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**MODALITIES OF STRENGTHENING THE INSTITUTIONAL
ARRANGEMENTS FOR MANAGEMENT IN THE ENERGY SECTOR
(CASE OF ZAMBIA AND ZIMBABWE)**

**MODALITIES FOR STRENGTHENING THE INSTITUTIONAL ARRANGEMENTS
FOR MANAGEMENT IN THE ENERGY SECTOR:
CASE OF ZAMBIA AND ZIMBABWE**

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1. INTRODUCTION

1. The energy sector in African countries suffers from a weak and poorly co-ordinated institutional infrastructure, when no one institution has been given primary responsibility for energy planning and policy formulation and areas of responsibility for energy sector strategy are divided among various ministries and institutions.
2. A systematic study of the institutional structure of the energy sector is a must in every African country. This study should define the tasks and the responsibilities of the various agencies and institutions, and should outline a network for the exchange of information.
3. Comprehensive energy management requires well established institutional infrastructure as well as availability of adequately trained personnel in order to successfully implement energy sector projects and programmes. Unfortunately in Africa the pool of energy managers is generally quite small. The two key reasons for this are: (a) scarcity of domestically trained managers due to inadequate technical level of training institutions and facilities and (b) brain drain when the skilled personnel departs abroad due to better paying opportunities there.
4. The most common weaknesses in energy management can be found in all types of public institutions in African countries. These weaknesses include insufficient experiences and training of the key staff, poor management practices and lack of familiarity with technologies and operating issues. They are compound by poor infrastructure, a lack of specialised consultants and by generally low level of education and skills among the work force. They are also exacerbated by the tendency of institutions to use their own scarce managerial and technical staff for tasks that could be sub-contracted to private industry on a long-term basis.
5. The task of managing energy establishments in Africa is made more difficult by the diffusion of responsibilities at the governmental level. As many as a dozen ministries sometimes make decisions and issue independent regulations bearing directly or indirectly on the energy sector. Various public or private organizations, such as industrial or agricultural banks may appraise investments involving energy without referring to the Ministry of Energy or any other energy authority. There is thus an inherent risk of conflict in a crucial area of national economic development.
6. However many African countries have recognised their weaknesses in institutional structure and have already established a specific organizations responsible for coordination and management of the energy sector. These organizations have often bi-level structures: (a) a directorate authorised to formulate policy and to make critical decisions concerning investment, prices, etc; (b) a technical agency to monitor plan implementation in the various subsectors. Ministries of energy (or energy and mines) have been established in many African countries.

7. Many of the problems in the energy sector in African countries reflect the still evolving organization and definition of the institutions within the sector which have been recognized and redefined more than once in the short time since independence. The resulting uncertainty about functions and responsibilities has led to ill-advised planning and investment decisions in the past, and continues to detract from the scarce management and technical capacity available in the energy sector.

8. Despite all these measures in many African countries, there is still a continuing need to strengthen institutional, managerial, training and staffing arrangements at all levels. In particular, there is a need to improve the framework for co-ordinating decisions on the management of the energy sector, including investment priorities, fuel substitution and energy pricing policy as these affect the activities of more than one agency within the country. These efforts have been supported by many international organizations and the best example probably is the ESAMP programme jointly executed by the UNDP and the World Bank. For this study the recent reports on energy sector in Zambia and Zimbabwe (Zambia energy sector strategy, 1988; and Zimbabwe Energy Strategy Evaluation, 1990) have been consulted and referred to in the text.

9. Serious policy and institutional deficiencies have persisted in African countries which have aggravated the structural weaknesses of the energy sector. Until very recently, there were no clear strategies to guide investment planning nor coherent policies to put objectives and strategies into effect.

10. In many African countries the Government implicitly recognizing the importance of an integrated approach to energy sector management have established the National Energy (committee/Commission as a high level body comprised of ministers and heads of energy sector parastatals under the chairmanship of the minister, responsible for energy development. However these Committees/Commissions were not accorded any real decision-making powers or significant administrative resources and soon were disbanded after their original members delegated their responsibilities to lower level staff.

