater inter-industry linkages.

Research and Development

As the Malaysian economy reaches almost full employment following six years of rapid growth, labour-intensive industries within the manufacturing sector may no longer be able to compete with similar industries in labour surplus countries, particularly those of the emerging economies. Therefore, to sustain competitiveness, these industries must shift towards capital and technology intensive production. With this objective, the

Chart 4.1
Manufacturing Production Index
(1988 = 100)



1/ For January - July only.

Government has placed greater emphasis on the need for the development of new high-tech industries and to encourage existing industries to upgrade their technology. In this connection, new industries were identified to be developed and these include the aerospace, composite materials, micro-electronics, automated manufacturing technology, biotechnology and information technology industries. Besides these, the development of heavy and strategic industries will continue to be given emphasis. These include the cement, iron and steel, telecommunications, automobile, petrochemicals, maritime as well as the tool and die industries. At the same time, the Government also recognises the importance of **research and development (R&D)** in upgrading the competitiveness of Malaysian industries. Therefore, the Government has undertaken several measures to encourage the private sector to undertake R&D on a larger scale. These measures include providing tax incentives for R&D, encouraging greater cooperation between industries and research institutions as well as increasing allocations for R&D under the Intensification of Research in Priority Area (IRPA) mechanism. An Action Plan for Industrial Technology Development has also been formulated to identify strategies for the upgrading of industrial technology.

Small and Medium-Scale Industries (SMIs)

The development of SMIs is important for industrial expansion and diversification as well as for creating inter and intra-industry linkages in the economy. However, SMIs face several constraints including inadequate finance, low technology, poor management and marketing skills, lack of infrastructural support as well as inadequate linkages with large domestic and multinational corporations.

In view of the importance of SMIs, the Government has launched a comprehensive programme for SMI development. This programme includes an institutional arrangement using the Lead Agency Concept, whereby four ministries and a department have been appointed to coordinate five categories of assistance required by SMIs. These lead agencies are the Ministry of Finance, Ministry of International Trade and Industry, Ministry of Science, Technology and Environment, Ministry of Human Resources and the Implementation and Coordination Unit in the Prime Minister's Department. The five categories

of assistance cover financial assistance, incentives, human resource development, technical assistance and market promotion.

Human Resource Development

With the rapid growth in industrialisation and the emphasis towards the development of high-tech industries, the demand for skilled manpower will increase. Given the shortages of skilled labour, the Government places greater emphasis on **human resource development** to meet industrial requirements. In this connection, the capacity of public training institutions, including vocational schools, industrial training institutes, Majlis Amanah Rakyat (MARA) vocational institutes and youth training institutes will continue to be expanded. More skill development centres will be established through collaboration with the private sector to cater specifically for industries. To ensure skill training programmes are oriented to meet industrial requirements, trade certification through an improved accreditation system was also implemented on a pilot basis for vocational schools and industrial training institutes. The Government has also undertaken the privatisation of the Industrial Training Institute in Prai and the corporatisation of the Centre for Instructors and Advanced Skill Training in Shah Alam. The German-Malaysian Institute was also launched in 1991 as a centre for training in advanced skills, industrial technology and electronics. In addition, training institutions managed by public corporations such as Petrolia Nasional (PETRONAS), Tenaga Nasional Berhad (TNB) and Telekom Malaysia Berhad (TMB) will be upgraded into higher educational institutions specialising in engineering and technical fields. The Government also established the Human Resource Development Fund to encourage greater involvement of the private sector in training, retraining and upgrading the skills of workers.

Industrial Dispersion

As industrialisation has largely been concentrated along the West Coast of Peninsular Malaysia, several incentives have been introduced to encourage industries to locate in the East Coast states of Peninsular Malaysia and in Sabah and Sarawak. This is to bring about a **more balanced growth** in the industrial sector within the country as well as encourage the relocation of labour intensive industries to these areas which still have surplus labour.

Table 4.2
Manufacturing Production Index
of Malaysia
(1988 = 100)

Weights		1993	1994 (January-July)
		% change	
Food, beverages and tobacco	11.35	4.4	7.1
Textiles and apparel	4.20	19.5	16.9
Petroleum refineries	1.23	8.3	1.5
Chemicals and chemical products	11.15	7.1	11.6
Rubber products	5.82	18.2	13.0
Wood and wood products (except furniture)	3.65	22.1	11.2
Non-metallic mineral products	3.90	6.1	9.0
Iron and steel	1.76	12.6	7.8
Non-ferrous metal products	0.52	3.8	2.1
Fabricated metal products	1.94	57.6	32.8
Electrical and electronic products and machinery	11.91	13.7	19.4
Transport equipment	2.17	3.5	5.2
TOTAL	59.60	12.8	14.1

Source: Department of Statistics.

Electrical and Electronic Products and Machinery

The output of the **electrical and electronic products industry** continued to expand by 19.4% during the first seven months of 1994, compared with 15.3% growth during the corresponding period of 1993. The higher growth was mainly due to the continued strong growth of the electronic components, radio and television sets and cables and wires. The increase in output of these sub-sectors was in response to increasing demand, particularly from traditional markets such as the United States (US), Japan and the Newly Industrialising Economies (NIEs). The electrical and electronic products industry, as a group, continues to remain the leading industry, contributing 26.6% to the total output of the sector during the first seven months of 1994.

The output of the **electrical sub-sector**, which includes the production of electrical appliances, wires and cables, electrical industrial equipment and other electrical products, increased by 16.5% during the first seven months of 1994 (January-July 1993: 19.2%). The **electrical appliances** sub-sector contributed about 40% of the electrical industry output and exports. The major products of this sub-sector include air-conditioners (Malaysia is presently the world's largest exporter), household refrigerators, washing machines and rice cookers. The output of the **cables and wires** sub-sector expanded by 9.1% during the first seven months of 1994, although at a lower rate than the 16% registered for the same period of 1993. The sub-sector produces a wide range of power and telecommunication cables, including aluminium cables, primary and secondary telephone cables, optic fibre cables and household cables. The growth in this sub-sector's output was underpinned by the favourable external demand as well as sustained domestic sales, arising from the rapid development and upgrading of the infrastructure facilities in telecommunications and electricity.

The output of the **electrical industrial equipment sub-sector**, which includes switchgears, distribution transformers and electric motors, is mainly for the domestic market. However, exports from this sub-sector have been on the increase with the establishment of several export-oriented projects. **Other electrical products** manufactured include dry cells, automotive batteries, incandescent lamps and fluorescent tubes which are also for the domestic market. The domestic market for many of the electrical products in Malaysia is not sufficiently large to support viable local production. Hence, Malaysia has been consistently a net importer of electrical goods. As such, the emphasis is to encourage the development and growth of the industry, based on producing a wide range of electrical products for both the domestic and export markets. In particular, focus will be given to encourage the expansion in the production of industrial equipment and electrical appliances, given the potential for greater import substitution as well as exports.

The **electronic products sub-sector** registered a higher output growth of 20.9% during the first seven months of 1994 (January-July 1993: 12.5%). This reflects increases in the production of electronic components, consumer electronics and industrial electronics. Output of the **semi-**

Table 4.3
Production of Selected Electrical and Electronic Products
(January-July)

	1993	1994	Annual change (%)
Semi-conductors (million units)	2,096	1,846	-11.9
Electronic transistors (million units)	4,329	4,338	0.2
Integrated circuits (million units)	4,439	5,241	15.3
Television sets ('000 units)	3,811	4,133	8.4
Radios ('000 units)	18,258	20,816	14.0
Room air-conditioners ('000 units)	1,532	1,841	20.2
Household refrigerators ('000 units)	151	151	—
Telephone/telegraphic cables (tonnes)	15,978	18,078	13.1
Insulated wires and cables (tonnes)	30,958	37,770	22.0

Source: Department of Statistics.

conductor and other electronic components expanded by 21.5% during the period under review (January-July 1993: 13.1%), due mainly to encouraging demand from both domestic and external markets, in particular the US, Japan and the NIEs. The rise in domestic demand for electronic products reflects the rapid expansion of domestic business activities and the need to keep pace with rising sophistication in technology.

The performance of the **electronic industry** during the period 1988 to 1993 had been remarkable, registering an output and export growth of about 30% per annum. Products of the industry are diverse, with semi-conductor devices accounting for the largest share (58% of the total output). Malaysia is today one of the largest semi-conductor exporters in the world. While the electronic industry in Malaysia is expected to continue to contribute substantially towards exports and employment, its contribution to value-added growth is still low. Furthermore, with labour

shortages, increasing competition from other Asian developing countries, limited Malaysian participation, lack of inter and intra-industry linkages, the high level of import content and lack of local R&D activities are factors that can limit the growth of the industry. In the light of this, the Government has formulated several strategies to encourage the industry to diversify its range of products and increase value added and local content so as to create more effective forward and backward linkages. These strategies include the granting of tax incentives to encourage greater local material content and linkage development as well as encourage more joint-ventures with foreign and local partners. Incentives are also given to the industry to undertake greater R&D, adopt improved technologies and move into the area of improved design, micro-electronics and automated technologies.

The output of the **non-electrical machinery industry**, which includes refrigerating, exhaust, ventilating and air-conditioning machinery increased by 22.5% during the period under review (January-July 1993: -0.2%), due to increased demand from the US, Singapore and Japan. The machinery industry which also produces machinery and related equipment, mainly for the tin mining, quarrying, rubber, palm oil and timber industries, has also diversified into the production of machine tools and industrial equipment. Nevertheless, the industry still has great potential in the area of import substitution. Malaysia imports a large amount of machinery and industrial equipment, especially for the manufacturing sector. As in other industries, its development is also constrained by inadequate supply of skilled manpower, low level of technological capabilities, lack of R&D activities and a limited domestic market. Therefore, the industry needs to be rationalised and modernised to make it more efficient and competitive.

Textiles and Apparel

In spite of continuing protectionism in the quota countries and stiffer competition from low-cost producers in the international market, the **textile industry** grew by 24.4% during the first seven months of 1994 compared with an increase of 31.1% for the same period of 1993. The rapid growth of the sector continued to be sustained

by higher domestic and external demand. The momentum of growth was supported by the expansion in output registered by the synthetic textile mills and knitting mills. However, the output of the wearing apparel industry registered a marginal increase during the period under review due to weak external demand.

The output of **synthetic textile mills**, which includes the manufacture of yarn and synthetic fibres and PVC leather cloth, grew by 39% during the period (January-July 1993: 149.2%), mainly due to strong orders from overseas. Similarly, the output of **knitted mills** comprising the manufacture of knitted fabrics, outer wear and jackets as well as shirts and gloves increased significantly by 39.9% during the period under review (January-July 1993: 11.1%). On the other hand, the production of **natural fibre spinning and weaving mills** increased marginally by 0.5% during the first seven months of 1994. The local spinning yarn producers face stronger competition from new low-cost producing countries such as China, India, Pakistan, Vietnam and Indonesia, not only in exports but also in the domestic market.

Growth of the **wearing apparel industry**, which mainly produces articles of apparel and clothing accessories, registered a marginal increase of 1% during the first seven months of 1994, (January-July 1993: 0.1%). The export sales of wearing apparel slackened during the period, mainly on account of competition from other low-cost producers.

Despite increasing external competition, the textiles and wearing apparel industry remained one of the largest foreign exchange earners in the manufacturing sector. However, the nation's textile industry is relatively small compared with that in Hong Kong, Taiwan and South Korea and even in other Association of South-East Asian Nations (ASEAN) countries, such as Thailand and Indonesia. The industry also faces problems of protectionism and competition from newly emerging low-cost producers like China, Sri Lanka, Bangladesh, India, Thailand, Pakistan and Indonesia. In addition, the Malaysian textile industry depends heavily on exports to countries of the European Union (EU) and North American Free Trade Agreement (NAFTA). Under the recently concluded Uruguay Round Agreement, the

Multifibre Agreement that has so far sheltered the industry from free competition will be phased out over 10-year period. Thus, the industry needs to further intensify its efforts in the production of higher value added up-market products, improve its manufacturing technology as well as increase its local content and domestic value added. It has also to adopt better marketing strategies, to expand its market, deepen and diversify activities and consolidate existing ones. In the long run, to regain competitiveness and cost effectiveness, the textile industry may have to venture into offshore manufacturing in other lower-cost countries.

Wood and Wood Products

During the first seven months of 1994, the output of **wood and wood products**, except furniture, expanded by 11.2% compared with an increase of 25.6% registered during the corresponding period of 1993. The increase in output was due to higher domestic consumption, especially by the construction sector as well as to strong external demand from Japan, China, Taiwan and Hong Kong. Imports of wood by these countries for their domestic production of wood products have been adversely affected by the tight supply of sawlogs in the world market, stemming from restraints or bans on exports of logs (particularly the hardwood species) by major suppliers in the North American and South-East Asian region.

During the first seven months of the year, the output of **sawn timber** stood at 4.8 million cubic metres, reflecting a decline of 6.9% compared with the output recorded during the same period of 1993, resulting from the decline in the production of sawlogs. While Peninsular Malaysia contributed the largest share (54%) to total sawn timber output, its share has been declining at an average rate of 2.5% for the past three years. On the contrary, output from Sarawak increased further by 14% during the first seven months of 1994 to 930,000 cubic metres, increasing its share to 19.3% of total output compared with 15.6% during the same period in 1993. The increase in production is due to the increased quota of sawlogs retained by the Sarawak State Government for the downstream processing industries as well as strong demand

from major consuming countries. Unlike Sarawak, Sabah's output of sawn timber registered a decline of 26.8% to 1.2 million cubic metres during the first seven months of 1994 compared with an increase of 11.6% during the same period in the preceding year.

