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**NATIONAL ENERGY EFFICIENCY
IMPROVEMENT PROGRAMME
(NEEIP)**

WORKSHOP

NYANGA, DECEMBER 16 - 17, 1993

VOLUME I.

SUMMARY OF PROCEEDINGS

(Ministry of Transport & Energy/World Bank)



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I. ACKNOWLEDGEMENT

This executive summary is a result of a two-day symposium on "National Energy Efficiency Improvement Programme (NEEIP)", held at Nyanga, 16-17 December 1993. A host of experts in the energy and related fields participated: energy economists and planners, farmers, energy scientists, engineers, donors, industrialists, policy makers, bankers, financial analysts and academics.

Particular thanks are due to the World Bank which sponsored the workshop, SIDA who provided funding through the Bank and the Department of Energy Resources and Development (DOERD) within the Ministry of Transport and Energy (MOT & E), which organized the symposium. We are specially indebted to those persons who authored session papers: J. Moyo, C.T. Mzezewa, K.F. Schenk, S. Brushett, A. Gilchrist, R. Spencer, D.D. Madzikanda, R.H.A. Williams, G.T. Rushwaya, J.J. Mangono, M. Nyambuya. C. Murove (DOERD) did the painstaking job of pre-workshop organization. The workshop was steered well on course by the able chairmanship of J. Moyo. The rapporteur of the workshop was G. Mandishona, who freely summarized the session papers. Any errors or omissions are regretted.

Special thanks are extended to all participants whose deliberations and comments were occasionally caustic, often critical, but always stimulating. The Report is compiled in two volumes:

Vol. 1: Summary of Proceedings

Vol. 2: The Working Papers.

..... G. Mandishona.
(Rapporteur)
January 1, 1994



II. LIST OF ACRONYMS

1. ADB: African Development Bank.
2. BUN: Biomass Users Network.
3. CCZ: Consumer Council of Zimbabwe.
4. CIDA: Canadian International Development Agency.
5. DOERD: Department of Energy Resources and Development.
6. DSM: Demand Side Management.
7. ESAP: Economic and Structural Adjustment Programme.
8. ESMAP: Energy Sector Management Assistance Programme.
9. ETSU: Energy Technical Support Unit.
10. GEF: Global Environmental Facility.
11. MOT & E: Ministry of Transport and Energy.
12. NEEIP: National Energy Efficiency Improvement Programme.
13. NOCZIM: National Oil Company of Zimbabwe.
14. NRSE: New and Renewable Sources of Energy.
15. R & D: Research and Development.
16. SAZ: Standards Association of Zimbabwe.
17. SIDA: Swedish International Development Agency.
18. SIRDC: Scientific and Industrial Research and Development Centre.
19. UNDP: United Nations Development Programme.
20. ZABO: Zimbabwe Association of Business Organizations.
21. ZEEP: Zimbabwe Energy Efficiency Project.
22. ZESA: Zimbabwe Electricity Supply Authority.



III. EXECUTIVE SUMMARY

A. INTRODUCTION

1. Objectives of the workshop were to develop:
 - a strategic framework for the NEEIP and implementation guidelines.
 - institutional capacity in the energy sector and integrate energy efficiency activities into the development plan.
 - a platform for free debate on energy efficiency and related programmes.
2. Participants to the workshop were drawn from a variety of disciplines: engineers, economists, producers, consumers, academics, donors and energy enthusiasts.

B. OPENING SESSION

1. In his opening remarks, the Permanent Secretary of the Ministry of Transport and Energy, J. Moyo, introduced the Minister, the Hon. D. Norman. He reminded participants that the workshop should aim to establish a working framework for the efficient use of all forms of energy: electricity, coal, liquid fuel, biomass, wind and hydro.
2. Mention was made on a number of institutional models which could achieve energy efficiency in various forms; and of other related initiatives underway; ZEEP and the SADC energy project.
3. The Hon. Minister, D. Norman, extended a warm welcome to participants and commended on their diversity and high calibre. Energy efficiency should narrow the gap between energy supply and demand. To achieve an optimal breakthrough, there is need to examine the factors which determine the implementation, acceptance and spread of energy efficiency activities. Energy consumption is affected by consumers, producers, equipment, type of power utility, fiscal policy and funding.

4. Energy is manifested in various facets of the economy, and it requires vast initial capital investment. Further, we should opt for an energy supply which is both cost effective and environmentally safe. Formulation of energy efficiency programmes requires skilled manpower; hence the need to have intensive training schemes. There will be several role players in the energy efficiency programme: Government, industry, parastatals and households.
5. The Hon. Minister declared the workshop officially open, after acknowledging the good work of ESMAP and others, who contributed to the realization of the symposium.

C. CONTRIBUTED PAPERS

- 1.1 Mr. Mzezewa (Director, DOERD) gave the Department's position paper. Zimbabwe is endowed with a rich energy resource base, constituting; coal, hydroelectricity, biomass, solar and wind power. It imports all the petroleum fuels. The final electricity consumption has the order: industry (46%), residential (17%), mining (16%), commerce (12%), agriculture (9%), transport (0.3%). Liquid fuels consumption ranks transport, industry, commerce and agriculture, in that order. 80% of the national population, mostly rural-based, depends on biomass.
- 1.2 The Government energy policy seeks to ensure; adequate/safe supplies of energy using indigenous resources, promotion of R & D and use of NRSE, environmental sustainability and efficient utilization of energy. Barriers to energy efficiency are; high initial costs of capitalisation, lack of forex, and of skilled personnel, low capacity utilization and long rates of investment return. DOERD is involved in other energy projects such as the ZEEP, which has several phases: project design, demonstrations, evaluation, training and publicity.

- 2.1 S. Brushett (World Bank) expressed the Bank's pleasure in being involved with the energy efficiency programme through ESMAP. The World Bank continues to support Zimbabwe with a strong energy efficiency focus. Capital investment projects, such as Hwange, ESMAP, and G.E.F. are being undertaken with the Bank's support, and with a view to develop energy efficient resources.
- 2.2 K.F. Schenk (World Bank) stressed that energy efficiency should be the cutting edge of the national energy policy, because it improves overall economic efficiency, reduces energy imports and conserves the environment. There are several prerequisites before achieving energy efficiency: economic/political stability, sound pricing policies and standards, promotion of private investment, sound environmental policy, R & D in energy efficient technologies, and finance. Energy efficiency programmes must be spread out in industries, buildings, transportation, households, and public utilities.
- 3.1 A. Gilchrist (ETSU) pointed to his organization's involvement in energy efficiency projects in Africa and Europe. Steep rises in energy costs and concern for environmental impacts have created the energy efficiency awareness. Six basic generic methods for energy efficiency improvement programmes were mentioned, with advantages and disadvantages for each programme spelt out.
- 3.2 Critical success factors in the NEEIP would be: a sound policy/institutional framework, supporting technology and services infrastructure, and information collection/database. Success should be viewed from the individual, company and institutional standpoints.
- 3.3 R. Spencer (ETSU) elaborated on the subtle relationship between energy utility and the consumer. Energy efficiency should be targeted to the rural sector, where the available biomass is not optimally utilized. Load-limiting and meter-limiting techniques should be complemented by a vigorous energy efficiency development programme.

