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**The Role of the Private Sector in
Energy Development in Malawi**

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**The Views Expressed in this Document are the
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1.0 Introduction

1.1 Physical Setting

Malawi is a small land-locked country bordered by Mozambique in the south, east and west, Zambia to the west and Tanzania to the north and east. Twenty percent of the country's total area of 119,140 square kilometers consists of Lake Malawi and in-land waters. Malawi is separated into three administrative regions: the Northern, Central and Southern Regions. The Malawi economy is based on Agriculture. This sector directly generates approximately 40 percent of GDP and 77 percent of the national export earnings. Ninety percent of all Malawians earn their livelihood from agriculture.

1.2 Economic Background

1.2.1 Throughout the period from 1964 to 1989, Malawi's development strategy has been focused on open market, export-oriented growth based on agriculture. Industrial development has been two-pronged ie import substitution industries and agro-based export industries. Import substitution industries have not been seen to offer opportunities for employment. Instead, the emphasis on agricultural production was considered vital in terms of both employment expansion and its direct and indirect impacts on other sectors of the economy.

1.2.2 The 1971-1980 Statement of Development Policies (Devpol) gave a broad outline of Government objectives for the 1970's. The main Government objectives and targets were:

- (a) an increase in the rate of economic growth of up to 8 per cent per annum.
- (b) a two-pronged approach which included increasing agricultural output to ensure both that rural incomes

are raised and that there is an increase in foreign exchange earnings.

(c) an improvement in the geographical balance of economic activity.

(d) containing the rural-urban drift to levels that are compatible with the expansion of the formal sector employment and the encouragement of labour intensive production technique through supportive policies.

1.2.3 Until 1979, considerable success was achieved in attaining most of the above objectives. Economic growth averaged 7 percent per annum. Industrial Sector output growth and employment expansion grew at an annual rate of more than 8 per cent. Dependence on budgetary grant-in-aid from the United Kingdom for the recurrent budget was eliminated during the early 1970's. Later, during the Second half of 1979's Malawi became self sufficient in the production of basic food. The main sources of economic growth up to 1979 were the rapid increase of output in the agricultural and industrial sectors as well as the maintenance of a continued high level of investment in both public and private sectors.

1.2.4 Malawi's early growth did not last. Although it generated relatively fast growth through most of the 1970's, the country's export and investment-led growth strategy faced a number of problems and these were;

(i) While exports had grown to command 28 per cent of the GNP, the composition of the exports had become highly concentrated. Malawi became increasingly vulnerable to movements in the international prices of a few commodities. In fact tobacco, tea and sugar, in that order, accounted for most of the export revenue. The

two commodity concentration ratios for tobacco and tea increased from 61 percent in 1965/66 to 77 percent in 1989/90. Groundnut, cotton, and pulses, the other export crops, had all decreased in importance during the past 20 years. Moreover, exports of manufactured goods were insignificant and limited to textiles, processed food and fishing nets.

- (ii) Aside from encouraging export growth, Malawi's open economy policy also resulted in an increased reliance on imports. Together with a change in the composition of imports favouring intermediate goods such as oil, this contributed to Malawi's vulnerability to the exogenous world price shocks that characterized the 1970's.
- (iii) Given the concentration of exports and the volume of imports, Malawi faced the dramatic fall in terms of trade at the end of the decade. The average of annual growth rate of Malawi's terms of trade for the period 1970 to 1977 had been 0.7 percent, but in the 3 years following 1977 it fell at an average rate of 15.5 percent per year. In 1980 it was less than 56 per cent of its 1970 level. The sharp fall in the terms of trade index was due to both the drop in the prices of all Malawi's exports and increases in the prices of imports.
- (iv) The terms of trade crash was further worsened by the shutdown of transport routes out of the country as a result of the war in Mozambique. Malawi faced a sharp increase in transportation costs as a result of the closure of the short routes to the sea through Beira and Nacala. In 1985, the Ministry of Transport and Communications estimated that the economic cost

of transport diversion from the traditional routes in 1983 was US\$30 million and the cost index of rail handling of imports and exports at 35 percent more than that in 1980.

- (v) To compound the balance of payment difficulties, adverse movements were also experienced on the factor services account during the same time. This was caused primarily by increasing interest burden from the foreign debt accumulated since the mid 1970s. The repatriation of wages and profits earned by foreign capital and labour employed in Malawi also exacerbated the situation, albeit to somewhat lesser extent.

1.3 Structural Adjustment Programme (New Initiatives for Economic Growth)

1.3.1 The net effect of these factors was economic crisis by the 1980. The MK113 million budget deficit for 1981, over 10 percent of GDP, was the largest ever recorded. Twenty percent of government recurrent expenditure in that budget was now needed to pay for the increasing burden on debt. The debt had grown to almost two thirds the size of GNP, while principal and interest to export ratio was close to 20 percent. Meanwhile, export revenue was falling far short of import costs. Imports share in nominal GDP had increased from 32 per cent in 1967 to 40.8 percent in 1979.