11. While the African Governments are committed to strengthen the institutions in the energy sector, they do not have the necessary financial and staff resources to do so. Managerial and administrative inadequacies affect the proper function of the subsector institutions at all levels and partially, limit their capability to devise and implement investment programmes. As the policy-making institutions in the energy sector often deal with a number of other matters besides energy, they tend to give secondary importance to energy matters, leaving the operating agencies without clear guidance or support in getting necessary measures enacted.

12. This paper is based on the study carried out in 1991 in the ECA Secretariat as well as findings of the missions in 1988-1989. Unfortunately the field missions planned to be undertaken by ECA staff to Zambia and Zimbabwe in 1991 did not materialize due to circumstances beyond ECA control. The paper reflects the firm commitment of the ECA Secretariat to implement the resolutions and recommendations of the Regional Workshop on aspects of energy management in Africa held in November 1987 in Addis Ababa.

II. SCOPE OF THE PROBLEM

13. There are several reasons why energy management is required at the national level in African member States, and these issues tend to be complex. Not only are individual projects complicated to design and implement but very frequently energy investments are complimentary with each other while others are mutually exclusive and decisions on energy are inevitable closely linked to almost every other aspect of development strategy. Moreover in Africa these decisions have to be taken on the basis of imperfect information about the energy resources base and in environment where future energy demand and relative prices are subject to considerable uncertainty.

14. Several peculiar characteristics make the management at the sectoral level as well as the investments into energy sector especially complex. The major are as follows:

- (i) The resource base is uncertain because its physical characteristics cannot be perfectly known before exploitation starts.
- (ii) The technology is new or rapidly changing or risky.
- (iii) The investments are huge and in case of some African countries are as large as the nation's annual GNP. The scale of investment can give rise to formidable problems in assembling the finance from several different sources, both external and domestic.
- (iv) Projections of energy demand are highly sensitive to macro-economic developments.
- (v) Energy investments require a long planning horizon of 10 to 20 years. Over such a long period there is a wide range of possible patterns of growth and structural change and hence of energy demand.
- (vi) Energy investments are both very risky and offer potentially high rates of return. It is often necessary and feasible to involve foreign equity partners and this requires negotiation of suitable arrangements to share the surplus.

- (vii) The limited extent of domestic private sector activity in energy production and supply in most African countries places an extra management burden on the public sector in this area.
- (viii) Environmental considerations are also important and environmental effects have to be explicitly considered in the course of evaluating energy investments and possibility of effective energy management.

15. At the subsectoral level, the operating agencies are hindered by a lack of managerial autonomy, inadequate financial management and management information systems, and the absence of project analysis and planning capability. Besides pricing and investment, the operating agencies have only limited autonomy in staff matters. Liaison is poor between the individual agencies which often do not inform each other about their respective programmes.

III. PROBLEMS OF ENERGY MANAGEMENT IN AFRICA AND PRIORITIES FOR ACTION

16. None of the African countries have coped with the challenges posed by the problems of energy development over the last decade. It is hardly surprising therefore that member States have management problems both at the national and institution level.

17. Because of their large scale and strategic importance, energy supply activities in African member States are generally managed by the Government or public institutions. It is entirely appropriate that long term objectives and strategic issues be determined by a high political authority but within clear national guidelines, the operating institution must be free to make final decisions on operations. In practice, supervision by government ministries can sometimes extend to interference in routine decisions by civil servant who lack operating knowledge and may not share responsibility for failures. Under these pressures, even when institutions are formally autonomous, key decisions may be delayed.

18. While the priorities for action in the energy management in each African country will need to be determined within the specific context, two areas which require widespread attention are the need to improve the quality and volume of preinvestment work and to strengthen the strategy formulation, overall management and manpower capability at both the institution and national levels.