The **plywood hardboard and particle board sub-sector** recorded an increase of 22.2% during the first seven months of 1994 (January-July 1993: 56.1%). This is mainly due to the sharp increase in the production of plywood by 23.4% to 1,747,880 cubic metres, resulting from strong demand from Singapore, Japan and China, and tight supplies from other producing countries. In the case of veneer, output increased by 0.01% to 643,918 cubic metres to cater for increased demand by Singapore and Japan. The increase in the number of plywood/veneer mills to 101 in 1994 (1993: 97), has expanded processing capacity by about 14%. Active demand for plywood from domestic processing industries as well as the export market has led to the capacity expansion. In Peninsular Malaysia, despite the expected increase in the number of plywood mills (from 38 in 1993 to 40 in 1994), production of plywood is expected to decline due to the shortage of sawlogs for processing. Consequently, its share to total output is also expected to decline to 31% in 1994 compared with 36% in 1993. On the other hand, output of plywood from Sabah and Sarawak is expected to increase by 16% and 22% respectively. Thus for 1994, Sabah is expected to emerge as the major producer of plywood, contributing to 36% of total national output while Sarawak is expected to contribute 33%.

The **furniture and fixtures sub-sector** also expanded rapidly. Between 1989 and 1993 the ex-factory sales of furniture and fixtures rose by an estimated 30% per annum. During the first seven months of 1994, the ex-factory value of sales of furniture and fixtures increased by 12.6% (January-July 1993: 93.8%).

The wood and wood products industry is one of the designated resource-based industries to be given greater emphasis under the Government's industrialisation policy. The aim is to develop the country into a centre for furniture and mouldings and encourage greater value added in the industry.

In this context, furniture parks and timber processing zones are being developed to bring about a more integrated development of the industry. The Government also encourages greater R&D and technology upgrading among producers of wood products which are mainly SMIs. The objective is to increase product quality and to sustain competitiveness in the export market.

To further enhance the development of the wood-based industry, the Malaysian Timber Industry Development Council (MTIDC) is actively looking into various avenues and strategies to strengthen the industry. These include reforestation programmes, processing rubber wood as an alternative for furniture manufacturing and combating the anti-tropical timber campaign. The wood-based industry in Peninsular Malaysia continues to face the problem of shortage of sawlogs for downstream processing, as local production of sawlogs is insufficient to meet demand. To help alleviate the problem, the importation of sawlogs from Sarawak has been undertaken over the last 10 years. At the same time, a rubber wood depot has also been set up for the benefit of small and medium-scale wood-based industries. A study on the current and future prospects of the rubber wood industry has also been commissioned and is expected to be ready by the end of 1994.

The **anti-tropical timber campaigns** by radical environmentalists in Western Europe, the US, Canada and Australia continue to be a threat to the development of the wood-based industry. In the United Kingdom (UK), Netherlands and Germany, such environmentalists have even urged their governments to impose the 'Sustainably Managed Forest' labelling of tropical wood to be implemented earlier in 1995 rather than the date agreed to (2020). In the US, the non-governmental organisations are lobbying the Federal and State Governments to pass a bill to minimise or even ban the use of tropical timber. To counter such threats, MTIDC has, in addition to setting up an office in London, also appointed public relations agents in Western Europe to disseminate information on sustainable forest management in Malaysia. Visits of foreign journalists to Malaysia are also being arranged to enable them to get a first hand look at forest management in Malaysia.

Rubber-Based Products

During the first seven months of 1994, the output of the **rubber-based industry** expanded by 13% (January-July 1993: 16.7%). The growth in output was mainly due to the strong performance of the tyres and tubes sub-sector and other downstream industries producing rubber gloves, rubber bands and catheters. However, the production of footwear and rubber remilling and latex processing declined due to weak external demand, particularly from traditional importing countries.

The output of the **tyres and tubes** sub-sector increased by 5.1% during the period under review (January-July 1993: 11.7%), due mainly to strong demand by the domestic automobile industry as well as favourable external demand, especially from the NIEs, the EU and the US. Local manufacturers will have to seek new markets especially non-traditional markets in the Middle-East, Latin America and Eastern Europe. In this context, Malaysian tyre manufacturers will have to ensure their products are competitive in terms of price, variety and quality in the international market, apart from embarking on effective marketing strategies.

The output of the **rubber remilling and latex processing** industries, which include Standard Malaysian Rubber (SMR) and Ribbed Smoked Sheets (RSS), except processed latex, declined by 8.1% during the first seven months of 1994 (January-July 1993: 0.4%). This is in line with weak external demand, especially from Singapore, Japan and Germany, in addition to the stiff competition in the world market. Similarly, the output of **rubber footwear** increased only marginally by 0.4% (January-July 1993: 0.4%), due mainly to weak demand from the EU countries. The production of rubber footwear also faces competition from the low-cost footwear producers, mainly from China.

The output of **other rubber products** increased by 25.1% during the first seven months of 1994 (January-July 1993: 29.1%) mainly due to a strong increase in the production of rubber gloves, catheters and rubber bands. The output of rubber gloves expanded by 38.7% to 3.73 billion pairs during the first seven months of 1994 (January-July 1993: 2.69 billion pairs), boosted by strong demand from the major consuming countries of

the EU and the US. Prospects for this sub-sector remain good, due to expected sustained increase in demand, especially for rubber gloves.

The rubber products industry has achieved credible growth since the launching of the Industrial Master Plan (IMP) in 1986. Growth of the industry, however, is still constrained by the low level of technology, uneconomic plant size, narrow base and low linkages with other industries. To achieve greater growth, the industry needs to be consolidated, rationalised and upgraded. At the same time, product development and quality enhancement via R&D, the establishment of ancillary industries as well as the formulation of effective marketing strategies would have to be undertaken to ensure that Malaysian rubber products remain competitive in the international market.

Food, Beverages and Tobacco

Growth in the output of the manufactured **food, beverages and tobacco industry** was sustained at 7.1% during the first seven months of 1994 (January-July 1993: 4.4%). The increase in growth can be attributed to higher consumer spending in the domestic market as well as encouraging demand by ASEAN countries, Japan and China. Despite the improved performance of the food, beverages and tobacco industry, its share in the manufacturing sector declined to 12% (January-July 1993: 12.8%) during the period under review.

During the first seven months of 1994, the output of the **manufactured food sub-sector** grew by 6.4% (January-July 1993: 11.4%). The increase in output was due to the strong performance of the dairy products, flour, palm oil processing and biscuit manufacturing industries. However, the output of fish, crustacea, rice milling and other manufactured food industries recorded declines. The output of the off-estate processing industry increased by 9.8% (January-July 1993: 15.1%), largely attributable to the increase in the processing of crude palm oil (10.2%) and palm kernel oil (5.0%).

As at July 1994, the number of **palm oil refineries** stood at 58, with a total approved processing capacity of 12.3 million tonnes. In view of the excess capacity, no new licences have been issued. In the downstream processing of palm oil, the oleochemical industry is also faced

with the problem of excess capacity. As at July 1994, there are 35 oleochemical plants with a processing capacity of 858,587 tonnes in operation. These oleochemical industries have to compete with the refining industry to get the supply of palm kernel oil. In terms of R&D activities, the Palm Oil Research Institute of Malaysia (PORIM) has successfully developed a new process for the production of deacidified and deodorised palm oil, the quality of which is similar to that of the refined, bleached and deodorised palm oil, but retaining most of the endogenous carotenes and vitamin E. The technology will be available in the market in the near future.

Given that the food manufacturing sector continues to depend heavily on imported inputs, there is great potential for increased import substitution of such inputs to increase value added. The availability of abundant supplies of domestic food resources, such as palm oil, cocoa,

pineapples, aquaculture products as well as poultry provides important sources of inputs for the local food processing industry. As the industry is dominated mainly by SMLs, the Government is encouraging them to upgrade and expand capacity to produce not only for the local market but also for exports.

In line with the increase in domestic demand, the output of the **beverages sub-sector** increased by 21.7% during the first seven months of 1994, after a decline of 20.4% in 1993. The production of carbonated and non-carbonated beverages rose strongly by 17.6% (January-July 1993: 7.2%). The output of the **tobacco** industry declined by 1.7% during the same period. About 70% of the cigarettes are made from locally grown tobacco leaves, with the balance being imported from the US and South America. More than 80% of the local tobacco consumed is sourced from Kelantan and Terengganu.

Petroleum and Gas Products

With large reserves of oil and gas, the potential development of the **petroleum and gas refining industries** remain bright. The main sub-sectors of the petroleum and gas industry consist of the petroleum and natural gas refining industries while other sub-sectors include the blending of lubricating oil, transformer oil and related products. The petroleum refining industry registered only a marginal growth of 1.5% during the first seven months of 1994 (January-July 1993: 12.4%) as a result of the decline in crude oil output during the period. Total output of refined fuel oil by the petroleum refineries amounted to 1.3 million tonnes (January-July 1993: 1.4 million tonnes) while that of liquefied petroleum gas totalled 682,393 tonnes (January-July 1993: 534,765 tonnes). The output of gasoline for motor vehicles amounted to 986,532 tonnes (January-July 1993: 1 million tonnes).

The total refining capacity of the five refineries is expected to increase by 46.2%. The additional refining capacity is on account of the sweet crude train in the refinery at Tangga Batu, Melaka with a capacity of 100,000 barrels per day (bpd). The refinery commenced operations in May 1994. The refinery in Kerteh is also expected to increase its production capacity from 30,000 bpd to 40,000 bpd when expansion work is completed in late 1994.

Table 4.4
Growth Rates of Selected
Food Manufacturing Sub-sectors
(%)

	1993	1993	1994
		(January-July)	
Rice mills	-1.3	1.4	-4.9
Dairy products	4.6	7.8	10.1
Biscuit factories	3.9	4.0	9.2
Fish, crustacea and similar foods	-2.7	5.3	-15.8
Palm oil	11.6	14.5	10.2
Palm kernel oil	18.7	22.1	5.0
Flour mills	2.9	-0.7	11.5
Sugar factories and refineries	0.5	2.8	1.3
Cocoa, chocolate and sugar confectionery	28.2	28.3	5.3
Animal feeds	-3.0	-3.1	1.1
Other food products	1.7	2.3	-1.1
TOTAL	8.9	10.9	6.7

Source: Department of Statistics.

Table 4.5**Domestic Refining Capacity for
Crude Oil**
(‘000 barrels per day)

	1993	1994 ^a
Designed capacity	238.0	348.0
Actual processing	225.5	298.0
Domestic crude	195.5	268.0
Imported crude	30.0	30.0

^a Estimate.

Source: Ministry of Domestic Trade and Consumer Affairs.

In order to develop Port Kelang as an entreport port, the provision of bunkering services has been included as part of the port's future development. In this regard, PETRONAS is studying the possibility of supplying bunkering fuel from its refinery in Melaka to Port Kelang. This is expected to be implemented in the second phase of development of the Melaka refinery in 1997/98.

In the **gas sub-sector**, the completion of the Peninsular Gas Utilisation (PGU) projects I and II has established a natural gas reticulation network that is supplying gas to power stations at Paka, Pasir Gudang, Port Dickson, Connaught Bridge, Kapar in Peninsular Malaysia as well as Senoko in Singapore. Gas is also supplied to the Independent Power Producers (IPP), petrochemical industries and a gas company which has been set up to implement and manage the Natural Gas Distribution System (NGDS) to supply gas to smaller consumers in industrial, commercial and residential areas. The implementation of the NGDS has already started in Kemaman, Kuantan, Pasir Gudang, Seremban, Kelang and Shah Alam. There are currently 23 enterprises being supplied with gas through the NGDS. The second phase of the NGDS development will include Kluang, Bangi, Petaling Jaya and Kuala Lumpur. The PGU III project which involves the extension of 549 kilometres of the pipeline northwards from Meru in Kelang to Lumut and from Lumut to Bukit Keteri, Perlis and a Gas Processing Plant (GPP4) is planned for completion in 1995 and will provide

further impetus to the establishment of a gas reticulation system in the northern region of Peninsular Malaysia.

The use of natural gas in the form of Natural Gas for Vehicles (NGV) was developed in 1991. To encourage a wider use of NGV, compressed natural gas is priced at half the price of premium petrol while car conversion kits are exempt from import duty and tax. As at the end of July 1994, 865 petrol vehicles, mostly taxis, have been converted to operate on NGV. PETRONAS, together with Heavy Industries Corporation Malaysia and a local transportation company, has launched a programme to use NGV for heavy vehicles. A 'Monogas City Bus' is presently on field trial. Another new usage of gas is in air-conditioning. A direct cooling system using gas is being implemented in the Kuala Lumpur City Centre project and this is expected to be completed in 1995. There are also plans to implement a similar system for the Kuala Lumpur International Airport at Sepang.

The other projects in the pipeline for the downstream gas industry include the construction of two additional LNG plants, LNG 2 and LNG 3 as well as the Liquefied Petroleum Gas (LPG) Extraction Plant, all in Bintulu. LNG 2 and LPG Extraction are expected to be fully operational by 1996 while the feasibility studies on LNG 3 are expected to be completed by 1994.

In the lubricating and transformer oil and related products sub-sector, 14 companies are now in production. Another seven companies have been approved for production and six are being implemented. The total approved capacity of the 21 companies is estimated at 350 million litres of output per annum. With domestic demand amounting to about 400 million litres per annum, the excess domestic demand is met by imports, mainly from Singapore and China.

In view of the vast potential of the petroleum and the gas industry, the Government has identified the petrochemical industries as some of the spin-off industries from the petroleum and gas refining sector. The large reserves of gas too are expected to lead to greater substitution of gas for other fuels for industrial, household and transportation requirements. The expected growth in these sectors is anticipated to sustain further expansion of the gas refining sector.

Chemicals, Petrochemicals and Plastic Products

During the first seven months of 1994, the production of **chemicals and chemical products**, comprising industrial chemicals, other chemical products and the manufacture of plastic products, registered a growth of 11.6% compared with 6.7% during the corresponding period in 1993. The major source of growth in output of industrial chemicals was from the production of industrial gases. In the case of other chemical products, the growth was mainly due to increased output of paints, varnishes and lacquers as well as soap and cleansing preparations. The pharmaceutical sub-sector, however, recorded a slight decline in output during the first seven months of 1994 (-1.9%).

The output of the **industrial chemical sub-sector** rose by 11.6% during the first seven months of 1994 (January-July 1993: 5.6%). The increase was mainly due to higher output of industrial gases (which include mainly the production of oxygen, nitrogen, hydrogen, carbon dioxide and acetylene) as well as other basic industrial chemicals. Domestic requirements of most types of industrial gases are met by local manufacturers, though some imports of specialty gases for specific industrial uses are undertaken, including rare gases, argon and specialty gas mixtures. The demand for acetylene and hydrogen is expected to increase in future, due to the rapid expansion of the industries utilising these products. So far, 12 companies have been approved to manufacture industrial gases, out of which 10 are in production.