1.3.2 The Government of Malawi reacted to this crisis with a stabilisation and structural adjustment programme, supported by the IMF, the World Bank, USAID and other donors. The adjustment programme has had significant impact in the evolution of the macro economy throughout last decade and continues to make some progress in economic developments.

1.3.3 The structural adjustment programme was designed to achieve multiple objectives. First it sought to attain both internal and external balance. Second, by manipulating demand and restricting supply, policy reform also targeted growth. These multiple objectives were addressed through major areas. First, price reform together with privatisation, particularly with respect to agricultural markets, and this has represented a major facet of the structural adjustment programme. The increased producer prices for most agricultural products and the increased role for private traders in marketing agricultural products. Second, price liberalisation has also directly and indirectly affected the industrial and service sectors. A third area of policy reform has been in exchange rate and trade policy reformulation. Exchange rates have been devalued in an attempt to boost exports and counter balance of payment crisis. Fourth, interest rate liberalisation has been implemented in order to increase the mobilisation of domestic savings and control demand. Fifth, fiscal policy reform has called for increased resource mobilisation, through higher levels of taxation among other means. Partly to control fiscal deficits and restrict demand for stabilisation purposes, policy reform has also entailed a reduction in government expenditure on aggregate, the institution of a more rationalised public sector investment programme, and associated efforts to revamp and revitalise Malawi's public enterprises.

1.3.4 Unlike most of Sub-Saharan Africa, Malawi did not favour industrialisation and relegate agriculture to a secondary role; it did not encourage labour and capital to flow to the cities, it did not view rural areas as a source of cheap food for the urban workers; and it did not grossly overvalue its currency and engage in extensive rationing of foreign exchange. However, Malawi has suffered in common with other

countries in Africa due to the neglect of agricultural research, the restrictions on trade, the distortions of market mechanism through administration of prices, the failure to invest in human resources, the inability to make investments with high returns, and the inability to forestall environmental degradation, especially the destruction of forests.

1.3.5 Many of these constraints to growth have not been addressed by the structural adjustment, policy reform has failed to reverse many of the weaknesses that characterized the Malawian economy. The freedom of policy makers to mitigate the impact of problems such as declining export commodity prices, soaring transport costs, declining competitiveness of exports and increasing costs of imports, and diminishing opportunities for migrant employment in neighboring countries has in fact proven limited. Consequently, there has been a continued and growing reliance on external financing to cope with the persistent disequilibria in the country's internal and external accounts and to mitigate the impact of such economic problems on the living standards of the population.

1.3.6 Resulting from the structural adjustment programme and policy reform, GDP was forecast to grow at a compound rate of 4 percent during the period from 1988 to 1992, and then to improve further, as the Northern Corridor improves the transport situation to 4.2 percent during the period from 1993 to 1996. Merchandise exports are forecast to increase at a compound annual rate of 4.6 percent during the period from 1988 to 1996. All this has yet to be seen.

2.0 Government Energy Policy

2.1 The 1979 jump in World Oil Prices, which doubled the cost of Malawi's oil imports and resulted in the ratio of the value of energy imports to domestic exports increasing from 16% in 1975 to 23% in 1980 had heavy budgetary costs for the Government. Government had at that time to optimise the utilisation of the petroleum products through various measures which were aimed at reducing consumption. The world economic recession between 1982 and 1984 and the closure of Malawi's transport routes through Mozambique, Beira in 1984 and Nacala in 1985 required Malawi to transport goods including fuel through the Republic of South Africa (RSA), roughly doubling transport costs. Since then the management of the petroleum products has become a very crucial issue for the Government. These factors together with those mentioned earlier on forced Government to review its development policies.

2.2 The Government's Statement of Development Policies, 1987 - 1996, and the subsequent National Energy Plan 1988 - 1997 set out the main objectives and strategies for the Energy Sector in Malawi. The objectives are: (a) minimising the impact of the high cost and of the uncertainties in supply of imported oil and coal; (b) developing a sustainable forest programme to meet woodfuel and construction needs; and (c) developing electric power supply in a least-cost manner to meet the demands of the economic and social development of the country. To achieve these objectives, the Government has laid out the following strategies: (a) establishment of National Strategic Fuel Reserve; (b) supporting the production of ethanol for blending with petrol as transport fuel; (c) exploring for and undertaking coal mining activity; (d) encouraging conservation of woodfuel resources (e) developing and implementing a least cost power development programme; and

(f) strengthening energy sector institutions to plan, manage and operate their subsectoral activities and enhance Government's capability to plan and manage the energy sector.

3.0 Energy Resources in Malawi

3.1 Malawi's major energy resource is biomass, which, in the form of wood and charcoal, meets the bulk of household and a large proportion of agricultural energy needs. There are four main sources of energy in Malawi of these fuelwood contributes 93%, petroleum 4%, electricity 2%, and coal and ethanol 1.0% of the primary energy needs. Several rivers notably the shire, which drains from Lake Malawi into the Zambezi, have hydropower potential. The country also has modest reserves of coal. There are no sources of oil or gas that have been discovered so far.