19. The organization of preinvestment work is only one aspect of a broader need to strengthen institutions in the energy sector. It is necessary to establish a working environment that will maintain the continuity of management and help to retain qualified staff and to upgrade their

skills. The latter will involve formal training and refresher courses as well as closer contact with experienced staff in international industry, consulting firms and lending agencies involved in project preparation and appraisal.

20. It is also necessary to ensure that major proposals concerning investments and pricing are analyzed with a broad perspective of the sector and the nation rather than in an isolated uncoordinated manner. This is particularly important given the uncertainties affecting the future evolution of energy demand and supply. To achieve these changes will require both staff devoted to long-run planning at the institution level and a small qualified group of analysts at the national level to advise the key decision makers on overall sector policy issues and on ways to strengthen the institutions operating in the energy sector.

21. The planning staff at the national level would be responsible for co-ordinating institution plans. That could be achieved by ensuring that institution makes the same assumptions about the growth of energy demand for different fuels for power generation is consistent with the projected availability of these fuels. They would also be responsible for evaluating the effects of exogenous changes on the demand and supply prospects for individual fuels and for ensuring that subsector investment programmes and pricing policies were altered quickly to take account of these changes.

22. A central energy secretariat/institution may also be concerned with efficiency in energy use. It may oversee programmes to reduce energy consumption, promote research studies and experimental projects for improving efficiency in the use of energy and disseminate information on how to save energy. It would ensure that adequate financial and managerial resources were being devoted in each of the subsector operating agencies to improving the efficiency of existing plant and operations.

23. This is important even if the energy source is imported. Significant reductions in the oil import bill can be achieved by switching to alternative sources or methods of supply. The location of the national energy policy staff will vary by country, depending on specific needs and institutional arrangements. The important requirement in all African countries however is that energy planning be an explicit element of national planning and public investment decisions and the national staff should have adequate authority to review all proposals with significant energy implications.

IV. ROLE OF EXTERNAL ASSISTANCE

24. The main effort to improve energy management has to come from the African countries themselves. In some vital areas for example, in the reform of the relationship between government ministries and public institutions, external agencies can highlight the problem and advise on how it is being addressed in other countries. In other areas there is greater scope for

external assistance in improving management structures, accounting systems and procedures for billing and collection, operations and maintenance even though the social and political frameworks within which solutions must be sought are fully known in the countries concerned.

25. International financial agencies can also help by preparing terms of reference for selecting and supervising the performance of consultants for pricing studies, in establishing priorities for preinvestment work identifying the manpower and financial requirements and mobilizing the funding. Through their joint energy assessment and sector management programmes, the UNDP and the World Bank are assessing the major energy problems in majority of African countries and helping to evaluate options for solving these problems and improving energy sector management.

26. Training in the areas where specific external assistance may be useful in several ways:

- Programmes within countries to train specialists in energy planning, economics, technologies, finance and environmental aspects; on the job management and technical training in energy companies;
- Workshops and seminars at which technical experts from African countries exchange ideas and experiences;
- Overseas training courses in various specialities;
- Secondment of key individuals to foreign energy sector institutions and financing agencies;
- Reorientation of training and educational institutions and programmes in the country concerned.

27. Training should be carefully focused to benefit the country in areas where it is most needed and can be of lasting use. For instance, training in building sophisticated models of the energy sector is of little value in African countries where basic data and analysis of energy issues are still rudimentary. At the same time the benefits that accrue from a well designed and well administered training programme must be emphasized. The high rates of return for such training make its high cost well worth incurring and it is frequently a prerequisite for realizing the fully benefits in plant and equipment.