- 4.1 The Z.E.S.A. paper was presented by D.D. Madzikanda, whose main contention was that Zimbabwe has a relatively high load factor electricity system (72% annually, 83% daily). Heavy load factors also arise in industrial and mining night shift work. Energy efficiency should further be promoted in new building designs and co-generation systems.
- 4.2 Government, energy supplier and consumer should get together to work out an electricity energy efficiency scheme. Some incentives are: customer rebates, subsidies, and vendor incentives for energy efficiency appliance purchases.
- 5.1 R.H.A. Williams (Z.A.B.O.) gave examples of energy efficiency programmes in industry; and mentioned the study carried out by a special task force during the 1992 electricity rationing. Several industries voluntarily undertook steps to cut down on electricity usage. To achieve energy efficiency, there is need for consumer education, existence of an enabling environment, and improvement in producer-customer relations.
- 6.1 G.T. Rushwaya (Zimb. Phos. Industries): During the 1992 energy crisis, the company devised an energy efficiency programme on the basis of "no cost" or "low cost" measures. Some of the activities included: repairs to air leaks, switching off unnecessary lights, insulation of vessels, use of efficient lighting, revamping instrumentation and water conservation. The adopted energy efficiency measures yielded an 11% energy reduction in costs.
- 7.1 J.J. Mangono (DOERD) pointed out that Zimbabwe could generate a lot more energy if energy efficiency practices are adopted. Total reduction in electricity consumption can be of the order of 22% of total consumption. Barriers to energy efficiency are: consumer ignorance, uncertainty on savings and lack of capital to procure energy efficient appliances.
- 7.2 Government should play a decisive role in establishing an energy efficiency programme; which includes; provision of finance, promotion of R. & D., development of database on energy use, and inclusion of energy efficiency topics in schools and colleges.

- 8.1 The Consumer Council of Zimbabwe was represented by M. Nyambuya (Director), who initially pointed to the importance of energy in industry, trade, mining, agriculture and domestic households. Z.E.S.A's monopoly as the sole utility supplier is to be discouraged. NOCZIM should ensure that there will be enough fuel stocks for the present and future needs, and should take steps to prevent devaluation and inflation from distorting consumer prices.

D. GROUP DISCUSSIONS

1. Participants were split into four groups for effective deliberation on the NEEIP, under the topics: overall mission, sector and fuel coverage, short and medium term aims.
2. The workshop had been tasked to find a satisfactory formula for a more efficient and equitable distribution of energy resources. Participants would identify approaches for sustained energy efficiency through optimal resource mobilization, allocation and utilization.
3. NEEIP's overall objectives are to mitigate short-term energy supply problems and price rises, coordinate energy efficiency at national level, raise public awareness on all forms of energy and its efficient use, reduce pollution, improve health and living standards for all. The sectors to be covered are: industry and mining, transport and agriculture, commerce and domestic residences.
4. Fuel coverage, constituting of indigenous and imported fuels, comprises: electricity, coal, liquid fuels, biomass, renewables (solar, wind, biogas, hydro). Biomass is a vastly untapped energy resource.
5. The short and medium-term aims of the NEEIP are:
 - to assist and support both energy suppliers and consumers.
 - to ensure a benign environment.
 - to ensure cost-effectiveness of energy use.
 - to ensure efficient and equitable distribution of available energy.
 - to promote R.& D. in energy efficiency and use of "renewables."

6. Government's role should be that of a policy making body. It should ensure energy efficiency legislation, setting up of standards, establishing fiscal incentives, rational pricing and programme management mechanisms.

7. Government should also:-
 - identify barriers to implementation
 - enact enabling legislation
 - create an energy efficiency database
 - set up an advisory body and appropriate infrastructure. The duties of the advisory body or Consultative Committee (or Coordinating Committee) include:
 - formulate the energy efficiency policy and its implementation strategy.
 - invoke policy cocktails for coordinating, monitoring and evaluating the implementation/progress of the energy efficiency programme.
 - ensure inclusion of the energy efficiency programme within the national development plan.
 - build a sound energy efficiency manpower force.
 - advise Government of the energy efficiency benefits and impacts; on industrial/economic programmes.
 - maintain the current momentum of the energy efficiency development initiative.

8. There is urgency in identifying a host organization of the NEEIP (e.g. SIRDC's Institute of Energy). In establishing the NEEIP, the following should be considered:
 - maintenance of consistency between energy efficiency objectives and other related strategies.
 - reflection of the socio-technical realities.
 - creation and encouragement of a critical mass of energy enthusiasts (Energy Champion) to spearhead energy efficiency programmes.

E. WORKSHOP RECOMMENDATIONS

1. An effective energy efficiency policy should include the following components: rationale, goals, objectives, targets, implementation strategy, institutional and organizational frameworks. It therefore follows, that NEEIP activities ought to embrace:

- formulation of a strategy and drawing up of an energy efficiency plan.
- setting up a Consultative Committee and infrastructure. The Steering Committee's role will be backstopping, trouble-shooting, consultative and coordination.
- fund raising: the NEEIP will be of semi-parastatal status, so that it functions autonomously and has fiscal independence.
- setting up of standards and codes of practice.
- establishing fiscal incentives for both energy producers and consumers.
- promoting R. & D., Renewables and Publicity.
- fostering twinning arrangement of ESMAP and ETSU to facilitate NEEIP activities.
- carrying out energy audits.
- publicising success stories.

2. In noting the above, it becomes clearer that the NEEP will have four stages of evolution:

- assignment of responsibility for development of energy efficiency activities; preferably in the proposed SIRDC's Institute of Energy, which will be a quasi-Government organization, capable of executing its mandate independently.
- publicity and awareness campaign to ensure maximum utilization of participative and consultative approaches.
- implementation plan and action programmes.
- execution/accessibility and availability of energy efficiency services.

3. Human Resources requirements should call for highly qualified personnel in the administrative, scientific/technical, marketing, financial and economic fields. There should be attractive packages to retain the services of skilled personnel.
4. DOERD (with technical assistance, if possible) will review legalities on the institutional setting and status of the SIRDC, Scientific Research Council and the proposed Institute of Energy, in as far as they reflect on the NEEIP.
5. The integration of energy efficiency (by NEEIP) into the overall national energy policy involves:
 - **diagnosis:** demonstrating the interplay of energy efficiency and economic objectives.
 - **prognosis:** examining and identifying which energy efficiency trends will contribute to realizable benefits.
 - **sectoral planning:** identifying potential energy efficiency programmes in different areas of economic activity, via-a-vis complete sector and fuel coverage; indicators for monitoring sectoral energy efficiency.
 - **integrated energy planning:** spatial rationalization and diffusion of energy efficiency.
 - **policy formulation:** determination of energy efficiency objectives and targets in terms of their contribution to the economy; policy guidelines.
6. Lastly, an Advisory Board should be established, with a tripartite structure: Government, Energy Producers and Energy Consumers. It is expected to provide logistic direction, monitoring, counselling and accountability for the NEEIP. This Coordinating Unit will have the mandate for:
 - instituting the NEEIP and specifying its terms of reference.
 - logistics to set up the NEEIP; budget and allocation of funds.
 - generating awareness of the need for energy efficiency.
 - strengthening linkages and formalisation of cooperation among producers and users of energy.

IV. INTRODUCTION

The Ministry of Transport and Energy, in collaboration with The World Bank, jointly resolved to hold a workshop to discuss the objectives, aims and goals of the National Energy Efficiency Improvement Programme (NEEIP), taking into consideration the modes of its implementation. The NEEIP is expected to focus on all sectors of the Zimbabwean economy.

The workshop objectives were to develop:

- a strategic framework for the NEEIP.
- institutional guidelines and mechanism for ensuring effective implementation of the programme.
- strengthening of the institutional capacity to identify strategic issues in the energy sector.
- integration of energy efficiency activities into policy formulation.
- ability to formulate present and future viable integrated energy strategies.

Participants to the workshop were drawn from a multiplicity of disciplines: energy engineers, economists, farmers, industrialists and energy consumers. The findings of the workshop were expected to include observations on energy use in Zimbabwe, identification of major actors and Government structures related to energy efficiency. The symposium further deliberated on generic types of energy efficiency improvement programmes undertaken world-wide and some models to implement them.

The overall objective of the workshop was to arrive at a consensus as to what will work vis-a-vis, energy efficiency programmes. It was not the intention of the workshop to impose recommendations on the best approaches, but rather to provide a platform for free debate whereby participants thought through key issues.