3.2 Biomass

Trees and shrubs cover about 4 million hectares, 35 percent of Malawi's total land area. Indigenous vegetation on customary land accounts for about 75 percent of the 4 million hectares, forest reserves accounts for about 20 percent, Government and private plantations, national parks and game reserves for the balance. Average annual sustainable wood yield is low, due to the slow growing characteristic of indigenous stock and generally poor ecological conditions. In aggregate, sustainable biomass supply is estimated to be greater than current national consumption.

3.2.1 Sugar cane molasses and juices produced by Malawi's two sugar estates are used to produce ethanol, which is blended with petrol to reduce petroleum imports. The ethanol plant, which was commissioned in 1982, currently produces close to 18 million litres of ethanol, sufficient to achieve an average ethanol/petrol blend of about 20:80.

3.2.2 Coal

Coal deposits occur in several different locations in Malawi. Exploration has been done on the Northern coal fields namely Kaziwiziwi and Mchenga. A mine was opened at Kaziwiziwi and about 115,000 tonnes have been produced, but accessible reserves are now virtually depleted and mining activities have shifted to Mchenga close to Kaziwiziwi coal mine. Mchenga produces about 55,00 tonnes a year. This production could be expanded with further investment. Coal exploration has also been undertaken in the Southern coal fields with assistance of the French Government. The exploration study revealed that low grade coal with about 40 percent ash content could be exploited at Mwabvi through open cast mining method. Further studies are underway to work out the financial viability of coal mine operations at Mwabvi coal mine in Southern Malawi.

3.2.4 Hydropower

The hydropower potential of Malawi is concentrated on the Shire River, which flows South from Lake Malawi and joins the Zambezi in Mozambique. The Shire estimated hydro potential is about 600 MW which is capable of providing nearly and 3,500 GWh of electric energy. To date, 144 MW has been installed. A number of generating plants are planned for installation i.e. Nkula Machine Number 5 of 20 MW in 1993, Tedzani III, two machines of 25 MW each to be ready in 1994 and Kapichira hydro-electric installations 5x25 MW to be ready towards end of 1990's. Several smaller rivers such as the Songwe, South Rukuru, Dwangwa and Bua, have limited hydro potential at a number of small sites, estimated to total about 300 - 400 MW. The development of a 4 MW mini-hydro plant on the South Rukuru river is planned as a first step toward exploitation of the small river, hydro-power generation.

3.2.5 Other Energy Resources

In respect to solar energy data on average number of sunshine hours per year, this information is not yet established. However, from data compiled by the Meteorological Department (MD), the average isolation level is estimated at 18MJ/M². Similarly, limited information is available on the supply of energy produced from wind and geothermal systems. Photovoltaic systems are providing electricity to power remote telecommunication systems and to provide lighting and vaccine refrigeration at rural health centres. Solar water heating systems have been installed at several missionary centres throughout the country and by the Ministry of Works and Supplies (MOWS) in hospitals and Government buildings. Unfortunately, due to lack of proper training of the users some of these machines are not in operation. Because of the poor wind regimes and lack of adequate data, wind systems are practically nonexistent. No significant geothermal resources have yet been identified.

2.6.0 With respect to the prospects for greater use of renewable energy resources in Malawi, the Government promotes the use of solar by recommending appropriate training of the users and the proper adaptation of the technology to the local circumstances. In addition to already established telecommunication and vaccine refrigeration applications, other applications include using photovoltaic systems for tobacco curing barns and low head water pumping schemes for domestic usage.

4.0 Energy Consumption

4.1 Malawi's primary energy consumption totalled 2.43 million tonnes of oil equivalent (toe) in 1989. Woodfuels accounted for 93 percent, petroleum products for 4 percent, electricity for 2 percent and coal and ethanol for the remaining 1 percent. Average per capital energy consumption is 0.36 toe per year. Households count for about 85 percent of total final energy, agriculture 8 percent, transport 4 percent, manufacturing 1.5 percent and commercial activities the remainder. The pattern of final energy consumption is summarised in the Table 1.1 and this takes into account of end use efficiencies.

Table 1.1

Final Energy Consumption by Customer Category and Fuel, 1989.

	<u>Fuelwood</u>	<u>Charcoal</u>	<u>Petroleum</u>	<u>Elect</u>	<u>Coal</u>	<u>Total</u>
Household	76.0	8.6	0.1	0.3	-	85.0
Agriculture	7.0	-	0.6	0.4	-	8.0
Transport	-	-	4.0	-	-	4.0
Manufacturing	-	-	0.2	0.4	0.9	1.5
Other	-	-	0.9	0.6	-	1.5
	83.0	8.6	5.8	1.7	0.9	100.00

Source: World Bank, Staff Appraisal Report, Power V Project

4.2 Woodfuel

An estimated 8.8 million tonnes of wood was used for energy purposes in 1989, about 94 percent of which was consumed by households, 5 percent in the processing of tobacco and tea and the balance in small rural and urban industries. Rural households gather wood free of charge for cooking and space

heating purposes from neighboring trees, bushes and shrubs. They also use crop residues when these are available and or wood is scarce. Most of the urban households use a combination of wood and charcoal. The charcoal and some of the wood is purchased, the remainder of the wood is gathered free. The tobacco and tea industries use wood either from their estates or neighboring customary land for curing and barn construction. Rapid population growth, now over 3.5 percent per year, relatively high population densities, competition for land for agriculture and the influx of more than one million Mozambican refugees have combined to cause rapid deforestation of wood resources in many parts of the country. The population growth projections are in the annex.