During the first seven months of 1994, the output of **fertilisers and pesticides** declined by 9.1% (January-July 1993: -10.1%). Malaysia is self-sufficient in the production of nitrogenous type of fertilisers, such as urea and ammonia nitrate. However, two other main types of fertilisers imported are phosphatic and potassic fertilisers. In the case of the pesticide sub-sector, the main components produced are herbicides in the form of tablets, capsules, liquids, powders, ointments and injections. During the first seven months of 1994, output of liquid herbicides rose 8.1% to 18,437,000 litres whilst non-liquid herbicides declined by 4.3% to 749 tonnes. Presently, more

than 90 companies have been given approvals to produce fertilisers and pesticides, of which more than half are in production.

The output of **plastic products** increased by 10.4% during the first seven months of 1994 (January-July 1993: 12.8%). The large influx of foreign investment in the electrical and electronic industry, together with the expansion of the automobile industry have increased demand for plastic products. Despite this rapid growth of the industry, the per capita consumption of resins in Malaysia is estimated at 15 kg, which is low when compared with developed countries. Malaysia is almost self-sufficient in paints, with only 10-15% of domestic requirements being imported. So far, 35 companies have been approved for the manufacture of paint and allied products. Of these, 23 companies are in production. During the first seven months of 1994, output of the paint industry rose by 5.8% (January-July 1993: 12.4%).

The **soap industry** produces soaps using locally available vegetables oils, namely palm oil, palm kernel oil and coconut oil. However, the industry is also switching over to fatty materials. Both imported and local materials are used in the detergent industry. The cosmetic and toilet preparations industry uses mainly imported ingredients for their products. So far, more than 80 companies have been approved for the soap, cosmetic and toilet preparations sub-sector of the industry with more than half in production. About 30% of these companies produce mainly soap and detergents. During the first seven months of 1994, the production of soaps and detergents is estimated at 63,122 million tonnes.

The **pharmaceutical industry** comprises the modern pharmaceutical industry and the traditional remedies industry, with most companies involved mainly in mixing and blending of medicinal formulations. During the first seven months of 1994, total output declined by 1.9%. There are about 50 companies approved to produce both types of the pharmaceutical products, with more than 40 companies in production. The majority of the traditional medicines and herbal remedies producers are small-scale industries.

The **petrochemical industry** is an emerging industry in Malaysia. There is a fully integrated

petrochemical complex in Pasir Gudang producing propylene, polypropylene, ethylene and polyethelene. The MTBE/Propylene and Polypropylene plants in Kuantan have started operations. In the case of plastic resin production, there are two polyvinyl chloride plants operating, which cater only for the domestic market. There are also three polystyrene plants producing mainly for the export-oriented plastic manufacturers in the Free Industrial Zones. In addition, an existing company has been approved to set up a second polystyrene plant. Presently, there are at least ten companies producing formaldehyde, phenol formaldehyde and their related products. In addition, nine other companies have been approved for the production of these petrochemical products. There is also a polyester staple fibre plant in Prai, a methanol plant in Labuan and the ASEAN urea/ammonia plant in Bintulu, Sarawak. Furthermore, there is a plasticiser plant in Johor and another producing phenolic resins and moulding compounds in Ipoh, Perak. Approvals have also been given to 35 companies to establish petrochemical plants in the country. With the availability of petroleum and gas, there is great potential for the development of the petrochemical industry, not only for import substitution but also for the export market. Over the longer term, the plastic products and industrial chemical sub-sectors are also expected to have great growth potential, as the rapid growth in industries, particularly the automobile, electrical and electronic products and the food packaging industries will increase demand for chemical and plastic products.

Non-Metallic Mineral Products

The **non-metallic mineral products** industry produces mainly for the construction industry. Its products include hydraulic cement, cement and concrete products, clay products (such as ceramic tiles and earthen bricks) as well as glass and glass products. The performance of the non-metallic mineral industry is closely related to the construction industry. During the first seven months of 1994, the output of the non-metallic mineral industry expanded by 9% (January-July 1993: 6.4%) while the production of glass and glass products expanded strongly by 19% (January-July 1993: -9.9%). The strong growth registered by most of the major non-metallic mineral industries has been

generated by the rapid expansion of construction activities, especially the construction of large infrastructural projects in the last few years.

All the major component products of the industry, except for hydraulic cement, registered increases in production. The output of **cement** increased by 4.6%, while that of structural clay products rose by 16.5% (January-July 1993: 10.5% and 4.1% respectively). Hydraulic cement output rose only by 4.1% during the first seven months of 1994, largely due to several factories stopping production in 1993 for upgrading of their existing plants. For the whole of 1994, the domestic production capacity of cement in Peninsular Malaysia is estimated at about 10.3 million tonnes, while that for clinker is 8.6 million tonnes. In Sabah and Sarawak, the production capacity of cement is about one million tonnes. Clinker still needs to be imported to supplement the shortfall in domestic clinker production. The shortfall is estimated at about 1.9 million tonnes and is expected to rise given the rapid growth in the domestic construction industry. In response to the strong growth in cement demand, two new cement plants have commenced operations in April 1994 in Negeri Sembilan and Perlis.

The **cement and concrete products sub-sector** produces a wide range of products manufactured from cement and concrete including flat sheets, roofing sheets, pipes, ready-mixed concrete and concrete beams. Sustained by the strong expansion in construction activities, the production of cement and concrete products rose by 14.4% during the first seven months of 1994 (January-July 1993: 7.2%). In the case of clay products, production has been on the uptrend for the last few years. Between 1989 to 1993, the production of structural clay products expanded at an average of about 17% per annum. During the first seven months of 1994, structural clay products output rose by 16.5% (January-July 1993: 4.2%). A number of new firms have entered the industry, which has led to rapid growth in output. Several ceramic tile producers are producing not only to meet domestic demand but also for the export market.

The **glass and glass products industry** which produces primarily flat glass, glass containers and tableware, recorded a significant output growth

of 19% during the first seven months of 1994 (January-July 1993: -9.9%). Downstream activities, such as the production of safety glass, mirrors and furniture glass have also expanded. Two factories have recently gone into the production of glass funnels and panels for television sets from imported raw glass. One of these companies is expected to start glass melting in December 1994 while the other in 1995. These two new glass melting projects are expected to generate output not only for the domestic market but also for exports as well.

The prospects for the non-metallic industry are expected to remain strong in the next few years, given the continued strong expansion in residential construction as well as the construction of several large infrastructural projects, like the Kuala Lumpur International Airport (KLIA), the Light Rail Transit System (LRT), the Second Causeway between Singapore and Johor as well as sports facilities for the Commonwealth Games in 1998. The non-metallic mineral industry, like other industries, faces the problem of lack of skilled workers. As a result, existing manufacturers are expanding their investment in new plants and machinery to increase automation and, therefore, reduce the dependence on labour.

Iron and Steel and Metal Products

The **iron and steel industry**, consisting mainly of primary iron and steel and other iron and steel basic industries, expanded by 7.8% during the first seven months of 1994 (January-July in 1993: 20.7%). The more moderate increase in output growth was due to the low rate of production in the other iron and steel basic industries, which rose by only 7.5%, and the primary iron and steel industries which rose by 7.9% during the first seven months of 1994 (January-July 1993: 7.4% and 27.6% respectively).

The iron and steel industry is concentrated mainly in the production of long products like bars, rods and wires. Since Malaysia has not developed any integrated flat steel complex to produce hot and cold rolled coils and sheets, products like steel sheets, strips and plates have to be imported, together with special grade billets and some specialised heavy duty steel pipes.

There is, therefore, a need to develop integrated steel plants for the production of flat products required by other heavy industries like the shipbuilding, automotive and machinery industries. The industry is, however highly capital intensive and requires large-scale operations.

The **non-ferrous metal basic industries** include the tin-smelting industry and the other non-ferrous metal basic industries such as the lead, aluminium, copper, zinc and nickel industries. During the first seven months of 1994, production in the non-ferrous metal basic industries rose by only 2.1% (January-July 1993: 9.3%) due mainly to the decline in the tin-mining industry. Tin smelting output declined by 1.9% during the period under review. The two tin smelters in Butterworth and Penang are the two largest in the world. As domestic tin production declined drastically, the smelters have to rely on imports. The production of other non-ferrous metal basic industries also rose moderately by 6.2% during the first seven months of 1994 (January-July 1993: 15.8%).

The **fabricated metal products industry** generally comprises two sub-sectors, that is, fabrication for the light engineering industries and fabrication for the heavy engineering industries. The fabrication of steel and aluminium structures caters for both heavy engineering and light engineering. Heavy engineering caters for industries like construction and mining. The output of the heavy engineering industries include the manufacture of modules, deck sections, cranes, derricks, pylons, buildings and hangars. In the case of light engineering metal products, the output includes domestic items like doors and window louvres, iron gates, partitions, wire netting, packaging materials, brass, copper and pewter products.

During the first seven months of 1994, the **fabricated metal products industry** expanded significantly by 32.8% (January-July 1993: 76.7%). The increase in output was attributed mainly to the strong expansion in the production of structural metal products, which rose by an impressive 59.5% (January-July 1993: 137.8%) as a result of buoyant construction activities which have generated a strong demand for structural metal products. The tin cans and metal boxes sub-sector also recorded strong growth of 18.1% (January-July 1993:

-5.0%). This is attributed to the increased demand for packaging products, especially by the food processing industry.

The **fabricated metal industry** is a highly diversified industry. The annual domestic demand is significant, estimated at about RM2 billion. There are also an estimated 2,000 enterprises involved in metal product fabrication. The industry has a potential for growth, in the light of demand for fabricated metal products expected to be generated by the construction sector, the petroleum and petrochemical industries, the food processing industry as well as other industries in the manufacturing sector. The sector has been identified as one of the potential growth sectors in manufacturing and is designated as a high priority sub-sector for development.

Transport Equipment

Following the moderate pickup in 1993, the output of the **transport equipment industry** is expected to record a stronger growth in 1994. This is due to strong external demand as well as to the effect of the relaxation of several restrictions on the provision of hire-purchase loans for private cars. During the first seven months of 1994, the output of the transport equipment industry increased by 5.2% (January-July 1993: 3.2%). The output of the three main sub-sectors within this industry, that is the manufacture and assembly of motor vehicles, the manufacture of motor vehicle parts and accessories as well as the manufacture and assembly of motorcycles and scooters increased by 3.6% and 9.7% and 7.9% respectively (January-July 1993: -1.4%, 1.7% and 9.8%).

There are presently 13 **motor vehicles assembly plants** in operation with an installed capacity of the 306,000 units of motorcycles and 202,000 units of passenger and commercial vehicles per year. PROTON accounts for 70% of the domestic market for passenger cars. In the third quarter of 1994, the Second National Car Project the PERODUA begun production with a

planned production capacity of 45,000 units a year. The number of passenger cars manufactured and assembled during the first seven months of 1994 totalled 88,106 units (January-July 1993: 81,637 units).

The production of commercial vehicles has been adversely affected by high duties in the past. After a significant decline of 60% in output in 1992, its production rose by 7.6% in 1993 and 21.7% during the first seven months of 1994. The number of motorcycles and scooters produced also increased by 5.4% during the first seven months of 1994 (January-July 1993: 8.7%). The output of both commercial vehicles and motorcycles has been stimulated by the buoyant economy and increased need for transportation services.

The production of the **motor vehicle components sub-sector** increased by 9.7% during the first seven months of 1994 (January-July 1993: 1.7%). The increase reflects the development of the motor vehicle component parts industry which has responded to the Government's encouragement for increased local content in industry. Its development will continue to contribute to the upgrading of local engineering and technical skills in the manufacturing of precision and sophisticated products. The components are manufactured mainly for the replacement market. Presently, there are about 200 companies involved in the manufacture of automotive components, including motorcycle parts and more than 70 of them cater for the original equipment market. There is great potential for the component parts industry in both the original equipment market of the assembly sector as well as in the replacement market. To realise this potential, the First National Car Project has been made the focal point for the development of component manufacturing. In this context, a Local Content Programme for passenger commercial vehicles was implemented in 1992. Under this programme, local content targets ranging between 45% to 60% has been set for various categories of vehicles for the next seven years. So far, a local content of 51% has been achieved by PROTON and about 30% by other passenger vehicles and commercial vehicles.

FEATURE ARTICLE 2

Towards the Development of High-Tech Industries in Malaysia

The Industrial Master Plan (IMP) for Malaysia was launched in 1986. It recognised the importance of developing high technology industries to pave the way for Malaysia to become an industrialised nation. The Government also launched the Action Plan for Industrial Technology Development (APITD) and a Committee was established to formulate the action plan in October 1987. In 1990, the APITD which outlines the strategies to encourage the development of industrial technology and provide the environment under which technological development can flourish was drawn up. In the APITD, several structural weaknesses relating to the state of technological development in the country were recognised. These include the weak science and technological (S&T) infrastructure in the country, the inadequate technology in industry and the lack of the human resource base to support industrial technology. Thus several strategic thrusts were outlined in the APITD to address these shortcomings. These strategic thrusts include the need to upgrade the development of key emerging technologies, strengthen institutions and mechanisms for technological development and encourage invention, innovation and technological advancement. It is with these objectives that a Cabinet Committee on Science and Technology was established and the Ministry of Science and Technology and Environment was charged with the responsibility of formulating, coordinating and monitoring effective S&T policies.

The need for Malaysia to move towards high technology industries is becoming increasingly necessary given that the country now faces shortages of labour with the rapid growth in the economy since 1988. Furthermore, other surplus labour countries, like Vietnam and China, are opening up their economies to foreign investors and Malaysia will no longer be able to compete for labour-intensive industries against these countries. In addition, Malaysian industries must also restructure to go upscale in technology in order to remain efficient and competitive in a rapidly changing global environment. Thus, the push towards the development of high-tech industries was given greater attention under both

the Sixth Malaysia Plan and the Mid-term Review of the Sixth Plan. Key industries designated for intensified industrial technology development were identified and these include the aerospace industry, advanced materials, micro-electronics, automated manufacturing technology, biotechnology and information technology.