28. Because of the growing complexity of strategy and policy decisions in the energy sector in African countries, there is need for well-coordinated external technical assistance to deal with the main sector issues, especially the requirements for institution building. In the short term, this external assistance should focus on strengthening the operating agencies in the subsectors, including project preparation and implementation. Over the medium term, it should contribute to strengthening the planning and monitoring process at the sectoral level. External technical

assistance thus is needed in three areas, that is (a) training and manpower development; (b) pre-investment evaluation; and (c) strategy, policy and institutional evaluation.

V. ENERGY SECTOR INSTITUTIONS AND STRATEGIES

A. CASE OF ZIMBABWE

29. In Zimbabwe various Government institutions are engaged in the management of the energy sector, but the Ministry of Energy and Water Resources and Development is the principal institution. Within the Ministry the Department of Energy Resources and Development is responsible for planning and policy formulation and coordination in the electricity and liquid fuel subsectors. This includes the preparation of investment programmes in cooperation with various agencies, and assisting these agencies in securing Government approval for their pricing and investment proposals.

30. Decisions on the pricing of electricity, petroleum products and coal are taken by the Development Committee of the Cabinet of Ministers. There is no government control over woodfuel markets and prices and no market mechanisms appear to exist to transfer fuelwood resources from areas of supply to areas of demand.

31. Given the complexity and wide repercussions of strategic and operational decisions in the energy sector and the high costs of energy investment projects, close co-ordination and efficient implementation of decisions are essential for effective sector management. However, policies impacting on energy supply and demand are adversely affected by (a) the lack of effective coordination between the sector institutions, which is not commensurate with the high degree of Government control over the sector; (b) lack of adequate policy analysis and project evaluation; and (c) weak links between energy planning and macro-economic planning. There is no lead institution within Government for preparing decisions on energy pricing, regulation and investment, to the detriment of the speed and quality of decision making process.

32. The lack of coordination between macro-economic and sectoral planning is a particularly serious impediment to conducting effective policies. Capabilities in policy planning and project evaluation are weak at the sectoral level largely due to organizational shortcomings and the absence of experienced staff. Managerial autonomy and accountability at the subsector agencies is limited which is bound to affect the efficiency of operations. As a result clear priorities in sector strategies are lacking, resources are diverted to pursue uneconomic options, energy pricing and efficiency options are not effectively addressed and donor interest can influence investment decisions.

2. Government objectives and strategy in energy management

33. The Government aims at ensuring adequate, secure and safe supplies of energy to all economic sectors and consumers groups, at prices which support the Government's basic objectives of economic growth, regional development and equity. The energy development objectives are as follows:

- (a) to achieve as far as possible self-sufficiency and security in energy supply thus reducing the dependence on imported fuels;
- (b) to increase the amount of energy produced from commercial sources such as coal and hydro-power; and
- (c) to increase the use of coal and electricity in rural areas, thus raising the quality of life of rural population, and at the same time reducing the degradation of the environment caused by deforestation.

34. The Government has been consistent in pursuing the objective of self-sufficiency as evidenced by the development of the coal-fired power stations, the upgrading of existing hydro-power stations and ethanol production. For a number of years the development of the energy sector has been directed by the Government's import substitution approach. The policy on electricity imports also is consistent with this strategy, as is the policy of keeping the price of diesel much lower than that of petrol so as to cross-subsidize industry, commercial transportation, and commercial agriculture.

35. The Government also has tried to stimulate the substitution of coal tar fuel for imported diesel. However the objective of maximum, self-sufficiency was pursued with comparatively less attention to cost considerations, which may have inadvertently affected the overall costs of energy supplies and thus the availability of supplies to lower income groups. Rural electrification is to contribute to promoting rural development, but is not in itself seen as means of arresting deforestation. All prices and investment decisions related to electricity, liquid fuels and coal are controlled by the Government, reinforcing its role in development, but energy demand management has yet to receive required attention.

36. More recently the Government has modified somewhat its strict adherence to self-sufficiency in electric supply and it appears to favour hydro over thermal projects but at the same time, has relaxed its limits on electricity imports as it is actively considering purchases of electricity from Cabora Bassa in Mozambique.