4.3 Petroleum Products

Consumption of petroleum products, all of which are imported in refined form, totalled 193 million litres in 1991. Prior to the outbreak of civil war in Mozambique, the products were imported through the Mozambican port of Beira, the nearest deep water port to the main consumption centres in Malawi. During 1980s insecurity in Mozambique forced Malawi to diversify its source of supply. In 1989, just over half (54%) of supplies were procured from the Republic of South Africa via Zimbabwe, 20 percent from Dar-es-Salaam in Tanzania, 13 percent from Ndola refinery in Zambia and 12 percent from Beira. The country has product storage capacity through the oil industries of about 18 days cover for diesel and petrol and two months for jet fuel. This is quite inadequate as a landlocked country. Concerned about this relatively small storage volume, the Government is planning to construct 10,000 cubic meters of additional petrol and diesel storage capacity, equivalent to a further three weeks of consumption.

4.4 Electricity

A total of 623 GWh of electricity was consumed in 1990 equivalent to about 70 KWh per capita. Some 40,000 consumers are currently connected to the grid, of which about 32,000 are residential consumers and most of the remainder are small businesses. Electricity Supply Commission of Malawi's (ESCOM) ten largest consumers accounted for 30 percent of total sales in 1990, the most important of which are Sucoma, Blantyre Water Board and David Whitehead and Sons company. Small industrial, commercial, government and agricultural consumers accounted for 52 percent of sales and residential consumers for the remaining 18 percent. Reflecting low average household incomes and the high proportion of rural dwellers, only about 2 percent of Malawian households use electricity. There are, however, a considerable number of urban and periurban potential consumers presently unconnected due partly to ESCOM's policy of requiring new customers to pay 90 percent of the system extensions/capital contribution. Over the period 1985 - 1990 consumption grew by an average of 7.2 percent per year, slightly below the twenty year average growth rate of 8.5 percent.

4.5 Coal

Total consumption of coal in 1990 was about 54,000 tonnes of which 44,000 tonnes were supplied from Midcor's Mchenga mine. The security and restricted access to foreign exchange limited imports from the Moatize mine in Mozambique, the least cost source, to 10,000 tonnes.

5.0 Institutional and Organisational Roles in the Energy Sector

5.1 The Ministry of Energy and Mining is responsible for all energy issues in Malawi. Biomass supply issues are dealt with by the Forestry Department of the Ministry of Forestry and Natural Resources. The Ministry of Energy and Mining is responsible for energy policy formulation, energy sector planning and overall Coordination of energy sector programmes. The least cost power development programme had been coordinated by the Energy Division, predecessor of the Department of Energy. The Energy Division also prepared the National Energy Plan which sets out priorities and outlines options available for energy development. The Energy Division was the implementing unit for the Energy Pricing Study funded by the World Bank under Energy 1 Project.

5.2 Three parastatal institutions responsible for energy matters are under the Ministry of Energy and Mining and these are; Petroleum Control Commission (PCC), the Electricity Supply Commission of Malawi (ESCOM) and Mining Investment and Development Corporation (MIDCOR). There are a number of other private institutions/companies dealing with energy.

5.3 P.C.C. is responsible for overseeing petroleum supply, marketing and distribution of the petroleum products while MIDCOR is responsible for coal production and supply. The generation, transmission and distribution of electricity is the responsibility of ESCOM. The Department of Statutory Bodies (DSB) of the Government of Malawi exercises financial control and monitors the overall performance of the parastatals through their respective Boards.

6.0 The Role of the Private Sector

6.1.0 The Government policy underlines the critical role the private is supposed to play in the overall economic development of the country. It is in recognition of this that when the Government of Malawi held its First National Energy Symposium from 4th to 7th April 1989 at Club Makokola, the critical and expanded role of the private sector in solving the nations energy problems was clearly spelled out. The overall objective of the National Energy Symposium was to discuss the findings of the Draft National Action Programme which was consistent with the objectives and policies outlined in the Statement of Development Policies 1987/1996. In drafting the National Energy Plan, the Government with the assistance of consultants consulted widely both in Government, parastatal and private sector and in the end provided implementing agencies both within Government, parastatal and private sector with a clear and sensible development path that is both internally consistent and implementable. It is against this background that the private sector involvement in each sub-sector is addressed.

6.2.0 Woodfuel

6.2.1 As stated earlier Biomass Supply issues are dealt with by the Forestry Department of the Ministry of Forestry and Natural Resources. It was in the late 1970s that Government realised the reduction in supply of woodfuel and the need to increase supply of woodfuel through the establishment of Government fuelwood plantations close to urban areas and nurseries for sell of seedlings to farmers.