The Aerospace and Advanced Materials Industries

The aerospace industry in Malaysia is a relatively new industry and has started to emerge only in recent years. The Government's objective is to develop the aerospace industry as a new strategic sub-sector, particularly for the manufacture of light aircraft and aircraft components. In addition, the aerospace industry is expected to provide opportunities for the development of components related to the engineering and avionics service industries, as well as the development of advanced materials technology.

So far, a few major enterprises have been identified as the major players in the aerospace industry. These include, among others, Aerospace Industries Malaysia Sdn. Bhd. (AIM) and its subsidiary Aircraft Inspection Repair Overhaul Depot (AIROD), SME Technology Holdings Bhd, Composites Technology Research Malaysia Sdn. Bhd. and Permodalan Nasional Berhad or PNB (which has gone into joint ventures with other aerospace enterprises). The Malaysian Airlines, the second national airline as well as other smaller airlines, together with related Government agencies, will also form part of the larger institutional framework to support the development of the aerospace industry in the country.

Aerospace Industries Sdn. Bhd. (AIM) was incorporated on 31 December 1983 as an investment holding company. AIROD, its subsidiary, was established on 10 December 1984 as a joint venture between AIM and Lockheed Aircraft Service International (LASI). The principal activities of AIROD are the provision of overhaul, repair and modification services to military and commercial aircraft as well as to supply related equipment and components to such aircraft companies. AIROD has established a joint venture company with a French company, Dornier Seastar,

and other local partners to manufacture the Seastar CD2 Amphibious Aircraft. The Seastar CD2 is an amphibious two-seater flying boat with a composite aircraft structure and can be used for maritime patrol search and rescue operations, off-shore oil operations and tourism related activities.

Syarikat Malaysian Explosive Technologies (SMET) and its four subsidiaries, SME Aerospace, SME Aviation, SME Manufacturing and SME Engineering, are also involved in the Malaysian aerospace industry. SMET's involvement in aerospace activities commenced in 1985, with the manufacture of mechanical components for the Lockheed Digital Flight Data Recorder (Black Box) and also special tooling for Malaysia Airlines. SME Aviation, its subsidiary, has recently built a light trainer aircraft, the SME MD3-160 which has been designed and developed by MDB Flugtechnik AG of Switzerland and is a two seater, all metal airplane, suitable for leisure flying, basic and aerobatic training. Another subsidiary, SME Aerospace, was incorporated in 1992 and it manufactures aircraft components. SME Aerospace has also expanded its sheet metal working capability, established new facilities for metal bonding and fabricate composite components for supply to SME Aviation Sdn. Bhd. The other two subsidiaries of SMET are SME Engineering (which manufactures aerospace components and equipment as well as general engineering products) and SME Manufacturing (which produces mainly automatic assault rifles).

The Government has also acquired the MIG29 airplanes from Russia for defence purposes. This acquisition will give a further boost to the aerospace industry in Malaysia. Under the Memorandum of Understanding signed between Malaysia and Russia, a joint venture company has been set up to provide service and support to the MIGs and other Russian airlines. Another enterprise involved in the aerospace industry is PNB which has plans to establish an Aerospace Park near the Subang International Airport. The aim is to attract aerospace component manufacturers, aerospace service providers and manufacturers to Malaysia. The use of the Aerospace Park is not limited to the production of components and the provision of aerospace services but also as a distribution centre for aerospace components and equipment as well as goods that use air transport. Other enterprises have also been

identified as potential manufacturers of precision and high-tech aerospace components and for the provision of related activities. To develop the aerospace industry, the Government has also signed Offset Programme Agreements with several foreign aviation agencies. These agreements cover areas such as transfer of technology, maintenance, support services and training which are important to the overall development of the aerospace industry in Malaysia.

In 1990, the Government agreed to develop the composite materials industry in the country. Thus, Composite Technology Research Malaysia Sdn. Bhd. (CTRM) was established in 1991 for the manufacture of aircraft as well as to act as a vehicle for the acquisition of composite technology in Malaysia. CTRM entered into joint ventures with several foreign composite material companies to develop composite materials. In a joint venture with PETRONAS, CTRM formed Eagle Aircraft Malaysia Sdn. Bhd. (EAM), which in turn has acquired 100% ownership in Eagle Aircraft Pty Ltd. (EAPL) of Perth, Australia. EAPL has developed an all-composite two-seater general aviation aircraft, Eagle XTS. The first Eagle XTS aircraft in Malaysia was launched in October 1993. A Composite Technology City (CTC) is being set up in Melaka to encourage organisations involved in the manufacturing of composite materials to establish operations in Malaysia. Industries in the CTC will manufacture parts of Eagle XTS, composite components for other aircraft, manufacture and fully assemble the Eagle XTS as well as design and manufacture new generations of Eagle aircraft and other aircraft components.

Other measures are also being planned by the Government to support the development of the composite materials industry. These include the establishment of an Advance Materials Research Centre (AMRC) in the Kulim High-Tech Park. A directory on Researchers, Equipment and Research Activities on Advanced Materials has also been started to provide information on the work done on advanced materials in the country. A comprehensive plan for the development of advanced materials is also being drawn up. The plan will evaluate the existing capacity of industries to produce advanced materials, the sectors which can benefit from its production as well as the technology required.

Electronics, Micro-Electronics and Automated Manufacturing Technology

Another area that has been earmarked for the development of high-tech industries in Malaysia is in the area of micro-electronics. Electronic technology has undergone rapid transformation during the last four decades, which saw the shrinking of constituent parts of electronic products to miniature forms, made possible by the development of micro-electronics. Furthermore, the growth in embedded intelligence and processing power allows for a wide range of more sophisticated electronic and electrical products to be developed. As electronics form the base for many high-tech processes and products, it is part of Malaysia's industrial policy to encourage the domestic electronic industry to undertake greater technological upgrading and to move into the area of micro-electronics and automated manufacturing.

At present, the Malaysian electronic and electrical industry is one of the most important manufacturing sectors in the economy. The industry has also undergone significant structural changes in the last two decades. In the 1970s, the electronic component sector contributed about 90% of the entire electronic industry. However its contribution declined to less than 70% as the industry now shows a more diversified structure, with the consumer electronic and industrial electronic sub-sectors together contributing about 32% of the electronic sub-sector output. These encouraging improvements over the last few years resulted from the large inflow of new investments into the consumer and industrial electronics sector by Japanese, Taiwanese and US firms.

There is also now greater vertical integration, which allows more of the components produced to be used as inputs for the manufacture of finished products. Furthermore, the capital intensity and technology intensity of the industry have also increased. In addition, the range of electronic and electrical products manufactured has increased to a large extent. However, there is still a need for a further deepening of product design and technology. Most of the firms in the industry are still mainly engaged in assembly activities. Despite the long presence of the electronic industry in the country, the linkages with local industries are still not that developed and the level of local

content in the industry remains low. Transfer of technology, too, has not been significant. Under the new industrial strategy of promoting high-tech industries, greater encouragement will be given to industries to go into wafer fabrication, technologies for manufacturing automation and engineering as well as computer-aided design and computer-aided engineering technologies.

A new design sub-sector has also emerged in the electronic industry to serve downstream integrated circuit (IC) users and customers. This can open up vast opportunities for the electronic industry in Malaysia. The local industry can go into new age IC production, design or application. Production of the new age IC devices will involve linking up with established semi-conductor houses for the local industry to move away from the present standard semi-conductor component production. On the design level, several companies have merged and user-type companies are integrating backwards into design. In the third area of application, the local electronic industry can move into the application of the new IC devices on a larger scale into industries like consumer electronics, computers and telecommunications. Thus, some existing IC manufacturers in Malaysia have already integrated backwards into wafer fabrication, an important pre-requisite for upstream IC designing. Wafer fabrication facilities have been set up in Penang and in Seremban. More are being planned by some of the existing IC producers. Other producers have moved forward into the fabrication of either finished goods or accessories or parts. Thus, a number of companies have set up plants to produce disk drives, computers, telecommunication equipment and calculators. Other manufacturers have set up design centres to design VLSI (very large-scale integrated) semi-conductors. One centre in Penang designs micro-controller products for embedded control applications, including electronic systems for home appliances, office automation products, computers, hard disk drives, industrial robots as well as equipment for the automotive aerospace and communication industries.

The Government is also trying to encourage industries to go into automated manufacturing technologies. In a move to promote computer-aided design/computer-aided manufacturing (CAD/CAM) in the country, the Standard and Industrial Research Institute of Malaysia (SIRIM) is setting

up a CAD/CAM laboratory at its Advanced Manufacturing Technology Centre (AMTC). The major functions of the laboratory is to coordinate and spearhead the national CAD/CAM related Research and Development (R&D) programmes between universities and industries and to act as a centre of reference for CAD/CAM technology.

Biotechnology Industries

Biotechnology refers to the application of scientific and engineering principles on biological agents for the production of goods and services. Biotechnological processes are already being used in several industries in Malaysia. In agriculture, biotechnology has been used in the production and processing of some of Malaysia's commodities like rubber, palm oil, sago, rattan, bamboo, fruits and vegetables to increase yields and to develop crop strains which are more resistant to pest and diseases. Biotechnological research activities are also being undertaken by some local institutions on the potential of producing herbal compounds for medical and commercial uses. Thus, the extracts of compounds from palm oil are now being used to produce vitamin E and carotenes. Biotechnology is also used for the development of better vaccination, culture, immunological and other medical products to improve the potential for further developing the pharmaceutical industry. In husbandry, biotechnology is used to improve cattle strains to increase milk and meat output as well to develop cattle that are more resistant to diseases. The development of better poultry vaccines has also benefitted the poultry industry. Some local institutions are also undertaking biotechnological investigations into the potential of integrated commercial goat and chicken development projects. Industrial fermentation using biotechnological processes is also used in many food and beverage industries in Malaysia. In addition, biotechnology can be used in the area of environment protection, especially for the treatment and management of industrial wastes as well as wastes from the production of agricultural crops like oil palm and rubber to make them less hazardous to the environment. At the same time, biotechnological processes can convert the effluents to greater value-added products, like biogas, fertilisers or products to facilitate fermentation.

Even though various biotechnologies are used in several industries in Malaysia, the availability

of large scale R & D in biotechnology in the country is still limited. There is still a scarcity of qualified manpower in the biotechnological field in the country and most of the R & D related to the field is currently undertaken by public sector institutions. The private sector will, therefore, need to be encouraged to undertake R & D in biotechnology on a larger scale. It is towards this direction that the Government has identified biotechnology as one of the areas to be promoted in its policy to encourage high-technology industries. In this context, the Government has set up a Working Group, which through its National Biotechnology Programme, has successfully implemented projects to upgrade the biotechnological capacity of the country. These include projects in molecular biology, genetic engineering, industrial and environmental biotechnology as well as medical biotechnology. There are also plans to set up a National Biotechnology Centre to coordinate all activities related to the field of biotechnology and to establish various funds for training in biotechnology.

Information Technology Industries

It has been estimated that Malaysia spent an average of about RM1.5 billion per annum on information technology (IT) in the early 1990s. The market for IT is expected to expand more strongly with the robust economic growth and the rapid rate of computerisation in the country. The IT industry is closely related to the electronic and telecommunications industries. Thus, the rapid development of the telecommunication sector that the Government plans to undertake will help to expand the IT industry. Malaysia has already one of the more developed telecommunication networks in the developing world. An even more advanced telecommunication infrastructure, utilising modern technologies like optic fibres, satellites, wireless transmissions and digitization will be further developed to provide more reliable and efficient services. At the same time, the country will have its own satellite services with the launching of the Malaysia East Asia Satellite (MEASAT) in 1995. Furthermore, the telecommunication infrastructure will be further expanded and upgraded in the rural areas while on the external front, telecommunications will also be improved upon to speed up international communications between Malaysia and the rest of the world. The Government, too, is encouraging the telecommunication industry to expand to overseas markets.

All these developments auger well for the IT industry as the potential market for the industry's products and services will be expanded significantly.

To speed up the development of the IT industry, the Government has formed a Working Group on Micro-electronics and Information Technology under the National Council for Research and Scientific Development. The Working Group has identified several areas critical to the growth of micro-electronics and IT in the country. The areas include IT development and management, telecommunications and data services, the computer industry and the small and medium-scale industries supporting IT industries. Expert groups have been set up in each of these areas to analyse developments and formulate appropriate strategies to promote the development of the micro-electronic and IT industries. The strategies include identifying small and medium-scale industries that can participate in the IT industry, the niche areas of IT technology for Malaysia, the existing IT capabilities, the areas for joint ventures between foreign and local IT companies, the infrastructure and manpower resources required for IT development.

In connection with the development of the IT industry, the Malaysian Institute of Micro-Electronics Systems (MIMOS) has implemented the Joint Advance Research Integrated Networking (JARING), which is a national information network infrastructure. The network was started in 1987 with the launch of Rangkom or Rangkaian Komputer Malaysia (Malaysian Computer Network). Rangkaian was renamed JARING. In 1992 MIMOS established a leased line link to the US. With this link, subscribers can get direct access to the Internet information network. There are also plans to link up schools and institutions of higher learning to JARING. This will enhance information sharing in the country and provide greater stimulus to the development of the IT industry.

Technology Parks

Several technology parks are also being established by the Government to encourage the development of high-tech industries. Malaysia's first technology park was opened in 1988 and

was initially housed at temporary premises in Bandar Tun Razak, Kuala Lumpur. The Park will eventually be moved completely to Bukit Jalil. Three other technology parks are being developed, including the Kulim High-Tech Industrial Park in Kedah, the Johor Technology Park in Skudai and the Sarawak Natural Resources Park. The objectives of these technology parks are to promote and improve the technological content of local industries, encourage R&D in both the public and private sectors, provide sites for the growth of high-tech industries, disseminate high-tech information to industries and facilitate technology transfer to domestic industries.