V. OPENING SESSION

A. Opening Remarks: J. Moyo, Permanent Secretary, MOT & E.

1. The PS welcomed the Honourable Minister and participants to the workshop, whose major aim is to establish a strategic framework for the efficient use of all forms of energy: electricity, coal, liquid fuel and biomass. The workshop was expected to come up with policies that would contribute to the efficient utilization of energy.
2. Mention was made on a number of institutional models that can be adopted for achieving energy efficiency: agency based information programme, grant-based programme, utility-based demand side management (DSM) programme, stimulation of supply industry, contract energy management or regulation/standards. Donors and financiers are expected to play a crucial role, since project implementation does require initial capital.
3. Mr. Moyo pointed to other energy efficiency initiatives underway; ZEEP and the SADC energy project; which would also fall under the framework of the NEEIP. Although some energy efficiency programmes have worked well in other countries, these may need to be modified accordingly to suit the Zimbabwean situation.

Mr. Moyo urged participants to work conscientiously in considering various aspects when formulating energy efficiency policies and strategies.

B. Official Opening Speech: The Hon. D. Norman, Minister of Transport and Energy.

1. Mr. Norman extended a warm welcome to participants of the workshop, and commended on their diversity and high calibre. He emphasized on the appreciation of the role of energy efficiency in bridging the gap between energy supply and demand. Some improvements in energy efficiency are not reaching out to society as rapidly as they should. Hence, there is need to examine the factors which determine the implementation, acceptance and spread of energy efficiency activities.
2. Energy consumption is shaped by a variety of factors: consumers, equipment, power utility, fiscal policy, funding, etc. Thus, to achieve energy efficiency, action is needed at several levels; from the end-user to the highest level of global agencies.
3. Energy is manifested in various forms of the economy: secures steady flow of goods and services, refrigerates food, pumps water, mines minerals, manufactures and transports goods. These benefits come at a price; energy requires vast capital investment; energy can damage the environment. For developing countries, it is thus expedient to opt for an energy supply which is both cost effective and safe.
4. Scientific advances have brought about more energy efficient and less polluting products and appliances. However, this is an evolving strategy. Government commitment is crucial in the implementation of such programmes; and MTE is giving its long-term backing. The Ministry is also setting an example by importing and utilizing energy efficiency electrical appliances in its buildings.
5. Formulation of energy efficiency programmes will require skilled manpower, hence the need for the Ministry to embark on extensive and intensive training programmes.

6. The Minister emphasized that promotion of energy efficiency should not stop at paper studies, but ought to permeate other aspects, such as; inducing, persuading, mandating and financing. Energy efficiency savings should be analysed in terms of energy savings compared to the cost of providing the additional supply.

7. Mr. Norman declared the workshop officially open, after thanking the Energy Sector Management Assistance Programme (ESMAP), and others; who contributed to the success of the symposium.

VI. SUMMARY OF WORKING PAPERS

A. DOERD POSITION PAPER:

NATIONAL ENERGY EFFICIENCY IMPROVEMENT PROGRAMME C.T. Mzezewa, Director, DOERD.

1. Zimbabwe's energy resource base consists of 10.6 billion tons of coal reserves (2 billion tons. mineable), 39 TWH p.a. hydroelectric potential, 13 million tons p.a. fuelwood, solar radiation 3000 hours/year sunshine and windspeeds averaging 3m/s (low regime).
2. Zimbabwe imports all its petroleum fuels requirements. Primary energy supply is made up of coal (44%), fuelwood (39%), hydropower (4%), molasses/bagasse (2%), import of petroleum products and electricity (11%). In terms of final consumption a total of 261 000TJ is consumed by residential (47.8%), industry (24.1%), agriculture (12.5%), transport (8.8%), mining (3.0%) and commerce (3.9%). The final electricity consumption has the following order: industry (46.2%), residential (17.3%), mining (15.5%), commerce (11.7%), agriculture (8.9%), transport (0.3%).
3. The liquid fuels consumption ranks highest in the sectors; transport, industry, commerce and agriculture, in that order.
4. Solar radiation, though fairly abundant, is being used at negligible levels. There is search (limited chances) for hydrocarbon deposits in the Zambezi valley, and coalbed methane in the Hwange area and South Eastern lowveld (Chiredzi).
5. 80% of the national population depends on biomass. Only 13% - 16% of the population has access to electricity for domestic use.

6. The Government energy policy enunciates:
 - adequate/safe supplies of energy to all sectors of the economy.
 - efficient utilization of all energy resources.
 - utilization of indigenous resources.
 - R. & D.; promotion of New and Renewable Sources of Energy (NRSE).
 - Integrated energy planning; optimal mix through pricing.
 - environmental sustainability.
 - regional cooperation.

7. The DOERD participated in the CIDA Energy Conservation Programme (1987 - 91). The major objectives were:
 - to develop further the ongoing initiative,
 - to create awareness,
 - to develop database and energy audits,
 - to promote training and workshops in the energy conservation field.

8. The barriers to energy efficiency are: low energy costs in comparison to total production costs, lack of forex, expensive materials, lack of skilled personnel, low capacity utilization, low investment incentive, benefits tend to be long-term.

9. ESAP has imposed additional requirements on the energy strategy:
 - reduction in the cost of energy production,
 - environmental concern,
 - promotion of NRSE.

10. ZEEP is an initiative between the DOERD and the International Energy Initiative, which is aimed at developing and implementing a comprehensive electrical energy efficiency programme.

Some of the proposed tasks are as follows:

Project design and implementation

Demonstration sub Projects

Analysis: Critical Path item on the Work Plan

Training and Public Awareness; linkages with other programmes.

Policy levers (instruments to create an enabling environment).

11. Conclusion

- Large potential exists in terms of energy efficiency. Hence there is need for energy audit services.
 - barriers have been identified:
 - relatively low costs of energy (as a proportion of total production costs).
 - lack of awareness
 - absence of an effective programme.
 - funding constraint.
 - inadequate management systems and lack of forex.
 - lack of monitoring on energy consumption or savings.
 - workshop should therefore recommend a sustainable strategic framework for energy efficiency; which identifies key role players and ensures its nationwide dissemination.
 - adoption of low - and no-cost measures is slightly higher than for capital-cost measures in the initial stages.
-

B. S. Brushett; World Bank

1. The Bank has been pleased to be associated with the energy efficiency programme through ESMAP. It expects to continue supporting Zimbabwe in promoting energy efficiency. Preparation of a Power IV project is expected to start in 1994. This will have a strong energy efficiency focus.
2. Various capital investment projects have already been intertained by the Bank in the power and energy sector: e.g. Hwange. Through GEF, development of new sources of energy are expected to be financed. These have had undertones of energy efficiency promotion, alternative energy sources and power sector investment planning.
3. The Bank notes the strong link between ESAP and energy efficiency promotion, the latter now being spurred by greater external capitalisation and higher power tariffs. These links need to be supported by our appropriate institutional framework.

C. K.F. Schenk; World Bank

Brief Overview of Energy Efficiency Policy Issues

1. The Bank endeavours to identify key elements in energy efficiency policy to assist in achieving a sustainable impact in the promotion of optimal energy objectives. The underlying concept requires decisions to be made within an overall integrated energy strategy which realizes the most efficient, equitable and sustainable use of resources.
2. The availability of a reliable energy supply is vital for the sustained economic and social benefit. For an integrated energy strategy coordination must be maintained within government to ensure consistency with economic development objectives.

3. Energy efficiency should be the cutting edge of a country's national energy policy. For;
 - it improves economic efficiency and competitiveness
 - it enhances energy security by reduced energy imports.
 - it increases efficiency in the use of scarce energy resources.
 - it conserves the finite global energy reserves.
 - it reduces adverse environmental impacts.

4. Good management is central to achieving energy efficiency. Very often, the payback period for the additional investment in energy savings is less than two years.

5. There are four critical factors from the World Bank's experience, with regard to differences in the efficiency of energy production and enduse.
 - (i) Energy pricing policies: Prices should be set at levels as close as possible to economic costs, or to the long-run costs of additional supplies. They should reflect the total cost of producing/importing and delivering energy (free of subsidies). The efficient use of energy does not require a subsidy.