6.2.2 Between 1980 and 1987 approximately 15,000 hectares of fuelwood plantations of eucalyptus were established by the Forestry Department. However, the yields from these

plantations were low with a mean annual increment (MAI) of about 4.7m³/ha/annum. Although the wood yields were low, the per hectare costs of establishing the Government plantations were quite high. The cost of wood produced by the Government under the project was estimated at around MK21.9 per stacked cubic meter (in 1986/87 pines). The official stumpage rate then was only MK1.80 (US\$1.03) per stacked cubic meter until March 1986, when it was raised to MK2.70. This was extremely low in comparison to the cost of producing wood.

This low administered stumpage rate did not provide individuals with incentives to produce their own wood supply and also implied that the Government as a major producer of wood could not recover its investment costs. In addition, the stumpage rate encouraged excessive consumption of fuelwood and led to low public revenues which prevented Government from financing measures to control forest depletion.

6.2.3 In the review of the first Wood Energy Project it was discovered that by the end of the seedling production level from the retail nurseries had reached the original target, but seedlings sales remained rather low, resulting in substantial carry over of stock from one year to another. Although inadequate extension services to smallholders for tree planting provided a partial explanation for this, planting trees was found to be well accepted and practiced where there existed a nearby cash market for wood or poles. This suggested that the problem was not that farmers did not know how to grow trees, but that they did not find it financially attractive to grow trees for fuelwood given the low producer prices of wood and availability of free wood in the virtually uncontrolled and protected natural forests.

6.2.4 The reforestation effort under the first Wood Energy Project did little to slow the destruction of the natural

forest. However, the efforts were considered as part of a learning process which contributed to the evaluation of a broad-based strategy for the management of wood energy on a cost-effective, sustainable and environmentally safe basis. The experience with Government plantations demonstrated that principal reliance on the Forestry Department to produce fuelwood was technically and fiscally infeasible, and economically undesirable for a number of reasons, including: (a) severe shortages of qualified manpower in the Forestry Department, (b) planting even 15,000 hectares over the last few years overwhelmed the capacity of the staff to implement the programme effectively, yet the annual wood flow from these plantations represented less than 1% of total annual demand. In addition, Malawi was undergoing a period of severe public expenditure cuts and hence budgetary constraints precluded Forestry Department planting on sufficient scale to make substantial contribution to sustainable supply. Furthermore this was uneconomical as Government had proved to be a very high cost producer of wood. Wood could be produced at much lower cost by the private sector, particularly the smallholders. It was in view of this that a critical review of Wood Energy I project was made and a review of objectives was made for Energy II.

6.2.5 The objective of the second Wood Energy Project was therefore to reorient the Forestry Department away from direct production of wood and towards the creation of an institutional and policy environment that encourages private production and conservation and more efficient utilisation of existing resources. Under the project, the Government is implementing a comprehensive package designed to promote tree planting by both smallholders and commercial users, through provision of subsidised seedlings, extension services and tree planting incentive payments, pricing reform including substantial increases in wood prices, and increased protection and revenue

collection activities in the natural forest. Provision was also made for a limited area of Government plantations in environmentally fragile areas.

6.2.6 In addition, the programme also included several components to promote simple but more efficient technologies for tobacco curing, charcoal making, and domestic cooking stoves. Here again, emphasis was placed on transferring the activities from the Forestry Department and other Government institutions to the private sector. For example charcoal production and marketing and production and marketing of domestic cooking stoves which hitherto had been under Forestry Department had to be gradually commercialised. The second Wood Energy Project became effective in December, 1986. The World Bank and the Malawi Government decided to cancel the IBRD loan for the second Wood Energy Project, reappraised and included it as part of Energy I IDA credit in July 1988. Despite this change in the mode of financing, the project concept and components were not changed except for the proposed plantation near Lilongwe City before the project has been on since 1986 and will be finished 1993/94 financial year.

6.2.7 The success to date is mixed. Some of the components of the project has succeeded for example, the production of seedlings by the private sector has worked. This mostly is because the price of the seedlings had to be raised. However, other people argue that the target number of people cannot afford to buy the seedlings. The farmers have taken the responsibility to plant seedlings given to them by Forestry staff and sell the excess to other farmers.

6.2.8 A lot of progress has been made on the commercialisation of charcoal production and marketing and production and marketing of cooking stoves. An Association of businessmen dealing with charcoal and domestic stoves has been

formed. Commercial organisation responsible for financing and management of business are supporting the Association. This activity took time to take off because of Government bureaucracy and logistics to be worked out. The impression from the members of the Association is that the business has taken off although they have not yet bought off the charcoal kilns from Forestry Department. The Association has so far concentrated on the marketing of charcoal and production and marketing of charcoal stoves. They have established a network throughout the country and have appropriately apportioned responsibility to different entrepreneurs in the production and marketing of charcoal stoves. For example, in the production of the domestic cooking stoves, the inner part is made of inner lining which is produced by businessmen who sell these parts to metal dealers who finally assemble the stoves for sell.