Other Measures to Promote High-Tech Industries

Other measures have also been taken by the Government to promote high-tech industries. These include the establishment of the Malaysian Technology Development Corporation to commercialise research and technology from universities and research institutions as well as to encourage the growth of technology-based enterprises. There are also plans to review the APITD to meet current development trends. In July 1994 the Academy of Sciences of Malaysia Bill 1994, which sought to establish a corporate body comprising eminent scientists, engineers and technologists to encourage the development of the sciences, engineering and technology, has been tabled. The academy will provide a forum for the interchange of ideas, grant fellowships, research funds and sponsor scientific projects. Tax incentives have also been introduced to encourage the development of high-tech industries. These incentives include tax exemption on statutory income for five years or investment tax allowance at 60% on eligible capital expenditure for five years from the date of project approval for high-tech industries.

The development of high-tech industries will continue to be given emphasis by the Government. The aim is to accelerate technological competence and to develop innovation in industries. This is important in order that industries can remain competitive in a changing global environment and respond to the rapid developments in technologies abroad.

Agriculture Sector

Growth in the agriculture sector is expected to stagnate at 0.5% after achieving a growth of 3.9% in 1993. The stagnation is on account of declines in the production of major agriculture commodities comprising palm oil, timber, rubber and cocoa. In line with the performance of the agriculture sector, its share to total GDP is expected to be lower at 14.8% (15.9% in 1993) whilst its share to total employment is also expected to be lower at 20% (21.3% in 1993).

Palm oil production is expected to decrease by 3% to 7.18 million tonnes. The contraction in output is associated with the cyclical effect of tree stress as a result of a bumper crop in 1993. Similarly, the output of sawlogs is expected to register a further decline of 5.1% (-14.7% in 1993) in tandem with the stricter enforcement of planned production imposed by the state governments, aimed at sustainable forest production. Although

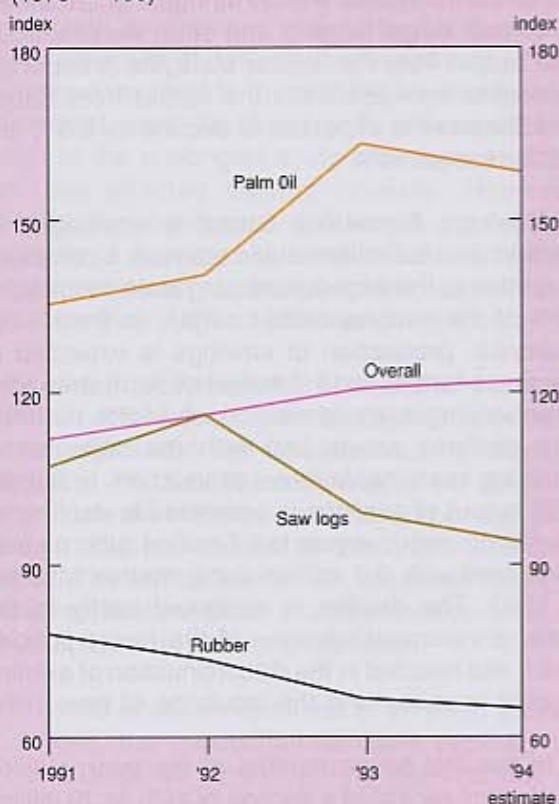
the prices of rubber are anticipated to be sustained at a higher level in 1994, the output of rubber is estimated to be lower by 5.6% to 1 million tonnes compared with 1.1 million tonnes produced in 1993. The expected decline is on account of the increasing area of untapped rubber trees as a result of labour shortages. Likewise, cocoa production decreased further by 2.5% (-9.1% in 1993), due to reduction in cocoa planted areas.

Palm Oil and Palm Kernel Oil

In 1994, the production of **crude palm oil** is anticipated to decline by 3% in contrast to a significant growth of 16.2% recorded in 1993. The decline is on account of tree stress as a result of bumper crop experienced in 1993. In addition, the decline is also associated with the poor extraction rate of 18.6% as loose fruits are not being picked due to labour shortages. In the first quarter of the year, output of crude palm oil surged by an annual rate of 11.2% to 1.5 million tonnes continuing the high output registered in the last quarter of 1993. However, production contracted by 14.3% in the second quarter bringing the cumulative output in the first half of 1994 to a negative growth of 3.7% compared with 16.1% attained in the corresponding period of 1993. In the first eight months of the year, output registered a negative growth of 5% to 4.3 million tonnes in contrast to 4.6 million tonnes registered in the same period of 1993. Output for the remaining months of the year is not expected to recover in anticipation of the continued tree stress. Changes in weather, due to haze that occurred in September 1994, is also expected to have an adverse effect on output. Notwithstanding this, Malaysia still retains its position as the world's largest producer of palm oil with a share of 51% of world production of 14.2 million tonnes in 1994.

Output from Peninsular Malaysia is estimated to decline by 2.8% to 6 million tonnes, representing 84% share of the total national output. Of the total production, Johor will lead with a share of 32% followed by Pahang (25%) and Perak (15%). The combined output from these three states constitute approximately 72% of total production in Peninsular Malaysia. In Sabah, production is estimated to decline by 3.9% to 1 million tonnes, while in Sarawak, production is expected to decrease by 3.5% to 158,290 tonnes. As such, their share to total national output is expected to be stable at 14% and 2% respectively.

Chart 4.2
Agricultural Production Index
(1978 = 100)



Total area cultivated with oil palm is expected to increase moderately by 7.6%. This increase is attributed to newly planted areas of 58,990 hectares, consequent to the conversion of land use from other uneconomic crops to that of oil palm and the opening of new areas especially in Sabah and Sarawak. On a regional basis, about 1.96 million hectares (80%) is located in Peninsular Malaysia, 403,507 hectares (16%) in Sabah with the balance of 89,467 hectares (4%) in Sarawak. Within Peninsular Malaysia, Johor, Pahang and Perak account for 1.4 million hectares or 57% of total national hectareage while Johor continues to remain the state with the largest area under oil palm (609,963 hectares), contributing approximately 25% of national hectareage.

The estate sector which comprises private and government agencies' managed estates, is estimated to account for about 2.24 million hectares or 91% of total planted area. The two subsectors contribute an almost equal portion of 50% equivalent to about 1.12 million hectares respectively. Within the Government managed estates, Federal Land Development Authority (FELDA) accounted for 64.6% or 727,644 hectares, Federal Land Consolidation and Rehabilitation Authority (FELCRA) 22.7% or 142,515 hectares while another 255,476 hectares is under various other government bodies. The smallholdings sector accounts for 9% or 210,913 hectares of the total planted area.

The yield of crude palm oil per hectare of matured area in 1994 is envisaged to decline marginally by 0.3% to 3,750 kilogramme compared with 3,763 kilogramme attained in 1993. The decline can be attributed to the stagnation of the extraction rate (18.6%) of crude palm oil associated with the continued labour shortage.

In contrast to the expected decline in crude palm oil production, the output of **palm kernel oil** is expected to increase marginally by 1.5%. In the first eight months of the year, production totalled 610,724 tonnes reflecting an increase of 2.5% compared with the output attained in the corresponding period of 1993. This increase can be attributed to the crushing of the carry-over stock of palm kernel from the end of 1993.

Timber

Malaysia's production of **sawlogs** in 1994 is estimated to decline by 5.1% for the second consecutive year to 35.3 million cubic metres, compared with 37.1 million cubic metres attained in 1993. The continued decline in output of sawlogs is attributed to the production quotas set by the state governments with the view to controlling the forest harvest as well as stringent enforcement to control illegal logging and other malpractices. The output from Peninsular Malaysia is expected to decline by 4.8% while the output from Sabah and Sarawak is expected to decline by 8.5% and 3.2% respectively.

Although Sarawak's output is envisaged to decline (to 16.2 million cubic metres), it continues to remain as the largest producing state contributing 46% of the national timber output. In Peninsular Malaysia, production of sawlogs is expected to decrease further to 10.7 million cubic metres after experiencing a sharp decline of 14.8% in 1993. The declines are in line with the objective of attaining sustainable forest production. In Sabah, total output of sawlogs is estimated to decline for the fifth consecutive year to 8.5 million cubic metres, compared with 9.3 million cubic metres attained in 1993. The decline is attributed partly to the state government's review of the forest policies which has resulted in the discontinuation of existing logging licences and the issuance of new ones.

In the first seven months of the year, sawlog production recorded a decline of 10% to 20 million

Table 4.6
Oil Palm Area and Palm Oil Production

	1993	% change	1994*	% change
Planted areas ('000 hectares)	2,281.0	3.8	2,455.0	7.6
Matured areas ('000 hectares)	2,007.3	1.2	2,160.4	7.6
Production ('000 tonnes)				
Crude palm oil	7,403.5	16.2	7,180.0	-3.0
Palm kernel oil	965.7	19.0	980.0	1.5
Yield (kg/hectare)	3,763.0	9.7	3,750.0	-0.3

* Estimate

Source: Ministry of Primary Industries

cubic metres, compared with 22.2 million cubic metres achieved in the corresponding period of 1993. The contraction in output was largely due to significantly low output from Sabah. For the remaining months of 1994, the timber output is expected to remain low.

In 1994, approximately 58% of Malaysia's total area is covered with forest. Of the total, 19 million hectares comprise natural forest while another 0.1 million hectares are plantation forest. In terms of distribution, some 6.2 million hectares are located in Peninsular Malaysia, 8.8 million hectares in Sarawak with the balance in Sabah. Malaysia is conscious of the need to conserve forest resources for environmental purposes and the need for sustainable exploitation of these resources. Consequently, approximately 4,640 hectares of forest is expected to be planted in 1994. This will bring the total hectareage under the forest plantation program to 97,476 hectares by the end of 1994.

Rubber

Malaysia's natural rubber production is expected to decline further by 5.6% in 1994 to 1 million tonnes. The continued contraction in production is attributed mainly to the decline in area under rubber cultivation as more rubber land is being converted to the planting of oil palm and other land uses. Another significant contributory factor is the prolonged acute shortage of labour that has affected tapping intensity. However, despite the continued decline in production, Malaysia is expected to remain the world's third largest producer of natural rubber, contributing approximately 18% of the world's output.

Output from Peninsular Malaysia is expected to constitute a major portion (96.4%) of total national output, with Sabah and Sarawak each contributing 2.6% and 1%. Smallholder's output will continue to dominate the industry, contributing approximately 72% or 730,800 tonnes of total natural rubber output. The estate sector, on the other hand, is expected to contribute 284,200 tonnes or 28% of total national rubber production.

In terms of the composition of different grades of rubber, the production of SMR declined by 8.1% to 255,150 tonnes during the first half of 1994, accounting for 55.3% of total rubber

production. Similarly, the combined output of RSS and processed latex declined by 13.4%. The decline was largely due to shortages of raw material for processing.

The total area under rubber cultivation in 1994 is expected to decline further by 1.4% to 1.76 million hectares. In Peninsular Malaysia, total planted area declined by 1.8% to 1.4 million hectares, resulting from the conversion of rubber lands to other crops and non-agricultural projects. On the other hand, the area planted with rubber in Sabah and Sarawak is expected to increase marginally by 1.1% and 0.4% respectively. The smallholders own 84% of rubber planted areas while the estate sector accounts for the balance of 16%.

Rubber yield is estimated to decline further in 1994. In the smallholding sub-sector the yield is anticipated to decline by 3.6% to 813 kilogrammes per mature hectare, while in the estate sector, the decline is even larger at 4.5% to 1,208 kilogrammes per mature hectare. The decline is largely on account of the existing low tapping intensity resulting from the labour shortage.

Table 4.7
Rubber Area, Yield and Production

	1993	% change	1994 ^a	% change
Total area ('000 hectares)	1,781	-1.6	1,756	-1.4
Smallholding	1,483	0.2	1,463	-1.3
Estate	298	-9.7	293	-1.8
Yield ¹ (kg. per hectare)				
Smallholding	844	-10.2	813	-3.6
Estate	1,265	2.0	1,208	-4.5
Total production ('000 tonnes)	1,075	-8.4	1,015	-5.6
% of world production	19.3	-10.6	18.0	-6.7
Smallholding	778	-7.2	731	-6.0
Estate	296	-11.6	284	-4.1

¹ Refers to Peninsular Malaysia only.

^a Estimate

Source: Ministry of Primary Industries and Department of Statistics.

However, efforts are continuously being taken by various Government agencies to minimise the problem of declining yields. These include the introduction of new tapping techniques to overcome the problems of labour shortage and the introduction of high yielding rubber clones. Some of the latest clones are the RRIM 938, PC119 and PC140.

Labour is expected to remain a critical problem in the plantation sector. This phenomenon has resulted in low tapping intensity and thus, reduced productivity. In January 1994, it is estimated that 67,973 workers are employed in the rubber estates, a decline of 9.8% from January 1993. Both the estate and smallholding sectors are now dependent on immigrant labour.

Other Agriculture, Livestock and Fishery

Output from other agriculture sub-sectors such as padi, cocoa, pepper, livestock and fishery is expected to show a mixed performance. **Padi** output from the eight granary areas of Peninsular Malaysia, Sabah and Sarawak is expected to increase marginally by 1.5% to 1.95 million tonnes, compared with 1.92 million tonnes produced in 1993. The expansion in output is on account of expected higher yield per hectare of padi produced in 1994, (3.7% to 3,051 tonnes per hectare). The 2.8% increase in hectareage of padi being planted for the main and off seasons during the year also contributed to the increase in output. On a regional basis, production of padi from Peninsular Malaysia is expected to account for 87% of total national output while Sabah and Sarawak account for 5% and 8% respectively. Similarly, the production of rice is expected to grow by 1.5% to 1.3 million tonnes in tandem with the increase in padi production. At this level of production, it is estimated that 80% of domestic consumption requirements, estimated at 1.61 million tonnes, will be met, well above the national target for self-sufficiency of 66%.

The production of **cocoa** is envisaged to decline further by 2.5% to 195,000 tonnes in 1994. The contraction in output is attributed largely to the continued decline in area under cocoa cultivation (-2.9% to 340,000 hectares). About 62% of the total production is expected to come from Sabah, 27% from Peninsular Malaysia with another 11% from Sarawak. In terms of hectareage, the area under cocoa cultivation in Sabah is still the largest

(173,500 hectares or 51%), followed by Peninsular Malaysia (106,000 hectares) and Sarawak (60,500 hectares).