 - (ii) Regulation of Energy Supplies:
 - transparency and openness, including tariff policy.
 - legal framework for promoting autonomy of energy enterprises.
 - accounting for environmental issues.

 - (iii) Protection from competition of energy - using industries: Energy efficiency consumption is directly related to existence of private sector firms in competitive markets. Protected industries generally consume more energy per unit of output than do un-protected ones.

- (iv) Barriers to the efficient functioning of markets: usually caused by legal, institutional and information hindrances.

Market imperfections include:

- information gaps on energy efficient technology and options.
- lack of coherent government policy to encourage energy efficiency.
- lag of consumer's response to price changes when energy costs represent a small proportion of total costs or there is a limited availability of energy efficiency equipment.
- consumers' high implicit discount for energy efficiency investments.
- general availability of energy inefficient appliances, equipment and structures; or absence of such codes and standards.

6. Elements for Achieving Energy Efficiency:

- (i) Economic stability and growth: this creates an enabling environment. Good governance demands accountability, transparency, predictability, openness and adherence to the rule of law.
- (ii) Sound Pricing Policies: inefficient prices cause distortions in consumption patterns.
- (iii) Sound regulatory policies: to increase efficiency of resource utilization.
- (iv) Consumer services, on a commercial basis, to encourage end-use efficiency.
- (v) Openness to private investment: to foster economic efficiency.
- (vi) Addressing and improving rural energy supplies.
- (vii) Sound Environmental Policy: pollution abatement.
- (viii) R & D in energy efficient technologies; public and private sector involvement; policy instruments and finance.

7. Priorities for Energy Efficiency Programs:

- must be tailored to the specific country situation.

- (i) Energy Intensive Industries: steel, cement, pulp/paper, fertilizer.
- (ii) Electric Power Sector: efficiency, emission controls, power loss reduction, optimal resource management.
- (iii) Large commercial and public buildings: energy efficiency codes, audits and retrofits.
- (iv) Transportation; traffic management, fuel quality monitoring, fuel standards, taxes and duties on vehicles, fuel pricing.
- (v) Electricity end-use efficiency: lights, pumps, appliances, water heating, standards.
- (vi) Residential building design: efficient lighting, water heating, air conditioning.
- (vii) Households: interfuel substitution, improved cookstoves, efficient lighting systems.

D. ETSU PAPER I: A. Gilchrist

1. ETSU is involved in energy efficiency projects in Africa and in Europe. Steep rises in energy costs and concern for pollution abatement have resulted in increased awareness of energy efficiency. Energy efficiency also implies efficient use of electricity, e.g. in electric motors and meters.
2. So far very little information exists on energy management or on how to measure and monitor energy efficiency. However, there are six basic generic methods for energy efficiency improvement programmes:

- (i) Agency-based Information Programmes:

These are marketing, seller-buyer types. They are characterized by a variety of salient elements: distrust, literature/leaflets, advertisements, demonstration/case study programmes. Advantages are high benefit-to-cost ratio, wide coverage of sector/fuel publicity. They cover a variety of technical and management issues; information is readily available and results are quick to come by.

Disadvantages: no guaranteed action; need for an efficient central focus; some sectors are difficult to deal with in terms of savings; difficult to encourage major investment decisions, e.g. major process change.

(ii) Grant-based Programmes:

Governments have encouraged investment in energy efficiency through grants, low-interest loans and tax reductions. Major objective is to reduce the payback and risk of an investment.

Summary:

For:

- stimulates equipment/service supply industry
- can be targeted at specific groups, e.g. low income groups
- can be targeted at specific measures, e.g. novel technologies and long payback/ high return measures.
- stimulates equipment supply industry
- can deliver savings.

Against:- expensive per saving generated.

- costs and savings difficult to predict
- can distort market, leading to long-term uncertainties.
- action not always in users' commercial self-interest.
- does not guarantee optimum use/action
- coverage generally patchy.

(iii) Utility-based Demand Side Management (DSM) Programmes:

(a) Fuel Substitution Programmes: in multi-fuel usage countries, programmes can be undertaken to promote, say, use of electricity or a rival fuel (e.g. gas). These programmes tend to offer the electricity utility benefits, and are not aimed at reducing the cost of electricity supply, though there are environmental benefits.

- (b) Load Management Programmes: electricity utilities can implement programmes to reduce costs; e.g. power-factor correction, tariff incentives.
- (c) Energy Saving Programmes: these programmes reduce the total cost of electricity supply by undertaking DSM measures that cost less than the cost of new generating plant. Costs are recovered through regulatory mechanisms. Examples can be drawn from:
 - Industrial sector (high efficiency motors, downsizing, audits, waste heat recovery).
 - Commercial sector (energy-efficient buildings, water heating recovery systems, coding/ventilation).
 - Domestic sector (solar water heating, audits, high efficiency appliances).

Advantages:

- reduces need for government intervention
- focus on mass volume products
- can provide quick savings
- can allow measures with low rates of return.

Disadvantages:

- needs substantial - technical and planning resources.
- requires knowledge of energy usage and market
- requires regulated price formula to recoup costs.
- possibility of market distortion.

(iv) Support for Equipment Supply Industry:

Governments can allow companies to write-off costs incurred against tax. Support for R & D gives the possibility of energy savings in the longer term.

Advantages:

- stimulates equipment supply industry
- projects can generate long-term viability

Disadvantages:

- energy savings only in the long term.
- no guarantee of technical/commercial success
- could be expensive compared with savings generated.

(v) Contract Energy Management (CEM)/Energy Service (ES) Company:

Such companies are sub-contracted by a host company to take over responsibility for the operation/management of energy services.

Advantages:

- CEM companies bring expertise to energy efficiency programmes.
- they target utility-type services
- can accommodate long payback.

Disadvantages:

- risky, and needs creation of a new market
- relevant only to industrial, commercial sectors
- savings difficult to establish
- needs a change in host management culture to accept a CEM company.

(vi) Legislation, Regulations and Codes:

These can further the uptake of energy efficiency. The main areas of activity are:

- Industrial and Commercial Processes (processes, emissions, combustion)

- Buildings (insulation standards, temperature control, lighting)
- Equipment Standards (appliances)
- Transport (speed limits, exhaust emissions).

For:

- guarantees energy savings in the long term
- ensures "level" playing field for manufacturers

Against:

- often long term
- difficult to get agreement on standards
- costly to enforce
- limited applicability.

3. Critical Success Factors in National Energy Efficiency Programmes

(i) Policy and Institutional Framework:

There must be a separation of responsibilities between policy formation and setting of programme objectives on the one hand; and design and implementation of programme activities on the other hand.

(ii) Individual Programme Formulation and Implementation:

- meet market needs.
- develop supporting technology and services infrastructure.
- establish formal targets and assessment procedures.
- develop skilled personnel with expertise and motivation.
- ensure provision of independent and authoritative information on energy efficiency programmes.

(iii) Success at Company Level:

- ensure senior management commitment.
- Energy champion: encourage initiatives of highly motivated staff in energy efficiency activities.
- access to information: ensure energy champions have easy access to information.

E. ETSU PAPER 2: R. Spencer

1. There is a subtle relationship between utility and consumer. In a country like Zimbabwe, energy efficiency efforts should be targeted to rural energy consumers. We need to optimize on what they are using now.
2. Load limiting has been used as a means of conserving energy in the urban areas of Zimbabwe. This is common only in the high density areas. ZESA is gradually moving away from load-limiting to meter-limiting supplies.
3. There is need for energy consumers to have easy access to information generated by DSM programmes. Question is; how do we finance the energy efficiency programme?