37. The Government is evaluating coal-based import substitution projects. In the liquid fuels subsector the Government would like to expand ethanol production with the target of maintaining

a 13% mix with petrol and possibly increasing this share to 20%. A joint venture to extend the Beira pipeline from Feruka to Harare was organized. The Government also plans to increase product storage for enhancing supply security and is considering to recommission the existing refinery to serve the local market.

38. The Government's objective is to attain both high technical reliability and strategic security of energy supplies through maximum use of local energy resources. This strategy is bound to entail high additional costs in all energy subsector depending on the options chosen. In the electricity subsector the Government's priority to restrict imports to no more than 25% of total supplies and build-up of generating capacity. For liquid fuels there are plans to raise strategic stocks to six months of consumption to be stored underground.

39. The upgrading of the existing refinery at Feruka will bring the costs of domestic refining higher than of importing petroleum products in most cases. This project thus does not relate well with stated energy priorities since the domestic refining of crude oil supplied from world markets is not likely to be cheaper or more secure than the supply of petroleum products procured contract as at present. The Government's programme of increasing the petrol blend ratio to 20% ethanol would have entailed investments costs and be uneconomic even at relatively high international petroleum prices if based on sugar as raw material.

40. Overall pursuing supply options that are least-cost simply because they reduce dependence on foreign energy supplies will adversely affect other public and private investment, and because of high costs of foreign investment and current operations ultimately the balance of payments as well. To the extent that the options under consideration involve technologies hitherto untried in Zimbabwe, there is the additional risk of operational complications which would increase costs and reduce the reliability of energy supplies rather than enhancing them.

41. The costs of energy supplies can be considerably reduced however through a strategy based on well-chosen projects of regional supplies as a means to capture comparative advantages and economies of scale. Energy supplies to Zimbabwe from neighbouring SADCC countries have been obtained in the past and offer scope for further increases in some cases at lower cost than could be domestically produced. Electricity from Zambia has been obtained since the late 1970s and will be available to Zimbabwe over the foreseeable future. In addition up to 500 MW of firm supplies are planned to be contracted from Cabora Bassa in Mozambique. The interconnection with Cabora Bassa could also justify the conjunctive operation with Kariba which would allow the postponement of significant electricity investment in Zimbabwe.

42. Over the longer term electricity exports could become feasible to Botswana and possibly South Africa. A high-voltage link between Zimbabwe and South Africa would make it feasible to eventually wheel electricity from Cabora Bassa through Zimbabwe and South Africa back to Maputo at a lower tariff than the purchases of electricity by Mozambique from South Africa.

43. In a liquid fuel subsector pooling the processing of petroleum products in accessible refineries in the SADCC region may offer region-wide economic advantages over the importation of some petroleum products from outside the SADCC region. Likewise importing fertilizers produced in Mozambique and Tanzania from local natural gas may be lesser-cost than production in Zimbabwe based on coal gasification.

44. Regional energy co-operation at mutually advantageous conditions thus would facilitate a needed expansion in trade: energy purchases by Zimbabwe will provide its partner countries with export outlets that would hardly exist elsewhere and with much-needed foreign exchange which would increase those countries' capacity to import Zimbabwean goods. Also exports of Zimbabwean coal to Zambia and Zaire offer minor sales outlets. They would bring about added dynamism in economic development and assist in institutional strengthening.

B. CASE OF ZAMBIA

1. Institutional framework

45. The Zambian energy sector is managed by a mixture of Government departments, public enterprises and a small number of semi-private enterprises. The roles of the various governmental bodies are not clearly defined, their roles appear to overlap and leadership and co-ordination is lacking. As a result, there is no clear energy strategy, with the risk that sub-optimal decisions will be taken, and opportunities missed, at significant cost to the economy.