After experiencing a marked decline of 32.7% in 1993, **pepper** output is expected to decline further by 1.1% to 17,300 tonnes, compared with 17,573 tonnes produced in 1993. The contraction in output is on account of stagnated (3.18 tonnes per hectare) pepper yield per hectare of matured area as a larger portion of matured areas is becoming less productive due to plant diseases. In addition to declining hectareage of pepper (for replanting), pepper growers have also left their crop unattended in the period of depressed prices, thus affecting productivity. Sarawak remains the main producer, contributing more than 99% of national pepper output.

Production of **major local fruits** comprising durians, rambutans, carambolas, guavas, mangosteens, bananas and papaya is expected to increase collectively by 10% to 919,000 tonnes in 1994. Amongst these, durian and rambutan

Table 4.8
Production of Other Agriculture
Livestock and Fishery
(‘000 tonnes)

	1993	% change	1994 ^a	% change
Padi	1,923	13.5	1,952	1.5
Cocoa	200	-9.1	195	-2.5
Pepper	17.6	-32.7	17.3	-1.1
Pineapple	161	-15.0	175	8.7
Tobacco ¹	92.3	-15.3	80.7	-12.6
Fruits ²	835	8.1	919	10.0
Fishery ³	1,047	12.3	1,114	6.4
Livestock ⁴	801	8.9	876	9.4

¹ Green tobacco leaves.

² Consists of seven major fruits namely durian, carambola, guava, rambutan, mangosteen, banana and papaya.

³ Marine fish landing only.

⁴ Including beef, poultry, pork and mutton.

^a Estimate

Source: Ministry of Agriculture and Ministry of Primary Industries.

production continue to be dominant, contributing 28.8% and 13.5% of total output respectively. The cultivated area of major fruits is also expected to increase by 15% to 263,935 hectares, in line with the Government's policy to develop the nation's food industry.

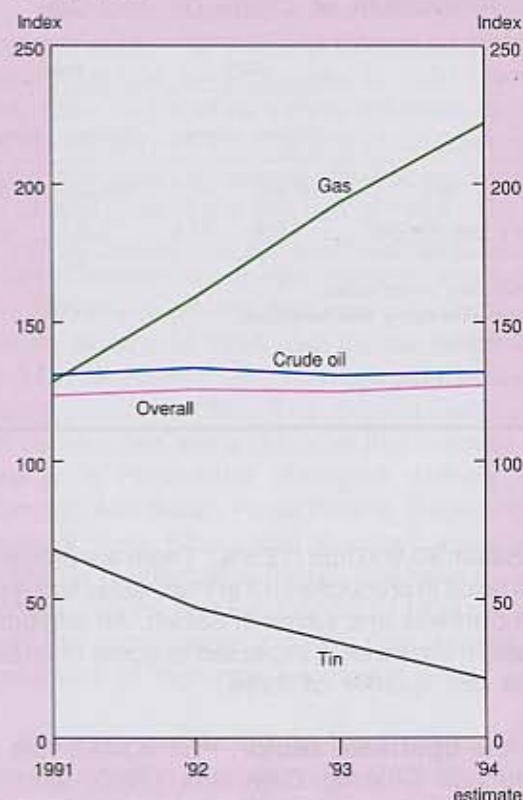
The ex-farm value of **livestock** production in 1994 is expected to increase by 10% to RM3.87 million, compared with RM3.52 million in 1993. The increase in production is expected to emanate mainly from poultry farming (11%) and swine farming (9%). The combined ex-farm value of these two sub-sectors is expected to amount to RM2.7 million contributing approximately 70% of total value. Similarly, the **fishery sector's** output (comprising marine and aquaculture fish) is expected to increase moderately by 6.5% to 1.24 million tonnes, compared with 1.16 million tonnes produced in 1993. About 90% of the total fish production is expected from marine sub-sector with the balance from the aquaculture sub-sector. The increase in the output of the fishery sector is reflected mainly in marine landings (6.4%) and is due to increased productivity as a result of improved fishing techniques in deep-sea fishing. In addition, improved management and conservation of coastal fishery resources also enhanced the industry's output.

Mining Sector

The mining sector is expected to turn around and register a growth of about 1.8% in 1994 compared with a negative growth of 0.5% in 1993. This is due to the anticipated increase of 0.9% in the production of crude oil (1993: -1.7%) and 15% in the production of natural gas (1993: 21.4%). In contrast, the production of tin is expected to continue to decline, with output declining by 37.5%. Nevertheless, the sector is expected to contribute 1.7% to GDP growth and account for 7.5% of national output.

In order to revive the mining industry, the Government has formulated and approved a National Mineral Policy with the objective to diversify and expand the industry, through a uniform regulatory framework for all States as well as provide incentives to encourage investment in prospecting, exploration and development of minerals particularly in hard rock mining. The policy also seeks to enhance the development

Chart 4.3
Mining Production Index
(1987 = 100)



of domestic expertise for mineral resource development through research, education and training, provide environmental protection and facilitate the dissemination of regulatory, scientific and technical information required by the industry. Towards this end, the Mineral Development Act 1994 was passed by Parliament in July 1994 and the State Legislatures are in the process of adopting it.

Crude Oil and Gas

In 1994, the production of **crude oil** including condensates is expected to stabilise at 653,400 bpd, a marginal increase of 0.9% compared with 647,600 bpd in 1993. The stable level of production reflects the conscious pursuance of the National Depletion Policy. Peninsular Malaysia is expected to produce the bulk of the output, that is 408,000 bpd or 62.3% of the total production. Sarawak is expected to contribute 161,500 bpd (24.7%)

Table 4.9

Production of Crude Oil and Gas

	1993		1994*	
	Volume	% change	Volume	% change
Crude oil (bpd) ¹	647,600	-1.7	653,400	0.9
Natural gas (mscf/d) ²	2,088	21.4	2,397	15.0

¹ Including condensates.² Excludes flaring and reinjection.

* Estimate.

Source: PETRONAS

and Sabah 83,900 bpd (12.8%). There are presently 32 oil fields in production, 13 in Peninsular Malaysia, 12 in Sarawak and seven in Sabah. An additional oil field in Sarawak is expected to come onstream in the last quarter of 1994.

In the **upstream sector**, PETRONAS has 27 Production Sharing Contracts (PSC) with 25 companies from 11 countries, in operation. No new contracts were signed in the first half of 1994. It is anticipated that there will be an increase in seismic and drilling activities in 1994 as a number of PSC contractors rescheduled their exploration activities from 1993 to 1994. It is estimated that 75,330 kilometres of seismic data will be acquired and 39 exploration wells drilled in 1994, against 44,764 kilometres of seismic data acquired and 28 exploration wells drilled in 1993. In addition, 117 development wells are expected to be drilled.

Total gross output of **natural gas** is estimated to increase by 13.2% to 3,010 million standard cubic feet per day (mscf/d) in 1994 compared with 2,658 mscf/d in 1993. The increase in output is attributed to increasing demand for natural gas. Of the total, 65% or 1,961 mscf/d will comprise non-associated gas from the seven gas fields while the remaining 35% or 1,049 mscf/d will be associated gas from 32 oil fields. Allowing for direct flaring and reinjection of 613 mscf/d, net production of natural gas is expected to increase by 15% to 2,397 mscf/d compared with 2,088 mscf/d produced in 1993.

Tin

The production of **tin-in-concentrates** is estimated to decline further by 37.5% to 6,500 tonnes, compared with 10,400 tonnes in 1993. The decline is mainly due to prolonged depressed prices in the face of rising operational costs, which led to the closure of marginal mines. Depleting reserves as well as depleting high grade ores in the existing mines are also factors contributing to lower production. At the current level of production, Malaysia is now ranked a step lower as the sixth largest producer of tin in the world after China, Brazil, Indonesia, Bolivia and Peru.

At the end of June 1994, there were only 38 mines in operation compared with 60 during the same period in 1993. As a consequence, total production of tin-in-concentrates fell by 46.3% during the first half of 1994 to 3,240 tonnes compared with 6,040 tonnes during the same period in 1993. In line with the closure of mines as well as declining levels of production, the number of workers employed in tin mines at the end of June declined by 37.6% to 2,105 compared with 3,377 workers during the same period in 1993.

Table 4.10

Production, Number of Mines and Employment in the Tin Mining Industry

	1993	% change	1994*	% change
Production ('000 tonnes)	10.4	-27.3	6.5	-37.5
Number of mines	43	-31.7	38*	-36.6
Dredges	7	-53.3	4*	-50.0
Gravel pumps	21	-27.5	23*	-30.3
Open cast and underground	15	-23.0	11*	-42.1
Workers employed	2,300	-50.8	2,105*	-37.6

* As at end of June 1994.

* Estimate.

Source: Ministry of Primary Industries and the Department of Statistics.

In contrast to production, domestic consumption of tin metal increased by 5.2% to 2,541 tonnes during the first half of 1994, compared with 2,416 tonnes consumed during the same period in 1993. The rise in consumption is mainly on account of increased usage by the solder and tin plate industry. Consumption of tin by the solder and tin plate industry increased by 5.3% to 1,340 tonnes and 4.8% to 440 tonnes respectively. However, the consumption of tin by the pewter industry fell by 5%.

Other Minerals

The production of other minerals, namely **copper, bauxite and iron ore** is expected to display a mixed performance in 1994. The output of copper is expected to increase by 12% to 112,150 tonnes from 100,130 tonnes in 1993 due to extraction from reserves with high content of copper. The output of bauxite is expected to increase significantly as most of the stocks accumulated earlier were cleared in 1993. On the contrary, the production of iron ore is expected to decrease due to depleting reserves. During the first half of 1994, the production of copper increased by 10.5% to 54,302 tonnes, bauxite by 52% to 66,086 tonnes. However, the production of iron-ore fell by 28% to 94,239 tonnes, compared with the corresponding period of 1993.

Construction Sector

The strong growth in the **construction sector** since 1989 continues into 1994 with value added increasing by 13%, compared with an 11.2% increase in 1993. The growth in the sector is supported by large infrastructural and civil engineering projects as well as strong construction starts in the residential and non-residential sectors. Therefore, the sector is expected to contribute 6.1% (1993: 5.2%) to GDP growth and account for 4.2% (1993: 4%) of national output.

Construction activity in the **residential sub-sector** is expected to remain buoyant in 1994, supported by the strong demand for housing as a result of improved disposable incomes brought about by sustained and rapid economic expansion during the past six years. With the strong demand, the volume and value of residential property transacted increased by 9.8% and 13% during

the first half of 1994, compared with decreases of 3.5% and 1.5% during the corresponding period of 1993. Reflecting the buoyant performance of the residential sector, loans extended by the banking sector for housing increased by 10.6% during the first seven months of 1994 (January-July 1993: 14.8%). The number of houses approved by the Ministry of Housing and Local Government for construction by private developers increased to 34,400 units in the first half of 1994 or by 2.3% when compared with the corresponding period of 1993. The number of new licences approved by the Ministry to private developers during the first seven months of 1994 also increased by 16.9% to 312, as against 267 licences approved in the same period of 1993. The Central Bank survey on construction starts indicated that in seven major towns in Peninsular Malaysia namely Kuala Lumpur, Alor Setar, Pulau Pinang, Seberang Prai, Melaka, Kota Bharu and Kuantan, construction starts for residential purposes had risen by almost 50% during the first five months of 1994 compared with the same period in 1993. Out of these, 73% consisted of high-rise residential units.

A survey conducted by the Central Bank on the construction of office space and condominiums in and around Kuala Lumpur indicated that construction activity of condominiums will remain strong in 1994. A total of 68 projects are scheduled for completion in 1994. This will add an estimated 17,560 condominium units to the existing stock of 17,450 units. At the end of June 1994, a total of 111 projects comprising 31,188 units were under various stages of construction and due for completion between the second half of 1994 to 1997. However, the number of condominium projects that was either launched or commenced construction during the first half of 1994, fell to 10 from 14 during the same period in 1993, on account of the freeze on approvals of condominium projects in prime areas by the Kuala Lumpur City Hall since the end of 1992. Eight of the projects launched were in the price range of RM100,000 to RM250,000 per unit, while the other two were priced over RM250,000. The survey also indicated that demand for medium and moderately priced condominiums was strong during the first half of 1994 although the demand for condominiums on hill sides was adversely affected during the first few months after the collapse of the Highland Towers in December 1993.

As for the **low-cost housing** scheme, by the end of 1993, the private sector achieved 68% (147,806 units) of its target of 217,000 units under the Sixth Malaysia Plan while the public sector managed to complete 22% of its target of 126,800 units by September 1994. The slower progress in the public sector is attributed to difficulties in securing suitable locations as well as financial and administrative constraints. As part of the Government's effort to ease the housing problems of the low and medium-income group, and to speed up the construction of low-cost houses, the Government has to date approved a housing package for the sum of RM2,104 million. A **Low-Cost Housing Fund** has been created with a sum of RM1,100 million. The first tranche of the Fund totalling RM500 million is to provide concessionary bridging finance to developers at 2% interest rate as an incentive to accelerate the construction of low-cost houses in approved schemes. The second tranche of RM600 million, with an initial sum of RM300 million provided jointly by the Government and the Central Bank and an additional RM300 million contributed by banks, financial institutions and other corporations from the private sector, is for the purpose of financing the construction of flats in the major towns with squatter problems. These flats will be rented out to the poor. Under this tranche, 23 projects costing RM510 million and involving the construction of 9,673 units have been approved up to September 1994. A sum of RM504 million is allocated under the Federal Government development expenditure and will be used to implement housing projects including the Special Site and Services Scheme under the Ministry of Housing and Local Government, as well as housing projects for Government employees in essential services. Reflecting the Government's commitment to provide more low-cost houses for the poor and middle income group, another RM500 million revolving fund was set up in August 1994. The fund is meant to supplement and accelerate the generation of affordable housing stock for the low income earners. It has three objectives. Firstly, to increase the number of affordable housing stock in the urban areas of Federal Territory, Selangor, Johor and Penang within the short term period of five years. Secondly, to promote house ownership for low income earners. Thirdly, to upgrade the living conditions of the low income earners in urban areas to avoid the squatter syndrome.