**F. NEEIP: ZIMBABWE ELECTRICITY SUPPLY AUTHORITY (ZESA)
PRESENTATION: D.D. Madzikanda**

Summary

1. The final energy supply in Zimbabwe (1991) was as follows:

liquid fuels	14.8%
Electricity	12.6%
Coal	24.6%
Biomass	48.1%
Total:	262623 TJ

Zimbabwe has a relatively high load factor electricity system; 72% annually and 83% on a daily basis. There are also night shifts in the industrial and mining sectors, which account for persistently heavy load factors. Peak periods (6 p.m. - 7 p.m.) are generally caused by domestic consumers.

2. Electricity conservation can be achieved in a variety of ways; such as new building designs, with air conditioning and heating systems, educating consumers on conservation, etc. A reduction of demand including line loss reduction programmes, installation of co-generation projects and end-use efficiency schemes would result in savings both to the utility's costs and to the consumer's tariff increases.
3. Reduction in electricity energy use can also be achieved through more efficient appliances, motors and power factor corrections. The utility must provide the consumer with a low energy cost accomplished by proper planning and/or by establishing new generating stations.
4. Electricity is inelastic with respect to pricing structure. Current electricity demand declines as economic trends go down. A wise option would be to reduce electricity demand. Z.E.S.A.'s electricity derives from Hwange and Kariba, and from Zambia and Zaire imports. An opportunity to assess the effect of DSM and Conservation would arise in the year 2000 when the Hwange units 7 and 8 are committed; or around 2003 when Batoka is commissioned.
5. Tariffs and the effect on Load Management:

Government, Supplier and Consumer should get together to work out an electricity energy efficiency scheme. Some incentives are as follows:-

- customer rebates for installation of energy efficient appliances through subsidies.
- vendor incentives for the purchase of these appliances.

The method of and amount of rebates must be properly assessed, since the utility depends upon its revenues from tariffs and money generated from the meters.

G. ZABO ENERGY TASK FORCE: R.H.A. Williams

1. The paper will concentrate on two broad areas:

- electrical energy rationing (1991-92);
- energy efficiency for industry.

The task force studied and submitted proposals on the impact of drought and the resulting energy rationing. Mines, farmers and industrial plants reduced production. In the case of Sable the drought reduced fertilizer demand, and there was actually a surplus.

2. There was also voluntary action from the private sector to promote and encourage energy conservation. Thus, the positive effect of electricity rationing has been the start of energy efficiency awareness. Mines reduced production accordingly resulting in shorter working week which reduced employee earnings.

3. Several industries became aware of the need to conserve energy. Some banned the use of office air conditioners, others repaired air leaks in compressors, etc.

4. With Kariba filling and thermal stations improving their operations, the incentive for energy efficiency and conservation is temporarily fading away. Only when electrical energy plays a role in the input costs of industry, does it get attention. Hence, two areas need to be tackled:

- educating consumers for whom the energy efficiency impact is small;
- creating an enabling environment for energy efficiency enthusiasts.

5. Let's focus on the last category:

Industries are fighting to survive, in the wake of several setbacks:

- high cost of money and inflation,
- increasing cost of capital resulting from devaluation,
- drop in international commodity prices,
- long payback periods for equipment replacement
- high import duties (60%) for new equipment.

To promote energy efficiency technology there must be "real" incentives, e.g. reduction of duties and import tariffs.

6. Investments in saving energy are generally lower than the investment to produce and supply it, hence the need to reduce tariff.
7. A way to get energy efficiency off the ground is for ZESA to improve its customer relations with the high voltage (300 KVA and above) consumers. The communication deliberations would centre on energy efficient systems in electric motors, irrigation equipment and other machinery.
8. With regard to the energy efficiency debate, the big hope is a win-win situation between energy supplier and enduser.

H. ZIMBABWE PHOSPHATE INDUSTRIES LTD. PAPER: G.T. Rushwaya

1. Zimbabwe Phosphate industries employs 750 staff, with 80% of its business in the fertilizer industry. The company devised an energy conservation programme which reduced electricity consumption without grossly affecting production, during the 1992 energy crisis (attributed to the drought). 35% of the employees live on company premises where water and electricity are supplied free.

2. 75% of total energy consumption is steam and 25% electricity. Prior to 1990, the only energy conservation mechanism was power factor correction and Maximum Demand Monitoring. In 1990 an energy audit was carried out through a SADC energy project, which came up with recommendations of 60776 GJ savings per annum (25% of the energy consumption). The recommendations were grouped into "no cost" and "low cost" measures.
3. By the end of 1991 all "no cost" measures, and some of the "low cost" measures had been implemented.

"no cost" measures examples:

- repairs to steam leaks, air leaks, switching off unnecessary lights, recovery of condensate for reuse.

"low cost" measures examples:

insulation of vessels, use of more energy efficient lights, revamping instrumentation.

4. To implement the programme, a special energy engineer was appointed, and he would report on a monthly basis, progress and savings achieved. Part of his responsibility was to make a monthly audit and submit his findings to management.
5. During 1992-93 the company intensified its efforts on the energy efficiency programme. Exploratory results showed that high electricity usage was between 6 p.m. and 10 p.m., and between 2 a.m. and 6 a.m. It was realized that success was dependent on the cooperation of all workers and residents at the site. Workshops and meetings thereafter ensued.

6. Some energy efficiency/conservation measures undertaken were as follows:-

- locking away office fans and heaters,
- switching off welding machines when not in use,
- switching off office equipment when not in use,
- switching on street lights between 9 p.m. and 5 a.m. (instead of 6 p.m. to 6 a.m.).
- improvement in effluent control and suppression
- switching off certain machinery when undergoing maintenance/repairs.
- immediate repairs to leaking water taps or pipes (at work or residence)
- general water conservation.

50% success was attributed to workers' participation.

The above measures yielded an 11% energy reduction against a calculated 15%.

**I. DEPARTMENT OF ENERGY: ECONOMIST POINT OF VIEW OF
NEEIP: J.J. Mangono**

**Some Economic and Non-Economic Barriers to Energy - Efficient
Investments Within Firms**

1. Zimbabwe has a lot more energy if attention were to be paid to energy-efficiency practices. The sectors which are potential for electric conservation are:-

- Industrial Sector (12% of total consumption),
- Domestic Sector (7%)
- Commercial Sector (3%).

Hence, expected total reduction in electricity consumption is of the order of 22% of total consumption. Most consumers, however, reject energy saving investments that have rates of return of 30% - 40% or more.

2. Well designed policies to improve energy efficiency might achieve a most sought-after objective - Pareto improvement with gains for all concerned. Firms do not behave like human individuals. Instead of profit maximizing first order conditions of the standard economic model, firms employ a variety of expedients; e.g. looking for satisfactory choices instead of optimal ones; replacing abstract, global goals with tangible subgoals; dividing up the decision-making task among several specialists, etc.

3. Managerial compensation is often tied to recent performance, and in many corporations, managers are rotated through different jobs every few years. This leads managers to prefer projects with short payback periods even if such projects are inferior, which is a disincentive to long-term energy efficiency investment.

4. Some standard barriers to energy efficiency are as follows:

- ignorance among consumers, about rapidly evolving energy efficiency technologies,
- uncertainty on savings, cost effectiveness and future energy prices.
- lack of capital and resistance to procure equipment with a greater purchase cost.

5. Policy Implications:

There is need for an increase in government participation which is both innovative and courageous.

- energy efficiency is a proven resource, with substantial future gains.
- many problems associated with the production, transportation and conversion of fuels are not reflected in the retail prices for fuels and electricity (e.g. air and water pollution).
- market imperfections keep energy consumers from making what would otherwise be economically rational choices.
- unlike most supply projects, energy efficiency improvements are very small and use a variety of technologies.

6. Suggestions for the Role of Government:

Government, through some institution, e.g. DOERD,

- should make a commitment to energy efficiency, to be embodied in the national energy policy.
- should make funds available for the energy efficiency programmes.
- should state clear goals and objectives of the strategy; e.g. percentage reduction in energy use; percentage improvement to GDP.
- should institute a national energy management programme to cater for suppliers, users and enthusiasts.