46. The Department of Energy in the Ministry of Power, Transport and Communications is in the best position to be one of two key institutions in the energy sector. It already has the primary role in the energy policy formulation, although this needs to be codified, and the Department needs substantial strengthening for it to undertake this role effectively. To be effective in policy development and co-ordination its responsibility and authority need to be legally clarified, so that it participates on all occasions when policy decisions are taken.

47. The second key institution in the energy sector is ZIMCO. It has the responsibility for implementing the energy policy decisions of the Government. It is responsible for initiating investments in other industries that have a direct impact on energy use and the energy balance and it has the in-house capability to analyse and advise on energy issues.

48. The Ministry of Power, Transport and Communications has the primary role in the energy sector, a role much broader than indicated by its title. Within the Ministry, the Department of Energy is responsible for implementation of the energy Programmes at the national level. It is important to clarify the role of the Department of Energy and that of others in the energy sector. The Department should be clearly responsible for energy policy advice in all energy subsectors, including petroleum, geothermal and coal exploration and development, wood and charcoal, energy pricing policy and the energy implications of investments having a noticeable impact on the energy balance.

49. The second Ministry with the important energy role is the Ministry of Mines, in part through the Geological Survey, the Hydrocarbons Unit and the Coal Department. The Hydrocarbons Unit need reinforcement, it should take a much more active exploration promotion

role. In contrast, there does not seem to be an early need for enhancing coal reserves. The Geological Survey is responsible for resource evaluation in a number of natural resources, including geothermal energy, and it will be important to link these efforts to the overall energy policy and guidance to be provided by a central energy policy and coordinating body such as Department of Energy.

50. Other Ministries and Departments have a less direct energy role. For efficient operation of the energy sector in the country it will be necessary for each institution to develop maintain regular policy co-ordination with the Department of Energy.

51. In Zambia the Government has established the National Energy Council in 1980 but it ceased to exist by 1989 because of low effectiveness in developing an appropriate energy policies and establishing priorities to resolve energy issues. There was no mandate governing liaison between NEC and other energy related agencies in respect of reviewing their investment plans, pricing proposals or corporate policies, hence, for the most part the NEC and the Department of Energy were by passed by the management of implementing agencies. In view of the above the NEC was dissolved.

2. GOVERNMENT OBJECTIVE AND STRATEGY IN ENERGY MANAGEMENT

52. There does not seem to be a need for significant changes in the overall structure and role of the operational energy companies. The only areas where further private sector activity could be considered a priority are petroleum exploration and petroleum distribution. Information on the petroleum distribution companies is generally unavailable. Further emphasis on encouraging competition would be useful by Government establishing price ceiling rather than fixing retail prices themselves.

53. Zambia is fortunate in having considerable indigenous resources of woodfuels, hydropower and coal which satisfy many of its energy needs. With the exception of petroleum, the country is virtually self-sufficient in energy and is a net exporter of hydropower. Wood was the dominant source of energy, contributing 72% of total primary supply, followed by hydroelectricity (13%), petroleum products (9%), and coal (6%). Effective use of the indigenous resources can minimize the need for energy imports.

54. Energy is imported to Zambia in a form of petroleum products which are brought in co-mingled form via the Tazam pipeline from Dar-es-Salaam to Ndola and processed at Indeni refinery.

55. The present structure of Zambia's industrial sector should make it possible for the Department of Energy to liaise with major producers and consumers regularly, ensure they are informed of national energy policy and to offer advice on energy issues, plans and investments at an early stage.

56. There are some institutional issues related to the operational energy establishments. In general it can be seen that in a number of these institutions, there should be stronger emphasis on strategic planning, on identifying key weaknesses and preparing contingency plans, on strengthening management and internal systems, and on a more careful definition of staffing needs. Expatriate technical support is a necessity if these institutions are to co-operate cost-effectively. Institutional strengthening is one of the most important issues of the energy management in Zambia.