The revival of **abandoned housing projects** built by the private sector has been fairly successful. A total of 442 projects involving 84,904 units was abandoned during the period from 1983 until the end of June 1994. Of this 222 projects involving 41,822 units have been revived, 96 projects are in various stages of revival while 124 projects are not suitable for revival. The **Abandoned Housing Project Fund (AHPF)**, set up by the Central Bank in June 1990 to help revive projects abandoned during the recession, has until the end of June 1994, provided financial assistance totalling RM379.6 million for 98 projects throughout the country. New applications to the AHPF was discontinued in March 1992, following rapid economic expansion.

The construction and demand of **non-residential buildings** such as shop-lots and office buildings is expected to remain strong. During the first five months of 1994, construction starts of non-residential projects in five towns increased significantly, Kuala Lumpur (186.8%), Alor Star (222.5%), Penang (112.9%), Seberang Prai (334.4%) and Kota Bahru (80.7%). In Kuala Lumpur, four office buildings were completed, while another 11 new office buildings were launched during the first half of 1994. A total of 36 office buildings including the Kuala Lumpur City Centre and Plaza Rakyat are currently under construction, 13 of which will be completed by the end of 1994, bringing the total net lettable area to 2.7 million sq. metres. The construction of industrial property is also expected to remain active following the buoyant growth of the manufacturing sector and the setting up of entrepreneurial parks and industrial estates.

Construction activity in the **civil engineering sub-sector** remained buoyant during 1994 due to development and upgrading of infrastructural facilities. The North-South Expressway was completed in mid-February 1994. Earth works for the KLIA, a mega project, has already started. Construction of Phase One of the LRT covering 12 kilometres from Ampang Town to Jalan Sultan Ismail, Kuala Lumpur is already underway and is expected to be operational in early 1996. Keretapi Tanah Melayu Berhad (KTM) is currently constructing double tracking on the route between Rawang-Seremban and Kuala Lumpur-Port Klang. This project is also scheduled for completion in early 1996. The construction of the North

Table 4.11

Production of Selected Construction Materials, January-July
(% annual change)

	1993	1994
Ceramic tiles	19.5	8.4
Asbestos cement roofing sheets	-11.0	33.6
Earthen bricks	-0.2	17.6
Ready-mixed concrete	7.6	39.8
Cement	10.6	4.6
Iron and steel rods	27.4	22.2

Source: Department of Statistics

Butterworth Container Terminal was completed in April 1994, while that of Phase One of the West Port in Port Klang is expected to be completed in October 1994. The other infrastructural projects that are under construction or will take off in 1994 include the Shah Alam Expressway, Second Link to Singapore, IPPs, PGU III, the National Sewerage Projects and the National Sports Complex as well as the Commonwealth Games village.

In consonance with the strong overall growth in construction activities, production of major construction-related materials increased during the first seven months of 1994, as shown in Table 4.11. Sales of construction materials also showed a similar trend with sales of cement and concrete products, hydraulic cement, plywood hardboard and particle boards as well as structural metal products increasing by 12.0%, 7.8%, 33.0% and 9.4% compared with increases of 8.4%, 7.6%, 85.6% and 5.2% registered in the corresponding period of 1993.

The construction sector is estimated to employ 594,000 people (1993: 544,600 people) or 7.8% of total employment in 1994. As a result of the rapid development of projects, the construction industry is facing acute shortages of skilled and semi-skilled workers. Construction companies have become increasingly dependent on foreign labour, with about 80% of the workers being foreign labourers.

Recognizing the importance and the need to upgrade the construction sector, the **Malaysian Construction Industry Development Board (MCIDB) Act 1994** was passed by Parliament in May 1994. The MCIDB is expected to commence operations in January 1995 and will be responsible for regulating and improving the industry by providing consultancy, quality accreditation, research coordination, the use of high technology as well as manpower training services. By December 1995, all contractors (except for those with less than 3 workers) have to be registered with the MCIDB. Initial capital investment for the Board will be borne by the Government and later it will be self-financing through the collection of levies and payment for consultancy services.

Services Sector

The **services sector** is expected to continue to expand strongly in 1994, albeit at a slightly more moderate growth of 9% compared with 10% in 1993. Despite the slight moderation, this pace of growth represents the fifth consecutive year that the sector's growth has outpaced overall GDP growth, reflecting the growing demand for services in tandem with the rapid expansion in the other sectors of the economy. This, to a large extent, is also attributable to the innovation, modernisation and expansion that have taken place in this sector in recent years, particularly in the sub-sectors of finance, transport and telecommunications, where great strides have been made to provide more sophisticated and technologically advanced services. Additionally, the corresponding rise in incomes has also increased the consumption of a wider range of non-business services, in particular personal services such as home improvement and food catering services. To complement the provision of services to the domestic economy, the Government's policy of encouraging the production of services for export to mitigate the services deficit in the balance of payments has also contributed to the stronger growth in this sector. This includes the promotion of tourism and the provision of educational, financial, consultancy and construction services for export. Indeed, the conclusion of the Uruguay Round and the attendant General Agreement on Trade in Services (GATS) will see a greater liberalisation of global trade in services. Therefore, efforts to

enhance Malaysia's capability in import substitution of services and in exporting services have become more urgent in order to reduce the deficit in the services account.

Given the strong growth in the sector, its share to overall GDP has been rising gradually, from 41.9% in 1989 to an estimated 44.6% in 1994. This increasing share reflects Malaysia's steady progression towards an industrial country status, following closely the path of the developed nations where services make up 60 to 70% of the overall GDP. Within the services sector, the largest sub-sector remains the wholesale and retail trade, hotels and restaurants with an estimated share of 12.4% of GDP in 1994, followed by the finance and insurance, real estate and business services (10.9%) and government services (9.9%) sub-sectors. The sub-sectors that are expected to provide the main impetus to growth in 1994 are the distributive trade, transport and communications and the financial services sub-sectors. Overall, the services sector is the second largest contributor to GDP growth (47.4%) after manufacturing.

The rising level of incomes and the pickup in tourism activities have generally boosted growth in the value added of the **wholesale and retail trade, hotels and restaurants sub-sector**, which is expected to register a growth of 10.5% in 1994. This is reflected in various indicators such as consumer spending on food, including food sales which increased 12.8% in the first seven months of 1994 (January-July 1993: 3.6%) and the import of consumption goods which increased 17.2% in the same period of 1994 (January-July 1993: 4.1%). The banking system's loans and advances for consumption increased by 14.6% in the same period of 1994 (January-July 1993: 9.8%) while sales tax collected increased 21.5% in the first seven months of 1994 (January-July 1993: 4.5%). The Business Expectations Surveys of the Department of Statistics (DOS) reaffirmed this trend, with gross revenue from the wholesale and retail sub-sector projected to grow by 17% in 1994 (1993: 3.6%). The good response to the Visit Malaysia Year 1994 campaign is also expected to contribute to the strong expansion of this sub-sector. Tourist arrivals to Peninsular Malaysia in the first seven months of 1994 registered an increase of 15.3% to four million arrivals, making the target of seven million tourists arrivals in 1994 attainable (1993: 6.2 million). The value added of hotel services is expected to increase with the anticipated completion of 108 new hotel projects in 1994, with a potential supply of 16,554 new rooms. A major boost to the tourism industry in 1994, particularly domestic tourism, is the completion of the North-South Expressway in February 1994, which has shortened travelling time considerably and improved access to the major tourist areas in the west coast of Peninsular Malaysia. In addition, a relatively strong increase in the number of scheduled conventions and seminars in 1994 of 14.7% (1993: 27.7%) also contributes to the value-added growth of this sub-sector.

The **finance, insurance, real estate (including ownership of dwellings) and business services** sub-sector is expected to achieve another year of strong growth in 1994, with growth of value added estimated at 11% (1993: 11.4%). The expansion of this sub-sector reflects fairly buoyant performance in the banking and insurance industry and on-going efforts to deepen and widen the capital market. For the banking industry, growth

Table 4.12
Services Sector Performance
(%)

Sub-sector	Share		Annual growth	
	1993	1994*	1993	1994*
Electricity, gas and water	4.9	5.0	12.5	13.0
Transport, storage and communications	15.6	15.6	8.0	9.0
Wholesale and retail trade, hotels and restaurants	27.5	27.8	10.0	10.5
Finance, insurance, real estate and business services	24.0	24.5	11.4	11.0
Government services	23.2	22.3	9.6	4.7
Other services	4.8	4.8	8.2	8.0
TOTAL	100.0	100.0	10.0	9.0
* Estimate				

in new loans and advances extended by the banking system expanded by 10% in the first seven months of 1994 (January-July 1993: 9.1%). The expansion is reflected in the increase in the growth of loans and advances to the manufacturing, general commerce and transport sub-sectors as well as for consumer credit. However, growth in loans and advances to the broad property sector moderated, while that to the agriculture and mining sectors declined. The performance of the insurance industry continues to be encouraging, with total premium income in the first quarter of 1994 growing by 19.8% compared with a growth of 17.4% in the corresponding period of 1993. In consonance with the softening of some segments of the property market, value-added growth of real estate services also moderated during the year. Loans and advances to the housing sub-sector grew by 10.6% in the first seven months of 1994 (January-July 1993: 14.8%), while loans to the real estate sub-sector declined by 10.6% in the first seven months of 1994 (January-July 1993: 5.4%). The number of real estate transactions grew by only 1.6% in the first half of 1994.

The buoyant conditions of the capital market is reflected in various indicators. Despite the recent consolidation of share prices on the Kuala Lumpur Stock Exchange, the value of shares traded was RM209.5 billion in the first eight months of 1994 (January-August 1993: RM153.5 billion), representing an increase of 36.5% over the corresponding period of 1993. Hence, the performance of the equity market remains robust while various segments of the capital market reflect increasing strength. New issues of private debt securities amounted to RM 6.4 billion in the first eight months of 1994 (January-August 1993: RM1.9 billion). In addition, six new unit trusts with a total paid-up capital of RM1.25 billion were launched in the period under review.

The **transport, storage and communications** sub-sector is expected to expand even more rapidly in 1994, reflecting the strong demand for better and more advanced transport and communication services. The growth in the value added of this sub-sector is estimated at 9% in 1994 (1993: 8%). In the transport sector, all three modes of transport, road, rail and air, are expected to register strong growth. Among the major contributory factors are the robust growth in exports and imports of

goods which has generated higher demand for transport services. In addition, several major developments to upgrade and expand the transport infrastructure will add significantly to the capacity of transport services. For road transport, this includes the completion of the North-South Expressway, the construction of the North-South Expressway Central Link and the rehabilitation and upgrading of Federal roads under the Sixth Plan. Rail services would be further upgraded with the on-going construction of the double-track railway system and the LRT. Port facilities are also being expanded, with the recently completed North Butterworth Container Terminal and the soon-to-be completed Phase I of the West Port, Pulau Indah in Port Klang and Phase Three of Johor Port's expansion which entails the construction of two additional berths for containerised cargo. The construction of KLIA, which is expected to be completed by 1997, will facilitate a higher flow of cargo and passenger traffic. Rail cargo revenue is estimated to expand by 14.3% in 1994, compared with 13.5% in 1993 while passenger revenue is expected to decline due to competition from other modes of transport. In terms of sea transport services, the volume of cargo handled by the four major ports will increase by 10.7% in 1994 (1993: 9.1%). Air transport services growth is also expected to strengthen in 1994, with Malaysia Airlines (MAS) reporting higher increases in both cargo and passenger revenue in the first seven months of 1994 of 9.9% (1993: -2.8%) and 17.3% (1993: 5%) respectively. The strong expansion in the transport, storage and telecommunications sub-sector is also reflected by the banking system's loans and advances to this group which increased by 28.2% in the first seven months of 1994 (January-July 1993: 25.7%).

The value-added growth of telecommunications services continues to expand rapidly in 1994, with the provision of new products in the voice, radio and mobile, data communication and video services categories, such as the Integrated Service Digital Network and video conferencing facilities. In addition, the Network Management System to integrate various company networks will serve to increase capacity as well as to improve the quality of telecommunications services. Investment in the modernisation and expansion of the telecommunications infrastructure network is also

adding to the capacity. These include the transformation to a nation-wide digitalised network, where work is currently in progress to change the switching networks and the transmission lines to the digitalised system. The fibre optic trunk system from the North (Kangar) to the South (Johor Bahru) and Sabah and Sarawak has been completed and this network is being expanded with the installation of branch lines to connect the various towns. Malaysia's first satellite (MEASAT I), which would enhance telecommunications and broadcasting services, is expected to be launched in late 1995. For 1994, applications for new telephone lines alone are expected to increase by 14.7% compared with a decline of 1.9% in 1993. The telephone penetration ratio at the end of 1993 was 13.1 telephones per 100 persons and there exists scope to increase capacity to reach the targetted ratio of 45 telephones per 100 persons by the year 2005. This will also include the upgrading of the telecommunications infrastructure in the rural areas to ensure that all segments of the population have access to telecommunications services.

Growth in the **government services** sub-sector is expected to moderate in 1994 to 4.7% compared with a robust 9.6% in 1993. The strong growth in 1993 was attributed to the payment of an additional half-month salary to government servants and a greater outlay on public expenditure on development. Growth in 1994 is expected to emanate mainly from higher development expenditure, as higher capital outlay is expected at the end of Sixth Plan period.

The strong economic expansion and rapid industrialisation have also led to a corresponding sharp increase in the consumption of utilities, pushing the value-added growth of the **electricity, gas and water** sub-sector to double-digit figures since 1989. The sub-sector is expected to maintain its performance in 1994, with value-added growth estimated at 13% (1993: 12.5%). Electricity consumption for Peninsular Malaysia is estimated to increase by 14.6% in 1994 (1993: 11.8%) while installed capacity is projected to increase significantly by 45.2% in 1994 (1993: 11.8%) as a result of additional capacity anticipated from

the IPPs. Installed capacity is expected to increase further between 1995 and 2000 with the additional planting-up programme by TNB and the commissioning of various electricity projects by the IPPs. Water consumption continues on an upward trend in 1994, with an estimated growth of 10.7% (1993: 9%) to reach 6,990 million litres per day (mld). Water output capacity is also expected to grow by 9.8% to 8,670 mld in 1994.