- should intensify R & D programmes in the appropriate institutions. Demonstrations should be held in schools, colleges and workplaces.
 - should develop an information database on energy use; its patterns, trends and determinants.
 - should sponsor inclusion of energy conservation in school and college curricula.
7. Lastly, energy efficiency will save millions of dollars for consumers, reduce polluting emissions, reduce dependence on imported oil, improve productivity and enhance international competitiveness of our products.

J. CONSUMER COUNCIL OF ZIMBABWE: NATIONAL ENERGY EFFICIENCY IMPROVEMENT PROGRAMME:

M. Nyambuya (Managing Director)

1. Energy is crucial to industry, trade, agriculture and domestic homes. Energy shortages and price escalations have adversely affected both the economy and the consumer.
2. The 1991/92 drought highlighted our vulnerability to energy shortages. ZESA introduced the ration system to conserve electricity. Electricity blackouts were the order of the day, with consumers hardest hit.
3. With the drought over, electricity supply problems are not yet over. Meter reading and the electricity billing system continue often to victimize the consumers. ZESA's monopoly as the sole utility supplier is not economically a healthy option. Its move to impose penalties to consumers who had exceeded their quotas, is to be regretted as it resulted in exorbitant bills based on mere estimates.
4. With pressure from CCZ, ZESA ultimately exempted assessed bills from penalty payments. ZESA should ensure that its public relations departments handles consumers' complaints honourably.

5. With regard to NOCZIM, consumers need an assurance that there will be enough stocks of fuel to meet their present and future needs. The fuel industry, to be energy efficient, should become more viable through competition under ESAP. NOCZIM should shop around for cheaper fuel sources for the benefit of consumers.
6. Fuel prices should be constantly reviewed so that a degree of equilibrium is achieved in the transport industry. NOCZIM should take cautionary steps in anticipation of devaluation, so that the negative impact on prices does not disturb the economy.
7. To achieve the expected energy efficiency levels, it will be necessary to import energy products from neighbouring countries, since interdependence is always a healthy aspect.

VII. GROUP DISCUSSIONS

The participants of the workshop were split into four mutually exclusive groups for the purpose of group deliberation and closed debate. The over-riding theme was to assess and discuss the main purpose of a NEEIP, under the following topics:

- overall vision and mission
- sector coverage
- fuel coverage
- short and medium term aims.

A. OVERALL VISION AND MISSION

1. The NEEIP will mitigate short-term energy supply problems and price rises. It should form part of the overall energy strategy.
2. Energy efficiency will be coordinated at a national level, and should form an integral part of the national economic development plan.

3. The NEEIP should raise national consciousness on all forms of energy and its efficient use.
4. Energy efficiency should provide sustainable development and reduce environmental degradation.
5. It should provide an equitable distribution of energy resources, and also reduce energy costs.
6. The NEEIP is expected to provide energy security and increase competitiveness.
7. It should improve health and standard of living for all.

B. SECTOR COVERAGE

1. On a prioritised basis, it was generally agreed that the sectors to be covered by the NEEIP are as follows:
 - Industry and Mining
 - Transport and Agriculture
 - Commercial
 - Domestic
 - Other.
2. To eliminate confusion "Energy Efficiency" is the normative operational undertaking, whereas "Energy Conservation" carries the implication of reducing growth and hence economic development.

C. FUEL COVERAGE

1. Fuel coverage should be broad spectrum, covering all energy fuels, on both the supply and demand sides. Prioritisation consideration should list electricity, coal and biomass. In Zimbabwe liquid fuels and some electricity have to be imported. The energy resource base is as follows:
 - Electricity
 - Coal
 - Liquid Fuels (hydrocarbons)
 - Biomass
 - Renewables. (Solar, wind, biogas, hydro).
2. With respect to liquid fuels, energy efficiency can be viewed in terms of speed limit impositions, availability of spare parts (for cleaner exhausts), and cost effective pricing.
3. Biomass points to a vast inefficient use of energy, and is a potential candidate for NEEIP.

D. SHORT AND MEDIUM TERM AIMS

1. The NEEIP should assist and support both suppliers and consumers of energy, leading to sustainable development.
2. Other objectives of the NEEIP are:
 - sustainable and cleaner environment
 - cost effectiveness of energy use
 - equitable distribution of energy resources.

3. In the implementation strategy, we expect to achieve the following:

- arrest demand growth in electricity.
- fuel switching.
- Renewable Energy Promotion (biogas, solar, wind, hydro).

E. BENEFITS

1. The target group for the NEEIP will be broadly the producers (e.g. ZESA) and consumers of energy.

2. The benefits of an energy efficiency programme should be viewed from the following perspectives:

- reduced fuel costs
- reduced hardships
- reduced pollution and environmental degradation.
- health improvement
- increased competitiveness
- increased standard of living for all.

F. ROLE OF GOVERNMENT

1. The government is to play a regulatory role as a facilitator in establishing the NEEIP. It should be looked upon as essentially a policy making body.

2. The salient areas for the role of government could be:

- energy efficiency legislation
- setting up or improving standards
- fiscal measures (tax rebates, subsidies, grants, incentives)
- pricing
- programme management mechanisms.

3. Government (DOERD) should formulate policy guidelines and set programme objectives, but refrain from the actual design and implementation of the NEEIP activities, which should be executed by the implementing agency.
4. In its strategy formulation the Government (DOERD) should:
 - identify barriers to implementation,
 - create a database on energy use,
 - set up an advisory body (steering committee),
 - draw up a National Energy Efficiency Strategic Plan
 - ensure national commitment
 - identify an umbrella organization (e.g. SIRDC).
 - set up an appropriate infrastructure.

G. TYPE OF ACTIVITIES ENVISAGED FOR THE NEEIP

1. From the above, leading questions would be;
 - What type of activities should NEEIP be involved with?
 - How will NEEIP implement the proposed programmes?
 - How will NEEIP interact with existing programmes and organisations?
2. The activities envisaged are multifaceted; some of which are:-
 - formulate NEEIP strategy and draw up the Energy Efficiency Plan.
 - set up consultative committee
 - set up infrastructure and seek funding (local and external)
 - set up standards and codes of practice
 - set up incentives (grants, rebates, loans)
 - promote efficient use of energy appliances
 - promote R & D, and establish a critical mass of energy efficiency enthusiasts (Energy Champion), to act as a conduit for the transfer and diffusion of the technology. R. & D. activity should include practical demonstrations, technical testing of products, and use of existing programmes.

- identify training needs; use of schools and vocationals, building industries, etc.
- carry out industry energy audits, and walk-through audits for consumers
- publicise success stories; use media coverage.
- promote information collection and set up database.
- assess energy efficiency demand; carry out survey.
- identify barriers
- enact enabling legislation.

VIII: WORKSHOP RECOMMENDATIONS

A. LEGAL AND INSTITUTIONAL ARRANGEMENTS

1. The implementing agency should ideally be an autonomous, quasi-government organization, capable of executing its mandate independently. The Institute of Energy to be established under the SIRDC is the natural host of the NEEIP. Government role should be limited to facilitator, coordination and regulatory.
2. An Advisory Board (Steering Committee), with a tripartite membership from Government, Energy Producers and Energy Consumers, should be set up to:
 - provide logistic direction to the NEEIP
 - provide strategic monitoring and counselling
 - ensure cost effectiveness of the NEEIP on policy basis
 - provide accountability for the NEEIP.

B. FUNDING

Funding for NEEIP should be along the same lines as for SIRDC. Government is expected to assist in the initial stages, but eventually the establishment should stand on its own feet.

C. COORDINATION

Coordination and dissemination activities could be effected:

- using technical assistance
- by approaching professional institutions
- through Government organizations
- using SIRDC as the databank for energy efficiency information.