In terms of increasing stumpage rates in order to make tree growing attractive, this has had mixed success. Stumpage rates have significantly been increased from MK2.70 stacked in March, 1986 to MK30.00 stacked in 1992. Even at such high rates tree planting is still not competitive in comparison to food crops. Moreover, it has been difficult for the Forestry Department with their inadequate staff on the ground to properly ensure that everybody buys the wood at the Government gazetted price. It is commonly felt that this has not been possible.

6.2.9 In respect to plantations, the removal of the Lilongwe plantations in the reappraisal of the second Wood Energy when incorporating it into energy is considered a grave error with serious environmental consequences to Malawi and a situation which needs to be immediately reassessed by Government. Compared to other forms of fuel, woodfuel has relatively been a cheaper form of fuel than the imported petroleum products and electricity. During the negotiations,

the Government insisted on having the Lilongwe plantations because without the plantations the Government envisaged extensive ecological damage due to deforestation of the peri-urban areas of Lilongwe. The increase in stumpage rates has encouraged the people around Lilongwe to cut their trees for sale to residents in Lilongwe. The environmental damage to the hinterland of Lilongwe is quite considerable and a reafforestation programme is necessary to reverse the situation.

6.2.10 On the Government incentives given to farmers who have planted trees, this programme has been very difficult for Government to administer. One of the problems has been to determine the right levels of incentive to encourage the farmers who have planted trees. Secondly, with the so many numerous farmers planting trees at small level, the accuracy of the statistics and to avoid repeating payment to the same farmers. The review of the implementation of this approach and recommendations are in Chapter 6.

6.3.0 Electricity

6.3.1 Electricity in Malawi is generated, transmitted and distributed by the Electricity Supply Commission of Malawi, ESCOM. ESCOM is a state owned parastatal or corporation established by the Electricity Act of 1963 when it took over the assets and liabilities of the former Nyasaland Electricity Supply Commission which was established under the Electricity Act 1956. ESCOM is empowered by its Act to generate, acquire or supply electricity. ESCOM exercises control on electricity generated by others by the power generated to it under the Act to recommend to the Minister responsible the licensing or renewal of licenses of suppliers with an installed capacity in excess of twenty kilowatts.

6.3.2 ESCOM reports to the Government through the Department of Statutory Bodies (DSB). At least three Government departments have direct interest in the operations of ESCOM, and these are the Ministries of Energy and Mining, Ministry of Finance and Department of Statutory Bodies. Although DSB's legal mandate is not gazetted, it is set up to: (i) assist parastatals in sound financial management; and (ii) provide guidelines related to employment, salaries, fringe benefits and other benefits including vehicle use and housing allowances for parastatal employees. ESCOM also liaises with the Ministry of Energy and Mining and its Secretary is an ex-officio member of ESCOM Commissioners. The Ministry of Energy and Mining is also informed on projects under implementation as well as on major new investments and tariff issues. ESCOM's loans require the prior approval of the Ministry of Finance. ESCOM is not allowed to correspond directly with the World Bank and other international funding agencies except through Ministry of Finance. Consequently bid documents are transmitted by ESCOM to DSB which transmits through the Ministry of Finance to the donor. This procedure has caused a lot of delays in procurement and Government has agreed to allow ESCOM to correspond directly with the donors in all matters related to any project, the Government's mandatory approval of procurements should be either at the bid evaluation or the contract award stage.

6.3.3 The Government recognising the weakness of the institutional framework undertook a study with assistance of the World Bank and UNDP, to improve the role of DSB and introduce efficiency and accountability of parastatals. The utility has powers under the act on matters relating to motivation, promotion, transfer, hiring and hiring of employees, of course necessary approvals have to be sought from

the Board on such matters. The attitude that ESCOM has been given in the performance of its activities has improved on its efficiency of operations.

6.4.0 Petroleum

Four private Oil Companies - Oil Company of Malawi (OILCOM), Mobil, Caltex and Total market petroleum products in Malawi with Oilcom accounting for 60 percent of the market. Before the Nacala and Beira railway routes were closed, each of the oil companies operating in Malawi procured its petroleum requirements directly through its international affiliates. In 1983 Malawi's four oil companies formed the Industry of Petroleum Supplies Unit (IPSU) to procure petroleum products on their behalf. IPSU is managed by Oilcom, which in turn, is managed by British Petroleum, a 20 percent shareholder in Oilcom. A Government parastatal, the Petroleum Control Commission (PCC), monitors the operations of all the oil companies including IPSU. PCC also arranges and supervises all the transport logistics for the petroleum products both inside and outside the country. The Petroleum Control Commission on behalf of Government also reviews petroleum product prices; monitors the costs of procurement and transport for petroleum products; for Malawi's petroleum requirements.