VI. RECOMMENDATIONS FOR STRENGTHENING THE INSTITUTIONAL ARRANGEMENTS

A. ZIMBABWE

57. Institutions at the sectoral and subsectoral levels need to be reinforced and institutional inter-relationships be rationalized. Co-ordination should be improved so that policy and investment decisions for each subsector take full account of developments and plans through out the energy sector and the economy at large and energy sector management is made more effective. Department of energy should (i) play a greater part in developing a consistent economic policy framework; (ii) coordinate energy sector strategy and policies with other Ministries; (iii) take the lead in implementing energy policies; (iv) promote private participation in sector development; (v) ensure the application of a consistent planning methodology; and (vi) provide informational support needed for energy producers and consumers to take economically and financially sound decisions. Improving co-ordination between the Ministries and National Planning Agency is important so that financial surpluses can be generated at the energy enterprises and energy investment requirements be properly evaluated.

58. Department of energy needs to be given proper authority and resources to effectively liaise with various Ministries. To this end its Staff needs to be reinforced to carry out integrated energy sector planning and policy analysis, evaluate projects and monitor project implementation. This should be mirrored by a build up of relevant expertise in sector and project analysis at National Planning Agency as a final arbiter in preparing the public investment programme. Furthermore the institutional and legal framework for stimulating energy efficiency and or promoting environmental protection in the energy sector should be developed. In order to facilitate a consensus on energy strategies the World Bank recommended that the Government should consider establishing an Advisory Committee on energy with representation of consumers, private investors and environmental interests as well as the parastatal entities in the energy sector.

59. The basic question raised is whether the Government's energy development strategy is consistent with the overall objective of enhancing the efficiency of the economy through supplying energy reliably and at least cost. Therefore it needs to be determined whether specific

proposals in the individual subsectors are economically viable as well as consistent with the Government's priority objective of enhancing the security of energy supplies.

60. The Government is cautious in accepting the risks of supply failure which it perceives to be associated with increased energy imports. However security of supply is not synonymous with self-sufficiency so it is important to assess projects in terms of their impact on supply reliability and not in terms of their physical location. There is a clear trade-off between the objective of achieving maximum security of supply and the need to ensure energy supplies at least cost: the additional expenditure required to achieve maximum security of energy supply is bound to impose substantial costs on the economy and tie up funds that are required for investments elsewhere.

61. They are justified only if the risk of supply interruptions and the associated costs are high. A proper balance needs to be struck between investments costs and the security of supplies based on an assessment of the acceptable risk and costs of supply interruptions. Indeed energy supply options involving regional cooperation may be lower-cost and more reliable than some national alternatives. Close regional coordination through adequate institutional arrangements based on clearly defined responsibilities will be required in planning, implementation and operation of these options and may also be needed for major schemes of national significance only. For regional cooperation in energy matters to be successful, well-defined policies, programmes and projects are essential, to be prepared and implemented by effective institutions. Also measure to improve the efficiency of energy production, transformation and marketing and energy demand management aimed at increasing the efficiency of energy end-use is an important option consistent with both least-cost supplies and supply reliability.

B. ZAMBIA

62. Recognising the role and importance of the energy institutions existing in Zambia at present, World Bank team has recommended that the Government should establish a high level energy policy coordinating committee to bring leadership and policy guidance to the energy sector using the Department of Energy as a secretariat. The Committee would act as Zambia's primary energy policy and energy coordinating body.

63. The functions of the Energy Policy Coordinating Committee should include:

- (a) Approval of the national energy strategy and annual on five year plans;
- (b) Report to the President annually on the energy issues facing the country;
- (c) Review and advise on all significant energy capital expenditure to be considered at one of the regular meetings. Emergency proposals would require special meetings;

- (d) Initiation of research and studies on energy issues, guidance on energy audits and energy conservation, policy on strategic storage;
- (e) Advise on all energy policy issues, including advice on prices, tariff levels and tariff structure and the financial viability of energy enterprises;
- (f) Dissemination of information and coordination across the energy sector;
- (g) Monitoring of the operations in the energy sector including logistics and the implementation of plans, policies programmes and investments.