D. HUMAN RESOURCES

The human resources requirements should call for expertise in a variety of fields: scientific/ technical, marketing, financial-economics. Employment will be effected on a contractual basis dependent on performance. There should be attractive packages to retain the services of the skilled personnel.

E. IMPLEMENTING STRATEGY

1. Prior to the above, DOERD (with technical assistance, if possible) will review legalities on the institutional status of the SIRDC, Research Council of Zimbabwe and the proposed Institute of Energy; in as far as they would reflect on NEEIP.
2. If the Institute of Energy within the SIRDC is late in starting, the NEEIP could be initiated right now, ahead of the Institute, in order to capitalise on the awareness generated so far, and on the urgency to implement energy efficiency. DOERD should hold discussions with the SIRDC and the Research Council of Zimbabwe, to launch the NEEIP soonest.

IX. MINISTER'S CONCLUDING REMARKS
(The Hon. D. Norman, M.P.)

1. Electricity is by far the focal point, among other energy resources, with respect to energy efficiency programmes. Zimbabwe has taken advantage of electricity imports from Zambia, Zaire and South Africa. Thanks to everybody's cooperation.
 2. As far as the Ministry of Transport and Energy is concerned, all energy technologies are welcome and expected to play some role: electricity, biomass, coal, hydro, liquid fuels, solar, wind, geothermal.
 3. The Government's role, in promoting the establishment of NEEIP, will be restricted to policy making and institutional support. The Zimbabwe Government is favoured by most donors because it pays up its debts.
 4. The NEEIP should primarily be a Zimbabwe project; planned, executed and implemented by Zimbabweans. We shall call upon technical/foreign assistance, only when and if it becomes necessary.
 5. It is now Government policy to refrain from subsidising parastatals. As such, NEEIP is expected to operate autonomously, on a commercial and profitable basis. I look forward to the practical establishment and implementation of the NEEIP.
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X. WRAP-UP

(Meeting held at Monomatapa Hotel, 18 December 1993)

A. GENERAL

1. The main idea is to start an Energy Efficiency Programme soonest, whilst the debate is most active, and move it later to the Institute of Energy at the SIRDC (if and when it materialises).
2. Two bodies need to be established before implementing the NEEIP: Energy Efficiency Coordinating Unit, and an Advisory Board (Steering Committee).
3. Identify gaps within the energy scene; raise funds; foster twinning with ETSU (promote reciprocal study tours).
4. Develop an information/database strategy.
5. Work on the legal status/statute for the NEEIP.
6. Institute a Consultative Committee to work out the modalities of initiating the NEEIP. The Committee would cooperate with ETSU and other technical assistance programmes.

B. ESMAP FOLLOW-UP

1. Ensure institutional strength of the DOERD to fulfill its policy and strategy formulation (skills, types of activities, planning) for the NEEIP.
2. Technical assistance required for establishing the NEEIP Coordinating Unit, and in part to determine its legal and corporate structure.
3. Further assistance to the DOERD for identifying gaps not covered by existing programmes within the Department. An information programme is a priority.

4. Funding to foster twinning arrangement of ESMAP and ETSU, for promoting the NEEIP activities.

C. ETSU FOLLOW-UP

1. Complete the workshop Final Report in mid-January 1994.
 2. Report on the strategy framework for a NEEIP.
 3. Ensure institutional guidelines and mechanism are in place, for effective implementation of energy efficiency activities.
 4. Produce recommendations on activities which DOERD should undertake to promote energy efficiency.
 5. Assist with guidelines to set up NEEIP's Coordinating Unit.
 6. Suggest strategies of the NEEIP Coordinating Unit.
-

XI. ANNEXE

ANNEX I: AGENDA

**NATIONAL ENERGY EFFICIENCY IMPROVEMENT PROGRAMME
JOINT DOERD/WORLD BANK WORKSHOP 15 - 17 DECEMBER 1993
MONTCLAIR HOTEL NYANGA**

Day 1 Thursday 16th December 1993

Morning Session 1

**Chairman Mr. J. Moyo Permanent Secretary,
Ministry of Transport & Energy**

0800 - 0830

Registration

0830 - 0840

**Opening Remarks.
Purposes and objectives of the NEEIP Workshop
The Permanent Secretary, Mr. J. Moyo**

0840 - 0850

**Opening Address:
The Honourable Minister of Transport & Energy
Mr. D. Norman**

0850 - 0855

Administrative arrangements

0855 - 0915

**DOERD Position Paper
Director of Energy, Mr. C.T. Mzezewa**

0915 - 0935

**World Bank
Mr. K.F. Schenk/Mr. S. Brushett
Presentation**

0935 - 1000

**ETSU
Overall situation in Zimbabwe & critical success
factors for energy efficiency programmes
Presentation**

1000 - 1015

*** * ***

Tea/Coffee

Morning Session 2

Chairman Mr. J. Moyo Permanent Secretary
Ministry of Transport and Energy

1020 - 1050

Questions on ETSU's presentation and report

1050 - 1115

Z E S A
Senior Manager (Corporate Planning)
Mr. D.D. Madzikanda
Presentation

1115 - 1140

ZABO, Chamber of Mines, CZI
Mr. R.H.A. Williams
Presentation

1140 - 1205

Zimbabwe Phosphate Industries
The Chief Engineer, Mr. Rushwaya
Presentation

1205 - 1230

Economist Point of View of NEEIP
Mr. J.J. Mangono (Department of Energy)

1230 - 1300

Consumer Council of Zimbabwe
Director, Mr. M. Nyambuya
Presentation

1300 - 1400

* * *

Lunch Break

Delegates are placed into four (4) discussion groups 10 - 12 people.

Each group chooses the Chairperson for the particular session

1400 - 1500

Aims/Purpose of NEEIP

1500 - 1530

Report back, agree definition of NEEIP

1530 - 1545

* * *

Tea/Coffee

1545 - 1645

Type of activity desired for NEEIP

1645 - 1715

Report back, agree desired activities

1715 - 1730

Announcements for the following day. **The formal DINNER**

Day 2 Friday 17 December 1993

Chairman Mr. J. Moyo Permanent Secretary
Ministry of Transport and Energy

Plenary Session:-

0800 - 0830		Review of previous day Then continue to work in groups
0830 - 0930		NEEIP Coordination and relevance to existing programmes
0930 - 1000		Report back, and agree
1000 - 1030	* * *	Tea/Coffee break
1030 - 1130		Individual programme implementation
1130 - 1200		Report back, and agree
1200 - 1230		ETSU summary of recommendations
1230 - 1300		Closing remarks Ministry of Transport & Energy
1300 - 1400	* * *	Lunch Break
1430		Delegates leave for home



ANNEX II

NATIONAL ENERGY EFFICIENCY IMPROVEMENT PROGRAMME LIST OF PARTICIPANTS

- | | | | |
|-----|--|-----|---|
| 1. | Mr. D. Norman
The Honourable Minister
Ministry of Transport & Energy | 2. | Mr. J. Moyo
Permanent Secretary
Ministry of Transport & Energy |
| 3. | Mr. C.T. Mzezewa
Director of Energy
Ministry of Transport & Energy | 4. | Mr. C.S. Murove
Assistant Director
Ministry of Transport & Energy |
| 5. | Mr. J. Chirara
Assistant Director
Ministry of Transport & Energy | 6. | Mr. T.W. Samunyai
Assistant Director
Ministry of Transport & Energy |
| 7. | Mr. J.J. Mangono
Principal Energy Dev. Officer
Ministry of Transport & Energy | 8. | Miss E. Muguti
Principal Energy Dev. Officer
Ministry of Transport & Energy |
| 9. | Mrs D. Kayo
Principal Energy Dev. Officer
Ministry of Transport & Energy | 10. | Mr. S.R. Wadesango
Principal Energy Dev. Officer
Ministry of Transport & Energy |
| 11. | Mr. F.N. Maziweyi
Principal Energy Dev. Officer
Ministry of Transport & Energy | 12. | Mrs J.Z. Mawema
Senior Energy Dev. Officer
Ministry of Transport & Energy |
| 13. | Miss E. Zhande
Planner
Ministry of Transport & Energy | 14. | Mr. C. Phaira
Energy Development Officer
Ministry of Transport & Energy |
| 15. | Miss S. Madau
Energy Development Officer
Ministry of Transport & Energy | 16. | Mr. H. Gonye
Energy Development Officer
Ministry of Transport & Energy |
| 17. | Mr. N. Msakwa
Energy Development Officer
Ministry of Transport & Energy | 18. | Mr. E. Bunjira
Energy Development Officer
Ministry of Transport & Energy |