As already stated, there are currently four oil companies; OILCOM, Mobil, Caltex, and Total. There is concentration within the market in that Oilcom commands more than half the market, two firms control 80 percent, and three more 90 percent. When certain market segments/areas are examined, the concentrations are more extreme due to the absence of one or more of the companies from that segment. This is often due to the absence of wholesale/retail infrastructure except that provided by one or two companies. The market segments/areas served by all four companies are few,

and until recently with the movement of Mobil into certain areas, Oilcom, had virtually local monopoly. There are significant barriers to entry amongst which are:

1. The relatively small size of the market growth resuming only in the last few years.
2. The country's landlocked position, providing natural barriers to upstream entry particularly in light of 3.
3. With more exceptions, all storage is owned by the companies. Government storage is operated by OILCOM. There is no "Commission Carrier" storage or regulatory provisions.

The supply side of the industry is a mixture of public and private ownership of entities. With all the aforementioned major supply companies including Ethanol Company of Malawi having significant ownership of foreign/multinational entities at the wholesale level. For example, in the case of the largest entity, OILCOM, a minority ownership resides with BP and the majority shares are held by the local Press Group, this making it subject to non-energy-related regulations pertinent to local companies. Mobil is wholly owned by the international parent, and operates under regulations relevant to foreign ownership. The difference in regulation has implications for access to and cost of debt capital from the local commercial banking system. At the retail level, ownership is also defacto a mixture of local and foreign ownership, as resellers (service stations) include: private (local) owned and operated; Oil company owned and operated under lease from the oil companies by Malawians.

Resulting from the problems identified above supported by the investigations of the Petroleum Control Commission and the preliminary findings of the Energy Pricing Study funded by World Bank under Energy I Project and a review of petroleum procurement procedures by the World Bank appraisal mission to Malawi Power V Project suggested that there was potential to reduce the cost of procurement, storage and bulk marketing through the introduction of more competition into the process. The PCC is the organisation currently best placed and equipped to inject that competition. The Malawi Power V Project has provided funds for technical assistance to the PCC to examine the scope for and means by which it could reduce the cost of petroleum supply, and for a review of its legal framework to identify any changes that would be needed for it to play a more activist role if the study suggests such a role would be cost-effective.

6.5.0 Coal

6.5.1 The presence of coal in Malawi has been known for many years. However, until quite recently, it was not considered economically feasible to exploit domestic coal resources because low cost and dependable supplies of coal were available from Mozambique, where a larger coal mine called Moatize was in operation. Due to disruptions in the supply of coal from Mozambique in the early 1980s, domestic coal mining activities were begun in 1985 and to day Malawi is meeting about 85 percent of its coal requirements from domestic resources. The rest of the coal requirements are met by supplies from Moatize in Mozambique.

6.5.2 A coal mine was opened at Kaziwiziwi in the Northern part of Malawi in 1985. About 115,000 tonnes have so far been produced, but accessible reserves are now virtually depleted.

and mining activities have shifted to Mchenga close to Kaziwiziwi coal mine. Mchenga produces about 55,000 tonnes of coal a year.

6.5.2 The main problem in the coal mining has been in the management of these coal mines, first with the Kaziwiziwi Coal Mine and then Mchenga Coal Mine. The mining operations were established through a Government parastatal company called the Mining Investment and Development Corporation (MIDCOR). It was given a subvention from Government to run the mine. However as a result of poor management, low capital investment and high transport costs to the commercial centres of Lilongwe and Blantyre, the corporation has continuously run on a loss. This has meant Government giving monies every year in order to sustain the operations of MIDCOR.

The MIDCOR management is based in Lilongwe about 400 km away from the Mine. The daily operations are managed by the Mining Manager. In several Board meetings of MIDCOR it was pointed out that MIDCOR was not aggressive in its marketing and that this partly was the cause of low sales of coal and therefore the losses for the corporation. In the middle of this year, the MIDCOR Board decided to establish Mchenga Coal Mine as a separate private company in which MIDCOR on behalf of the Board and Government is a minority shareholder. This is now considered the most commendable approach to coal production and marketing in Malawi.

The anticipated coal demand is about 95,000 tonnes and an aggressive marketing strategy is required by the coal mining company at Mchenga in order to reduce on supplies from Moatize which are not erratic because of transport problems. However, coal users normally buy in bulk and stock pile the Moatize coal which is of a lower quality.

Efforts are underway to develop the coal Mine at Mwabvi in the Southern Coal field. MIDCOR is undertaking trial mining and washability tests. If exploitation of the coal from Mwabvi proves to be commercially viable then a private company will be formed to operate the Mine. MIDCOR is arranging with the coal users a joint venture company for the exploitation of this coal.

6.6 New and Renewable Forms of Energy - Solar Energy

As already stated, with respect to the prospects for greater use of renewable energy resources or non-conventional energy resources, the Government promotes the use of solar by recommending appropriate training of the users and the proper adaptation of the technology to the local circumstances. A Government parastatal, Malawi bureau of Standards ensures that the right standards and specifications are met. The Technical Services Division of the Energy Department coordinates all the research work and also does its own performance analysis.