64. The Department of Energy would undertake the major part of the Secretariat's work and needs a clear definition of its functions so that there is no doubt as to its responsibility for energy policy advice. In order to undertake these duties successfully the Department of Energy needs significant strengthening.

VII. CONCLUSIONS

65. Improving management of the energy sector in African countries as could be exemplified by Zambia and Zimbabwe should be based upon the following:

- (i) careful analyzing national energy sector issues and formulating overall sector development strategy.
- (ii) strengthening national energy institutions and developing an effective sector planning and management capabilities;
- (ii) selection, formulation and implementation of national projects specifically devised to improve upon energy management in the enterprises;
- (iv) development of subregional and regional co-operation in the establishing the standard of energy management.

66. The Chapter V has identified a multiplicity of organizations operating energy sectors of Zambia and Zimbabwe with a lack of any effective control coordination. In the future it will be essential to anticipate additional demands from existing and from major new energy users and to ensure that the long-term planning of energy supply is carried out on a more integrated basis.

67. Consideration should therefore be given to the establishment of a coordinating body which may be called an Inter-Ministerial Energy Commission. World Bank team have already recommended that in Zimbabwe an Advisory Committee on energy should be established. In Zambia the recommendation was made for the establishing of a high-level Energy Policy Coordinating Committee.

68. By now the energy surveys and feasibility / pre-investment studies have been completed in Zambia and Zimbabwe and special agencies on energy are translating the findings and conclusions into programmes, targets and prospects consistent with objectives of the plan of

economic development. However, in the ECA's view, the current level of development expenditures for the institutional structures is inadequate. ECA recommends that external assistance for institution building should be given to both countries.

69. Based on the case study of Zambia and Zimbabwe this management report tries to provide sound advice on a number of aspects related to the management structure of the energy sector in African countries. Therefore, there would be a need for the Governments to take a decision on these recommendations. On the part of ECA the arrangements are being made to organize the training workshop on energy planning/management in 1992-1993 biennium.

70. The paper recognizes that fragmentation in institutional responsibilities in Zambia and Zimbabwe has hindered the planning and implementation of some energy programmes, especially those that affect more than one subsector. The ECA mission has found out in 1988/89 that:

- (a) energy sectors plans that drawn up as part of national development plans have not hitherto been as detailed as may be desirable;
- (b) in spite of recent changes in the management of the energy sector in Zambia and Zimbabwe, the allocation of planning or operational responsibilities in the energy sector is still not clear;
- (c) data on energy supply/demand are scattered and in many cases unreliable.

71. In both cases of Zambia and Zimbabwe the establishing of the advisory committee on energy was recommended. In the ECA mission's view the staff of these committees should comprise experts with background in engineering, economics, energy management and statistics.

72. The absence of an effective management information system in African countries makes it difficult, if not impossible, for energy managers to make national decisions about the efficient running of the sector. There is an urgent need for a better management information system both for planning and budgeting and for monitoring the results of policy, pricing and administrative measures designed.

73. Demand and supply management policy should be strengthened. A demand management policy is needed to promote conservation, interfuel substitution and national energy use through appropriate pricing policies and fiscal incentives at the level of supply policy, economic financial and social impacts of each energy source have to be thoroughly examined, especially for possible interfuel substitution.

74. In African countries, substantial energy investments will be required in future to provide for expansion or development of domestic resources and many of these investments will have to be made by external sources. However, the Governments should also encourage investments by the public and private sectors.

75. All African member States are facing the challenge of proper managing the energy sector now, in a period marked by severe economic difficulties and limited resources. The crisis most pronounced in sub-saharan Africa is felt throughout the continent where they have a limited pool of financial resources for the management of the energy sector.