- | | | | |
|-----|---|-----|--|
| 19. | Mr. F. Mambwere
Energy Development Officer
Ministry of Transport & Energy | 20. | Mr. A.F.N. Mangena
Assistant Secretary
Local Govt. Rural & Urban Dev. |
| 21. | Miss E.M. Hlazo
Senior Economic Planner
National Economic Planning Commission | 22. | Mr. W.T. Vengesai
Director of Professional Services
Min.of Public Const. & Nat.Housing |
| 23. | Mr. L.D. Mwaita
Under Secretary
Ministry of Mines | 24. | Mr. A.Z. Matiza
Design Policy Analyst
Min. of Environment & Tourism |
| 25. | Mr. M.I. Muzondo
Project Officer
Biomass Users'Network | 26. | Mr. O. Gomm
Programme Coordinator
Energy Programme Zimbabwe |
| 27. | Mr. I. Dube
Research Engineer
Z E S A | 28. | Mr. D. Madzikanda
Senior Manager (Corporate Plan.)
Z E S A |
| 29. | Mr. M. Mushambi
Marketing Manager
NOCZIM | 30. | Dr. E.G. Mtetwa
Member
Research Council of Zimbabwe |
| 31. | Mr. M. Chateuka
Lecturer
University of Zimbabwe | 32. | Mr. T. Mutiti
Marketing Manager
Wankie Colliery Co. Pvt Ltd |
| 33. | Mr. L.K. Chirombo
Partner/Architect
The Institute of Archetects | 34. | Mrs M.P. Mutasa
Director of Standards
Standards Association of Zimbabwe |
| 35. | Mr. H.R.A. Williams
Production Manager
ZIMASCO Kwekwe Division | 36. | Mr. D. Chigodora
Production Manager
Sable Chemicals |
| 37. | Mr. G. Stiles
Industrial Energy Consultant
S A D C | 38. | Mr. M. Nyambuya
Director
Consumer Council of Zimbabwe |
| 39. | Mr. C. Manzira
Chief Economist
Ministry of Finance | 40. | Mr. S. Brushett
Deputy Resident Representative
World Bank Mission |

- | | | | |
|-----|---|-----|---|
| 41. | Mr. K.S. Ndoro
Senior Economist
Commercial Farmers'Union | 42. | Ms. A. Muskwe
Assistant Secretary
Ministry of Industry & Commerce |
| 43. | Mr. P. Karhammar
Resident Representative
S I D A | 44. | Mr. O. Onyango
Principal Financial Analyst
African Development Bank |
| 45. | Ms. P. Hensnen
The Chief Executive
Zimbabwe Institution Engineers | 46. | Dr. C. Mukora
Director
Zimbabwe Farmers'Union |
| 47. | Mr. G.T. Rushwaya
Chief Engineer
Zimbabwe Phosphate Industries | 48. | Mr. B. Kanu
Programme Officer
U N D P |
| 49. | Dr. G. Mandishona
National Project Manager
Global Environmental Facility | 50. | Mr. S. Moyo
Research Fellow
Z I D S |
| 51. | Mr. L. Sibanda
Senior Agricultural Economist
Min. of Lands, Agric. & Water Dev. | 52. | Mrs. J. Madzongwe
Energy Specialist
C I D A |
| 53. | Mr. C.S. Moyo
Maintenance Manager
Monomatapa Hotel | 54. | Dr. C.B. Thornton
Technical Director
Hunyani Holdings Ltd. |
| 55. | Mr. Kurt F. Schenk
Power Specialist
WB ESMAP Operations Division | 56. | Dr. A. Gilchrist
Industrial Utilities Specialist
Energy Technology Support Unit |
| 57. | Mr. R. Spencer
Energy Efficiency Marketing Specialist
Energy Technology Support Unit. | | |

NB

<i>SADC</i>	<i>Southern Africa Development Community</i>
<i>SIDA</i>	<i>Swedish International Development Agency</i>
<i>IBDC</i>	<i>Indegenous Business Development Centre</i>
<i>UNDP</i>	<i>United Nations Development Programme</i>
<i>ZIDS</i>	<i>Zimbabwe Institute of Development Studies</i>
<i>CIDA</i>	<i>Canadian International Development Agency</i>
<i>WB</i>	<i>World Bank</i>
<i>ESMAP</i>	<i>Energy Sector Management Assistance Programme</i>
<i>NOCZIM</i>	<i>National Oil Company of Zimbabwe</i>



ANNEX III

WORKSHOP DISCUSSION GROUPS

GROUP A	GROUP B	GROUP C	GROUP D
Mr. C.T. Mzezewa Director Energy CHAIRMAN	Mr. Chirara Ass. Director DOERD CHAIRMAN	Mr. Samunyai Ass. Director DOERD CHAIRMAN	
Ms. E. Muguti PEDO DOERD	Mr. F. Maziweyi Pedo DOERD	Mr. J.J. Mangono PEDO DOERD	Mrs D. Kayo PEDO DOERD
Mr. C. Pfaira EDO GEF Project	Mrs J.Z. Mawema SEDO DOERD	Mr. N. Msakwa EDO DOERD	Mr. E. Bunjira ED DOERD
Miss S. Madau EDO DOERD	Mr. H. Gonye EDO DOERD	Ms. E.M. Hlazo Snr Econ. Planner (NEPC)	Mr. W. Vengesai Director Prof. Services (MPCNH)
Mr. F. Mambwere EDO DOERD	Mr. A.F. Mangena Acting Sec. LGR & UD	Mr. M. Mzondo Proj. Officer BUN	Mr. O. Gomm Prog. Co-ord. GTZ
Mr. L.D. Mwaita Under Secretary Min. of Mines	Mr. A.Z. Matiza Design Policy Analyst (MoE & T)	Mr. M. Mushambi Sales Manager NOCZIM	Mrs MP Mutasa Director of Standards SAZ
Mr. I. Dube Rrsearch Eng. ZESA	Mr. Madzikanda Sen. Mgr (CP) ZESA	Mr. S. Brushett Deputy Rep. World Bank	Mr. K.S. Moyo Sen. Economist CFU
Mr. M. Chateuka Lecturer UZ	Mr. T. Mutiti Marketing Mgr Wankie Col. Co.	Mr. T. Onyongo Princ. Financial Analyst (ADB)	DR. E.G. Mletwa Member RCZ
Mr. R. Williams Prod. Manager ZIMASCO	Mr. D. Chigodora Prod. Manager Sable Chemicals	Dr. C. Mkora Director ZFU	Mr. S. Moyo Research Fellow ZIDS
Mr. G. Stiles Ind. Energy Consultant SADC	Mr. M. Nyambuya Director CCZ	Mr. G. Rushwaya Chief Engineer Zimphos Ind.	Mr C.S. Moyo Maintenance Eng. Monomatapa Hotel
Mr. Kurt Schenk Power Specialist WORLD BANK	Ms. A. Muskwe Ass. Secretary Min of Ind & Comm.	Ms. E. Zhande Planner MoT & E	Dr. C.B. Thornton Group Tech Mgr. Hunyani Pulp
	Mr. P. Karhammar Resident Rep SIDA	Dr. A. Gilchrist Ind. Util Specialist ETSU	Mr. R. Spencer EE Marketing Specialist ETSU
	Mrs Madzongwe Energy Specialist CIDA		