The Technical Services Division of the Energy Department in close collaboration with the dealers of solar gadgets disseminate the information on the use of solar gadgets including spectrum of applications, reliability and costs. There is a Solar Energy Committee chaired and coordinated by the Ministry of Energy and Mining with broad based representation. The mandate of the committee is to review the progress of the implementation of the action plan that we have for solar energy; inform other institutions about the progress made; and discuss emerging issues relevant for the cost-effective development of solar energy in Malawi. This committee meets quarterly.

In respect to the production and marketing of solar equipment, this is entirely left to the private sector.

Government has not yet constituted price controls and has not yet provided enough incentives to make solar energy competitive vis a vis other energy resources. This is an area where the solar energy symposium had very strong recommendations. The area is quite complicated as regards the incentives to be provided to solar appliances which may include tax exemptions etc, but these would only be meaningful where there is enough competition among suppliers and a big market, both of these are not yet in place. The Government is still discussing with the suppliers and all the concerned parties on how this could be best addressed.

7.0 Lessons and Recommendations

7.1 The policy of the Malawi Government is to make the parastatal and private sector to be partners in economic development. It is against this background that the private sector was given a greater role in the energy sector activities. A number of lessons have been learned in respect to the role the private sector could play in the energy sector development.

In respect to the woodfuel sub-sector; Government acknowledges the crucial role the private sector can play in the production and marketing of charcoal and woodstoves. The private sector has made significant progress in this area and has significantly reduced costs which hitherto were being borne by Government. The Government continues to provide an environment which facilitates the private sector production and marketing of charcoal and woodstoves. The commercialisation process of charcoal and woodfuel production and marketing is not yet completed but the success so far achieved clearly indicates the cost effectiveness of involving the private sector in such type of activity. However, as regards production of fuelwood for both the rural household as well as provision of wood for the cities and urban areas, the production of wood by the smallholder farmer is not adequate to meet such demand. It is required that Government plantations should be established in such cases.

They view that the private sector would establish fuelwood plantations for the urban centres has not proved feasible for Malawi. The businessmen look at the financial implications of using land for wood production instead of crops and because of the long gestation period for tree growing minimum of 5 years, it is not financially attractive to put land on wood crop rather than food crop like tobacco or maize.

However, Government has realised that the economic costs outweigh the financial costs of establishing such plantations by the private sector. The environmental costs of rehabilitating the degraded areas of the hinterlands of urbans are quite costly in medium and long term. It is therefore recommended that in such situations provision of woodfuel should be compared with other sources of energy i.e. electricity and petroleum products and if the economics of provision of wood energy is cheaper than other forms of energy, Government should establish the woodfuel plantations even if in financial terms Government may be more expensive than the private sector. The long term effect is the environmental degradation and resultant cost of rehabilitating these areas.

7.3 In respect to petroleum products, it should be realised that petroleum products sustain the development of the economy and therefore proper pricing of these products is required. The experience in Malawi has shown that most of the oil companies which are branches of multinationals have short term objectives of maximum profits without concern for economic growth. When Petroleum Control Commission tendered for 50 percent of the petrol and diesel products, it was interesting to note that one of our normal supplies tendered the delivery of the product at 31 percent lower than the price the company was currently charging in the country. There is need therefore to have control over these multinational oil companies to ensure least cost supply and adequate competition in order to reduce cost of product to the users. Nationalising oil companies is not the best solution in terms of providing competition and reducing the cost of supplies to the customer. Private companies do it much better but what is necessary is provide adequate competition and clear monitoring of their activities.

7.4 The development of power is the most difficult considering that in the long term that is the major energy source for the future. Although woodfuel dominates the supply at the moment, it is more a reflection of underdevelopment rather than what should happen. As African countries develop, they will move away from traditional fuels like woodfuel to commercial and renewable fuels like electricity.

7.5 It is against this background that the management and pricing of electricity should be such that should reflect the development process. It is in this regard that privatising a power utility, knowing quite well that would necessitate foreign capital, at the moment would be inconsistent with our overall development policy. The Electricity Supply Commission of Malawi as a parastatal has functioned well considering the latitude and autonomy it has been given in its operations and this is considered as the best solution for power development in Malawi at the moment.

7.6 As regards the coal mine operations and coal marketing, the private sector would do much better provided clear guidelines and incentives are given for them to operate. It is very costly to nationalise or put such an operation under parastatal administration because such ventures are profit oriented, a concept very difficult for Government or quasi Government to appreciate.

7.7 Finally for the non-traditional energy sources, it is important that Government provides the correct environment for their development. It would not be cost effective for Government to completely take over such activities since in the end they are profit making if they prove financially viable. In Malawi a lot of solar adaptation research has been done by private organisations like Applied Energy Research Division of Habitat for Humanity (Malawi). They have come up with box

cooker which has helped many households in the rural areas where firewood has become increasingly scarce. The Government should coordinate such research activities on non-conventional energy in consultation with the parastatal sector like the University and the private sector.

7.8 In conclusion, it is important that the parastatal and the private sector are partners in energy sector development. The term of involvement will differ from country to country but the role of the private sector increases with the level of economic development in the country. In order to enhance overall economic development, the private sector should be given more role but with clear guidelines and necessary restrictions in order to prevent exploitation from foreign interests.