Overall, the expected strong performance of the services sector is indicated in the performance of selected services industries as shown in Table 4.13.

Table 4.13
Growth Performance, January-July
(% annual change)

	1993	1994
Malaysia Airlines		
Revenue from cargo	-2.8	9.9
Revenue from passengers	5.0	17.3
KTM Berhad		
Revenue from cargo	10.1	13.2
Revenue from passengers	11.1	-20.4
Eight major ports		
Cargo throughput	4.9	8.4
Containerised cargo	11.2	24.3
Telekom Malaysia Berhad		
New telephone subscribers	-1.3	16.5
Tenaga Nasional Berhad		
Electricity consumption	12.6	15.1
Installed capacity	11.3	17.9
Public Works Department		
Water consumption	9.0	10.0
Total production	9.9	10.0

Source: MAS, KTM, various ports, TMB, TNB, PWD.

FEATURE ARTICLE 3

The Power Sector in Malaysia-Towards Meeting the National Requirements

Introduction

In line with the strong growth in the economy, the consumption of electric power has expanded steadily in the last decade. Since 1980, peak demand for electricity has grown at an average rate of 10% annually. As Malaysia prepares to achieve developed nation status by the year 2020, the power sector will continue to play a key role.

The growth of the electricity supply industry is governed by the Electricity Supply Act 1990 which provides for the issuance of licences to generate, transmit and distribute electricity in Malaysia. The provisions of this Act are administered by the Department of Electricity Supply under the Ministry of Energy, Telecommunications and Posts. In 1979, the Government established the National Energy Policy, which laid down broad guidelines on long term energy objectives, strategies and consideration for the environment. The focus of this policy is the four-fuel diversification strategy aimed at ensuring reliability and security of supply

involving shifting the present dependence on oil to natural gas, hydro-electric power and coal. Other policies relating to the energy sector are the National Petroleum Policy which established the framework for the exploitation and use of oil and gas resources, and the National Depletion Policy which regulates the rate of production of oil and gas resources.

In the Second Outline Perspective Plan (1991-2000), the main thrusts of the energy sector place specific references to the power sector. The focus will be on the greater utilisation of gas and the exploitation and development of hydro resources. At the same time, the use of local coal will be enhanced in the power sector and in the cement and brick industries as well as for industrial boilers.

Demand and Installed Capacity

The current total installed capacity of electricity power generation for Malaysia as a whole is 7,504 megawatts (MW). Total installed capacity is expected to rise to 12,873 MW by the year 2000. In terms of peak demand, present peak demand total 6,220 MW and is projected to rise to 10,518 MW by the year 2000, as against total installed capacity of 12,873 MW. The following table illustrates generation capacity and consumption for Peninsular Malaysia, Sabah and Sarawak.

Table 1
Demand and Installed Capacity in Malaysia, 1990-94
(in MW)

Year	Peninsular Malaysia		Sabah		Sarawak	
	Peak demand	Installed capacity	Peak demand	Installed capacity	Peak demand	Installed capacity
1990	3,436	5,040	204	306	194	363
1991	3,990	4,939	222	340	220	364
1992	4,545	5,859	240	340	254	445
1993	5,086	6,298	262	372	281	469
1994 ¹	5,622	6,634	287	415	311	455

¹ Excluding IPP's installed capacity

Source:: Ministry of Energy, Telecommunications and Posts

Table 1 indicates that over the 1990-1994 period, peak demand in Peninsular Malaysia, Sabah and Sarawak grew at an average annual rate of 11.6%, 8.3% and 11.4% respectively. Installed capacity over the same period expanded at an average rate of 5.2% (Peninsular), 5.8% (Sabah) and 4.1% (Sarawak).

During 1992 and 1993, signs of power mismatch in terms of supply and demand occurred. Demand for electricity increased more than supply on account of the intensity of consumption by the industrial and commercial sectors. Due to the slower rate of growth in the generation capacity, relative to the growth in demand, supply constraints emerged during the period. The reserve margin of electricity declined from 33% in 1990 to 18% in 1993 which was below the acceptable level of 25%. As a result, power disruptions occurred frequently in 1992 and early 1993. Localised load shedding was then introduced to combat shortfalls during peak hours. A blackout of the whole of the Peninsular occurred in September 1992.

A major challenge in the power sector, therefore, is to ensure that there is a proper balance between the supply and demand of electricity. In the Peninsular, peak demand for power between 1995 and 2000 is forecast to increase at an annual average rate of about 9%. While annual growth rates for the same period in Sabah and Sarawak are anticipated to be at 8% and 9% respectively. The peak demand over the years 1995 to 2000 is as shown in Table 2 below.

Table 2
Projected Peak Demand for
Electricity, 1995-2000
(in MW)

Year	Peninsular Malaysia	Sabah	Sarawak
1995	6,138	310	343
1996	6,700	335	375
1997	7,315	362	411
1998	7,985	392	450
1999	8,718	426	492
2000	9,517	463	538

Source: Ministry of Energy, Telecommunications and Post

Emergence of Independent Power Producers

With rapid economic growth and the intensification of Malaysia's industrialisation programme, there is a need to accelerate the construction of power plants with the view to doubling of power production by the end of this decade to ensure stable and secure supplies of power. However, given the capital-intensive nature of investments in the power sector, the Government has encouraged the private sector to participate in power generation. In line with the tremendous growth in the demand for electrical power in the country, the Government found that independent power producers (IPPs) could participate in providing these needs in view of its various benefits. By having IPPs, the Government can reduce financial and administrative expenses, promote competition, as well as increase productivity and efficiency of electricity generation.

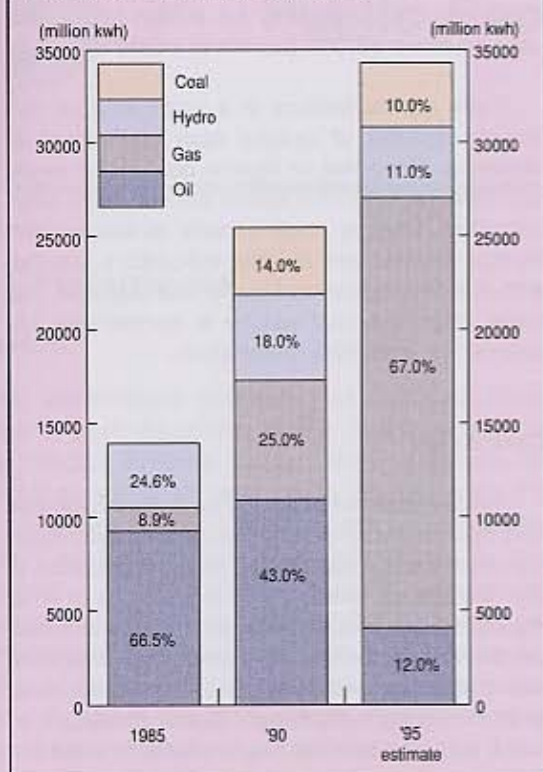
As at April 1994, the Government has issued five IPP licences to build, own and operate power plants to supply electricity to Tenaga Nasional Berhad (TNB). These include gas-fired plants totalling 1,170 MW at Paka in Terengganu and Pasir Gudang in Johor. Another IPP licence has been granted for the building of a 1,303 megawatt facility in Lumut, Perak. Kuala Langat, in Selangor, will have an IPP plant with a capacity amounting to 720 MW while the other two plants are in Port Dickson (440 MW) and Melaka (440 MW). By June 1996, the total generating capacity of the five IPPs is expected to be 3,960 MW and this will enable the country to increase its reserve margin to 35%.

Fuel for Power Generation

In terms of fuel for power generation, the implementation of the Energy Policy has gradually reduced the overwhelming dependence on oil as primary source of energy. In 1990, oil was the predominant fuel used (43.1%), followed by gas (25%) hydro (18%) and coal (14%). However, this pattern is expected to change by 1995 with gas as the major fuel used (67%) followed by oil (12%), hydro (11%) and coal (10%). Chart 1 illustrates the fuel mix from 1985 to 1995 and reflects that the four-fuel diversification policy has succeeded in reducing the dependence on oil for electricity generation.

The evolution of fuel mix for electricity generation is very dependent on the availability of gas as it is the least cost economic energy option because of relatively low production cost as well as being

Chart 1
Generation Mix of Electricity 1985-95



a cleaner fuel. While the power sector is the base-load gas consumer, efforts are being made to promote its use in the industrial, transportation, commercial and residential sectors. Overall in the Peninsular, 65% of the base-load gas demand is required for power generation by TNB and the IPPs. The supply of offshore gas to power stations in the southern and western parts of Peninsular Malaysia has been made possible with the establishment of the Peninsular Gas Utilization (PGU) Projects. Under the PGU II pipeline system, natural gas is being supplied to TNB's power stations in the southern and western parts of Peninsular Malaysia, as well as the Senoko power station in Singapore. Plans are also underway to supply natural gas to the IPPs.

Transmission and Distribution

Presently, the transmission system in the Peninsular by TNB consists of 275 kV, 132 kV and to a lesser extent, 66 kV systems. The 275

kV transmission line, as the backbone to the national grid system, links all major power generation stations to load centres in all states in the Peninsular. In the Sixth Malaysia Plan, the transmission and distribution network will be expanded and upgraded with the view to not only widening the coverage of the grids, but also reducing system losses and improving reliability and efficiency. In Peninsular Malaysia, some 1,800 kilometres of transmission lines will be constructed. In Sarawak, a 275 kV transmission line will be extended from Bintulu to Miri, while in Sabah, the implementation of a 132 kV line will link Kota Kinabalu to Kota Belud and then to Kudat.

Regulatory Framework

The privatisation of the utility have brought about greater need to provide directions and ensure overall development in the energy sector besides ensuring that the services provided keep pace with the increasing demands of consumers. Thus as far as the energy sector is concerned, the role of the Ministry of Energy, Telecommunications And Posts, includes the formulation of policies, strategies and procedures to control and monitor the activities of the privatised companies which are licensed by the Ministry. The regulation of these industries is important to ensure the availability of high quality, efficient and safe services at reasonable prices to the consumers and that the rapid growth of the industry is balanced with the interest of the consumers and the country. The Department of Electricity is responsible for the regulatory framework for the electricity supply industry.

There is a need to ensure a more balanced national energy objectives of supply, utilisation and environmental protection. While there are laws governing energy supply (Electricity Supply Act 1990) and environmental protection (Environment Quality Act, 1974), there are no laws governing effective and efficient utilisation of energy. Efforts to promote energy efficiency have to be wholesome and coordinated. Towards this end, the Government has included measures to achieve overall energy efficiency in the power sector which include improving generating efficiency of power plants, reducing transmission and distribution losses and energy storage. Regulations to establish a minimum or reference energy efficiency requirements or common standards are also being looked into.

Prospects

Malaysia is moving into a gas era where indigenous natural gas resources are and will be developed to reduce the dependence on crude oil and to secure adequate and longer term energy supply for the nation's development. In line with the four-fuel diversification policy, gas will play a major role in the power sector, in ensuring adequate electricity supply. The current natural gas reserves are substantial. Preliminary estimates of the total natural gas resources as at 1 January 1994 is 80.8 trillion cubic feet, while the total crude oil reserves is 4.28 billion barrels. In terms of energy equivalent, natural gas reserves is about four times that of crude oil reserves. Between 1995 and 2000, some 6,000 MW of new capacities which are largely gas-based plants will be constructed. These will include, projects of TNB, the IPPs, Sabah Electricity Board (SEB) and Sarawak Electricity Supply Corporation (SESCO). In the Peninsular, PGU III, which involves the extension of 549 kilometres of the existing PGU I and PGU II pipelines, is expected to be completed by the end of 1995. It will facilitate the transmission of gas northwards from Meru in Klang to Lumut, and from Lumut to Bukit Keteri (Perlis). By the year 2000, gas-powered capacity will rise to 70% from 54% in 1993.

Malaysia has significant hydro-power potentials that could be tapped to provide the necessary electricity requirement. Major hydro-electric projects being developed are the 600 MW Pergau and the Bakun Hydro-electric Projects. The Bakun Dam in Sarawak, the biggest power project undertaken by Malaysia, has the potential to produce 2,400 MW. Once completed it will be South-east Asia's largest dam. The project, expected to be completed in 6-8 years, will connect 650 km of undersea submarine power cables from Tanjung Datu on the western tip of Sarawak to Mersing in Johor, transmitting about 1,800 MW of electricity to the Peninsular.

The Bakun Dam will consequently increase the contribution of hydro in the overall energy

mix. Once the potential of Bakun is fully realised, it will also contribute significantly to saving fossil fuel reserves particularly oil. Generation from Bakun hydro-electric is equal to 4.2 million tonnes per year or about 85,000 barrels of crude oil a day.

There are indications of a small amount (8.5 million tonnes) of quality coal in Peninsular Malaysia. Reserves of lignitic coal in Sarawak, estimated at over 700 million tonnes, have been identified. Coal is commercially available from foreign sources and current indications are that with the development of world and regional coal trade, imported coal will be a competitive fuel source for electricity generation.

Conclusion

The development of energy resources in general and the electricity supply industry, in particular, has significantly contributed to the expansion of the Malaysian economy. Electricity is a vital ingredient for industrialisation. In this context, the private sector has an increasingly important role to play in power generation. The Government is encouraging independent power producers to build, own and operate power plants to meet the increasing demand in the country. The restructuring of the power sector is being done with the main objective of improving efficiency and to meet the development needs of the country adequately.

With the Malaysian economy undergoing sustained growth of more than 8% per annum over the last seven years, the demand for electricity as the engine to power the economic development is expected to rise approximately by 10% annually. The current installed capacity in Malaysia is about 7,504 MW. Energy demands over the next 20 years is expected to increase to about 20,000 to 25,000 MW, or about three times the current capacity. In view of current and future planned power generation projects from the three utilities and the IPPs, supply is expected to be adequate to meet Malaysia's power requirements till the year 2000.